Maintenance Alarms for Avaya Aura™ Communication Manager, Media Gateways and Servers

03-300430
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Contents

Introduction

This document provides procedures to monitor, test, and maintain an Avaya Server or Media Gateway system. It covers many of the faults and troubles that can occur and provides procedures to correct them.

Using this documentation, the Avaya technicians and the technicians of their business partners and customers should be able to follow detailed procedures for:

- Monitoring, testing, and maintaining an Avaya Server, Media Gateway, and many other system components.
- Using troubleshooting methods to clear faults.
- Required replacements, visual inspections, continuity checks, and clarifying operating procedures with end users.

Document set

Although this maintenance book is published separately, it is part of a set:

- *Maintenance Alarms for Avaya Aura™ Communication Manager, Media Gateways and Servers,* 03-300430 (formerly 03-300190, 555-245-102)
- *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers,* 03-300431 (formerly 03-300191, 555-245-101)
- *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers,* 03-300432 (formerly 03-300192, 555-245-103)

Organization

The Server Alarms chapter has been moved to *Avaya Aura™ Communication Manager Server Alarms (03-602798)*

The Denial Events chapter has been moved to *Avaya Aura™ Communication Manager Denial Events (03-602793)*

The Media Gateway Traps chapter has been moved to *Gateway Traps for the G250/G350/G430/G450/G700 Avaya S8xxxx Servers (03-602803)*

The LEDs chapter has been moved to *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*

Chapter 1: Communication Manager Maintenance Object Repair Procedures, contains specific troubleshooting and repair instructions for every component in the system. The maintenance objects are listed alphabetically by name as they appear in the Alarm and Error Logs. Under each maintenance object appears a description of the object's function, tables for interpreting alarm and error logs, and instructions on how to use tests, commands, and replacements to resolve associated problems.

Chapter 2: Maintenance Demand Tests contains all of the demand tests that can be executed, the error codes returned, and the recommended actions for troubleshooting and repairing the problem.

Equipment/platforms

This book contains information regarding alarms on the following equipment/platforms

- Avaya Media Servers
- Avaya Media Gateways

Audience

The information in this book is intended for use by Avaya technicians, provisioning specialists, business partners, and customers, specifically:

- Trained Avaya technicians
- A maintenance technician dispatched to a customer site in response to a trouble alarm or a user trouble report
- A maintenance technician located at a remote maintenance facility
- The customer's assigned maintenance technician

The technician is expected to have a working knowledge of telecommunications fundamentals and of the particular Avaya Server and/or Media Gateway to the extent that the procedures in this book can be performed, in most cases, without assistance.

This book is not intended to solve all levels of troubles. It is limited to troubles that can be solved using:

- The Alarm Log
- The Error Log
- Trouble-clearing procedures
- Maintenance tests
- Traditional troubleshooting methods

If the trouble still has not been resolved, it is the maintenance technician's responsibility to escalate the problem to a higher level of technical support. Escalation should conform to the procedures in the Technical and Administration Escalation Plan.

How to use this Document

Most maintenance sessions involve analyzing the Alarm and Error Logs to diagnose a trouble source and replacing a component such as a circuit pack or media module. The information in Chapter 1: Communication Manager Maintenance Object Repair Procedures of this reference will generally suffice to address these needs.

Certain complex elements of the system require a more comprehensive approach. Special procedures for these elements appear in Chapter 4: General troubleshooting of *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

Structure of the book

This document includes new information developed for this release of Communication Manager. In order to present maintenance information from all these sources side-by-side, marking conventions delineate material specific to a particular source. The markers act on two levels:

- Major and minor sections
- Paragraphs or inline comments

Major and minor sections

At the Major and minor sections level, a ruled line delineates the beginning of a section of material specific to the server or gateway identified in bold. At the conclusion of the section, another ruled line marks the end of the specific material and a return to common text. For example, a section of material specific to the S8720 or S8500 server would look like:

S8700 | S8710 | S8720 | S8500

1. If only 1 analog circuit pack in the system has this problem, replace the circuit pack.
2. If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier.
3. If analog circuit packs on many carriers have this error, it is probably a problem with the ringing generator.

Such sections can occasionally extend for several pages.

Paragraphs or inline comments

At the paragraph level and for inline comments, the specific server or gateway is indicated by its bold name, and the parenthetical information follows immediately afterward. For example, a paragraph insert for the S8710 and S8500 servers might looks like:

1. If the Tone-Clock circuit is a slave clock, then the EI to which it is listening is providing a bad timing source. Follow the diagnostic procedures specified for TDM-CLK Error Code 2305.
2. **S8700 | S8710 | S8720** | **S8500**: If no problem can be found with the incoming synchronization signal, replace the IPSI or Tone-Clock circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.

In such cases, it is not necessary to delineate the beginning and end of the material.

An example of an inline comment might look like:

3. **Error Type 1**: There is a serial number mismatch between the hardware serial number and installed license file (**S8700 | S8710 | S8720** | **S8500**: there is a serial-number mismatch of the reference IPSI and a subsequent License Error failure. **S8300**: there is a serial-number mismatch of the Media Gateway motherboard on which the serial number resides and a subsequent License Error failure). This error is caused by the:
   - **S8700 | S8710 | S8720** | **S8500**: Reference IPSI not responding
     S8300: Media Gateway motherboard not responding
   - Expiration of the 10-day timer

   The system enters No-License mode.

It is hoped that, by these techniques, material specific to several different sources can be combined and viewed side-by-side without confusion.

Conventions used in this document

Table 1: Typography used in this book describes the typographic conventions used in this document.

Table 1: Typography used in this book *1 of 2*

To represent . . .	This typeface and syntax are shown as . . .	For example, . . .
SAT screen commands	• Bold for **literals** • Bold italic for ***variables*** • Square brackets **[ ]** around optional parameters • "Or" sign **|** between exclusive choices	**refresh ip-route [all | *location*]**
SAT screen input and output	• Bold for **input** • Constant width for `output (screen displays and messages)`	Set the `Save Translation` field to **daily**. The message `Command successfully completed` should appear.
Linux commands	• Constant-width bold for **`literals`** • Constant-width bold italics for ***`variables`*** • Square brackets `[]` around optional arguments • "Or" sign **|** between exclusive choices	**`testmodem [-s] | [-t arg]`**
Linux output	`Constant width`	Linux returns the message `almdisplay 4: Unable to connect to CommunicaMgr.`
		1 of 2

Table 1: Typography used in this book ***2 of 2***

To represent . . .	This typeface and syntax are shown as . . .	For example, . . .
Web interface	• Bold for **menu selections, tabs, buttons,** and **field names**	Select **Alarms and Notification,** the appropriate alarm, and then click **Clear**.
	• Right arrow **>** to separate a sequence of menu selections	Select **Diagnostics > View System Logs**, then click **Watchdog Logs**.
Keys	Special font for **keyboard keys** and SAT screen **clickable buttons**	Press **Tab**. Click **Next Page**.
		2 of 2

Other conventions used in this book:

- Physical dimensions are in English [Foot Pound Second (FPS)] units, followed by metric [Centimeter Gram Second) (CGS)] units in parentheses.

  Wire-gauge measurements are in AWG, followed by the diameter in millimeters in parentheses.
- Circuit-pack codes (such as TN790B or TN2182B) are shown with the minimum acceptable alphabetic suffix (like the “B” in the code TN2182B).

  Generally, an alphabetic suffix higher than that shown is also acceptable. However, not every vintage of either the minimum suffix or a higher suffix code is necessarily acceptable.

Useful terms

Table 2: Terminology summary summarizes several of the terms used in this book and relates them to former terminologies.

Table 2: Terminology summary

Present Terminology	Former Terminology
Communication Manager	DEFINITY MultiVantage Avaya Call Processing
S8300 Server	ICC, Internal Call Controller
S8700-series Server (or non-co-resident S8300)	ECC, External Call Controller
MGP, Media Gateway Processor	860T Processor
Layer 2 Switching Processor	P330 Stack Processor Cajun Stack Processor i960 Processor
Fiber-PNC	Multiconnect. This is an umbrella term for direct-connect, CSS-connected, and ATM-connected PNC.
IP-PNC	IP-connect

Related resources

Additional document resources lists additional documentation that is available from the Avaya web site http:/support.avaya.com.

Table 3: Additional document resources *1 of 2*

Document	Number
Avaya Aura™ Communication Manager Denial Events (03-602793)	03-602793
Avaya Aura™ Communication Manager Server Alarms (03-602798)	03-602798
Gateway Traps for the G250/G350/G430/G450/G700 Avaya S8xxxx Servers (03-602803)	03-602803
LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)	03-602804
Avaya Aura™ Communication Manager Survivable Options	03-603633
Avaya Aura™ Communication Manager Hardware Description and Reference	*555-245-207*
Administering Avaya Aura™ Communication Manager	03-300509
Installing and Upgrading the Avaya S8300 Server	555-234-100
Installing and Upgrading the Avaya G700 Media Gateway	03-603333
Installing and Upgrading the Avaya G250 Media Gateway	03-300434
Installing and Upgrading the Avaya G350 Media Gateway	*03-300394*
Installing and Upgrading the Avaya G430 Media Gateway	*03-603233*
Installing and Upgrading the Avaya G450 Media Gateway	*03-602054*
Maintenance Commands Reference (03-300431)	03-300431
Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)	03-300432
User's Guide for the Avaya P333T Stackable Switch Release 3.12	See web page
DEFINITY® AUDIX Maintenance	585-300-110
DEFINITY® Communications System Network and Data Connectivity	555-025-201
Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager	03-601508
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Table 3: Additional document resources *2 of 2*

Document	Number
DEFINITY® Communications System Generic 2.2 and Generic 3 V2 DS1/ CEPT1/ISDN-PRI Reference	555-025-107
DEFINITY® Communications System Generic 1 and Generic 3i Wiring	555-204-111
Maintenance for the Avaya S8700 Media Server with an Avaya SCC1 Media Gateway or an Avaya MCC1 Media Gateway	555-233-143
Avaya MultiVantage Solutions Installation and Maintenance for Survivable Remote EPN	555-233-121
Installing the Avaya S8700 Media Server with the Avaya G600 Media Gateway, the Avaya MCC1 Media Gateway, or the Avaya SCC1 Media Gateway (Library CD)	Library CD
ATM Installation, Upgrades, and Administration using Avaya Communication Manager	555-233-124
Multiple Asynchronous Data Unit User Manual, 555-401-702	555-401-702
Administering Network Connectivity on Avaya Aura™ Communication Manager	555-233-504
Site Preparation, Installation, and Operator's Manual - See appropriate manual for the UPS Model	See web page
Installing and Configuring the Avaya S8700-Series Server	03-300145
Installing the Avaya G650 Media Gateway	03-300685
Installing and Configuring the Avaya S8500-Series Server	03-300143
Job Aids for Field Replacements (FRUs) for the Avaya S8700-Series Servers	03-300530
Job Aids for Field Replacements (FRUs) for the Avaya S8500 Server	03-300529
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A warning statement calls attention to a situation that can result in harm to hardware or equipment.

DANGER:

A danger statement calls attention to a situation that can result in harm to personnel.

SECURITY ALERT:

A security alert calls attention to a situation that can increase the potential for unauthorized use of a telecommunications system.

Safety precautions

When performing maintenance or translation procedures on the system, observe all caution, warning, and danger admonishments to prevent loss of service, possible equipment damage, and possible personal injury. In addition, the following precautions regarding electromagnetic interference (EMI) and static electricity must be observed:

Electromagnetic interference

This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise in the customer's equipment. If the equipment is not installed and used in accordance with the instruction book, radio interference may result.

To maintain the EMI integrity of the system, maintenance personnel must ensure that all cabinet panels, covers, and so forth, are firmly secured before leaving the customer's premises.

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Chapter 1: Communication Manager Maintenance Object Repair Procedures

This chapter provides information for troubleshooting and repairing maintenance objects.

Note:

This chapter does not contain maintenance objects for the Avaya Wireless Business System or messaging systems. Refer to the documentation that accompanies these products for this information.

Each identifiable part in the system is considered a maintenance object (MO). A maintenance object can be:

- An individual circuit pack or media module
- A hardware component that is part of a circuit pack or media module
- Any software process
- Significant events
- Environmental controls
- A cabinet

Each maintenance object has its own unique set of tests, error codes, and recovery strategy. Maintenance software logs inline errors reported by circuit packs and media modules, runs tests for error diagnosis and recovery, and raises and clears alarms.

"Maintenance names" are recorded in the Error and Alarm logs. Individual copies of an MO are assigned an address that defines the MO's physical location in the system when applicable. These locations display as the **port** field in the Alarm and Error logs and as output of commands such as **`test board`** (see Figure 1: Display of test board**).**

Figure 1: Display of test board

```
test board 1v4 long                                                 Page   1

                              TEST RESULTS

Port        Maintenance Name  Alt. Name Test No. Result             Error Code

001V4       MG-DS1                      50       ABORT              1412
001V4       MG-DS1                      52       PASS
001V4       MG-DS1                      138      PASS
001V4       MG-DS1                      139      PASS
001V4       MG-DS1                      140      PASS
001V4       MG-DS1                      141      PASS
001V4       MG-DS1                      142      PASS
001V4       MG-DS1                      143      PASS
001V4       MG-DS1                      144      PASS
001V4       MG-DS1                      145      PASS
001V4       MG-DS1                      146      PASS
001V4       MG-DS1                      1227     ABORT              1412
001V401     TIE-DS1           0001/001  7        ABORT              1412
```

Displaying MOs Maintained by Communication Manager

Communication Manager maintenance objects are displayed using the **`list configuration`** or **`show mg list_config`** command.

`list config` ***`all`*** on the Communication Manager System Access Terminal (SAT) screen displays the Board Name (location), Board Type, Code, Vintage, and the assigned ports, if any, of all installed equipment in the system.

`show mg list_config` on the MGP displays information for the installed equipment in that media gateway.

Media Gateway Subsystems

The Media Gateway subsystems are either field replaceable or integrated (part of the system and not replaceable). These subsystems are not under Communication Manager control and are not maintained by the system. Table 4: Media Gateway Subsystems Maintained by Communication Manager lists the applicable subsystems and if they are field replaceable or not.

Table 4: Media Gateway Subsystems Maintained by Communication Manager

Subsystem	Field Replaceable
Any Media Module	Yes
VOIP Media Module	No
Announcement Circuitry (part of the MGP)	No

Media Gateway Maintenance Objects Maintained by Communication Manager

The maintenance strategy for the Media Gateways is intended to provide easy fault isolation procedures and to restrict problems to field-replaceable components. The following list contains the maintenance objects which are under Communication Manager control and are maintained by the system:

- MED-GTWY (MEDIA GATEWAY)
- MG-ANA (Analog Media Module)
- MG_ANN (Media Gateway Announcement Module)
- MG-BRI (BRI Trunk Media Module)
- MG-DCP (Digital Line Media Module)
- MG-DS1 (DS1 Interface Media Module)
- MG-IAMM (Integrated Analog Media Module)
- MG-VOIP (MM760 VoIP Media Module)

MO groupings by Media Module type

Table 5: Media Module Types shows MO groupings by Media Module type.

Table 5: Media Module Types *1 of 2*

Media Module (MM)	Maintenance Object (MO)
E1/T1 Media Module	Board (MG-DS1)
	DS1 CO Trunk (CO-DS1)
	DS1 DID Trunk (DID-DS1)
	DS1 Tie Trunk (TIE-DS1)
	DS1 ISDN Trunk (ISDN-TRK)
	ISDN-PRI Signaling Link Port (ISDN-PLK)
	ISDN-PRI Signaling Group (ISDN-SGRP)
	Wideband Access Endpoint Port (WAE-PORT)
Analog Media Module	Board (MG-ANA)
	Analog Line (AN-LN-PT)
	Analog Co Trunk (CO-TRK)
	Analog DID Trunk (DID-TRK)
	DIOD Trunk (DIOD-TRK)
	Alarm Port (ALARM-PT)
DCP Media Module	Board (MG-DCP)
	Digital Line (DIG-LINE)

1 of 2

Table 5: Media Module Types ***2 of 2***

Media Module (MM)	Maintenance Object (MO)
BRI Trunk Media Module	Board (MG-BRI)
	ISDN Trunk Side BRI Port (TBRI-PT)
	ISDN Trunk Side Signaling (TBRI-TRK)
Integrated Analog Module in V7 (G350) Integrated Analog Module in V3(G250's)	MG-IAMM
	2 of 2

Viewing Communication Manager Alarms

Communication Manager alarms and events are viewed using commands that are available via the Web Interface or the SAT command-line interface (CLI). See Table 6: Commands for Viewing Communication Manager Alarms.

Table 6: Commands for Viewing Communication Manager Alarms

Command	Interface	Purpose	Description
`View Current Alarms`	Web Interface, under Alarms and Notification	View a list of outstanding alarms against Communication Manager	Displays a summary of alarms, if present, followed by a detailed table of explanation.
`display alarms`	SAT CLI	View logged Communication Manager alarms	These are alarms that have not yet been cleared, either manually or via an Expert System.

Command Syntax

Commands use a different syntax for the board or port location depending upon whether they refer to circuit packs or media modules. Test command sequences can be either short or long (l). The default is short. The test sequence can be repeated several times. The default is 1.

The following is an example for running a long test sequence twice on a port on a circuit pack:

test port *UUCSSpp l r 2*

- *UU* = the universal cabinet number (1 - 64)
- *C* = the carrier designation (A, B, C, D, or E)
- *SS* = the circuit pack slot number (01, 02,...)
- *pp* = the 2-digit port number (01, 02,...)
- *l* = long test sequence
- *r* = repeat
- *2* = the number of times the test sequence should be repeated.

The following is an example for testing a port on a media module. It runs the short test sequence:

test port *GGGVSpp r 3*

- *GGG* = the media gateway number (1 - 250)
- *V* = the literal letter V, which designates a media gateway
- *S* = the media module number (1 - 9)
- *pp* = the 2-digit port number (01, 02,...)
- *r* = repeat
- *3* = the number of times the test sequence should be repeated

Alarm levels

During normal operations, software or firmware may detect error conditions concerning specific Maintenance Objects (MOs). The system automatically attempts to fix or circumvent the problem. The alarms are classified depending on their effect on system operation:

- **Major alarms** — Failures that cause critical degradation of service. These alarms require immediate attention.
- **Minor alarms** — Failures that cause some degradation of service, but do not render a crucial portion of the system inoperable. A minor alarm typically affects a few trunks or stations or a single feature. Minor alarms require attention, but the consequences are not immediate.
- **Warning alarms** — Failures that cause no significant degradation of service or failures in equipment. These failures are not reported to INADS or the attendant console.
- **On-Board** problems originate in the circuitry on the alarmed Media Module or circuit pack.

- **Off-Board** problems originate in a process or component that is external to the Media Module or circuit pack.

Alarms are communicated by entries in the alarm log and the turning on of LEDs located on the attendant console, on all circuit packs, on the server, on the Ethernet switch if there is one, and, optionally, on customer-designated voice terminals.

Abort Code 1412

Tests which are not applicable for media modules or media gateways abort with Error Code 1412. This error indicates that the test is not valid for the particular maintenance object and can be ignored.

Escalation Procedure

This document is not intended to solve all problems. If the limits of these procedures have been reached and the problem is not resolved, the problem should be escalated to a higher level of technical support.

This escalation should conform to the procedures in the *Technical and Administration Plan*.

Frequently, a repair procedure recommends repeating a test several times after waiting short time intervals, for example, at one minute intervals up to five times. If, after these repetitions, no response to the test has occurred or if the same Abort or Failure continues to occur, escalate the problem to a higher level of technical support.

EPN Angel Address/Slot Mapping

The following table contains the Angel addresses for EPNs. Note the different mappings for different A-carrier types.

Table 7: EPN Angel Address/Slot Mapping

Slot Number	Carrier								
	A[1]	A[2]	A[3,4]	B[4]	C[4]	D[4]	E[4]	D[5]	E[5]
0	27	----	90	86	118	54	22	----	----
1	28	30	27	66	98	34	02	----	----
2	29	31	28	67	99	35	03	32	00
3	30	56	29	68	100	36	04	33	01
4	31	57	30	69	101	37	05	34	02
5	56	58	31	70	102	38	06	35	03
6	57	59	56	71	103	39	07	36	04
7	58	60	57	72	104	40	08	37	05
8	59	61	58	73	105	41	09	38	06
9	60	62	59	74	106	42	10	39	07
10	61	63	60	75	107	43	11	48	16
11	62	----	61	76	108	44	12	----	----
12	63	----	62	77	109	45	13	49	17
13	88	----	63	78	110	46	14	40	08
14	89	----	88	79	111	47	15	41	09
15	90	----	89	80	112	48	16	42	10
16	91	----	----	81	113	49	17	43	11
17	92	----	----	82	114	50	18	44	12
18	93	----	----	83	115	51	19	45	13
19	94	----	----	84	116	52	20	46	14
20	95	----	----	85	117	53	21	47	15
21[6]	----	----	----	86	118	54	22	----	----

1. Carrier A mappings for EPN MCC1/SCC1 media gateways

2. Carrier A mappings for EPN G600 media gateway (RMC) carrier

3. Carrier A mappings for G650 media gateway (ERMC) carrier

4. G650 MGs have power supply in slots 0/15. Slots 16-20 n/a
5. Carrier E/D mappings for SN/Dup SN carrier slots 2-10, 12-20
6. Service Slot is labeled slot 0, external slot 21

ABRI-POR (ASAI ISDN-BRI Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full MO Name
ABRI-POR [1]	MAJ MIN WRN	**test port *location* l**	ASAI ISDN-BRI port

1. Use **set options** to set the alarm level for ABRI ports. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ABRI port in the system.

For repair procedures, see BRI-PORT (ISDN-BRI Port).

AC-POWER

AC Power for AC-Powered Systems

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AC-POWER	WRN	**test environment *location***[1]	AC Power

1. Cabinet number indicated in the PORT field of the alarm log.

Three different cabinet types are supported as PNs: multicarrier cabinets, single-carrier cabinets, and the G650 rack mounted cabinets. All types may be powered by either an AC or DC power source. Environmental maintenance differs according to a cabinet's type and its power supply.

CAUTION:

Before powering down a cabinet or carrier that contains an EMBEDDED AUDIX circuit pack (TN566), first power down the AUDIX unit to avoid damaging its software. Instructions for powering down this unit are in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

Power System for Single-Carrier Cabinet

Each single-carrier cabinet has one power supply that distributes DC power and AC ringing voltage to the circuit pack slots in the cabinet.

AC Power Supply (WP-91153)

In an AC-powered cabinet, a single, plug-in, multi-output AC power supply is in the power supply slot. A power cord, with a 3-prong plug on one end and an appliance connector on the other end, connects the supply to a dedicated AC power source. The inputs to the power supply can be (depending on list version):

- 120 VAC, 60 Hz, 15 to 20 Amp; three wires in the power cord (one hot, one neutral, and one ground wire)
- 220 VAC or 240 VAC, 50 Hz, 10 Amp; three wires in the power cord (one hot, one neutral, and one ground wire)

The AC power supply produces the following DC outputs: +5 VDC, -5 VDC, -48 VDC, +12 VDC, and a battery-charging voltage. The DC outputs distribute power on the cabinet backplane to the circuit pack slots.

The AC power supply also produces AC ringing voltage. The AC ringing voltage output value and frequency depend on the country of use. The power supply has a circuit breaker and EMI filtering.

Nominal Power Holdover

Multicarrier Cabinets

Two types of battery holdover are available:

- The small battery assembly provides short-term battery holdover. If AC power fails, 48 VDC batteries power the system for:
  - 15 seconds in a PN cabinet
  - 10 minutes in the expansion control carrier in the “A” position of a PN cabinet
- Some AC-powered multicarrier cabinets (MCCs) contain three 48-Volt batteries and a battery charger (397C) to provide backup power in case power is interrupted. The holdover times are identical to those above.

Single-Carrier Cabinets

A holdover circuit in the power supply allows a system to operate normally during AC power interruptions. When AC input power fails, reserve batteries supply power to the memory and processor circuit packs and fans for two minutes. Every port circuit pack is inactive during this time. The power supply contains a battery charger to charge the holdover batteries.

Error log entries and recommended actions

Table 8: AC-POWER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0[1]	0	Any	Any	Any	**`test environment`** ***`location`***
513	Any	AC Power Query Test (#78)	WRN	OFF	**`test environment`** ***`location`***

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test’s description, and follow its recommended procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Note:
The following tests apply to J58890CE, J58890CF, and J58890CH.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

AC-POWER for DC-Powered Systems

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AC-POWER	WRN	**test environment** ***location***	AC Power

Note:

In a DC-powered multicarrier cabinet, the AC-POWER MO exists but serves no functional purpose. Because the system cot determine the type of power used, the AC-POWER test should always pass or abort. See CARR-POW (Carrier Power Supply) for the maintenance strategy for power components in DC cabinets.

S8700-series Fiber-PNC supports three cabinet types for PNs: multicarrier cabinets (MCCs), single-carrier cabinets (SCCs), and 19-inch rack mounted cabinets. Every type may be powered by either an AC or DC power source. Environmental maintenance differs according to a cabinet's type and its power supply.

S8700-series IP-PNC supports 19-inch rack mounted cabinets, powered by either an AC or DC power source.

Error log entries and recommended actions

Table 9: AC-POWER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0[1]	0	Any	Any	Any	**test environment** ***location***
513	Any	AC Power Query test (#78)	WRN	OFF	**test environment** ***location***

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

ADJ-IP (ASAI Adjunct TCP/IP Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADJ-IP	MAJ MIN WRN	**test port** ***location***	ASAI Adjunct TCP/IP Link

The ASAI Adjunct TCP/IP Link is the Adjunct Switch Application Interface (ASAI) proprietary link which connects to a C-LAN circuit pack.

Error log entries and recommended actions

Table 10: ADJ-IP Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test aesvcs** ***link#***
2 (b)	Any				**test aesvcs** ***link#***
18 (c)		**busyout port** ***location***	WRN	OFF	**release aesvcs** ***link#***
257 (d)	Any	ASAI Link Status Test (#1365)	MAJ MIN WRN[1]	OFF	**test aesvcs** ***link#***
1025 (e)			MAJ MIN WRN[1]	OFF	**test aesvcs** ***link#***
3329 (f)		ASAI Link Status Test (#1365)	MAJ MIN WRN[1]	OFF	**test aesvcs** ***link#***

1. Alarms may be downgraded according to values set on the **set options** form.

Notes:

a. **Error Type 0**: Run the ASAI Link Status Test (#1365) and follow its recommended procedures.

b. **Error Type 2**: Too many Q931 protocol timeouts in a short time. No action to take.

c. **Error Type 18**: The ASAI link has been busied out by command. To release the link, enter **`release aesvcs link#`**

d. **Error Type 257**: The ASAI TCP/IP link is not in an "established" state.

e. **Error Type 1025**: TCP Tunnel Connection failure

f. **Error Type 3329**: ASAI TCP/IP link failure.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
ASAI Link Status Test (#1365)	X	X	ND

1. D = Destructive; ND = Nondestructive

ADM-CONN (Administered Connection)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADM-CONN	MAJ MIN WRN	`status administered-connection n` [1]	Administered Connection

1. ***n*** is an administered connection number indicated in the PORT field of the Alarm or Error Log.

An administered connection provides an end-to-end connection between two access endpoints or data modules residing in either the same switch or different switches. When administered, the connection is automatically established and scheduled to be permanently active.

An error is logged whenever an administered connection fails or cot be established. A failed connection generates an error whether or not the connection is subsequently reestablished by fast retry, re-dial, or auto restoration.

An alarm is logged when an administered connection cot be established either initially or after a connection failure. Both the alarm level (none to major) and a failure threshold can be administered for each administered connection. An alarm is raised when either of the following occurs:

- The number of consecutive failed attempts to establish a connection reaches the administered threshold.
- The failure to establish a connection is due to a mistake in administration. See Table 11: Administered Connection Error Log Entries.

Error log entries and recommended actions

Table 11: Administered Connection Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0, 29	Any	None	Any	OFF	None
1, 28 (a, b)	Any	None	Any	OFF	None
2 (c)	Any	None	Any	OFF	None
6, 21, 31, 127 (d)	Any	None	Any	OFF	None
16 (a)	Any	None	Any	OFF	None
					1 of 2

Table 11: Administered Connection Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
17 (e)	Any	None	Any	OFF	None
18, 102 (f)	Any	None	Any	OFF	None
22 (a, g)	Any	None	Any	OFF	None
34, 42, 44, 58 (h)	Any	None	Any	OFF	None
38, 41 (i)	Any	None	Any	OFF	None
43, 81	Any	None	Any	OFF	None
50 (a)	Any	None	Any	OFF	None
52 (a)	Any	None	Any	OFF	None
54	Any	None	Any	OFF	None
65, 66, 69 (a)	Any	None	Any	OFF	None
82	Any	None	Any	OFF	None
88 (a)	Any	None	Any	OFF	None
91, 95, 96, 97, 98, 99, 100, 111	Any	None	Any	OFF	None
					2 of 2

ADM-CONN Errors

None of the Administered Connection Error Types have a specific associated test and, except for errors 17 and 127, are valid only for administered connections established over ISDN-PRI facilities. Error 127 is valid for administered connections established over non-ISDN facilities or between two endpoints on the same switch.

Notes:

a. **Error Types 1, 16, 22, 50, 52, 65, 66, 69, 88** are typically associated with administration problems and are not expected to be temporary. The administered connection is not retried and the failure is alarmed immediately. The alarm threshold specified by the customer is ignored.

b. **Error Types 1, 28**: the address of the destination endpoint is: an unassigned number (**1**), has an invalid number format (**28**), or is restricted from terminating calls due to Class of Restriction ("Access Denied"). Verify that the destination address is correct and that the destination endpoint is administered. The destination endpoint is not administered on the switch where this error is logged.

c. **Error Type 2**: a request has been made to use a transit network or common carrier that cot be accessed. Check the routing pattern used by this administered connection and verify that the inter-exchange carrier specified is correct.

d. **Error Types 6, 21, 31, 127**: the exact failure cause is unknown or has been mapped to one of these values. If this is a permanent condition, try reversing the direction of the Administered Connection (originate the administered connection from the destination switch). This may yield another failure cause.

e. **Error Type 17**: the destination endpoint is not available. Check the status of the destination endpoint at the far-end switch. The status for the destination endpoint will not be available on the switch where this error is logged. At the far end, use **`status access-endpoint`** or **`status data-module`** to see whether the endpoint is busy, out-of-service, or otherwise unavailable.

f. **Error Types 18, 102**: this switch sent an ISDN message to another switch that either did not respond (**18**) or did not respond within the time allowed (**102**). This could be due to link failure, or congestion, or an outage at the other switch.

g. **Error Type 22**: the address of the destination endpoint has changed. Change the administered connection accordingly. The destination endpoint will not be administered on the switch where this error is logged.

h. **Error Types 34, 42, 44, 58**: a resource (for example, a circuit or bearer capability) required by the administered connection is not currently available.

i. **Error Types 38, 41**: a network failure (**38**) or temporary failure (**41**) has occurred. Error Log entries for other MOs (for example, DS1-BD) may indicate a local problem.

ADX8D-BD (AUDIX Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX8D-BD	MIN WRN	**test board** ***location***	AUDIX circuit pack

The ADX8D-BD MO defines a TN566/TN2169 EMBEDDED AUDIX circuit pack operating in DP (digital-port) mode.

For port-level problems, see ADX8D-PT (AUDIX Digital Port).

For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module).

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests apply only to switch-side maintenance which tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY® AUDIX Maintenance*.

ADX8D-PT (AUDIX Digital Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX8D-PT	MIN	**test port *location* l**	AUDIX digital port
	WRN	**test port *location***	

The ADX8D-PT MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack operating in DP (digital-port) mode. The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADX16D-P (16-Port AUDIX Digital Port).

The tests apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY® AUDIX Maintenance*.

AUDIX resides on a combined pair of circuit packs: the TN566 MFB (multifunction board) and the TN2169 ALB (alarm board). The 2 boards occupy 5 slots, but only 1 slot is functional as far as the switch is concerned. The other 4 slots are seen by the switch as "AUDIX-reserved" slots (or ADXDP-RS/ADX8D-RS).

In DP mode, the TN566 pack supports up to 8 voice ports, each with a primary and a secondary information channel. Ports are administered in increments of two. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

CAUTION:
Always shut down AUDIX first before removing circuit packs. Follow instructions on the TN566/TN2169 faceplate:

- Remove EMBEDDED AUDIX circuit packs
- Cycle power to a carrier containing EMBEDDED AUDIX circuit packs
- Remove power to a carrier containing EMBEDDED AUDIX circuit packs

Error log entries and recommended actions

Table 12: ADX8D-PT Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test port *location***
					1 of 2

Table 12: ADX8D-PT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
1 (b)	40987	None	WRN	OFF	
1 (c)	1 to 20	None	WRN	OFF	
15 (d)	Any	None			
18 (e)	0	**busyout port** ***location***	WRN	OFF	**release port** ***location***
23 (f)	0	None	WRN	OFF	
130 (g)		None	WRN	ON	**test port** ***location***
257 (h)	40971	None			
513 (i)	Any	None			
1537 (j)	40968	None	WRN	OFF	
1793		Voice & Ctrl. Local Loop (#13)	MIN WRN[1]	ON	**test port** ***location*** **l r 3**
2049		GPP NPE Crosstalk Test (#9)	MIN WRN[1]	ON	**test port** ***location*** **l r 3**
2305 (k)	40967	None			
3840 (l)	40965	None			
3840 (m)	41029	None			
					2 of 2

1. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1, Aux Data 40987**: the user may experience a noisy port or link due to an off-board problem. If so, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a predetermined time.

c. **Error Type 1, Aux Data 1 to 20**: At least 15 off-board problems have been detected with the link to the voice port. Also see Note (a).

d. **Error Type 15**: internal error that occurs when an audit request fails.

e. **Error Type 18**: the port is busied-out by command. Enter **`release port`** ***`location`*** to release the port.

f. **Error Type 23**: the circuit pack is administered but not physically installed. The alarm will clear when a circuit pack is inserted.

g. **Error Type 130**: the circuit pack was removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the AUDIX circuit pack (see Caution at the beginning of this section).

h. **Error Type 257**: Something is interfering with transmission to the voice port. This is usually an on-board problem and can be ignored if there are no user complaints.

i. **Error Type 513**: AUDIX is not available to the switch, possibly due to a busyout on the AUDIX system. See *DEFINITY® AUDIX Maintenance*, if necessary.

j. **Error Type 1537**: There is a problem with the link to the voice port. This error can be ignored if there are no user complaints. If the problem persists, replace the circuit pack (see Caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a certain period of time.

k. **Error Type 2305**: the link between the circuit pack and the voice port successfully reset. No action is necessary.

l. **Error Type 3840, Aux Data 40965**: no voice ports are connected to the EMBEDDED AUDIX circuit pack. No maintenance action is required.

m. **Error Type 3840, Aux Data 41029**: the message buffer in the circuit pack is full.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Local Loop Test (#13)		X	ND
GPP NPE Crosstalk Test (#9)		X	ND

1. D = Destructive; ND = Nondestructive

ADX8D-RS (AUDIX Reserve Slots)

See AXA12-RS (AUDIX Reserve Slots).

ADX16A-B (AUDIX Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX16A-B	MIN WRN	**test board *location***	AUDIX circuit pack

The ADX16A-B MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack combination operating in control-link (CL) mode.

For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module).

Port-level maintenance is covered by AESV-LNK (AE Services Link).

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY® AUDIX Maintenance*.

ADX16A-P (AUDIX Analog Line/Control Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX16A-P	MIN	`test port` *`location`* `l`	AUDIX Analog Line/ Control Link
	WRN	`test port` *`location`*	

CAUTION:

Never do any of the following without first shutting down AUDIX. Follow the instructions on the TN566/TN2169 faceplate:

- Remove EMBEDDED AUDIX circuit packs
- Cycle power to a carrier containing EMBEDDED AUDIX circuit packs
- Remove power to a carrier containing EMBEDDED AUDIX circuit packs

The ADX16A-P MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack that is operating in control-link (CL) mode.

For circuit-pack-level problems (ADX16A-B or ANL-16-B), see XXX-BD (Common Port Circuit Pack/Media Module).

For port-level problems with AUDIX operating in digital-port mode, see:

- ADX8D-PT (AUDIX Digital Port)
- ADX16D-P (16-Port AUDIX Digital Port)

The tests apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY® AUDIX Maintenance*.

AUDIX resides on a combined pair of circuit packs: the TN566 Multifunction board (MFB) and the TN2169 Alarm board (ALB). The 2 boards occupy 5 slots, but only 1 slot is functional as far as the switch is concerned. The other 4 slots are seen by the switch as "AUDIX-reserved" slots.

In CL mode, the TN566 pack supports up to 16 voice ports. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

Error log entries and recommended actions

Table 13: ADX16A-P Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0[1]	0	Any	Any	Any	**test port *location***
1 (a)	40977	None			
18	0	**busyout station *ext***	WRN	ON	**release station *extension***
23 (b)	0	None	WRN	OFF	
130 (c)		None	WRN	ON	**test port *location***
257 (d)	40973	None			
513 (e)	Any	None			
1025 (f)		Looparound Test (#161)	MIN WRN[2]	ON	**test port *location* l r 2**
1281		Conference Circuit Test (#7)	MIN WRN[2]	ON	**test port *location* l r 2**
1537		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	**test port *location* l r 2**

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.
2. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error Type 1** is an inline error that can only be resolved over time. No terminal equipment was present when ringing was attempted. Execute **test port *location***

b. **Error Type 23**: The circuit pack was logically administered but not physically installed. The alarm will clear when the circuit pack is installed.

c. **Error Type 130**: The circuit pack was removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

d. **Error Type 257** is an inline error and can only be resolved over time. Ringing voltage is absent. If only one analog circuit pack in the system has this problem, replace the circuit pack. If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, check the ringing generator.

e. **Error Type 513**: AUDIX is not available to the switch. Check the **AUDIX** system, referring to *DEFINITY® AUDIX Maintenance*.

f. **Error Type 1025**: The **TDM** bus is out of service. See TDM-BUS (TDM Bus).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Looparound Test (#161))		X	ND
Conference Circuit Test (#7)		X	ND
NPE Crosstalk Test (#6)		X	ND

1. D = Destructive; ND = Nondestructive

Tests 36 and 48 ABORT when AUDIX is not running.

ADX16D-B (16-Port AUDIX Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX16D-B	MIN WRN	**test board *location***	AUDIX circuit pack

The ADX16D-B MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack combination operating in 16-port mode digital (DP).

For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module).

Port-level maintenance is covered by ADX16D-P (16-Port AUDIX Digital Port).

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy of its own that is described in *DEFINITY® AUDIX Maintenance*.

ADX16D-P (16-Port AUDIX Digital Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ADX16D-P	MIN WRN	**test port *location* l**	AUDIX Digital port

CAUTION:

Never do any of the following without first shutting down AUDIX. Follow the instructions on the TN566/TN2169 faceplate:

- Remove EMBEDDED AUDIX circuit packs
- Cycle power to a carrier containing EMBEDDED AUDIX circuit packs
- Remove power to a carrier or cabinet containing EMBEDDED AUDIX circuit pack

The ADX16D-P MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack operating in digital-port (DP) mode. The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADX16A-P (AUDIX Analog Line/Control Link).

The tests apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY® AUDIX Maintenance*.

AUDIX resides on a combined pair of circuit packs: the TN566 Multifunction board (MFB) and the TN2169 Alarm board (ALB). The 2 boards occupy 5 slots, but the system sees only 1 slot as functional. The other 4 slots are seen by the switch as “AUDIX-reserved” slots (or ADX16-RES/ ADX16D-RS).

In 16-port DP mode, the TN566 pack supports up to 16 voice ports, each with a primary and a secondary information channel. Ports are administered in increments of two. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

Error log entries and recommended actions

Table 14: ADX16D-P Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	40987		WRN	OFF	
1 (c)	1 to 20		WRN	OFF	
15 (d)	Any				
18 (e)	0	**busyout port *location***	WRN	OFF	**release port *location***
23 (f)	0		WRN	OFF	
130 (g)			WRN	ON	**test port *location***
257 (h)	40971				
513 (i)	Any				
1537 (j)	40968		WRN	OFF	
1793		Voice and Control Local Loop Test (#13)	MIN WRN[1]	ON	**test port *location* l r 3**
2049		GPP NPE Crosstalk Test (#9)	MIN WRN[1]	ON	**test port *location* l r 3**
2305 (k)	40967				
3840 (l)	40965				
3840 (m)	41029				

1. Minor alarms may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow the recommended procedures

b. **Error Type 1 with Aux Data 40987**: The user may experience a noisy port or link, due to an off-board problem that is detected by the port circuit. If so, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a predetermined time.

c. **Error Type 1**: At least 15 off-board problems have been detected with the link to the voice port. When an error with the link is detected, an on-board counter is incremented. Also see Note a above.

d. **Error Type 15**:An audit request failed - internal error.

e. **Error Type 18**: The port is busied-out by command. Release the port with **`release port`** ***`location`***.

f. **Error Type 23**: The circuit pack is administered but not physically installed. The alarm will clear when a circuit pack is inserted.

g. **Error Type 130**: The circuit pack has been removed or has been insane for more than 21-minutes. To clear the error, reseat or replace the AUDIX circuit pack (see caution at the beginning of this section).

h. **Error Type 257**: Something is interfering with transmission to the voice port. This is usually an on-board problem and can be ignored if there are no user complaints.

i. **Error Type 513**: AUDIX is not available to the switch, possibly due to a busyout on the AUDIX system. Refer to *DEFINITY® AUDIX Maintenance*.

j. **Error Type 1537**: There is a problem with the link to the voice port. This can be ignored if there are no user complaints. If the problem persists, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a certain period of time.

k. **Error Type 2305**: The link between the circuit pack and the voice port is successfully reset. No action is necessary.

l. **Error Type 3840 with Aux Data 40965**: No voice ports are connected to the EMBEDDED AUDIX circuit pack. No action is required.

m. **Error Type 3840 with Aux Data 41029**: The message buffer in the circuit pack is full.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Local Loop Test (#13)		X	ND
GPP NPE Crosstalk Test (#9)		X	ND

1. D = Destructive; ND = Nondestructive

AESV-LNK (AE Services Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AESV-LNK	MAJ WRN	`test aesvcs-server`	Application Enablement Services (AESVCS) Link

AESVCS Links provide a connection between Communication Manager and an AESVCS Server in which data is exchanged. Communication Manager dynamically creates and deletes AESVCS Links as socket connections to the AESVCS Server are established and torn down. AESVCS Links that are connected to the same AESVCS Server are grouped into an AESVCS Session.

Error log entries and recommended actions

Table 15: AESV-LNK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
513 (a)			WRN	Off	none
769 (b)		AESVCS Link Heartbeat Test (#1624)	Log only		**`test aesvcs link`** ***link#***
1537 (c)	Any		Log only		
2561 (d)			Log only		

Notes:

a. **Error Type 513** is displayed when an AESVCS Link is hyperactive. The hyperactivity might be caused by fluctuations in the engineered traffic load being generated by the AESVCS Server. Both an AESVCS Session level and Link level alarm are generated to indicate that a link is overloaded.

Once the problem has been resolved, it might take up to 45 minutes for the alarm to clear. If the hyperactivity persists, escalate the problem.

b. **Error type 769** is a log only error and is displayed when Communication Manager does not receive a response from the AESVCS Server to a heartbeat message that was sent over the AESVCS Link. Failure to receive a response to a heartbeat message results in the deletion of the AESVCS Link by Communication Manager. Both an AESVCS Session Level and Link level error are generated against this condition. Escalate if the error persists.

c. **Error type 1537** is a log only error and displayed when an AESVCS Link is deleted from an AESVCS Session for reasons other than a heartbeat failure. Both an AESVCS Session Level and Link level error are generated against this condition. The Aux Data field contains the reason code.

Aux Data	Description
1	The far end closed the socket connection. Check the error logs on the AEVCS Server for more information.
100	The **`reset aecvcs-link`** command was used to close the socket connection
101	The AESVCS Interface on the IP Services form was disabled.
102	The AESVCS Interface was removed from the IP Services form.
103	The AE Services Server was disabled on the AE Services Administration page of the IP Services form.
104	The AE Services Server was deleted on the AE Services Administration page of the IP Services form.
200	The socket connection closed due to an internal error. Escalate if the problem persists.
201	The socket connection was unexpectedly closed by Communication Manager. Escalate if the problem persists.
202	Communication Manager detected an error and closed the socket connection. Escalate if the problem persists.
203	Communication Manager detected an error reading from the socket and closed the connection. Escalate if the problem persists.
204	Communication Manager failed to write a complete message and closed the socket connection. Escalate if the problem persists.
205	AE Server established a new connection causing Communication Manager to close the existing one. Escalate if the problem persists.
206	Communication Manager failed to send a heartbeat request and closed the socket connection. Escalate if the problem persists.
207	Communication Manager detected a protocol violation and closed the socket connection. Escalate if the problem persists.
	1 of 2

Aux Data	Description
208	Communication Manager detected processing the data from the AESVCS Server and closed the socket connection. Escalate if the problem persists.
209	Communication Manager could not read data from the socket and closed the connection. Escalate if the problem persists.
	2 of 2

d. **Error Type 2561** is a log only error and is displayed when an AESVCS message is discarded due to a link buffer overflow. Both an AESVCS Session Level and Link level error is generated against this condition. Escalate if the problem persists.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
AESVCS Link Heartbeat Test (#1624)	X	X	ND
AESVCS Session Level Link Status Test (#1623)	X	X	ND

1. D = Destructive; ND = Nondestructive

AESV-SES (AE Services Session)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AESV-SES	MAJ WRN	**test aesvcs-server**	Application Enablement Services Session

An AESVCS Session is a logical connection between Communication Manager and a single AESVCS Server, and encompasses all the AESVCS Links that are connected between them.

Error log entries and recommended actions

Table 16: AESV-SES Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
513 (a)	1-16		WRN	Off	none
769 (b)	1-16	AESVCS Link Heartbeat Test (#1624)	Log only		
1025 (c)	1-16		MAJ	Off	**test aesvcs-server**
1537 (d)	1-16		Log only		
2561 (e)	1-16		Log only		

Notes:

a. **Error Type 513** occurs when one or more AESVCS Links within a given AESVCS Session is hyperactive. The hyperactivity might be caused by fluctuations in the engineered traffic load being generated by the AESVCS Server. Both an AESVCS Session Level and Link level alarm is generated to indicate that a link is overloaded. The Aux Data field contains the link ID of the last AESVCS Link to report hyperactivity.

   Once the problem has been resolved, it might take up to 45 minutes for the alarm to clear. Refer to AESV-LNK (AE Services Link) for more information.

b. **Error type 769** is a log only error and is displayed when Communication Manager detects a heartbeat failure on one or more AESVCS Links within the AESVCS Session. The Aux Data field contains the link ID of the last AESVCS Link to report a heartbeat failure. An AESVCS

Link level error is also generated against this condition. Refer to AESV-LNK (AE Services Link) for more information.

c. **Error Type 1025** is displayed when no AESVCS Links are left in an AESVCS Session. This alarm is cleared when Communication Manager associates a new AESVCS Link to the session. The Aux Data field contains the link ID of the last AESVCS Link deleted from the session.

d. **Error type 1537** is a log only error and is displayed when one or more AESVCS Links, within the AESVCS Session is deleted for reasons other than a heartbeat failure. The Aux Data field contains the link ID of the last AESVCS Link deleted from the session. An AESVCS Link level error is also generated against this condition. Refer to AESV-LNK (AE Services Link) for more information.

e. **Error Type 2561** is a log only error and is displayed when one or more AESVCS Links within the AESVCS Session is discarding messages due to a link buffer overflow. This error represents the sum of all the discarded messages in a given session. The Aux Data field contains the link id of the last AESVCS Link, within the session, to discard a message. An AESVCS Link level error is also generated against this condition. Refer to AESV-LNK (AE Services Link) for more information.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
AESVCS Link Heartbeat Test (#1624)	X	X	ND
AESVCS Session Level Link Status Test (#1623)	X	X	ND

1. D = Destructive; ND = Nondestructive

ALARM-PT (Alarm Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ALARM-PT	MIN	**test port** ***location*** **l**	Alarm Port
	WRN	**test port** ***location***	

The Alarm Port MO provides on-board maintenance for an analog line port that is administered as an external device alarm port. Tests are provided to verify the analog line port's ability to detect an external device alarm. The related MO, EXT-DEV ADMIN? Y (External Device Alarm), is used for the off-board external device alarm.

Error log entries and recommended actions

Table 17: ALARM-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test port** ***location***
15 (b)	Any	Port Audit and Update (#36)			
18	0	**busyout station** ***extension***	WRN	OFF	**release station** ***extension***
130 (c)		None	WRN	ON	**test port** ***location***

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended repair procedures.

b. **Error Type 15**: software audit error that does not indicate any hardware malfunction. Run the short test sequence and investigate errors.

c. **Error Type 130**: the circuit pack or media module was removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack or media module.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Port Diagnostic Test (#35)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

AN-LN-PT (Analog Line Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AN-LN-PT	MIN	**test port** ***location*** **l**	Analog Line port
	WRN	**test port** ***location***	

The TN793B/TN2793B Analog Line circuit pack (w/ Caller ID) provides 24 ports for voice terminals and supports both on-premises and off-premises analog voice terminals.

The TN797 Analog Trunk and Line circuit pack provides 8 ports, each of which may be administered in any of several ways, as described in TR-LN-BD (Analog Trunk/Line Board).

The MM711 Analog Trunk and Line Media Module provides 8 ports. The MM716 provides 24 ports. Each of the ports may be administered in any of several ways, as described in MG-ANA (Analog Media Module). Not all of the tests that run on the circuit packs are applicable to the media modules. These tests will abort with error code 1412. This error can be ignored.

Ringing caused by maintenance testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it in the `Tests` field of the **change station** ***extension*** form. Be aware that this action also disables Tests #6, 7, 161, and 35 on some software releases.

Error log entries and recommended actions

Table 18: AN-LN-PT Error log entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
1 (b)	40960 40975 40977	none			
15 (c)	Any	Port Audit and Update (#36)			
18	0	**busy station** ***extension***	WRN	ON	**release station** ***extension***
130 (d)		None	WRN	ON	**test port** ***location***
					1 of 2

Table 18: AN-LN-PT Error log entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (e)	40973	None			
513 (f)		Ringing Application Test (#48)	WRN	OFF	`test port` *`location`* `r 2`
769		Port Diagnostic Test (#35)	MIN WRN[1]	ON	`test port` *`location`* `r 2`
1025		Looparound test (#161)	MIN WRN2	ON	`test port` *`location`* `l r 2`
1281		Conference Circuit Test (#7)	MIN WRN2	ON	`test port` *`location`* `l r 2`
1537		NPE Crosstalk Test (#6)	MIN WRN2	ON	`test port` *`location`* `l r 2`
					2 of 2

1. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error type 0:** Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** these are inline errors and can only be resolved over time.

- Aux Data 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call causes an inline error from the board.
- Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance.
  1. Call the terminal equipment and verify that the terminal rings.
  2. If the terminal does not ring, replace it. Otherwise, run **`test port`** ***`location`***, and follow the procedure for ONS Ringer Application Test (#48).
- Aux Data 40977 indicates that no terminal equipment was connected when ringing was attempted. Run **`test port`** ***`location`***, and follow the procedure for the results of ONS Ringer Application Test (#48).

c. **Error Type 15:** software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate any associated errors.

d. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack or media module.

e. **Error Type 257**: this is an inline error and can only be resolved over time. This error indicates that ringing voltage is absent.

For media modules: If not resolved over time, replace the media module.

For circuit packs:

- If only 1 analog circuit pack in the system has this problem, replace the circuit pack.
- If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier.
- If analog circuit packs on many carriers have this error, it is probably a problem with the ringing generator.

f. **Error Type 513:**Test #48 can cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the **`change station`** ***`extension`*** form to **n**. In some software releases, this also disables Tests #6, 7, 161, and 35.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ ND[1]
Port Diagnostic Test (#35)	X	X	ND
ONS Ringer Application Test (#48)	X	X	ND
Analog Looparound Test (#161)		X	ND
Conference Circuit Test (#7)		X	ND
NPE Crosstalk Test (#6)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

ANL-16-L (16-Port Analog Line)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ANL-16-L	MIN	**test port *location* l**	16-Port Analog Line
	WRN	**test port *location***	

The circuit packs listed below provide 16 analog line ports for single-line voice terminals. The table below indicates which circuit packs are equipped with lightning protection (for off-premises, out-of -building stations), and which ones support the neon message waiting lamp feature.

16-Port Analog Line Circuit Packs		
Circuit Pack	**Off- Premises**	**Neon**
TN468B	y	
TN479		
TN746		y
TN746B	y	y
TN2135	y	
TN2144	y	
TN2149	y	
TN2180	y	

S8700 Series | S8500

These circuit packs provide 16 ports for analog voice terminals. The TN746, TN468, and TN749 support only single-line, on-premises/in-building, analog voice terminals, and not off-premises stations, since these circuit packs are not equipped with lightning protection. The TN746B, TN2144, TN2149, and TN468B support both on-premises and off-premises (that is, out-of-building) analog voice terminals. The TN468, TN468B, TN479, TN2135, TN2144, and TN2149 do NOT support the neon message waiting feature.

No maintenance of the terminal connected to the 16-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of common port circuit pack errors. See errors 1281 and 1793 in XXX-BD (Common Port Circuit Pack/Media Module).

Ringing Caused by Maintenance Testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled in the `Tests` field of the **`change station`** ***`extension`*** screen. Be aware that this action will also disable Tests #6, 7, 161, and 35.

Error log entries and recommended actions

Table 19: ANL-16-L Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test port** ***location***
1(b)	40960 40975 40977				
15(c)	Any	Port Audit and Update (#36)			
18	0	**busyout station** ***extension***	WRN	ON	**release station** ***extension***
130(d)			WRN	ON	**test port** ***location***
257(e)	40973				
513(f)		Ringing Application Test (#48)	WRN	OFF	**test port** ***location*** **r 2**
769		Port Diagnostic Test (#35)	MIN WRN[1]	ON	**test port** ***location*** **r 2**
1025		Looparound (#161)	MIN WRN1	ON	**test port** ***location*** **l r 2**
1281		Conference Circuit Test (#7)	MIN WRN1	ON	**test port** ***location*** **l r 2**
1537		NPE Crosstalk Test (#6)	MIN WRN1	ON	**test port** ***location*** **l r 2**

1. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** These are inline errors and can only be resolved over time.

   Aux Data 40960: too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call causes an inline error from the board.

   Aux Data 40975: the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal does not ring, replace it. Otherwise, enter **`test port`** ***`location`***, and follow the procedure for ONS Ringer Application Test (#48).

   Aux Data 40977: no terminal equipment was connected when ringing was attempted. Run the short test via **`test port`** ***`location`***, and follow the procedure for the results of ONS Ringer Application Test (#48).

c. **Error Type 15**: software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors.

d. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

e. **Error Type 257**: ringing voltage is absent.

   If only 1 analog circuit pack in the system has this problem, replace the circuit pack.

   If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier.

   If analog circuit packs on many carriers have this error, there may be a problem with the ringing generator.

f. **Error Type 513**: Associated Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the **`change station`** ***`extension`*** screen to `n`. On some software releases, this will also disable Tests #6, 7, 161, and 35.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Port Diagnostic Test (#35)	X	X	ND
ONS Ringer Application Test (#48)	X	X	ND
Analog Looparound Test (#161)		X	ND
Conference Circuit Test (#7)		X	ND
NPE Crosstalk Test (#6)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

ANL-BD (Analog Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name Of MO
ANL-BD	MIN WRN	**test board** ***location***	Analog Line circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See ANL-16-L (16-Port Analog Line) or ANL-LINE (8-Port Analog Line) for related line information.

ANL-LINE (8-Port Analog Line)

MO Name in Log	Alarm Level	Initial Command To Run	Full Name of MO
ANL-LINE	MIN	**test port** ***location*** **l**	8-Port Analog Line
	WRN	**test port** ***location***	
ANL-NE-L	MIN	**test port** ***location*** **l**	8-Port Neon Analog Line
	WRN	**test port** ***location***	

Error log entries and tests apply to ANL-LINE and ANL-NE-L.

The 8-port Analog Line circuit packs,

TN411	TN443	TN467
TN712	TN742	TN769

provide eight ports for single-line, on or off-premises analog endpoints such as analog voice terminals, queue warning level lamps, recorded announcements, dictation machines, PAGEPAC paging equipment, external alerting devices, modems, fax machines, and AUDIX voice ports. Only the TN769 supports a neon message waiting lamp.

Note:

PAGEPAC™ is a registered trademark of Harris Corporation, Dragon Division.

Test #48 may cause some terminal equipment to ring briefly during daily maintenance, which may disturb the customer or the terminal equipment. Test #47 may cause a false alarm when the port is connected to certain off-premises equipment, non-voice terminal equipment, or loop equipment. In either case, the tests can be disabled by entering **n** in the `Tests` field on the **change station** ***extension*** screen. Be aware that this will disable Tests 6, 35, 47, and 48.

No maintenance of the terminal connected to the 8-Port Analog Line circuit pack or 8-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the common ringing application circuitry and the neon message waiting lamp power (ANL-NE-L only) are reported as errors 1281and 1793 against XXX-BD (Common Port Circuit Pack) in Common Port Circuit Pack Maintenance Error Log Entries.

Error log entries and recommended actions

Table 20: ANL-LINE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *`location`*
1 (b)	40960 40975 40977				
15 (c)	Any	Port Audit and Update Test (#36)			
18	0	**`busyout station`** ***`extension`***	WRN	OFF	**`release station`** ***`extension`***
130 (d)			WRN	ON	`test port` *`location`*
257 (e)		Ringing Application Test (#48)	WRN	OFF	`test port` *`location`* `r 3`
513		Port Diagnostic Test (#35)	MIN WRN[1]	ON	`test port` *`location`* `r 2`
769 (f)		Looparound & Conference (#47)			`test port` *`location`* `l r 3`
1025		NPE Crosstalk Test (#6)	MIN WRN[1]	ON	`test port` *`location`* `l r 3`
1281 (g)					
1793 (g)					

1. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. Error Type 0: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** These are inline errors that are resolved over time by the system.

Aux Data 40960: too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call will cause an inline error from the board.

Aux Data 40975: the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal doesn't ring, replace it. Otherwise, enter **`test port`** ***`location`***, and follow the procedure for ONS Ringer Application Test (#48).

Aux Data 40977: no terminal equipment was connected when ringing was attempted. Run **`test port`** ***`location`***, and follow the procedure for the results of ONS Ringer Application Test (#48).

c. **Error Type 15**: software audit error, does not indicate any hardware malfunction. Run the short test sequence, and investigate errors (if any).

d. **Error Type 130**: the circuit pack was removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 257**: Associated Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled via **`change station`** ***`extension`***. However, on some releases of the software, this will disable Tests #6, 47, and 35 as well as Test #48.

f. **Error Type 769**: Associated Test #47 may cause a false alarm when the port is connected to off-premises equipment, some non-voice terminal equipment, and some loop equipment. If this causes a false alarm, use **`change station`**, and change the **Tests** field to **n** to disable the test.

g. **Error Types 1281 and 1793**: See XXX-BD (Common Port Circuit Pack/Media Module).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Port Diagnostic Test (#35)	X	X	ND
ONS Ringer Application Test (#48)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Looparound and Conference Test (#47)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

ANL-NE-L (8-Port Analog Line)

Neon message waiting lamp power on the 8-port analog line board.

See ANL-LINE (8-Port Analog Line).

-BD (Announcement circuit pack)

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
-BD	MIN WRN	**test board** ***location*** **l**	Announcement Circuit Pack

Note:

The information contained in -BD refers only to the TN750-series of circuit packs. Expressions such as "announcement circuit pack" and "announcement board" are to be interpreted to mean the TN750-series only.

The TN750 announcement circuit pack is a service circuit which provides an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (for example, announcements on hunt group calls). There are 16 Announcement Ports on the announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. In addition to the 16 announcement Ports, the announcement circuit pack also has one Data Line Circuit Port (port 17). The Data Line Circuit Port is used for uploading/downloading the announcement memory to/from the memory card. If there are any errors associated with port 17, refer to DAT-LINE (Data Line Port). If there are any errors associated with any other port, refer to -PT (Announcement Port).

Note:

TN750C is required if the system has multiple TN750x announcement boards (up to ten are allowed). Only one TN750A/B may be present in the system with up to nine additional TN750C boards. All ten boards may be TN750C. The announcements from a TN750A/B can be saved and restored to a TN750C, but once the announcements are recorded onto a TN750C they are not backward compatible with the TN750A/B.

The announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack and communicates with the switch via the control channel on the TDM Bus. The second processor, or Speech Processor (SP), controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels (one for each Announcement Port).

General notes

Here are a few important general notes that apply to any problem on the announcement circuit pack. Read this before attempting to work on the TN750 announcement circuit pack or announcement Ports, especially if the circuit pack needs to be replaced.

1. The TN750 announcement circuit pack retains all integrated announcements *as long as the circuit pack has power*. For this reason, whenever there is a problem with either the announcement circuit pack or an announcement Port that may require the circuit pack to be reset, it is always best to try to reset the circuit pack with **`reset board`** ***`location`*** first. If that does not work, replace the circuit pack. Announcements are preserved through a software reset, but they are lost when the circuit pack is reseated.
2. If a customer has announcements on the announcement circuit pack, then announcements must be saved on the memory card to ensure that they are not lost. This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the circuit pack is in proper working order (see Note).

   Note:

   Unlike translations, announcements are NEVER automatically saved to the memory card.
3. **`Save announcements`** replaces the TN750x announcement file on the memory card. Care must be taken not to mistakenly enter this command and, as a result, destroy a valid file on the memory card.
4. **`Restore announcements`** replaces the TN750x announcement circuit pack speech memory with the announcement file on the memory card. Care must be taken not to mistakenly enter this command, destroying valid speech memory, especially if the memory card does not have a valid announcement file on it.
5. Whenever the TN750x announcement circuit pack is replaced, announcements must always be rerecorded or downloaded to the new circuit pack. Otherwise, call processing is not able to use the pack.
6. If announcement speech memory is corrupted, announcements should not be saved [that is, if the Announcement Checksum Test (#209) fails, or if the speech sounds corrupted on playback]. This can ruin a good announcement file on the memory card and potentially cause errors/alarms on any circuit pack to which the new file is downloaded. However, if the customer does not have a valid announcement file on the memory card, announcements can be saved in an effort to try to retain some of them (all of the announcements recorded may not be corrupted).
7. Due to a hardware fault in the TN750 announcement board, the following sequence of events may cause the announcement file to become corrupted and unusable:
   a. Fill the board with recorded announcements.
   b. Delete the last few announcements recorded.

c. Re-record the announcements deleted.

If the announcement file becomes corrupted, the only solution is to re-record all announcements. To do this, follow these steps:

d. Remove the announcement board.

e. Remove the tape cartridge from the tape drive. Do this so that announcements are not automatically restored from tape.

f. Re-insert the announcement board.

g. Re-record all announcements.

h. Insert the tape cartridge in the tape drive.

i. Enter **`save announcements`** to save all the announcements on the tape.

This hardware fault is fixed in the TN750B announcement board. However, the TN750B board will not automatically correct an announcement file which has previously been corrupted by a TN750 board. The only way to correct an announcement file corrupted by the TN750 board is to follow the steps above.

Announcement administration

A brief description of the integrated announcement administration is given here to aid in troubleshooting the announcement circuit pack and its ports. In many cases, it is necessary to record, play back, and/or delete announcements to resolve an alarm. It may also be necessary to save and restore announcements as part of the maintenance procedures. For a complete description of integrated announcement administration, please refer to *Administering Avaya Aura™ Communication Manager*.

Announcement session

Announcements can be recorded, played back, and deleted from an announcement session. A station's COS needs to include console permissions in order for that station to be able to enter an announcement session.

To enter an announcement session, go off-hook on a station that has console permissions and enter the appropriate Feature Access Code (FAC), administered as announcement access code on the FACs form. Dial tone should be returned at this point. Enter the extension of the announcement that needs to be recorded, deleted, or played back. Again, dial tone should be heard. To record an announcement, press station keypad digit 1, record after the tone, and hang up when done. To play back an announcement, press **2**. To delete an announcement, press **3** (confirmation tone is given if the delete worked). Announcements can also be played back by simply calling the announcement extension associated with them.

Uploading/Downloading Announcements

Integrated announcements on the TN750 announcement circuit pack can be uploaded to the memory card with **save announcements**. Likewise, integrated announcements can be downloaded to the announcement circuit pack with **restore announcements**. Both of these commands require a free data module of NETCON type to be administered, a data module of announcement type (on the announcement circuit pack) to be administered, and a memory card. These commands are useful in maintaining the customer's recorded announcements. Depending on system traffic, announcement uploads and/or downloads take between 30 and 45 minutes.

The system automatically tries to download the announcement circuit pack five minutes after it is inserted. This automatic download procedure is aborted if:

- An announcement is recorded within 10 minutes of circuit pack insertion.
- An announcement download is invoked sooner with the **restore announcements**.
- No announcement and/or NETCON data module is administered.
- Either the announcement data module is busy or all the administered NETCON data modules are busy.
- No memory card is in the system.
- The memory card in the system does not have a valid announcement file saved on it.

Note:

Unlike translations, there is no provision in the system for automatically saving announcements to the memory card.

Announcement Board Locked Condition

The announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the announcement ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and will attempt to use the ports.

If the circuit pack is locked into this state, the following symptoms will be observed:

1. When attempting to record an announcement, users will hear the proper record tone, but the announcement will not record (they will not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state will yield the following abort codes:

- Ports 1 AND 9 abort Test 206 with code 1024.
- Ports 1 AND 9 abort Test 205 with code 2000.
- Board-level Tests 209 and 210 abort with code 1024.

3. The **save/restore announcements** times out with:

   `Error encountered, can't complete request`

The announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board** ***location*** (this command drops every call in progress on the announcement circuit pack).
- Reset the circuit pack using **reset board** ***location***.
- Release the board using **release board** ***location***.

Error log entries and recommended actions

Table 21: -BD Error Log Entries *1 of 2*

Error Type	Aux Data	Associated test	Alarm Level (See WRN message)	On/off Board	Recommended action
0 (a)	0	Any	Any	Any	test board location
1 (b)	0	Circuit pack removed or SAKI Test failed (#53)	MIN	ON	
2 (c)		None			
14 (d)	1 to 64	announcement Checksum (#209)			
18	0	busyout board location	WRN	OFF	release board location
23 (e)	0	None	WRN	OFF	
125 (f)		None	MIN	ON	
170	0	None	MIN	ON	
217 (g)	0	None	WRN	OFF	
257	65535	Control Channel Looparound Test (#52)	MIN	ON	test board location l r 20
257 (h)	Any	None			
267 (g)	0	None	WRN	OFF	
					1 of 2

Table 21: -BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated test	Alarm Level (See WRN message)	On/off Board	Recommended action
513 (i)	Any	None			
1025 (j)	4363	NPE Audit Test (#50)			test board location l
1281 (k)	17699	None			
1538 (l)	Any	None	MIN	ON	
1793		Angel SP Handshake (#208)	MIN	ON	test board location l r 3
	17680	inline Error			
2049 (m) (n)		Clock Match Inquiry (#212)	MIN	ON	test board location r 3
	17674	inline Error			
2305		140AY Looparound (#210)	MIN	ON	test board location r 3
2561		Super Frame Match Inquiry (211)	MIN	ON	test board location r 3
	17676	inline Error			
2817 (m)		Announcement Checksum (#209)	MIN	ON	test board location r 3
	17682	inline Error			
	17699	inline Error			
3840 (j)	Any	None			
3999 (o)	Any	None			
					2 of 2

All -BD alarms are upgraded to MAJOR when the BASE Tone Generator is set to 12 (France).

Notes:

a. **Error Type 0**: Run the short test sequence first. If all tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 1**: the circuit pack totally stopped functioning or it was physically removed from the system.

If the circuit pack is not in the system, insert a circuit pack in the same slot as the error indicates to resolve this error. Or, if the circuit pack is in the system and the red LED is on, follow the instructions for Red (alarm) in the Circuit Pack LEDs section of *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

Note:

The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

Reseating and/or replacing the circuit pack results in loss of integrated announcements (TN750/B only). See General notes near the beginning of this Maintenance procedure.

c. **Error Type 2**: Check the Class of Restriction (COR) administered for the Data Line extension assigned to the TN750 for uploading and downloading announcements. The extension can be found by using **`list data-module`**.

d. **Error Type 14**: logged when the announcement Checksum Test (#209) fails. The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by **`display announcement`**. This error only appears in the Error Log in conjunction with Error Type 2817. Follow the procedures for Error Type 2817 to troubleshoot Error Type 14.

e. **Error Type 23**: the circuit pack has been logically administered but not physically installed. The alarm is cleared when the circuit pack is installed.

f. **Error Type 125**: the wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use **`change circuit-pack`** to re-administer this slot to match the circuit pack inserted.

g. **Error Type 217 and 267**: there is more than one TN750 announcement circuit pack inserted in the system. Remove the alarmed circuit pack.

h. **Error Type 257**: transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

i. **Error Type 513**: if the Aux Data is in the range of 4352 - 4358, there is a hardware failure on the circuit pack. The circuit pack should be replaced.

   Replacing the circuit pack results in loss of integrated announcements (TN750/B only). See General notes for more information.

j. **Error Types 1025 and 3840**: not service-affecting, no action is required.

k. **Error Type 1281**: the speech processor (SP) found one or more faults in the speech main memory (SMM). Whenever this error is logged, error 2817 is also logged [see Note (m)], which causes the announcement Checksum Test (#209) to run to determine if the bad memory location was being used by an announcement.

l. **Error Type 1538**: the hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

   1. The tests run on the ports of this circuit pack are returning with a NO-BOARD.
   2. A busyout/release of the circuit pack has no effect on test results.
   3. A **`list configuration`** command shows that the circuit pack and ports are properly installed.

The system tries to restore the circuit pack within 15 minutes. If the error recurs after 15 minutes, replace the circuit pack. For more information, refer to *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

m. **Error Types 2049 and 2817**: logged in conjunction with Error Type 1281, Aux Data 17699. Because Error Type 1281 means that a defective speech memory location was found, [see Note (k)] the announcement checksum error is also logged. This causes the announcement Checksum Test (#209) to run, which determines if the defective memory location has corrupted any recorded announcements. If the Checksum Test passes, the faulty memory location is currently not being used, and the SP marks the location as faulty to ensure that future announcements do not attempt to use it.

   Note:

   As memory locations are marked faulty, the amount of available memory decreases, which decreases the total amount of announcement time available on the circuit pack.

n. **Error Type 2049**: transient error that does not cause an alarm can occasionally occur during a TDM BUS or Tone Clock interchange. It is possible for a marginal Tone-Clock circuit pack to cause this error against the -BD without alarming the TONE-BD. If this error occurs again, replacing the Tone-Clock circuit pack may clear up this error. See the FAIL case in the Clock Match Inquiry Test (#212).

o. **Error type 3999**: the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)		X	ND
Angel Speech Processor Handshake Test (#208)		X	ND
Clock Match Inquiry Test (#212)	X	X	ND
Super Frame Match Inquiry Test (#211)	X	X	ND
140AY Looparound Test (#210)	X	X	ND

Order of investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Announcement Checksum Test (#209)	X	X	ND
NPE Audit Test (#50)		X	ND

1. D = Destructive, ND = Nondestructive

-PT (Announcement Port)

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
-PT	MIN WRN	**test port *location* l**	Announcement Port

The TN750 announcement circuit pack provides an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (that is, announcements on hunt group calls). There are 16 Announcement Ports on the announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. If there are any errors associated with the circuit pack, refer to -BD (Announcement circuit pack).

The announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack, and communicates with the switch via the control channel on the TDM Bus. The second processor, or SP, controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels, one for each Announcement Port.

See -BD (Announcement circuit pack) for general notes that apply to problems on the TN750 announcement circuit pack.

- There is no memory card in the system.
- The memory card in the system does not have a valid announcement file saved on it.

Note:

Unlike translations, there is no provision in the system for automatically saving announcements to the memory card.

Error log entries and recommended actions

Table 22: -PT Error Log Entries

Error Type	Aux Data	Associated test	Alarm Level	On/Off Board	Recommended action
0 (a)	0	Any	Any	Any	`test port location`
1		Playback Speech Memory Array (PSMA) Test (#206)	MIN	ON	`test port location r 3`
18	0	The port was busied out	WRN	OFF	`release port location`
130 (b)		None	WRN	ON	`test port location`
257		Channel Administration Memory Array (CAMA) Test (#205)	MINOR	ON	`test port location l r 3`
	17667	inline error			
513		140AY Channel Sanity Inquiry Test (#222)	MINOR	ON	`test port location r 3`
	17684	inline error			
769 (c)		None			

Notes:

a. **Error Type 0:** Run the short test sequence first. If all tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c. **Error Type 769** is logged and the port is alarmed when an alarm is raised on the announcement circuit pack because of a faulty condition with a common circuit pack resource. Any one of the following alarmed errors on the announcement circuit pack causes this error to be logged against the announcement Port: 1793, 2049, 2305, 2561. Follow the -BD (Announcement circuit pack) repair procedures to resolve these alarms. When the corresponding circuit pack alarm is cleared, this alarm clears.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Channel Administration Memory Array Test (#205)		X	ND
Playback Speech Memory Array Test (#206)	X	X	ND
140AY Channel Sanity Inquiry Test (#222)	X	X	ND

1. D = Destructive; ND = Nondestructive

ANNOUNCE (announcement)

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
ANNOUNCE	none	none	ANNOUNCEMENT

The ANNOUNCE MO logs an error in the error log if **`save announcements`** or **`restore announcements`** does not complete successfully or if the system fails to restore announcements from the memory card at boot time.

Error Log Entries

Table 23: ANNOUNCE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a) (d)	any	None			
257 (d)	any	None			
513 (b) (d)	0	None			
769 (d)	0	None			
1025 (c) (d)	any	None			

Notes:

a. **Error Type 1**: occurred while saving announcements. See Aux data error codes and recommended repair procedures.

b. **Error Type 513**: User pressed cancel while announcements were being saved.

c. **Error Type 1025**: Error occurred while restoring announcements. See Aux data error codes and recommended repair procedures.

d. **Error Types 1, 257, 513, 769, 1025**: The port field for this error contained the active PE complex when the error occurred.

Aux data error codes and recommended repair procedures

Table 24: Aux data error codes and recommended repair procedures ***1 of 2***

Aux data	Description/ Recommendation
32001	Internal system error. 1. Check other ANNOUNCE errors and take corrective action. 2. If there are no ANNOUNCE errors, retry the command at 2-minute intervals a maximum of 3 times. 3. If **restore announcements** fails, escalate the problem.
32002	Announcement circuit pack is in use. 1. Retry the command at 2-minute intervals a maximum of three times. 2. If **restore announcements** fails, escalate the problem.
32003	Announcement port is in use. 1. Wait for all announcement ports to become available. 2. Enter **save/restore announcements**.
32004	There are no announcements recorded on the announcement Circuit Pack. **Save announcements** does not prevent the destroying of the announcement file on tape [286 systems] or on the memory card [386 systems].
32005	Integrated announcement circuit pack is not present. The Announcement Circuit Pack is not inserted, or it is defective. 1. Enter **list config** to check for the presence of the circuit pack in the system. 2. If the announcement Circuit Pack is present, use **test board *location*** to check the status of the announcement Circuit Pack.
32006	Announcement Data Module not available. 1. Enter **status** to check the status of the Announcement Data Module.
32007	Announcement Data Module out of service. 1. Enter **status** to check the status of the Announcement Data Module.
32008	Announcement data is being saved or loaded. 1. Retry the command at 2-minute intervals a maximum of three times. 2. If **save/restore announcements** fails, escalate the problem.
	1 of 2

Table 24: Aux data error codes and recommended repair procedures ***2 of 2***

Aux data	Description/ Recommendation
32012	Required Announcement Data Module is not administered. 1. Add an Announcement Data Module and repeat the command.
32015	Time of day not set. 1. Set the time of day, and reenter **`save/restore announcements`**.
32016	Internal system errors. Check for any other ANNOUNCE errors and take corrective action.If there are no other announcements errors, do the following: 1. Retry the command at 2-minute intervals a maximum of three times. 2. If **`save/restore announcements`** fails, escalate the problem.
	2 of 2

ASAI-ADJ (ASAI Adjunct)

The error log entries and recommended actions for ASAI-ADJ (ASAI Adjunct) are the same as the error log entries and recommended actions for BRI-SET, Various Adjuncts. For more information about specific ASAI-ADJ (ASAI Adjunct) error type, see the same error type on the BRI-SET/Adjunct Error Log Entries table in the BRI-SET, Various Adjuncts section.

ASAI-BD (Multi-Application Platform Board)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-BD	MIN WRN	**test board *location***	ASAI-BD

Refer to BRI-BD (ISDN-BRI Line Circuit Pack) Maintenance documentation for circuit pack level errors. See also ASAI-PT (ASAI Port) and ASAI-EPT (ASAI Endpoint) for related line information. See the following exceptions listed below:

- Hyperactivity: Currently, the common circuit pack is considered “hyperactive” if the circuit pack sends 200 uplink messages in a 10-second period. An alarm is issued when the limit reaches 400. When the limit reaches 500 uplink messages in 10 seconds, the board is taken out of service.
- Port Administration: In Administration Without Hardware (AWOH), the switch allows administration of up to 8 ports in any of the first 12 ports. If the port type later reported by the board does not match the existing type, the switch assumes it to be a MAPD board with a different configuration and rejects the board.

ASAI-EPT (ASAI Endpoint)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-EPT	MAJ[1]	**test station** ***extension***	ASAI-Adjunct

1. The alarm level for ASAI adjuncts is administered using **set options**. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct in the system.

The TN800 is a PC-based platform that allows interaction of multiple applications with Communication Manager at any time. Communication Manager (native mode) supports emulation of three types of port MOs on this board. The type of ports to be emulated is defined by the applications running on the TN800.

Note:

If the TN800 is emulating BRI, the software/firmware supports up to 12 ports, but only 8 of the 12 ports can be administered at any one time.

Error log entries and recommended actions

Table 25: ASAI-EPT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level ASAI-EPT	On/ Off Board	Recommended action
0 (a)	0	Any	Any	Any	**test ASAI-ADJ**
2 (b)	2-102	None			
257 (c)	Any	BRI Layer 3 query	MAJ WRN[1]	OFF	**test station** ***ext*** **r 2** **test data-module** ***ext*** **r 2**
351 (d)	0	none	WRN	OFF	**busyout** and **release station**
513 (e)	0	None			
769 (f)	0	None	MAJ	OFF	
2562-2566 (g)	0	None			
2567 (h)	0	None			
2568 (i)	0	None			
3329 (j)	Any	Signaling Link status (#626)	MAJ WRN†	OFF	
					1 of 2

Table 25: ASAI-EPT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level ASAI-EPT	On/ Off Board	Recommended action
3584-3839 (k)	Any	None			
3841 (l) 4095	Any	None			
					2 of 2

1. Major alarms on this MO may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 2**: ISDN-BRI signaling protocol violation. Timers associated with layer-3 messages expired before a required response was received. In the following table, the aux data column indicates which timer has just expired.

Aux Data	Timer Type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer-2 Failure timer)
16	TM100 (Management Information message Timer 1)
17	TM200 (Management Information message Timer 2)
102	TASAI (ASAI Routing Timer)

The switch sent a message to an endpoint that did not respond in the time allowed. This may be due to failure of the point-to-point signaling link or because of a problem in the ASAI adjunct. To repair, enter **`test station`** ***`extension`*** and perform the associated repair procedures for those tests.

c. **Error Type 257**: An endpoint is not responding to the service state query message sent to the adjunct or to the endpoint. This error causes an alarm to be raised. The alarm is retired when the switch receives a response to the service state query to the endpoint or to the adjunct.

When this error occurs for an ASAI adjunct, the Aux Data field indicates the state of the ASAI link and whether an invalid response or no response was received to the query from the switch, as shown in the following table:

Aux Data	ASAI Link State	Error
102	13-restarting	No response to RESTART message
104	13-restarting	Invalid response to RESTART message
152	13-restarted	No response to layer-3 query
154	13-restarted	Invalid response to layer-3 query
202	13-established	No response to layer-3 query
204	13-established	Invalid response to layer-3 query

See the section on maintenance SAT commands on Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431) for an explanation of the ASAI link states.

For ASAI or Avaya adjuncts, the switch queries the adjunct every two minutes. The Layer 3 Query test is not executed for ASAI or Avaya adjuncts through a command entered from the management terminal. While alarmed for this error, the switch takes the associated port out-of-service for five seconds every 15 minutes. This action attempts to stimulate recovery actions to be taken by the adjunct.

When this error occurs for an ASAI or Avaya adjunct, the service technician should:

1. Execute **`test station extension`** and perform the associated repair procedures.
2. Check the health of the adjunct by following the recommended repair procedures of the manufacturer of the adjunct if the preceding step does not resolve the problem.

d. **Error Type 351:** logged against an ASAI endpoint when the adjunct asks the switch to suspend maintenance on the ASAI endpoint. Clear with busyout and release of the ASAI station.

e. **Error Type 513:** the endpoint sent more messages than the switch could handle. The switch suspends the reception of messages from the endpoint for a short period of time. There is no repair procedure for this error. If the condition persists, replace the endpoint.

f. **Error Type 769:** an ASAI endpoint's associated signaling link has too much traffic related to link establishment. This occurs when the signaling link is alternating between assigned and established states. If this problem persists, replace the endpoint.

g. **Error Type 2562 - 2566:** the ASAI message is not transmitted because the transmit buffer for the ASAI link is full, causing the link to be flow-controlled. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the signaling link or the ASAI adjunct. Follow the repair procedures issued by the manufacturer of the adjunct. If these attempts fail, re-engineering of the traffic on the signaling link or adjunct may be necessary.

h. **Error Type 2567**: This version of ASAI is not supported. Check the software version that is running on the ASAI adjunct.

i. **Error Type 2568:** The adjunct identification is invalid. Check the vendor ID or software running on the ASAI adjunct.

j. **Error Type 3329**: the point-to-point signaling link to the endpoint went down, except when the link goes down because either a system technician has busied out the PKT-BUS, or it has failed. This error raises an alarm against the endpoint or adjunct. Execute **`test station`** ***`extension`*** **`short`** and note the results of the Signaling Link Status Test (#626). If this test fails, follow the repair procedure for Signaling Link Status Test (#626). The alarm is retired when the signaling link is re-established to the endpoint or adjunct.

k. **Error Type 3584 - 3839:** The switch software logs certain ASAI cause values. The cause value is determined from the following formulas:

   – If the Error Type is greater than 3712, the ASAI cause value is equal to the Error Type minus 3712. The switch sent this value to the adjunct.

   – If the Error Type is less than 3712, the ASAI cause value is equal to the Error Type minus 3584. The adjunct sent this value to the switch.

   Table 26: ASAI cause values contains a description of the various ASAI cause values and recommended system technician actions associated with the cause value.

l. **Error Type 3841 - 4095**: The switch software logs certain ASAI cause values. The cause value is determined from the following formula:

   – If the Error Type is greater than 3968, the ASAI cause value is equal to the Error Type minus 3968. The switch sent this value to the endpoint.

   – If the Error Type is less than 3968, the ASAI cause code is equal to the Error Type minus 3840. The endpoint sent this value to the switch.

Table 26: ASAI cause values ***1 of 3***

Code	Explanation	Recommendation
0	Unrecognized ASAI Protocol Operation.	Requested ASAI protocol is not implemented by switch or adjunct. `Aux Data` field of error log entry contains protocol identifier for unrecognized operation. 1. Consult switch and adjunct documentation to determine which set of operations is supported by switch and the adjunct. Turning off adjunct operations not implemented by the switch may resolve the problem.
34	No circuit or channel available	A resource on the switch is unavailable for a call. For BRI endpoints, this cause value is not logged. For ASAI, this condition means that there are no available trunks for an outgoing call request. 1. Verify that the adjunct is administered to support the trunk capabilities of the switch. 2. Investigate trunk-group status by entering **`status trunk`** from the SAT or by requesting trunk-group queries from the adjunct. 3. Perform trunk diagnostic procedures such as **`test trunk`**.
40	Resources not available.	No available internal resources to service switch or adjunct request. Exceeds system transaction capacity for adjunct or switch. 1. May require re-engineering of adjunct services.
		1 of 3

Table 26: ASAI cause values *2 of 3*

Code	Explanation	Recommendation
50	Requested facility not subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. For BRI endpoints: 1. Verify the switch administration of endpoint using **`display station`** or **`display data-module`**. 2. If step 1 does not resolve the problem, refer to the endpoint's service manual and verify administration on the endpoint. For ASAI adjuncts: 1. Display the Customer Optional Features screen (administration screen) on the switch to determine which ASAI capabilities are turned on in the switch. 2. Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administered capabilities, then re-administer the switch and/or the adjunct to establish a consistent set of desired capabilities on both the switch and the adjunct.
58	Bearer capability not currently available	Requested bearer capability is implemented, but not administered. No B-Channel is administered. See code 50 above.
63	Service or option not available	Requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resource. Potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. 1. Verify that no overlapping administration of switch resources (for example, requesting notifications on a single domain by multiple adjuncts attempting to control a single call) exists across any adjunct connected to the switch. If an overlap exists, then re-administer the adjuncts to ensure that each adjunct is associated with a unique set of switch resources.
65	Bearer service not implemented	Requested service not implemented in switch or endpoint.
		2 of 3

Table 26: ASAI cause values ***3 of 3***

Code	Explanation	Recommendation
69	Requested facility not implemented	Requested service not supported in switch or endpoint. 1. Consult switch and endpoint documentation to determine service support.
79	Service or option not implemented	Requested service or option (or combination of selected options) is not supported (implemented) in switch or the adjunct. 1. Consult switch and adjunct documentation to determine ASAI service and options supported by both switch and adjunct. Re-administration of the switch-administered capabilities (see Customer Optional Feature screen) or those of the adjunct may be necessary to correct the problem.
81	Invalid CRV	An invalid CRV was sent by the adjunct. 1. This may indicate a CRV inconsistency between the switch and the adjunct. See the CallVisor protocol reference manual.
87	Internal switch audit	There is an inconsistency in switch data records. 1. There is no action needed, since the switch has corrected the data inconsistency.
		3 of 3

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Signaling Link Status Test (#626)	X	X	Nondestructive

ASAI-PT (ASAI Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-PT	MAJ[1,2] WRN	**test port *location* l**	ASAI ISDN BRI port

1. The alarm level for ASAI adjunct ports may be administered using **set options**. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct port in the system.
2. All alarming for an ASAI adjunct and off-board alarming for an ASAI port is disabled if the ASAI adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm is logged against the ASAI adjunct. Check the Hardware Error and Alarm Logs to see if the adjunct has disabled alarming.

Unless otherwise stated, every maintenance action contained in this section applies to ASAI-PT and ISDN-BRI ports connected to ASAI adjuncts. This port type is administered as an ASAI-BD on the TN800 circuit pack.

The TN800 circuit pack is a PC-based platform that allows interaction of multiple applications with Avaya™ Communication Manager. Communication Manager software (native mode) supports emulation of three types of port MOs on this board. The type of ports to be emulated are defined by the applications running on the TN800. The TN800 can support up to 32 ports (time slots) at a time.

The TN800 connects to the switch through a single slot in the backplane, however its width is not limited to one slot. The number of slots occupied by the TN800 is supplied by the board during its insertion. The TN800 (Release 5 and higher) is three slots wide. The blank (reserve) slots are to the left of the functional slot.

In non-native mode, the TN800 is recognized as TN556, TN2181, TN754, or TN746 based on the switch software and the application running on the TN800. In non-native mode only one type of port MO runs at any time, and the port type depends on the application running on the TN800. If the TN800 fails diagnostics in non-native mode, the system's alarm and error logs would show a failure for the board type the TN800 is emulating.

Error log entries and recommended actions

Table 27: ASAI-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	(a)	Level 1 Status Inquiry (#621)	MAJ[1]	OFF	**test port *location* r 2**
513 (c)	0	none	MAJ	ON	
1537 (d)	46210	CRC Error Counter (#623)	MAJ[1]	OFF	
3841 (e)	46208	None			
3844 (f)	46223	None			
3845 (g)	46211	None			
3846 (h)	TEI	None			

1. Major and Minor alarms may be downgraded to warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0:** Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: Level 1 Status inquiry failed or the BRI circuit pack detected that Level 1 has been deactivated on the port. The `Aux Data` field contains one of the following values:

Blank	The Level 1 Status Inquiry failed.
32773	The ASAI-Line circuit pack detected Level 1 has been deactivated.

Refer to the repair procedures for Level 1 Status Inquiry Test (#621) If the alarm does not clear, verify the status of the PC/server. This could be a customer network issue and not a board problem.

c. **Error Type 513:** The circuit pack is having problems transmitting data to the packet bus. This error occurs when the packet bus transmit FIFO buffer overflows and most likely indicates a hardware problem. Use troubleshooting procedures for both on-board hardware problems and potential off-board packet bus problems.

d. **Error Type 1537:** The port received an invalid frame over the D-Channel. This error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

- Check the wiring to the endpoints or the adjunct.
- If the problem persists, replace the endpoints or adjuncts.

e. **Error Type 3841**: a Layer 1 Transmission error is detected for the port. Run the long test sequence, and note the results of the Layer 1 Transmission Error Counter Test (#624).

f. **Error Type 3844**: the circuit pack detects an overflow of its receive buffers. Run the long test sequence, and note the results of the Receive FIFO Error Counter Test (#625).

g. **Error Type 3845:** the BRI Port Local LAN Looparound Test (#618) fails. Run the long test sequence, and note the results of Test #618.

h. **Error Type 3846:** the TEI (Terminal Endpoint Identifier) administered for the ASAI endpoint most likely does not match the TEI administered in the ASAI adjunct. Check the switch administration of the TEI against that of the adjunct, and make sure that both are using the same TEI.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
BRI Port Local LAN Looparound Test (#618)		X	D
Level 1 Status Inquiry Test (#621)	X	X	ND
CRC Error Counter Test (#623)		X	ND
Layer 1 Transmission Error Counter Test (#624)		X	ND
Receive FIFO Error Counter Test (#625)		X	ND
Clear Error Counters Test (#270)	X	X	ND

1. D = Destructive, ND = Nondestructive

ASAI-RES (TN800 reserve slot)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-RES	NONE	NONE	TN800 ASAI reserve slot
DIG-RES	NONE	NONE	TN800 DIG reserve slot

Error log entries and tests also apply to DIG-RES (TN800 reserve slot).

There are no tests associated with these MOs. Both the **`test board`** and **`busyout board`** commands abort when either is attempted on a reserved slot. An error message indicates the slot is associated with the circuit pack that the TN800 is emulating, but the requested operation is not valid.

The TN800 MAPD (Multi-Application Platform) circuit pack connects to the switch through a single slot in the backplane. The number of slots occupied by the MAPD pack is supplied by the board when inserted. The TN800 in R5EM is three slots wide. The TN800 requires 2 reserve slots to its left. The reserve (blank) slots are to left of the functional slot and are place holders on the switch, and do not have any interaction with the switch.

Each instance of these MOs represents a reserve slot associated with respective circuit pack mode in which the MAPD is working.

ATM-BCH (ATM B-Channel Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-BCH	MAJ[1] MIN	`test port` ***location*** `l`	ATM B-Channel Trunk
	WRN	`test port` ***location***	

1. A MAJOR alarm on a trunk means that alarms on these trunks are not downgraded by **set options**, and at least 75% of the trunks in this trunk group are alarmed.

ATM-BCH explains how to test and repair TN230x ATM Interface circuit packs (TN2305 and TN2306) that have ATM B-Channel trunks administered for ATM Circuit Emulation Service (CES).

For additional repair information, see also, ATM-SGRP (ATM Signaling Group) and PKT-BUS (Packet Bus).

For maintenance instructions for TN230x circuit packs that are administered as Expansion Interfaces for ATM network connectivity, see ATM-INTF (ATM Interface).

ATM Circuit Emulation Service

Under ATM Circuit Emulation Service, you simulate ISDN-PRI circuits by assigning ATM ports to signaling groups. Each signaling group represents a PRI circuit, and the ports in the group represent the D-Channel and B-Channels of that circuit. B-Channels must also be assigned to ISDN-PRI trunk groups. TN230x circuit packs support up to 248 ports per circuit pack.

Signaling Group Components

B (bearer) channels (ATM-BCH) transmit digitized voice or data, while a separate D-channel (ATM-DCH) handles call-control signaling. One D-channel handles signaling for a group of B-Channels that combine to form a signaling group (ATM-SGRP).

B-Channel Service States

The ISDN specification defines two service state categories for B-Channels as listed in ATM ISDN service states.

Table 28: ATM ISDN service states

<table>
<tr><th>Category</th><th colspan="3">Description</th></tr>
<tr><td colspan="4">Service states</td></tr>
<tr><td rowspan="2">In-Service (INS)</td><td rowspan="2">B-Channel is in normal operating state</td><td>Active</td><td>A call is connected over the B-Channel.</td></tr>
<tr><td>Idle</td><td>There is no call on the B channel.</td></tr>
<tr><td>Out-of-Service/ Far-End (OOS/FE)</td><td colspan="3">The switch has not successfully negotiated B-Channel connection as of yet. Calls cot be placed or received.
When you first administer a B-Channel, the switch initializes the B channel to this state while it tries to negotiate a connection to the far end. If the request times out with no response from the far end, the switch leaves the B-Channel in the OOS/FE state.</td></tr>
<tr><td>Out-of-Service/ Near-End (OOS/NE)</td><td colspan="3">The NPE Crosstalk test has failed, or the trunk is busied out. Calls cot be placed or received.</td></tr>
<tr><td>Maintenance/ Far-End (MTC/FE)</td><td colspan="3">A request has timed out with no response from the far end after signaling is in place and B-Channels are in service. Calls can be received but not placed, and stable calls are unaffected.</td></tr>
<tr><td>Maintenance/ Near-End (MTC/NE)</td><td colspan="3">The signaling channel ISDN-PLK has been busied out, possibly after <code>test trunk</code> <code>grp#/mem#</code> <code>long</code>. Calls cot be placed or received, but stable calls are unaffected.</td></tr>
<tr><td>Pending states</td><td colspan="3">The switch is waiting for a reply from the far end. Pending service states remain in effect until the near end receives a response or times out.</td></tr>
<tr><td>Pending-in-Service</td><td colspan="3">The near end is waiting for a response to a transition-to-service request.</td></tr>
<tr><td>Pending-Maintenance</td><td colspan="3">The near end is waiting for a transition-to-maintenance-service request (US and other country-protocol-1 systems).</td></tr>
<tr><td colspan="4"></td></tr>
</table>

B-Channel Alarms

The Maintenance/Far-End and Out-Of-Service/Far-End states generate warning alarms displayed with **status trunk** ***grp#/mem#***.

Table 29: ATM-BCH alarms by service state

Service state	Alarm[1]	Possible cause	Possible solution
Out-of-Service/NE	WRN	Trunk busied out	Release the port with **release trunk** ***grp#/mem#***.
	MIN	NPE Crosstalk test (#6) failed	Replace ATM circuit pack.
	None	ATM circuit pack lost signal or there is a circuit pack problem.	Install circuit pack or cable. Check circuit pack using procedures in ATM-BCH. Check far-end switch status.
Out-of-Service/FE	WRN	Unadministered far end	Administer the corresponding trunk on the far-end switch.
	WRN	Far-end busied out	Check the status of the far-end switch.
Pending/ In-Service Pending/Maint	None	Maintenance message timed out waiting for reply	Wait 2 minutes after the pending state clears, and check the service state.
Maint/NE	None	ISDN test call in progress (**test trunk long**)	Wait for the test to finish and recheck.
	None	System link busied out	Check link status. Run **release link** ***link#***.
Maint/FE	WRN	Signaling channel down for over 90 sec.	See ATM-SGRP (ATM Signaling Group) or ATM-DCH (ATM D-Channel Port).
	WRN	Repeated lack of response to messages sent to the far end	Wait. Maintenance software resends messages periodically. Or run **test trunk** ***grp#/mem#*** or **test signaling-grp** ***grp#***.
	WRN	The far-end trunk is being tested.	Check status of the far-end switch. Wait for testing to finish.
In-Service	None	Normal operating state	

1. ATM-BCH alarms. Alarms against other MOs may also be present.

Error log entries and recommended actions

Table 30: ATM-BCH Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1(b)	Any				**test port *location***
18	0	**busyout trunk *grp/mbr***			**release trunk *grp/ mbr***
129 (c)			WRN	OFF	**test port *location***
130 (d)					**test port *location***
257(e)	Any	Service State Audit Test (#256)			**test port *location***
513(f)	Any		WRN	OFF	**test port *location***
769(g)	Any	Service State Audit Test (#256)			**test port *location***
1793 (h)	Any				**test port *location***
3073(i)	Any	Service State Audit Test (#256)			**test port *location***
3585(j)	Any				none
3841 (k)	Any		WRN	OFF	none

Notes:

a. **Error Type 0:** Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: the two ends of the ATM trunk do not agree on the ISDN call state. Possible causes:

- Received a DISConnect or RELease COMplete message with cause value 52 (outgoing calls barred)
- Received a DISConnect or RELease COMplete message with cause value 54 (incoming calls barred)

- Outgoing call renegotiated by the far end to another B-Channel in the absence of SETUP message glare
- Near end attempted a call on a B-Channel that the far end has marked OOS

When running the short test sequence, note the results of the Call State Audit Test (#257).

c. **Error Type 129:** the far-end switch changed its ISDN service state to either out-of-service or maintenance. This may be a temporary condition because the far end is testing that trunk or a hardware problem with the trunk. Outgoing calls may not be allowed over that trunk.

   1. Investigate the trunk's status (**`status trunk`** ***`grp#/mem#`***).

d. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. Reinsert or replace the circuit pack to clear the error.

e. **Error Type 257:** SETUP received for a B-Channel that is in an invalid service state. Service states may be incompatible at the two ends of the trunk. A normal call was received while the B-Channel was MTC/FE, MTC/NE, OOS/FE, or OOS/NE or a test call was received while the B channel was OOS/FE or OOS/NE.

f. **Error Type 513**: RELease COMplete message received with cause value 82 (nonexistent channel). The B-Channel may not be administered at the far end. The trunk has been placed in the OOS/FE state.

g. **Error Type 769:** inconsistent SERVice or SERVice ACKnowledge message. Possible causes:

- SERVice or SERVice ACKnowledge message received containing a change status that is more available than the previously-transmitted SERVice message.
- Unsolicited SERVice ACKnowledge message received containing a change status that does not match the current B-Channel state.

ISDN-PRI service-state negotiation rules have been violated and may indicate that a pending service-state audit is failing. The system:

- cancels the maintenance timer
- increments the Service State Audit counter
- attempts a Service State Audit

When running the short test sequence, note the results of the Service State Audit Test (#256).

h. **Error Type 1793:** TN230x circuit pack failed. The maintenance system

- places the trunk in the OOS/NE state
- sends a SERvice message to the far end (if possible) containing a change status of OOS for the B-Channel
- returns the trunk to service when the ATM trunk circuit pack reports the failure cleared

i. **Error Type 3073:** Service State Audit attempt failed. See Service State Audit Test (#256). Calls can be received but not placed until the test passes and the trunk state returns to In-Service. Check the trunk's status with **`status trunk`** ***`grp#/mem#`***.

j. **Error Type 3585:** ISDN RESTART message received. Active calls have been dropped.

The following Aux Data values (Error Type 3585 only) below represent the trunk's ISDN call state at the time Error 3585 occurred. This information can be useful if users report dropped calls on the ISDN-PRI trunks.

Aux Data	Description
0	An idle trunk received a restart.
10	An ISDN RESTART from the far end has unexpectedly cleared a call in the ACTIVE state (call stable, parties talking).
4 7 8 260 263	An ISDN RESTART from the far end has unexpectedly cleared a RINGING call.
1 3 6 9 265	An ISDN RESTART from the far end has unexpectedly cleared a call before the call entered the RINGING state.
11 12 19 531 267 268	An ISDN RESTART from the far end has unexpectedly cleared a call that was already in the process of clearing. If this condition occurs frequently, the far end may be trying to clear trunks that appear to be in the "hung" state.

k. **Error Type 3841**: the far end rejected an ATM CES trunk selected by the near end 10 times. The ATM CES trunk may not be administered on the far end.

1. Get the physical name of the ATM trunk by noting the decimal number in the `Aux Data` field.
2. Check administration for the named trunk on the far end.
3. If problems persist, then busyout the ATM trunk to take it out of the hunt group.

The WARNING alarm retires automatically whenever a called endpoint answers an outgoing or incoming call that uses the alarmed trunk.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link State Audit Test (#255)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND
ISDN Test Call Test (#258)		X	ND

1. D = Destructive, ND = Nondestructive

ATM-DCH (ATM D-Channel Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-DCH	MIN	`test port` *`location`* `l`	ATM D-Channel
	WRN	`test port` *`location`*	

Note:

TN2305 and TN2306 circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

ATM-DCH uses the existing ISDN-PLK or D-channel maintenance strategy with modifications. The ATM circuit pack can be administered for up to 8 Circuit Emulation Service (CES) or signaling groups, each with its own D-Channel, as opposed to one D-Channel for an entire DS1 circuit pack.

Note:

Due to the dual personalities and the number of D-Channels that the ATM board can possess, the inline errors and signaling port LAN loopback test have been moved to ATM-TRK (Circuit Emulation Service Circuit Pack). When an inline error is sent due to packet bus errors, the ATM circuit pack receives the error, not ATM-DCH.

The D-channel ISDN-PRI interface is emulated for ATM-CES and uses out-of-band signaling to transmit control messages between two endpoints. User information or bearer channels (B-Channels) carry digitized voice and digital data and are assigned to DS1 ISDN trunks or PRI endpoints. Call-control signaling for the B-Channels is combined and carried over the separate ISDN-PRI Signaling Link port D-Channel.

Problems with ATM-DCH affects every associated B-Channel, since call-control signaling cot reach the far-end switch or terminal adapter. Stable calls can remain operational, but no new calls can be made. In turn, ATM-DCH depends on the:

- TN230X ATM Trunk circuit pack where it resides
- Packet bus that provides the link to the processor

When working ATM-DCH alarms or errors, also investigate

- ATM-TRK (Circuit Emulation Service Circuit Pack)
- PKT-BUS (Packet Bus)

Error log entries and recommended actions

Table 31: ATM-DCH Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
18 (b)	0	**busyout port *location***	WRN	OFF	**release port *location***
130 (c)			WRN	ON	**test port *location***
1793 (d)		Signaling Link Board check (#643)			**test board *location* l**

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 18:** D-Channel busied out. No calls possible over this D-Channel.

c. **Error Type 130**: circuit pack removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. **Error Type 1793**: ATM Trunk circuit pack failed the Signaling Link Board check (#643). Resolve any ATM-TRK (Circuit Emulation Service Circuit Pack) errors in the Error Log.

Demand test descriptions and error codes

The command to test the ATM-DCH MO is **test port *location***, where ***location*** is port number 9-32.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Signaling Link Board Check (#643)	X	X	Nondestructive

ATM-EI (Expansion Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-EI	MAJ MIN WRN	**test board *location***	ATM Expansion Interface circuit pack

ATM-EI covers the ATM circuit pack administered as an Expansion Interface (ATM-EI) for ATM Port-Network Connectivity (ATM PNC). The ATM-EI monitors port network connectivity between a server and every PN through the ATM switch.

The circuit packs listed in Table 32: ATM-EI circuit packs are ATM-EI boards if they are administered to support ATM Port Network Connectivity (ATM PNC).

Table 32: ATM-EI circuit packs

Circuit pack	Fiber	Echo cancellation
TN2305	Multimode	Y
TN2306	Single mode	Y

Note:

TN230x circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

Note:

ATM switch maintenance is not covered in this section. When maintenance software suspects the ATM switch connections, it raises appropriate Communication Manager alarms. To clear any ATM switch faults, refer to the particular ATM switch's documentation.

LEDs

The ATM Interface circuit pack has three LEDs:

- Red indicates some alarm condition.
- Green indicates maintenance testing in progress.
- Amber provides useful visual information regarding the operating mode of the ATM-EI and possible error conditions.

The possible LED states are described in Table 33: ATM Interface LED codes.

Table 33: ATM Interface LED codes

LED	LED Status	Condition
Red	Steady on	Board is not healthy
	Not on	Normal conditions
Red and Green	Red LED solid on Green LED 200 msec on; 200 msec off	Board is in the processes of booting
Green	Steady on[1]	Maintenance is running tests on the board
	100 msec on - 100 msec off	No links to the board
Amber	100 msec on -100 msec off	Board has loss of signal alarms - Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC
Amber	500 msec on; 500 msec off	Signal to the ATM switch is down
Amber	2 sec on; 0.2 sec off	ATM-EI is Expansion Archangel (EAA)
Amber	Steady on	ATM-EI active (Center Stage Switch PN)
Amber	Not on	ATM-EI standby

1. The green LED flashes between tests.

ATM-EI-Related Commands

The following commands can be helpful in resolving ATM-EI problems:

add atm pnc	**list measurements atm**
busyout/release atm pnc	**remove atm pnc**
busyout/release board	**reset board**
change atm pnc (pnc duplication)	**status atm pnc**
display atm pnc	**status cabinet**
list atm oam-statistics	**status port-network**
list atm pnc	**test board**

Replacing an ATM-EI Circuit Pack

Standard Reliability

1. Enter **busyout atm *pn#*** (this is service-affecting) on the SAT.
2. Replace the ATM PNC circuit pack, and reconnect the fiber.
3. Enter **release atm pnc.**
4. Wait 2½ minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.
6. Enter **test board *location***, and verify that every test passes.

Duplex or High Reliability

There is 1 ATM-EI circuit pack in each PN.

1. Enter **busyout atm pnc *#*** on the SAT.

   Note:
   If the ATM-EI is in a PN, this is service-affecting.
2. Replace the circuit pack.
3. Enter **release atm pnc**.
4. Wait 2½ minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.

6. Enter **test board *location***, and verify that every test passes.

Critical Reliability

There are 2 ATM-EI circuit packs in each PN.

1. Enter **status pnc** on the SAT. If the board is on the active side, enter **reset pnc interchange** to switch the active ATM-EI board to the standby side.
2. Enter **busyout pnc-standby.**
3. Enter **busyout atm pnc # a-pnc** or **b-pnc**.
4. Replace the circuit pack.
5. Enter **release atm pnc #.**
6. Enter **release pnc-standby.**
7. Wait 2½ minutes for board insertion.
8. Enter **test board *location***, and verify that every test passes.

Basic ATM PNC Administration

Note:

This section contains basic administration information only. Refer to *ATM Installation, Upgrades, and Administration using Avaya Communication Manager,* for more detailed information.

ATM PNC connections involve administering

- 1 ATM-EI board in each PN (standard, duplex, or high reliability)
- 2 ATM-EI boards in each PN (critical reliability)

Adding ATM PNC Connections

Standard, Duplex or High Reliability

1. If the ATM-EI circuit pack is absent or if the circuit pack is present but in a PN, use the **change circuit-pack** command to add circuit pack translations.
2. Enter **add atm pnc *n*** (connection number), and administer the circuit pack's location and its ATM address.

Critical Reliability

1. Enter **change system-parameters duplication**, and change the **Enable Operation of PNC Duplication field** to **n.**

2. If the ATM-EI circuit pack is absent or is present but in a PN that does not yet have PNC connectivity to it, use the **`change circuit-pack`** command to add circuit pack translation for the missing circuit pack.
3. Enter **`add atm pnc`** ***`n`*** (connection number), and administer the circuit pack location and ATM address.
4. Enter **`change system-parameters duplication`**, and change the **Enable Operation of PNC Duplication** field to **y.**

Removing ATM PNC Connections

Standard, Duplex or High Reliability

Note:

These systems are *not* equipped with PNC duplication.

1. Enter **`busyout atm pnc`** ***`n`*** (connection number).
2. Enter **`remove atm pnc`** ***`n`*** (connection number).

Critical Reliability

1. Enter **`status pnc`**, and ensure that the A-PNC is active.

   If not, request a PNC interchange using the **`reset pnc interchange`** command.
2. Enter **`busyout pnc-standby.`**
3. Enter **`change system-parameters duplication`**, and change the **Enable Operation of PNC Duplication** field to **n.**
4. Enter **`busyout atm pnc`** ***`n`*** (PN’s number)**.**
5. Enter **`remove atm pnc`** ***`n`*** (PN’s number) to remove both ATM-EI boards, or enter **`change atm pnc`** to remove the B-side ATM-EI board.
6. Enter **`change system-parameters duplication`**, and change the **Enable Operation of PNC Duplication** field to **y**.

Changing Circuit Pack Location or ATM Address

Standard, Duplex or High Reliability

Note:

These systems are *not* equipped with PNC duplication.

1. Remove the ATM PNC connection. See Removing ATM PNC Connections.
2. Add an ATM PNC connection. See Adding ATM PNC Connections.

A-side ATM-EI—Critical Reliability

1. Remove the ATM PNC connection. See Removing ATM PNC Connections.
2. Add an ATM PNC connection. See Adding ATM PNC Connections.

B-side ATM-EI—Critical Reliability

1. Enter **status pnc**, and ensure that the A-PNC is active.

   If not, request a pnc interchange using **reset pnc interchange**.
2. Enter **busyout pnc-standby**.
3. Enter **list config carrier**, and verify that an ATM circuit pack is assigned for the new location. If not, add the ATM circuit pack's translations.
4. Enter **busyout atm pnc *n*** (connection number) **b-pnc**.
5. Enter **change atm pnc *n*** (connection number) and change circuit pack location for the B side.
6. Enter **release pnc-standby**.

Changing ATM Address of Standby ATM PNC EI, Critical Reliability

1. Enter **busy pnc-standby**.
2. Enter **change atm pnc *n*** (connection number), and change the ATM address for the standby side.
3. Enter **release pnc-standby**.

Error log entries and recommended actions

Table 34: ATM-EI Error Log Entries *1 of 3*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
2 (b)			MIN	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (d)	0		WRN	OFF	
125 (e)			MIN	ON	
					1 of 3

Table 34: ATM-EI Error Log Entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
131 (f)			MIN	ON	
257-259 (g)	Any	Expansion Interface Control Channel test (#316)	MAJ	ON	`test board` *`location`* `r 2`
513 (h)	Any	ATM Crosstalk test (#1298)	MIN	ON	`test board long` *`location`*
769 (i)	34 35	ATM Board Error Query (1259)	WRN	OFF	`test board` *`location`*
770 (i)	25	ATM Board Error Query (#1259)	WRN	OFF	`test board` *`location`*
771 (i)	26	ATM Board Error Query (#1259)	WRN	OFF	`test board` *`location`*
1024–1151 (j)	Any		WRN MIN	ON	`test board` *`location`*
1153 (k)			WRN	ON	`test board` *`location`*
1281 (l)		ATM Board Error Query (1259)	MAJ	OFF	`test board` *`location`*
1537 (m)	12		MIN	ON	
1538 (n)	0		MIN	ON	
1793 (o)	13		MIN	ON	`test board` *`location`*
2049 (p)	15		MIN	OFF	`test board` *`location`* `r 4`
2050 (p)		Expansion Interface Lock Query (#304)	MIN	OFF	`test board` *`location`* `r 4`
2305 (q)			MIN	ON	
2309 (q)		Packet interface test (#598)	MIN	ON	`test board` *`location`* `r 2`
2561 (r)		Expansion Interface 2-way Transmission test (#241)	MAJ	OFF	`test board` *`location`* `r 3`
2817 (s)	Any	ATM Board DSP test (#1293)	MIN	ON	`test board` *`location`*
					2 of 3

Table 34: ATM-EI Error Log Entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2818 (s)	Any		MIN	ON	**test board *location***
3329 (t)	3	LANHO critical error	MAJ	OFF	
3585 (u)		ATM Framer Looparound (#1260)	MAJ	ON	**test board *location* l**
3586 (u)		ATM Framer Looparound (#1260)	MAJ	ON	**test board *location* l**
3841 (v)					
3842(w)					
3843 (x)					
3999 (y)	Any				
Any (z)	32767				
					3 of 3

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 2:** The on-board DUART chip failed. This results in communication failure between the PN's Maintenance board and the ATM-EI board. The Maintenance board should have a red LED lit because the link to the ATM-EI is down in this PN.

1. Reset the board with **reset board *location***.
2. If the board does not recover, replace the board.

c. **Error Type 18**: The ATM-EI circuit pack has been busied out.

1. Release the circuit pack (**release board *location***).

d. **Error Type 23**: An ATM-EI circuit pack has been administered with the **add atm pnc *n*** command, but the circuit pack has not been physically inserted into the system.

1. Insert an ATM-EI circuit pack at this location.

e. **Error Type 125:** A wrong circuit pack is located in the slot where the ATM-EI circuit pack is logically administered.

1. Either remove the wrong circuit pack and insert the ATM-EI circuit pack or remove the ATM-EI administration. See Basic ATM PNC Administration.

2. Remove the ATM-INTF administration and re-administer the slot (change circuit-pack) to match the circuit-pack that is physically present in this slot.

f. **Error Type 131:** An ATM-EI circuit pack has been removed from the slot for 5 minutes.

1. Insert the ATM-EI circuit pack into its administered slot.
2. Another way to resolve or prevent this alarm is to remove the ATM-EI administration. See Basic ATM PNC Administration, then remove the ATM-INTF administration (change circuit-pack).

It is possible that the ATM-EI could be held in reset by the PN's Maintenance board and is not inserted in the system.

3. Try **`test maint`** ***`P`*** **`long`** on the maintenance board in the same PN.

g. **Error Type 257**: Expansion Interface Control Channel Test (#316) failed (board cot communicate on the TDM bus control channel). Follow the suggested test procedures.

Error Type 258: The archangel is out of sequence (Aux Data indicates Angel number).

Error type 259: The expansion archangel link (EAL) to the active ATM-EI board is down. See SYS-LINK (System Links).

h. **Error Type 513**: The ATM Crosstalk test failed. The board is either writing to or reading from a TDM time slot that is not allocated to the board.

1. Test the board (**`test board`** ***`location`***), and follow the procedures suggested for this test. In random tests of a single DSP during low or high traffic, the same DSP can be tested more than once.

i. **Error Types 769 and 770**: are board-degraded alarm errors that result when the ATM switch is sending corrupted cells or excessive AAL/LAPD retransmissions (off-board ATM cell corruption errors). These errors indicate the detection of a problem in handling ATM cells that are received from the fiber interface.

Aux Data for these Error Types:

Error Type	Aux Data	Description
769	34	Excessive AAL-5 retransmission requests
769	35	Excessive LAPD retransmission requests
770	25	Uncorrectable ATM cell headers – threshold
771	26	VPI, VCI pair unknown

The problem is most likely *not* on the ATM-EI circuit pack reporting the errors, but it could be due to one or more of the following reasons:

- The fiber is not snugly connected to either the board or the ATM switch.
- The PN's packet bus is corrupting the cells. See PKT-BUS (Packet Bus) (Aux Data 35 only).

- The fiber between the ATM switch and the ATM-EI is too long (greater than 2 km for multimode fiber). Use loopback to see if the fiber is corrupting the cells.
- Some other ATM-EI board is not receiving the cells properly.
- The intervening ATM switch is dropping the ATM cells due to a shortage of bandwidth, or the server is using more than the subscribed bandwidth.

Error Type 771: The ATM switch is sending cells with unknown VPI and VCI address (wrong connection).

1. Ensure that the address translations are correct.

j. **Error Types 1024-1151**: These errors represent problems detected by the ATM-EI board in response to SETUP and ADDPARTY requests from software.

- The Error Types and descriptions are in Table 35: ATM Error Types 1024 - 1151.
- Aux Data values represent PN and Angel numbers and are in Table 36: Error Type 1024-1151 Converted Aux Data Values.

Table 35: ATM Error Types 1024 - 1151 ***1 of 3***

Error Type	Description	General problem
1024	Next node unreachable	ATM protocol stack on ATM-EI3 circuit pack
1056	DTL Transit not my node ID	
		1 of 3

Table 35: ATM Error Types 1024 - 1151 ***2 of 3***

Error Type	Description	General problem
1088 1104	ATM-EI circuit pack received a request with an invalid connection identifier.	Firmware-detected problems on the ATM-EI circuit pack. Note: Error Types 1088–1103 are reported by the board that is originating the connection. Error Types 1104–1119 are reported by the board that is terminating the connection. In most cases, when the terminating board reports one of these errors, the originating board also reports an ATM-NTWK error for the same event (usually with Error Type 21).
1089 1105	ATM-EI circuit pack received a request with a reference to an unknown VC token.	
1090 1106	ATM-EI circuit pack did not have enough resources (memory) for the requested operation.	
1091 1107	Internal failure in the local protocol stack. This can occur when the connection to the ATM switch failed, perhaps because the: ● ATM switch rebooted ● fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1092 1108	ATM-EI circuit pack received a request for which the referenced VC was in the wrong call state.	
1093 1109	ATM-EI circuit pack received a request for which the VPI/VCI pair was invalid or out of range.	
1094 1110	ATM-EI circuit pack received a request to add a party to an existing VC. The add party request failed, and a retry was not possible.	
1095 1111	ATM-EI circuit pack in link recovery after the lower ATM layer (Q.SAAL portion of the protocol stack) failed. This can occur when the connection to the ATM switch failed, perhaps because the: ● ATM switch rebooted ● fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1096 1112	ATM-EI circuit pack received an error from the local protocol stack for which no more detailed cause was specified.	
1102	ATM-EI circuit pack asked to create more connections that it was capable of creating.	
1103	ATM-EI circuit pack detected an illegal message from software. Check the Error Log for CONN-M errors for more information.	
		2 of 3

Table 35: ATM Error Types 1024 - 1151 ***3 of 3***

Error Type	Description	General problem
1113		Problems detected by the board terminating the connection
		3 of 3

1. Test the ATM-EI circuit pack (**`test board location`**) and investigate further based on each test's results. If every test passes, the error was a transient problem.

Aux Data values: For Setup and Add Party connection request failure type, the port-network and the Angel number of the destination ATM-EI circuit pack are logged Aux Data values in the form XXYYY, where

- port-network number = XX
- Angel number = YYY

Since you need to know the slot number also, Table 36: Error Type 1024-1151 Converted Aux Data Values converts the Aux Data to slot numbers.

Table 36: Error Type 1024-1151 Converted Aux Data Values ***1 of 2***

Slot	Carrier									
	A		B		C		D		E	
	Failure type		Failure type		Failure type		Failure type		Failure type	
Slot #	Set up	Add Party	Set up	Add Party	Set up	Add Party	Set up	Add Party	Set up	Add Party
1	28	528	66	566	98	598	34	534	02	502
2	29	529	67	567	99	599	35	535	03	503
3	30	530	68	568	100	600	36	536	04	504
4	31	531	69	569	101	601	37	537	05	505
5	56	556	70	570	102	602	38	538	06	506
6	57	557	71	571	103	603	39	539	07	507
7	58	558	72	572	104	604	40	540	08	508
8	59	559	73	573	105	605	41	541	09	509
9	60	560	74	574	106	606	42	542	10	510
										1 of 2

Table 36: Error Type 1024-1151 Converted Aux Data Values *2 of 2*

Slot	Carrier									
	A		B		C		D		E	
	Failure type		Failure type		Failure type		Failure type		Failure type	
Slot #	Set up	Add Party	Set up	Add Party	Set up	Add Party	Set up	Add Party	Set up	Add Party
10	61	561	75	575	107	607	43	543	11	511
11	62	562	76	576	108	608	44	544	12	512
12	63	563	77	577	109	609	45	545	13	513
13	88	588	78	578	110	610	46	546	14	514
14	89	589	79	579	111	611	47	547	15	515
15	90	590	80	580	112	612	48	548	16	516
16	91	591	81	581	113	613	49	549	17	517
17	92	592	82	582	114	614	50	550	18	518
18	93	593	83	583	115	615	51	551	19	519
19	94	594	84	584	116	616	52	552	20	520
20	95	595	85	585	117	617	53	553	21	521
21	NA	NA	86	586	118	618	54	554	22	522
22	NA	NA	87	587	119	619	55	555	23	523
										2 of 2

k. **Error type 1153**: The ATM connection audit found some discrepancy in the firmware's VC token numbers and live VCs. The problem is rectified in firmware and no action is needed. This is an indication of an event only.

l. **Error Type 1281**: The ATM circuit pack cot talk to the ATM switch. The loss of high-level signal error indicates operational problems of equipment located outside of the circuit pack and the fiber connected to the board. Aux Data values are listed in Table 37: Error type 1281 Aux Data and repair procedures.

Table 37: Error type 1281 Aux Data and repair procedures *1 of 3*

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone-Clock problem. 1. Check for TDM-BUS or TONE-BD errors in the Error Log. 2. If no other problems are present, reset the circuit pack (**reset board** ***location***)
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-EI board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. 1. Run **test board** ***location***. 2. If Test #1259 fails, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does, the problem is off-board. 3. If the amber LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cot obtain or maintain STM-1/OC-3 framing. 1. Try to move the fiber on the ATM switch side to a different port. This could require administration on the ATM switch. 2. If the problem persists, reset the circuit pack (**reset board** ***location***).
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. 1. See if the ports at the MUX and/or the ATM switch are connected snugly. 2. Run **test board** ***location***. 3. If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does, the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
		1 of 3

Table 37: Error type 1281 Aux Data and repair procedures ***2 of 3***

Aux Data	Alarm Description	Repair procedure
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far end is detecting a major problem with the signal that this board is transmitting. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. 2. Run **test board *location***. 3. If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. 1. Reset the board (**reset board *location***). 2. If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/ SONET)	The incoming signal payload is not set up for transmission of ATM data. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface.
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. 2. Run **test board *location***. 3. If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack.
		2 of 3

Table 37: Error type 1281 Aux Data and repair procedures ***3 of 3***

Aux Data	Alarm Description	Repair procedure
23	High-level path Remote defect Indicator: HP_RDI	The far end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. 2. Run **test board *location***. If the Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 3. If it does, the problem is off-board. 4. If the amber LED continues to flash, replace the circuit pack.
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. 1. Reset the board (**reset board *location***). 2. If the error persists, replace the board.
27	SIGCON_DOWN ATM switch high level signal	The board cot communicate with the ATM switch. 1. Busyout the board with **busyout board *location***. 2. Test the board with **test board long *location***. 3. Release the board with **release board long *location***. 4. If Test #1260 fails, replace the board. 5. If Test #1260 passes, make sure the ATM address on both the server and the ATM switch sides are the same for this board. 6. If the address is the same, change the port on the ATM switch side. This could require administration on the ATM switch. 7. If the error is resolved, the problem is on the ATM switch port.
		3 of 3

m. **Error Type 1537**: LAN bus time out. The circuit pack is transmitting a packet larger than 1,024 bytes. Replace the circuit pack.

n. **Error Type 1538**: A hyperactive ATM-EI circuit pack is generating an excessive amount of control messages to the processor. When this error is generated, the system automatically resets the ATM-EI.

Duplicated PNC?	Then:
Yes	service to the PN is disrupted
No	the system switches to the standby PNC

1. Enter **reset board *location*** for this ATM-EI circuit pack.
2. If the same error persists, replace the ATM-EI circuit pack.

o. **Error Type 1793**: LANHO transmit FIFO overflow error (the transmit FIFO RAM buffers on the circuit pack overflowed). This most likely indicates a hardware problem on the circuit pack because the speed of the LAN/packet bus is much higher than the speed of the link connected to the port.

1. Test the ATM-EI circuit pack (**test board *location***).
2. If Test #598 fails again, replace the ATM-EI circuit pack.

p. **Error Types 2049 and 2050**: The ATM-EI clock generation is out of lock with the backplane system clock.

1. Test the ATM-EI circuit pack (**test board *location***).
2. If Test #304 fails, follow the repair procedures suggested for this test.

q. **Error Type 2305**: Too many parity errors on data received from the LAN/packet bus (could be due to packet bus problems).

1. Test the ATM-EI circuit pack (**test board *location***).
2. If Test #598 fails, follow the repair procedures for Packet Interface Test (#598).
3. If the test passes, look for and resolve any PKT-BUS (packet bus) alarms/errors.
4. If there are no PKT-BUS errors and the problem persists, escalate the problem.

Error Type 2309: The packet-interface chip (LANHO) is malfunctioning. Perform the following steps:

5. Test the ATM-EI circuit pack (**test board *location***).
6. If Test #598 fails, follow the repair procedures for Packet Interface Test (#598).

r. **Error Type 2561**: ATM-EI 2-way transmission failure (circuit pack is having problems creating connections to other PNs in the system).

1. Test the ATM-EI circuit pack (**test board *location***).
2. Follow the repair procedures suggested for Expansion Interface 2-Way Transmission Test (#241).

s. **Error Types 2817 and 2818**: A bad DSP was detected on the ATM-EI circuit pack.

Error Type	Description	Aux Data indicates
2817	DSP test failure	The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs
2818	One or more DSPs failed	DSP number that has failed

1. Test the ATM-EI circuit pack (**test board *location***).
2. Follow the repair procedures for any test that fails.

t. **Error Type 3329**: The on-board LANHO chip is insane, possibly due to a problem in packet bus arbitration, the transmission line frame, or the circuit pack itself. The circuit pack cot talk to the packet bus.

If the packet bus is alarmed:

1. Resolve any PKT-BUS errors. The probability of this error being related to a packet bus problem increases with the number of other circuit packs using the bus that are also showing this error.

If the packet bus is *not* alarmed:

2. Reset the circuit pack (**reset board *location***).
3. If the problem persists, replace the ATM-EI circuit pack.

If the system has a duplicated PNC, and the inline error received is from an active ATM-EI, the system switches to the standby PNC.

CAUTION:

If the system does not have duplicated PNC, services to the PN could be disrupted.

u. **Error Types 3585 and 3586**: Board major component failure. A failure of critical components involved in the operation of the circuit pack. If the system has a duplicated PNC and the inline error received is from an active ATM-EI, the system switches to the standby PNC.

CAUTION:

If the system does not have duplicated PNC, services to the PN could be disrupted.

Error Type 3585

Aux Data (Error Type 3585 only):

Aux Data	Description
1	ATM framer failure
2	NCE failed (only from ATM-EIs in PN)
4	TDM_PLD_FAILED
5	DSP_ALL FAILED
6	Receive Network Processor (RNP) failure

Aux Data	Description
7	Transmit Network Processor (TNP) failure
8	MEMORY read/write failure

1. If the system has duplicated PNC:
   a. Test the ATM-EI (**`test board`** ***`location`*** **`l`**).
   b. If Error 3585 is detected again, or if the board is not recognized anymore, replace the ATM-EI circuit pack.
2. If the system does *not* have duplicated PNC and the circuit pack is in a PN:
   a. Replace the ATM-EI circuit pack.

Error Type 3586: Framer Looparound test (#1260) failed.

Aux Data (Error Code 3586 only):

Aux Data	Description
2	Packet path failed
3	Circuit path failed
4	TDM loop cot be created
5	Packet loop cot be created

3. If Error Type 3586 is detected again, replace the circuit pack.

v. **Error Type 3841**: The board received a message from the switch that it does not recognize, and the board responded with an inconsistent down link error message. This error does not affect service, and no action is required.

w. **Error Type 3842**: The circuit pack received data from the packet bus faster than it could distribute the data to its endpoint. This circuit pack should be able to recover by itself, and no action is necessary.

x. **Error Type 3843**: The firmware on the circuit pack is reporting a resource that is low. This error does not affect service and no action is required.

y. **Error Type 3999**: The circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	The circuit pack is taken out of service
Error Type 1538 is absent	The circuit pack is not taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. This can be normal during heavy traffic. If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

z. **Aux Data 32767** for any error log entry indicates that an alarmed ATM-EI was busied out and then released. When this occurs, existing service-affecting alarms must be preserved. Typically, every alarm is resolved when the ATM-EI is released. Therefore, the Alarm and Error Logs must be repopulated with the alarms present at time of busyout. This Aux Data indicates that existing Error Type and Error Log time stamps are no longer valid because they were lost when the circuit pack was released.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
ATM Board Time Of Day Update (#1261)		X	ND
Expansion Interface Control Channel Test (#316)	X	X	ND
Packet Interface Test (#598)	X	X	ND
ATM Board DSP Test (#1293)	X	X	ND
Expansion Interface 2-Way Transmission Test (#241)	X	X	ND
ATM Board Framer Looparound Test (#1260)		X	D
ATM Crosstalk Test (#1298)		X	ND
			1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Expansion Interface Lock Query Test (#304)	X	X	ND
ATM Board Error Query Test (#1259)	X	X	ND
The following test is executed as part of the **reset board** command			
ATM Board Reset (#1256)			D
			2 of 2

1. D = Destructive, ND = Nondestructive

Note:

To get a better indication of a problem's location, test both ATM-EI circuit packs on the associated fiber link, whether the circuit packs are both ATM-EI circuit packs or not.

ATM-INTF (ATM Interface)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-INTF	WRN	`test board` *`location`*	ATM interface board

The system recognizes a TN2305/6 as an ATM interface board (ATM-INTF) unless it has an assigned personality (**`add atm pnc`** or **`add atm trunk`**). ATM-INTF does not have an associated maintenance strategy, although the:

- **`list config`** and **`change circuit-pack`** display information regarding the board
- **`test board`** runs an on-demand Control Channel test
- **`reset board`** resets the board

Table 38: ATM-EI circuit packs for ATM PNC lists circuit packs that are ATM-EI boards if they are administered to provide ATM port-network connectivity (ATM PNC).

Table 38: ATM-EI circuit packs for ATM PNC

Circuit Pack	Fiber	Echo Cancellation
TN2305	Multimode	Yes
TN2306	Single-mode	Yes

Note:

Always replace an ATM-EI circuit pack with the same type.

Error log entries and recommended actions

Table 39: ATM-INTF Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
23 (a)	0	None	WRN	Off	
125 (b)		None	MINOR	On	
217 (c)	0	None	WRN	Off	

Notes:

a. **Error Type 23**: The ATM expansion interface circuit pack is administered through a **change circuit-pack** command, but has not been inserted into the system. Insert the circuit pack.

b. **Error Type 125**: A wrong circuit pack is located in the slot where this circuit pack is logically administered. To resolve this problem either remove the wrong circuit pack or insert the logically-administered circuit pack.

c. **Error Type 217**: The ATM circuit pack is physically present but has not been given a personality. Remove the circuit pack or administer it using **add atm pnc** or **add atm trunk**.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Control Channel Looparound Test (#52)	X	X	Nondestructive

ATM-NTWK (ATM Network Error)

S8700-series Fiber-PNC

MO Name in Log	Physical Name in Error Log[1]	Alarm Level	Full Name of MO
ATM-NTWK	ATUUP	WRN	ATM Network Error
ATM-NTWK	location	WRN	ATM Network Error

1. *AT* indicates it is an ATM switch-related address, *UU* is the connection number. The connection number can be converted into a board location with **`display atm pnc`** ***`UU`***, which shows the translations for the board that reported the ATM network error. *P* indicates if the ATM-EI board (reporting the ATM network error) is on the PNC's A side or the B side. If the system is simplex, only A is valid.

In an ATM PNC configuration, a proprietary Center Stage Switch (CSS) is replaced by an ATM network. Because CSS nodes are replaced by the ATM network in the ATM PNC configuration, SNI boards are no longer needed. In place of the SNI boards, ATM Expansion Interface (EI) or ATM Circuit Emulation Service (CES) boards are connected to an ATM switch port over a fiber-optic cable. The ports on the ATM switch are under control of its maintenance software. Refer to *ATM Installation, Upgrades, and Administration using Avaya Communication Manager,* for more information.

An error against ATM-NTWK indicates a problem in the ATM network (including the ATM switch) that is affecting service quality. These error events are either:

- Reported by the ATM network to an ATM EI or ATM CES board
- Detected by either the ATM EI or ATM CES board itself

Since these errors are ***not*** related to the ATM EI or ATM CES board, they are not reported against the ATM-EI or ATM-TRK MO. However, some of these errors invoke alarms that require action by the system's maintenance software, while other log-only errors require no action.

Error Codes and Aux Data values

The Cause Code/Error Type information is shown in Table 40: Error codes and Aux Data values ATM-NTWK. These are the possible errors that can be logged against ATM-NTWK.

If ATM-NTWK receives more than 6 errors, the most recent are discarded.

Table 40: Error codes and Aux Data values ATM-NTWK ***1 of 6***

Cause Code/ Error Type	Aux Data	Cause Codes Description
NORMAL EVENTS		
0	(a)	Network unreachable
1	(a)	Unallocated (unassigned) number. This cause indicates that the called party cot be reached because, although the number is in a valid format, it is not currently assigned (allocated).
2	(a)	No route to specified transit network. This cause indicates that the equipment sending this cause has received a request to route the call through a particular network that it does not recognize, either because the transit network does not exist or because that particular transit network does not serve the equipment that is sending this cause. This cause is supported on a network-dependent basis.
3	(a)	No route to destination. This cause indicates that the called party cot be reached because the network through which the call has been routed does not serve the destination desired. This cause is supported on a network-dependent basis.
10	(a)	VPCI/VCI unacceptable. This cause indicates that the virtual channel most recently identified is not acceptable to the sending entity for use in this call.
16	(a)	Normal call clearing. This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared. Under normal situations, the source of this cause is not the network.
17	(a)	User busy. This cause indicates that the called party is unable to accept another call because the user busy condition has been encountered. This cause value can be generated by the called user or by the network.
18	(a)	No user responding. This cause is used when a called party does not respond to a call establishment message with a connect indication within the prescribed period of time allocated.
		1 of 6

Table 40: Error codes and Aux Data values ATM-NTWK ***2 of 6***

Cause Code/ Error Type	Aux Data	Cause Codes Description
21	(a)	Call rejected. This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible. **Note**: If the call was rejected by the far-end ATM-EI or ATM-CES board, there could also be additional information about this rejection in an ATM-EI error log entry. Look for an ATM-EI or error with an Error Type between 1104 and 1119 inclusive, with approximately the same time stamp as this error.
22	(a)	Number changed. This cause is returned to a calling party when the called party's number indicated by the calling user is no longer assigned. The new called party's number can optionally be included in the diagnostic field. If a network does not support this capability, cause number 1 "*unassigned (unallocated) number*" is used.
23	(a)	User rejects every call with CLIR (calling line identification restriction). This cause is returned by the called party when the call is offered without calling party's number information and the called party requires this information.
27	(a)	Destination out of order. This cause indicates that a user-indicated destination cot be reached because a signaling message could not be delivered to the remote user over the destination's interface (for example, a physical-layer or SAAL failure at the remote user, or remote user's equipment is off line).
28	(a)	Invalid number format (address incomplete). This cause indicates that the called user cot be reached because the called party's number is not in a valid format or has insufficient digits.
30	(a)	Response to STATUS ENQUIRY. This cause is included in the STATUS message when the reason for generating the STATUS message was the prior receipt of a STATUS ENQUIRY message.
31	(a)	Normal, unspecified. When no more specific cause values apply, this cause reports a normal event.
32	(a)	DTL transit not-my-node ID
RESOURCE UNAVAILABLE		
35	(a)	Requested VPCI/VCI not available. This cause indicates that the requested VPCI/VCI is not available. This can be caused by mismatched VCI ranges on different ATM switches.
36	(a)	VPCI/VCI assignment failure
		2 of 6

Table 40: Error codes and Aux Data values ATM-NTWK ***3 of 6***

Cause Code/ Error Type	Aux Data	Cause Codes Description
37	(a)	User Cell Rate not available
38	(a)	Network out of order. This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long time. (Immediately retrying the call is unlikely to succeed.)
41	(a)	Temporary failure. This cause indicates that the network is not functioning correctly, but the condition is unlikely to last long. (Immediately retrying the call is likely to succeed.)
43	(a)	Access information discarded. This cause indicates that the network could not deliver access information to the remote user as requested (that is, ATM adaptation-layer parameters, Broadband low-layer information, Broadband high-layer information, or sub-address as indicated in the diagnostic).
45	(a)	No VPCI/VCI available. This cause indicates that no appropriate VPCI/VCI is currently available to handle the call.
47	(a)	Resource unavailable, unspecified. When no more specific cause values apply, this cause reports a resource-unavailable event.
SERVICE OR OPTION UNAVAILABLE		
49	(a)	Quality of Service unavailable. This cause reports that the requested Quality of Service cot be provided.
51	(a)	User cell rate not available. This cause reports that the requested ATM Traffic Descriptor is unobtainable.
57	(a)	Bearer capability not authorized. This cause indicates that a user-requested bearer capability is implemented by the cause-sending equipment, but the user is not authorized to use the capability.
58	(a)	Bearer capability not currently available. This cause indicates that the user-requested bearer capability is implemented by the cause-sending equipment, but the capability is currently unavailable.
63	(a)	Service or option not available, unspecified. When no more specific cause values apply, this cause reports an unavailable service or option event.
65	(a)	Bearer capability not implemented. This cause indicates that its sending equipment does not support the bearer capability requested.
73	(a)	Unsupported combination of traffic parameters. This cause indicates that the combination of traffic parameters contained in the ATM traffic descriptor information element (IE) is not supported.
		3 of 6

Table 40: Error codes and Aux Data values ATM-NTWK ***4 of 6***

Cause Code/ Error Type	Aux Data	Cause Codes Description
78	(a)	AAL parameters cot be supported.
INVALID MESSAGES		
81	(a)	Invalid call reference value. This cause indicates that its sending equipment received a message with a call reference that is currently inactive on the user-network interface.
82	(a)	Identified channel does not exist. This cause indicates that its sending equipment received a request to use a channel not activated for the call's interface.
88	(a)	Incompatible destination. This cause indicates that its sending equipment received a request to establish a call with either Broadband low-layer information, Broadband high-layer information, or other compatibility attributes that cot be accommodated.
89	(a)	Invalid endpoint reference value. This cause indicates that its sending equipment has received a message with an endpoint reference that is currently idle on the user-network interface.
91	(a)	Invalid transit network selection. This cause indicates that a transit network identification was received in an incorrect format.
92	(a)	Too many pending add-party requests. This cause indicates a temporary condition when the calling party sends an add-party message, but the network rejects the message due to full queues.
93	(a)	AAL parameters cot be supported. This cause indicates that its sending equipment received a request to establish a call with ATM adaptation-layer parameters that cot be accommodated.
PROTOCOL ERROR		
96	(a)	Mandatory information element (IE) is missing. This cause indicates its sending equipment has received a message with a missing IE.
97	(a)	Message type either non-existent or not implemented. This cause indicates that its sending equipment received a message with an unrecognized type, either because the type is undefined, or defined but not implemented by the cause-sending equipment.
		4 of 6

Table 40: Error codes and Aux Data values ATM-NTWK ***5 of 6***

Cause Code/ Error Type	Aux Data	Cause Codes Description
99	(a)	Information element (IE) either non-existent or not implemented. This cause indicates that its sending equipment received a message with an unrecognized IE, either because the IE's identifier(s) are undefined, or defined but not implemented by the cause-sending equipment. This cause indicates that its sending equipment discarded the IE. However, the equipment could still process the message since this IE was not required.
100	(a)	Invalid contents in information element (IE). This cause indicates that its sending equipment received and implemented an IE. However, one or more of the IE's fields are coded in a way that the cause-sending equipment has not implemented.
101	(a)	Message not compatible with call state. This cause indicates receipt of a message that is incompatible with the call state.
102	(a)	Recovery on timer expiration. This cause indicates that a timer's expiration initiated an error-handling procedure.
104	(a)	Incorrect message length
111	(a)	Protocol error, unspecified. When no more specific cause values apply, this cause reports a protocol-error event.
		5 of 6

Table 40: Error codes and Aux Data values ATM-NTWK *6 of 6*

<table>
<tr><th>Cause Code/ Error Type</th><th>Aux Data</th><th>Cause Codes Description</th></tr>
<tr><td>257 to 300 (b)</td><td>(b)</td><td>ATM Impaired Paths
Examine the error log (<code>display errors</code>), atm setup-events log (<code>list measurements atm svc-setup</code>), and atm pnc-latency (<code>list measurements atm latency</code>) screens to help diagnose the problem, although the switch could be operating normally. In this case, you should consider raising the Activation threshold and/or increasing the Timeout value on the ATM-RELATED System Parameters screen. (<code>change system atm</code>).
Enter <code>list measurements atm svc-setup</code> to see information about errors associated with connection numbers.
After entering the above command, note the time stamps shown in the <code>list measurements atm setup-events</code> screen. Execute the above command periodically and note the time stamps. If the time stamps have changed for a particular From Conn-To Conn pair, this indicates there are still setup failures/delays for that connection.
After verifying that every associated ATM endpoint is operating correctly, and if errors are still occurring, contact your local service provider.</td></tr>
<tr><td>301 (c)</td><td>ANY</td><td>System wide ATM Impaired Paths.
See the suggestions listed above to trouble shoot these errors.</td></tr>
<tr><td>769 (d)</td><td></td><td>ATM CLP (Cell Loss Priority) Bit Errors</td></tr>
<tr><td>1025 (e)</td><td></td><td>ATM Congestion Bit Errors</td></tr>
<tr><td>1281 (f)</td><td></td><td>ATM Cell Underrun Errors</td></tr>
<tr><td>1537 (g)</td><td></td><td>ATM Cell Overrun Errors</td></tr>
<tr><td>1793 (h)</td><td></td><td>ATM Lost Cells</td></tr>
<tr><td colspan="3" align="right">6 of 6</td></tr>
</table>

Notes:

a. Aux Data values for Setup and Add Party (XX = port network, YYY = location code). Table 41: Location codes from Aux Data values is a list of UNI 3.1 location codes:

Table 41: Location codes from Aux Data values

Setup (Location Code)	Add Party (Location Code)	Location Code Meaning
0	500	User
1	501	Private network serving the local user
2	502	Public network serving the local user
3	503	Transit network
4	504	Public network serving the remote user
5	505	Private network serving the remote user
7	507	International network
10	510	Network beyond interworking point

b. **Error Types 257 to 300**: displays the destination PNC connection number of an ATM Network connection that is experiencing an impaired path. The connection number is obtained by subtracting 256 from the number that is shown in the Error Type field. For example:

If the Error Type field = 263, subtract 256, which equals 7, the PNC destination connection number.

The Aux Data field contains the originating and destination PN number (XXYY). XX = the originating PN #, and YY = the destination PN # for example:

1. Aux Data = 302
   3 = orig
   2 = dest
2. Example Aux Data = 1510
   15 = orig
   10 = dest

c. **Error Type 301** indicates that there is a system wide impaired path network problem.

Note:

Under certain circumstances network errors can be against the ATM EI board.

d. **Error Type 769**: ATM CLP (Cell Loss Priority) Bit Errors

The ATM cell header has a bit called the cell loss priority (CLP) bit. The bit indicates one of two states: the cell is eligible for discarding, or it is not. In an ATM configuration, every cell is transmitted into the ATM network with the CLP bit set to 0 indicating that these cells are NOT eligible for discarding. Should the system ever receive a cell from the ATM network with the CLP bit set to 1 (discard eligible), an entity in the ATM network modified the bit during transit. Generally, an ATM network switch sets the CLP bit to 1 (discard eligible) only if the cell fails to conform to the cell rate specified in the traffic contract for the VC. However, Communication Manager cell emissions conform with the VC traffic contract. Therefore, the presence of a non-conforming cell implies that something else in the ATM network switch is setting the CLP bit in some cells, the ATM switch can also be policing out (discarding) cells which do not conform to the traffic contract. This error can occur together with other errors such as:

“Excessive AAL-5 CRC errors” or
“Excessive LAP-D retransmissions”

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Again, this indicates problems with cell transmissions in the ATM network.

If cell discard is happening generically in the ATM network, other symptoms can affect the Constant Bit Rate (CBR) SVCs including audible artifacts in talk paths, failure of modems over voice lines, and “Cell Underruns” - see note (f).

e. **Error Type 1025**: ATM Congestion Bit Errors

The ATM cell header has a bit called the congestion bit. In Communication Manager ATM, every cell is transmitted into the ATM network with the congestion bit set to 0 (congestion not experienced). Should the system ever receive a cell from the ATM network with the congestion bit set to 1 (congestion experienced), an entity in the ATM network modified the bit during transit. It simply indicates that the ATM network is experiencing heavy traffic.

During periods of congestion, the ATM network can choose to discard cells even though those cells conform to their traffic contracts. Should the ATM network discard cells, errors such as the following can occur:

“Excessive AAL-5 CRC errors”
“Excessive LAP-D retransmissions”.

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Symptoms that can affect the Constant Bit Rate (CBR) SVCs include audible artifacts in talk paths, failure of modems over voice lines, and “cell Underruns” – see note (f).

f. **Error Type 1281**: ATM Cell Underruns

Communication Manager ATM monitors for cell underrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive below that rate, an underrun condition exists. The most likely cause of cell underruns is a problem with cell transmission through the ATM network.

Possible symptoms include audible artifacts in talk paths and failure of modems over voice lines. If cell loss is happening generically in the ATM network, other symptoms like “excessive AAL-5 CRC errors” or “excessive LAP-D retransmissions” are possible on SVCs with Variable Bit Rate (VBRnt) traffic contracts. The VBR SVCs transport system links such as EAL, PACL, and PRI links.

Another ATM board within the system originally generated the arriving cells at the specified traffic contract rate. In order to have arrived at a lower rate, these cells were either slowed during transmission or possibly discarded by the ATM network. This indicates problems with cell transmission in the ATM network. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

Cell underruns often happen in conjunction with cell overruns. If both occur, it further indicts the ATM network.

g. **Error Type 1537**: ATM Cell Overruns

Communication Manager ATM monitors for cell overrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive above that rate, an overrun condition exists. The most likely cause of cell overruns is a problem with cell transmission through the ATM network.

Both cell underruns and overruns are typical symptoms of cell transmission problems like cell jitter or delay. The ATM board attempts to compensate somewhat by buffering cells. However, if the ATM network transmission delays are high, the board could conclude that it has seen a cell overrun because it has exhausted all of its buffer space.

If cell underruns or both cell underruns and overruns occur, indict the ATM network. Consult the ATM vendor. Ask about cell delay variation, cell discard, and traffic policing.

Another much less likely cause of cell overruns is that an ATM board is generating cells above the traffic contract rate. Suppose, a board somehow generates cells too quickly. The ATM network likely reacts by at least setting the CLP bit in the cells that exceed the traffic contract (see note (d) for ATM CLP errors). The ATM network can also discard the excess cells.

If only cell overruns occur, locate the ATM board generating those cells. Execute **`test board long`**. If the board passes, then the ATM network remains the likely cause of transmission problems. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

h. **Error Type 1793**: ATM lost cells:

The ATM board receiving the CBR cell stream is detecting out-of-sequence AAL1 sequence numbers, above the defined threshold. This normally indicates that the ATM network has lost the missing cells. In this case, “lost” could mean that the cells were, for example, policed out, lost to congestion, or misdirected to another endpoint.

The likely user-visible symptoms of lost cells are missing talk paths or poor voice quality.

The “lost cells” error can help you diagnose cell underrun problems. When cell underruns are accompanied by lost cells errors, the lost cells could have caused the underruns. But if you have cell under runs without lost cells, it could indicate that the underruns were due to network jitter instead. It is also possible that network jitter can cause both cell underruns and lost cells, if the jitter is so severe it causes the cells to violate their traffic contract.

When accompanied by congestion or CLP errors, the congestion or CLP can be causing the lost cells.

When accompanied by cell overrun errors, the cell overruns can be causing the TN2305 to discard cells, which in turn can show up as lost cells.

Lost cells without other errors can indicate that cells are being corrupted, especially the AAL1 sequence number.

In any case, consult your ATM network vendor about possible causes. Look for jitter (cell delay variation), cell discard, and traffic policing.

ATM PNC-DUP (ATM PNC Duplication)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PNC-DUP	NA	**status pnc**	PNC duplication

The PNC-DUP MO tracks the health of the active and standby PNCs, controls pled and spontaneous interchanges, and manages related functions such as double call refresh and unrefresh, antithrashing, and so on. The main responsibility of PNC-DUP is to recover the system to full service in the event of a fault. In the event of multiple faults, PNC-DUP does its best to maximize service continuity.

Note:

ATM PNC-DUP behaves differently when the system is running the ATM PNC feature. While not a separate MO, this discussion explains the unique behavior of PNC-DUP under the ATM PNC feature.

In critical-reliability systems, the following components comprising the port-network connectivity (PNC), are duplicated:

- ATM-Expansion Interface (ATM-EI) circuit packs in port networks (PNs)
- Fiber-optic cables connecting the above circuit packs to the ATM Switch Interface Modules
- ATM Switch

Although not part of the PNC, Tone-Clock circuit packs are also duplicated in each PN. ATM PNC systems can have up to 64 PNs.

PNC duplication architecture utilizes an active/standby duplication scheme in which one complete set of PNC components supports call processing, while the duplicate PNC is held in reserve. All calls on the active PNC are simultaneously set up, or shadowed, on the standby PNC in order for it to be capable of instantly assuming active status when necessary, allowing for interchanges without service disruption (in the case of single faults).

PNC duplication does not introduce any additional types of hardware or hardware faults, and there are no tests associated with the PNC-DUP MO. Instead, its error log entries contain useful information about the occurrence and causes of interchanges in order to facilitate diagnosis of problems, which can then be addressed by using the documentation for the individual MO involved.

PNC-DUP Related Commands

Table 42: PNC-DUP Commands lists the PNC-DUP related commands. Their output forms are fully described in *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)*.

Table 42: PNC-DUP Commands

Command	Description
`status pnc`	Shows information about both PNCs' operational status, including state of health, alarms, busyouts and locks.
`reset pnc interchange`	Initiates a demand PNC interchange. If the standby is healthy (all-zero state-of-health indexes), there is no effect on service. Otherwise, calls may be dropped.
`set pnc`	Locks or unlocks the active PNC, preventing interchanges. Does not interfere with double call setup.
`busyout pnc`	Removes the standby PNC from service. See also the section on busyout of PNC components.

Busyouts and PNC-DUP

`Busyout pnc` puts the standby PNC in the busyout state. In this condition:

- Double call set up is turned off.
- The standby PNC is unrefreshed; existing duplicate call connections are removed.
- PNC interchanges are prevented.

Upon release, interchanges are re-enabled and a global refresh of double call setup on the standby is performed.

When PNC duplication is in effect:

- An active PNC component cot be busied-out.
- A standby PNC component can only be busied-out when the standby PNC is first busied-out.
- The standby PNC cot be released unless all standby PNC components are released.

Enabling and Removing PNC Duplication

To Enable PNC Duplication

To enable PNC duplication, perform the following sequence of steps:

1. Enable administration of PNC-DUP on the **`change system-parameters customer-options`** screen.
2. Fully administer duplicate ATM PNC connectivity. Verify by **`list atm pnc`**. Or for IP duplication, go to step three.
3. Fully administer IPSI duplication (**`ipserver-interface duplication`**). Verify by using **`list ipserver-interface`**.
4. Activate PNC-DUP through the **`change system-parameters duplication`** screen. This is not allowed if any component of either PNC (A or B) is busied out.
5. The system must insert all connectivity-related components for both standby and active PNC, a process that takes up to 5 minutes, depending upon circuit pack insertion. The process finishes when the first terminal login prompt appears.
6. The PNC-DUP initialization anti-thrashing timer must expire (this occurs 5 minutes after completion of board insertion, PNC interchange, or system reset of level 2 or higher).

To Disable PNC Duplication

To disable PNC duplication perform the following sequence of steps:

1. Verify that the A-PNC is active. A forced interchange may be required. See **`reset pnc`**.
2. Busyout the standby PNC (B-PNC).
3. Turn off the system parameter for PNC-DUP through **`change system-parameters duplication`**.
4. Remove the B-PNC connectivity by removing the Board Locations on the **`change fiber`** screen for ATM PNC.
5. Remove the B-PNC circuit packs (ATM-EI boards). Enter **`change circuit-pack`** ***`location`***.
6. Disable administration of PNC duplication on the **`change system-parameters customer-options`** screen by changing the **PNC Duplication** field to **n**.

   Notes:

   - Alterations to PNC that involve only the addition of connectivity can be done with PNC-DUP operational.
   - Alterations requiring the removal of connectivity must be done with PNC-DUP removed.

- PNC-DUP must be removed and translations should be saved before making any hardware changes.

Steady State LEDs

The LEDs of PNC components in a stable duplicated system should appear as follows:

- For an ***active*** ATM EI (functioning as Archangel) in a PN ***without*** IPSIs, the amber LED's flash pattern is 2 seconds on/200 ms off.
- For a ***standby*** ATM EI in a PN without IPSIs, the amber LED is off.
- For an ***active*** ATM EI in a PN ***with*** IPSIs, the amber LED is on steady.
- For an ***standby*** ATM EI in a PN with IPSIs, the amber LED is off.

PNC State of Health

PNC-DUP software monitors the health of the two PNCs as determined by their state-of-health (SOH) vectors, and initiates an interchange when the health of the active falls below that of the standby (unless prevented from doing so by a PNC lock, busyout, or antithrashing mechanism). Potentially service-disrupting faults that occur in a PNC's components are reported to PNC-DUP and incorporated in the affected PNC's state of health. The SOHs of both PNCs are displayed on the **`status pnc`** screen, as shown in Figure 2: Status PNC screen with standby PNC fully In-Service.

Figure 2: Status PNC screen with standby PNC fully In-Service

```
status pnc                                                    page 1 of 1
                           PORT-NETWORK CONNECTIVITY

                             Duplicated? yes
                        Software Locked? no
                         Standby Busied? no

                      Standby Refreshed? yes
                   Interchange Disabled? no

              A-PNC                                 B-PNC

           Mode: active                          Mode: standby
State of Health: functional           State of Health: functional

 Inter PN Index: 00.00.00.00              Inter PN Index: 00.00.00.00

   Major Alarms: 0                          Major Alarms: 0
   Minor Alarms: 0                          Minor Alarms: 0
 Warning Alarms: 0                        Warning Alarms: 0
```

PNC State-of-Health Indexes

The Inter-PN Index screen the state-of-health vector is used to track and compare the states of health of both PNCs. The fields making up the indexes are 2-digit numbers separated by periods (.), with each field representing a different class of faults. The fault class fields are arranged in order of decreasing importance from left to right. In other words, each field in the index supersedes the following fields in determining which PNC is healthiest. A fault class drives an interchange only when all of the higher priority fault classes are equal. A zero entry indicates no faults present for that class. Increasing numbers indicate increasingly higher numbers of faults present in that class.

The Inter-PN Index contains four fields (XX.XX.XX.XX). The Inter-PN Index reports faults in connectivity between PNs.

- The meaning of each fault class field is given in Table 43: PNC State-of-Health Fault Classes.
- A zero entry indicates that there are no faults reported.
- Higher numbers indicate increasing number of faults.
- All zeros indicate a perfect state of health.
- Unless the PNCs are locked, the active PNC's state of health should always be equal to or better than the standby's. Otherwise, the system performs a spontaneous interchange.

After a PNC-related alarm is cleared, the system performs a partial refresh of the standby PNC. The corresponding fault class field is not updated to reflect the improved state of health until the refresh is done. The state-of-health indexes do not agree with the current alarm status during this period.

Table 43: PNC State-of-Health Fault Classes

Fault Class	Priority	Description	MOs
FC_EAL	1	Number of PNs with EALs down	EXP-PN
FC_PACL	2	Number of PNs with LINL, RINL, or EI-SNI neighbor link faults	EXP-PN
FC_BFD	3	Number of PNs with BFDL (Bearer Fault Detection Link) faults	SYS-LINK
FC_HW	4	Number of PNs affected by hardware faults in a link having an EI as an endpoint. Enter **list atm pnc** to see endpoint designations.	ATM-EI

Resolving Poor State of Health

When both PNCs do not have an all-zero SOH (perfect health), use the following steps to identify and repair the problem.

1. Look for PNC component alarms (major or minor) for the PNC side without an all-zero SOH. The standby PNC should be repaired first.
2. Busy-out the standby PNC.
3. Follow the appropriate diagnostic and repair procedures for the alarmed PNC components just as with a simplex PNC. Both the alarm and error logs should be examined to isolate the fault.
4. Verify that the related PNC’s SOH is restored to all zeros.
5. Release the standby PNC.

Refresh and Unrefresh of the Standby PNC

In a fully-functional PNC with healthy standby and active sides, the standby PNC has a complete set of call connections corresponding to those in the active PNC. If, however, the standby PNC’s state of health degrades, a selective unrefresh of those connections that utilize the faulted component(s) is performed. If the standby PNC’s health improves, a selective refresh of connections on the affected route is performed so that call setup is consistent between the active PNC and the healthy parts of the standby PNC.

The **Standby Refreshed?** field on the **`status pnc`** screen does *not* refer to the selective type of refresh. It refers only to a global refresh that is performed when:

- The system is initialized and PNC duplication is enabled.
- There has been a spontaneous PNC interchange.
- The standby PNC has been released from busy-out.
- A system reset of level 2 or higher has taken place.

The `Refreshed` field may display `yes` when in fact the standby is partially unrefreshed. An interchange into an incompletely refreshed standby results in dropped calls. This can happen when a more severe fault occurs on the active PNC or when **`reset pnc interchange`** is used with the override option.

PNC Interchanges

PNC spontaneous interchanges occur when PNC duplication software determines that the standby PNC's state of health (SOH) surpasses the active PNC's.

- PNC-DUP executes a spontaneous interchange in response to a message from a PNC component MO indicating that either a fault has occurred on the active PNC or a fault has been resolved on the standby PNC.
- The PNC SOH is compared to the standby PNC, and an interchange occurs if the standby PNC's state of health surpasses the active PNC's.
- A corresponding Major or Minor alarm is logged by the reporting MO, stimulating an alarm report.

When the resolution of a fault on the standby renders it more healthy than a simultaneously-faulted active PNC, the error message indicates the type and location of the *improved* component.

Once the interchange completes, the failed component is on the standby PNC. A demand interchange can be requested in the presence or absence of standby PNC faults. The following sequence of actions can be observed during a fault-free interchange:

1. The ATM-Expansion Interfaces currently acting as archangels in the PNs are deactivated as indicated by the amber LEDs going from flashing to on solid.
2. The ATM-EIs in IPSI connected PNs are interchanged, indicated by the new standby ATM-EI amber LED off and the new active ATM-EI amber LED on steady.
3. One by one, the ATM-EIs in non IPSI connected PNs are interchanged as indicated by new standby ATM-EI amber LED turning off and the new active ATM-EI amber LED flashing (2 seconds on / 200 milliseconds off). At this point, the interchange is functionally complete.

Certain conditions may interfere with the normal execution of the interchange:

1. In a faulted spontaneous interchange, it is possible the PN(s) directly affected by the fault will be the last to interchange.
2. A user directly affected by the single fault instigating a PNC interchange can experience a momentary voice path outage during the switch.
3. If faults exist on both the standby and active PNC, it is possible to have some PNs go out of service while others are returned to service.

In any multifault situation, rely on **`status pnc`** to determine which is the active PNC.

PNC duplication informs Timing Synchronization maintenance when a PNC interchange has been completed and indicates which PNC is active. This causes Synchronization to audit and ensure that the primary source for synchronization of Tone-Clocks in each PN is supplied by a path associated with the active PNC.

Antithrashing and PNC Interchanges

Following a spontaneous PNC interchange, subsequent PNC interchanges are prevented for 5 minutes. This condition is indicated by **y** in the **Interchange Disabled?** field of the **`status pnc`** screen. After 5 minutes, the antithrashing timer expires, interchange decisions are re-enabled, and the field displays **n**.

Note:

Should a catastrophic failure occur on the active PNC during the period when the `Interchange Disabled?` *field is set to "yes," there will be no spontaneous PNC interchange.*

Demand PNC interchanges also invoke anti-thrashing, but only for a period of 30 seconds. During antithrashing mode, demand interchanges are also prevented unless the override option is specified.

CAUTION:

Use of this option may cause a service disruption.

Repairs on the Standby PNC Components

CAUTION:

If there is a TDM-CLK alarm, system timing may be routed through part of the standby PNC, and circuit switched data may be affected by the following repair procedures. This can happen, for example, when a slave tone/clock circuit pack experiences a loss of signal and switches to receive timing from the standby ATM-EI. In this case TDM-CLK 2305 error is logged, and the clock problem should be addressed first, if possible.

To repair PNC components in a duplicated PNC proceed as follows:

1. Most repairs involve fixing a single fault on the standby PNC. Enter **`set pnc lock`** or **`busy-out pnc`** to prevent an interchange into the PNC being repaired.
2. If a faulty component exists on the active PNC, this also means that the standby PNC is more severely faulted. Normally, the *standby* PNC is repaired first, since it is the most severely impaired.

   To repair the active PNC (the standby is already repaired), enter **`set pnc unlock`**, which generates a spontaneous interchange. In a PNC demand interchange with **`reset pnc interchange`** use the ***`override-and-lock`*** qualifier for the active PNC. The ***`override-and-lock`*** option ensures that no subsequent interchange can occur during the repair of the standby PNC. A demand interchange may not be necessary if the following conditions drive a spontaneous interchange:

   - The anti-thrashing period from the last interchange has expired.

- The global refresh from releasing the standby PNC has completed.
- The standby PNC's state of health surpasses the active PNC's.

At this point, the faulty component is on the standby PNC, and the PNCs are locked in their current active/standby state.

3. Busyout the PNC with **`busyout pnc`**.
4. Use fault isolation and component testing procedures for the individual PNC components, just as for a simplex PNC. Replacement of components does disrupt operation of the active PNC.
5. Once the failed component is replaced, use **`status pnc`** to check the health standby PNC component.
6. When confident that the problem has been resolved, as indicated by an all-zero state of health, unlock (**`set pnc unlock`**) and release (**`release pnc`**) the PNC. Note that no further PNC interchange is required since you can test the standby PNC as thoroughly as the active.

Interactions: Server Resets and PNC Interchanges

- A system reset of level 1 (warm), 2 (cold2) or 4 (reboot) does not change which PNC is active. If a PNC interchange was in progress when the reset took place, the PNC interchange continued until completion.
- If a **`reset system 1`** (warm) takes place during a PNC interchange, the reset is escalated to level 2 (cold2).

Fault Isolation Using Duplicated PNC

In some cases, PNC duplication can aid in the fault isolation procedure. PNC interchanges can be used to help isolate the faulty hardware. Two examples demonstrating this technique follow:

1. There is a fault that can occur in either an IPSI connected PN's ATM-EI or the PKT-INT which cot be readily attributed to one board or the other. If the packet bus transceivers on either the PKT-INT or ATM-EI fail, the two boards cot communicate, but it will not be clear which board is at fault. In this case, a pled interchange of the PNC can be used to indicate which of the two boards. If the interchange:
   - Cures the problem, the ATM-EI was at fault
   - Does not cure the problem, the PKT-INT is suspect (provided there are no PKT-BUS faults)

2. A similar relationship exists for the PN Archangel (EAA - the active ATM-EI) and certain TDM-bus problems. If the EAA is unable to communicate with a port board over the TDM bus, either the EAA has a fault, the port board has a fault, or there is a problem with the TDM bus itself. If TDM bus maintenance tests find no problems with the bus, then it is either the port board or the EAA. It may be simpler to replace the port board than to request a PNC interchange. However, if it is not clear which port board may be at fault or maintenance is being performed remotely, verify that the EAA is not at fault by executing a PNC interchange. If the interchange solves the problem, then the EAA is faulty. If the problem persists after the interchange, but TDM bus maintenance finds no problem, then the port board is faulty.

Error Log Entries

Whenever a PNC interchange takes place, an error is logged against PNC-DUP with a code that conveys information about the cause of the interchange and which PNC became active. There are no alarms associated with PNC-DUP errors, but there should be an alarm against the PNC component that caused the interchange. There are no PNC-DUP test sequences, but **`status pnc`** provides information regarding the status of the PNCs. The information in Table 44: Error Code descriptions and Aux Data correlations and Table 45: Error Log Encode Field Decoding can help to identify which areas of the Alarm Log to investigate to find the source of the problem.

Table 44: Error Code descriptions and Aux Data correlations

Error Code	Description	Aux Data[1]
00000	Error in generating error code	None
1cxpp	Spontaneous Interchange in response to a constraint for A-PNC	Active PNC
2cxpp	Spontaneous Interchange in response to a constraint for B-PNC	Active PNC
51000	Spontaneous Interchange at expiration of SOH validation timer	Active PNC
52000	Spontaneous Interchange upon PNC UNLOCK	Active PNC
53000	Spontaneous Interchange at completion of Global Refresh	Active PNC
60801	PNC Demand Interchange	Active PNC
60800	PNC Demand Interchange with override	Active PNC

1. The Aux Data indicates which PNC became active after the PNC interchange: “0” denotes PNC-A; “1” denotes PNC-B.

Table 45: Error Log Encode Field Decoding

Field	Variable Name	Values	Description
c	Alarm Type	0 1	Alarm retired MAJOR or MINOR alarm on any PNC component
x	Fault class; see description for contributing MOs	0	EAL (Expansion Archangel Link - EXP-PN) carries CCMS messages
		1	PACL (ATM-EI) carries ATM signaling commands from Call Processing to the remote ATM-EI circuit packs
		2	PNC hardware (providing connectivity of PN-to-PN or -ATM-EI)
		5	BFDL (bearer fault detection link) solely for the purpose of detecting bearer faults
pp	Port-network number	0–63	0–2 for constraint class (this is an internal number; add 1 for external port number)

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18	None	**`busy PNC-DUP`**	WRN	ON	**`release pnc-dup`**

Note:

The **`list config port-network`** command displays the cabinet number associated with a PN.

ATM-SGRP (ATM Signaling Group)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-SGRP	MIN WRN	`test sig-group grp#`	ATM-CES Signaling Group

1. ***grp#*** is the signaling group number (1–166); the test sequence can be either short or long.

ATM-SGRP applies when ATM signaling groups have been administered on an ATM circuit pack as ATM trunks.

Table 46: ATM-SGR circuit packs outlines the differences between ATM interface circuit packs:

Table 46: ATM-SGR circuit packs

Circuit pack	Channel types	Interface	Fiber	Echo cancellation
TN2305	B and D-Channels	24- or 32-channel	Multimode	Y
TN2306	B and D-Channels	24- or 32-channel	Single-mode	Y

The TN2305 and TN2306 ATM Interface circuit boards are referred to as TN230X for the remainder of ATM-SGRP.

An ATM Signaling Group is a collection of B-Channels for which a given ISDN-PRI signaling-channel port (ATM D-Channel) carries signaling information. ATM B channels (ATM-BCH) carry voice or data and are assigned to ISDN trunks. For more information see ATM-TRK (Circuit Emulation Service Circuit Pack).

The operation of the entire ATM signaling group depends on several other entities:

- ATM-DCH signaling-channel port
- TN230X Interface circuit pack where a D-Channel resides
- System link to the processor via the packet bus

When there are problems with ATM-SGRP (ATM signaling group), also investigate:

- ATM-DCH (ATM D-Channel Port)
- ATM-BCH (ATM B-Channel Trunk)
- SYS-LINK (System Links)
- PKT-BUS (Packet Bus)

Error log entries and recommended actions

Table 47: ATM-SGRP Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any		**`test sig-group grp#`**
1 (a)	Any	None			
18 (b)		MO busied out			
257 (c)	Any	None			**`test sig-group grp#`**
769 (d)	Any	Primary Signaling Link Hardware Check (#636)			**`test sig-group grp#`**
1281 (e)	Any	Secondary Signaling Link Hardware Check (#639)			**`test sig-group grp#`**
1793 (f)	Any	Layer 2 Status Test (#647)	WRN	OFF	**`test sig-group grp#`**
2305 (g)	Any	Remote Layer 3 Query test (#637)	MIN	OFF	**`test sig-group grp#`**
3585 (h)	Port number	None			
3840 - 3928 (i)	Port number	None			

Notes:

a. **Error Type 1:** switch sent a message to the far-end switch or terminal adapter, and the far end did not respond in the time allowed. Possible causes include link failure and congestion or outage at the far end. The Aux Data field contains layer-3 protocol information used by internal counters.

   If no other symptoms are present, no action is required.

   If layer-3 communication is down, check for alarms and errors against link components.

   Check out other errors against ATM-SGRP, ATM-TRK, and other hardware components on the link. There is no test to clear these errors. The error counter is decremented by 1 every 15 minutes.

b. **Error Type 18**: the ATM circuit pack has been busied out either with the command **`busyout atm sig-grp`** or **`busyout board`** ***`location`***.

   1. Release the ATM signaling group (**`release atm sig-grp)`** or the circuit pack (**`release board`** ***`location`***).

c. **Error Type 257:** the primary signaling channel connection has been lost for more than 90 seconds.

   - The associated B-Channels are placed in the ISDN Maintenance/Far-End state.
   - The B-Channels are not usable for outgoing calls, although incoming calls can be accepted.
   - The switch automatically attempts to recover the signaling link.

   1. Check the results of the Primary Signaling Link Hardware Check (#636) in the test sequence.

   - When the link does recover, the B-Channels are negotiated back to the In-Service state and their alarms are retired.

   2. When this error occurs, the state of the Signaling Group is changed to out-of-service (verify using the **`status sig-group`** command).

d. **Error Type 769**: signaling link hardware error.
   Service-affecting failures of the hardware which is used to transport the D-Channel are reported to the ATM CES Signaling Group MO. Maintenance logs this error, places the D-Channel into the OOS state, and raises a board-level alarm. The D-Channel is returned to service, and the alarm is retired once the hardware failure condition clears.

e. **Error Type 1281:** Degraded PVC alarms indicate that a particular Permanent Virtual Circuit, or signaling group, has encountered sufficient errors to exceed firmware thresholds. Operations can continue but at a lower level of reliability or performance. Firmware filters these alarms so that only one is reported active at a given time. The following inline error is considered a Degraded PVC alarm:

   - Excessive AAL – The AAL layer is experiencing an excessive number of errors in trying to reconstruct Service Data Units (SDUs). Possible causes:
     – Problem with the ATM switch
     – Noisy communication paths on opposite side of ATM switch
     – Unhealthy sending node
     – Congestion at the ATM switch

f. **Error Type 1793:** Layer 2 Query test for the primary signaling channel failed.

   - Excessive AAL – The AAL layer is experiencing an excessive number of errors in trying to reconstruct Service Data Unit (SDUs). Possible causes:
     – Problem with the ATM switch
     – Noisy communication paths on opposite side of ATM switch
     – Unhealthy sending node
     – Congestion at the ATM switch

g. **Error Type 2305:** The Remote Layer 3 Query (#637) failed. A specific message was sent to the far-end switch, and it did not respond within the time allowed.

   1. Investigate elements of the ATM D-Channel(s) (ATM-DCH) for both this switch and the far-end switch.

   If Test #637 fails twice in a row, the B-Channels are alarmed and made unavailable for outgoing calls (although incoming calls are still accepted). When Test #637 succeeds and the far-end switch starts responding properly, the ATM trunk (B-Channels) are placed back into normal operation and their alarms retired.

h. **Error Type 3585:** A SERV or SERV ACK ISDN D-channel message has been received by a non-US-type interface (country option other than `1` on the DS1 administration screen). However, these messages are used only for duplex NFAS signaling, which is supported by country protocol 1.

   Thus, there may be a mismatch in administration between the local and far-end switches.

   1. Consult with the customer's network provider to determine whether the D-Channel is set up correctly on the far-end switch.

i. **Error Type 3840-3928:** These Error Types report certain error messages received by the ATM-SGRP Signaling Group for one of its associated B-Channels. The Aux Data field is the port number of the B channel from which the message was received.

   The error code generated equals 3840+*x*, where *x* is a Cause Value defined by the ISDN PRI Specification. Note that there is no recommended action for these Error Types; selected ISDN cause values are placed in the log when they are received, but no direct action or alarming is performed solely in response to receiving them. They provide added data that may prove useful when tracking down obscure networking and routing problems. See Table 48: Descriptions and repair recommendations (Error Types 3840-3928) for more information.

Table 48: Descriptions and repair recommendations (Error Types 3840-3928) ***1 of 5***

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cot be accessed.	From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 1. Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
		1 of 5

Table 48: Descriptions and repair recommendations (Error Types 3840-3928) ***2 of 5***

Error Code	Description	Recommendation
3846	The far-end switch has indicated that the B channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate ● an administration problem (for example, the local switch and the far-end switch have different B-Channels administered) ● a normal race condition (for example, the local switch has requested use of a B-Channel that the far-end switch had just reserved for use on another call). 1. From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Enter **status trunk** for the indicated trunk. 3. Refer to Table 28: ATM ISDN service states on page 116 for recovery suggestions.
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch or terminal adapter that did not respond in the time allowed.	1. Check for alarms and errors against link components 2. Check out other errors against ATM-SGRP (ATM Signaling Group), ATM-TRK (Circuit Emulation Service Circuit Pack), and other hardware components on the link.
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	1. From the circuit pack and port number (in the Aux Data field, determine the trunk group against which the error was reported. 2. Consult with the network provider to determine the nature and expected duration of the out of service condition. 3. Consider modifying every routing pattern containing this trunk group, to route calls around the network that is out of service.
		2 of 5

Table 48: Descriptions and repair recommendations (Error Types 3840-3928) ***3 of 5***

Error Code	Description	Recommendation
3890	A request to use a network service (for example, SDN) has been denied. Administration somewhere in the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could indicate ● a local administration problem ● a mismatch between the local administration and that of the network provider. 1. From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Display the trunk group screen. If the trunk group is Call-by-Call (the **Service Type** field is **cbc**), check every routing pattern screen containing this trunk group to see if the Service/ Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the **Service Type** field contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	1. If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
		3 of 5

Table 48: Descriptions and repair recommendations (Error Types 3840-3928) ***4 of 5***

Error Code	Description	Recommendation
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	Do the following: 1. Eliminate any transitory state mismatch problems (**`test port`** ***`location`*** for the trunk port shown in the Aux Data field). Service State Audit Test (#256) is the important test in the sequence. 2. If Test #256 passes yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	Do the following: 1. If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	Do the following: 1. If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the recommendations for Error Type 3890.
		4 of 5

Table 48: Descriptions and repair recommendations (Error Types 3840-3928) ***5 of 5***

Error Code	Description	Recommendation
3928	A call was denied because of a basic incompatibility between the type of call and either the facilities selected by the routing pattern or the called user itself.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks or PRI endpoints. 1. Determine the trunk group from the circuit pack and port number (in the aux data field) 2. check the BCC fields of the pertinent routing patterns. 3. Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).
		5 of 5

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Primary Signaling Link Hardware Check (#636)	X	X	ND
Layer 2 Status Query Test (#647)	X	X	ND
ATM Remote Layer 3 Query (#1291)	X	X	ND

1. D = Destructive, ND = Nondestructive

ATM-SYNC (ATM Synchronization)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-SYNC	MIN	**display errors**	ATM Synchronization
	WRN	**test synchronization**	

This section discusses intra-switch synchronization maintenance and the hardware and software components that provide a common reference frequency for reliable digital communications among the system, the ATM switch, and other PBXs, Central Offices (COs) or customer-premises equipment (CPE). Circuit packs involved in synchronization include:

Note:

TN768 or TN780 Tone-Clock circuit packs are not compatible with ATM EIs.

- TN2312 IPSI circuit pack's Tone-Clock circuit
- TN2182 Tone-Clock
- TN722, TN464, and TN767 DS1 Interfaces (all suffixes)
- TN2305/6 ATM Expansion Interface (multimode fiber)

Synchronization is achieved between the S8700-series Server IPSI and the port networks (PNs) through the ATM port-network connectivity (ATM PNC) between the networks. Depending on the network's synchronization plan and the status of synchronization sources, the system timing reference may be:

- The clock circuit pack on the ATM switch
- A DS1 or UDS1 interface circuit pack-tapped T1 input signal connected to the ATM switch clock circuit
- An OC-3 interface circuit pack on the ATM switch

Stratum 4 synchronization extracts timing information directly from

- A DS1 or UDS1 reference
- An OC3 reference
- The ATM switch clock

For further information about synchronization including network synchronization, refer to *DEFINITY® Communications System Network and Data Connectivity*.

Stratum 4 Synchronization

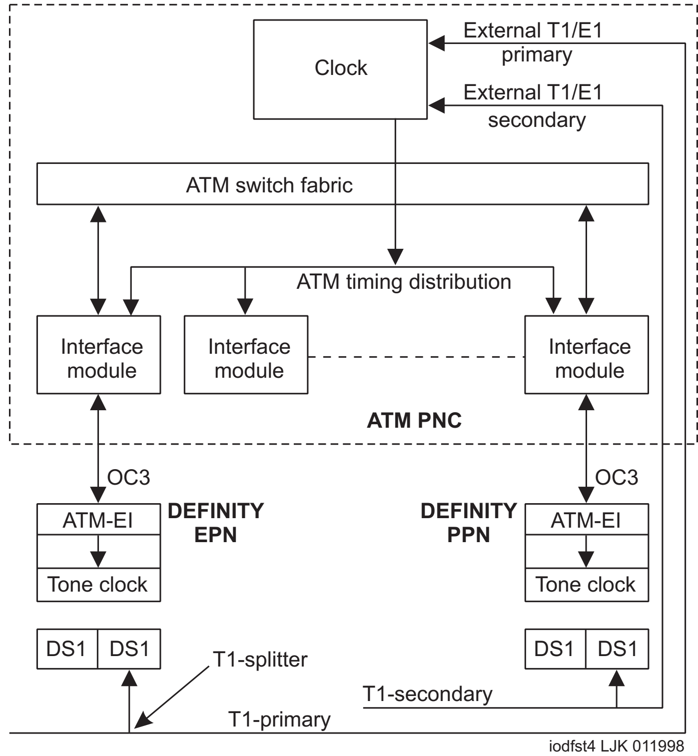
Systems may have primary and secondary synchronization references (DS1/UDS1 interface circuit packs or ATM-Switch) when using Stratum 4 synchronization.

If the primary synchronization reference in Figure 3: Stratum-4 Synchronization with Unduplicated ATM PNC is providing a valid timing signal, then the flow of system synchronization would travel from the DS1 interface circuit pack in the PN to the ATM switch. The primary DS1 interface circuit pack provides a timing signal for the ATM switch clock circuitry. This synchronization source is then distributed to all of its OC3 Interface Modules. Each ATM Expansion Interface circuit pack uses the received data stream from the ATM switch to generate a timing signal. The Tone-Clock circuits in the PNs use this signal to generate timing for every circuit pack in their respective PNs. All PNs, in the above mentioned scenario are designated the *slave* PNs. The ATM switch is the *master* that contains the system synchronization source. If the primary synchronization reference does not provide a valid timing signal, ATM synchronization maintenance infers a switch to the secondary reference.

If the primary synchronization reference is not providing a valid timing signal, the system automatically switches to the secondary synchronization reference. If the primary synchronization reference is invalid, and if the secondary reference does not provide a valid timing signal or is not administered as a synchronization reference, the switch infers that the local oscillator of the ATM switch provides the system timing source. If the system is using the local oscillator of the ATM switch as the system timing source because the primary and secondary references are providing invalid timing signals, when either the primary or secondary reference becomes valid again, the system switches back to the primary or secondary source. When both the primary and secondary source become valid, the system switches to the primary source, since the primary source is always preferred over the secondary source when both sources are equally healthy.

Figure 3: Stratum-4 Synchronization with Unduplicated ATM PNC depicts a simplex ATM PNC with T1/OC3 synchronization reference into the ATM switch.

Figure 3: Stratum-4 Synchronization with Unduplicated ATM PNC



Note:

The TN722 DS1 Interface circuit pack does not provide a synchronization reference as reliably as the TN767 or TN464 circuit packs. Therefore, administer the TN767 or TN464 circuit packs as the primary or secondary sources.

Stratum-3 Synchronization

Stratum-3 synchronization is not supported on S8700-series servers with ATM PNC.

Troubleshooting ATM synchronization

A significant part of the Synchronization Recovery Strategy for a S8700-series system with ATM PNC resides in the ATM switch's clock hardware, firmware, and software. The system monitors synchronization performance and alarms any faulty components. See SYNC (Port Network Synchronization).

ATM-SYNC Commands

Use the commands in Table 49: ATM-SYNC commands to help troubleshoot ATM-SYNC problems:

Table 49: ATM-SYNC commands

Command	Description
change synchronization	Allows primary and secondary references to be administered for the Stratum 4 option, or ATM-Switch, indicating that the synchronization references are input directly to the ATM switch
status synchronization	Shows the current inferred synchronization reference
status synchronization	Shows the administered primary and secondary synchronization references
disable/enable synchronization-switch	Prevents or allows switching to another synchronization source
test synchronization	Tests the administered synchronization source

Error log entries and recommended actions

Table 50: ATM-SYNC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test synchronization**
1 (b) (h)			WRN MINOR	OFF	
257 (c) (h)			WRN MINOR	OFF	
513 (d) (h)			WRN MAJOR	OFF	
1537 (e)			WRN	OFF	
1793 (f)	0-50		NONE	OFF	
2049 (g)	0		WRN	OFF	

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: problem with the primary DS1 reference. It is cleared when the primary reference is restored. The following steps should give an indication of the source of the problem:

   1. Check if the primary DS1 interface circuit pack is inserted in the carrier with **`list configuration board`** ***`location`***.

   2. Verify that the administered primary reference matches the DS1 reference from the network synchronization plan.

   3. Test the primary DS1 interface circuit pack with **`test board`** ***`location`*** **`long`**. Check the Error Log for DS1-BD or UDS1-BD errors and see DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) to resolve any errors associated with the primary DS1 (DS1 or UDS1) interface circuit pack. If the only errors against DS1-BD or UDS1-BD are slip errors, then follow the procedures described in the troubleshooting section above. If no errors are listed in the Error Log for the primary DS1 interface circuit pack, continue with the following steps.

   4. Test the active Tone-Clock circuit in the master PN with test tone-clock location long. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 (TDM Bus Clock Circuit Status Inquiry test) passes successfully. If Test #148 fails with an Error Code 2 through 32, see TDM-CLK (TDM Bus Clock) to resolve the problem.

c. **Error Type 257**: problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting **`secondary`** for **`primary`** in the preceding resolution steps.

d. **Error Type 513**: the ATM switch clock is inferred to be providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

e. **Error Type 1537**: over half of the DS1s that are administered with slip detection enabled through the **Slip Detection** field set to **y** are experiencing slips. It may take up to 1 hour for these alarms to clear.

f. **Error Type 1793**: inferred excessive switching of system synchronization references has occurred. When this error occurs, it is inferred that the ATM switch clock has become the synchronization reference for the system. It may take up to 1 hour for these alarms to clear.

   1. Check for timing loops and resolve any loops that exist.

2. Test the active Tone-Clock circuit in the master PN with **`test tone-clock`** ***`location`*** **`long`**.

   Check the Error Log for TDM-CLK errors, and verify that TDM Bus Clock Circuit Status Inquiry test (#148) passes successfully.

   If Test #148 fails with an Error Code 2–32, see TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following steps.

3. For Duplicated Tone-Clock circuit packs in the master PN: Switch Tone-Clock circuit packs on the master PN with **`set tone-clock`** ***`location`***.

   For Simplex Tone-Clock circuit packs in the master PN: replace the primary and secondary (if administered) DS1 Interface circuit packs.

4. Investigate any other SYNC errors.

g. **Error Type 2049**: the ATM Expansion Interface circuit packs have errors that affect synchronization. Test the ATM Expansion Interface circuit pack with **`test board`** ***`location`***. This error can take up to one hour to clear.

h. **Error Types 1**, **257**, and **513**: noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a synchronization problem occurs on Error Types 1, 257, or 513, a WARNING alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MINOR or MAJOR alarm.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Synchronization Update Test (#417)	X	X	ND

1. D = Destructive, ND = Nondestructive

ATM-TRK (Circuit Emulation Service Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ATM-TRK	MAJ MIN WRN	`test board` *`location`*	ATM TRUNK (ATM Circuit Emulation Service)

ATM-TRK explains how to test and repair TN230x ATM Interface circuit packs (TN2305 and TN2306) that have been administered as virtual ISDN-PRI trunks for ATM Circuit Emulation Service (CES). The maintenance instructions for TN230x circuit packs that have been administered as Expansion Interfaces for WAN connectivity are in ATM-INTF (ATM Interface)

Description

The TN2305 and TN2306 (Table 51: ATM-TRK circuit packs) are dual-purpose ATM circuit packs that can be administered as either:

- ATM Circuit Emulation Service or virtual ISDN-PRI signaling trunks
- Expansion Interfaces (ATM-EIs) for port-network connectivity (ATM PNC) between the PNs

Either circuit pack "personality" requires SONET OC-3 or SDH STM-1 fiber cable connections between the circuit pack and the ATM switch. As a trunk board, it supports direct connection between ATM CES circuit packs without an intervening ATM switch.

Table 51: ATM-TRK circuit packs

Circuit pack	Channel types	Interface	Fiber	Echo cancellation
TN2305	B and D-Channels	24 or 32 channel	Multimode	Y
TN2306	B and D-Channels	24 or 32 channel	Single-mode	Y

Note:

TN230x circuit packs are not interchangeable.

ATM Circuit Emulation Service

Under ATM Circuit Emulation Service (CES), simulate ISDN-PRI circuits by assigning ports to signaling groups. Each signaling group represents a PRI circuit, and the ports in the group represent the D-Channel and B-Channels of that circuit.

Virtual D-Channels

Non-facility associated signaling is not supported under ATM-CES, so you must reserve one port in each signaling group for use as a D channel. Use channel 24 when emulating a T-1 ISDN facility, anD-Channel 16 when emulating an E-1 facility. The D-Channel can be any physical port from 9 to 32.

Virtual circuits

The TN230x can support a varied number of virtual circuits, depending on the switch and the administration of the circuit pack.

Virtual trunk groups

You cot bundle physical DS1 ISDN-PRI circuits and virtual ATM-CES circuits into the same trunk groups. Virtual circuits can only be assigned to all-virtual, all-ATM trunk groups.

LEDs

The ATM circuit pack LEDs give you a visual indication of the condition of the TN230x circuit pack (Table 52: ATM-TRK LED interpretation).

Table 52: ATM-TRK LED interpretation

LEDs	Condition	LED status
Red	Error (alarm logged)	On
Red & Green	Booting (LEDs being tested)	Blinking (on 200 ms, off 200 ms)
Green	Test/maintenance in progress	On
Amber	Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC	Blinking fast (100 ms on, 100 ms off)
Amber	Signal to ATM switch down	Blinking slowly (500 ms on, 500 ms off)
Amber	One or more CES signaling groups administered	On
Amber	CES signaling group not administered or not reporting to firmware	Off

ATM-TRK-related commands

Table 53: ATM CES troubleshooting commands lists some commands that can be useful in troubleshooting ATM errors and alarms.

Table 53: ATM CES troubleshooting commands

Command	Description
display circuit-packs ***cabinet***	Shows the circuit packs in the cabinet, identifying ATM trunk as well as ATM-EI boards. “ATM Interface” boards have not been administered as CES or PNC.
display atm ports ***location***	Shows the 256 ports on the ATM board with the corresponding signaling and trunk group.
list configuration atm	Lists the ATM boards, identifying equipment location, board code, type, and vintage.
list configuration trunks	Lists boards identifying assigned ports. While the ATM board is listed, the 256 ports are not.
busyout/release atm signaling-group	Busyout or release of an ATM signaling group within a trunk group.
status atm signaling-group	Show current status of an ATM signaling group.
status trunk-group	Shows status of the trunk group (ATM signaling groups are part of trunk groups).

Error log entries and recommended actions

Table 54: ATM-TRK Error Log entries ***1 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any		**test board** ***location***
1(a)		None	MIN	ON	
					1 of 3

Table 54: ATM-TRK Error Log entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18(b)	0	`busyout board` *`location`*	MIN	ON	`release board` *`location`*
23(c)	0		MIN	ON	
125(d)			MIN	ON	
257(e)	Any	Control Channel Looparound (#52)	MIN	ON	`test board` *`location`* `r 2`
513(f)	Any	ATM Crosstalk (#1298)	MIN	ON	`test board` *`location`* `l`
769(g)	35	ATM Error Query (#1259)	WRN	OFF	`test board` *`location`*
770(g)	25	ATM Error Query (#1259)	WRN	OFF	`test board` *`location`*
771(h)	26	ATM Error Query (#1259)	WRN	OFF	`test board` *`location`*
1281(i)		ATM Board Error Query (#1259)	WRN MIN	OFF	`test board` *`location`*
1537(j)	12		WRN MIN	ON	
1538(k)	0		WRN MIN	ON	`reset board` *`location`*
1794(l)	13		MIN	ON	
2049(m)	15		WRN	OFF	`test board` *`location`*
2306(n)					
2561(o)		Packet interface test (#598)	MIN	ON	`test board` *`location`* `r 2`
2817(p)	1-24	ATM Board DSP (#1293)	WRN MIN	ON	`test board` *`location`*
2818(p)	1-24		WRN MIN	ON	`test board` *`location`*
3330(q)	3		MIN	OFF	
3585(r)		ATM Board Error Query (#1259)	WRN MIN	ON	`test board` *`location`* `l`
3841(s)	Any				
3842(t)	11				
					2 of 3

Table 54: ATM-TRK Error Log entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3843 (u)					
3999(v)	Any				
					3 of 3

Notes:

a. **Error Type 1:** the ATM-TRK circuit pack does not appear to be in its assigned slot.

1. Make sure that the ATM-TRK circuit pack is installed correctly seated in the slot administered for the ATM trunk.

b. **Error Type 18:** the ATM circuit pack is busied out.

1. Run **release board *location***.

c. **Error Type 23:** an ATM trunk is administered, but the corresponding ATM-TRK circuit pack does not appear to be physically installed.

1. Make sure the ATM-TRK circuit pack is installed and correctly seated in the slot.

d. **Error Type 125:** an ATM trunk is administered but a non-ATM-TRK circuit pack is installed in the corresponding slot. You have two options:

- Replace the incorrect circuit pack with an ATM-TRK circuit pack.
- Or re-administer the slot for the circuit pack that is physically present, locate the slot where the ATM-TRK circuit pack is actually installed, and re-administer the ATM trunk.

e. **Error Type 257:** Control Channel Looparound test (#52) failed. The circuit pack is not properly connected with the control channel on the TDM bus.

1. Take the corrective action specified by Control Channel Looparound Test (#52).

f. **Error Type 513:** ATM CrossTAlk Test #1298 failed. The board is writing to or reading from a TDM time slot that is not allocated to the board, or the Digital Signal Processor (DSP) selected for this test has malfunctioned.

1. Run **test board *location***.
2. Take the corrective action specified for ATM Crosstalk Test (#1298)

g. **Error Type 769, 770:** the ATM switch is requesting too many LAPD retransmissions (off-board ATM cell corruption errors).

Error Type	Aux Data	Description
769	35	Excessive LAPD retransmission requests
770	25	Uncorrectable ATM cell headers – threshold

1. Check the connections between the fiber cable, the ATM-TRK circuit pack, and the ATM switch.
2. See PKT-BUS (Packet Bus) for test and corrective procedures.
3. Determine what type of fiber is installed between the ATM-TRK circuit pack and the ATM switch.

If	Then
There is multimode fiber	Check the length of the fiber. If the cable is longer than 2 km, it may be causing errors.
There is single-mode fiber or the length of the multimode fiber is less than 2 km	The source of the errors can lie in the ATM facility, the ATM-TRK circuit pack, or the far-end circuit pack.

4. Perform ATM loopback tests on the near-end ATM-TRK circuit pack and on the far-end circuit pack or ATM switch.

If	Then
The ATM-TRK circuit pack fails the loopback test.	The problem is in the ATM-TRK circuit pack. Replace the circuit pack.
The far-end circuit pack or ATM switch fails the loopback test.	The problem is in the far-end circuit pack or ATM switch. Consult the circuit-pack or ATM switch documentation for advice.
The equipment at each end of the ATM span passes the loopback test	The problem is somewhere in the ATM span. Lack of bandwidth can be forcing an intermediate ATM switch to drop cells.

5. Check capacity and peak bandwidth consumption for the ATM span.

If	Then
The capacity of the span is inadequate, or bandwidth consumption is too high.	Reduce traffic on the system to ensure that it is using no more that its subscribed bandwidth.

h. **Error Type 771:** the ATM switch is sending cells with unknown Virtual Path-Identifier (VPI) and Virtual Channel-Identifier (VCI) addresses.

1. Make sure that the ATM-TRK circuit-pack address is administered identically on the ATM switch and the S8700-series system.

i. **Error Type 1281:** Board major signals error (loss of high-level signal). The far end has detected a major problem in transmissions originating from the ATM-TRK circuit pack. The possible Aux Data values for this software counter are listed in Table 55: Error type 1281 Aux Data and repair procedures on page 190.

Table 55: Error type 1281 Aux Data and repair procedures ***1 of 3***

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone-Clock problem. 1. Check for TDM-BUS or TONE-BD errors in the Error Log. 2. If no other problems are present, reset the circuit pack with **reset board location**
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-TRK board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. 1. Run **test board *location***. 2. If Test #1259 fails with Error Code 16, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. 3. If the amber LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cot obtain or maintain STM-1/OC-3 framing. 1. Try to more the fiber on the ATM switch side to a different port. 2. If the problem persists, reset the circuit pack with **reset board location**.
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. 1. See if the ports at the MUX and/or the ATM switch are connected snugly. 2. Run **test board *location***. 3. If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
		1 of 3

Table 55: Error type 1281 Aux Data and repair procedures ***2 of 3***

Aux Data	Alarm Description	Repair procedure
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far end is detecting a major problem with the signal that this board is transmitting. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface 2. Run **test board** ***location***. 3. If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. 1. Reset the board with **reset board location**. 2. If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/ SONET)	The incoming signal payload is not set up for transmission of ATM data. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface.
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. 2. Run **test board** ***location***. 3. If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. 4. If it does the problem is off-board. 5. If the amber LED continues to flash, replace the circuit pack.
		2 of 3

Table 55: Error type 1281 Aux Data and repair procedures ***3 of 3***

Aux Data	Alarm Description	Repair procedure
23	High-level path Remote defect Indicator: HP_RDI	The far end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. 1. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. 2. Run **`test board`** ***`location`***. If Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. ● If it does the problem is off-board. ● If the amber LED continues to flash, replace the circuit pack.
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. 1. Reset the board with **`reset board location`**. 2. If the error persists, replace the board.
27	SIGCON_DOWN ATM switch high level signal.	The board cot communicate with the ATM switch. 1. Busyout the board (**`busyout board`** ***`location`***). 2. Test the board (**`test board long`** ***`location`***). 3. If Test #1260 fails, replace the board. 4. If Test #1260 passes, make sure the ATM address on both the server and the ATM switch sides are the same for this board. 5. If the address is the same, change the port on the ATM switch side. 6. If the error is resolved, the problem is on the ATM switch port.
		3 of 3

j. **Error Type 1537:** LANHO bus timeout. The circuit pack is transmitting too many bytes on the LAN bus for a single frame. This can be due to:

- an on-board fault.
- a faulty data received on one of the circuit pack's external ports.

If the error occurs three times in 10 minutes, the board is isolated from the packet bus, and the board is alarmed. To clear the alarm:

1. Restore this circuit pack to the packet bus with this command sequence:

   a. **`busyout board`** ***`location`***

   b. **`reset board`** ***`location`***

   c. **`test board`** ***`location`*** **`long`**

   d. **`release board`** ***`location`***

2. If the problem persists and there are no PKT-BUS or port alarms, replace the circuit pack.

k. **Error Type 1538:** The ATM-TRK circuit pack is hyperactive (sending an abnormal number of control messages to the processor). Use the following command sequence for this ATM-TRK circuit pack:

   1. **`busyout board`** ***`location`***
   2. **`reset board`** ***`location`***
   3. **`test board`** ***`location`*** `long`
   4. **`release board`** ***`location`***
   5. If this error persists, replace the circuit pack.

l. Error Type 1794: LANHO transmit FIFO overflow. The circuit pack's transmit buffers have overflowed.

   1. Run **`test board`** ***`location`*** **`r 5`**. If Test #598 fails, replace the circuit pack.

m. **Error Type 2049:** ACL Link Failure (link is down). The ATM Control Link (ACL) has failed, communication has been interrupted between the server and the ATM-TRK circuit packs on the system, and signaling-group parameters are not communicated across the packet bus.

   1. Check the PKT-BUS (Packet Bus) and SYS-LINK (System Links) MOs, and follow the repair procedures indicated.
   2. Run **`test board`** ***`location`*** against the ATM-TRK circuit pack. If Test #598 fails, follow the repair procedures for Packet Interface Test (#598)

n. **Error Type 2306:** too many parity errors in data received from the LAN/packet bus.

   1. Run **`test board`** ***`location`***

If	Then
Test 598 fails.	Follow the repair procedures for Packet Interface Test (#598).
Test 598 passes	See PKT-BUS (Packet Bus) and perform the specified repair.
There are no errors against the packet bus MO	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

o. **Error Type 2561:** Packet Interface Looparound test (#598) failure. The ATM-TRK circuit pack has failed, the packet bus has a minor alarm active, or the packet bus is out of service.

1. Run **test board** ***location***

If	Then
Test 598 fails	Follow the repair procedures for Packet Interface Test (#598).
Test 598 passes	See PKT-BUS (Packet Bus) and perform the specified repair.
There are no errors against the packet bus MO	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

p. **Error Type 2817, 2818:** DSP failure detected along the circuit path.

1. Run **test board** ***location***.
2. Follow the repair procedures suggested for ATM Board DSP Test (#1293).

Error Type	Description
2818	One or more DSPs failed. The Aux Data field contains the ID number of DSP that failed
2817	DSP test failure. The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs

q. **Error Type 3330:** LANHO critical error. The circuit pack reports that the on-board LANHO chip is insane (possibly due to a problem in packet bus arbitration, in the transmission line frame, or in the circuit pack itself). The circuit pack cot talk to the packet bus.

1. Check for PKT-BUS alarms.

If	Then
There is a packet bus alarm	There is probably a packet bus problem, particularly if other circuit packs on the packet bus report the same error. See PKT-BUS (Packet Bus) and Isolating and repairing packet-bus faults in Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432) for repair procedures.
	1 of 2

If	Then
There are no packet bus alarms	Run the following command sequence: 1.**busyout board** ***location*** 2.**reset board** ***location*** 3.**test board** ***location*** **long** 4.**release board** ***location***
The problem persists	Replace the ATM-TRK circuit pack.
	2 of 2

r. **Error Type 3585:** Major board alarm; failure of critical components involved in the operation of the circuit pack. The circuit pack has failed, and the switch can no longer recognize it.

Aux Data	Description
1	ATM framer chip failure
2	NCE failed
4	TDM PLD failed
5	Every DSP on the circuit pack has failed.
6	RNP (Receive Network Processor) failed
7	TNP (Transmit Network Processor) failed
8	MEMORY read/write failure
9	DUART failure

1. Run **test board** ***location*** **long**.

If	Then
Test #1259 fails with Error Code XXYY and XX is an AUX value in the preceding table	Replace the ATM-TRK circuit pack.
The system does not recognize the circuit pack	Replace the ATM-TRK circuit pack.

s. **Error Type 3841:** the ATM-TRK circuit pack received an unrecognized message from the switch and responded with an inconsistent down-link error message.

1. Do nothing. This error does not affect service.

t. **Error Type 3842:** LANHO Receive FIFO Overflow error; the packet bus is delivering data to the ATM-TRK circuit pack faster than the circuit pack can distribute it to the endpoint.

   1. Do nothing. The circuit pack can recover by itself.

u. **Error Type 3843:** The firmware on the circuit pack is reporting a resource that is to low. This error does not affect the service and no action is required.

v. **Error Type 3999:** circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	The circuit pack is taken out of service.
Error Type 1538 is absent	The circuit pack is not taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. ● This can be normal during heavy traffic. ● If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
ATM Board Time Of Day Update (#1261)		X		ND
NPE Audit Test (#50)		X		ND
Control Channel Looparound Test (#52)		X		ND
Packet Interface Test (#598)	X	X		ND
ATM Board DSP Test (#1293)	X	X		ND
ATM Board Framer Looparound Test (#1260)		X		D
ATM Board Error Query Test (#1259)	X	X		ND
				1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
ATM Crosstalk Test (#1298)		X		ND
ATM Board Reset (#1256)			X	D
				2 of 2

1. D = Destructive, ND = Nondestructive

ATT-ADJ (Avaya Adjunct)

See BRI-SET, Various Adjuncts.

ATTE-AJ (Ethernet Avaya Adjunct)

See BRI-SET, Various Adjuncts.

AUX-BD (Auxiliary Trunk Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AUX-BD	MIN WRN	**`test board`** ***`location`***	Auxiliary Trunk circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) maintenance information for circuit pack-level errors.

See AUX-TRK (Auxiliary Trunk) for related trunk information.

AUX-TRK (Auxiliary Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AUX-TRK	MAJ[1] MIN	**test port *location* l**	Auxiliary Trunk
	WRN	**test port *location***	

1. A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75% of the trunks in this trunk group are alarmed.

The TN763B/C/D and TN417 Auxiliary Trunk circuit packs may be used to provide ports for the following features: Music-On-Hold, loudspeaker paging (voice and coded chimes), dictation, automated wake-up with AUDICHRON. Recorder/Announcer, and recorded announcements. TN763C circuit packs support Mu-law companding. TN417 circuit packs support A-law companding. TN763D can support either companding mode and defaults to mu-law on initialization. Companding modes are administered on the **location-parameters** screen.

Use the following commands to administer the features:

Command	Administration
change system-parameters features	Music-On-Hold
change paging loudspeaker	loudspeaker paging
add trunk-group *grp#* [Customer-Provided Equipment (CPE) Type]	loudspeaker paging
change paging loudspeaker	system-provided paging
add trunk-group *grp#*	access to otherwise-provided (CPE) paging
change paging code-calling-ids	translation for code chiming
add trunk-group *grp#* (CPE Type)	Recorded announcement and dictation
change system-parameters hospitality	Automatic wake-up (uses all four ports on a TN763B Auxiliary Trunk circuit pack)

Music-On-Hold provides audible feedback to a held, parked, or otherwise split-away party indicating that the call is still connected. The feedback can be customer-provided music, a recorded message, or other audible indication. Since the Music-On-Hold port is always busy, some of its port tests always abort.

The Loudspeaker Paging feature provides voice and/or code calling chime paging. If multiple paging zones are provided at a customer's premises, the Loudspeaker Paging feature gives a user the option of paging to a particular zone or to every zone. If a zone is active for one page, it cot be used at the same time for another.

An Auxiliary Trunk circuit pack contains four ports and uses DTMF signaling. A different hardware interface between the switch and the auxiliary equipment is used for the four types of signaling that the auxiliary trunk circuit pack supports.

The interface used for the Communication Manager loudspeaker paging consists of the following three pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries answer supervision and/or make busy information.
- The SZ (SZ-SZ1) pair that provides the external equipment with a seizure indication.

The interface used for recorded announcement, dictation, and other loudspeaker paging consists of the following two pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries answer supervision and/or make busy information.

The interface used for Music-On-Hold consists of one pair:

- The Tip-Ring (T-R) pair used for voice transmission.

The interface, used for automatic wake-up using an Audichron recorder/announcer unit, consists of the following two pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries the synchronization signal.

Error log entries and recommended actions

Table 56: AUX-TRK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1(b)	57481				
1(c)	57482				
15(d)	Any	Port Audit and Update Test (#36)			
18	0	**busyout port *location***	WRN	OFF	**release port *location***
130(e			WRN	ON	**test trunk *grp#/mem#***
					1 of 2

Table 56: AUX-TRK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
769(c)	57482				
257		Hybrid/Conference	MIN WRN[1]	ON	**test port *location* l r 3**
		Looparound Conference test (#33)			
513		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	**test port *location* l r 3**
1025		Auxiliary Trunk Diagnostic Test (#114)	WRN	ON	**test port *location* r 3**
					2 of 2

1. Major or Minor alarms may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1** with **Aux Data 57481** indicates a port fault. Use an empty port if one is available until the circuit pack can be replaced.

c. **Error Type 1** or **769** with **Aux Data 57482** indicates a fault on signaling lead, which is an off-board error. This error should only occur with loudspeaker paging. If the trunk is being used for another application, check that the administration is correct. Otherwise, check the wiring to the external equipment connected to the Auxiliary Trunk and check the external equipment.

d. **Error Type 15**: software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

e. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Looparound and Conference Test (#33)		X	ND
NPE Crosstalk Test (#6)		X	ND
Auxiliary Trunk Diagnostic Test (#114)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

AXA12-BD (AUDIX Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AXA12-BD	MIN WRN	**`test board`** ***`location`***	AUDIX circuit pack

TN568 EMBEDDED AUDIX circuit packs operating in control-link mode appear to the system as TN746 Analog Line circuit packs with vintage greater than 50.

For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module).

The AUDIX system has an extensive maintenance strategy of its own that is described in *DEFINITY® AUDIX Maintenance*.

AXA12-RS (AUDIX Reserve Slots)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AXA12-RS	NONE	NONE	TN568 12-port analog reserve slot
ADX8D-RS	NONE	NONE	TN568 8-port digital reserve slot
AXD12-RS	NONE	NONE	TN568 12-port digital reserve slot

There are no tests associated with these MOs. Both **`test board`** and **`busyout board`** abort when either is attempted on a reserved slot. An error message indicates that the slot is associated with the circuit pack that the TN568 is emulating, but the requested operation is not valid. If there are errors logged against these MOs, see XXX-BD (Common Port Circuit Pack/ Media Module).

The TN568 circuit pack connects to the switch through a single slot in the backplane. However, the number of slots physically occupied by the circuit pack is supplied by the board when inserted. The TN568 is 2 slots wide: the functional slot and a reserve slot. The reserve (blank) slot to the left of the functional slot is a place holder on the switch and has no interaction with the switch.

These MOs are place holders for the extra slot needed for the EMBEDDED AUDIX board. Each instance of these MOs represents a reserve slot associated with the respective circuit pack mode in which the TN568 (EMBEDDED AUDIX) is working. They are used for EMBEDDED AUDIX and emulation of respective port types.

AXD12-BD (AUDIX circuit pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
AXD12-BD	MIN WRN	**test board *location***	AUDIX circuit pack

The AXD12-BD MO represents a TN568 EMBEDDED AUDIX circuit pack operating in 12-port digital (DP) mode. TN568 EMBEDDED AUDIX circuit packs operating in 12-port digital mode appear to the system as TN2181 Digital Line circuit packs with vintage greater than 50.

For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module).

AXD12-RS (AUDIX Reserve Slots)

See AXA12-RS (AUDIX Reserve Slots).

BRI-BD (ISDN-BRI Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
BRI-BD	MAJ MIN WNR	**test board** ***location*** **l**	ISDN-BRI Line circuit pack
LGATE-BD	MAJ MIN	**test board** ***location*** **l**	LAN Gateway
	WRN (See Caution)	**test board** ***location***	

CAUTION:

A detailed flowchart for isolating and resolving Packet Bus faults is included in Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*. This flowchart, along with the other information presented in the chapter, can help in resolving problems that involve more than a single station or circuit pack. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to see Isolating and repairing packet-bus faults. See also PKT-BUS (Packet Bus) for repair procedures.

Error log entries and tests also apply to LGATE-BD.

This section relates to the TN556 ISDN BRI, TN2198 ISDN BRIU, and TN2208 LAN Gateway (LGATE) Multifunction (MFB) circuit packs.

The TN2208 LGATE MFB provides the system with the interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). This circuit pack contains 12 ports for line circuit interface (although only 8 are usable by the switch), each of which operates with two B channels and one D-Channel. In this context, the term “ISDN-BRI port” is used to refer to ports on the TN2208 MFB circuit pack that are connected to ASAI or Avaya adjuncts. The TN2208 LGATE MFB is handled by the switch software as if it is an ISDN-BRI compatible board, and every maintenance action referring to ASAI and Avaya adjunct links in this section applies.

The TN556, TN2198, and TN2208 ISDN-BRI Lines are packet port circuit packs that provides access to ISDN-BRI endpoints. The ISDN-BRI Line circuit packs supports 12 ports, each of which provides access to ISDN stations. Voice and circuit-switched data from the ISDN stations are carried on the Time Division Multiplex (TDM) Bus. Signaling is carried over the packet bus.

Error log entries and recommended actions

Table 57: BRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test board` *`location`*
1(b)	Any		MIN	ON	
18(c)	0	`busyout board` *`location`*	WRN	OFF	`release board` *`location`*
23(d)	0		WRN	OFF	
257(e)	65535	Control Channel Looparound (#52)	MIN	ON	`test board` *`location`* `r 20`
513(f)	4352 to 4357				
769(g)	4358				
1025(h)	4363	NPE Audit Test (#50)			
1293 1294 (i)	46088 to 46096	SAKI Sanity test (#534)	MIN	ON	
1537 1538 (j)	46082		MIN	ON	
1793 (k)	46080		MIN	ON	
1794 (k)	46094		MIN	ON	
1795 (k)	46085		MIN	ON	
2306 (k)		LANBIC Receive Parity Error Counter test (#595)			
3330 (l)	46083		MIN	OFF	
3840 (m)	4096 to 4101				
3843 (n)	46097				
3999 (o)	Any				

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: the circuit pack totally stopped functioning or it was physically removed from the system. The alarm is logged approximately 11 minutes after the circuit pack has been removed and/or SAKI Sanity test (#53) fails.

   If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, follow the instructions for "Red (alarm)" in the Circuit Pack LEDs section of *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

c. **Error Type 18**: This circuit pack has been busied out via **busyout board *location***.

d. **Error Type 23**: Port(s) has (have) been administered on this circuit pack but the circuit pack is not physically present.

e. **Error Type 257**: transient communication problems between the switch and this circuit pack. Execute **test board *location*** and see Control Channel Looparound Test (#52) for the repair procedures.

f. **Error Type 513**: An on-board hardware failure has been detected by the circuit pack.

   Aux Data 4352: External RAM error
   Aux Data 4353: Internal RAM error
   Aux Data 4355: ROM Checksum error
   Aux Data 4357: Instruction set error

   Reset the circuit pack by executing **busyout board *location***, **reset board *location*** and **release board *location***. When it is reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedure in footnote (a) for Error Type 0.

g. **Error Type 769**: reported by the circuit pack when it detects a program logic error. No action is required, but this error may lead to errors of other types being reported against this circuit pack.

h. **Error Type 1025**: reported by the circuit pack when it cot update NPE memory and read it back. No action is required, but this error may lead to errors of other types being reported against the circuit pack.

i. **Error Type 1293, 1294**: a critical hardware failure has been detected on the circuit pack.
   Error Type 1293: On-board auxiliary processor insane.
   Error Type 1294: Internal memory access error.
   Reset the circuit pack via **busyout board *location*** and **reset board *location***. If the Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm via **test board *location* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

j. **Error Type 1537**: Frame overrun at packet bus interface. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those MOs.

Error Type 1538: Circuit packet is hyperactive; that is, it is flooding the switch with messages sent over the control channel. The circuit pack is taken out-of-service when a threshold number of these errors is reported to the switch. Clear the alarm with **busyout board *location***, **reset board *location***, **test board *location* long clear**, **release board *location***. If the error recurs within 10 minutes, then replace the circuit pack.

k. **Error Type 1793, 1794, 1795, 2306**: the circuit pack is having problems transmitting data to the packet bus.

Error Type 1793: Parity errors are detected when transmitting data to the packet bus.
Error Type 1794: Overflow of packet bus transmit buffers has occurred.
Error Type 1795: Circuit pack cot find end of frame when transmitting to packet bus.

Clear the alarm via the following commands: **busyout board *location***, **reset board *location***, **test board *location* long clear**, **release board *location***. If the error recurs within 10 minutes, then replace the circuit pack.

Error Type 2306: This error occurs when the circuit pack detects an error in a received frame from the packet bus. These errors are most likely caused by a packet bus problem, but may be due to a circuit pack fault. An invalid Link Access Procedure Data (LAPD) frame error occurs if the frame contains a bad cyclical redundancy check (CRC), is greater than the maximum length, or violates the link level protocol. When bus parity errors are reported, the LANBIC Receive Parity Error Counter test (#595) should be performed to determine whether the condition had cleared. See Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)* to determine whether the problem is isolated to this circuit pack or is caused by packet bus faults.

l. **Error Type 3330**: A critical failure has been detected in the packet bus interface of the circuit pack. This failure may be due to either a packet bus or to an on-board fault. If the packet bus is alarmed, see PKT-BUS (Packet Bus) and Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)* for recommended repair procedures. The probability of this error being related to packet bus problems increases with the number of ISDN-BRI circuit packs displaying this error.

If the packet bus is not alarmed, reset the circuit pack with **busyout board *location*** and **reset board *location***. If the Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm with **test board *location* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack. If the problem persists after complying with the above instructions, then follow normal escalation procedures.

m. **Error Types 4096, 4097, 4098, 4099, 4100, 4101**: the circuit pack received a bad control channel message from the switch. Not service-affecting, no action is required. The auxiliary data identifies the error events.

Error Type 4096: Bad major heading
Error Type 4097: Bad port number
Error Type 4098: Bad data
Error Type 4099: Bad sub-qualifier
Error Type 4100: State inconsistency
Error Type 4101: Inconsistent downlink message

n. **Error Type 3843**: bad translation RAM detected, but call continues by using another translation location. This error is not service-affecting. No action is required.

o. **Error Type 3999**: the circuit pack sent a large number of control channel messages to the switch in a short period of time.
If **Error Type 1538** is also present, the circuit pack was taken out-of-service due to hyperactivity.
If **Error Type 1538** absent, the circuit pack was not taken out-of-service, but has generated 50% of the messages necessary to be considered hyperactive. This may be normal during heavy traffic periods. If traffic is light, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND

1. D = Destructive; ND = Nondestructive

BRI-DAT (ISDN-BRI Data Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
BRI-DAT	WRN[1]	**test data-module *extension***	ISDN-BRI Stand-alone Data Module

1. The alarm level for ASAI or Avaya adjuncts may be administered using **set options**. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct in the system.

See BRI-SET, Various Adjuncts.

BRI-PORT (ISDN-BRI Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
BRI-PORT	MIN	**test port *location* l**	ISDN-BRI port
	WRN	**test port *location***	
ABRI-POR	MAJ [1] WRN [1]	**test port *location* l**	ASAI ISDN-BRI port
ATT-PORT	MAJ [1] WRN [1]	**test port *location* l**	Avaya Adjunct ISDN-BRI port
LGATE-PT	MAJ [1] WRN [1]	**test port *location* l**	Ethernet ASAI port
ATTE-PT	MAJ [1] WRN [1]	**test port *location* l**	Ethernet Avaya Adjunct port

1. Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Note:

The section, Isolating and repairing packet-bus faults, in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*, along with the other information presented in the chapter, can help resolve problems involving more than one station or circuit pack.

If a significant packet bus failure occurs, errors and alarms may not be logged as expected for BRI-PORT/ABRI-POR/ATT-PORT/ LGATE-PT/ ATTE-PT. Conditions under which this occurs are detailed in the Isolating and repairing packet-bus faults section in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

The following circuit packs/media modules support this maintenance object:

- TN2208 LGATE Multifunction Board (MFB)
- TN556 ISDN-BRI Line circuit pack
- TN2198 ISDN-BRI Line circuit pack
- MM720 BRI Media Module

The TN2208 LGATE MFB provides Communication Manager with the interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). The circuit pack contains 12 ports of line circuit interface (although only 8 are usable by the switch), each of which operates with two B-Channels (referred to as B1 and B2 throughout this section) and one D-Channel. In this context, the term “ISDN-BRI port” is used to refer collectively to ports on the TN2208 circuit pack that are connected to ASAI or Avaya adjuncts.

The TN556 and TN2198 ISDN-BRI Line circuit packs provide the system with the interface to ISDN-BRI endpoints, Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). The circuit packs contain 12 ports of line circuit interface, each of which operates with two B-Channels (referred to as B1 and B2 throughout this section) and one D-Channel. In this context, the term “ISDN-BRI port” is used to refer collectively to ports on the TN556 and TN2198 circuit packs that are connected to either BRI endpoints, ASAI or Avaya adjuncts.

The MM720 BRI Media Module provides 8 S/T ISDN 2B+D ports that interface to either the central office or another PBX. The MM720 contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb channels (B1 and B2) and over a 16Kb signaling (D) channel. The B1 and B2 channels can be simultaneously circuit switched, or individually packet switched. The D-channel is circuit switched. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64Kb clear data channels.

Note:

This maintenance object applies to the MM720 BRI Media Module only if its ports are all configured as station line ports instead of trunk ports.

For BRI endpoints, each B-Channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B-Channels are not used on ports connected to ASAI or Avaya adjuncts. The D-Channel is used for conveying signaling between the switch and a BRI endpoint(s), ASAI or Avaya adjunct. Each ISDN-BRI D-Channel is connected to the switch processor and the ISDN-BRI port through the packet bus.

ISDN-BRI endpoints are available in various configurations. Every endpoint requires the D-Channel to convey signaling information to the switch. Only one B-Channel is required for a voice-only set or a stand-alone data module (BRI-DAT). A voice and data-capable set requires both B-Channels (one for voice and one for data). Therefore, each TN556 or TN2198 port can support either two voice-only sets, two stand-alone data modules (BRI-DAT), or one voice and data-capable set. Only a single ASAI or Avaya adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 4: ISDN-BRI Port Interactions illustrates the physical connection (solid line) between an ISDN-BRI port and its associated ISDN-BRI set(s). Each physical connection allows for two B-Channels and one D-Channel. Each ISDN-BRI circuit pack can support up to 12 of these *physical* connections to different voice and voice/data sets or ASAI or Avaya adjuncts. On a TN2198 each ISDN-BRI circuit pack can support up to 12 *physical* connections to a NT1 which in turn connects to 2 terminals.

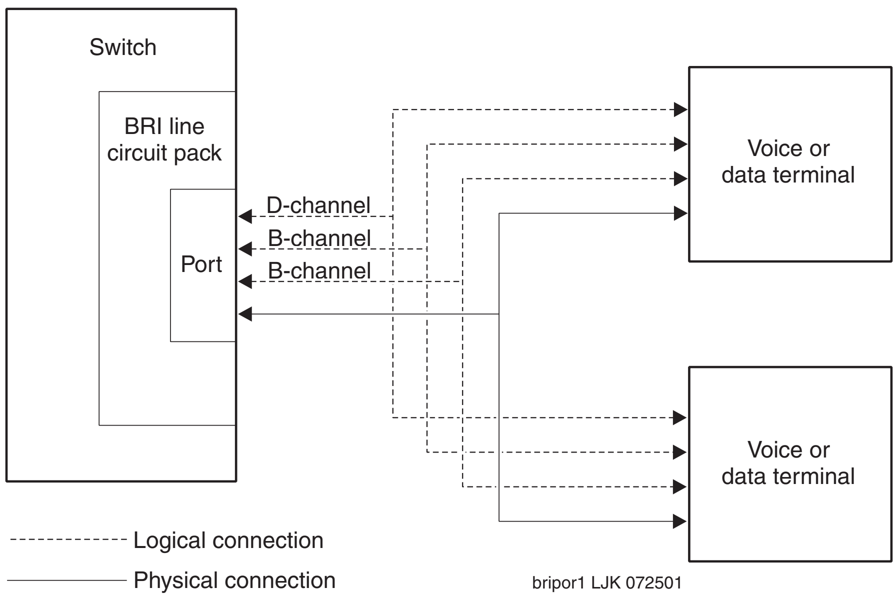
This section covers the maintenance documentation for ISDN-BRI ports. Some of the results of maintenance testing of ISDN-BRI ports may be affected by the health of the ISDN-BRI Line circuit pack (BRI-BD), BRI endpoint (BRI-SET), or ASAI adjunct (ASAI-ADJ/LGATE-ADJ/LGATE-AJ) or Avaya adjunct (ATT-ADJ/ATTE-AJ). These interactions should be kept in mind when investigating the cause of ISDN-BRI port problems. For more information about the circuit pack, see:

- BRI-BD (ISDN-BRI Line Circuit Pack)
- BRI-SET, Various Adjuncts

and for more information about its endpoints, see:

- ASAI-ADJ (ASAI Adjunct)
- ATT-ADJ (Avaya Adjunct)
- LGATE-AJ (Ethernet ASAI Endpoint)

Figure 4: ISDN-BRI Port Interactions



Error log entries and recommended actions

Table 58: BRI-PORT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level for BRI-PORT	Alarm Level for ABRI-PORT ATT-PORT LGATE-PT ATTE-PT	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	Any	`test port location`
1(b)		Level 1 Status Inquiry (#621)	WRN	Any[1]	OFF	`test port location r 2`
18		`busyout port location`	WRN		OFF	`release port location`
130(c)			WRN		ON	`test port location`
257(d		EPF Inquiry (#622)	WRN	Any1	OFF	`test port location`
513(e)	46222		(d)	(d)	ON	
769(f)	0		WRN	MAJ	OFF	
1281(g)		BRI NPE Crosstalk (#617)	MIN WRN1		ON	`test port location l r 2`
1537(h)	46210	CRC Error Counter (#623)	WRN	Any1	OFF	
1793(i)		BRI Port Local TDM Looparound (#619)	MIN WRN1		ON	`test port location l r 2`
3841(j	46208					
3842(k)	0					
3843(l)	0					
3844(m)	46223					
3845(n)						
3846(o)	TEI					
3847(p)	0					

1. Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: the Level 1 Status Inquiry fails or when the BRI circuit pack detects that Level 1 has been deactivated on the port. Refer to the repair procedures for Level 1 Status Inquiry Test (#621).

   Aux Data blank: the Level 1 Status Inquiry failed.
   Aux Data 32773: the BRI-LINE circuit pack detected that Level 1 has been deactivated.

c. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

d. **Error Type 257**: the EPF Status Inquiry fails due to an overcurrent condition or when the BRI-LINE circuit pack detects that the EPF is in an over current condition. The aux data field contains one of the following values:

   - blank – This indicates that the EPF Status Inquiry failed due to an overcurrent condition.
   - 40988 – This indicates that the BRI-LINE circuit pack has detected an overcurrent condition and has turned the EPF off.

   Execute the short test sequence, and see the repair procedures for Test #622.

e. **Error Type 513**: the circuit pack is having problems transmitting data to the packet bus, thus affecting the conveyance of signaling information over the D-Channel. With Aux Data 46222, this error occurs when the packet bus transmit buffers overflow. This condition probably indicates a hardware problem. The BRI-PORT Alarm Level for the error with Aux Data 46222 is "MINOR/WARNING," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJOR/MINOR/WARNING." With Aux Data 0, this error occurs whenever the packet bus transmit FIFO buffers overflow. This condition can be caused by an on-board hardware problem as well as by problems on the packet bus that disrupt the BRI circuit pack's ability to transmit data onto the packet bus. Use troubleshooting procedures for both on-board hardware problems and potential off-board packet bus problems. See PKT-BUS (Packet Bus) as well as Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)* for more information about troubleshooting the packet bus. The BRI-PORT Alarm Level for the error with Aux Data 0 is "MINOR," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJOR."

f. **Error Type 769**: the BRI NPE Crosstalk Test (#617) fails. Run the long test sequence, and note the results of Test #617.

g. **Error Type 1281**: a port's associated broadcast-signaling links have too much traffic related to link establishment. This could occur if an endpoint on this port is sending link establishment traffic on a port level broadcast link or if there are Level 1 problems on the port. Check the error logs for Level 1 errors. If Level 1 problems exist, follow the repair procedures listed for Test #621. Software will suspend activity to this port for 75 minutes when the port is alarmed due to this error (note that service suspension does not occur if the port is an ABRI-PORT/LGATE-PT/ATTE-PT/ATT-PORT). If this problem persists, replace the endpoint or endpoints associated with this port. If replacing the endpoints does not fix the problem, follow normal escalation procedures.

h. **Error Type 1537**: the port receives an invalid frame over the D-Channel. When CRC errors exceed five within 15 minutes, the port is taken out of service for five seconds. If five more CRC errors are received within 15 minutes of the first set of five errors, the port is taken out of service for one minute. If five more CRC errors are received within 15 minutes of the last five, the port is taken out of service for 15 minutes.

   This error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

   - Check the wiring to the endpoints or the adjunct.
   - If the problem persists, replace the endpoints or adjuncts, or escalate the problem.

i. **Error Type 1793**: the BRI Port Local TDM Looparound Test (#619) fails. Run the long test sequence, and note the results of Test #619.

   There are no recommended actions for the following Error Types. The Error Types are simply provided as additional data that may prove useful while troubleshooting.

j. **Error Type 3841**: a Layer 1 Transmission error is detected for the port. Run the long test sequence, and note the results of the Layer 1 Transmission Error Counter Test (#624).

k. **Error Type 3842**: A BRI port supports up to three Terminal Endpoint Identifiers (TEIs). This error occurs when the switch receives a request for a fourth TEI on a port. Check the number of endpoints administered for this port.

l. **Error Type 3843**: a SPID initialization request is made from an endpoint and the switch determines that the SPID value is invalid or is a duplicate of another SPID that is already initialized at Layer 3 on the port. Check the administration of the endpoints.

m. **Error Type 3844**: the circuit pack detects an overflow of its receive buffers. Run the long test sequence, and note the results of the Receive FIFO Error Counter Test (#625).

n. **Error Type 3845**: the BRI Port Local LAN Looparound Test (#618) fails. Run the long test sequence, and note the results of Test #618.

o. **Error Type 3846**: most likely occurs when the Terminal Endpoint Identifier (TEI) administered for the ASAI or Avaya endpoint does not match the TEI administered in the ASAI or Avaya adjunct. Check the switch administration of the TEI against that of the adjunct and make sure that both are using the same TEI.

p. **Error Type 384**: sets on the port do not support layer-3 initialization. Consult the Service Set documentation.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
BRI NPE Crosstalk Test (#617)		X	D
BRI Port Local LAN Looparound Test (#618)		X	D
BRI Port Local TDM Looparound Test (#619)		X	D
Electronic Power Feed Restoral Test (#620)	X	X	ND
Level 1 Status Inquiry Test (#621)	X	X	ND
Electronic Power Feed Inquiry Test (#622)	X	X	ND
CRC Error Counter Test (#623)		X	ND
Layer 1 Transmission Error Counter Test (#624)		X	ND
Receive FIFO Error Counter Test (#625)		X	ND
Clear Error Counters Test (#270)	X	X	ND

1. D = Destructive; ND = Nondestructive

BRI-SET, Various Adjuncts

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
BRI-SET	WRN[1]	`test station` *`extension`* `l`	ISDN-BRI Set
BRI-DAT	WRN1	`test data-module` *`extension`* `l`	ISDN-BRI Data Module
ASAI-ADJ	MAJ1	`test station` *`extension`* `test data-module` *`extension`*	ASAI-Adjunct
	WRN[2]	`test data-module` *`extension`*	
ATT-ADJ	MAJ1 WRN2	`test station` *`extension`*	Avaya-Adjunct
LGATE-AJ	MAJ1 WRN2	`test station` *`extension`*	Ethernet ASAI-Adjunct
ATTE-AJ	MAJ1 WRN2	`test station` *`extension`*	Ethernet Avaya-Adjunct

1. The alarm level for ASAI and Avaya adjuncts may be administered using **set options**. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI and Avaya adjunct in the system.
2. Alarming for an ASAI and Avaya adjuncts is disabled if the adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm are logged against the endpoint. Busying out and releasing the ASAI station or ADDLE station will clear the alarm.

Information for isolating and resolving packet bus faults is included in Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*. The Troubleshooting Packet Bus Problems flowchart, along with the other information presented in the chapter, can help resolve problems that involve more than a single station or circuit pack.

If a significant packet bus failure occurs, errors and alarms may not be logged as expected for BRI-PORT/ABRI-POR/ATT-PORT/ LGATE-PT/ ATTE-PT. Conditions under which this occurs are detailed in the Isolating and repairing packet-bus faults in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

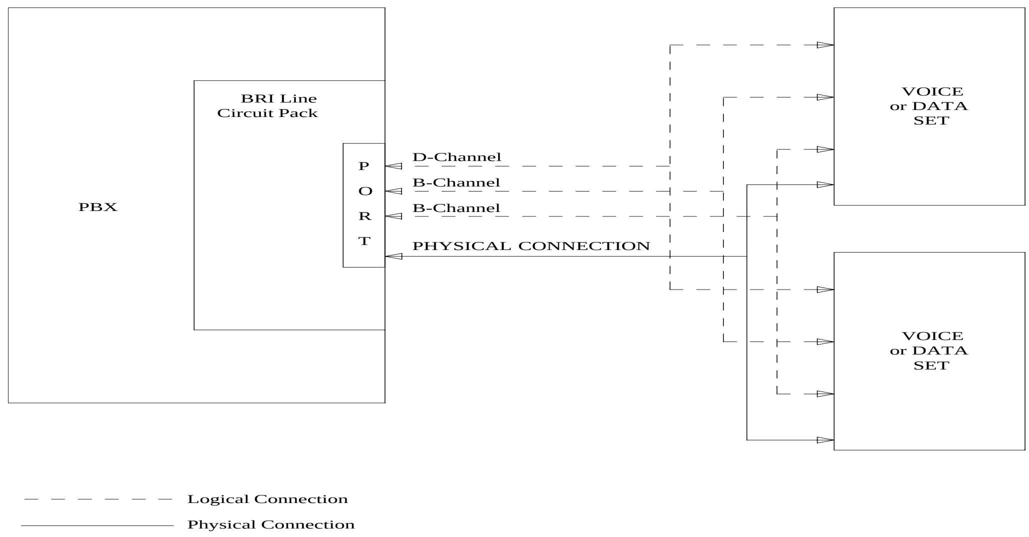
The TN2208 ESAI MFB provides the system with an Ethernet interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). This circuit pack contains 8 ports of line circuit interface, each of which operates with two B-Channels (referred to as B1 and B2 throughout this section) and one D-Channel. In this context, the term ``ISDN-BRI port'' is used to refer collectively to ports on the TN2208 MFB circuit pack that is connected to ASAI or Avaya adjuncts. The TN2208 ESAI MFB is handled by switch software as it is an ISDN BRI compatible board and every maintenance action referring to ASAI and Avaya Adjunct Links in this section applies.

Two types of ISDN-BRI endpoints may be connected to ISDN-BRI (ISDN Basic Rate Interface Line) TN556 and TN2198 circuit packs: ISDN-BRI station endpoints, ASAI (Adjunct-Switch Application Interface) and Avaya adjuncts (for example CONVERSANT® Voice System). These circuit packs contain 12 ports of line circuit interfaces, each of which operates at 192 kilobits per second (kbps) with two B-Channels and one D-Channel. For BRI endpoints, each B-Channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B-Channels are not used by ASAI or Avaya adjuncts. The D-Channel is used for conveying signaling between the switch and a BRI endpoint(s) or ASAI or Avaya adjuncts. Each ISDN-BRI D-Channel is connected to the switch processor and the ISDN-BRI port through the PKT-BUS (packet bus).

ISDN-BRI endpoints come in a number of configurations. Every endpoint requires the D-Channel to convey signaling information to the switch. A voice-only set requires only one B-Channel. A voice and data-capable set requires both B-Channels (one for voice and one for data). Therefore, each TN556 port can support either two voice-only sets or one voice and data-capable set. Only a single ASAI or Avaya adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 5: ISDN-BRI Set Interactions illustrates the physical connection (solid line) between an ISDN-BRI circuit pack and a voice or voice/data set. Each physical connection allows for two B-Channels, as stated above, plus one D-Channel. Each ISDN-BRI circuit pack can support up to 12 of these PHYSICAL connections to different voice and voice/data sets or ASAI and Avaya adjuncts.

Figure 5: ISDN-BRI Set Interactions



This section contains the ISDN-BRI Set, ASAI Adjunct and Avaya Adjunct Maintenance documentation. Some of the results of maintenance testing of the ISDN-BRI Set or the ASAI and Avaya Adjunct may be affected by the health of the ISDN-BRI circuit pack and port. These interactions should be kept in mind when investigating the cause of ISDN-BRI Set problems.

Error log entries and recommended actions

Table 59: BRI-SET/Adjunct Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level BRI-SET BRI-DAT	Alarm Level ASAI-ADJ ATT-ADJ ATTE-AJ LGATE-AJ	On/ Off Board	Recommended Action
0 (a)	0	Any	Any	Any	Any	`test station` ***ext*** `r 2` `test data-module` ***ext*** `r 2`
2 (b)	2-102					
18	0	`busyout station` ***ext***	WRN	MAJ WRN[1]	OFF	`release station` ***ext***
130 (c)			WRN		ON	`test port` ***location***
						1 of 2

Table 59: BRI-SET/Adjunct Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level BRI-SET BRI-DAT	Alarm Level ASAI-ADJ ATT-ADJ ATTE-AJ LGATE-AJ	On/ Off Board	Recommended Action
257 (d)	Any	BRI Layer 3 Query (#629)	WRN	MAJ WRN1	OFF	`test station` ***ext*** `r 2` `test data-module` ***ext*** `r 2`
351 (e)	0			WRN	OFF	`busyout station` and `release station`
513 (f)	0					
769 (g)	0		WRN	MAJ	OFF	
2562-2566 (h)	0					
2567 (i)	0					
2568 (j)	0					
2817 (k)	0	XID test (#628)	WRN	MAJ WRN1	OFF	`test station` ***ext*** `r 2` `test data-module` ***ext*** `r 2`
3073 (l)	0	BRI Remote Loopback (#627)	WRN		OFF	`test station` ***ext*** `l r 2` `test data-module` ***ext*** `l r 2`
3329 (m)	Any	Signaling Link Status (#626)	WRN	MAJ WRN1	OFF	
3584-3839 (n)	0					
3840-4095 (o) (p)	0					
						2 of 2

1. Major and Minor alarms for this MO may be downgraded to Warning alarms based on the value used with **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 2**: violations of the ISDN-BRI signaling protocol. Timers associated with certain layer-3 messages have expired before a required response was received. In the following table, the aux data field indicates what timer has just expired.

Aux Data	Timer Type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer-2 Failure timer)
16	TM100 (Management Information message Timer 1)
17	TM200 (Management Information message Timer 2)
102	TASAI (ASAI Routing timer)

The switch sent a message to the endpoint that did not respond in the allotted time. This can happen occasionally due to failure of the point-to-point signaling link or because of a problem in the BRI endpoint or ASAI adjunct or Avaya adjunct. Execute **`test station`** ***`extension`*** **`sh`** and note the results of the BRI Layer 3 Query test (#629). If this test fails, follow the repair procedure for BRI Layer 3 Query Test (#629).

c. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

d. **Error Type 257**: the endpoint does not respond to the service state query message sent to the adjunct or the endpoint. This error causes an alarm to be raised. The alarm is retired when the switch receives a response to the service state query to the endpoint or the adjunct.

For BRI endpoints, the Aux Data field for this error contains “0.” When it occurs, execute **`test station`** ***`extension`*** **`sh`** and note the results of the BRI Layer 3 Query test (#629). If this test fails, follow the repair procedure for BRI Layer 3 Query Test (#629)

When this error occurs for an ASAI or Avaya adjunct, the Aux Data field indicates the state of the ASAI link or Avaya link and whether an invalid response or no response was received to the query from the switch, as shown in the following table:

Aux Data	ASAI Link State	Error
102	13-restarting	No response to RESTART message
104	13-restarting	Invalid response to RESTART message
152	13-restarted	No response to layer-3 query
154	13-restarted	Invalid response to layer-3 query
202	13-established	No response to layer-3 query
204	13-established	Invalid response to layer-3 query

See the section on maintenance SAT commands in *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)* for an explanation of the ASAI link states.

For ASAI or Avaya adjuncts, the switch automatically queries the adjunct every two minutes (and therefore the Layer 3 Query test is not executed for ASAI or Avaya adjuncts via a command entered from the G3MT terminal). While alarmed for this error, the switch momentarily (for five seconds) takes the associated port out-of-service every 15 minutes. This action is taken in an attempt to stimulate recovery actions to be taken by the adjunct.

When this error occurs for an ASAI or Avaya adjunct:

1. Execute **`test station`** ***`extension`*** and note tests that fail. Perform the associated repair procedures for those tests.
2. Check the health of the adjunct by following the recommended repair procedures of the manufacturer of the adjunct if the preceding step does not resolve the problem.
3. If the above steps do not resolve the problem and the alarm persists, follow normal escalation procedures.

e. **Error Type 351** and associated WARNING alarm are logged against an ASAI or Avaya endpoint when the adjunct has asked the switch to suspend Maintenance on the ASAI or Avaya endpoint. Busy out and release the ASAI station or ADJLK station to clear the alarm.

f. **Error Type 513**: the endpoint sends more messages than the switch can handle. The switch suspends the reception of messages from the endpoint for a short period of time. There is no repair procedure for this error. If the condition persists, replace the endpoint.

g. **Error Type 769**: a BRI endpoint’s signaling-associated link has too much traffic related to link establishment. This could occur if the signaling link is bouncing between assigned and established states. Software suspends activity to this endpoint for 75 minutes when the endpoint is alarmed due to this problem. Note that service suspension does not occur if the endpoint is an ASAI or Avaya adjunct. If this problem persists, replace the endpoint. If replacing the endpoint does not fix the problem, follow normal escalation procedures.

h. **Error Type 2562-2566**: the ASAI message is not transmitted because the transmit buffer for the ASAI link is full, causing the link to be flow controlled. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the signaling link, or the ASAI or Avaya adjunct. Attempt to resolve the problem by following the repair procedures issued by the manufacturer of the adjunct. If these attempts fail, the problem should be escalated because re-engineering of the traffic on the signaling link, or adjunct may be necessary.

i. **Error 2567**: the version of ASAI is not supported, check version of the software running on the ASAI or Avaya adjunct.

Table 60: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Notes) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1	Channel in use	Another station is using requested channel on the BRI-PORT. (Not applicable for ASAI or Avaya adjuncts.) For BRI endpoints: 1. Try to originate a call to or from this port. 2. If the error persists, busyout and release the port. 3. If the problem still persists, replace stations on the port. 4. If the problem still persists, escalate to the next tier.
34	No circuit or channel available	A resource on the switch is unavailable for a call. For BRI endpoints: This cause value is not logged. For ASAI or Avaya Adjuncts: This condition means that there are no available trunks for an outgoing call request. 1. Verify that the adjunct is administered to support the trunk capabilities of the switch. 2. Investigate trunk group status by entering **`status trunk`** commands from the SAT or by requesting a trunk group query or queries from the adjunct. 3. Perform trunk diagnostic procedures such as **`test trunk`**. 4. If step 3 does not resolve the problem, escalate to the next tier.
42	Switch Equipment Congestion	Switch takes control to limit received traffic. For BRI endpoints: This cause value is not logged. For ASAI or Avaya Adjuncts: 1. Refer to the CallVisor protocol reference manual. 2. If step 1 does not resolve the problem, escalate to the next tier.
		1 of 3

Table 60: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Notes) ***2 of 3***

Error Code	Test Result	Description / Recommendation
50	Requested Facility Not Subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. For BRI endpoints: 1. Verify the switch administration of endpoint using **`display station`** or **`display data-module`**. 2. If step 1 does not resolve the problem, refer to the endpoint's service manual and verify administration on the endpoint. 3. If step 2 does not resolve the problem, escalate to the next tier. For ASAI adjuncts: 1. Display the Customer Optional Features screen (administration screen) on the switch to determine which ASAI capabilities are turned on in the switch. 2. Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administered capabilities, then re-administer the switch and/or the adjunct to establish a consistent set of desired capabilities on both the switch and the adjunct. 3. If step 2 does not resolve the problem, escalate to the next tier. For Avaya adjuncts: 1. Display the Customer Optional Features screen (administration screen) on the switch to determine whether the Avaya adjunct is set enabled on in the switch. 2. If Error Type 2567 or 2568, verify the Avaya adjunct version, and re-administer if needed. 3. If step 2 does not fix the problem, escalate to the next tier of support
58	Bearer Capability Not Currently Available	Requested bearer capability is implemented, but not administered. No B-Channel is administered. See recommendation for Error Code 50 above.
65	Bearer Service Not Implemented	Requested service not implemented in switch or endpoint.
69	Requested Facility Not Implemented	Requested service not supported in switch or endpoint. 1. Consult switch and endpoint documentation to determine service support. 2. If step 1 does not resolve the problem, escalate to the next tier.
		2 of 3

Table 60: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Notes) ***3 of 3***

Error Code	Test Result	Description / Recommendation
81	Invalid CRV	An invalid CRV was sent by the adjunct. 1. This may indicate a CRV inconsistency between the switch and the adjunct. Refer to the CallVisor protocol reference manual. 2. If step 1 does not resolve the problem, escalate to the next tier.
		3 of 3

j. **Error 2568**: the adjunct ID is invalid, check the vender ID or software running on the Avaya adjunct

k. **Error Type 2817**: there is a layer-2 problem over the D-Channel between the switch and the endpoint. When this error occurs, an alarm is raised against the station or adjunct. Execute **`test station`** ***`extension`*** **`short`** and note the results of the BRI XID test (#628). If this test fails, follow the repair procedure for BRI XID Test (#628).

l. **Error Type 3073**: there is a problem with the B-Channel connection between the switch and the endpoint. When this error occurs, a warning alarm is raised against the endpoint. Execute **`test station`** ***`extension`*** **`long`** and note the results of the BRI Remote Loopback Test (#627). If this test fails, follow the repair procedure for BRI Remote Loopback Test (#627).

m. **Error Type 3329**: occurs whenever the point-to-point signaling link to the endpoint goes down (except when it goes down because either the PKT-BUS has failed or has been busied out by system technician). When this error occurs, an alarm is raised against the endpoint or adjunct. Execute **`test station`** ***`extension`*** **`short`** and note the results of the Signaling Link Status test (#626). If this test fails, follow the repair procedure for Signaling Link Status Test (#626). The alarm is retired when the signaling link is reestablished to the endpoint or adjunct.

n. **Error Type 3584-3839**: Certain ASAI protocol-specific cause codes are logged by switch software. The cause code can be determined from the following formula:

If the Error Type is greater than 3712, then the ASAI cause code is equal to the Error Type minus 3712. This code was sent to the adjunct by the switch.

If the Error Type is less than 3712, then the ASAI cause code is equal to the Error Type minus 3584. This code was sent to the switch by the adjunct.

A description of the various ASAI cause values is contained in the Table 61: ASAI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes). This table also contains recommended actions associated with the cause value. In addition, the Aux Data field of the Error Log entry contains additional diagnostic information additional diagnostic.

Table 61: ASAI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
0	Unrecognized ASAI Protocol Operation	Requested ASAI protocol operation is not implemented by the switch or adjunct. Aux Data field of Error Log entry contains protocol identifier for unrecognized operation. 1. Consult switch and adjunct documentation to determine which set of operations is supported by the switch and the adjunct. Adjunct administration turning off operations not implemented by the switch may resolve the problem. 2. If step 1 does not resolve the problem, escalate to the next tier.
40	Resources not available	No available internal resources to service switch or adjunct request. System transaction capacity for adjunct or switch is exceeded. 1. Re-engineering of adjunct services my be required. If problem persists, escalate problem to the next tier.
63	SERVICE OR OPTION NOT AVAILABLE	Requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resources. Potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. 1. Verify that no overlapping administration of switch resources (e.g., requesting notifications on a single domain by multiple adjuncts or multiple adjuncts attempting to control a single call) exists across any adjunct connected to the switch. If an overlap exists, then re-administer the adjuncts to guarantee that each adjunct is associated with a unique set of switch resources. 2. If step 1 does not resolve the problem, escalate to the next tier.
79	SERVICE OR OPTION NOT IMPLEMENTED	Requested service or option (or combination of selected options) is not supported (implemented) in switch or the adjunct. 1. Consult switch and adjunct documentation to determine ASAI service and options supported by both switch and adjunct. Re-administration of the switch-administered capabilities (see Customer Optional Feature screen) or those of the adjunct may be necessary to correct the problem. 2. If step 1 does not provide the set of desired services due to deficient implementation, escalate the problem to the next tier.
87	Internal switch audit	There is an inconsistency in switch data records. 1. There is no action needed since the switch has corrected the data inconsistency. 2. If a number of these errors continue to occur, then escalate to next tier.

o. **Error Type 3840-4095**: Certain ISDN-BRI cause codes are logged by switch software. The cause code can be determined from the following formula:

If the Error Type is greater than 3968, then the ISDN-BRI cause code is equal to the Error Type minus 3968. This code was sent to the endpoint by the switch.

If the Error Type is less than 3968, then the ISDN-BRI cause code is equal to the Error Type minus 3840. This code was sent to the switch by the endpoint.

A description of the various ISDN-BRI cause values is contained in Table 60: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Notes). This table also contains recommended actions associated with the cause value. In addition, the Aux Data field of the Error Log entry contains additional diagnostic information.

p. **Error 3847**: sets on the port do not support level 3 initialization. Consult the set service documentation.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Status Test (#626)	X	X	ND
BRI XID Test (#628)	X	X	ND
BRI Layer 3 Query Test (#629)	X(a)	X(a)	ND
BRI Remote Loopback Test (#627)		X(a)	ND
BRI Set Audits Test (#630)	X(a)	X(a)	ND

1. D = Destructive; ND = Nondestructive

Note:

a. Execute **test port long *location***, and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.

SPID Facility Test

This test verifies the wiring and operation of the signaling link between the switch and a endpoint or adjunct on a BRI interface. This test is not executed from the administration terminal, but rather is executed by using a BRI test set equipped with a display. The test set may replace the BRI set, ASAI or Avaya adjunct under test by plugging it into the same jack or by bridging it onto the wiring at some point between the switch and the endpoint (or adjunct), thereby creating a pseudo-BRI multipoint configuration.

When plugged into the port in this mer, the test set establishes a signaling link connection with the switch and attempts to complete Service Profile IDentifier (SPID) initialization by using the Service SPID administered for the system (see the System Maintenance Administration screen). If the test set displays the correct administered port address for the endpoint or adjunct under test, the test passes (see Table 63: Service SPID Display). If after one minute nothing is displayed on the test set, the test fails.

Table 62: SPID Facility Test ***1 of 2***

Test Result	Description / Recommendation
FAIL	No response is received from the endpoint. 1. Check the physical wiring between the switch and the endpoint or adjunct. 2. If test continues to fail, escalate the problem.
FAIL	Display does not match administered port address for the endpoint or adjunct. 1. Change station administration for endpoint or adjunct to match displayed port address. 2. If test continues to fail, escalate the problem.
	1 of 2

Table 62: SPID Facility Test ***2 of 2***

Test Result	Description / Recommendation
PASS	Display matches administered port address for the endpoint or adjunct. For BRI endpoints: 1. Verify that the SPID values administered in the switch and the endpoint are consistent. 2. If the SPID values are correct, replace the endpoint. 3. If test continues to fail, escalate the problem. For ASAI adjuncts: 1. Verify that the TEI values administered in the switch and the adjunct are consistent. 2. If the TEI values are correct, consult the recommended repair procedures of the manufacturer for the adjunct. 3. If test continues to fail, escalate the problem.
	2 of 2

The abbreviations used in Service SPID Display have the following meanings:

UU	Universal cabinet number (1 – 44 for PNs)
C	Carrier (A,B,C,...)
SS	Slot (01, 02,...)
pp	port (01 – 12)
ext	extension one and two (1 – 99999)
SPID	service profile identifier

Table 63: Service SPID Display

Restricted Service starting display column		8		14		25		31
port location	-	ext1	-	SPID111111	-	ext2	-	SPID222222
starting display column		8		14		25		31
port location	*	ext1	*	SPID111111	-	ext2	-	SPID222222
Bound to Second Endpoint Translation starting display column		8		14		25		31
port location	-	ext1	-	SPID111111	*	ext2	*	SPID222222

CAB-CALM (Customer alarm)

G650

MO Name in Log	Alarm Level	Initial Command to Run	Full name of MO
CAB-CALM		**test customer-alarm *location***	Customer Alarm

CAB-CALM provides control of a relay contact between a pair of leads from the TN2312BP IPSI that can be wired to an external alarming device that is provided by the customer (CPAD). A contact closure is provided between the leads when the alarm exceeds the level specified in the **CPE Alarm Activation Level** field on the **change system-parameters maintenance** screen.

CAB-CALM is not associated with any background or demand tests that are used to clear alarms. CAB-CALM becomes active when any other MO reaches a predetermined level (none, warning, minor, or major) and generates an alarm. Clear the MO that is generating the alarm to retire the contact closure across the CPAD relay contact.

If you think that there is a problem with the CPAD, you can test it by executing the **test customer-alarm** command that activates the device closing the relay on the TN2312BP IPSI for one minute. You can specify the repeat parameter to close the relay contact for a longer time. The number of repeats that you specify is the number of minutes the external device is activated.

Demand test descriptions and error codes

The **test customer-alarm *location*** (**short|long**) **repeat #** command causes the TN2312BP IPSI to:

- Close the CPAD relay contact for one minute
- Return to the state determined by the active alarm level specified by the **CPE Alarm Activation Level** field on the **change system-parameters maintenance** screen

Order of investigation	Short test sequence	Long test sequence	D/ND
Customer-Provided Alarming Device Test (#115)	X	X	Nondestructive

CAB-EXFR (Emergency Transfer)

G650

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
CAB-EXFR	MIN	**test environment** ***location***	Emergency Transfer
	MAJ	**test environment** ***location*** **l**	

The emergency transfer feature connects some central office trunks directly through to analog user stations when the system has a serious problem or experiences a total power failure.

Emergency transfer is activated by the TN2312BP IPSI when:

- The system is booting.
- The cabinet containing the TN2312BP IPSI board is in power failure.
- The TN2312BP IPSI has detected a loss of control connectivity for more than 70 seconds.
- The server has detected a serious problem in the cabinet.
- A request is made from a SAT command to set the state of emergency transfer.

Refer to Figure 66: G650 Cabinet Environmental Hardware Components for further information.

On, off, and auto in emergency transfer

This is introduced to set the state of emergency transfer (**set emergency-xfr on | off | auto** ***location***), because a physical switch is not provided on the faceplate of the TN2312BP IPSI circuit pack to control the state of emergency transfer.

The TN2312BP IPSI supplies -48V DC voltage to an emergency transfer panel. This -48V supply keeps relays within the emergency transfer panel operating which, in turn, keep analog stations and CO trunks wired to ports (station and trunk respectively) on the system. When the TN2312BP IPSI is supplying -48V, the state of emergency transfer is off. When a problem is detected and the TN2312BP IPSI stops supplying -48V the state of emergency transfer is on. When the TN2312BP IPSI is in the auto state, it is usually supplying -48V to the emergency transfer panel, but automatically switches to the on state and stops supplying -48V if it detects a problem.

Error log entries and recommended actions

Table 64: CAB-EXFR Error Log Entries

Error Type	Aux Data	Associated test	Alarm Level	On/Off Board	Recommended Action
1 (a)		Emergency transfer query test (#1532)	MAJ	On	**test environment *location***
2 (b)		Emergency transfer query test (#1532)	MAJ	On	**test environment *location***
257 (c)		Emergency transfer query test (#1532)	WRN	On	**test environment *location***

Notes:

a. **Error Type 1** – Manual on. Run **test environment *location*** and follow the repair steps for Emergency Transfer Query Test (#1532).

b. **Error Type 2** – Firmware has activated emergency transfer. This error is not expected. Run **test environment *location*** and follow the repair steps for Emergency Transfer Query Test (#1532).

c. **Error Type 257** – Manual off. Run **test environment *location*** and follow the repair steps for Emergency Transfer Query Test (#1532).

Demand test descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND
Emergency Transfer Query Test (#1532)	X	X	Nondestructive

CAB-MTCE (Media Gateway Maintenance)

G650

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
CAB-MTCE	MIN	`test maintenance location`	Media Gateway Maintenance
	MAJ	`test maintenance location l`	

The CAB-MTCE MO is used for the alarming and logging of environmental maintenance errors for the TN2312BP IPSI in a G650 media gateway. Since the TN2312BP IPSI supports environmental maintenance in the G650 media gateway, trouble with the TN2312BP IPSI may cause environmental maintenance to falsely report problems. The following environmental MOs may be affected:

- CAB-EXFR (Emergency Transfer)
- CAB-CALM (Customer alarm)
- CAB-PFL (Power Fan Lead)
- SER-BUS (Serial Communication Bus)
- EXT-DEV (External Device Alarm)

When the TN2312BP is used in the SCC1 and MCC1 media gateways, the TN775D Maintenance circuit pack performs environmental maintenance.

When the TN2312BP IPSI is used in a G600 or CMC1 media gateway, it monitors environment maintenance (power supply and fans) using the AuxSig lead.

Error log entries and recommended actions

Table 65: CAB-MTCE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)		Correct Board Test (#1546)	MIN	ON	`test maintenance location`
257 (b)		Sanity Test (#1547)	MIN	ON	`test maintenance location`
513 (c)	Any	All			
769 (d)	Any	All			

Table 65: CAB-MTCE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1025 (e)		Reset Test (#1545)	MIN	ON	**test maintenance** ***location***
1281 (f)		Environmental Maintenance Initialization Test (#1548)	MIN	ON	**reset maintenance** ***location***

Notes:

a. **Error Type 1**—When a TN2312AP IPSI is inserted into a CMC1 or G650 Media Gateway, a minor alarm is raised. Full environmental maintenance is NOT available. Replace the TN2312AP IPSI with a TN2312BP IPSI. NOTE: A TN2312AP inserted in a G600 media gateway does NOT raise any alarm or error.

b. **Error Type 257**—The test is unable to communicate with the TN2312BP IPSI board. NOTE: The board must be a TN2312BP IPSI for this test to run.

c. **Error Type 513**—The TN2312BP sent a message with an unknown op-code in response to the test. The unknown op-code is recorded under Aux Data.

d. **Error Type 769**—The TN2312BP sent a message with a valid op-code but some other part of the message was indecipherable. The op-code with the error is recorded under Aux Data.

e. **Error Type 1025**—An attempt to reset environmental maintenance was unsuccessful.

f. **Error Type 1281**—Environmental initialization failed. Run the Reset Environmental Maintenance Test (#1545), which calls the Environmental Maintenance Initialization Test (#1548).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Correct Board Test (#1546)	X	X	ND
Sanity Test (#1547)	X	X	ND
Reset Environmental Maintenance Test (#1545)		X	D

1. D = Destructive, ND = Nondestructive

CAB-PFL (Power Fan Lead)

G650

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
CAB-PFL	MAJ MIN	**test environment *location***	Power Fan Lead

The CAB-PFL represents the state of a combined power/fan lead. This lead is known as the AuxSig lead. On a G650, the AuxSig output signal is a ground referenced relay contact closure indicating a failure of the 655A power supply outputs, hot spot thermal warning, hot spot thermal shutdown, or failure of the fan assembly in a G650.

Use the AuxSig lead to determine the alarm state of the power supplies and fans if the serial bus or the interface to the serial bus of the TN2312BP IPSI in a G650 fails. If there is a CAB-PFL alarm in a G650 carrier, there should also be a SER-BUS, POW-SUP, CAB-TEMP, or PS-RGEN alarm indicating the source of the failure.

Refer to Figure 66: G650 Cabinet Environmental Hardware Components for further information.

When the TN2312BP IPSI is used in a CMC1 or a G600 carrier, use the CAB-PFL MO to determine the status of the power supply and fans, but use the repair procedure for RMC-ENV (Power/Fan Sensors).

Fan/filter replacement procedures for the CMC1 and G600 media gateways are found under Variable-speed fans in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

Error log entries and recommended actions

Table 66: CAB-PFL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level[1]	On/Off Board	Recommended Action
1 (a)		Power/Fan Lead Query Test (#1533)	MAJ MIN	OFF	**test environment *location***

1. The alarm level of CAB-PFL is adjusted to be the same as the highest active alarm level for SER-BUS, POW-SUP, CAB-TEMP, or PS-RGEN, or it will be a MAJOR alarm if no G650 alarms in that category are found.

Note:

a. **Error Type 1:** The AuxSig lead is active. Run **test environment *location*** and follow the repair steps for Power/Fan Lead Query Test (#1533).

Demand test descriptions and error codes

Order of Investigation	Short test sequence	Long test sequence	D/ND
Power/Fan Lead Query Test (#1533)	X	X	Nondestructive

CAB-TEMP (Cabinet Temperature)

G650

MO Name in Log	Alarm Level	Initial Command to Run	Full name of MO
CAB-TEMP	MAJ MIN	`test board` *location*	Cabinet Temperature

CAB-TEMP monitors the G650 and the 655A for the following:

- The power supply
  - Inlet temperature
  - Hot spot temperature status
  - Fan speed
  - Fan alarm lead
- The G650 carrier exhaust temperature

The serial bus is used by the TN2312BP IPSI to obtain this information from each power supply in a G650 media gateway. There is only one outlet temperature sensor and fan assembly in a G650, so information obtained from dual power supplies (slot 0 and 15) is redundant.

Refer to Figure 66: G650 Cabinet Environmental Hardware Components for further information.

Note:

Fan/filter replacement procedures for the CMC1 and G600 media gateways are to be found under Variable-speed fans in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

Error log entries and recommended actions

Table 67: CAB-TEMP Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)		Power supply temperature test (#1537)	MIN	OFF	`test enviroment` *location* `test board` *location*
257 (b)		Power supply temperature test (#1537)	MIN	ON	`test enviroment` *location* `test board` *location*
					1 of 2

Table 67: CAB-TEMP Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (c)		Power supply temperature test (#1538)	MIN MAJ [1]	ON	`test enviroment location` `test board location`
769 (d)		Power supply fan test (#1538)	MIN	ON	`test enviroment location` `test board location`
					2 of 2

1. This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

Notes

a. **Error Type 1:** the inlet temperature is over the threshold—120^{o} Fahrenheit (49^{o} Celsius). Run **`test board`** and check the results of the Power Supply Temperature Test (#1537).

b. **Error Type 257:** the exhaust temperature is over the threshold—120^{o} Fahrenheit (49^{o} Celsius). Run **`test board`** and check the results of the Power Supply Temperature Test (#1537).

c. **Error Type 513:** the hot spot temperature is over the threshold. Run **`test board`** and check the results of the Power Supply Temperature Test (#1537).

d. **Error Type 769:** the fan alarm is active. Run **`test board`** and check results of the Power Supply Temperature Test (#1537).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short test sequence	Long test sequence	D/ND
Power Supply Temperature Test (#1537)	X	X	Nondestructive
Power Supply Fan Test (#1538)	X	X	Nondestructive

CABINET (Cabinet Sensors)

S8700 Series | S8500 | G600

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CABINET	MAJ MIN	**test environment** ***location***	Cabinet Sensors

This maintenance object covers environmental maintenance for S8700-series servers and S8500 servers equipped with multicarrier cabinets (MCCs), and for servers equipped with CMC1 or G600 carriers.

S8700 Series | S8500

Note:

The CABINET MO for S8700-series servers and S8500 servers is valid only for multicarrier cabinets (MCCs). For information about environmental maintenance on single-carrier cabinets (SCCs), see DC-POWER (Single-Carrier Cabinet Environment).

The cabinet sensors monitor cabinet temperature and fan rotation. Variable-speed fans are used extensively in S8700-series systems.

The Maintenance circuit pack in an MCC PN monitors a temperature sensor (S1) at the top of the cabinet and generates a major alarm if the exit air temperature exceeds 65 degrees Celsius (149 degrees Fahrenheit). Another temperature sensor in the top of the cabinet (S2) also monitors exit air temperature. If it exceeds 70 degrees Celsius (158 degrees Fahrenheit), the power-distribution unit turns off all cabinet power and invokes emergency transfer. Other sensors monitor fan performance.

The repair procedures that follow rely on your ability to distinguish between high and low fan speeds by the sound of the fans. Experience will allow you to distinguish between the high and low pitches generated by high and low speeds. A thermometer is also required for some of the procedures that follow.

In making replacements, observe the following rules:

- New fan assemblies accept *only* variable-speed fans.
- Old fan assemblies accept either variable- or constant-speed fans.
- Replace a fan assembly (carrier) *only* with a fan assembly of the same type (new for new, old for old).

Variable-Speed Fans

A variable-speed fan is identified by the following features:

- A fan and air filter assembly with product code ED-67077-30, Group 4 or greater, labeled on the front of the carrier
- A 5-pin white connector mounted next to each fan on the fan assembly cover plate for speed control and alarm circuitry
- A 2-pin black -48 V power connector to each fan
- A power filter (ED-1E554-30, G1 or G2) located in a metal box mounted behind the fans on the right-hand cable trough as you face the rear of the cabinet
- The AHD1 circuit pack and the two S4 sensors used with older fan assemblies are absent.

Alarm leads from each fan are tied together into a single lead that registers a minor alarm against CABINET whenever a fan's speed drops below a preset limit or fails altogether.

Note:

The front fans may run at a different speed than the rear fans since they are controlled by different sensors.

Note:

Fan/filter replacement procedures for the CMC1 and G600 media gateways are to be found under Variable-speed fans *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.

Error log entries and recommended actions

S8700 Series | S8500

Table 68: S8700 Series | S8500: Cabinet Sensors Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	`test environment` *`location`*
1	0 or 1	Cabinet Temperature Query (#122)	MIN	ON	`test environment` *`location`* `r 3`
257	0 or 1	Cabinet Temperature Query (#122)	MAJ	ON	`test environment` *`location`* `r 3`

CMC1

Table 69: CMC1: Cabinet sensors error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test environment`
1(b) 257 (c) 513 (d) 769 (e) 1025 (f) 1281 (g) 1537 (h) 1793 (i)	Any	Cabinet Temperature Query Test (#122)	MAJ	ON	`test environment`

Notes:

a. **Error Type 0**: Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 1**: the Power/Fan Status lead indicates that the power supply of one or more CMC1 cabinets has detected an alarm condition. The condition can be caused by the failure of any fan or the failure of any power supply output. If more than one CMC1 cabinet exists, all of the Power/Fan Status leads are tied together (the fan and power lead is an O-ring of all cabinets' status leads). Since an error condition on a fan or power supply output could be the result of a temporary overload (e.g. during board insertion) or caused by the location of the equipment (e.g. fan blockage), a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm.

c. **Error Type 257**: temperature Sensor 1: Since temperature alarms can be transient, a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm and may indicate a need to replace one or more components (e.g. a Cabinet Fan may be bad, or check to see if the equipment room air conditioning supply/unit is functional).

d. **Error Type 513**: temperature Sensor 2: Since temperature alarms can be transient a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm and may indicate a need to replace one or more components (e.g. a Cabinet Fan may be bad, or check to see if the equipment room air conditioning supply/unit is functional).

Note:

An out-of-tolerance voltage condition may be caused by transient conditions (e.g. board insertion or electrical noise). Voltage problems can cause serious damage to the TN2314 or highly unpredictable failure modes. Therefore, a repeating condition will cause a major alarm. The following Error Types 769 through 1793 represents the various system voltages and are listed below:

e. **Error Type 769**: Out-Of-Tolerance voltage condition for -48 VDC.

f. **Error Type: 1025**: Out-Of-Tolerance voltage condition for -5 VDC.

g. **Error Type: 1281**: Out-Of-Tolerance voltage condition for +5 VDC.

h. **Error Type: 1537**: Out-Of-Tolerance voltage condition for +12 VDC.

i. **Error Type: 1793**: Out-Of-Tolerance voltage condition for +3.3 VDC.

Demand test descriptions and error codes

S8700 Series | S8500

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

CMC1

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Cabinet Temperature Query Test (#122)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

CARR-POW (Carrier Power Supply)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CARR-POW	MAJ	**recycle carrier *location***	Carrier Port Power Supply

Single-carrier and multicarrier cabinet types can be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

CAUTION:

Before powering down a cabinet or carrier that contains EMBEDDED AUDIX circuit packs (TN566), first power down the AUDIX unit to avoid damaging the AUDIX software. Instructions for powering down this unit are in the Removing and restoring power on the CM Messaging system in Chapter 4: General troubleshooting in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*, and in *DEFINITY® AUDIX Maintenance*.

The CARR-POW MO represents the pair of power supplies that supply +5V, -48V and -5 VDC power to each carrier in a multicarrier cabinet. In AC-powered cabinets, these are called Off Line Switches (OLS). In DC-powered cabinets, they are DC/DC converters.

Cycling Power Supplies

When a port carrier power supply problem is reported by hardware, the system can cycle the power supplies in that carrier. When a carrier is cycled, the power supplies are turned off for 2 seconds and then turned back on. The system cot cycle the power supplies on any of the following types carriers even if they are duplicated:

- Expansion control carrier
- Switch node carrier
- Single-carrier cabinet

When port carrier power is cycled, all service dependent upon circuit packs in that carrier is disrupted.

Table 70: Carrier Port Power Supplies for Multicarrier Cabinets

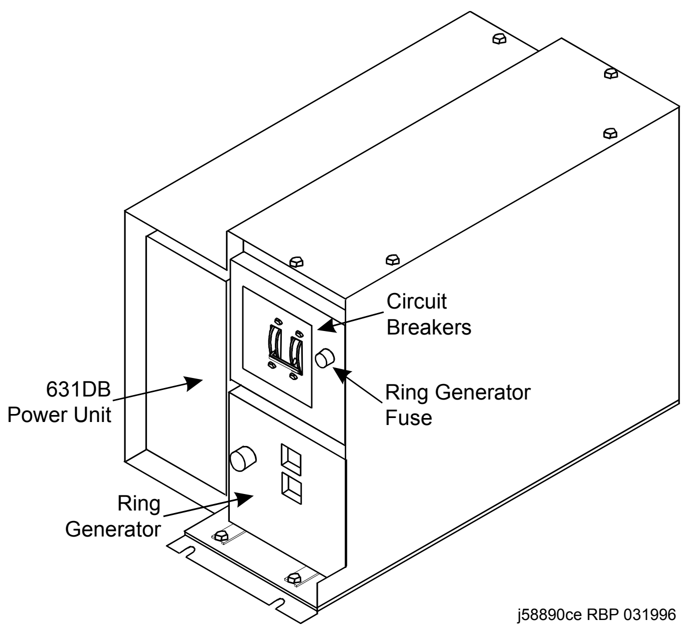
Code	System Power	Output (VDC)	Location
631DA	AC	+5	Left side
631DB	AC	-48/-5	Right side
644A	DC	+5	Left side
645B	DC	-48/-5	Right Side
TN755B		165	Slots 17 and 18
631WA/AR	AC	+5	Left side
631WB/BR	AC	-48	Right side
TN736	AC	-5	Used with 631
TN752	AC	165/-5	WA/WB or AR/AB
649A	AC	-48 at 10 Amps +5 VDC and -5 VDC at 6 Amps	Right side on control and port carriers. Left and right side on switch node carriers.

AC-Powered Cabinets

AC Power-Distribution Unit and Battery Charger (J58890CE-2)

Figure 6: AC Power-Distribution Unit (J58890CE-2): Front shows an AC power-distribution unit (List 9 or List 10). This unit sits at the bottom of some multicarrier cabinets.

Figure 6: AC Power-Distribution Unit (J58890CE-2): Front

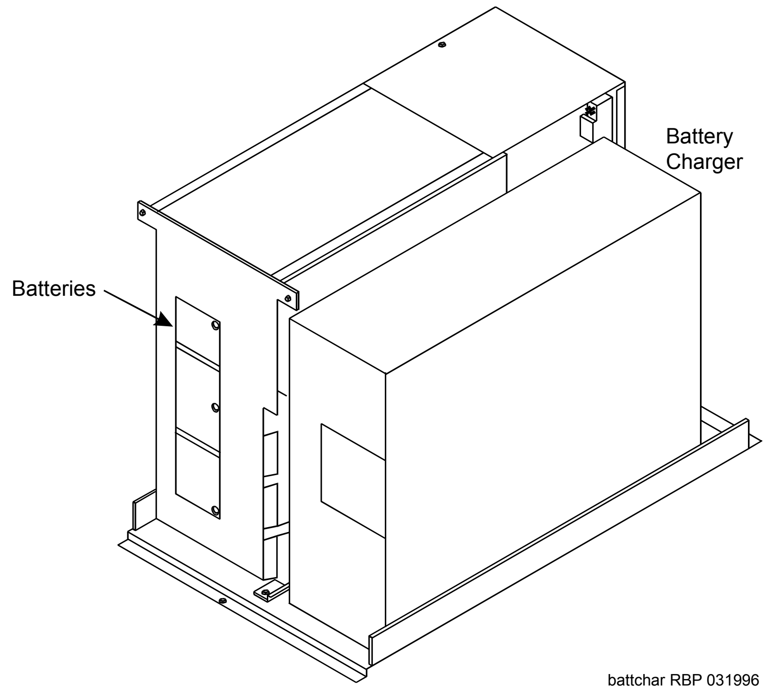


The AC power-distribution unit contains the following components:

- Circuit breaker
- Electromagnetic Interference (EMI) filter
- Ring generator
- AC input fuse
- 20-Amp fuses
- Signal connector
- -48 VDC fan power

The optional battery charger (List 11) sits at the bottom of some multicarrier cabinets. See Figure 7: Battery Charger (Optional Part of J58890CE-2): Front.

Figure 7: Battery Charger (Optional Part of J58890CE-2): Front

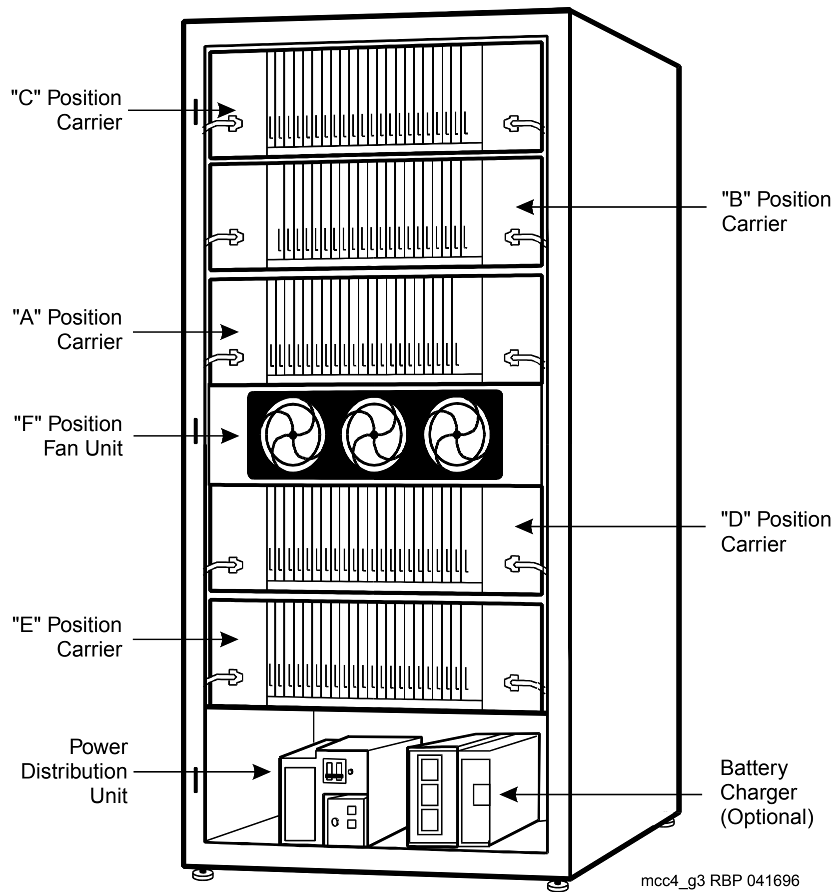


The charger is used only without an uninterruptible power supply (UPS). The charger contains:

- Three 48 VDC batteries for backup power to the cabinet
- A DC power relay to automatically switch the batteries into the power circuit if a main power failure is detected

Figure 8: AC Power Distribution in Multicarrier Cabinets shows AC power distribution in some multicarrier cabinets. The DC power-distribution cables are on both sides of the cabinet. **These cables supply power to each of the carriers**. The optional battery charger is at the right side of the power-distribution unit.

Figure 8: AC Power Distribution in Multicarrier Cabinets



Power Backup

If AC power fails, three 48-V DC batteries power the system for:

- 15 seconds in a PN cabinet
- 10 minutes in the expansion control carrier in the “A” position of a PN cabinet

Uninterruptible Power Supply

An external UPS provides a longer backup time than holdover batteries and can replace the batteries and battery charger. The unit connects from the AC power source to a cabinet’s AC power cord. If AC power fails, the unit supplies its own AC power to the cabinet.

J58890CH-1

In AC-powered cabinets, the power-distribution unit (J58890CH-1), distributes 170 to 264 VAC from a wall outlet to a set of BU3200A Battery Interface Units (BIU). See Figure 9: AC Power-Distribution Unit (J58890CH-1): Front and Figure 10: Power-Distribution Unit (J58890CH-1).

Figure 9: AC Power-Distribution Unit (J58890CH-1): Front

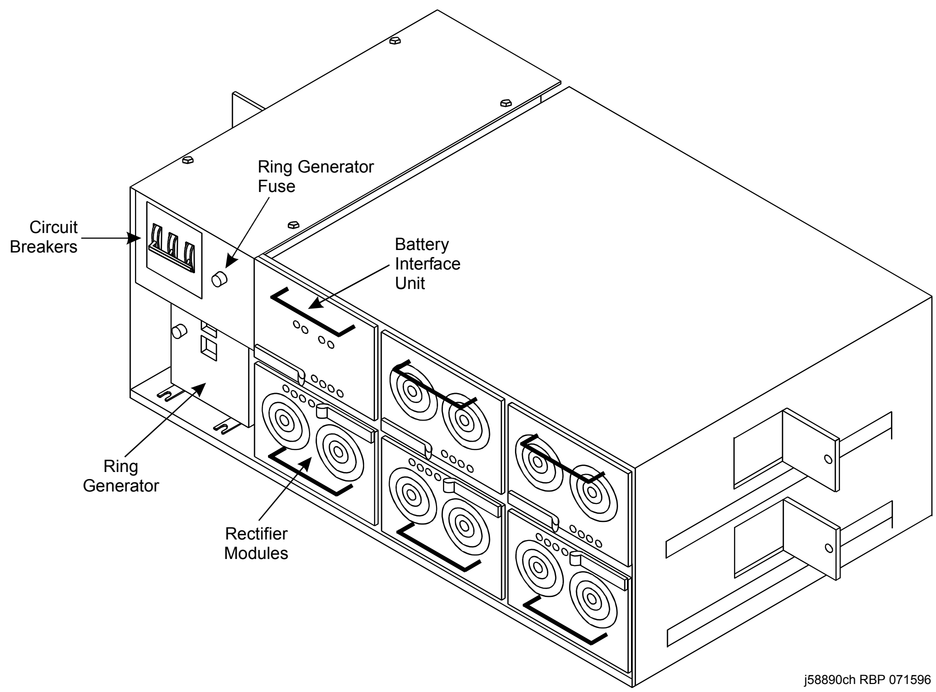
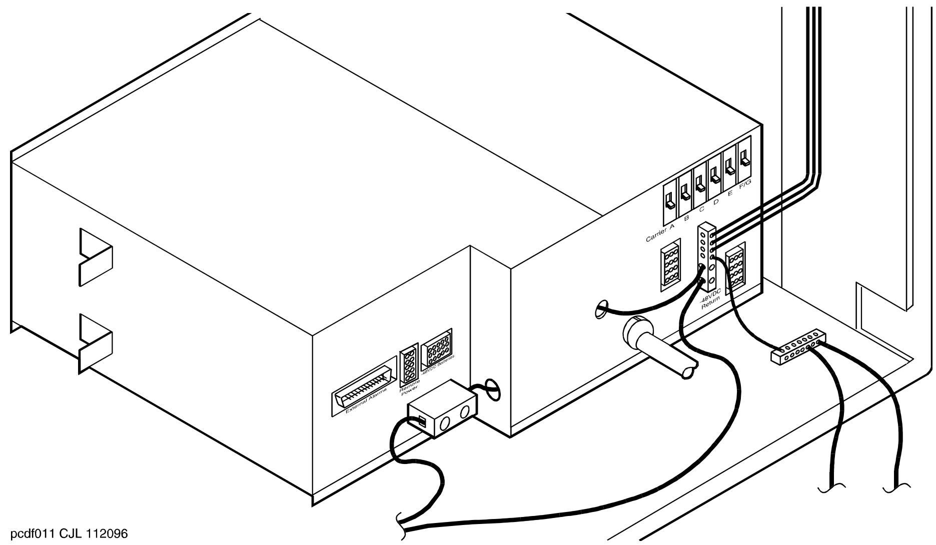


Figure 10: Power-Distribution Unit (J58890CH-1)



Power Backup

The small battery is at the center rear of the multicarrier cabinet. This 8-AH (Amp Hour) battery is fused for short circuit protection and is charged by the J58890CH-1. The batteries also contain a thermal sensor that changes the charging voltage depending on battery temperature.

The small batteries provide short-term battery holdover. If AC power fails, 48-V DC batteries power the system for:

- 15 seconds in a PN cabinet
- 10 minutes in the expansion control carrier in the "A" position of a PN cabinet

Figure 11: Small Battery Assembly shows the small battery assembly.

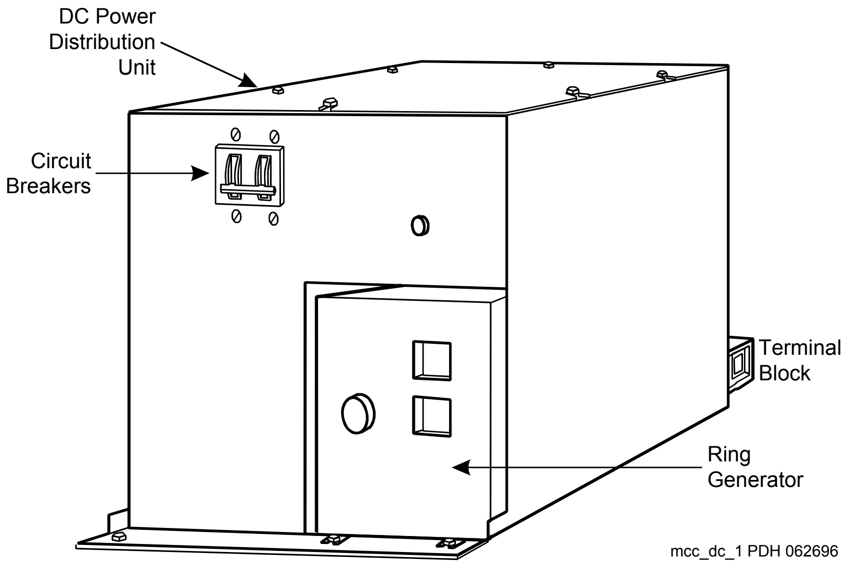
Figure 11: Small Battery Assembly

DC-Powered Cabinets

DC Power-Distribution Unit (J58890CF-2)

Figure 12: DC Power-Distribution Unit (J58890CF-2): Front shows a power-distribution unit in some DC-powered multicarrier cabinets. The unit sits at the bottom of the cabinet and contains the ring generator, 20-Amp circuit breakers, terminal blocks, and system fan power.

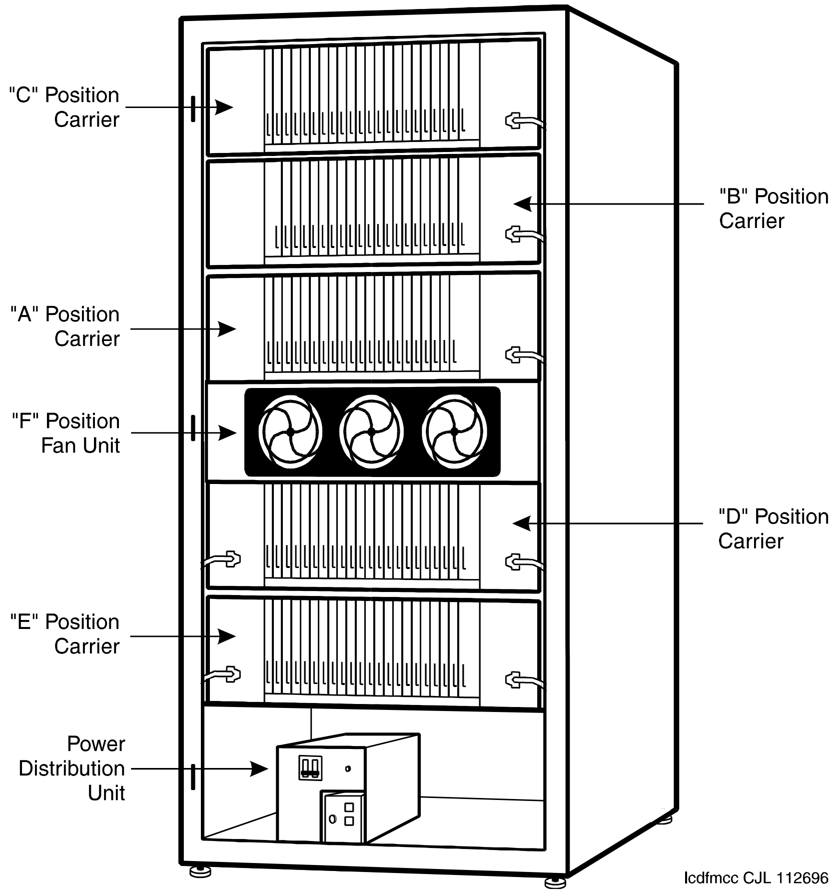
Figure 12: DC Power-Distribution Unit (J58890CF-2): Front



Some carriers may contain two power supplies, the 644A and the 645B, that together supply the required voltages to the carrier. Other carriers may contain one 649A power supply located on the right side of the carrier. In these systems, an additional 649A is located on the right of the optional switch node carriers.

Figure 13: Typical Multicarrier Cabinet with 649A Power Units shows a typical AC-powered multicarrier cabinet.

Figure 13: Typical Multicarrier Cabinet with 649A Power Units



The table below shows what carriers are protected by each circuit breaker on the J58890CF-1. The ring generator is protected by a fuse located next to the main circuit breaker on the front of the unit.

Circuit Breaker	Associated Carriers
CB1	Carrier A, both sides
CB2	Carrier B, both sides
CB3	Carrier C, both sides
CB4	Carrier D, both sides
CB5	Carrier E, both sides
CB6	Level F (Fans) and Level G (Ring Generator)

The table below shows what carriers are protected by each circuit breaker on the J58890CH-1. The ring generator is protected by a fuse located next to the main circuit breaker on the front of the unit.

Circuit Breaker	Associated Carriers
CB1	Carrier A, both sides
CB2	Carrier B, both sides
CB3	Carrier C, both sides
CB4	Carrier D, both sides
CB5	Carrier E, both sides
CB6	Level F (Fans) and Level G (Ring Generator)

Neon Lamp Power

The system can also support neon message waiting lamps on analog telephones. Any carrier containing a TN769 Neon Analog Line circuit packs must also be supplied with 150 Volts from a TN755B power supply circuit pack. See the table above for other supported neon power circuit packs.

Error log entries and recommended actions

Table 71: CARR-POW Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1[1]	0 or 1	OLS Query Test (#127)	MAJ	ON	`test environment` ***UU*** `r 2` `recycle carrier` ***UUC***

1. Run the OLS Query test (#127) using **test environment *UU* r 2**. If a carrier must be recycled to clear the CARR-POW alarm, use **recycle carrier *UUC*** to run the OLS Recycle Test (#126). The OLS Recycle test (#126) is not included in either the long or short test sequences.

The OLS Recycle Test (#126) is destructive. For more information, see OLS Recycle Test (#126).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78))	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
OLS Recycle Test (#126)			D
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

CDR-LNK (Call Detail Recording Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CDR-LINK	MIN	**test cdr [*primary* | *secondary*] l**	CDR Link
	WRN	**test cdr [*primary* | *secondary*]**	

Refer to PRI-CDR (Call Detail Recording Link) for Call Detail Recording Link problems.

CLAN-BD (Control LAN Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CLAN-BD	MIN	**test board *location* long**	Control LAN circuit pack
	WRN	**test board *location***	

Control LAN circuit pack

The TN799 Control LAN (C-LAN) circuit pack provides TCP/IP connection to adjunct applications such as CMS, INTUITY, and DCS Networking. The C-LAN circuit pack has one 100BASE-T Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. C-LAN also extends ISDN capabilities to csi models by providing packet bus access. The TN799DP also supports QoS.

A RSCL (remote socket control link) links the C-LAN and the server to pass call control and other management information. Because one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit-pack maintenance.

C-LAN socket load balancing

The C-LAN socket load balancing feature provides for a more uniform balancing of the load across the available C-LANs. With this feature, an IP endpoint registers to the C-LAN with ***the least number of used sockets*** (regardless of the number of available sockets). This applies to the following IP endpoints:

- H.245, H.248, and H.323 signaling groups
- H.323 stations
- SIP endpoints

Socket counts include H.245 and H.248 endpoints but the load-balancing algorithm will not be used for registering these endpoints. Sockets used by adjuncts are not included in the socket count.

Note:

This allocation is performed for the C-LANs assigned within each network region, independently of the C-LANs assigned to other network regions.

The system logs a warning to the error log when a TN799x circuit pack has reached the socket usage value specified in the **Number of CLAN Sockets Before Warning field** on the **ip-interfaces** form. The warning can be viewed using **display errors**.

Note:

IP endpoints can still register to this circuit pack after the warning has been issued.

The presence of the warning in the error log indicates that the customer needs to look at the network configuration. The **`status socket-usage`** command displays socket usage for C-LAN circuit packs in a system. This allows the customer to verify that IP endpoint registration has been evenly distributed, or to determine whether additional TN799x circuit packs are needed.

Also, even though all C-LANs may be available, all endpoints are configured to be in a few specific network regions, and may possibly be overloading the C-LANs in those network regions. This would indicate that additional capacity is required in the affected network regions, or that network configuration and administration needs to be altered to make it more balanced. Additional C-LANs can be administered, or existing administration of C-LANs can be changed using the **`add/change ip-interfaces`** commands (see *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)* for details).

Note:

When a TN799x is replaced or added, re-balancing does not occur. That is, the system does not un-register an IP endpoint for the purpose of load balancing. Replaced or added TN799x circuit packs will be detected as the least-used C-LANs, and IP endpoints will register with them until the socket load is evenly balanced.

C-LAN congestion controls

The switch activates congestion controls on a C-LAN when it detects a buffer exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffers have returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval,	Raises MINOR alarm.
Exhausts buffers,	Raises MINOR alarm.
Ceases for 12 minutes,	Retires MINOR alarm.

Error log entries and recommended actions

Table 72: CLAN-BD Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	0	Sanity Failure	MIN	ON	
18 (b)	0	Board busied out	WRN	OFF	**release board *location***
217 (c)	0		WRN	ON	
257	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* l r 2**
257 (d)					
513 (e)	4352-4357	Angel background error	MIN	ON	
769 (f)	4358	Program Logic Inconsistency			
1290 to 1297 (g)	Any		MIN	ON	**reset board *location***
1537 (h)	Any		MIN	ON	
1794 (i)			MIN	ON	
1796 (j)	46211 Any		MIN	ON	
1797 (k)					
1798 (l)					
2049 (m)		Packet Interface test (#598)	MIN	ON	**test board *location* l r 3**
2305 2306 (n)		Bus Frame Error			
2561 to 2668 (o)	Any	Socket Error			
2817 2819 (p)		Congestion Query test (#600)	MIN	ON	**test board *location* r 3**
					1 of 2

Table 72: CLAN-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2820 (af)			WRN	OFF	
3073 (q)		Link Status test (#601)	MIN	ON	`test board` *`location`*
3330 (r)		LAN Critical	MIN	OFF	`reset board location`
3586 (s)		Hyperactive Angel Error			
3999 (s)		Hyperactive Angel Warning			
3840 (t)	4096-4102	Inconsistent downlink			
3841 3843 (u)					
3842 (v)					
3844 (w)	Any				
3845 (x)	Any				
3846 (y)	Any				
3848 (z)	Any				
3849 (aa)	Any				
3850-3861 (ab)	Any				
3862 (ac)	Any				
3865 (ad)	Any				
3866 (ae)	Any				
					2 of 2

Notes:

a. **Error Type 1**: Circuit pack stopped functioning or is not physically present.

1. Verify that the circuit pack is present in the slot indicated by the error. If circuit pack is present, reset the circuit pack with **`reset board location`**.
2. If the error persists, replace the circuit pack.

b. **Error Type 18**: The C-LAN circuit pack is busied out by command.

c. **Error Type 217**: applies to 10 circuit packs:

   1. Remove the circuit pack(s) against which the error is logged.

d. **Error Type 257**: Transient communication problems between the switch and circuit pack. This error is not service affecting and can be ignored unless repeated failure of the Control Channel Looparound test (#52) indicates a hardware failure of the circuit pack. If this is the case, replace the circuit pack.

e. **Error Type 513**: Circuit pack detected a hardware failure. Reset the circuit pack with **`reset board location`**.

   Aux Data 4352: External RAM error
   Aux Data 4353: Internal RAM error
   Aux Data 4355: ROM Checksum error
   Aux Data 4357: Instruction set error

f. **Error Type 769**: Program logic error. By itself this error may be ignored, but it may result in other Error Types being reported.

g. **Error Type 1290-1297**: A critical hardware or firmware error has been detected on the circuit pack.

If the switch detects:	Then the switch:
1 error,	Resets circuit pack.
3 errors in 15 minutes,	Raises MINOR alarm.

   1. Attempt to clear the alarm with **reset board *location*** command
   2. If the alarm persists, replace circuit pack.

h. **Error Type 1537**: The circuit pack is hyperactive. The switch has taken it out of service.

   1. Attempt to clear the alarm with the **reset board *location*** command
   2. If the error happens again within 15 minutes, replace the circuit pack.

i. **Error Type 1794**: packet bus transmit buffers have overflowed.

   1. Attempt to clear the alarm with the **reset board *location*** command.
   2. If the error recurs within 15 minutes, replace the circuit pack.

j. **Error Type 1796, Aux Data 42611:** DLCI out of range. The switch activates congestion controls on C-LAN when it detects buffers exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffer level has returned to normal. A minor alarm is raised if congestion persists for 14 minutes or if buffers are exhausted because of congestion. The alarm is retired when the alarm condition ceases for 12 minutes.

   1. Attempt to clear the alarm with **reset board *location***.
   2. If the alarm recurs within 15 minutes, replace the circuit pack.

Aux Data Any: Bad DLCI.

3. Reset circuit pack with the **busyout board *location***, **reset board *location***, and **release board *location*** commands.
4. Clear alarms using the **test board long clear** command.
5. If the error returns within 15 minutes, replace the circuit pack.

k. **Error Type 1797**: Invalid layer 2 frame received.

l. **Error Type 1798**: Unable to write translation RAM.

1. Attempt to clear alarm with **reset board *location***.
2. If the alarm recurs within 15 minutes, replace the circuit pack.

m. **Error Type 2049**: Packet Interface test (#598) failed.

1. Attempt to clear the alarm (**test board *location* l r 3**).
2. If alarm does not clear, reset the circuit pack with **reset board *location***.
3. If circuit pack resets successfully, execute the Packet Interface test (#598) several times.
4. If the Packet Interface test (#598) continues to fail, replace the circuit pack.

n. **Error Type 2305-2306**: Error in a received frame from the packet bus.

Error Type	Description
2305	Received invalid LAPD frame.
2306	Detected parity error on received frame.

1. Enter **test board *location*** and see if the condition clears.
2. If the condition persists, execute the Packet Interface test (#598) to verify circuit pack integrity.
3. If the Packet Interface test (#598) fails, see Packet Interface Test (#598).

o. **Error Type 2561-2668:** System software received an indication that the socket was closed due to an error. Errors are reported as log only. Errors logged here are for the sockets that had *no* processor channels associated with them, for example, sockets to read SNMP data. The counter base is offset by the application type of the application associated with this socket that is down. The Aux Data field of the log entry contains this application's number, for example, a SNMP application would have its application number in the Aux Data field.

Note:

2561 - 2668 is a range of reserved numbers for future applications.
2570 represents an SNMP socket failure.

p. **Error Type 2817-2819**: Congestion Query test (#600) failed.

Error Type 2817: All buffers exhausted.

Error Type 2819: Utilized buffers exceed threshold

1. Refer to the Congestion Query Test (#600) for repair procedures.

q. **Error Type 3073**: RSCL (Remote Socket Control Link) failure or Link Status Test (#601) failed. This failure may be due to:

- Circuit pack problems
- Packet bus problems
- Packet Interface circuit pack problems

r. **Error Type 3330**: Critical failure in packet bus interface. If the switch detects 1 error, the circuit pack is reset. If two errors occur within 15 minutes, the switch raises an MINOR alarm.

1. Attempt to clear the alarm with **reset board location**.
2. If the alarm persists, replace circuit pack.

s. **Error Type 3586 and 3999**: Switch removed hyperactive circuit pack that reported threshold number of errors. One or more of the following symptoms may be present:

- Circuit pack port tests return NO BOARD.
- List configuration command shows circuit pack and ports are installed properly

If Error Type 3999:	And traffic volume is:	Then:
Does not accompany Error Type 3586,	Heavy	Circuit pack is in service, but sent at least half hyperactive threshold. With heavy traffic, this is normal.
Does not accompany Error Type 3586,	Light	Circuit pack is in service, but sent at least half hyperactive threshold. With light traffic, this error indicates a problem with the circuit pack, its links, or the equipment attached to the links.
Accompanies Error Type 3586,	Light or Heavy	Switch removed hyperactive circuit pack.

1. Busyout (**busyout board *location***) and release (**release board *location***) circuit pack
2. Allow 30 minutes for condition to clear itself.
3. To re-establish circuit pack into service manually, busyout (**busyout board *location***), reset with **reset board location**, and release (**release board *location***) the circuit pack.
4. If error recurs within 15 minutes, replace the circuit pack.

5. If the same error occurs on a different circuit pack, follow normal escalation procedures.

t. **Error Type 3840**: Circuit pack received bad control channel message from switch.

Aux Data:
4096 - Bad major heading
4097 - Bad port number
4098 - Bad data
4099 - Bad sub-qualifiers
4100 - State inconsistency
4101 - Bad logical link
4102 - Bad application identifier

u. **Error Type 3841-3843**: errors do not affect service.
Error Type 3841: Internal firmware error
Error Type 3841: Bad translation RAM. Call uses another translation location.

These errors do not affect service. However, they may cause other errors that do affect service.

If Error Type 3843 begins to affect service, it escalates to Error Type 1294.

v. **Error Type 3842**: Packet interface receive buffers overflowed.

If this error occurs frequently, the overflow may be congesting the circuit pack.

1. Refer to Receive FIFO Overflow Error Counter Test (#596).

w. **Error Type 3844**: LAPD frame contains LAPD protocol error.

By themselves, these errors do not affect service.

x. **Error Type 3845**: Angel interprocessor error.

By themselves, these errors do not affect service.

y. **Error Type 3846**: High CPU occupancy.

By themselves, these errors do not affect service.

z. **Error Type 3848**: Interprocessor LAPD protocol error.

By themselves, these errors do not affect service.

aa. **Error Type 3849**: Interprocessor LAPD frame error.

By themselves, these errors do not affect service.

ab. **Error Type 3850 - 3861**: IBL error.

By themselves, these errors do not affect service. These errors can occur only on a G3csi machine that has an Interboard Link (IBL).

ac. **Error Type 3862**: Memory allocation failure.

By themselves, these errors do not affect service.

ad. **Error Type 3865**: S8700 Series | S8500: C-LAN DLCI audit action has removed CIP only DLCIs. By themselves, these errors do not affect service.

ae. **Error Type 3866**: S8700 Series | S8500: C-LAN DLCI audit action has removed C-LAN only DLCIs. By themselves, these errors do not affect service.

af. **Error Type 2820:** A threshold number of sockets in use for IP endpoint registration per C-LAN can be administered by the customer. When the threshold is reached, a warning message is logged, but IP endpoints can still register with that C-LAN if it has additional sockets available. The warning can be viewed using **`display errors`**.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
Circuit Pack Restart Test (#252)			D
Invalid LAPD Frame Error Counter Test (#597)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND
Receive FIFO Overflow Error Counter Test (#596)		X	ND
Packet Interface Test (#598)	X	X	ND
Congestion Query Test (#600)	X	X	ND
Link Status Test (#601)	X	X	ND

1. D = Destructive; ND = Nondestructive

CLSFY-BD (Call Classifier Circuit Pack)

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MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CLSFY-BD	MIN WRN	**`test board`** ***`location`***	Call Classifier circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See CLSFY-PT (Call Classifier Port) for related port information.

CLSFY-PT (Call Classifier Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CLSFY-PT	MAJ MIN WRN	**test port *location***	Call Classifier Port

The TN744 Call Classifier is a service circuit pack that provides specialized tone detection capabilities to support the Outbound Call Management (OCM) and Inbound Call Management (ICM) features. The TN744 supports both A-law and Mu-law companding.

The TN744 has eight ports (CLSFY-PTs), each capable of supporting call classification, touch-tone reception and MFC-tone generation and detection. The CLSFY-PT MO implements a set of tests designed to ensure proper operation of the Call Classifier.

Error log entries and recommended actions

Table 73: CLSFY-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1	any	Tone Detector Audit/ Update Test (#43)	MAJ / MIN (a)	ON	**test port *location* r 2**
18		**busyout port**	WRN	OFF	**release port *location***
257 (b)	17666	Tone Detector Audit/ Update Test (#43)	MAJ / MIN (a)	ON	**test port *location* r 3**
513 (c)	any	Tone Detection Verification Test (#42)	MAJ / MIN (a)	ON	**test port *location* r 3**

Notes:

a. A major alarm is raised if the total number of call classifier ports currently in-service is less than or equal to 1/2 of the administered threshold number. For major or minor alarm, run the short test sequence on the alarmed port and follow the error code procedures for the individual tests.

The in-service threshold number for alarming call classifier ports is administered using the **change system-parameters maintenance**.

1. Enter these commands in order: **`busyout board`**, **`reset board`**, **`release board`**. The board reset is required to reload on-board RAM associated with the TN744's DSPs. This takes all 8 Tone Detector ports out of service for a few seconds. Only 4 of the 8 would be out of service due to the alarm. (There are five Tone Detectors on each of the two DSPs.) Other than the unlikely potential of running out of Tone Detector resources in the switch, there is no other effect when the board is reset.
2. Test the board with **`test board`** ***`location`*** **`long`**.
3. If the test still fails, replace the board.

b. **Error 257:** The CLSFY-PT lost its translation. Testing the CLSFY-PT is sufficient to reload its translation. If testing the call classifier port does not clear the error, then the call classifier circuit pack containing the defective call classifier port should be replaced.

c. **Error 513:** This error indicates the call classifier port is having problems detecting call classification tones or detecting and generating R2-MFC tones This is usually accompanied by failures of some incoming or outgoing calls. If this Error Type is persistently logged, then replace the call classifier circuit pack containing the defective CLSFY-PT.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1. D = Destructive; ND = Nondestructive

CO-BD (Central Office Trunk Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CO-BD	MIN WRN	**test board *location***	Central Office Trunk circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See CO-TRK (Analog CO Trunk) for related trunk information.

CO-DS1 (DS1 CO Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CO-DS1	MAJ[1] MIN	`test trunk grp#/mem# l`	DS1 CO Trunk
	WRN	`test trunk grp#/mem#`	

1. A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by **`set options`** and that at least 75 percent of the trunks in this trunk group are alarmed. For more information about **`set options`**, see *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)*.

Note:

For media gateways, consult local records for the location and designation of the equipment rack where the media gateway is mounted.

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to the *Administering Avaya Aura™ Communication Manager* for information on how to administer trunks. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

A DS1 CO (central office) trunk provides a link for digitized voice or data communications between the system and a central office switch. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

  32-channel mode is supported on the TN464C or higher suffix, TN2207, and TN2464 circuit packs, and on DS1 Interface Media Modules.

The DS1-CO MO monitors and maintains a CO trunk port on a TN767 DS1 Interface circuit pack, a TN464 UDS1 Interface circuit pack, or on DS1 Media Modules. Throughout this discussion, the term DS1 applies to all. For more information, see one of the following maintenance objects:

Circuit Pack/Media Module	Maintenance Object
TN767 DS1 Interface Circuit Pack	DS1-BD
TN464 UDS1 Interface Circuit Pack	UDS1-BD
DS1 Interface Media Modules	MG-DS1

The DS1 circuit pack or media module supports low level CO trunk signaling interfaces for both ground-start and loop-start trunks.

The DS1 Interface Media Module supports T1/E1, and delivers the same functionality as the TN464 circuit pack.

Three trunk service states are specified by DS1 CO trunk maintenance:

out-of-service	The trunk is in a deactivated state and cot be used for either incoming or outgoing calls.
in-service	The trunk is in an activated state and can be used for both incoming and outgoing calls.
disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

Error log entries and recommended actions

Table 74: CO-DS1 Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test trunk` ***`grp/mbr`***
1 (b)	57408				
1 (b)	57487				
15 (c)	Any	Port Audit and Update (#36)			
18 (d)	0	`busyout trunk` ***`grp/mbr`***	WRN	OFF	`release trunk` ***`grp/mbr`***
130 (e)		None	WRN	ON	`test trunk` ***`grp/mbr`***
257 (f)	57392	DS1 CO Trunk Dial Tone Seizure (#314)	MIN WRN	OFF	
513 (g)	57393	DS1 CO Trunk Dial Tone Seizure (#314)	MIN WRN	OFF	
769 (h)	57484				
1025		DS1 CO Trunk Dial Tone Seizure (#314)	MIN WRN[1]	OFF	`test trunk` ***`grp/mbr`*** `r 2`
1281		Conference Circuit (#7)	MIN WRN[1]	ON	`test trunk` ***`grp/mbr`*** `l r 4`
1537		NPE Crosstalk (#6)	MIN WRN[1]	ON	`test trunk` ***`grp/mbr`*** `l r 3`
1793 (i)					`test board` ***`location`*** `l`
2562 (j)	16665				
2817 (k)	52992				
					1 of 2

Table 74: CO-DS1 Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3840 (l)		Port Audit and Update (#36)			
					2 of 2

1. CO-DS1 Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:**

Aux Data 57408: No tip ground is detected on an outgoing call.
Aux Data 57487: PBX could not get “loop close” signal.

If the error occurred on a port of a TN767 DS1 or TN464 UDS1 Interface circuit pack, the circuit pack detected a hardware fault. These errors will cause the DS1 Dial Tone Test #314 to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in the ready-for-service state (shown as “disconnected” by **`status`**), which allows only incoming calls. Run the DS1 Dial Tone Test #314, and follow the procedures.

c. **Error Type 15:** software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

d. **Error Type 18:** the trunk was busied-out and is in an out-of-service state. No calls can be made on this trunk except Facility Access Test Calls. Release the trunk and retest.

e. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

f. **Error Type 257:** the DS1 Interface circuit pack detects a hardware fault. Aux Data 57392 indicates no external release on PBX disconnect. This alarm will only be raised when the System-Parameter Country screen has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

g. **Error Type 513:** The DS1 Interface circuit pack detects a hardware fault. Aux Data 57393 indicates belated external release on PBX disconnect. This alarm will only be raised when the System-Parameter Country screen has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

h. **Error Type 769:** The DS1 Interface circuit pack or media module detects a hardware fault. The Aux Data contains the following Error Type:—57484, fault is detected on tip/ring.

i. **Error Type 1793:** DS1 Interface circuit pack or media module is out-of-service. Look in the Error Log:

If the port is on	Look at
TN767 DS1 Board	DS1-BD (DS1 Interface Circuit Pack)
TN464 UDS1 Board	UDS1-BD (UDS1 Interface Circuit Pack)
DS1 Interface Media Module	MG-DS1 (DS1 Interface Media Module)

j. **Error Type 2562:** Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

k. **Error Type 2817:** Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and far ends. Attempt to place the call again. If the error persists, execute the Dial Tone Seizure test (#314), and follow those procedures.

l. **Error Type 3840:** Port Audit and Update test (#36) failed due to an internal system error. Enter **`status trunk`** to verify the status of the trunk. If the trunk is out-of-service, then enter **`release trunk`** to put it back into in-service. Retry the test command.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 CO Trunk Dial Tone Seizure Test (#314)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

CO-TRK (Analog CO Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CO-TRK	MAJ[1] MIN WRN	**test port *location***	Analog CO Trunk

1. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75% of the trunks in this trunk group are alarmed.

For systems supporting circuit packs:

If ATMS testing is enabled, check the error log for ATMS errors 3840 and 3841. If the error log indicates that measurements exceeded acceptable thresholds, and no other trouble is found with **test trunk**, run the ATMS test call with **test analog-testcall port *location* full**.

Note:

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end.

Analog CO trunks are 2-wire analog lines to the CO that support both incoming and outgoing calls. CO trunk circuit packs have eight ports, each of which provides an interface between the 2-wire CO line and the 4-wire TDM bus. The system supports the following CO trunk circuit packs:

TN438	TN2138
TN447	TN2147
TN465	TN2148
TN747	

For systems supporting media modules:

Analog CO trunks are 2-wire analog lines to the CO which support both incoming and outgoing calls. CO trunk MM711 Analog Media Modules have eight ports.

Not all tests in the demand test sequences are applicable for media modules. These tests will abort with error code 1412. This error can be ignored.

The following sequences show the interactions between the switch and the CO during call setup for both loop-start and ground-start trunks.

Interactions between switch and CO

The following sequences show the interactions between the switch and the CO during call setup for both loop-start and ground-start trunks.

Loop Start Operation

Idle State:

Tip = ground, Ring = CO Battery

Outgoing Call:

PBX Off-Hook (Seize message): Closes the Tip-Ring Loop

CO response: DC loop current + Dial tone

PBX On-Hook (Drop message): Open Tip-Ring loop, no loop current

CO response: CO goes to idle state (see Note)

Incoming Call:

CO Applies Ringing Voltage

PBX response: Detect ringing current

PBX Off-Hook (Answer message): Close loop

CO response: Trip ringing, provide loop current

PBX On-Hook (Drop message): Open Tip-Ring loop, no loop current

CO response: CO goes to idle state

Note:

CO does not normally provide an On-Hook (Disconnect) signal. Exceptions to this rule include Netherlands loop start and UK loop-calling guarded-clearing.

Ground Start Operation

Idle state:

Tip = open, Ring = CO Battery

Outgoing Call:

PBX Off-Hook (Seize message): Places ground on Ring

CO response: Places ground on Tip

PBX response: Close the loop

CO response: Provide loop current

PBX response: Dial out digits

PBX On-Hook first (Drop message): Open the Tip-Ring Loop, no loop current

CO response: Open circuit on Tip

CO On-Hook first (Disconnect): Open circuit on Tip, no loop current

PBX response: Open Tip-Ring loop

Incoming Call:

CO Off-Hook (Seizure): CO applies ground on Tip and applies ringing voltage to the Ring lead.

PBX response: Make trunk busy for outgoing calls

CO Ringing: CO applies ringing voltage to the Ring lead.

PBX response: Detect ringing, ring destination (Attendant, hunt group, etc.)

PBX Off-Hook (Answer message): Close loop

CO response: Trip ringing, provide loop current

PBX On-Hook first (Drop message): Open the Tip-Ring Loop, no loop current

CO response: Open circuit on Tip

CO On-Hook first (Disconnect): Open circuit on Tip, no loop current

Error log entries and recommended actions

Table 75: CO-TRK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *location*
1 (b)	57347				
15 (c)	any	Port Audit and Update (#36)			
18	0	`busyout trunk`	WRN	OFF	`release trunk` *grp#/mem#*
130 (d)			WRN	ON	`test port` *location* `r 2`
257 (b)	50176				
513 (b)	57364		MAJ MIN WRN[1]	ON	
769 (b)	57392		MAJ MIN WRN[1]	OFF	
1025 (f)	Any	CO Port Diagnostic Test (#3)	MAJ MIN WRN[1]	OFF	`test port` *location* `r 2`
1281 (f)	Any	CO Port Diagnostic Test (#3)	MAJ MIN WRN[1]	ON	`test port` *location* `r 3`
1537		Dial Tone Test (#0)	MAJ MIN WRN[1]	OFF	`test port` *location* `l r 2`
1793		Looparound and Conference Test (#33)	MAJ MIN WRN[1]	ON	`test port` *location* `l r 3`
2049		NPE Crosstalk Test (#6)	MAJ MIN WRN[1]	ON	`test port` *location* `l r 3`
2561 (e)	57345				
2817 (b)	57360				
2817 (b)	57393				
2817 (b)	57484	Dial Tone Test (#0)	MAJ MIN WRN	OFF	`test port` *location* `long`
3073 (e)	57376				
					1 of 2

Table 75: CO-TRK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3329 (e)	57408				
3329 (e)	57484	Dial Tone Test (#0)	MAJ MIN WRN	OFF	`test port` ***`location`*** `long`
3585 (e)	57424				
3840 (g)	8000	ATM Transmission Test (#844-848)		OFF	`test analog-testcall full`
3841 (g)		ATM Transmission Test (#844-848)	MIN	OFF	`test analog-testcall full`
					2 of 2

1. Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. These are inline errors that have no specific test associated with them. Numerous Error Types have these errors. Refer to Table 76: CO Trunk Errors with No Tests for an explanation and appropriate action.

c. **Error Type 15:** software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

d. **Error Type 130:** the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. Numerous Error Types have these errors.

Aux data 57345: Single polarity ringing current
Aux data 57376: No loop current on incoming call
Aux data 57408: No tip ground detected on outgoing call
Aux data 57424: No loop current on outgoing call
Aux data 57484: No dial tone on outgoing call

These errors will cause Dial Tone Test #0 to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1537 will also show up). In this case, the trunk may be put in "Ready-for-Service" state (shown as "disconnected" by status command), that allows only incoming calls. Run Dial Tone Test #0, and follow its outlined procedures.

If error count associated with this Error Type is very high (i.e., 255) and if Alarm Status on the Hardware Error Report is “n” (not alarmed), then the existence of this Error Type indicates that, despite the fact that many inline error messages have been received, every Call Seizure test has passed. Problems at the CO may cause this condition rather than problems with the PBX.

f. **Error Types 1025/1281:** logged for every version of the CO-TRK/CO-BD. However, no MINOR alarms will be generated for Central Office Trunks [TN747B] with vintages V8 or greater. Any failures received by this test will still be logged as Error type 1025/1281.

Check for the use of MFT/Range extenders. If there are extenders present, and there are no other complaints or maintenance errors against this trunk, then there is a good chance that Test #3 failed due to excessive loop current and may be ignored.

g. **Error Type 3840**: test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements in the unacceptable range.

Error Type 3841: measurements were in the marginal range. Enter **`list testcall detail`** to examine the specific transmission parameters that are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, then the AMTS thresholds administered on the trunk group screen should be changed.

Table 76: CO Trunk Errors with No Tests ***1 of 3***

Error Type	Aux Data	Error Description and Repair Action
1	57347	Port error. Ringing without ground. This error is detected on an incoming call on a ground-start CO trunk. The CO trunk circuit pack has not detected a Tip ground before ringing current is detected. This may indicate that the ground detector is not working. However, the call will be accepted. Busyout the affected port, and run a long test. Observe the test results. If any tests fail, refer to the description of the tests and the associated error codes. Release the port. If users continue to report troubles, check for other errors and make test calls to determine whether the problem should be referred to the CO.
257	50176	Battery reversal detected. This is usually caused by the CO. This is detected if the direction of the loop current changes from normal to reverse for at least 40 msec. Could occur if the trunk was just installed and for some reason the Tip and Ring wires were reversed at the PBX. If battery reversals occur during dialing, wrong numbers may result. Refer problem to CO. Ask them to remove the battery reversal option.
513	57364	Ground detector stuck active. After several occurrences, an on-board minor alarm is generated. Run the short test sequence. If test aborts with Error Code 1000, disconnect Tip and Ring and repeat short test. If test still aborts, replace circuit pack. If test passes, refer problem to CO. If any other error code is received, pursue that problem.
		1 of 3

Table 76: CO Trunk Errors with No Tests ***2 of 3***

Error Type	Aux Data	Error Description and Repair Action
769	57392	CO not releasing after call is dropped from PBX end, or the loop is not open after a disconnect. After several occurrences, an off-board or on-board warning alarm is generated. Refer problem to CO.
2561	57345	Single polarity ringing current. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) Another cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the dial tone test will also fail. The last cause could be that certain types of noise are present on the CO line during the silent period of ringing. First check for other errors. If the count for this error is very high (255), and every test passes, then either the reverse current detector is defective or the CO line is noisy. If the CO line is suspect, make Tip and Ring observations. If the line is determined to be noisy, refer the problem to the CO. If the reverse current detector is defective, ignore this error.
2817	57360	Ground but no ringing. This error occurs on an incoming call on a ground-start trunk. If ringing is not detected within 5 seconds of the Tip being grounded, the call is still accepted. If the CO is of the No. 5ESS. switch type, ringing delays of more than 5 seconds during heavy traffic are fairly common. Check for other errors.
2817	57393	The loop is opening too slowly after a disconnect. This error indicates an on-board problem, although the trunk may be functional. Check for other errors.
3073	57376	No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the dial tone test and every outgoing call should also fail. Check for other errors.
3329	57408	Trunk error. No Tip ground detected on outgoing call. This error occurs when an attempt is made to seize a ground-start CO trunk for an outgoing call and Tip ground is not detected or the caller hangs up before Tip ground is detected. 1. Busyout the affected port, and run a long test. Observe the test results. If any tests fail, refer to the description of the tests and the associated error codes. Release the port. 2. If users continue to report troubles, check for other errors and make test calls to determine whether the problem should be referred to the CO. Busyout the affected port, and run a long test. If Dial Tone Test #0 passes, ignore this error. Release the port.
		2 of 3

Table 76: CO Trunk Errors with No Tests *3 of 3*

Error Type	Aux Data	Error Description and Repair Action
3585	57424	No loop current on outgoing call. This error occurs on attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected. Busyout the affected port, and run a long test. If the CO Port Diagnostic Test #3 passes and this error keeps occurring, refer problems to CO. Release the port.
		3 of 3

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Dial Tone Test (#0)		X	ND
CO Port Diagnostic Test (#3)	X	X	ND
Looparound and Conference Test (#33)		X	ND
Port Audit And Update Test (#36)	X	X	ND
Automatic Transmission Test (#844-848)			ND

1. D = Destructive; ND = Nondestructive

Note:

The CO Port Diagnostic Test (#3) will always return a PASS indication for CO-TRK/CO-BD [TN747B] version 8 or greater. However, any errors produced as a result of this test will be logged and produce no alarms.

If errors logged by Test #3 are the only complaints against this trunk, then check if MFT/Range Extenders are being used. If extenders are present, then there is a good chance that there is excessive loop current, which will cause Test #3 to log errors.

However, all else being normal, these errors should not affect the customer.

Note:

The ATMS tests are not part of either test sequence. They are run either on demand with **`test analog-testcall`** or by the ATMS schedule.

CONFIG (System Configuration)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
CONFIG	none	none	System Configuration

The System Configuration MO oversees logical insertion and removal of circuit packs in the system. When the system detects that a circuit pack is present in a port slot, it queries the circuit pack to determine the type and vintage of the circuit pack. The system also detects when a circuit pack has been removed from a port slot.

There are no alarms or tests for System Configuration, but three types of errors are logged to the error log.

Error log entries and recommended actions

Table 77: CONFIG Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0				
1–119 (b)	0–63				
257 (c)			MAJ		
1001–1119 (d)	0–63				

Notes:

a. **Error Type 0**:An attempt was made by the system to raise an alarm against CONFIG without first logging a CONFIG error.

b. **Error Types 1-119**: a port circuit pack in the system did not respond to a circuit pack type inquiry. Follow the procedures outlined in (d) to determine whether there is an error.

c. **Error Type 257**: less than 25% of a trunk group is available.

d. **Error Types 1001 - 1119**: a port circuit pack in the system did not respond to a vintage inquiry. A port circuit pack may be physically inserted in a port slot, but the system may not recognize its existence. The `Aux Data` value specifies the circuit pack's internal port network number. To convert the `Aux Data` value to the physical port network number, add

'1' to the `Aux Data` value. For example, if the `Aux Data` value is '0', the port network number is 1. If the `Aux Data` value is '29', the port network number is 30.

The **Error Type** field specifies the carrier and slot location of the circuit pack that caused the error as indicated in Table 78: Converting Error Types To Carrier Locations. If the **Error Type** is greater than 1000, subtract 1000 from the **Error Type** field before consulting the table.

S8700 Fiber-PNC:Before proceeding, if multiple CONFIG errors are simultaneously logged with an Aux Data of 1, investigate any EXP-INTF (Expansion Interface Circuit Pack) errors.

Once the port's circuit-pack location has been determined, use **`list configuration all`** to determine whether the circuit pack is inserted. If the circuit pack has already been inserted but the error persists, replace the circuit pack. If not, insert the pack.

Table 78: Converting Error Types To Carrier Locations *1 of 5*

Error Type	Carrier Location
1	(a)
2	E01
3	E02
4	E03
5	E04
6	E05
7	E06
8	E07
9	E08
10	E09
11	E10
12	E11
13	E12
14	E13
15	E14
16	E15
17	E16
18	E17
	1 of 5

Error Type	Carrier Location
19	E18
20	E19
21	E20
22	E00 (d)
23	(a)
24	(a)
25	(a)
26	(a)
27	A00 (e)
28	A01 (b)
29	A02
30	A03
31	A04
32	(a)
33	(a)
34	D01
35	D02
36	D03
37	D04
38	D05
39	D06
40	D07
41	D08
42	D09
43	D10
44	D11
45	D12
	2 of 5

Table 78: Converting Error Types To Carrier Locations ***3 of 5***

Error Type	Carrier Location
46	D13
47	D14
48	D15
49	D16
50	D17
51	D18
52	D19
53	D20
54	D00 (d)
55	(a)
56	A05
57	A06
58	A07
59	A08
60	A09
61	A10 (c)
62	A11
63	A12
64	(a)
65	(a)
66	B01
67	B02
68	B03
69	B04
70	B05
71	B06
72	B07

3 of 5

Table 78: Converting Error Types To Carrier Locations *4 of 5*

Error Type	Carrier Location
73	B08
74	B09
75	B10
76	B11
77	B12
78	B13
79	B14
80	B15
81	B16
82	B17
83	B18
84	B19
85	B20
86	B00 (d)
87	(a)
88	A13
89	A14
90	A15
91	A16
92	A17
93	A18
94	A19
95	A20
96	(a)
97	(a)
98	C01
99	C02
	4 of 5

Table 78: Converting Error Types To Carrier Locations ***5 of 5***

Error Type	Carrier Location
100	C03
101	C04
102	C05
103	C06
104	C07
105	C08
106	C09
107	C10
108	C11
109	C12
110	C13
111	C14
112	C15
113	C16
114	C17
115	C18
116	C19
117	C20
118	C00 (d)
119	(a)
	5 of 5

Notes:

a. **Error Types 1, 23, 25, 25, 26, 32, 33, 55, 64, 65, 87, 96, 97, 119** do not represent physical port circuit pack slots and are not logged against CONFIG.

b. If **Error Type 28** occurs in a PN, it refers to the circuit pack in slot A01.

c. If **Error Type 61** occurs in a PN, it refers to the circuit pack in slot A10.

d. **Error Type 22, 54, 86, 118:** Slots B00, C00, D00, and E00 refer to the *Service Slots* in the B, C, D, and E carriers.

e. **Error Type 27:** In a PN's A carrier, slot A00 is the Tone Generator's slot.

CUST-ALM (Customer-Provided Alarming Device)

See MAINT (PN Maintenance Circuit Pack) for information about this maintenance object.

DAT-LINE (Data Line Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DAT-LINE	MIN WRN	**test port** ***location*** **l**	Data Line port

The TN726 Data Line circuit pack has eight ports, each of which supports an RS-232 interface to asynchronous CPE (customer-premises equipment). Each of these ports and the equipment connected to it constitute a data line.

For DT-LN-BD (Data Line circuit pack) errors, see XXX-BD (Common Port Circuit Pack/Media Module). Check circuit pack-level errors first since the usability of the ports depend on the health of the circuit pack.

Enter **add data-module** to administer data line ports at the terminal. The data module type is *data-line*. The **list data-module** command shows every administered data module in the system.

The TN750 announcement circuit pack has one data line-type port on it. This data line port is used for saving and restoring announcements. This data line port is not supported on the S8500 and S8700-series servers. For a description of and repair instructions for the TN750, see ANL-BD (Analog Line Circuit Pack).

Note:

If the tests for the data line port in question pass, and user-reported complaints persist, there is probably an external problem. Test the ADU (asynchronous data unit), using the procedures in *Multiple Asynchronous Data Unit User Manual, 555-401-702*. If the ADU appears to be working properly, check the external wiring, then check the equipment.

Error log entries and recommended actions

Table 79: DAT-LINE Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
1		Digital Looparound test (#171)	MIN	ON	**test port** ***location*** **r 2**
					1 of 2

Table 79: DAT-LINE Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
15(b)	Any	Port Audit and Update (#36)			
18	0	**busyout port *location***	WRN	OFF	**rel port *location***
130 (c)			WRN	ON	**test port *location***
257		Conference Circuit Test (#7)	MIN	ON	**test port *location* l r 2**
513		NPE Crosstalk Test (#6)	MIN	ON	**test port *location* l r 2**
769(d)	40983				
					2 of 2

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 15**: Software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate errors.

c. **Error Type 130:** The circuit pack has been removed or has been insane for more than 11-minutes. To clear the error, reseat or replace the circuit pack.

d. **Error Type 769:** the data line circuit pack found an error in the transmit/receive circuitry of an administered data line when the circuit pack was inserted. Perform the following:

1. Enter **busyout board location** for the circuit pack on which the port resides.
2. Enter **reset board *location***. Check the Error Log to determine whether Error Type #769 is logged again for DAT-LINE. Verify that the **Active Alarms Only** field is **n**.

   If Error Type #769 reappears, replace the data line circuit pack. If not, enter **release board *location***.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Looparound Test (#171)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

DC-POWER (Single-Carrier Cabinet Environment)

S8700 Series

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DC-POWER	MAJ	**test environment *location*** ***(location*** is the universal cabinet number in the PORT field of the alarm log)	Single-Carrier Cabinet Environment

Two different cabinet types are supported: multicarrier and single-carrier. Single-carrier cabinets are used only for PNs. Both cabinet types may be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply. Refer to the following table to determine which MO documentation to use for environmental maintenance.

Cabinet Type	Power Source	Environmental Maintenance Objects
Single-carrier (PN)	AC or DC	DC-POWER (all environmental maintenance)
Multicarrier	AC	AC-POWER for AC-powered systems (external power source) POWER for AC-powered systems (battery backup) CARR-POW (carrier port power supply) CABINET (temperature and fan sensors)
Multicarrier	DC	CARR-POW (carrier port power supply) CABINET (temperature and fan sensors)

The DC-POWER MO represents all environmental maintenance for single-carrier cabinets, whether the external power supply is AC or DC. This includes the external power supply and every Carrier Port Power Supply in an PN composed of a single-carrier cabinet stack. A Carrier Port Power Supply provides +5, -5, and/or -48 Volts DC to the circuit packs on the carrier. The following power supplies are used:

WP-91153	Accepts AC power input
676B	Accepts DC power input

Each power unit has one amber LED. A lit LED signifies normal operation. An unlit LED signifies a loss of external power to the cabinet, or a fault in the power unit. When hardware detects a problem with any of these components, it reports the information to the system software through a single lead. System software does not differentiate between different environmental failures. Since several environmental elements of single-carrier cabinets are logged against the DC-POWER MO, it is possible to have a DC-POWER alarm while there is still power to the system.

If a Carrier Port Power Supply is physically removed from a carrier in a single-carrier cabinet, there will not be a DC-POWER alarm. DC-POWER maintenance cot distinguish between removal of the power supply and the physical absence of the cabinet.

There is a nominal power holdover of .25 second in an PN single-carrier cabinet.

Error log entries and recommended actions

Table 80: Single-Carrier Cabinet Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action[1]
0[2]	0	Any	Any	Any	**`test environment`** ***UU***
513	0 or 1	Single-carrier cabinet power query test (#79)	MAJ	ON	**`test environment`** ***UU*** **`r 2`**

1. UU is the universal cabinet number indicated in the `PORT` field of the Alarm Log.
2. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and recommended procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Single-Carrier Cabinet Power Query Test (#79)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

DETR-BD (Tone Detector Circuit)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DETR-BD	MIN WRN	**test board *location***	Tone Detector circuit

For proper tone detection, the companding mode administered for the system must match that of the DETR-BD circuit. The companding mode is administered on the **location-parameters** screen.

See XXX-BD (Common Port Circuit Pack/Media Module) for DETR-BD (Tone Detector circuit) errors.

DID-BD (Direct Inward Dial Trunk Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DID-BD	MIN WRN	**test board *location***	Direct Inward Dial Trunk circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See DID-TRK (Direct Inward Dial Trunk) for related trunk information.

DID-DS1 (Direct Inward Dial Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DID-DS1	MAJ[1] MIN	**test trunk** ***grp#/mem#*** **long**	Direct Inward Dial Trunk
	WRN	**test trunk** ***grp#/mem#***	

1. A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

The DID-DS1 trunk provides a digital Direct Inward Dial (DID) trunk from a CO switch to the system through a DS1 link. A 24-channel DS1 link can support up to 24 DID-DS1 trunk calls simultaneously. A 32-channel link can support up to 30.

A DID-DS1 trunk can be used for digitized voice and data communications with DS1 signaling mode (for example, common-channel signaling). The TN767 and TN464 circuit packs and the DS1 Interface Media Module support wink-start and immediate-start trunks and Communication Manager signaling. Throughout this section, the term DS1 applies to all. For more information, see one of the following maintenance objects:

Circuit Pack/Media Module	Maintenance Object
TN767 DS1 Interface Circuit Pack	DS1-BD
TN464 UDS1 Interface Circuit Pack	UDS1-BD
DS1 Interface Media Module	MG-DS1

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

Two trunk service states are specified in the DID-DS1 trunk maintenance:

out-of-service	The trunk is in a deactivated state and cot be used for incoming calls.
in-service	The trunk is in an activated state and can be used for incoming calls.

If a DS1 is out-of-service, every trunk on the circuit pack or media module is put into the out-of-service state, and a Warning alarm is raised.

Error log entries and recommended actions

Table 81: DID-DS1 Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test trunk** ***grp#/mem#***
1 (b)	Any				
15 (c)	Any	Port Audit and Update test (#36)			
18 (d)			WRN	OFF	**release trunk** ***grp#/mem#***
130 (e)			WRN	ON	**test trunk** ***grp#/mem#***
257 (f)	57474 57473				
513 (g)	57392		MAJ MIN[1]		
769 (h)	57393		MAJ MIN[1]		
1281		Conference Circuit Test (#7)	MIN WRN[2]	ON	**test trunk** ***grp#/mem#*** **long r 4**
1537		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	**test trunk** ***grp#/mem#*** **long r 3**
1793 (i)					**test board** ***location*** **long**
2305 (j)	50944		MAJ MIN[1]	OFF	
3840 (k)		Port Audit and Update (#36)			

1. This alarm is raised only when the `Base Tone Generator` field is 4 (Italy) on the System-Parameter Country screen. This alarm is a MINOR alarm unless 75% or more trunks in this trunk group are out of service, when the alarm is upgraded to a MAJOR alarm.
2. Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 1:** DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. The `Aux Data` field indicates the following:

57476	On-hook before wink
57477	On-hook before ready to receive digits
57485	Wink too short for valid signal

Maintenance does not start any testing or generate any alarms in response to these errors.

c. **Error Type 15:** Software audit error that does not indicate hardware malfunction. Run short test sequence, and investigate any errors.

d. **Error Type 18:** The trunk has been taken out of service by a demand busyout. No calls can be made on this trunk.

e. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

f. **Error Type 257:** DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. The `Aux Data` field indicate the source of the error:

57473	Rotary dial rate above 8 pulses per second
57474	Rotary dial rate below 12 pulses per second

g. **Error Type 513:** DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. Aux Data 57392 indicates no external release on PBX disconnect.

h. **Error Type 769:** DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. Aux Data 57393 indicates belated external release on PBX disconnect.

i. **Error Type 1793:** DS1 Interface circuit pack or media module is out-of-service. Look in the error log:

If port is on	Look in
TN767 DS1 Board	DS1-BD
TN464 UDS1 Board	UDS1-BD
DS1 Interface Media Module	MG-DS1

j. **Error Type 2305** indicates that a signaling change was detected by the PBX trunk circuit pack or media module which is inconsistent with the present state of the trunk.

k. **Error Type 3840:** Port Audit and Update test (#36) failed due to an internal system error. Enter **`status trunk`** to verify the status of the trunk. If the trunk is out-of-service, enter **`release trunk`** to put it back to in-service. Retry the test command.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

DID-TRK (Direct Inward Dial Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DID-TRK	MAJ[1] MIN	`test port` ***location*** `l`	DID Trunk
	WRN	None	

1. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **`set options`** and that at least 75 percent of the trunks in this trunk group are alarmed.

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to the *Administering Avaya Aura™ Communication Manager*, for information about how to administer trunks. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

Direct Inward Dial (DID) trunks coming from the Central Office (CO) allow outside parties to call directly to an extension in the system. DID Trunk circuit packs include:

TN753	United States
TN2146	Belgium and the Netherlands
TN2139	Italy
TN 436	Australia
TN459	United Kingdom

DID trunk circuit packs and the MM711 Media Module support eight incoming-only ports. Each port provides an interface between the 2-wire analog CO line and the 4-wire TDM bus on the switch.

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

DID Trunk Operation

The DID port receives three to seven digits from the CO that are used to directly connect an outside caller to the called station without assistance from an attendant. For each call, the CO switch signals the system by opening and closing individual DID loops (one of the eight ports), causing the starting or stopping of loop current.

DID Trunk Testing

The system uses technician-invoked tests of on-board circuitry to diagnose the health of the trunk. These are described in the following sections. Additionally, inline testing which can generate errors, is performed while a call is in progress. See the Error Log table for a description of these errors. These errors may be reproduced by placing a call on the trunk and checking the error log.

Problems detected during signaling may be caused by off-board faults in the CO switch or connections for which a Warning alarm is raised.

Before a maintenance test can be run on a port, the port must be idle. If an incoming call seizes a port that is being tested, the test will abort and the incoming call will proceed.

Ports Out-of-Service without Errors or Alarms

A common trouble on DID trunks that produces no errors or alarms occurs when the CO busies out (disconnects) the port. This situation occurs when the CO thinks there are problems with the DID port. In this case, no incoming calls will be possible through this port. This may result in complaints from outside callers trying unsuccessfully to call in. This problem can be diagnosed by listing measurements on lightly used trunks. If a particular port is detected as idle, a call to the CO will be necessary to get the connection back in service.

Error log entries and recommended actions

Table 82: DID-TRK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**`test port`** ***`location`***
1 (b)	Any		WRN	OFF	
1 (c)	57476		WRN	OFF	
1 (d)	57477		WRN	OFF	
1 (e)	57483		WRN	OFF	
15 (f)	Any	Port Audit and Update (#36)			
					1 of 2

Table 82: DID-TRK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18	0	**busyout trunk** ***grp#/ mem#***	WRN	OFF	**release trunk** ***grp#/mem#***
130 (g)			WRN	ON	**test trunk** ***grp#/mem#***
257 (h)	57472		WRN	OFF	
257 (i)	57473		WRN	OFF	
257 (j)	57474		WRN	OFF	
257 (k)	57475		WRN	OFF	
513 (l)	57392		MIN WRN[1]	OFF	
513 (m)	57393				
769	Any	Port Diagnostic (#35)	MIN WRN[1]	ON	**test port** ***location*** **r 3**
1025		Looparound and Conference (#33)	MIN WRN[1]	ON	**test port** ***location*** **l r 3**
1281		NPE Crosstalk (#6)	MIN WRN[1]	ON	**test port** ***location*** **l r 3**
1537	Any	Port Diagnostic (#35)	MAJ MIN WRN[1]	OFF	**test port** ***location*** **r 3**
1793 (n)	57489		None		
					2 of 2

1. Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence.

b. **Error Type 1, Aux Data - Any**: the tone detector timed out waiting for digits. Change wink/ immediate-start parameter to wink/immediate-start and rotary/tone-dial parameters.

1. Verify trunk administered wink/immediate-start parameter.
2. Test trunk using BUTT set.

3. Refer problem to CO.

c. **Error Type 1, Aux Data 57476:** Rotary dial before wink occurs when the CO starts dialing before the PBX sends wink on a wink-start trunk.

   1. Verify trunk administered wink/immediate-start parameter.
   2. Refer problem to CO.

d. **Error Type 1, Aux Data 57477:** Rotary dial too early occurs when the CO starts dialing too soon after seizure on an immediate-start trunk.

   1. Verify trunk administered wink/immediate-start parameter.
   2. Refer problem to CO.

e. **Error Type 1, Aux Data 57483:** Rotary dial pulse during wink occurs when the CO sends rotary dial digits too soon after seizure on a wink-start trunk.

   1. Verify trunk administered wink/immediate-start parameter.
   2. Refer problem to CO.

f. **Error Type 15:** software audit error that does not indicate a hardware malfunction. Run short test sequence, and investigate any associated errors.

g. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

h. **Error Type 257, Aux Data 57472:** Rotary dial pulse on-hook longer than 105 msec, the break between rotary pulses is too long.

   1. Test trunk by performing an incoming test call.
   2. Refer problem to CO.

i. **Error Type 257, Aux Data 57473:** Rotary dial rate below 8 pulses/sec, more than 135 msec between two successive breaks.

   1. Verify trunk administered interdigit-timing parameters.
   2. Refer problem to CO.

j. **Error Type 257, Aux Data 57474:** Rotary dial rate above 12 pulses/sec, less than 75 msec between two successive breaks.

   1. Verify trunk administered interdigit-timing parameters.
   2. Refer problem to CO.

k. **Error Type 257, Aux Data 57475:** Digit detection, CO is starting new rotary dial digit within 150 msec of previous digit.

   1. Verify trunk administered interdigit timing parameters.
   2. Refer problem to CO.

l. **Error Type 513, Aux Data -57392:** Loop current active, CO is not releasing trunk after PBX disconnect. Occurs when the PBX end drops first and the CO does not release the trunk within 4 minutes.
   1. Verify the interface to the network with a hand telephone set. If calls are placed correctly, then refer problem to the CO.
   2. If unable to place calls or this equipment is not available, check the status on port using **`status trunk`**. If active but not connected, disconnect bridging clips at the network interface. Check status on the trunk. If trunk went idle, then replace clips. If trunk is still active but unable to place calls, refer problem to the CO.

m. **Error Type 513, Aux Data 57393:** Late CO trunk release occurs only after the occurrence of Error Type 513. The CO released the trunk 4 minutes after the PBX dropped the call. This event decrements the severity (error count) of Error Type 513, or may mean the problem related to Error Type 513 has been fixed.

   Verify that Error Type 513 does not occur again. Refer to Error 513.

n. **Error Type 1793:** Incomplete Dial timer expired. Applies only to the TN459 and indicates a problem with incoming dialing stream. Refer the problem to the CO.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Port Diagnostic Test (#35)	X	X	ND
Looparound and Conference Test (#33)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

DIG-BD (Digital Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIG-BD	MIN WRN	**test board *location***	Digital Line circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See DIG-LINE (Digital Line) for related line information.

DIG-IP-S (Digital IP Station)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIG-IP-S	WRN	**test station *extension***	Digital IP Station

The DIG-IP-S MO represents Softphone and Avaya 46XX phones. Softphone has some DCP maintenance capability in the form of audits, updates, error log entries, and tests. Avaya 46XX IP phones communicate to the switch via an IP LAN and emulate DCP signaling carried over TCP.

The IP phone is not attached to a port board. Insertion of the phone is driven by successful registration of the endpoint, not by board insertion. It is maintained via a set of explicit TCP/IP ping requests and errors reported by the User Manager software, which terminates the H.323 signaling portion of each endpoint. The MO follows standard maintenance methodology and supports **test**, **busyout**, **release** and **status** commands.

A registered extension has a port number or ID in the form of S*NNNNN*, where *N* is a digit from 0–9. This ID indicates that the extension is a virtual port and a station.

Note:

A port number or ID of SNNNNN does not necessarily indicate that the extension is registered. A registered extension retains the S*NNNNN* port number or ID, even if the extension later unregisters.

Error log entries and recommended actions

Table 83: DIG-IP-S Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any		**test station *extension***
1 (a)		Registration Status Inquiry (#1372)	WRN	OFF	
18 (b)	0	**busyout *port* | *station***	WRN	OFF	**release *port* | *station***
257 (c)		Signaling Path PING test (#1373)	WRN	OFF	
513 (d)	Any	Digital Station Audits Test (#17)	WRN	OFF	**test *port* | *station***
					1 of 2

Table 83: DIG-IP-S Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1281 (e)	Any	Digital Station Audits Test (#17))	WRN	OFF	**test *port* | *station***
1537 (f)	40968		WRN	OFF	**test *port* | *station***
1793 (g)			WRN	OFF	
2305 (h)	Any				
2817 (i)		Station Hyperactivity			
					2 of 2

Notes:

a. **Error Type 1:** reports the registration status of the endpoint. If Communication Manager software claims the endpoint is registered and receives keep-alive handshakes from the endpoint, the test passes. If keep-alive handshaking has failed, the test fails. If the user has intentionally un-registered from the S8700-series server, the station is now basically an AWOH station and is no longer being maintained. No tests are run for this station.

b. **Error Type 18:** the port/station is busied out by maintenance personnel. Make sure the port/ station is released from busy via **release *port* | *station*** (IP terminal only).

c. **Error Type 257** tracks failures of the signaling path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with the C-LAN board through which the endpoint is registered. If the PING response packet is received, the test passes. If the PING response packet times out, the test fails.

d. **Error Type 513** indicates that the terminal failed to respond to the ID Query request. This implies that there is something wrong with the terminal or the communication path. (IP terminal only).

e. **Error Type 1281** indicates that the terminal is reporting a bad state of health (IP terminal only).

f. **Error Type 1537** indicates that the link has gone down between the terminal and its gateway to the switch. This likely means that the terminal has unregistered (IP terminal only).

g. **Error Type 1793**: indicates the IP station has registered with a Survivable Remote Server. Follow standard practices to repair the primary server, or network failure.

h. **Error Type 2305** indicates that there was an unsolicited Link Reset even though switch software believed the terminal to be functional and in service. This error can be ignored if no user complaints are received (IP terminal only).

i. **Error Type 2817** tracks failures of the port hyperactivity counter. If a port generates more than 50 uplink CCMS messages within 10 seconds, the port is taken out-of-service for 30 seconds. Even though the Softphone actually signals over a TCP/IP link, DCP CCMS messages received over the TCP link are counted as regular CCMS uplinks and can cause the station to be marked as hyperactive.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Registration Status Inquiry Test (#1372)	X	X	ND
Signaling Path PING Test (#1373)	X	X	ND
Digital Station Lamp Update (#16)	X	X	ND
Digital Station Audits Test (#17)		X	ND

1. D = Destructive; ND = Nondestructive

DIG-LINE (Digital Line)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIG-LINE	MIN	**test port *location* long**	Digital Line
	WRN	**test port *location***	

DIG-LINE maintenance monitors and tests ports on digital line circuit packs or digital line media modules and on hardware administered as a digital station on those ports. These include stations with only a digital phone and stations with a digital phone linked to a data module.

Standalone data modules and data adaptors in standalone mode are covered by PDMODULE (Processor Data Module).

Circuit pack maintenance is covered by DIG-BD (Digital Line Circuit Pack), the strategy for which is described in XXX-BD (Common Port Circuit Pack/Media Module).

The following circuit packs support digital lines:

Table 84: Digital Line Circuit Packs

Code	Ports	Type	Companding	Endpoints
TN754 TN754B TN2181 TN2224B/CP	8 8 16 24	4-wire DCP 4-wire DCP 2-wire IDCP 2-wire IDCP	mu-law A-law/mu-law A-law/mu-law A-law/mu-law	7400 series digital voice terminals, attendant consoles, 510D personal terminals, MT515 BCTs, DCP data modules
TN2136 TN2181 TN2224B/CP	8 16 24	2-wire IDCP 2-wire IDCP 2-wire IDCP	A-law/mu-law A-law/mu-law A-law/mu-law	Data Adaptors (DA), Italtel Digital Telephone Models 1 and 2 (IDT1/2).

Each digital line port supports two 64 kbps information channels (primary and secondary) and one 8kbps signaling channel. Digital voice terminals always use the primary information channel, and only one voice terminal can be connected to each port. The secondary information channel can be used to connect a data terminal via a Digital Terminal Data Module (DTDM) or a Data Adaptor (DA). All other devices currently supported by Digital Line circuit packs communicate on the primary information channel. Figure 14: Digital Line Connectivity shows examples of digital line connectivity.

Use only the TN754B or TN2136 circuit packs in out-of-building applications.

The TN2181 and TN2224B/CP support both modes as shown in Figure 14: Digital Line Connectivity and Figure 15: Digital Line Connections.

Figure 14: Digital Line Connectivity

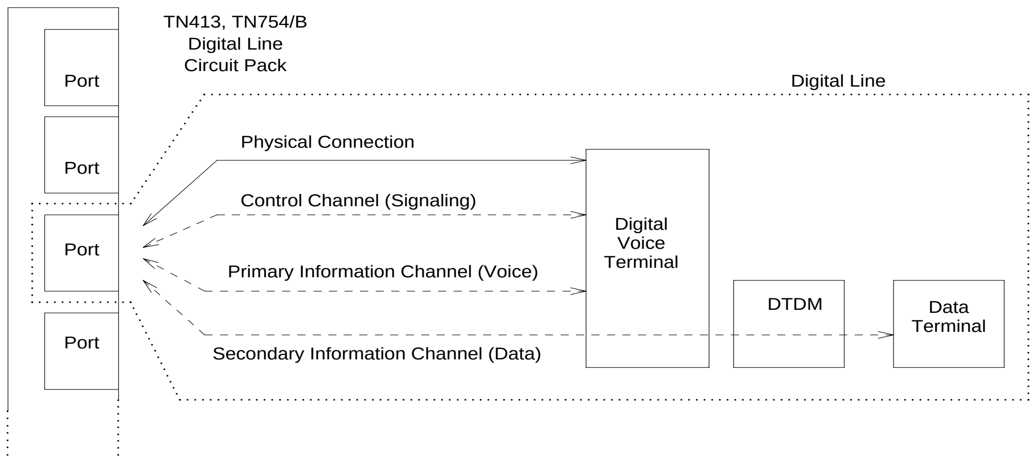
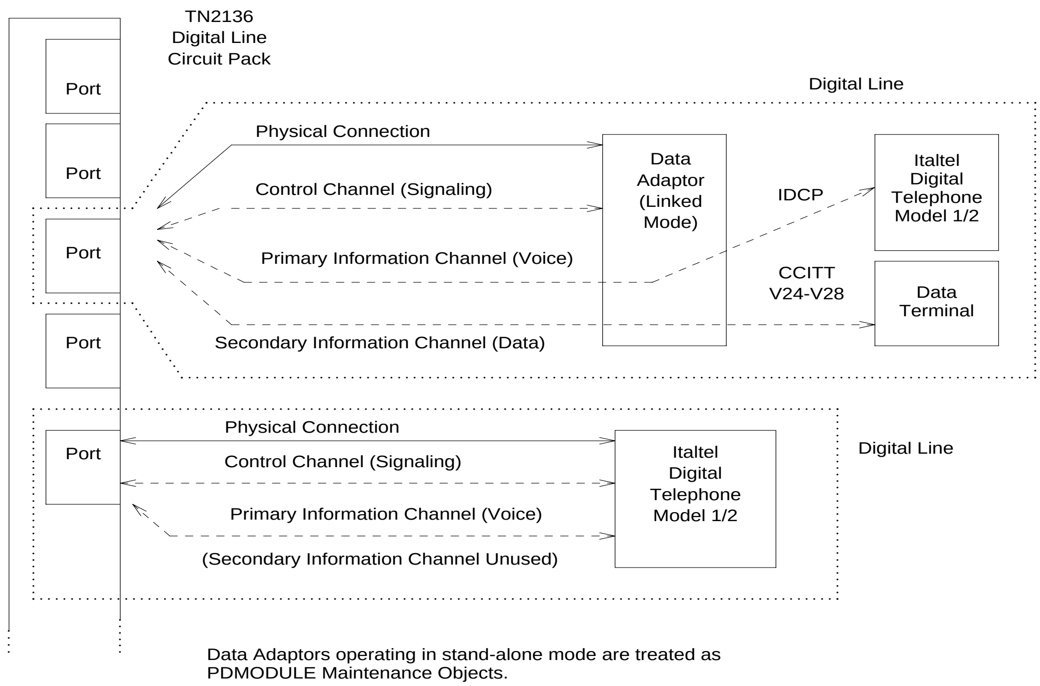


Figure 15: Digital Line Connections



Only 2-wire Italtel Digital Telephone Models 1 and 2 (IDT1/2) or DAs can directly connect to a TN2136 circuit pack. Avaya DCP (4-wire) digital voice terminals and data modules can connect to these circuit packs via Italtel's 2/4-wire adapter. DAs operate in either of 2 modes, and are covered by different MOs:

DA Mode	Administered as:	Endpoint	MO
Standalone	PDM	Data endpoint only	PDMODULE
Linked	DTDM	IDT1/2 and optional data terminal	DIG-LINE

Service States

Digital line maintenance interacts with digital line circuit pack (DIG-BD), or with digital line media module (MG-DCP) maintenance. The health of the digital-line circuit pack or media module can affect the results of DIG-LINE testing. Keep this in mind when investigating digital-line problems.

It is sometimes important to know the service state of a station. These service states apply to digital-line stations:

Out-of-Service state	The port, and thus the station, have been removed from service. The busyout command puts the port in the out-of-service state.
Ready-for-Service state	The port on the circuit pack or media module has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service state	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally. It can also be forced into the in-service state by going off-hook.

Downloading Terminal Parameters

This section explains how maintenance software interacts with terminal parameter downloading.

For Systems Supporting Circuit Packs

Terminal Types:

Software can interact with the following terminal types:

- 84xx multi button digital voice terminals (8403D01A, 8410B, 8410D02A, 8434D01A) with optional expansion module.
- 603A1 and 603D1 Callmaster terminals for telemarketing applications.
- 302B1 and 302C1 attendant console.

Circuit Packs:

- 8400x, 302B1 Terminals
  - TN754 (4-wire, mu-law)

  Note:
  Minimum usable vintage for 8410D and 8434D terminals - V11
  - TN413 (4-wire, A-law)
  - TN754B (4-wire, A-law/mu-law selectable)
  - TN2177 (2-wire, 16-port, A-law/mu-law selectable)
  - TN2181 (2-wire, 16-port, A-law/mu-law selectable)
  - TN2224 (2-wire, 24-port, A-law/mu-law selectable)
- 603A1/D1 Terminals
  - TN754 (4-wire, mu-law),
  - TN413 (4-wire, A-law)
  - TN754B (4-wire, A-law/mu-law selectable)

For Systems Supporting Media Modules

The MM712 Media Module supports 8410D and 8434D terminals (2-wire, 8-port, A-law/mu-law selectable).

Programmable Terminals

The following parameters are downloaded to programmable terminals.

Table 85: Parameters Downloadable to Programmable Terminals

Parameter	Scope	Terminal
International Flags (A-law/mu-law, Display Mode, DLI Voltage level)	System level	84xx, 603x, 302B1
Primary Levels (Transmission & Sidetone)	System level	84xx, 603x, 302B1
Adjunct Levels (Transmission & Sidetone)	System level	84xx
Handset Expander Option	System level	84xx
Administrable Options (Speakerphone & Mute Button)	Per-terminal	84xx
Administrable Softkeys	Per-terminal, System level	8410D, 8434D

Nonvolatile Memory

Nonvolatile memory stores downloadable parameters in programmable terminals. Once the terminal is downloaded, it is not be necessary to download it again, even if power is removed from the terminal. If nonvolatile memory fails with power still present, the terminal reverts to its default factory settings except for its A-law/mu-law companding settings which are stored in RAM. If power is removed after the nonvolatile memory fails, the terminal reverts to its factory default settings.

Note:

The mu-law companding mode is assigned as a default setting at the factory. For the United States, a programmable terminal can place calls even though it has not been downloaded from the system.

Download Actions

There are several different scenarios that cause a terminal to be downloaded. These can occur as part of background maintenance activity or on demand from the system access terminal or from a station.

For the following background actions, the terminal downloads automatically if a download retry flag for the terminal is set in software. This flag is set:

- At boot time when translation is loaded
- When translation that affects the parameters of a terminal is changed as part of system administration action
- When a port is inserted in software as a result of board insertion or translation change

Automatic Download Actions

This section describes download actions that occur automatically.

System Reboot/Restart

A global download action is started when periodic maintenance tests start after a system reboot/restart regardless of whether the parameters have been downloaded previously.

Periodic Tests

If the download flag is still set when periodic tests are run on a terminal, a download action will occur. This operation is required in case a terminal could not be downloaded previously either:

- Because it was off-hook at the time the system first booted
- Because the terminal was off-hook at the time translation associated with downloadable parameters was changed

Note:

It may take more than 1 hour for periodic tests to reach the terminal that needs to be downloaded.

Terminal Administration

A downloadable terminal is automatically downloaded when translation changes associated with downloadable parameters are made as part of system administration. As shown in Table 85: Parameters Downloadable to Programmable Terminals, these changes can be for a specified terminal or may be system-wide. If the change is for system-level parameter, a background global update request is made to download all programmable terminals.

This global update may take more than an hour for a system with several thousand programmable terminals.

Port Insertion

Whenever maintenance software initiates a request to place a port into service, a terminal download action is started on that terminal if that terminal is programmable. This port insertion action occurs under the following circumstances:

- A digital line circuit pack or media module that is physically inserted into the system has ports currently administered for programmable terminals.

  If more than 20 port insertion requests are received within a few seconds, a global download request is started up as a background task. This action updates all programmable terminals instead of just those being inserted. This is done to avoid system overload for situations where there is massive board insertion. This could occur when connectivity to an PN is re-established after that PN was down.
- A station port is added to the system by **`add station`** or **`change station`**.
- A TTI port is activated.

Audits

As part of periodic maintenance, the hardware status audit test queries programmable terminals to determine what levels and/or options are being used. If the reported values are not equal to the administered values, the system will initiate a terminal download action. This audit does NOT check the parameters used for softkeys.

Activation of TTI

A terminal is downloaded automatically when it is activated using the Terminal Translation Initialization feature. Therefore, no special user actions are required for TTI.

Note:

Plugging the station cord into a terminal does not automatically cause the terminal to be downloaded. If this terminal has factory defaults or if the terminal has been previously downloaded with parameters different from those desired, use one of the following demand download actions to download the terminal.

Demand Download Actions

Busyout/Release Command

A maintenance demand busyout/release request for a station causes the terminal to be downloaded regardless of its previous download status.

Feature Access Code

A Refresh Terminal Parameters Feature Access Code can be used to request a terminal download action. When this code is followed by a pound sign (#), the programmable parameters for the current terminal are downloaded when the terminal goes on-hook. When this code is followed by an extension, the programmable parameters for the specified station are downloaded.

Assign the Refresh Terminal Parameters Feature Access Code on the Feature Access Codes form.

A confirmation is returned if the download request is accepted. A busy tone is returned if the request is made from a different station when the target station is off-hook.

Note:

For systems supporting circuit packs, the first three green call appearance LEDs on the 84xx 603x terminal will be turned on for three seconds if the station was successfully downloaded as a result of an entry of a Refresh Terminal Parameters Facility Access Code. This is not true for the 302B1 terminal.

There is no visible display on a station for the other background or demand download actions. Use **`status station`** and **`status attendant`** forms to check the download status of a specified terminal.

Parameter Download Status

The **status station** and **status attendant** forms display the current download status of individual 84xx, 603, and 301B1 terminals in the **Download Status** field. Possible download states are:

Status	Explanation
Complete	Terminal successfully downloaded sometime in the past.
Pending	System waiting to download the terminal. This may require the execution of a background periodic test which could take more than an hour. A demand download as previously described may also be used to initiate an immediate download.
Not Applicable	Not a programmable terminal.

Possible reasons for a terminal not being downloaded include:

- Terminal is off-hook.
- Terminal detected a bad checksum.
- Terminal detected a bad or missing EEPROM (refer to error log).
- Terminal is busy programming data from a previous PROGRAM message.
- Terminal is in the Programming Disabled state.
- Terminal is in the Local Program Options mode.
- Terminal is disconnected or out of service (use **status station**).

Error log entries and recommended actions

Table 86: DIG-LINE Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
1 (b) (c)	40987 1 – 20		WRN	OFF	
18 (d)	0	**busyout port** ***location***	WRN	OFF	**release port** ***location***
					1 of 2

Table 86: DIG-LINE Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
130 (e)			WRN	ON	**test port *location***
257 (f)	40971				
513	0	Digital Station Audits (#17)	WRN	OFF	**test port *location* r 6**
767 (g)	40964		WRN	OFF	
769 (h) (i)	40963 40988		WRN	OFF	
1026 (k)			WRN	OFF	
1281	Any	Digital Station Audits (#17)	WRN	OFF	**test port *location* r 4**
1537 (l)	40968		WRN	OFF	
1793		Voice and Ctrl. Local Loop test (#13)	MIN WRN[1]	ON	**test port *location* l r 3**
2049		GPP NPE Crosstalk Test (#9)	MIN WRN[2]	ON	**test port *location* l r 3**
2304 (m)					
2305 (n) (o)	32770 40969				
2817 (p)	Any			OFF	
3585 (q)					
3840 (r) (s)	40965 40989				
3841 (t)	41029				
					2 of 2

1. Major alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence.

b. **Error Type 1, Aux Data 40987** could indicate a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem is resolved, the alarm is retired after a predetermined amount of time.

c. **Error Type 1, Aux Data 1 - 20** occurs when at least 15 off-board problems with the link to the terminal have been detected. When an error with the link is detected, an on-board counter is incremented.

   The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem is resolved, the alarm is retired after a predetermined amount of time.

d. **Error Type 18:** the port in question is busied out by maintenance personnel. Use **`release port`** ***`location`*** to release the port from busyout.

e. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack or media module.

f. **Error Type 257:** problems transmitting to the voice terminal. This can be caused by defective wiring, which can cause varying degrees of problems on different types of sets. Sets such as the 7410 appear to be more susceptible to wiring problems than other sets. This is usually an on-board problem and can be ignored if no user complaints are received.

g. **Error Type 767:** a favorable response was received from running the Digital Line Electronic Power Feed Test (#11). No action is necessary. This alarm is resolved with the passing of time.

h. **Error Type 769, Aux Data 40963:** unfavorable response was received from the Digital Line Electronic Power Feed Test (#11). See the test for repair procedures.

i. **Error Type 769, Aux Data 40988:** the EPF/PTC circuit has been turned off due to an overcurrent condition.

   For TN754 vintage 13 or earlier and TN413, the EPF circuit senses an overcurrent condition at the voice terminal. Check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

   For TN754 vintage 14 or later, TN754B and TN2136, the PTC will open if there is a short on the power line for 1/2 second or longer. The voice terminal is probably not operating properly. Unplug the voice terminal for 30 seconds and then plug it back in. If the voice terminal still does not operate, then check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

   Once the problem has been resolved, it may take up to 1 hour for the alarm to clear. If the problem cot be resolved by one of the previous steps, then replace the circuit pack or media module.

j. **Error Type 769, Aux Data 40989:** the CM software sends an EPF query to the port board for a particular port. The board returns the failure message 40989. This error is caused if the board is busy on TN2224CP HV4 FV15. 40989 represents a message from the board that the EPF is off for that port. This means that the power for this particular port is not working. As a recovery strategy, you may busy out or release the port and then re-test the port. However, if the failure still continues, replace the board.

k. **Error Type 1026:** There is a problem with the voice terminal EEPROM. When the voice terminal is repaired the alarm will be resolved with the passing of time.

l. **Error Type 1537:** an off-board warning was generated due to a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack or media module. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

m. **Error Type 2304:** Internal system error. No action is necessary.

n. **Error Type 2305, Aux Data 32770:** This indicates that the station went off-hook while it was in the ready-for-service state. Use **`status station`** to determine the state of the station. The off-hook should have moved the station to ready-for-service. No action is necessary.

o. **Error Type 2305, Aux Data 40967:** an off-board warning was generated due to some problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack or media module. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

p. **Error Type 2817:** Port Level Hyperactivity. Fifty or more CCMS uplink messages were received from the port within ten seconds. The user is taken out of service for a short interval of time (default 30 seconds).

q. **Error Type 3585:** an attempt to execute a firmware download of a DCP terminal has failed. The DCP terminal must be replaced before the firmware download can be executed successfully. Replace the DCP terminal and re-execute the firmware download.

r. **Error Type 3840, Aux Data 40965:** No terminal is connected to the Digital Line board. No maintenance action is required.

s. **Error Type 3840, Aux Data 40989:** the Electric Power Feed (EPF) is on with no load on it. No action is necessary.

t. **Error Type 3841:** The circuit pack's or media module's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack or media module. No action is necessary.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Terminal Remote Looparound Test (#1201)		X	D
Local Loop Test (#13)		X	ND
GPP NPE Crosstalk Test (#9)		X	ND
Digital Line Electronic Power Feed Test (#11)		X	ND
Digital Station Lamp Update (#16)	X	X	ND
Digital Station Audits Test (#17)	X	X	ND

1. D = Destructive; ND = Nondestructive

DIG-RES (TN800 reserve slot)

See ASAI-RES (TN800 reserve slot).

DIOD-BD (DIOD Trunk Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIOD-BD	MIN	**test port *location***	DIOD circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module).

DIOD-DS1 (DS1 DIOD Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIOD-DS1	MAJ[1] MIN	`test trunk` *`grp#/mem#`* `l`	DS1 DIOD Trunk
	WRN	`test trunk` *`grp#/mem#`*	

1. A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by `set options` and that at least 75 percent of the trunks in this trunk group are alarmed.

Note:

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administering Avaya Aura™ Communication Manager* for information on how to administer trunks. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

A DS1 Direct Inward Outward Dialing (DIOD) trunk provides a link for digitized voice or data communications between the system and a central office switch. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

Note:

32-channel mode is supported only on TN464C and higher suffix circuit packs.

The DS1-DIOD MO monitors and maintains a DIOD trunk port on a TN464 UDS1 Interface circuit pack. See UDS1-BD (UDS1 Interface Circuit Pack) for more information about this circuit pack. The DS1 circuit pack supports low-level CO trunk signaling interfaces for both ground-start and loop-start trunks. This maintenance strategy covers the inline errors log, initialization tests, periodic tests, scheduled tests, demand tests, and alarm resolution and escalation.

Three trunk service states are specified by DS1 DIOD trunk maintenance:

out-of-service	The trunk is in a deactivated state and cot be used for either incoming or outgoing calls.
in-service	The trunk is in an activated state and can be used for both incoming and outgoing calls.
disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

Error log entries and recommended actions

Table 87: DIOD-DS1 Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test trunk *grp#/mem#***
1(b)	57408				
1(b)	57487 57476 57485				
15 (c)	Any	Port Audit and Update (#36)			
18 (d)	0	**busyout trunk *grp#/ mem#***	WRN	OFF	**release trunk *grp#/mem#***
130 (e)		None	WRN	ON	**test trunk *grp#/mem#***
257 (f)	57392	DS1 CO Trunk Dial Tone Seizure (#314)	MAJ MIN[1]	OFF	
513 (g)	57393	DS1 CO Trunk Dial Tone Seizure (#314)	MAJ MIN[1]	OFF	
769 (h)	57484				
1025 (i)	51200				
1025		DS1 CO Trunk Dial Tone Seizure (#314)	MIN WRN[2]	OFF	**test trunk *grp#/mem#* r 2**
1281		Conference Circuit Test (#7)	MIN WRN[2]	ON	**test trunk *grp#/mem#* l r 4**
1537		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	**test trunk *grp#/mem#* l r 3**
1793 (j)					**test board *location* l**
					1 of 2

Table 87: DIOD-DS1 Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2049 (k)	57473 57474 57475				
2305 (l)	50944				
2562 (m)	16665				
2817 (n)	52992				
3840 (o)		Port Audit and Update (#36)			
					2 of 2

1. This alarm is raised when the `Base Tone Generator` field is 4 (Italy) on the System-Parameter Country screen. This alarm is MINOR unless 75% or more trunks in this trunk group are out of service, then the alarm is upgraded to a MAJOR alarm.

2. Major alarms may be downgraded to Warning alarms based on the value used in **`set options`**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 1**
Aux Data 57408: No tip ground is detected on an outgoing call.
Aux Data 57476: Rotary Dial before Wink.
Aux Data 57477: Rotary Dial pulse too early.
Aux Data 57485: Wink too short for a valid signal.
Aux Data 57487: PBX could not get "loop close" signal.

The DS1 Interface circuit pack detected a hardware fault. These errors will cause the DS1 CO Trunk Dial Tone test (#314) to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in the ready-for-service state (shown as "disconnected" by the status command), which allows only incoming calls. Run the DS1 CO Trunk Dial Tone Seizure Test (#314) and follow the procedures.

c. **Error Type 15:** software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate any errors.

d. **Error Type 18**: the trunk has been busied out and is in the out-of-service state. No calls can be made on this trunk except Facility Access Test Calls. For details, see Facility test calls in *Maintenance Procedures (03-300432)*.

e. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

f. **Error Type 257**: The DS1 Interface circuit pack detects a hardware fault. Aux Data 57392 indicates no external release on PBX disconnect.

g. **Error Type 513**: The DS1 Interface circuit pack detects a hardware fault. Aux Data 57393 indicates belated external release on PBX disconnect.

h. **Error Type 769**: The DS1 Interface circuit pack detects a hardware fault. Aux Data 57484 indicates fault is detected on tip/ring.

i. **Error Type 1025**: The DS1 Interface circuit pack detects a hardware fault, and `Aux Data` contains 51200, port is unavailable. Run the DS1 CO Trunk Dial Tone Seizure Test (#314).

j. **Error Type 1793**: DS1 Interface circuit pack is out-of-service. Look for UDS1-BD errors in the error log if the port is on a TN464 UDS1 board. See UDS1-BD (UDS1 Interface Circuit Pack) for details.

k. **Error Type 2049**:

Aux Data 57473 – Rotary dial rate below 8 pulses per second.
Aux Data 57474 – Rotary dial rate above 12 pulses per second.
Aux Data 57475 – Rotary Dial interdigit time is too short.

The DS1 interface circuit pack detects a hardware error on the DS1 DIOD trunk. The trunk cot communicate with the far end because it is unable to interpret digits sent from the far-end switch. Check with the far-end switch or Operating Company for proper trunk connection.

l. **Error Type 2305**: Recorder message, trunk could not be seized (Aux Data 50944). Run DS1 CO Trunk Dial Tone Seizure Test (#314) and follow the outlined procedures.

m. **Error Type 2562**: Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from Communication Manager and is generated when a second attempt (retry) to seize an outgoing trunk fails.

n. **Error Type 2817**: Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and far ends. Attempt to place the call again. If the error persists, execute the DS1 CO Trunk Dial Tone Seizure Test (#314), and follow those procedures.

o. **Error Type 3840**: The Port Audit And Update Test (#36) failed due to an internal system error. Enter **`status trunk`** to verify the status of the trunk. If the trunk is out-of-service, then enter **`release trunk`** to put it back into in-service. Retry the test command.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 CO Trunk Dial Tone Seizure Test (#314)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive, ND = Nondestructive

DIOD-TRK (DIOD Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DIOD-TRK	MAJ[1] MIN WRN	**test port *location***	DIOD Trunk

1. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to the *Administering Avaya Aura™ Communication Manager*, for information about how to administer trunks. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

Direct inward and outward dial (DIOD) trunks are 2-wire analog lines to the CO which support the following services:

- Both incoming and outgoing CO calls
- DID trunk
- DID trunk and 1-way outgoing DIOD

TN429 DIOD trunk circuit packs and MM711 Analog Media Modules provide eight ports for loop-start CO trunks and serve as an interface between the 2-wire analog CO line and the 4-wire TDM bus on the switch.

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

Loop Start Operation

Idle State: Tip = ground, Ring = CO Battery

Outgoing Call

1. PBX Off-Hook (Seize Message): Closes the Tip-Ring Loop
2. CO Response: DC loop current + Dial tone
3. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
4. CO Response: CO goes to idle state (see Note)

Incoming Call

1. CO Applies Ringing Voltage
2. PBX Response: Detect ringing current
3. PBX Off-Hook (Answer Message): Close loop
4. CO Response: Trip ringing, provide loop current
5. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
6. CO Response: CO goes to idle state (see Note)

Direct Inward Dialing (DID) (Loop Start)

1. CO Applies Ringing Voltage
2. PBX Response: Detect ringing current and close loop
3. CO Response: Send DTMF digits
4. PBX Response: Acknowledge of Number dialed and open loop
5. PBX Off-Hook (Answer Message): Close loop
6. CO Response: Trip ringing, provide loop current
7. PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current
8. CO Response: CO goes to idle state (see Note)

Note:

CO does not normally provide an On-Hook (Disconnect) signal.

Error log entries and recommended actions

Table 88: DIOD-TRK Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port sh`
15 (b)	any	Port Audit Update Test (#36)			
18	0	`busyout trunk` *`grp/mbr`*	WRN		`release trunk`
769 (c)	57392		MAJ MIN WRN[1]	ON	
					1 of 2

Table 88: DIOD-TRK Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1537		Dial Tone Test (#0)	MAJ MIN WRN[1]	ON	`test port long r 2`
1793		Looparound and Conference Test (#33)	MAJ MIN WRN[1]	ON	`test port long r 3`
2049		NPE Crosstalk test (#6)	MAJ MIN WRN[1]	ON	`test port long r 3`
2561 (d)	57345				
2817 (e)	57393				
3073 (f)	57376				
3585 (g)	57424				
					2 of 2

1. Major alarms on this MO may be downgraded to Warning alarms based on the value in **`set options`**. If the Minor alarm is not downgraded by **`set options`** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Additional Information:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 15:** software audit error and does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors.

c. **Error Type 769, Aux Data 57392** are inline errors that have no specific test associated with them. The CO is not releasing after the call is dropped from the PBX end. After several occurrences, an off-board warning alarm is generated. Refer the problem to the CO.

d. **Error Type 2561, Aux Data 57345:** Single polarity ringing current. This is an inline error that has no specific test associated with it. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. This error code is logged for information purposes only and does not cause additional testing to occur. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) The other cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the Dial Tone test (#0) also fails. Check for other errors.

e. **Error Type 2817 Aux Data 57393** is an inline error that has no specific test associated with it. CO released the trunk at least four minutes after the PBX dropped the call. This error code is log only and causes no other testing to occur. No alarm is generated. Check for other errors.

f. **Error Type 3073 Aux Data 57376** is an inline error that has no specific test associated with it. No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the Dial Tone test (#0) and every outgoing call should also fail. Check for other errors.

g. **Error Type 3585 Aux Data 57424** is an inline error that has no specific test associated with it. No loop current on outgoing call. This error occurs on an attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected. Busyout the affected port, and run a Long test. If the Dial Tone test (#0) passes, ignore this error. Release the port.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Dial Tone Test (#0)		X	ND
CO Port Diagnostic Test (#3)	X	X	ND
Looparound and Conference Test (#33)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

DLY-MTCE (Daily Maintenance)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DLY-MTCE	MINOR MAJOR WRN	NONE	Daily Maintenance

The DLY-MTCE MO performs daily translation audits and saves as part of the administered daily maintenance options on the **`change system-parameters maintenance`** form. If a translation save times out or fails, an error is logged against this MO.

If save fails	Then system raises
3 times in a row	MINOR Alarm
7 times in a row	MAJOR Alarm

If the audit fields are enabled on the **`change system-parameters maintenance`** form and the audit fails, a WARNING alarm is raised.

Error log entries

There is no repair action for these errors. Escalate the problem.

Table 89: DLY-MTCE Error Log Entries

Error Type	Description	Alarm Level
542	Translation save failure during scheduled maintenance	MIN MAJ
571	Translation save timeout during scheduled maintenance	MIN MAJ
572	Translation save failure during translation backup via the web (either scheduled or on-demand)	MIN MAJ
573	Translation audit has detected translation corruption during scheduled maintenance	WRN

Daily Maintenance Interference

Table 90: Communication Manager SAT Command Actions lists Communication Manager SAT administration command actions that, when active, interfere with daily maintenance. Customer administrators frequently use these commands for routine administration of the system.

Table 90: Communication Manager SAT Command Actions

Likely to Disrupt	Less Likely to Disrupt	
add	**backup**	**ping**
change	**busyout**	**recycle**
duplicate	**clear**	**release**
remove	**display**	**reset**
set	**enable**	**restore**
	format	**resume**
	get	**save**
	list	**status**
	mark	**test**
	monitor	**upgrade**
	netstat	

Other command actions can also interfere with daily maintenance when certain qualifiers are used in the commands, or under certain circumstances. For example, certain **test** commands, when used with the modifier ***continuously***, could interfere with daily maintenance. However, such command actions are not typically used by customer administrators doing routine administration, and are less likely to disrupt daily maintenance routines than are the **add**, **change**, **duplicate**, **remove**, and **set** command actions.

Incomplete Command Time-Out

A command time-out feature exists on the **system-parameters maintenance**. The command time-out feature improves the operation of daily maintenance by allowing maintenance routines to run that might otherwise not run. It also helps to prevent the loss of translations that were not saved with **save translation**, and were also not saved because daily maintenance was prevented from running prior to the system reset. Highlights of the feature include:

- Options for blank, 1, 2, 3, 4, 5, or 6 hours (the default is 2 hours)
- The blank option indicates that the feature is not active

- Only commands that block the running of daily maintenance (add, change, duplicate, remove, and set) are affected
- All logins will time-out if any of these commands are active for the prescribed time (except for the “blank” option)
- The feature applies to all logins, regardless of type (init, dadmin, craft, inads) or permissions granted to the specific login ID of an administration or maintenance user
- The corresponding “time-out” entry is appended to the list history log

The **Command Time-out** field can be viewed by customer administrators. A craft, init, dadmin, or inads login is required to change the option for the field. Figure 16: change system-parameters maintenance shows the Maintenance-related System Parameters screen for Communication Manager.

Figure 16: change system-parameters maintenance

```
change system-parameters maintenance                            Page  1 of  3
                   MAINTENANCE-RELATED SYSTEM PARAMETERS

OPERATIONS SUPPORT PARAMETERS
     CPE Alarm Activation Level: none

SCHEDULED MAINTENANCE
                                          Start Time: 22 : 00
                                           Stop Time: 06: 00
                                    Save Translation: daily
 Update LSP and ESS Servers When Saving Translations: y
                          Command Time-out (minutes): 60
                         Control Channel Interchange: no
                      System Clocks/IPSI INterchange: no
```

```
change system-parameters maintenance                            Page  3 of  3
                   MAINTENANCE-RELATED SYSTEM PARAMETERS






MAINTENANCE SAVE TRANSLATION CORRUPTION AUDIT
                Enable Translation Audit? y
           Display Warning When Detected? n
                     Alarm When Detected? n
    Block Save Translation When Detected? n
```

DS1-BD (DS1 Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DS1-BD	MAJ MIN	`test board location l`	DS1 Interface circuit pack
	WRN	`test board location`	

The DS1 Interface circuit pack provides an interface to an external DS1 facility and supports 24 DS0 channels carried on a 1.544-Mbps DS1 link. These DS0 channels can be administered as either trunks to other switches or lines to off-premises stations. The TN464C (or later-suffixed) Universal DS1 Interface also supports a 32-channel interface on a 2.048-Mbps link.

The functions and maintenance strategy for the TN464 circuit packs are covered under a separate MO, UDS1-BD (UDS1 Interface Circuit Pack).

The following table shows the capabilities of each DS1 circuit pack. The TN722 and TN722B are not supported on G3r V1 or later systems.

Circuit Pack Code	24-Channel	32-Channel	Tie Trunk Signaling	CO Trunk Signaling	DID Trunk Signaling	OPS Line Signaling
TN722/B	X		X			
TN767/B/C/D/E	X		X	X	X	X
TN464C/D/E/F/GP/HP	X	X	X	X	X	X (24-chl only)
TN2313	X	X	X	X	X	X

ISDN-PRI Trunk signaling (for example, Q.921, Q.931) requires a TN464D or higher suffix, TN2464, or TN2242 (tie trunk signaling only) and is handled by system software. The TN464, TN2464, and TN2242 are covered in UDS1-BD (UDS1 Interface Circuit Pack).

Each trunk and line have their own maintenance strategies. However, they all depend on the health of the DS1 Interface circuit pack. See the following sections for details:

- TIE-DS1 (DS1 Tie Trunk)
- CO-DS1 (DS1 CO Trunk)
- DID-DS1 (Direct Inward Dial Trunk)
- OPS-LINE (DS1 Off-Premises Station Line)
- ISDN-TRK (DS1 ISDN Trunk)
- ISDN-PLK (ISDN-PRI Signaling Link Port).

Signaling over the DS1 link must be synchronized between the transmitting and receiving ends to ensure error-free communication. See SYNC (Port Network Synchronization) for details.

Combined with a TN767E circuit pack, Avaya's 120A Integrated CSU module becomes an enhanced CSU. The 120A CSU, combined with new switch software and the functionality provided by a TN767E's hardware and firmware, provides functionality equivalent to an external stand-alone Avaya ESF T1 CSU. The 120A CSU connects to the TN767E circuit pack on the I/O connector panel on the back of the port carrier, and thus becomes an integrated part of the system. Throughout this document, the term 120A means a 120A (or later-suffixed) CSU.

The 120A CSU and the TN767E are for use in the United States of America with 1.544-Mbps DS1 service. For more information about the 120A CSU module see *Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager.*

A TN767E and a 120A integrated CSU support on-demand loopback tests assisting fault detection between the:

- TN767E circuit pack and the integrated CSU
- Integrated CSU and an optional customer-premises loopback jack
- Integrated CSU and a remote CSU.

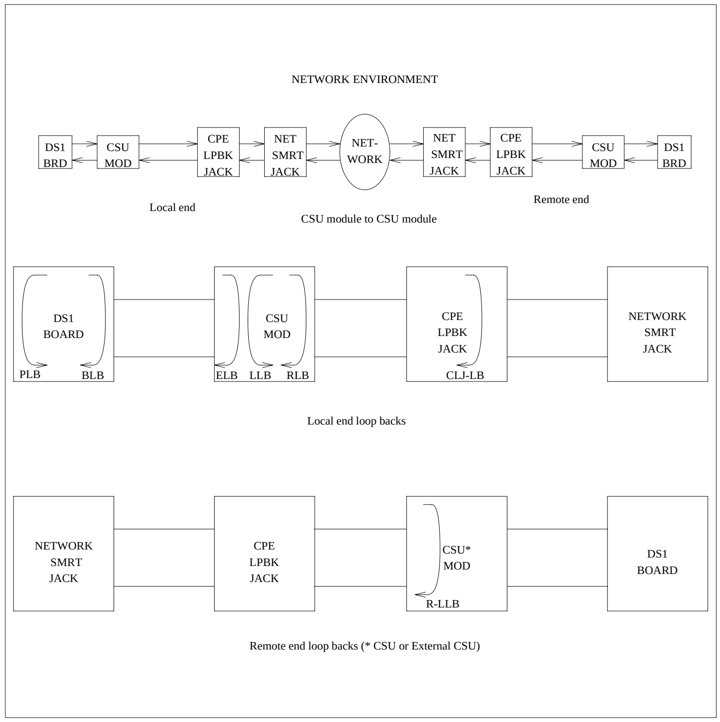
These loopback tests are explained in detail later in this DS1-BD section, but Figure 17: High-Level Overview Of Loopback Points gives a high-level overview of the loopback points.

The following list of acronym definitions are for Figure 17: High-Level Overview Of Loopback Points:

- PLB = Payload Loopback
- BLB = Board Loopback
- ELB = Equipment Loopback
- LLB = Line Loopback
- RLB = Repeater Loopback
- CLJ = Loopback Jack Loopback
- R-LLB = Remote Line Loopback
- SMRT = Smart Jack
- LPBK = Loopback

For more information about DS1 interfaces, refer to the *DEFINITY® Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT1/ISDN-PRI Reference*.

Figure 17: High-Level Overview Of Loopback Points



Error log entries and recommended actions

Table 91: DS1-BD Error Log Entries ***1 of 4***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test board location`
1 (b)	0	Circuit pack removed or SAKI Test failed (#53)	MIN WRN‡	ON	
18 (c)	0	`busyout board location`	WRN	OFF	`release board location`
23 (d)	0		WRN	OFF	`add ds1 location`
125 (e)			MIN	ON	
					1 of 4

Table 91: DS1-BD Error Log Entries ***2 of 4***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257	65535	Control Channel Looparound Test (#52)	MIN	ON	**`test board location l r 2`**
257 (f)	Any				
513 (g)	Any		MIN	ON	
769 (h)	4358				
1025 (i)	4363	NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	OFF	**`test board location`**
1300 (i)	Any	Loss of Signal Alarm Inquiry (#138)	WRN	OFF	**`test board location`**
1301 (j)	Any	Loss of Signal Alarm Inquiry (#138)	WRN	OFF	**`test board location`**
1302 (k)	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	OFF	**`test board location`**
1303 (l)	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	ON	**`test board`** ***`location`***
1310 (m)	Any	Board Loopback test (#1209)	MIN	ON	**`test ds1-loop location ds1/csu-loopback-tests`**
1311 (n)	Any	Equipment Loopback test (#1210)	MIN WRN†	OFF	**`test ds1-loop location ds1/csu-loopback-test`**
1312 (o)	Any	Repeater Loopback test (#1211)	MIN WRN†	OFF	**`test ds1-loop location ds1/csu-loopback-tests`**
1313 (p)	Any	CPE Loopback Jack test (#1212)	MIN WRN†	OFF	**`test ds1-loop location end-loopback/span-test`**
					2 of 4

Table 91: DS1-BD Error Log Entries *3 of 4*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1314 (q)	Any	Far CSU Loopback test (#1213)	MIN WRN†	OFF	**test ds1-loop location end-loopback/span-test**
1320	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	OFF	**test board location**
1321	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	OFF	**test board location**
1322	Any	Loss of Signal Alarm Inquiry (#138)	MIN	ON	**test board location**
1323	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN†	OFF	**test board location**
1324	Any	Loss of Signal Alarm Inquiry (#138)	WRN	OFF	**test board location**
1538 (r)	Any		MIN	ON	
1793	Any	Blue Alarm Inquiry test (#139)	MAJ MIN WRN**	OFF	**test board location**
1794	Any	Blue Alarm Inquiry test (#139)	MAJ MIN WRN**	OFF	**test board location**
1795	Any	Blue Alarm Inquiry test (#139)	MAJ MIN WRN**	OFF	**test board location**
2049	Any	Red Alarm Inquiry test (#140)	MIN WRN†	OFF	**test board location**
2305	Any	Yellow Alarm Inquiry test (#141)	MIN	OFF	**test board location**
2306	Any	Yellow Alarm Inquiry test (#141)	MIN	OFF	**test board location**
2561	Any	Major Alarm Inquiry test (#142)	MIN WRN†	OFF	**test board location**
					3 of 4

Table 91: DS1-BD Error Log Entries ***4 of 4***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2817		Minor Alarm Inquiry test (#143)	MIN WRN†	OFF	`test board location`
3073 to 3160 (s)	Any	Slip Alarm Inquiry test (#144)	MIN WRN†	OFF	`test board location r 6`
3329 to 3345 (t)	Any	Misframe Alarm Inquiry test (#145)	MIN WRN†	OFF	`test board location r 6`
3840 (u)	Any	None			
3900 (v)	Any	CPE Loopback Jack test (#1212)			
3901(w)	Any	Far CSU Loopback test (#1213)			
3902 (x)	Any	One-Way Span test (#1214)			
3999 (y)	Any				
					4 of 4

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to the test's description and follow the recommended procedures.

b. **Error Type 1:** the circuit pack stopped functioning or is not completely administered. The alarm is logged approximately 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be completely administered, a DS1 circuit pack must:

- Have an entry in the circuit plan field in **`change circuit-packs`**
- Be administered using **`add ds1`** ***`location`***
- Be physically inserted in the correct slot

If the circuit pack has an entry in the circuit plan and either of the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error, either:

- Make sure all conditions for administration are met and that a functioning DS1 circuit pack is inserted in the correct slot, or
- Completely remove the DS1-BD from the system:
  1. Remove any administered DS1 trunks or access endpoints associated with the circuit pack from their trunk groups.

2. Execute **remove ds1 *location*** and **change circuit-packs *UU***.

If all the administration conditions are met for this circuit pack and the red LED is still on, follow the instructions in LED alarms without alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

c. **Error Type 18:** the DS1 Interface circuit pack has been busied out by the **busyout board *location*** command. Use **busyout board *location*** to release the circuit pack.

d. **Error Type 23:** the DS1-BD circuit pack is not completely administered. Ensure that the DS1-BD circuit pack has an entry in the circuit plan via **change circuit-packs**, is administered via **add ds1 location**, and is inserted into the correct port slot.

e. **Error Type 125:** the circuit pack in the slot does not match the type administered to that position. Either replace the circuit pack with one of the type administered, or use **change circuit-packs** to re-administer the slot. This error may also indicate that the 24/32-channel selection on the DS1 administration screen does not match the configuration of the circuit pack.

f. **Error Type 257:** transient communication problems between the switch and this circuit pack or media module. Enter **test board *location*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

g. **Error Type 513**: The DS1 Interface circuit pack has detected a transient hardware problem (for example, external RAM failure, internal RAM failure, internal ROM failure, or instruction set failure). This error disappears when no faults are detected for 30 minutes. The value in the `Aux Data` field indicates the type of hardware problem. However, if the **Aux Data** value is in the range of **4352** - **4358**, the circuit pack has reported a hardware failure. Escalate the problem.

h. **Error Type 769:** The DS1 Interface circuit pack detected a transient hardware logic error (for example, program logic inconsistency). This error disappears when no faults are detected for 100 minutes. The value in `Aux Data` field indicates the type of hardware problem.

i. **Error Type 1025:** CSU module or T1 sync splitter missing. The `Near-End CSU Type` field on the **add ds1** screen has been administered as `integrated`, but the 120A CSU or T1 sync splitter is not physically connected (or is improperly connected) to the DS1 board on the back of the port carrier.

If using the 120A CSU or T1 sync splitter, plug (or replug) the CSU or T1 sync splitter into the TN767E circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the `Near-End CSU Type` field using the **change ds1** screen to `other`.

If this error remains after plugging the 120A CSU or T1 sync splitter into the board's connector, there could be a problem with the I/O connector panel.

j. **Error Type 1301:** CSU module/T1 sync splitter not expected. The 120A CSU or T1 sync splitter is physically connected to the TN767E board on the back of the port carrier, but the `Near-End CSU Type` field on the **`add ds1`** screen has not been administered as `integrated`.

   If the 120A CSU or T1 sync splitter is to be used, use **`change ds1`** to change the `Near-End CSU Type` field to `integrated`. Otherwise, physically remove the 120A CSU or T1 sync splitter from the back of the port carrier.

k. **Error Type 1302:** DS1 configuration error. Attempting to use a 120A CSU with a TN767E circuit pack that is configured for 32-channel (2.048-Mbps) operation. This CSU only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America.

l. **Error Type 1303:** DS1 circuit pack suffix incorrect for CSU or T1 sync splitter. The `Near-End CSU Type` field on the **`add ds1`** screen has been administered as `integrated` but the DS1 circuit pack is not a TN767E (or higher-suffixed) DS1 board.

   If the 120A CSU or T1 sync splitter is to be used, remove the circuit pack and replace it with a TN767E (or higher-suffixed) board. Otherwise, use **`change ds1`** to change the `Near-End CSU Type` field to `other`.

m. **Error Type 1310:** BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using **`busyout board location`**, **`test ds1-loop location ds1/csu-loopback-tests`**, **`release board location`**. If the BLB test continues to fail, then the TN767E circuit pack needs to be replaced.

n. **Error Type 1311**: ELB failure. This error occurs when the Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test fails. This test is executed during I-CSU/T1 sync splitter power-up/reset (i.e., the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed) or when the CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The ELB test is also executed as part of **`test ds1-loop location ds1/csu-loopback-tests`**.

   Attempt to clear the alarm with **`busyout board location`**, **`test ds1-loop location ds1/csu-loopback-tests`**, and **`release board location`**. If the ELB test continues to fail, then either the TN767E board, the CSU module, the T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Escalate this problem.

o. **Error Type 1312:** RLB failure. This error occurs when the Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test fails. This test is executed during I-CSU/T1 sync splitter power-up/reset (i.e., the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed) or when the CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command **`test ds1-loop location ds1/csu-loopback-tests`**.

   Attempt to clear the alarm with **`busyout board location`**, **`test ds1-loop location ds1/csu-loopback-tests`**, and **`release board location`**. If the RLB test continues to fail, then the CSU module/T1 sync splitter needs to be replaced.

p. **Error Type 1313:** CPE loopback jack deactivation error. This error occurs when the TN767E circuit pack could not deactivate a CPE loopback jack loopback.

Attempt to clear the alarm with **busyout board location**, **test ds1-loop location end-loopback/span-test**, and **release board location**. If the attempt to deactivate the CPE loopback jack loopback continues to fail, other steps must be taken to deactivate the loopback.

q. **Error Type 1314:** Far CSU Loopback deactivation error. This error occurs when the TN767E circuit pack could not deactivate a far-end CSU loopback on power-up/reset or upon software request.

Attempt to clear the alarm with **busyout board location**, **test ds1-loop location end-loopback/span-test**, **release board location**. If the attempt to deactivate the Far CSU loopback continues to fail, then escalate the problem.

r. **Error Type 1538:** The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

- The common circuit pack-level tests, such as Test #51 and Test #220, are aborting with Error Code 2000.
- The tests run on the ports of this circuit pack are returning NO BOARD.
- A **busyout/release** of the circuit pack has no affect on test results.
- **List configuration** shows that the circuit pack and ports are properly installed.

The circuit pack is isolated from the system and all trunks of this circuit pack are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 Interface circuit pack is restored to normal operation. All trunks of the DS1 Interface circuit pack are then returned to the in-service state. If the error recurs after 15 minutes, then escalate this problem.

s. **Error Type 3160:** this board is receiving slips. The AUX Data displays the last Slip count that was reported.

t. **Error Type 3329 - 3345:** this board is receiving misframes. The AUX Data displays the last misframe count that was reported.

u. **Error Type 3840:** ignore. This error is not service-affecting.

v. **Error Type 3900**: gives status information about a CPE Loopback Jack test. The value in the `Aux Data` field indicates the status of the loopback test:
Aux Data 1: Test is currently running.
Aux Data 2: Test failed because loopback could not be activated.
Aux Data 3: Test failed because test pattern could not be detected.
Aux Data 4: Test has been deactivated.

w. **Error Type 3901**: gives status information about a Far CSU Loopback test. The value in the `Aux Data` field indicates the status of the loopback test.
Aux Data 1: Test is currently running.
Aux Data 2: Test failed because loopback could not be activated.

Aux Data 3: Test failed because test pattern could not be detected.
Aux Data 4: Test has been deactivated.

x. **Error 3902**: gives status information about a One-Way Span test. The value in the `Aux Data` field indicates the status of the span test:
Aux Data 1: Test is currently running.
Aux Data 2: Test failed because loopback could not be activated.
Aux Data 3: Test pattern was not received from the far end.
Aux Data 4: Test has been deactivated.

y. **Error Type 3999**: the circuit pack sent a large number of control-channel messages to the switch within a short period of time. If Error Type #1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type #1538 is absent, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
NPE Audit Test (#50)		X			ND
Control Channel Looparound Test (#52)		X			ND
Loss of Signal Alarm Inquiry Test (#138)	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND
Misframe Alarm Inquiry Test (#145)	X	X			ND
					1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
DS1 Translation Update Test (#146)	X	X			ND
ICSU Status LEDs Test (#1227)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Looparound Test (#135)			X		D
DS1 Board Loopback Test (#1209)				X	D
CSU Equipment Loopback Test (#1210)				X	D
CSU Repeater Loopback Test (#1211)				X	D
CPE Loopback Jack Test (#1212)				X	D
Far CSU Loopback Test (#1213)				X	D
One-Way Span Test (#1214)				X	D
Inject Single Bit Error Test (#1215)				X	D
End Loopback/Span Test (#1216)				X	D
					2 of 2

1. D = Destructive, ND = Nondestructive

DS1-FAC (DS1 Facility)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DS1-FAC	MAJ MIN WRN	**test board** ***location***	DS1 Facility

The DS1-FAC is a part of the DS1 Converter (DS1C-BD) complex. The DS1C-BD complex consists of two TN574 DS1C-BD circuit packs or two TN1654 DS1C-BD circuit packs connected by one to four DS1 facilities. The MO name for the DS1 converter circuit pack is DS1C-BD, and the MO name for the connected DS1 facilities is DS1-FAC.

The TN1654 DS1 Converter circuit pack is a redesign of the TN574 DS1 Converter board. The TN1654 provides functionality equivalent to the TN574, and adds a 32-channel E1 interface for international support as well as circuit-switched wideband connections (NxDS0).

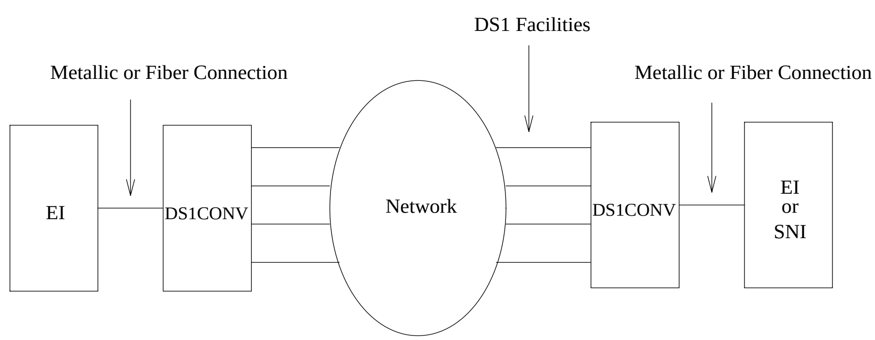
The TN1654 DS1 converter circuit pack is not compatible with the TN574 DS1 converter board or the Y-cable used to interface to the TN574 DS1 converter. A TN573B (or higher-suffixed) SNI board must be used when connecting to the TN1654 DS1 converter board. See DS1C-BD for information about both DS1 converter circuit packs.

The DS1 converter complex is a part of the port-network connectivity (PNC). The DS1 converter complex is used to extend the range of the 32-Mbps fiber links that connect PNs to the Center Stage Switch, allowing PNs to be located at remote sites.

The DS1 converter circuit pack contains on-board firmware that detects DS1 facility alarms and errors, provides status for maintenance software, and runs either background or on-demand tests.

DS1 converter circuit packs are connected to the Expansion Interface (EI) circuit packs (TN570) and the Switch Node Interface (SNI) circuit packs (TN573) as shown in Figure 18: DS1 Converter Complex and the DS1 Facilities.

Figure 18: DS1 Converter Complex and the DS1 Facilities



The DS1 converter complex can replace fiber links between two EIs and fiber links between an PN's EI and an SNI. Fiber links between two SNIs and fiber links between the and the Center Stage Switch (CSS) cot be replaced by a DS1 converter complex.

On the TN574 DS1 converter circuit pack, one of the four DS1 facilities is used as the primary facility (or packet facility), and it is the only facility that can carry packet traffic besides providing circuit connections. The primary facility has 22 channels available for circuit and packet connections. Other facilities each have 24 channels available for circuit connections. On the TN574 primary facility, channels 1 and 24 are not available for packet or for circuit connections. Channel 1 is used for excess packets traffic to prevent packet overflow that might result from zero code substitutions. Channel 24 is the DS1 control channel that carries control link data between the two DS1 converter circuit packs.

The primary facility on the TN1654 DS1 converter circuit pack is restricted to facility A or facility B. The TN1654 provides fixed packet bandwidth of 192 kbps while the TN574 provides packet bandwidth of up to 1408 kbps with a dynamic allocation mechanism that could change packet/ circuit use of individual channels. The first three 64-kbps channels on the primary facility of the TN1654 are reserved as the packet channels. The DS1 control channel will be Channel 24 in T1 mode and Channel 31 in E1 mode. In T1 format the TN1654 provides 24 circuit channels for use on non-primary facilities and 20 circuit channels on the primary facility. E1 format provides 31 circuit channels for use on non-primary facilities and 27 circuit channels on the primary facility.

When there are alarms on the packet facility, DS1 converter circuit pack firmware changes the mapping of the DS1 channels to move the packet traffic to another facility. On TN574 DS1 converter boards, the packet traffic will be moved to another "Digital Data Compatible" facility (as indicated on the fiber link administration screen). On TN1654 DS1 converter boards, the packet traffic will be moved to either facility A or B if available. This mapping is done to keep the packet service operational at all times as the system control links are carried on these packet connections. When packet traffic is moved to another facility, circuit connections on the new facility are torn down and circuit connections on the old (faulty) facility are re-mapped to the new packet facility.

After firmware initialization, facility A, the first facility, is chosen as the default primary facility for both DS1 converter boards.

The TN574 DS1 converter has seven LEDs that provide an indication of the state of the DS1 converter circuit pack and the DS1 facilities. There is a yellow, a green, and a red LED under software and/or firmware control. There are four Green LEDs under hardware control that indicate, for each DS1 facility, whether a receive signal is present for the DS1 facility. From top to bottom these green LEDs correspond to DS1 facilities A, B, C, and D respectively. If one of the four green LED is on, it indicates a signal is present, but it does not imply that the signal is using the correct framing format (ESF or D4) or line coding (ZCS or B8ZS). See section DS1C-BD for the description of the red, the green, and the amber LEDs on the DS1 converter circuit pack.

The TN1654 DS1 converter board has eleven LEDs on its faceplate. The top three system standard LEDs (yellow, green and red) are used to provide an indication of the state of the DS1 converter board. The bottom four LEDs on the TN1654 board are labeled SPAN LEDs. These LEDs are under firmware control. If the facility is not administered, then the LED is not lit. The LED is lit amber if the facility is running alarm free. If the facility is detecting either a red alarm (loss-of-signal or loss-of-frame), a yellow alarm (remote frame alarm) or a blue alarm (AIS signal), the LED is lit red.

The TN1654 DS1 converter circuit pack supports the Wideband Switching feature. The TN574 DS1 converter does not.

DS1 Facility Busyout

Busy out the MO to gracefully disconnect service. Busyout puts the object out-of-service until the repair procedures are completed.

Use **`busyout ds1-facility`** to busy out DS1 facilities. When an attempt is made to busyout the packet facility (or primary facility), the system prints a warning message indicating that the ***`override`*** option must be used to busyout the packet facility. Busying out the packet facility moves the packet traffic to another facility, and disconnects circuit connections on that new facility.

The system does not allow the last packet DS1 facility to be busied out. In this case, busy out the DS1 converter circuit pack instead.

When the **`busyout ds1-facility`** command is executed, software communicates with both DS1 converter circuit packs in the DS1 converter complex. If the board at which the facility is being busied out is not accessible, the abort code 2100 is returned. If the board at the other end of the DS1 converter complex is not accessible, the abort code 105 is returned.

DS1 Facility Administration

DS1 facility administration is a part of the fiber link administration. DS1 options are set on the Fiber Link Administration screen. For critical-reliability systems, the Fiber Link Administration screen contains the DS1 facility options for the B side of the PNC.

DS1 facility administration is explained in the following sections. These descriptions do not provide complete coverage of fiber link administration.

Replacing a DS1 Facility

Disconnecting a DS1 facility is service disrupting except on critical-reliability systems since they have PNC duplication.

For a standard-, duplex-, or high-reliability system (no PNC duplication):

This procedure is destructive.

1. Use **`busyout ds1-facility`** to busy out the DS1 facility.
2. Replace the DS1 facility.
3. Use **`release ds1-facility`** to release the DS1 facility.

For a critical-reliability system (PNC duplication):

This procedure is nondestructive.

1. If the DS1 facility to be replaced is on the active PNC (its amber LED is on solid), use **`reset pnc interchange`** to do a PNC demand interchange. Use **`status pnc`** to determine the active PNC.
2. When the DS1 facility to be replaced is on the standby PNC (if the DS1 facility was originally on the standby PNC or after the PNC interchange has finished), use **`busyout ds1-facility`** to busyout the DS1 facility.
3. Replace the DS1 facility.
4. Use **`release ds1-facility`** to release the DS1 facility.

Installing a DS1 Facility

To install a DS1 facility:

1. Connect the facility.
2. Use **`list fiber-link`** to check the fiber link number.
3. Use **`change fiber-link`** to administer the DS1 facility via the command. Set the `Facility Installed` field to **y** for the facility that is being installed.
4. Use **`busyout board`** to busyout the DS1 converter circuit pack.
5. Use **`test board location long`** to run the DS1 Facilities Connectivity Test (#790), to ensure that the facilities are connected correctly.
6. Use **`release board`** to release the DS1 converter circuit pack.

Removing a DS1 Facility

Removing a DS1 facility is service disrupting in any system configuration, because the DS1 facility administration is similar on both sides of the PNC on critical-reliability systems.

This procedure is destructive.

1. Use **`busyout ds1-facility`** to busyout the DS1 facility.
2. Use **`list fiber-link`** to check the fiber link number.
3. Use **`change fiber-link`** to administer the DS1 facility. Set the `Facility Installed` field to **n** for the facility that is being removed.
4. Disconnect the DS1 facility (or facilities in a critical-reliability system configuration).

DS1 Interface Options

Use fiber link administration to set the following DS1 Interface options. Use **`list fiber-link`** to check the number of the fiber link. Execute **`change fiber-link`** and set the following fields:

Table 92: DS1 Interface Options administration *1 of 3*

Field	Description
Facility Installed	***y*** when the facility is installed. For TN574 DS1 converter boards, facility A must be installed first. Install Facilities B, C and D in any order on any of the four facilities. For TN1654 DS1 converter boards, facility A must be installed first, then B, then C or D. This is required because the primary facility can only reside on facilities A or B.
Passes Far-End Clock	***y*** when the DS1 facility is used as a clock reference for the receive fiber signal. Appears on the Fiber-Link screen for TN574 DS1 converter circuit packs. On the TN1654 DS1 converter board, none of the facilities can be used as a clock reference for the receive fiber signal, and administration of this field is not applicable. DS1 facilities cot be used as system synchronization sources.
Digital Data Compatible	**y** when the DS1 facility is digital data compatible and suitable for carrying packet traffic. Appears on the Fiber-link screen for TN574 DS1 converter circuit packs. The TN574 circuit pack allows any of the four facilities to be used as the primary facility that carries the packet traffic. The TN1654 DS1 converter board allows packet traffic only on facilities A and B, and administration of this field is not applicable.
Bit Rate	Select domestic T1 operation or international E1 operation for all facilities in the TN1654 DS1 converter complex: ● 1.544 Mbps for T1 operation ● 2.048 Mbps for E1 operation Appears on the fiber-link screen only for TN1654 DS1 converter circuit packs. The TN1654 DS1 converter circuit pack is also field configurable for T1 or E1 operation. All four DS1 facilities are configured to either T1 or E1 as a group via an option switch located on the component side of the circuit pack. An error is logged and an alarm is raised if there is a T1/E1 inconsistency between the administered bit rate and the board option switch setting.
	1 of 3

Table 92: DS1 Interface Options administration *2 of 3*

Field	Description
Idle Code	Set the idle code for all facilities on the TN1654 DS1 converter board. This field can accept any combination of ones (1) and zeros (0) with the exception that the second left-most digit must be set to one (1) at all times. Appears on the fiber-link screen for TN1654 DS1 converter circuit packs
CRC	This field determines if CRC is enabled for every facility on a TN1654 circuit pack. The field is ***y*** if a cyclic redundancy check (CRC) is to be performed on transmissions that the board receives. CRC only applies to E1 operation and appears on the Fiber-link screen only for TN1654 DS1 converter circuit packs with a bit rate of 2.048 Mbps.
DS1 Converter-1 and DS1 Converter-2 Line Compensation	The DS1 facility line signal is pre-equalized at the transmitter on the DS1 converter circuit pack so that DS1 line pulses have correct amplitude and shape when they reach the Network Interface (see Figure 19: DS1 Facility Connections). The amount of equalization necessary is determined by the distance to the Network Interface, and also by the type of wiring used to connect to the Network Interface. If the equalization is not set to the correct value, potentially high error rates (errored seconds) will be observed on the DS1 facility. Table 93: DS1 Facility Line Signal Equalization Values explains how equalization values are determined. Line compensation is applicable only to T1 operation, thus these fields will not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 2.048 Mbps.
Line Coding	Administer the line coding for the DS1 facility. For the TN574 board and the TN1654 board in T1 mode, the field may be set to ***ami-zcs*** or ***b8zs***. If the TN1654 board is set for E1 operation, the line coding may be set to either ***ami-basic*** or ***hdb3***. The line coding must be the same at each end of the DS1 converter complex.
	2 of 3

Table 92: DS1 Interface Options administration *3 of 3*

Field	Description
Framing Mode	***esf*** or ***d4*** for the DS1 facility. The same framing mode must be used at each end of the DS1 converter complex. For TN574 DS1 converter boards, this is administrable. For TN1654 DS1 converter boards, this field is display only. The TN1654 has option switches located on the component side of the circuit pack. If T1 operation is selected via the first switch, four additional switches are used to select the framing mode for each facility. Each facility can be set to either D4 or ESF framing. The `Framing Mode` field will display what the switch is set to for the DS1 facility. Framing Mode is applicable only to T1 operation. This field does not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 2.048 Mbps.
Line Termination	Display only, shows the line termination for the DS1 facility on the TN1654 DS1 Converter circuit pack. The TN1654 has option switches located on the component side of the circuit pack. If E1 operation is selected via the first switch, four additional switches are used to select the line termination for each facility. Each facility can be set to either CEPT 75 ohm coaxial or 120 ohm CEPT twisted pair. This line termination field will display what the switch is set to for the DS1 facility. Line Termination is applicable only to E1 operation. This field does not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 1.544 Mbps
Facility Circuit ID	Specify a unique alpha-numeric name for each DS1 facility. This field appears for each facility when **Facility Installed** is ***y***.
	3 of 3

Table 93: DS1 Facility Line Signal Equalization Values *1 of 2*

DS1 Converter-1 and DS1 Converter-2 Line Compensation (cont'd)	**Equalizer Setting**	**Distance to Network Interface (feet)**	
		Cable type 22 AWG ABAM & 24 AWG PDS	**Cable type 26 AWG PDS**
	1	1 to 133	0 to 90
			1 of 2

Table 93: DS1 Facility Line Signal Equalization Values *2 of 2*

DS1 Converter-1 and DS1 Converter-2 Line Compensation (cont'd)	**Equalizer Setting**	**Distance to Network Interface (feet)**	
		Cable type 22 AWG ABAM & 24 AWG PDS	**Cable type 26 AWG PDS**
	2	133 to 266	90 to 180
	3	266 to 399	180 to 270
	4	399 to 533	270 to 360
	5	533 to 655	360 to 450
			2 of 2

DS1 Converter Performance Measurements Report

The DS1 Converter Performance Measurements provide link performance measurements for the DS1 facilities.

When no facility alarms exist on the DS1 facility, events that indicate a degradation in the performance of the DS1 facility are monitored and recorded. These events will generate alarms when performance of the DS1 facility has degraded below acceptable levels. These measurements include errored seconds, bursty seconds, severely errored seconds, and failed seconds.

There are two DS1 Converter Performance Measurements Sub-reports:

- The DS1 Converter Performance Measurements Summary Report provides information about the worst 15-minute interval of data, the total for 24 hours of data and the current 15-minute counter for each of the previously mentioned counters.
- The DS1 Converter Performance Measurements Detailed Report displays a detailed log for the last 96 15-minute intervals for each of the previously mentioned counters.

Access the DS1 Converter Performance Measurements Summary Report with **`list measurements ds1-facility summary location [print | schedule]`**. Access a more detailed version of the report with **`list measurements ds1-facility log location f [print | schedule]`**.

You can reset every hardware- and software-measurement counter for a given facility with **`clear measurements ds1-facility  location f`**. The *Counted Since* time is also reset and the *Number of Valid Intervals* count is set to zero.

The reports are printed on the screen or, by using the **`print`** option, on a printer attached to the terminal.

Clearing Firmware Errors

DS1 converter error reports are generated by firmware autonomously. DS1 converter error reports are not associated with demand tests. The **test board clear** command does not affect the error status known by the DS1 converter firmware. To clear every on-board firmware-detected error unconditionally, use **clear firmware-counters**.

Error log entries and recommended actions

Table 94: DS1-FAC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	test ds1-facility location
1 (b)		Failure Audit #949	MAJ	ON	test board location
18 (c)	0	busyout ds1-facility *location*	WRN	OFF	release ds1-facility location
257 (d)		Failure Audit #949	MIN	ON	test board location
513 (e)	1	Failure Audit #949	MIN	OFF	test board location
513 (e)	2	Failure Audit #949	MIN	OFF	test board location
856 (f)		DS1 Facility Query for Slips/Misframes #972	MIN	OFF	none
1025 (g)		Failure Audit #949	MAJ[1]	OFF	test board location
1281 (h)	None	Failure Audit #949	MAJ[1]	OFF	test board location
1281 (h)	1	Failure Audit #949	MAJ[1]	OFF	test board location
1281 (h)	2	Failure Audit #949	MAJ[1]	OFF	test board location
1537 (i)		Failure Audit #949	MAJ[1]	OFF	test board location
1793 (j)		Failure Audit #949	MAJ[1]	OFF	test board location
2065 (k)		DS1 Facility Query for Slips/Misframes #972	MIN	OFF	none
2305 (l)		Failure Audit #949	MAJ	OFF	test board location
2561 (m)		Failure Audit #949	MIN[1]	OFF	test board location

1. These failures are logged as a WRN alarm when the error is first reported. The alarm severity is raised to a MAJOR in 15 minutes if the problem persists.

Notes:

When problems persist, use **`reset board`** to reset the DS1 converter circuit pack. This may temporarily resolve the error condition and restore service until further assistance is provided.

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 1**: A major failure occurred on the DS1 interface hardware on the DS1 converter circuit pack associated with this DS1 facility. Replace the DS1 converter circuit pack.

c. **Error Type 18:** the DS1 facility has been busied out via the **`busyout ds1-facility`** command. To resolve this error, release the DS1 facility via **`release ds1-facility`**.

d. **Error Type 257**: A minor failure occurred on the DS1 interface hardware on the DS1 converter circuit pack associated with this DS1 facility. Replace the DS1 converter circuit pack.

e. **Error Type 513**: DS1 converter circuit packs in this DS1 converter complex do not match in their framing formats or line coding formats.

   Aux Data 1 indicates that the framing formats (ESF or D4) do not match. For TN574 DS1 converter boards, the framing mode is administered on the fiber-link screen. The TN1654 DS1 converter has option switches located on the component side of the circuit pack. If T1 operation is selected via the first switch, four additional switches are used to select the framing mode for each facility. The `Framing Mode` field on the fiber-link screen is display-only for the TN1654 boards. It displays what the switch is set to for the DS1 facility. It cot be administered.

   Aux Data 2 indicates that the line coding formats do not match. Line Coding is an administrable value on the fiber-link screen. The line coding options are *ami-zcs* or *b8zs* for TN574 boards and TN1654 boards in T1 mode. For TN1654 boards in E1 mode, the line coding options are *ami-basic* or *hdb3*.

   This error should clear in 15 minutes.

   1. Verify that DS1 facility and the network is using the same line coding (ami-zcs, b8zs, ami-basic, hdb3) and framing mode (ESF, D4). Use **`list fiber-link`** and **`display fiber-link`** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network.

      If the framing mode format differs on boards in a TN1654 DS1 converter complex, the DS1 converter board that has its option switch set incorrectly will have to be physically removed from the system in order to set the facility framing mode switch properly.

   2. If the problem persists, reset both DS1 converter circuit packs via the **`reset board`**.
   3. If the problem still persists, replace this DS1 converter circuit pack.
   4. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

f. **Error Type 856**: More than 88 negative and/or positive slip errors occurred. This error clears when there are no slips for 1 hour.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
2. Verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Use **list fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See Line Coding and Framing Mode for details on how these options apply to the TN574 and TN1654 DS1 converter boards.
3. For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in DS1 Converter-1 and DS1 Converter-2 Line Compensation”
4. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.
5. If the problem still persists, replace this DS1 converter circuit pack.
6. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

g. **Error Type 1025**: Loss of Frame Alignment (LFA) Alarm, the RED alarm. This alarm indicates that the DS1 interface associated with the DS1 facility cot frame up on the received data.

For the following repair procedure, see to Figure 19: DS1 Facility Connections and the diagrams in the related test descriptions.

1. If the network is used instead of private T1 lines, check that the DS1 facility and the network are using the same line coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. For TN1654 boards, verify that the two boards in the DS1 converter complex are using the same bit rate. Use **Llist fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to verify the modes set for the network. See Line Coding, Framing Mode, and Bit Rate for details on how these options apply to the TN574 and TN1654 DS1 converter boards.
2. Run the Near-End External Loopback Test (#799) via **test ds1-facility location external-loopback** by setting up a loopback at CPE side of CSU towards DS1 converter circuit pack shown as loopback point **LB 1** in the test description diagram. If the test fails, replace connectors and the cables between CSU and the DS1 converter circuit pack.
3. If the test passes, run the Near-End External Loopback Test (#799) via **test ds1-facility location external-loopback** by setting up a loopback at DS1 facility side of CSU towards the DS1 converter circuit pack shown as loopback point **LB 2** in the test description diagram. If the test fails, replace the CSU.

4. If Test #799 passes, run the Far-End Internal Loopback Test (#797) via **`test ds1-facility location long`**. If Test #797 passes, go to step 6. If the test fails, run the Near-End External Loopback Test (#799) using **`test ds1-facility location external-loopback`** at the other end of the DS1 converter complex, and repeat steps 2 and 3 for the other endpoint.

   If this is not a critical-reliability system and if there is only one DS1 facility, then Test #799 can only be executed at the end that is closer to the server relative to the DS1 converter circuit pack at the end of the DS1 converter complex. If the test cot be executed for this reason, then replace the cables, connectors and the CSU at the other end of the DS1 converter complex.

5. If the problem could not be isolated by the near-end external loopback tests, then the fault should be between CSU A and CSU B. Contact T1 Network Service to resolve the problem(*).

6. If the problem still persists, check for excessive slips and synchronization problems. Enter **`display errors`** and follow the associated repair procedures for any SYNC, TDM-CLK, or SNC-BD errors. For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in DS1 Converter-1 and DS1 Converter-2 Line Compensation.

7. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **`display errors`** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

8. If the problem still persists, replace this DS1 converter circuit pack.

9. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

If D4 framing mode is used, an in-band alarm signal (RFA) will be transmitted that will corrupt the transmit data on this facility.

h. Error Type 1281:

Aux Data None: This entry in the DS1 Facility Error Log occurs only prior to Release V5. The DS1 converter circuit pack's neighbor (the DS1 converter circuit pack at the other end of the DS1 converter complex) is unable to frame up on the signal being sent to it by this DS1 converter circuit pack on this DS1 facility. The far-end facility will be in LFA state. To isolate faults for this case, follow the repair procedure for Error Type #1025 for the other end of the DS1 facility. Note that references to the near and far ends are reversed, for example, the neighbor is now the near end. If D4 framing is used, received data will be corrupted as well as transmitted data.

Aux Data 1: indicates that the facility is detecting a Remote Frame Alarm (RFA), also known as the YELLOW alarm, being sent by the remote DS1 endpoint. This Yellow alarm corresponds to the yellow F2 state documented in CCITT Recommendation I.431. If D4 framing is used, received data will be corrupted in addition to transmitted data.

Aux Data 2: indicates that the facility is detecting a yellow F5 state alarm. This error only applies to TN1654 DS1 converter boards in 32-channel E1 operation with CRC enabled via the fiber-link screen. The F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

The far-end facility will be in LFA state. To isolate faults for this case, follow the same repair procedure as in Error Type #1025 (loss of frame alignment) for the other end of the DS1 facility.

i. **Error Type 1537**: Alarm Indication Signal (AIS), the BLUE alarm. This alarm indicates that the far end of the facility is out of service. This means that the other end of the DS1 facility is undergoing maintenance testing or has a LOS condition and the CSU is providing a Keep Alive signal. If the Keep Alive signal is not supplied by the CSU, a LOS condition will exist on the facility instead of the AIS. If a LOS condition exists on the facility, the green LED on the TN574 DS1 converter circuit pack that is associated with the facility will be off; if an AIS condition exists on the facility, the green LED that is associated with the facility that has the AIS will be on. For TN1654 DS1 converter boards, the LED associated with the facility will be lit red if either the LOS or AIS conditions exist.

To isolate faults for this case, follow the same repair procedure as in Error Type #1793 (loss of signal) for the other end of this DS1 facility.

An RFA alarm indication (YELLOW alarm) is transmitted in response to this BLUE alarm. If D4 framing is used, transmitted data is corrupted.

j. **Error Type 1793**: Loss of Signal (LOS) alarm. This alarm indicates that no signal is present at the DS1 interface associated with the facility. On TN574 DS1 converter boards, the green LED that is associated with the facility will be off. For TN1654 DS1 converter boards, the LED that is associated with the facility will be lit red. If the LED behavior differs, replace the DS1 converter circuit pack.

Fault isolation for this problem may be different depending on the capabilities of the CSU device that is being used. Typically, CSUs provides an LED that is useful for fault isolation (see Figure 20: Typical CSU Maintenance Capabilities). This is the “16 Zeros” LED. This LED is momentarily lit when a string of 16 consecutive zeros is detected in the DS1 signal from the DS1 converter. Zeros on a DS1 link are represented by an absence of a pulse. Thus, an active 16 Zeros LED indicates a LOS alarm from the DS1 converter.

For the following repair procedure, see Figure 19: DS1 Facility Connections and the diagrams in the related test descriptions.

1. If the DS1 facility side LOS indication on CSU A is off (inactive), check for a problem between the DS1 converter A circuit pack and the CPE side of CSU A. Connectors, cables, and the CSU may need to be replaced.
2. If the DS1 facility side LOS indication on CSU A is on (active), check for a problem between the CSU A and the CSU B. Contact T1 Network Service to resolve the problem. DS1 facility may be a private line or it may be connected to the Network. Network Interface (NI) point is where the customer’s maintenance responsibility ends and the DS1 facility vendor’s maintenance responsibility begins. This point ideally is the T, R, T1, and R1 terminals on the rear of the CSU to which the wires of the DS1

facility vendor's DS1 facility is attached. If the NI does not occur at this point, then any cabling between the CSU terminals and the NI is also considered to be part of the CPE. This cable typically runs between the DS1 facility terminals of the CSU and a cross-connect field where the DS1 facility vendor has terminated the DS1 facility. Maintenance responsibility for this portion of the DS1 facility resides with the customer unless other arrangements are made.

3. If the CPE side LOS indication on CSU B is on (active), check for a problem between the CPE side of CSU B and the DS1 converter B circuit pack. Connectors, cables, and the CSU B may need to be replaced.

4. If the CSU A and the CSU B do not provide visual CPE side and DS1 facility side LOS indications, follow the repair procedure that is given for Error Type1025 (loss of frame alignment). Apply the procedure first to the DS1 converter B side instead of the DS1 converter A where the error is reported (external loopback test is not expected to pass if we execute it at this end as long as we have the LOS indication).

   Repair procedure for Error Type #1025 (loss of frame alignment) includes execution of the Near-End External Loopback Test (#799). If this is not a critical-reliability system and if there is only one DS1 facility, then Test #799 can only be executed at the end that is closer to the server relative to the DS1 converter circuit pack at the end of the DS1 converter complex. If the test cot be executed for that reason, then still make the external loopback as if the test was going to be executed, but instead of executing the test, check the green LED at the face plate of the DS1 converter B that is associated with this DS1 facility. If the green LED is off, then replace the connectors, cables, and the CSU B.

5. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

6. If the problem still persists, replace this DS1 converter circuit pack.

If D4 framing is used, an in-band alarm signal (RFA) is transmitted that corrupts transmit data in response to this alarm.

k. **Error Type 2065**: More than 17 misframe errors occurred. This error will clear when there are no misframes for 1 hour.

1. Enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), or SNC-BD (Switch Node Clock Circuit Pack) errors.

2. Verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Use **`list fiber-link`** and **`display fiber-link`** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See Line Coding and Framing Mode for details on how these options apply to the TN574 and TN1654 DS1 converter boards.

3. For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in DS1 Converter-1 and DS1 Converter-2 Line Compensation.

4. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **`display errors`** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.
5. If the problem still persists, replace this DS1 converter circuit pack.
6. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

l. **Error Type 2305**: Facility Packet Channel Loopback Error. This error indicates that the DS1 converter primary facility that carries the packet time slots and DS1 control channel is looped to itself. This error applies only to facilities A and B on TN1654 DS1 converter boards. If both facilities A and B are being used and firmware detects a loopback condition an attempt will be made to switch the primary facility to the other facility. If the other facility is looped, down or not being used, the PN will be down until this loopback is removed.

1. Check the loopback LEDs on both CSU A and CSU B as shown in Figure 19: DS1 Facility Connections to see if a CSU is in a loopback mode. Also check to see if the CSUs have been manually hard-wired into a loopback mode. Remove detected loopbacks.
2. If the CSUs are not in loopback mode, reset both DS1 converter boards via **`reset board`**.

m. **Error Type 2561**: Facility Jitter Alarm. This alarm indicates excessive receive jitter on the DS1 facility. This error only applies to TN1654 DS1 converter boards. The problem is external to the DS1 converter board. It could be caused by bad wiring, a bad device (CSU or repeater) or a bad signal coming in at the Network Interface.

Figure 19: DS1 Facility Connections

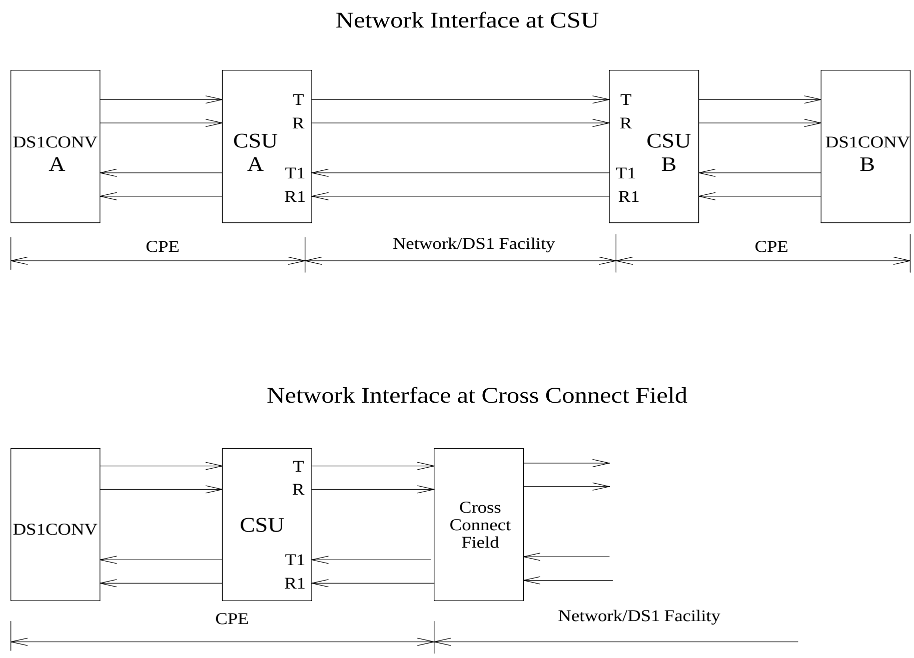
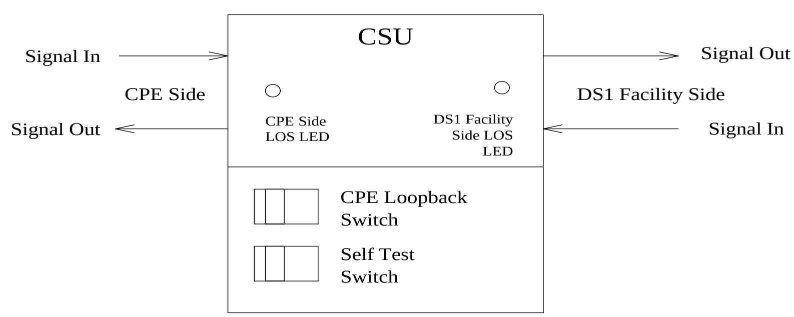


Figure 20: Typical CSU Maintenance Capabilities



Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	External Loopback	D/ND[1]
Failure Audit Test (#949)	X	X		ND
DS1 Interface Options Audit (#798)	X	X		ND
Far-End Internal Loopback Test (#797)		X		D
Near-End External Loopback Test (#799)			X	D

1. D = Destructive; ND = Nondestructive

DS1C-BD (DS1 Converter Circuit Pack)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DS1C-BD	MAJ MIN WRN	`test board` *location*	DS1 converter circuit pack

The DS1 converter complex is part of the port-network connectivity (PNC) consisting of two TN574 DS1 Converter or two TN1654 DS1 Converter circuit packs connected by one to four DS1 facilities. It is used to extend the range of the 32-Mbps fiber links that connect PNs to the Center Stage Switch, allowing PNs to be located at remote sites.

The TN1654 DS1 Converter Circuit pack is a redesign of the TN574 DS1 Converter board. The TN1654 provides functionality equivalent to the TN574 but also adds a 32-channel E1 interface for international support as well as circuit-switched wideband connections (NxDS0).

Every error condition reported by the firmware is associated with background tests that the firmware runs autonomously. Demand tests that are executed by the maintenance software do not cause any new error generation by the firmware. However, the Failure Audit Test (#949) affects auditing of the software error log by forcing the firmware to report the pending errors again.

Maintenance of the DS1 facilities themselves is covered under the “DS1-FAC” MO.

The DS1 converter complex can extend a fiber link between two EIs or between a PN EI and an SNI. Fiber links between two SNIs or between a PN and the Center Stage Switch (CSS) cot be extended.

The TN1654 board is not compatible with the TN574 board. A DS1 converter complex may consist of two TN574 boards or two TN1654 boards, but a TN574 cot be combined with a TN1654 in the same complex. A system with multiple DS1 converter-remoted PNs may contain DS1 converter complexes of both types, TN1654 board-pairs and TN574 board-pairs. Critical-reliability configurations with a pair of DS1 converter complexes serving an PN require identical board pairs and facilities. For example, a TN574 complex and a TN1654 complex may not be used together to serve the same PN in a critical-reliability configuration.

DS1 converter circuit packs connect to TN570 Expansion Interface (EI) circuit packs and TN573 Switch Node Interface (SNI) circuit packs via metallic cables as shown in Figure 21: DS1 converter connection to EIs and SNIs. A fiber link cable can be used instead of the metallic cable if it is necessary to locate the DS1 converter far from the connected EI or SNI circuit pack, for example, in an adjacent cabinet.

The DS1 converter circuit pack can be placed in any regular slot in a PN carrier. However, the DS1 converter circuit pack can only be placed in slots 1 and 21 in a Switch Node (SN) carrier. The DS1 converter circuit pack is not connected to the TDM bus or the SN backplane. Communication to the circuit pack is done through the connected EI or the SNI circuit packs. Therefore, there is considerable interaction between the DS1 converters and the connected EIs and the SNIs. A special “Y” cable connects the DS1 converter circuit pack to the Fiber Endpoint and to the facilities.

Note:

The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

The TN573 SNI circuit pack is incompatible with the TN1654 board. A TN573B (or higher-suffixed) SNI board must be used when connecting to a TN1654 board. The TN573B SNI board is fully backward compatible with the TN573 board and can be connected to either TN1654 or TN574 boards.

Note:

A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 board. Error 125 will be logged and an on-board minor alarm will be generated against the SNI board if it is incompatible with the TN1654 circuit pack.

Figure 22: DS1 converter Complex in Direct Connect PNC and Figure 23: DS1 Converter Complex in Duplicated PNC with 1 SN show DS1 converter connections in a direct-connect PNC configuration and between the CSS and an PN in a critical-reliability system configuration (duplicated PNC).

Figure 21: DS1 converter connection to EIs and SNIs

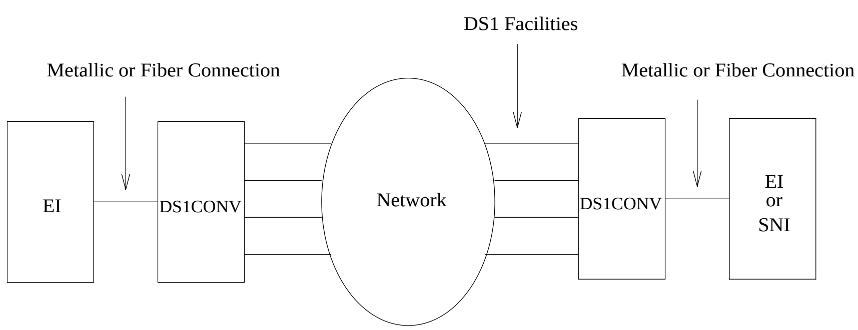


Figure 22: DS1 converter Complex in Direct Connect PNC

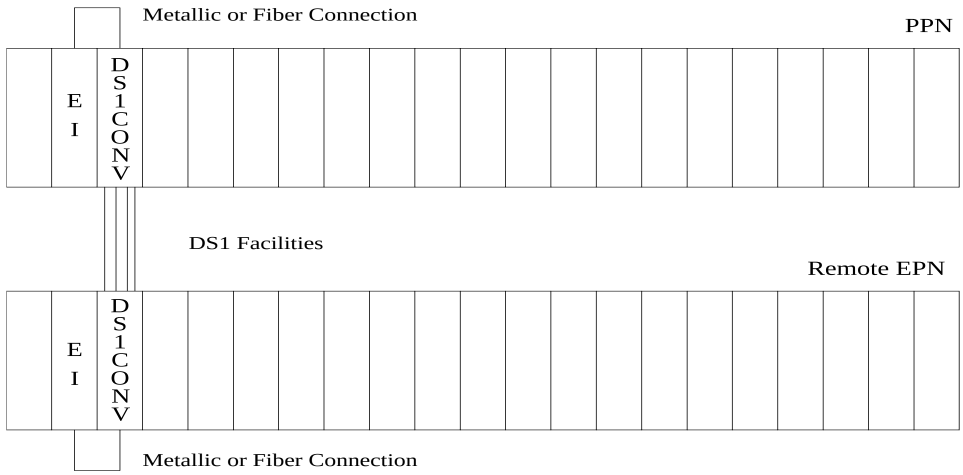
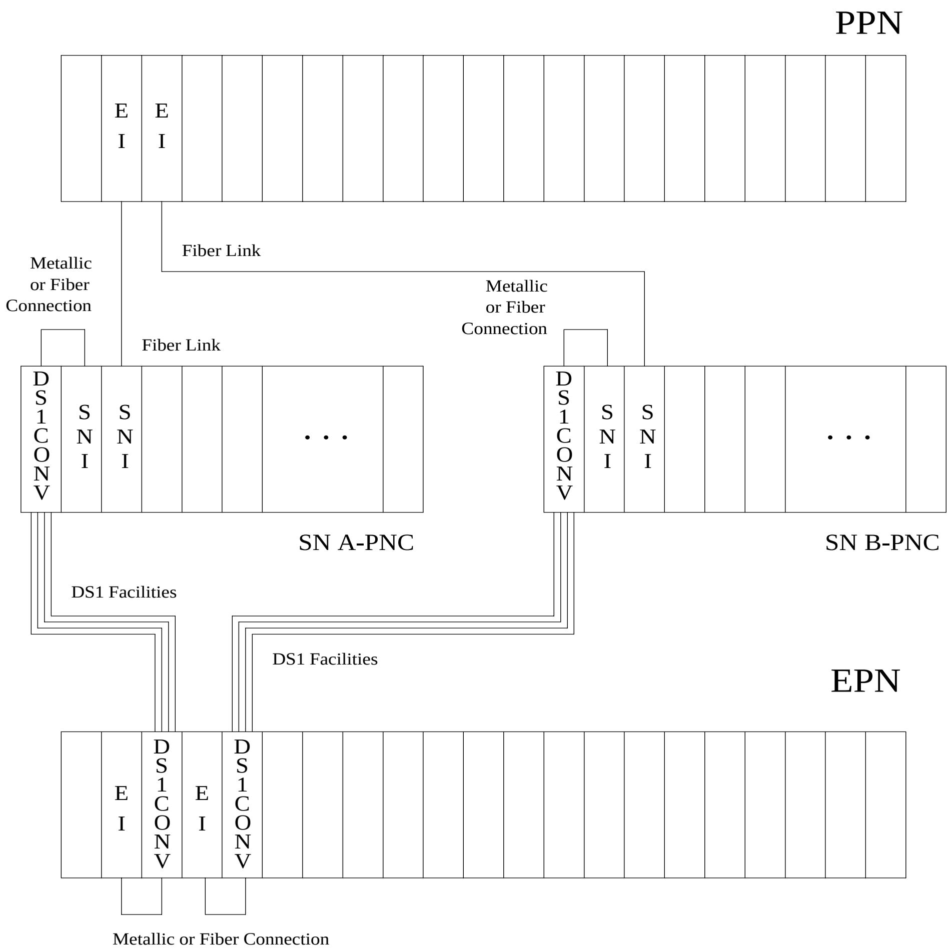


Figure 23: DS1 Converter Complex in Duplicated PNC with 1 SN



DS1 Converter Administration and Board Insertion

Board insertion is the detection of a circuit pack by the system. The DS1 converter circuit pack will not be inserted unless the circuit pack type, TN574 or TN1654, is entered into the associated field in circuit pack administration screen. The Fiber Endpoint (the EI or the SNI) must also be inserted and be operational for the DS1 converter circuit pack to function.

Fiber link administration must be completed before the DS1 converter maintenance can be operational. Fiber links are administered via **`add fiber-link`**. Fiber Endpoints, DS1 converter circuit pack locations and DS1 facility options are entered as a part of the fiber link administration.

To administer a standard-, duplex-, or high-reliability system (no PNC duplication):

1. Administer carriers via **`add/change cabinet`**.
2. Administer circuit packs via **`change circuit-pack`**.
3. Administer connectivity and the facility options of the DS1 converter complex via **`add/change fiber-link`**.

To administer a critical-reliability system (PNC duplication):

1. Enable PNC duplication feature using the **`change system-parameter customer-option`**.
2. Administer carriers via **`add/change cabinet`**.
3. Administer circuit packs via **`change circuit-pack`**.
4. Administer connectivity and the DS1 facility options of each DS1 converter complex via **`add/change fiber-link`**.
5. Turn on PNC duplication via **`change system-parameter duplication`**.

TN1654 Board Configuration Switch Settings

The TN1654 DS1 converter circuit pack is field configurable for T1 or E1 operation so that a single board serves worldwide application. All four DS1 facilities are configured to either T1 or E1 as a group via an option switch located on the component side of the circuit pack. If T1 operation is selected, four additional switches are used to select the framing mode for each facility. Each facility can be set to either D4 or ESF framing. If E1 operation is selected, the same four switches are used to select the E1 facility line termination impedance. The E1 line termination impedance for each facility can be set to either 120Ω for twisted-pair or 75Ω for coaxial wiring.

T1 or E1 operation must also be administered for the TN1654 DS1 converter board on the fiber-link screen via the `Bit Rate` field. An error will be logged and an alarm will be raised if there is a T1/E1 inconsistency between the administered bit rate and the board option switch setting.

The T1 facility framing mode and the E1 facility line termination impedance are defined by the option switch settings only. Administration of these values is not allowed. The fiber-link screen will display the selected option switch settings for each facility.

DS1 Converter LEDs

The TN574 board has seven LEDs on its faceplate. The TN1654 board has eleven LEDs on its faceplate. The top three system standard LEDs are used to provide an indication of the state of the DS1 converter board. These LEDs are under firmware control until the board has established a link to the server via the EI or SNI. Once the link is established, software controls the three LEDs. If the link breaks, the LEDs are again under firmware control.

The red and green LEDs have the traditional use where red means an alarm condition and green indicates that maintenance testing is in progress. The red and green LED is also turned on during circuit pack initialization by firmware. When the control link to the circuit pack is lost, firmware controls the red LED to indicate an alarm condition.

The amber LED indicates the state of the:

- Physical fiber interface
- Fiber channel (link to EI or SNI)
- DS1 control channel (link to opposite DS1 converter board)
- Server communications link

in the following mer and descending order of priority. (The amber LED stays lit longer as the DS1 converter complex approaches full operation.)

1. If the fiber is out of frame or is in a loss-of-signal condition, the amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).
2. If the fiber channel is down (DS1 Converter circuit pack/fiber endpoint communications), the amber LED will flash at a 1-Hz rate (on for ½ second, off for ½ second).
3. If the DS1 control channel is down between the two DS1 converters in the DS1 converter complex, the amber LED will pulse at a 1/2-Hz rate (on for 1 second, off for 1 second).
4. If the server communications link is down, the amber LED will wink off every 2 seconds for 200 msec (2 seconds on, 0.2 second off).
5. If all is well with the Fiber Interface and every communications channel, the amber LED will remain on continuously in a standard-, duplex-, or high-reliability system. In a critical-reliability system (duplicated PNC):
   - An active DS1 converter circuit pack's amber LED remains on continuously.
   - A standby DS1 converter circuit pack's amber LED remains off.

   The LED will then be under software control.

The bottom four green LEDs on the TN574 DS1 converter board are under hardware control. The four green LEDs indicate, for each DS1 converter facility, whether a receive signal is present for the DS1 facility.

The next four LEDs on the TN1654 DS1 converter board are labeled STATUS LEDs and are for future use. These LEDs will not be lit.

The bottom four LEDs on the TN1654 board are labeled SPAN LEDs. These LEDs are under firmware control. If the facility is not administered, then the LED is not lit. The LED is lit amber if the facility is running alarm free. If the facility is detecting either a red alarm (loss-of-signal or loss-of-frame), a yellow alarm (remote frame alarm) or a blue alarm (AIS signal) then the LED is lit red. The SPAN SELECT Switch on the TN1654 faceplate is for future use. Pushing the switch will have no affect on the board.

Clear Firmware-Counters Command

DS1 converter firmware generates error reports autonomously. This takes place independently of demand tests. The **test board *location* clear** command will not affect the error status reported by firmware. The **clear firmware-counters** command clears every on-board firmware-detected error unconditionally.

The **clear firmware-counters *location*** command sends a downlink message to the DS1 converter circuit packs, causing them to clear out their firmware error counters and failure databases. Once the firmware failure database is cleared, the Failure Audit Test (#949) will pass. If problems still exist, the firmware will increment its error counters and the failure audit test will begin failing again.

This command should not be used as a replacement for the repair procedures associated with the error log entries. This command may be useful if a problem has been fixed and off-board alarms associated with the problem are still active.

Downtime Required when Upgrading to TN1654 DS1 Converter Circuit Packs

Upgrading from TN574 DS1 converter circuit packs to TN1654 DS1 converter circuit packs will require down time for the affected PN.

The TN1654 DS1 Converter circuit pack is not compatible with the TN573 SNI circuit pack, the TN574 DS1 converter board, the Y-cable used to connect to the TN574 DS1 converter board or pre-G3V5 software. All DS1 converter boards and Y-cables must be upgraded. If the PN is remoted via a Center-Stage Switch, the connected SNI must also be upgraded. A TN573B (or higher-suffixed) SNI board must be used when connecting to a TN1654 DS1 converter board.

Use **remove fiber-link** to remove the fiber-link administration for the TN574 DS1 converter complex. Use **change circuit-pack** show that TN1654 boards are now being used. Then use **add fiber-link** to administer the TN1654 DS1 converter complex.

Replacing a DS1 Converter Circuit Pack with the Same Type DS1 Converter Circuit Pack — Unduplicated PNC

Do not power down a Switch Node carrier to replace a circuit pack.

Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface or DS1 Converter circuit pack on an unduplicated system disrupts service. The service effect can range from outage of a single PN to outage of the entire system.

A DS1 Converter complex must consist of two TN574 boards or two TN1654 boards. A TN574 cot be combined with a TN1654 in the same DS1 converter complex.

Steps	Comments
Enter **`busyout board location`**.	location represents the cabinet-carrier-slot address of the circuit pack to be replaced.
Replace the circuit pack with the same DS1 converter board type.	
Wait for the circuit pack to reset.	Red and green LEDs will light and then go out.
Enter **`release board`** ***`location`***	CAUTION: *Do not busyout any Expansion Interface circuit packs after this point.*
Enter **`test alarms long clear`** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, FIBER-LK, and DS1C-BD alarms to clear, or enter **`clear firmware-counters a-pnc`**.	

Replacing a DS1 Converter Circuit Pack with the Same Type DS1 Converter Circuit Pack—Duplicated PNC

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WRN alarm against TDM-CLK with Error Type #2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

Steps	Comments
Enter **`status pnc`**.	Verify that the component to be replaced is on the standby PNC.
Enter **`busyout pnc`**.	
Enter **`busyout board location`**.	location represents the cabinet-carrier-slot address of the circuit pack to be replaced.
Replace the circuit pack with the same DS1 converter board type.	
Enter **`release board`** ***`location`***.	CAUTION: *Do not busyout any Expansion Interface circuit pack after this point.*
Enter **`test alarms long clear`** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C-BD alarms to clear, or enter **`clear firmware-counters`** <***`a-pnc`*** or ***`b-pnc`***>.	Use the letter designation of the pnc that holds the replaced component (the standby pnc).
Enter **`status pnc`**.	If either PNC's state of health is not "functional", consult the PNC-DUP section of the Maintenance Manual.
Enter **`release pnc`**.	

Do not power down a Switch Node carrier to replace a circuit pack.

Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface or DS1 Converter circuit pack on an unduplicated system disrupts service. The service effect can range from outage of a single PN to outage of the entire system.

A DS1 Converter complex must consist of two TN574 boards or two TN1654 boards. A TN574 cot be combined with a TN1654 in the same DS1 converter complex.

The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 DS1 Converter board.

Steps	Comments
Enter **`list fiber-link`**	Determine the fiber-link number associated with the two TN574 circuit packs to be upgraded.
Enter **`busyout fiber-link`** ***`fiber#`***	***Fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complex that is being upgraded to a TN1654 DS1 converter complex.
Enter **`remove fiber-link`** ***`fiber#`***	
Remove the TN574 DS1 converter circuit packs from the system.	
Replace the TN574 Y-cables with TN1654 Y-cables.	
Replace the removed TN574 DS1 converter circuit packs with TN1654 DS1 converter circuit packs. Prior to installing the TN1654 boards, review the prior section, *TN1654 Board Configuration Switch Settings*.	
If a TN1654 DS1 converter board is connected to an SNI board, upgrade the SNI to a TN573B or greater.	
Wait for the circuit packs to reset	Red and green LEDs will light and then go out.
	1 of 2

Steps	Comments
Enter **`change circuit-packs`** ***`cabinet #`***. Update the screen to show that TN1654 boards are now being used instead of TN574 boards. Also update the connected SNI, if applicable, to suffix B.	***Cabinet #*** represents the cabinet associated with a DS1 converter board. The *change circuit-packs* screen needs to be updated for both DS1 converter boards. Also, if needed, re-add translations for connected EI boards.
Enter **`add fiber-link`** ***`fiber#`*** to re-add the fiber-link using TN1654 DS1 converter circuit packs.	***`Fiber#`*** represents the fiber-link number associated with the TN574 DS1 converter complex that is being upgraded to a TN1654 DS1 converter complex
Enter **`test alarms long clear`** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, FIBER-LK AND DS1C-BD alarms to clear, or enter **`clear firmware-counters a-pnc`**	
	2 of 2

Upgrading TN574 DS1 Converter Circuit Packs in a Fiber-Link to TN1654s — Duplicated PNC

Do not power down a Switch Node carrier to replace a circuit pack.

In duplicated PNC configurations, one DS1 converter complex in the fiber-link serves as the active and the second DS1 converter complex serves as the standby. Each DS1 Converter complex consists of two TN574 boards or two TN1654 boards. A TN574 cot be combined with a TN1654 in the same DS1 converter complex. It is also required that all four DS1 converter boards and interconnecting facilities that serve an PN be of the same type. Note, however, that TN574 and TN1654 boards can coexist within the same system, they just cot be in the same fiber-link.

The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 DS1 Converter board.

Table 95: Upgrading TN574 DS1 Converter Circuit Packs in a fiber-link to TN1654s — Duplicated PNC ***1 of 2***

Steps	Comments
Enter **`status pnc`**.	Verify that the A-PNC is active. If the B-PNC is active, enter the reset pnc interchange command to cause the A-PNC to go active.
Enter **`busyout pnc-standby`**.	Fiber link cot be removed if PNC duplication is operational. Must busyout the standby PNC first.
Enter change system-parameters duplication. Change the `Enable Operation of PNC Duplication` field to **n**.	Disable PNC duplication.
Enter **`list fiber-link`**.	Determine the fiber-link number that the four TN574 circuit packs to be upgraded are associated with.
Enter **`busyout fiber-link`** ***`fiber#`***.	***`fiber#`*** represents the fiber-link number associated with the TN574 DS1 converter complexes that are being upgraded to TN1654 DS1 converter complexes.
Enter **`remove fiber-link`** ***`fiber#`***.	
	1 of 2

Table 95: Upgrading TN574 DS1 Converter Circuit Packs in a fiber-link to TN1654s — Duplicated PNC ***2 of 2***

Steps	Comments
Remove the four TN574 DS1 converter circuit packs from the system.	
Replace the TN574 Y-cables with TN1654 Y-cables.	
Replace the removed TN574 DS1 converter circuit packs with TN1654 DS1 converter circuit packs. Prior to installing the TN1654 boards, review the prior section, *TN1654 Board Configuration Switch Settings*.	
If a TN1654 DS1 converter board is connected to an SNI board, upgrade the SNI to a TN573B or greater.	
Wait for the circuit packs to reset.	Red and green LEDs will light and then go out.
Enter **change circuit-packs** ***cabinet#***. Update the screen to show that TN1654 boards are now being used instead of TN574 boards. Also update the connected SNI, if applicable, to suffix B.	***cabinet#*** represents the cabinet associated with a DS1 converter board. The *change circuit-packs* screen needs to be updated for all four DS1 converter boards. Also, if needed, re-add translations for connected EI boards.
Enter **change system-parameters duplication**. Enter **y** in Enable Operation of PNC Duplication field.	Enable PNC duplication.
Enter **add fiber-link** ***fiber#*** to re-add the fiber-link using TN1654 DS1 converter circuit packs.	***fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complexes that are being upgraded to TN1654 DS1 converter complexes.
Enter **test alarms long clear** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK and DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc | b-pnc**.	
Enter **status pnc**.	If either PNC's state of health is not "functional", consult the PNC-DUP section of the Maintenance Manual.
	2 of 2

Converting DS1-CONV Complex to Direct-Connect Fiber (duplicated PNC)

Note:

The following procedure is generic in its scope. Check the customer's switch configuration for EI/SNI structures.

Do not power down a Switch Node carrier to replace a circuit pack.

In duplicated PNC configurations, one DS1-CONV complex in the fiber-link serves as the active and the second DS1-CONV complex serves as the standby. Each DS1 Converter complex consists of two TN574 or TN1654 circuit packs.

Table 96: Convert from DS1-CONV to direct-connect fiber in a duplicated PNC *1 of 2*

Step	Command/Step	Description
1.	**`status pnc`**	Verify that the A-side is active. ● If the B-PNC is active, enter **`reset pnc-interchange`** ● Then verify that the A-side is active (**`status pnc`**).
2.	**`busyout pnc-standby`**	Busyout the duplicated switch side.
3.	**`change system-parameters duplication`**	Disable PNC duplication by changing the `Enable Operation of PNC Duplication` field to **n**.
4.	**`list fiber-link`**	Lists administered fiber connections by number. Select the link number associated with the DS1-CONV complex that you are removing.
5.	**`busyout fiber link n`**	Busyout the fiber link of interest. The fiber link number (step 6) is **n** for this command.
6.	**`remove fiber link`** ***`n`***	Remove the link administration for this link.
7.	**`change circuit-pack`** ***`cabinet`***	Remove the DS1-CONV administration for the four designated circuit packs. ***`cabinet`*** is the cabinet number where these DS1-CONV complexes reside.
		1 of 2

Table 96: Convert from DS1-CONV to direct-connect fiber in a duplicated PNC *2 of 2*

Step	Command/Step	Description
8.	Remove the DS1- CONV hardware.	Remove the 4 TN574 or TN1654 DS1-CONV circuit packs and Y-cables. The TN1654 and TN574 DS1-CONV boards use unique “Y” cables that are incompatible with each other. Reuse these cables only with the proper circuit pack.
9.	Install fiber-optic cable.	Add the lightwave transceivers (multimode 9823A or single-mode 300A) to match the lightguide fiber. Add these to the EIs and SNIs formerly connected to the DS1 converter circuit packs. Connect the lightwave transceivers with lightguide fiber.
10.	Check fiber-optic cable connections.	Ensure that the fiber-optic cables are securely connected to the lightwave transceivers that are attached to the designated circuit packs through the connections on the back of the cabinet.
11.	**`add fiber-link`** ***`n`***	Administer the new EI/SNI fiber connection.
12.	**`change system-parameters duplication`**	Enable PNC duplication by changing the `Enable Operation of PNC Duplication` field to **`y`**.
13.	Enter **`test alarms long clear`** for category **exp-intf**.	
14.	Wait 5 minutes.	SNI-BD, SNI-PEER, FIBER-LK and EXP-INTF MOs need time to clear (or enter **`clear firmware-counters`** ***`a-pnc`*** **`or`** ***`b-pnc`***)
15.	Enter **`status pnc`**.	If either PNC’s state of health is not `functional`, consult the PNC-DUP MO.
		2 of 2

Removing Fiber Connectivity to an PN

This procedure covers removing the connectivity to an PN or between SNs. Removing an PN and its associated carrier and circuit packs can be handled on a board-type basis.

If this system is duplicated, start with step 1; otherwise, start with step 6.

Note:

The following procedure is generic in its scope. Check the customer's switch configuration for EI/SNI structures.

Do not power down a Switch Node carrier to replace a circuit pack.

In duplicated PNC configurations, one DS1-CONV complex in the fiber-link serves as the active and the second DS1-CONV complex serves as the standby. Each DS1 Converter complex consists of two TN574 or TN1654 circuit packs.

Table 97: Removing Fiber Connectivity from a PN *1 of 2*

Step	Command/Step	Description
1.	**status pnc**	Verify that the A-side is active. 1. If the B-PNC is active, enter **reset pnc-interchange** 2. Verify that the A-side is active (**status pnc**).
3.	**busyout pnc standby**	Busyout the duplicated switch side.
4.	**change system-parameters duplication**	Disable PNC duplication by setting the Enable Operation of PNC Duplication field to **n**.
5.	**list fiber-link**	List administered fiber connections by number. Record the endpoints (EIs, SNIs, and DS1Cs), and fiber link numbers that you are removing.
6.	**busyout fiber-link *n***	Busyout the fiber link of interest. The fiber link number (step 4) is ***n*** for this command.
7.	**remove fiber- link *n***	Remove the link administration for this link.
8.	**change system-parameters duplication**	Enable PNC duplication by changing the Enable Operation of PNC Duplication field to **y**.
9.	Physically remove the a-pnc and b-pnc fiber endpoint circuit packs	Physically remove EI, SNI, and DS1C circuit packs associated with the b-pnc.
		1 of 2

Table 97: Removing Fiber Connectivity from a PN *2 of 2*

Step	Command/Step	Description
10.	**change circuit-pack**	Un-administer the PNC circuit packs.
11.	**clear firmware**	Clear any alarms or errors against those circuit packs.
12.	**status pnc**	Use **status pnc** to ensure that the PNC is in good health.
		2 of 2

Downgrading from Critical to High Reliability

The strategy this downgrade follows is to change from critical to high reliability. High reliability is actually duplication of the server, control network, and IPSIs without duplicate paths from IPSIs to CSS.

Table 98: Downgrading from Critical to High Reliability *1 of 2*

Step #	Command/Step	Description
1.	**status pnc**	Check to see if A-side is active. If not: 1. Resolve any alarms against a-pnc. 2. **reset pnc-interchange** to activate a-pnc.
3.	**busyout pnc-standby**	Busyout the standby PNC.
4.	**change system-parameters duplication**	Disable PNC duplication by setting the `Enable Operation of PNC Duplication` field to **n**.
5.	**list fiber-link**	Lists administered fiber connections by number.
6.	**change fiber-link *n***	**Change fiber** removes the b-pnc endpoints (EI, DS1Cs, if equipped). ***n*** is the number of the fiber from step 4. Repeat this step for every fiber from step 4.
		1 of 2

Table 98: Downgrading from Critical to High Reliability ***2 of 2***

Step #	Command/Step	Description
7.	Physically remove the b-pnc endpoint circuit packs	Start with the switch carrier most distant from the server. Physically remove EI, SNI, and SNC circuit packs associated with the b-pnc. Remove fiber cable not used for b-pnc carriers. See the following CAUTION.
8.	**`change circuit-packs`**	Update the translations for the removed circuit packs using **`change circuit-packs`** for the: ● Cabinet with b-pnc SN carrier – SNIs – SNCs – EIs and DS1Cs, if any ● Cabinet with b-pnc SN carrier – DS1Cs from port carrier ● Cabinet with b-pnc EIs in every PN (also DS1Cs, if equipped)
9.	**`change cabinet`** ***`UU`***	Remove the b-pnc SN carrier.
10.	Disable duplication.	Obtain a license file to disable PNC duplication.
		2 of 2

CAUTION:
The removal of hardware and fiber cable will interrupt service.

Note:
At this point in the downgrade procedure, the system is in unduplicated mode and is operational. The physical removal of the SN carriers may be done at a time that is convenient for the customer. The next step in the downgrade is to follow the normal upgrade procedures from standard to high reliability.

Error log entries and recommended actions

Table 99: DS1C-BD Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test board location`
1 (b)		Failure Audit test (#949)	MAJ	ON/OFF	`test board location`
18 (c)	0	`busyout board UCSS`	WRN	OFF	`release board UCSS`
125 (d)	3	None	MIN	ON	
218 (e)	any	None	MAJ	ON	
257 (f)		Failure Audit test (#949)	MIN	ON	`test board location`
513 (g)	1	Failure Audit test (#949)	MAJ	ON	`test board location`
513 (h)	2	Failure Audit test (#949)	MAJ	ON	`test board location`
513 (i)	3	Failure Audit test (#949)	MAJ	ON	`test board location`
513 (j)	4	Failure Audit test (#949)	MAJ	ON	`test board location`
513 (k)	5	Failure Audit test (#949)	MAJ	ON	`test board location`
769 (l)	1	Failure Audit test (#949)	MIN	ON/OFF	`test board location`
769 (m)	2	Failure Audit test (#949)	MIN	ON/OFF	`test board location`
769 (n)	3	Failure Audit test (#949)	MIN	ON/OFF	`test board location`
769 (o)	5	Failure Audit test (#949)	MIN	ON/OFF	`test board location`
769 (p)	6	Failure Audit test (#949)	MIN	ON	`test board location`
					1 of 2

Table 99: DS1C-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
769 (q)	7	Failure Audit test (#949)	MIN	ON	`test board location`
1281(r)		Failure Audit test (#949)	MIN	OFF	`test board location`
1537 (s)		Failure Audit test (#949)	MAJ	OFF	`test board location`
1793 (t)		Failure Audit test (#949)	MAJ	OFF	`test board location`
2049 (u)		Failure Audit test (#949)	MAJ	OFF	`test board location`
3329 (v)		Failure Audit test (#949)	WRN	OFF	`test board location`
					2 of 2

Notes:

When problems persist, resetting the DS1 converter circuit pack via **`reset board`** may temporarily resolve the error condition and restore service until further assistance is provided.

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. **Error Type 1**: If the alarm is on board, then a major hardware error has occurred in a common part of the circuit pack, not circuit or packet specific. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a major hardware error has occurred in a common part of the circuit pack, or a good clock signal cot be recovered from the synchronization source. The synchronization source can be the fiber link or any one of the DS1 facilities.

1. Enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.
2. Enter **`display errors`** and follow the associated repair procedures for any FIBER-LK (Fiber Link) and DS1-FAC (DS1 Facility) errors.
3. If the problem persists, replace the DS1 converter circuit pack.

c. **Error Type 18**: the DS1 converter circuit pack has been busied out via **`busyout board`**. To resolve this error, release the DS1 converter circuit pack via the **`release board`**.

d. **Error Type 25**: The 24/32-channel option switch setting on the TN1654 circuit pack does not match the administered Bit Rate on the fiber-link screen. If the on-board switch setting is wrong, the circuit pack must be physically removed to change the setting of the board option switch. If the administered bit rate is wrong, use **`change fiber-link`** to correct it.

e. **Error Type 218**: The DS1 converter board is physically installed in a slot different than its administered slot. Remove the DS1 converter board and install it in its administered slot or execute **`remove fiber-link`** followed by **`add fiber-link`** to re-add the fiber-link setting the DS1 converter board's administered location to the physically installed slot.

f. **Error Type 257**: A minor hardware error has occurred in a common part of the circuit pack, not circuit or packet specific. Replace the DS1 converter circuit pack.

g. **Error Type 513, Aux Data 1**: A major hardware problem has occurred that affects only circuit data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

h. **Error Type 513, Aux Data 2**: A major hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

i. **Error Type 513, Aux Data 3**: A major hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

j. **Error Type 513, Aux Data 4**: A major hardware problem has occurred that affects only packet data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

k. **Error Type 513, Aux Data 5**: A major lightwave transceiver transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. Replace the DS1 converter circuit pack.

l. **Error Type 769, Aux Data 1**: This error only applies to TN574 DS1 converter circuit packs.

   If the alarm is on board, then a minor hardware problem has occurred that affects only circuit data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

   If the alarm is off board, then either a minor hardware problem has occurred that affects only circuit data being received into the DS1 converter circuit pack or a good clock signal cot be recovered from one of the DS1 facilities.

   1. Enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.
   2. Enter **`display errors`** and follow the associated repair procedures for any DS1-FAC (DS1 Facility) errors.
   3. If the problem persists, replace the DS1 converter circuit pack.

m. **Error Type 769, Aux Data 2**: This error only applies to TN574 DS1 converter circuit packs.

If the alarm is on board, then a minor hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack or a good clock signal cot be recovered from the fiber channel.

1. Enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.
2. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF (Expansion Interface Circuit Pack), SNI-BD (SNI Circuit Pack), and FIBER-LK (Fiber Link)errors.
3. If the problem persists, replace the DS1 converter circuit pack.

n. **Error Type 769, Aux Data 3**: *This error only applies to TN574 DS1 converter circuit packs*.

If the alarm is on board, then a minor hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack or corrupted packets are being received from the packet facility.

1. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF (Expansion Interface Circuit Pack), SNI-BD (SNI Circuit Pack), and DS1-FAC (DS1 Facility) errors.
2. If the problem persists enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.
3. If the problem still persists, replace the DS1 converter circuit pack.

o. **Error Type 769, Aux Data 5**: If the alarm is on board, then a minor FOI transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor FOI transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. or corrupted packets are being received from the packet facility.

1. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF (Expansion Interface Circuit Pack), SNI-BD (SNI Circuit Pack), and DS1-FAC (DS1 Facility) errors.
2. If the problem persists enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.

3. If the problem still persists, replace the DS1 converter circuit pack.

p. **Error Type 769, Aux Data 6**: A minor FOI receive error occurred that affects data received from the DS1 facility and transmitted to the fiber link. Replace the DS1 converter circuit pack.

q. **Error Type 769, Aux Data 7**: A minor on-board hardware failure exists on the processor/control hardware on the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

r. **Error Type 1281**: For TN574 DS1 converter boards, this error indicates that the facility masks or the clock reference masks do not match between the two DS1 converter circuit packs in the DS1 converter complex.

For TN1654 DS1 converter boards, this error indicates that the facility masks do not match between the two DS1 converter circuit packs in the DS1 converter complex.

Alarm should clear in 15 minutes.

1. If the problem persists, reset both DS1 converter circuit packs in the DS1 converter complex via **`reset board`**.
2. If the problem persists, replace this DS1 converter circuit pack.
3. If the problem persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

s. **Error Type 1537**: The two TN574 DS1 converter circuit packs in the DS1 converter complex do not have the same firmware vintage. The TN574 DS1 converter with the older vintage should be replaced. This error does not apply to TN1654 boards.

t. **Error Type 1793**: Fiber Loss of Frame Alignment (LFA) alarm occurred at the other end of the DS1 converter complex. The DS1 converter circuit pack at the other end of the DS1 converter complex cot frame up on the signal coming into the circuit pack from the fiber. (The neighbor DS1 converter circuit pack detected the LFA and relayed this information to this DS1 converter circuit pack via the DS1 control channel.) The amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).

1. Execute **`list fiber-link`** to determine the Fiber Endpoint that is connected to the DS1 converter circuit pack. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) or SNI-BD (SNI Circuit Pack) errors for the Fiber Endpoints. Enter **`display errors`** and follow the associated repair procedures for any FIBER-LK (Fiber Link) errors for this fiber link.
2. If the problem still persists, check for excessive slips and synchronization problems. Enter **`display errors`** and follow the associated repair procedures for any SYNC (Port Network Synchronization), TDM-CLK (TDM Bus Clock), and SNC-BD (Switch Node Clock Circuit Pack) errors.
3. If the problem still persists, run the Far-End DS1 converter Circuit Pack Loopback test (#788) on this DS1 converter circuit pack via **`test board`** ***`location`*** **`long`**. This test indicates if the neighbor DS1 converter circuit pack hardware is functioning. If the test fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

4. If the problem still persists, run the Far-End Fiber Optic Terminator (lightwave transceiver) Loopback test (#789) on this DS1 converter circuit pack via **`test board`** ***`location`*** **`long`**. If this test fails, replace the lightwave transceiver that is connected to the neighbor DS1 converter circuit pack at the other end of the DS1 converter complex. If the neighbor board is connected to the Fiber Endpoint via metallic cable, this test aborts.
5. If the problem still persists, replace connectors and the cable between the neighbor DS1 converter circuit pack and the Fiber Endpoint at the other end of the DS1 converter complex. The cable may be a fiber or a metallic cable.

u. **Error Type 2049**: Fiber Loss of Signal (LOS) alarm occurred at the other end of the DS1 converter complex. The DS1 converter circuit pack at the other end of the DS1 converter complex does not detect a signal coming into the circuit pack from the fiber. (The neighbor DS1 converter circuit pack detected the LOS and relayed this information to this DS1 converter circuit pack via the DS1 channel.) The amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).

1. Execute **`list fiber-link`** to determine the Fiber Endpoints that are connected to both ends of this DS1 converter complex. Enter **`display errors`** and follow the associated repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) or SNI-BD (SNI Circuit Pack) errors for the Fiber Endpoints that are administered on this fiber link, and Enter **`display errors`** and follow the associated repair procedures for any FIBER-LK (Fiber Link) errors for this fiber link.
2. If the problem still persists, run the Far-End DS1 converter circuit pack loopback test (#788) on this DS1 converter circuit pack via **`test board`** ***`location`*** **`long`**. This test shows if the neighbor DS1 converter circuit pack hardware is functioning. If this test fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.
3. If the problem still persists, run the Far-End Fiber Optic Terminator (lightwave transceiver) Loopback test (#789) on this DS1 converter circuit pack via **`test board`** ***`location`*** **`long`**. If this test fails, replace the lightwave transceiver that is connected to the neighbor DS1 converter circuit pack. If the neighbor board is connected to the Fiber Endpoint via metallic cable, then this test will abort.
4. If the problem persists, replace connectors and the cable between the neighbor DS1 converter circuit pack and the Fiber Endpoint at the other end of the DS1 converter complex. The cable may be fiber or metallic.

v. **Error Type 3329**: This error indicates that excessive slips have occurred on the fiber link between the DS1 converter board and the Fiber Endpoint. See SYNC (Port Network Synchronization) for diagnosing slip problems.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Tests 788 and 789 are executed by the TN574 DS1 Converter circuit pack only.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Failure Audit Test (#949)	X	X	ND
DS1 Facilities Connectivity Test (#790)		X	D
Far-End DS1 Converter Circuit Pack Loopback Test (#788)		X	D
Far-End Lightwave Transceiver Loopback Test (#789)		X	D
DS1C Board Options Audit (#795)	X	X	ND
The following test is executed as part of the **reset board** command			
Reset Board Test (#787)			D

1. D = Destructive; ND = Nondestructive

Note:

Test #984 is not an actual demand maintenance test. This test number reports the results from **clear firmware-counters**. Refer to the table for Failure Audit Test (#949) to interpret ABORT codes for Test #984.

DT-LN-BD (Data Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DT-LN-BD	MIN WRN	**test board *location***	Data Line circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See DAT-LINE (Data Line Port) for related line information.

DTMR-PT (Dual-Tone Multifrequency Receiver Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
DTMR-PT	MAJ MIN	**test port *location***	Dual-Tone Multifrequency Receiver port (TTR)
	WRN	**release port *location***	

Dual-Tone Multifrequency Receiver ports (DTMR), also known as Touch-Tone Receivers (TTRs), reside on the following circuit packs:

- TN748
- TN420
- TN756
- TN744B and TN744C
- TN2182
- TN2312AP
- TN2312BP

There are four Dual-Tone Multifrequency Receiver (DTMR-PT) ports and two General Purpose Tone Detector (GPTD-PT) ports on the TN748, TN420 and TN756 Tone Detector packs. There are eight GPTD-PT ports on each TN744, TN2182 and TN2312AP circuit packs.

The GPTD ports can be used for TTR, call progress tone detection, call prompting, MF signaling, dial tone detection, CO answer detection and OCM call classification.

The DTMR port is used to detect touch-tone digits that are placed on the Time Division Multiplex (TDM) bus. Examples of touch-tone digits are digits 0 through 9, digit #, and digit *. The ability of the DTMR port to detect touch-tone digits is essential in placing a station-to-station call. Calls originating from a hybrid station *do not* require a DTMR port.

For any Tone Detector circuit-level error (DETR-BD), see XXX-BD (Common Port Circuit Pack/ Media Module).

Error log entries and recommended actions

Table 100: DTMR-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (d)	17664	Tone Detector Audit/ Update test (#43)	MAJ MIN (b)	ON	**test port *location* r 2**
18	0	**busyout port *location***	WRN	ON	**release port *location***
130 (e)		None	WRN	ON	**test port *location* r 2**
257 (c)	17666	Tone Detector Audit/ Update test (#43)	MAJ MIN (b)	ON	**test port *location* r 3**
513 (d)	Any	Tone Detection Verification test (#42)	MAJ MIN (b)	ON	**test port *location* r 3**

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

b. There are two possible alarm levels for this error. A Major alarm is raised if the total number of DTMR ports currently in service is less than or equal to 1/2 of the administered threshold number. Otherwise, a Minor alarm is raised. In either case, run the short test sequence against the DTMR port and follow the repair procedures for the individual tests.

   The threshold number of DTMR ports for service is administered using **change system-parameters maintenance**.

c. **Error Type 257:** The DTMR port lost its translation. Testing the DTMR port is sufficient to reload its translation. If testing the DTMR port does not clear the error, then the IPSI or Tone Detector circuit pack containing the defective DTMR port should be replaced.

d. **Error Type 513**: The DTMR port is having problems detecting touch-tone digits. If this error is being constantly logged, the IPSI or Tone Detector circuit pack containing the defective DTMR port should be replaced.

e. **Error Type 130**: The circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1. D = Destructive; ND = Nondestructive

E-DIG-BD (Multi Application Platform Board)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
E-DIG-BD	MIN WRN	**test board *location***	MAPD Board

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See E-DIG-ST (Emulated Digital Line) for related line information.

E-DIG-ST (Emulated Digital Line)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
E-DIG-ST	MIN	`test port location l`	Emulated Digital Station
	WRN	`test port location`	

E-DIG-ST maintenance monitors and tests ports on the TN800 MAPD circuit pack and the hardware connected to those ports for lines administered as a digital station. Stand-alone data modules and data adaptors in stand-alone mode are not supported by the TN800 circuit pack.

Error log entries and recommended actions

Table 101: E-DIG-ST Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port location`
18 (b)	0	`busyout port location`	WRN	OFF	`release port location`
130 (c)			WRN	ON	`test port location`
257 (d)	40971				
1537 (e)	40968		WRN	OFF	
1793 (f)		Voice and Control Local Loop test (#13)	MIN WRN[1]	ON	`test port location l r 3`
2049 (g)		GPP NPE Crosstalk Test (#9)	MIN WRN[1]	ON	`test port location l r 3`
2305 (h)	32770				
3840 (i)	40965				
3841 (j)	41029				
2304 (k)					

1. Major alarms may be downgraded to Warning alarms based on the value used in `set options`.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 18:** Maintenance personnel have busied out the port in question. Release the port by using **`release port`** ***`location`***.

c. **Error Type 130:** The circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

d. **Error Type 257:** Problems transmitting to the voice terminal. This problem can be caused by defective wiring that can cause varying degrees of problems on different types of sets. Sets such as the 7410 appear to be more susceptible to wiring problems than others.

e. **Error Type 1537:** There is a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (number of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired after a predetermined amount of time.

f. **Error Type 1793:** The local loop test failed. Each failure increments an internal counter by 1 when the local loop test fails. The counter is decremented when the loop test passes. When the counter reaches a threshold of 3, an on-board MINOR alarm is raised.

g. **Error Type 2049:** The NPE Crosstalk test failed. The internal counter increments by 1 when the NPE Crosstalk test fails. The counter is decremented by 1 when the NPE Crosstalk test passes. When the counter reaches a threshold of 3, an on-board MINOR alarm is raised and the board is taken out of service.

h. **Error Type 2305:** The station went off-hook while it was in the ready-for-service state. Use **`status station`** to determine the state of the station. The off-hook should have moved the station to ready-for-service. No action is necessary.

i. **Error Type 3840:** No terminal is connected to the Digital Line board. No maintenance action is required.

j. **Error Type 3841:** The circuit pack's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack. No action is necessary.

k. **Error Type 2304:** Internal system error. No action is necessary.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Local Loop Test (#13)		X	D
GPP NPE Crosstalk Test (#9)		X	ND
Digital Station Lamp Update (#16)		X	ND

1. D = Destructive; ND = Nondestructive

EMG-XFER (Emergency Transfer)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
EMG-XFER	MAJ WRN	`test environment` *UU*	Emergency Transfer

1. ***UU*** is the universal cabinet number listed in the PORT field of the Alarm or Error Log.

The maintenance software for Emergency Transfer monitors the position of the Emergency Transfer switch(es) on the EPNs' Maintenance circuit packs. It does not monitor whether the system is actually in Emergency Transfer.

Emergency Transfer (ET) provides the ability to connect designated analog phones to CO trunks when the switch cot provide minimal phone service.

Emergency Transfer is automatically controlled by the system or can be manually controlled via the Emergency Transfer switch located on the Maintenance circuit pack. A manual ON position (up) generates a Major alarm. A manual OFF position (down) generates a Warning alarm. Unless a technician is currently working on the system, the switch should be left in the auto position.

Emergency Transfer Status

The **`status cabinet`** ***UU*** command shows the location of the ET switches and the current status of ET in the designated cabinet as follows:

auto+	ET is invoked and under system control.
auto-	ET is not in effect and is under system control (normal operating state).
unavailable	The switch setting(s) is not available.

Error log entries and recommended actions

Table 102: EMG-XFER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test environment` *UU*
1 (b)	0	Emergency Transfer Query (#124)	MAJ	ON	`test environment` *UU* `r 3`

Table 102: EMG-XFER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (c)	0	Emergency Transfer Query (#124)	WRN	ON	`test environment UU r 3`

Notes:

a. **Error Type 0:** Run the short test sequences first. If every tests passes, run the long test sequence. Refer to each appropriate test's description and follow its recommended repair procedures.

b. **Error Type 1:** the Emergency Transfer switch located on the Processor circuit pack is set to the manual ON position (up). When the Emergency Transfer switch is in this position, a Major alarm in generated.

c. **Error Type 257:** the Emergency Transfer switch located on the Processor circuit pack is set to the manual OFF position (down). When the Emergency Transfer switch is in this position, a Warning alarm is generated.

Demand test descriptions and error codes (Single Carrier)

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Cabinet Temperature Query Test (#122)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

Demand test descriptions and error codes (Multi-Carrier)

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive, ND = Nondestructive

EPN-SNTY (PN Sanity Audit)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
EPN-SNTY	None	None	EPN Sanity Audit

The EPN Sanity Audit feature enhances the system's ability to recover from failure conditions that disable an entire PN. In such situations, not only is the affected PN unable to provide service to the system, but the system itself has not detected the condition. The EPN Sanity Audit feature recognizes a PN as unable to provide service when the software cot receive control messages from PN circuit packs. When such a failure is detected by the EPN Sanity Audit, a sequence of recovery actions is triggered to restore the PN to service.

For a standard-reliability system (unduplicated server), the recovery sequence is:

1. TDM bus switch
2. EPN WARM reset
3. EPN COLD reset

The recovery sequence is:

1. TDM bus switch
2. Tone-Clock switch within the PN
3. PNC interchange
4. PN WARM reset
5. PN COLD reset

The EPN Sanity Audit feature activates only when every existing maintenance operation has failed to detect the PN problem. The EPN Sanity Audit serves as a safety net for the PN.

Note:

It is not clear why certain types of PN problems activate this feature. Error log entries related to these problems do not specify which hardware to replace. The error log entries only indicate that some drastic recovery action occurred due to an unknown problem. Clues as to the root cause of the PN outage may be present in the Error Logs and the Alarm Logs of the following MOs: TDM-BUS (TDM Bus), EXP-INTF (Expansion Interface Circuit Pack), TDM-CLK (TDM Bus Clock), EXP-PN (Expansion Port Network), and PNC-DUP (PNC Duplication). Refer to these maintenance sections during troubleshooting operations.

Error log entries and recommended actions

Table 103: EPN-SNTY Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any			None
8801 (b)	Any				
8803 (c)	Any				
9901 (d)	Any				
9902 (e)	Any				
9903 (f)	Any				
9904 (g)	Any				
9905 (h)	Any				

Notes:

a. **Error Type 0:** Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error 8801:** the PN is unable to send uplink control messages, and the control channel of the PN's TDM bus is swapped as part of the recovery procedure.

c. **Error 8803:** the PN is unable to send uplink control messages and the PN's Tone-Clock is swapped as part of the recovery procedure.

d. **Error 9901:** the PN is unable to send uplink control messages, but recovers after the control channels of the PN's TDM bus are swapped.

e. **Error 9902:** the PN is unable to send uplink control messages, but recovers after the PN's active Tone-Clock is swapped.

f. **Error 9903:** the PN is unable to send uplink control messages, but recovers after a PNC interchange has taken place.

g. **Error 9904:** the PN is unable to send uplink control messages, but recovers after a PN WARM reset.

h. **Error 9905:** the PN is unable to send uplink control messages, but recovers after a PN COLD reset.

ERR-LOG (Error Log)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ERR-LOG	none	none	Error Log

The ERR-LOG MO is responsible for the sanity of the Alarm Log, the Hardware Error Log, and the Software Error Log. If an inconsistency is detected in any one of these logs, every log will be re-initialized and a hardware error will be logged against ERR-LOG indicating the time of inconsistency. There are no tests and no alarms for the Error Log MO. It exists solely for the purpose of allowing errors to be logged against it.

Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
510 (a)	See Note		none	none	none

Notes:

a. **Error Type 510**: An inconsistency was detected in either the Alarm Log, the Hardware Error Log, or the Software Error Log. The system attempts to recover the logs but, depending on the extent of the corruption, some or all entries in the logs may be lost. Any alarms that were active at the time of this error have been cleared. There is no associated test for this error.

The Aux Data value indicates when the inconsistency was found:

0	During a periodic audit of the Error Log
1	After an extended reboot
2	After a reboot
3	After a Reset System 3 (Cold_1)
4	After a Level-3 System Reset (Cold_1)
4	After a Reset System 2 (Cold_2)
8	After a Level-2 System Reset (Cold_2)
16	After a Level-1 System Reset (Warm Start)
100	After an internal software audit
2500	After a single-process (MDM) restart

Survivable Core Server

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
Survivable Core Server	MAJ MIN	None	Survivable Core Server

The Survivable Core Server maintenance object (MO) monitors the status of the Survivable Core Server feature.

On the Main server, the MO will:

- Monitor the registration status for all administered Survivable Core Servers. The commands **`display survivable-processor`** and **`display system-parameters port-networks`** list the administered Survivable Core Servers. The registration status of all Survivable Core Servers is initially checked approximately ten minutes after the Main boots up. Subsequent to this, the registration status for all Survivable Core Servers is monitored each time a Survivable Core Server registration status change is received at the Main server.

On a Survivable Core Server, the MO will:

- Monitor the registration status of the active server within a Survivable Core Server. Only the active server of a Survivable Core Server server pair will register with the active Main server. The Survivable Core Server MO at a Survivable Core Server does not track the registration status of other Survivable Core Servers.
- Monitor the IP Server Interface (IPSI) socket connections for all administered IPSI circuit packs. Each Survivable Core Server establishes a socket connection to all administered IPSI circuit packs. These connections advertise the Survivable Core Server administered values to all IPSIs. If needed, the IPSI will use this socket connection to request service from the Survivable Core Server.

Error log entries and recommended actions

Table 104: Survivable Core Server Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)		None	MAJ	OFF	Survivable Core Server controlling Port Network(s). Resolve any server and/or network problems. Schedule or initiate an on-demand switchback of Port Networks to the Main server.
					1 of 2

Table 104: Survivable Core Server Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (b)		None	MIN	OFF	Survivable Core Server is not registered. Resolve any server and/or network problems.
513 (c)		None	MIN	OFF	Connection not established between Survivable Core Server and IPSI. Resolve any Survivable Core Server and/or network problems. Use the PING command to verify connectivity to IPSI circuit packs.
769 (d)		None	MIN	OFF	This alarm is raised when a main server has administration for a duplicated Survivable Core Server that is missing the Server A IP address. Typically, this alarm is raised after an upgrade from a pre-CM 5.2 Release to a CM 5.2 or later Release. To retire the alarm, use the **change survivable-processor** command to administer the Server A IP address for each Duplicated Survivable Core Server.
					2 of 2

Notes:

a. **Error Type 1:** This error only applies to a Survivable Core Server. A Survivable Core Server has become the master of an IPSI Port Network.

Investigate and attempt to retire the alarm with the following steps:

1. Avaya Fault and Performance Management can be used to obtain a network view of the Survivable Core Server configuration. Note any network fragmentation or server outages (Main or Survivable Core Server).
2. Use the SAT command **status ess port-network** to identify which Survivable Core Server Cluster IDs each Port Network (IPSI) is connected to. This command may be executed on either a Main server or Survivable Core Server. With a fragmented network, it may be necessary to execute this command on each server in the system configuration to acquire a complete view of IPSI connectivity.
3. Using either Avaya Fault and Performance Management or SAT sessions to each server, determine the extent of any server or network outages.
4. Resolve any server outages. If possible, bring the Main server(s) back online first.

Note:

Bringing a Main server back online will not cause Port Networks to immediately switch back to it. Restoring Port Network control to a Main server in a stable network requires proactive interaction. See step 7 below.

5. Resolve network fragmentation and outage issues per local practice.

6. Use either Avaya Fault and Performance Management or the SAT commands **`status ess port-network`** and **`status ess clusters`** to verify that all servers and network resources are operational.

CAUTION:

Entering the commands below will cause a service interruption. When Port Networks switch to either a Main server or Survivable Core Server, a level 2 restart is initiated on the Port Network, and service will be interrupted to the entire Port Network. Note that shuffled IP to IP calls will not be dropped, but during the restart, they will not have any access to features (Hold, Transfer, Conference, etc.).

7. When the Main server(s) and network are operational and stable, schedule or initiate an on-demand switchback of Port Networks to the Main server. On the Main server, use these commands:

Note:

ATM PNC
When a Port Network which is providing control for other sub-tending Port Networks via an ATM Expansion Interface (ATM-EI) circuit pack switches to a server, the other sub-tending Port Networks may or may not end up being controlled by the same server. All IPSI controlled Port Network(s) in the configuration will vie for control of the sub-tending Port Networks. The only way to guarantee that ATM-EI controlled Port Networks will be controlled by the same server is if all IPSI controlled Port Networks are controlled by that same server.

- Schedule a switchback to the Main with the **`change system-parmeters ess`** command. See *Avaya Aura™ Communication Manager Survivable Options* for more information. The **Auto Return** field may be set to ***`scheduled`*** or ***`no`***. If ***`no`*** is used, the only way to initiate a switchback is by using an on-demand command (See below). The **`survivable-processor`** and **`system-parameters port-networks`** administration screens may be displayed on all Survivable Core Servers but may only be changed on the Main server.

- Initiate an on-demand switchback by entering the **`get forced-takeover ipserver-interface port-network`** ***`N`*** command. This command may be issued with a qualifier for ***`all`*** Port Networks or a single individual ***`port-network N`***.

b. **Error Type 257:** This error applies to a Main or Survivable Core Server. This error is generated when a Survivable Core Server is translated on the Main but is NOT registered with the Main.

For detailed information on maintenance commands, see *Maintenance Commands Reference (03-300431)*.

For detailed information on administration commands, see *Avaya Aura™ Communication Manager Survivable Options*.

Follow these steps to investigate and attempt to retire the alarm:

On the Main server:

1. Enter **`display survivable-processor`** and **`display system-parameters port-networks`** to verify that the Survivable Core Server is properly administered. a Survivable Core Server must be administered on the Main server before it can register with the Main server. Record these values for troubleshooting the Survivable Core Server.
2. On the SAT, enter **`ping ip-address board <location> nnn.nnn.nnn.nnn`** to verify connectivity between the Main server and the Survivable Core Server, where ***`board`*** is the location of the C-LAN circuit pack the Survivable Core Server is trying to register with and ***`nnn.nnn.nnn.nnn`*** is the IP address of the Survivable Core Server .
3. Use the **`display events`** command with a **category** of **denial** to display denial events related to Survivable Core Server. The Survivable Core Server registration denial events are in the 36xx range. See Survivable Core Server Denial Events in *Avaya Aura™ Communication Manager Denial Events (03-602793)* for descriptions of individual Survivable Core Server denial events.
4. Use the **`list trace ras ip-address`** command to monitor registration requests from the Survivable Core Server. This command displays registration requests from the Survivable Core Server and the associated response from the Main server. Note that under normal operation a Keep-Alive (KA) message is periodically sent from the Survivable Core Server to the Main server. This should not be confused with a registration failure.
5. Firewalls or other security measures may prevent the Main server and Survivable Core Server from communicating. Verify that these ports are open through the network between the Main server and the Survivable Core Server:
   - 1719 Registration between the Survivable Core Server and the Main.
   - 21874 Filesync (rsync) between the Main server and Survivable Core Server.

On the Survivable Core Server that is not registered:

CAUTION:

In the next steps, be careful to use the **`Close Window`** button to cancel out of the **`Configure Server`** page to avoid a reboot of the Survivable Core Server. Do not Update the system.

6. Use the bash **`ping`** ***`nnn.nnn.nnn.nnn`*** command to verify connectivity between the Survivable Core Server and Main servers, where ***`nnn.nnn.nnn.nnn`*** is the IP address of the C-LAN in the Main server that the Survivable Core Server is trying to register with. To determine which IP address the Survivable Core Server is attempting to register with, enter the **`Configure Server`** command from the Maintenance Web Interface on the Survivable Core Server to display the **`configure ESS`** screen.
7. Firewalls or other security measures may prevent the Main server and Survivable Core Server from communicating. Verify that these ports are open through the network between the Main and the Survivable Core Server:
   - 1719 Registration between the Survivable Core Server and the Main server.
   - 21874 Filesync (rsync) between the Main server and Survivable Core Server.
8. On the Maintenance Web Interface **`Configure Server`** pages:
   - On the **`Set Identities`** page, verify that the correct Server ID (SVID) is entered. This should be a unique value for each server. The SVID must be between 1 and 99. Gaps in the SVIDs for a configuration are allowed (10, 20, 30,...) but the servers may be consecutively numbered if desired. Each server in the system, duplex or simplex, Main or Survivable Core Server, requires a unique SVID.
   - On the **`Configure ESS`** page, verify that the correct platform type is selected and the correct C-LAN and Main server IP addresses are entered. The Survivable Core Server will use these addresses to establish a connection with the Main server and register. On the Main server, enter **`display survivable-processor`** and **`display system-parameters port-networks`** to verify that the Survivable Core Server is properly administered. A Survivable Core Server must be administered on the Main server before it can register with the Main server. Record these values for troubleshooting the Survivable Core Server.
   - On the **`Status Summary`** page, verify that the Cluster ID is correct. Verify that the individual server IDs are correct.

Note:

Note: The individual server IDs should be the same as those entered on the **`Set Identities`** page of the Configure Server procedure.

9. On the SAT, enter **`display system-parameters customer-options`**.
   - Verify that the **ESS Administration** field is set to **y**.
   - Verify that the **Enterprise Survivable Server** field is set to **y**.

Tip:

Customer options may only be set with the Communication Manager license file. If the fields above are incorrect, obtain a new license file with corrected data.

10. From the Maintenance Web Interface, click on the **`License File`** command. Verify that the license mode is **normal**.

11. Use the SAT command **`status ess clusters`** to verify that a translation file has been sent to this Survivable Core Server. The translation file is only sent after a successful registration. If a translation file has never been sent, it is an indication of either serious network connectivity issues or Communication Manager administration and/or configuration errors. See above.

Note:

It may take several minutes for the Survivable Core Server to register with the Main server.

c. **Error Type 513:** This error only applies to a Survivable Core Server. A socket connection cot be established between the Survivable Core Server and an IPSI.

1. On the Maintenance Web Interface, use the **`ipsiversion`** command to verify that all IPSIs have the current hardware and firmware. See the Minimum Firmware/Hardware Vintages document found at: http://support.avaya.com

2. From the Maintenance Web Interface pages of the Survivable Core Server that is not connecting, initiate a **`PING`** to the administered IPSIs to verify connectivity between the Survivable Core Server and IPSIs.

3. Firewalls or other security measures may prevent the server and IPSI from communicating. Verify that these ports are open through the network between the server and the IPSI:

   - 5010 IPSI / Server control channel
   - 5011 IPSI / Server IPSI version channel
   - 5012 IPSI / Server serial number channel

4. Use **`status ess port-network`** to identify which Survivable Core Server Cluster IDs a Port Network (IPSI) is connected to. This command may be executed on either a Main server or Survivable Core Server. With a fragmented network, it may be necessary to execute this command on each server in the system configuration to acquire a complete view of IPSI connectivity. Figure 24: status ess port-networks example shows an IPSI (the standby IPSI in PN 2) that does not have a connection established with the server.

Figure 24: status ess port-networks example

```
status ess port-networks

Cluster ID 1              ESS PORT NETWORK INFORMATION

                   Port IPSI    Pri/ Pri/     Cntl Connected
   Com  Intf  Intf Ntwk Gtway   Sec  Sec      Clus Clus(ter)
PN Num  Loc   Type Ste  Loc     Loc  State     ID  IDs

 1   1  1B01  IPSI up    1B01   1AXX standby  1   1   44  64  13  9   200 100 500
                                1B01 actv-aa  1   1   44  64  13  9   200 100 500

 2   1  2AXX  IPSI up    2AXX   2AXX actv-aa  1   1   44  64  13  9   200 100 500
                                2B01 standby  *   *   44  64  13  9   200 100 500

 3   2  3AXX  IPSI up    3AXX   3AXX actv-aa  1   1   44  64  13  100 500 850 9
                                3B01 standby  1   1   44  64  13  100 500 850 9

 4   2  4A01  IPSI up    4A01   4A01 actv-aa  1   1   44  64  13   100 500 850 9
                                4B01 standby  1   1   44  64  13  100 500 850 9

 5   1  5A01  EI    up   3AXX

Command successfully completed
Command:
```

5. Resolve network fragmentation and outage issues per local practice.
6. Enter the SAT command **`status ess port-network`** to verify that all Port Networks (IPSIs) are communicating with servers.

d. **Error Type 769**: If the main Survivable Core Server detects a Survivable Core Server administration for a duplicated Survivable Core Server which is missing the server A IP address, an alarm is raised.
In a translation upgrade, as the Main Survivable Core Server detects Survivable Core Server administration for a duplicated Survivable Core Server, an alarm is always raised after the upgrade to a Survivable Core Server system that has duplex ESSs.
Demand test descriptions and error codes

There are no demand tests for the Survivable Core Server maintenance object. The following table contains the explanation of the error codes from Tests 1605, 1606, and 1607 on the **`TEST RESULTS`** screen which is displayed from the following commands:

- **`enable ess`**
- **`disable ess`**

- `get forced-takeover ipserver-interface`

Error Code	Description
1991	Requested Survivable Core Server cluster is not administered.
1992	Requested Survivable Core Server cluster is not registered.
1993	Requested Survivable Core Server is controlling an IPSI PN.
1994	A Survivable Core Server cluster may not enable/disable other clusters (Survivable Core Server or main). It can only change its own enable/ disable state.
1995	Survivable Core Server cluster is disabled.
1996	Port network does not exist.
1997	Not an IPSI port network
2500	Internal operation failed

See also:

- **`list survivable-processor`** command in *Maintenance Commands Reference (03-300431)*
- SP-REG-M (Survivable Processor-Main)
- SP-REG-S (Survivable Processor)

ETH-PT (Control LAN Ethernet)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ETH-PT	MAJ MIN	**test port *location* long**	Ethernet Port
	WRN	**test port *location***	

The TN799DP Control LAN (C-LAN) circuit pack provides TCP/IP connection to adjunct applications such as CMS, INTUITY, and DCS Networking. The C-LAN circuit pack has one 100BASE-T Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. Multiple C-LAN circuit packs in a system provide additional TCP/IP capacity.

A RSCL (remote socket control link) links the C-LAN and the server to pass call-control and other management information. Since one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit pack's maintenance.

Control LAN Congestion Controls

The switch activates congestion controls on the C-LAN when it detects buffers exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffers have returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises a MINOR alarm
Exhausts buffers	Raises a MINOR alarm
Ceases for 12 minutes	Retires a MINOR alarm

Error log entries and recommended actions

Table 105: ETH-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *`location`*
1 (b)	0	Ethernet Local Looparound Test (#1278)	MIN	ON	`test port` *`location`* `l r 3`
513 (c)	0	Link Integrity Inquiry Test (#1282)	MIN	OFF	`test port` *`location`* `r 3`
769 (d)	0		WRN	OFF	
1281 (e)	0				
1537 1538 (f)		Session Status test (#1286)	MIN	OFF	
1793– 1920 (g)					
2305– 2560 (h)					
2561– 2816 (h)					
3329 (i)		TCP/IP Ping test (#1281)	MIN WRN[1]	OFF	`test port` *`location`* `r 3`

1. Major alarms may be downgraded to Warning alarms based on the value used in **`set options`**.

Notes:

a. **Error Type 0:** Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** Ethernet Local Looparound Test (#1278) failed.

1. Test the port (**`test port`** ***`location`*** **`long`**).
2. See Ethernet Local Looparound Test (#1278) for repair procedures.

c. **Error Type 513**: Link Integrity Inquiry test (#1282) failed, or the C-LAN port detected loss of Ethernet link integrity.

Possible causes:

- Cables
- Ethernet transceiver

1. Test the port (**`test port`** ***`location`*** **`long`**).
2. If the Link Integrity Inquiry Test (#1282) fails, refer to its repair procedure.

d. **Error Type 769**: Port received invalid frame.

Invalid Ethernet frame errors occur when the frame:

- Contains a bad cyclic redundancy check (CRC)
- Is misaligned

1. Isolate the problem with the Ethernet Local Looparound Test (#1278).
2. Test the port (**test port *location* long**).
3. Verify the repair with the Ethernet Local Looparound Test (#1278).
4. Clear the alarm (**test port *location* long clear**).

e. **Error Type 1281:** System software received an indication that the far end has requested a disconnect of a session on this link. This is a log-only error. No action is necessary.

f. **Error Type 1537–1538**: Some or all sessions on a port are down.

If:	Then the switch raises:
Some sessions are down	WARNING alarm on circuit pack
Every session is down	MINOR alarm on circuit pack

1. Test the port (**test port *location***).
2. Refer to Session Status Test (#1286) repair procedure to verify repair.

g. **Error Type 1793–1920**: System software received an indication that a socket was closed due to an error.

The Error Type indicates the application associated with this socket. The Aux Data value indicates the internal application number.

Error Type	Application
1793	Unused
1794	DCS
1795	AUDIX
1796	CMS
1797	ISDN Gateway
1798–1920	Reserved for future

h. **Error Type 2305–2816**: System software detected a session is down. The Aux Data value indicates the session number. These are log-only errors. Error types 2305–2560 are for session numbers 1–256. Error types 2561–2816 are for session numbers 257–512.

i. **Error Type 3329:** TCP/IP Ping test failed. A WARNING alarm is raised if the test fails twice. A MAJOR alarm is raised if the test fails 6 times.

1. Test port (**`test port location`**).
2. Refer to TCP/IP Ping Test (#1281) repair procedures.

Demand test descriptions and error codes

Investigate errors in the order they appear in the following table.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ethernet Local Looparound Test (#1278)		X	D
TCP/IP Ping Test (#1281)	X	X	ND
Session Status Test (#1286)	X	X	ND
Link Integrity Inquiry Test (#1282)	X	X	ND
Verify NIC Options Test (#1511)	X	X	ND

1. D = Destructive, ND = Nondestructive

ETR-PT (Enhanced Tone Receiver Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ETR-PT	MAJ MIN WRN	**test port *location***	Enhanced Tone Receiver Port

Note:

Replacing the Tone-Clock circuit pack requires a special procedure which is described in TONE-BD (Tone-Clock Circuit Pack). That section also describes the LED display for this board.

TN2312AP IPSI Circuit Pack's Tone-Clock

For a PN with a TN2312 IPSI, the TONE-BD is a module located on the IPSI circuit pack. It provides tone generation, tone detection, call classification, and clock generation and synchronization. The TN2312 replaces the TN2182B Tone-Clock board and is inserted into each PN's Tone-Clock slot. For a non IPSI PN, the TN2182B Tone-Clock circuit packs provide the TONE-BD functions.

The TN2312 IPSI circuit pack (for PNs equipped with IPSIs) or the Tone-Clock circuit packs (for non IPSI PNs) both house two independent components:

- Tone Generator that provides every tone needed by the system
- Clock that generates clocks for both the system's Time Division Multiplex (TDM) bus and the LAN bus. It also aids in monitoring and selecting internal synchronization references.

When resolving errors/alarms on an IPSI or Tone-Clock circuit pack, the following sections should also be consulted:

- For a non IPSI PN, use **set tone-clock UC** to establish the tone and synchronization resources for the system.
- For an IPSI PN, use **set ipserver-interface UC** to establish the tone and synchronization resources for the system.
- TONE-PT (Tone Generator)
- TDM-CLK (TDM Bus Clock)
- SYNC (Synchronization)
- TONE-BD
- PKT-INT (IPSI only)

TN2182 Tone-Clock Circuit Pack (for Non IPSI Connected PNs)

A TN2182 is a combined Tone Generator/Tone Detector board. It provides eight Enhanced Tone receiver (ETR) ports. Each of these ports provides the functions previously found individually on DTMR-PTs, GPTD-PTs and CLAS-PTs ports. Each port on the TN2182 may be used for any tone-detection function that was previously done by TN748, TN420, or TN744 Tone Detection boards.

The TN2182 provides Mu-law or A-law tone-detection capability.

Since the TN2182 also provides Tone-Clock function, only one TN2182 circuit pack may reside in a PN (or two if your system is duplicated). If more tone-detection resources are needed, the additional resources must be provided by TN748, TN420, or TN744 circuit packs.

Error log entries and recommended actions

Table 106: ETR-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	any	Test #43 Tone Detector Audit/Update Test	MAJ MIN	ON	`test port location r 2`
18		`busyout port`	WRN	OFF	`release port location`
257 (a) (b)	17666	Test #43 Tone Detector Audit/Update Test	MAJ MIN	ON	`test port location r 3`
513 (a) (c)	any	Test #43 Tone Detector Audit/Update Test	MAJ MIN	ON	`test port location r 3`

Notes:

a. **Error Type 1, 257, 513**: There are two possible alarm levels for this Error Type: major alarm and minor alarm. These alarm levels are dependent on the administered thresholds for TTR, CPTR, and CCTR. Each ETR port is capable of operating on any of these.

   A major alarm is raised if the total number of ports capable of TTR, CPTR or CCTR detection currently in service is less than or equal to one-half of the administered TTR, CPTR, or CCTR threshold number. Otherwise, a minor alarm is raised. The threshold number of ports for service is administered with **`change system-parameters maintenance`**.

   If a major or minor alarm occurs, follow this repair procedure.

   1. Use **`list configuration carrier`** to get the board type and location. If the board is TN744, then do steps 2–4; if it is TN2182 or TN2312, do steps 5–12.

2. Reset the board with **busyout board location**, **reset board *location***, and **release board location**. A reset is required to reload RAM associated with the TN744's DSPs. This will take all eight tone detector ports out of service for a few seconds. Only four of the eight would be out of service due to the alarm. (There are four tone detectors on each of the two DSPs.) Other than the unlikely potential of running out of tone detector resources in the switch, there is no other effect when the board is reset.
3. Test the board (**test board location long**).
4. If the test passes, terminate the repair process. If the test fails, replace the board.
5. Check to see if the board is duplicated (**list cabinet** and **status port-network** on the affected PN).
6. If the board is not duplicated, use **test tone location long** to resolve the error. The long test resets the board and is required to reload on-board RAM associated with the DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds. This means no dial pulses or touch tones during this interval, which probably will not affect calls in progress but could cause a call origination to abort or cause a user to not get dial tone when going off-hook.
7. If every test passes and the alarm does not resolve, retest (**test tone location long clear**).
8. If the test passes, terminate the repair process. If it fails, replace the circuit pack at the customer's convenience.
9. If the board is duplicated, switch to the standby side (**set tone/set ipserver-interface**).
10. Test the alarmed board (**test tone location long**). This resets the board and is required to reload on-board RAM associated with the circuit pack's DSPs.
11. If every test passes and the alarm does not resolve, retest with **test tone *location* long clear**.
12. If the test passes, terminate the repair process. If it fails, replace the board.

b. **Error Type 257**: The ETR-PT lost its translation. Testing the ETR-PT is sufficient to reload its translation. If testing the ETR port does not clear the error, the circuit pack containing the defective ETR port should be replaced at a time when it is convenient to remove a clock board from the system. Follow the procedures described in TONE-BD (Tone-Clock Circuit Pack) for replacing a Tone-Clock circuit pack.

c. **Error Type 513**: This error indicates the (ETR-PT) Enhanced Tone Receiver is having problems detecting touch tones, call-progress tones, or MFC tones. If this Error Type is persistently logged, the circuit pack containing the defective ETR-PT should be replaced at a time it is convenient to remove a clock board from the system. Follow the procedures described in TONE-BD (Tone-Clock Circuit Pack) for replacing a Tone-Clock circuit pack.

Demand tests descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1. D = Destructive; ND = Nondestructive

EXP-INTF (Expansion Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
EXP-INTF	MAJ MIN WRN	**test board *location***	Expansion Interface circuit pack

If the Expansion Interface (EI) circuit pack that is being investigated is associated with a Survivable Remote EPN (SREPN), every LAPD EI link problem must be cleared, and the SREPN slide switch on the TN2301 (located in the SREPN carrier) must be manually set to the normal position before the SREPN can be returned to normal service. See Restoring Normal Service to the SREPN.

Refer also to *Avaya MultiVantage Solutions Installation and Maintenance for Survivable Remote EPN*.

Following this introductory description of the Expansion Interface (EI) circuit pack are sections on the following topics:

- EI In-Service Mechanism
- Survivable Remote EPN
- LEDs
- EI and Tone-Clock Interactions
- Replacing an EI Circuit Pack—Unduplicated PNC
- Replacing an EI Circuit Pack— Duplicated PNC
- Expansion Interface Manual Loopback Procedure

The TN570 or the TN776 Expansion Interface (EI) circuit pack provides a TDM- and packet bus-to-fiber interface for the communication of signaling information, circuit-switched connections, and packet-switched connections between endpoints residing in separate PNs. EI circuit packs are connected via optical fiber links. An EI can be connected to:

- Another EI, in a direct-connect configuration
- A DS1 converter in a DS1 converter complex, used to remote a PN
- A Switch Node Interface (SNI), in a center stage switch (CSS) configuration
- A survivable remote EPN (SREPN)

In a CSS configuration with duplicated Port Network Connectivity (PNC), EI circuit packs reside in the Switch Node Carrier (see Figure 28: Center Stage Switch Configuration with Duplicated PNC). In this case, the EI and SNI circuit packs may be connected via a metallic cable instead of an optical fiber link. Metallic cable should be tested and replaced in the same mer as optical fiber.

A PN-to-PN connection can be extended through a DS1 converter complex. (See Figure 29: Fiber Link with DS1 Converter Complex). When discussing problems that may be related to fiber links, the DS1 converter is considered part of the fiber link. If diagnosis of the problem points to fiber connectivity and a DS1 converter circuit pack is part of the connectivity, problems with the DS1 converter circuit pack should be investigated (see DS1C-BD (DS1 Converter Circuit Pack)). The DS1 converter circuit pack runs diagnostics for the EI circuit pack via such tests as the Expansion Interface Neighbor Query Test (#237), the Expansion Interface Fiber Out-of-Frame Query Test (#238), the Expansion Interface 2-Way Transmission Test (#241), and the Expansion Interface Packet Interface Test (#589).

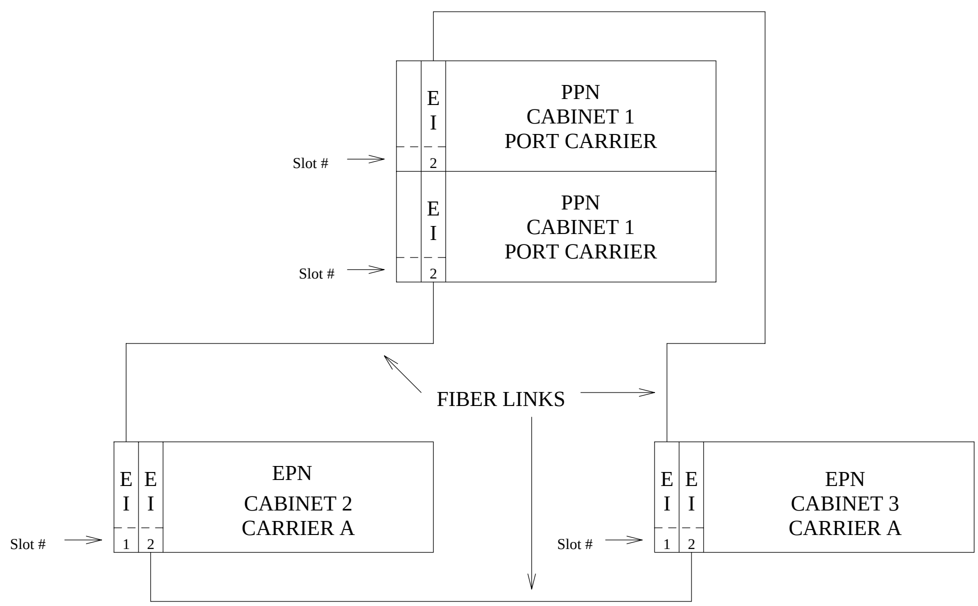
In a critical-reliability system, the fiber link's are duplicated as part of PNC duplication. In a high-reliability system with a CSS (Center Stage Switch) and unduplicated PNC, a single point of failure between the server and the CSS is eliminated by duplicating each link, consisting of:

- SNI in the CSS to which the PN's EI connects
- Physical fiber paths between them

These dual connections normally share the call-processing load. Should one of these links fail, the entire load can be shifted to the operational link.

Figure 25: Direct Connect Configuration with Unduplicated PNC shows the location of the EI circuit packs in a typical unduplicated PNC, direct connect configuration.

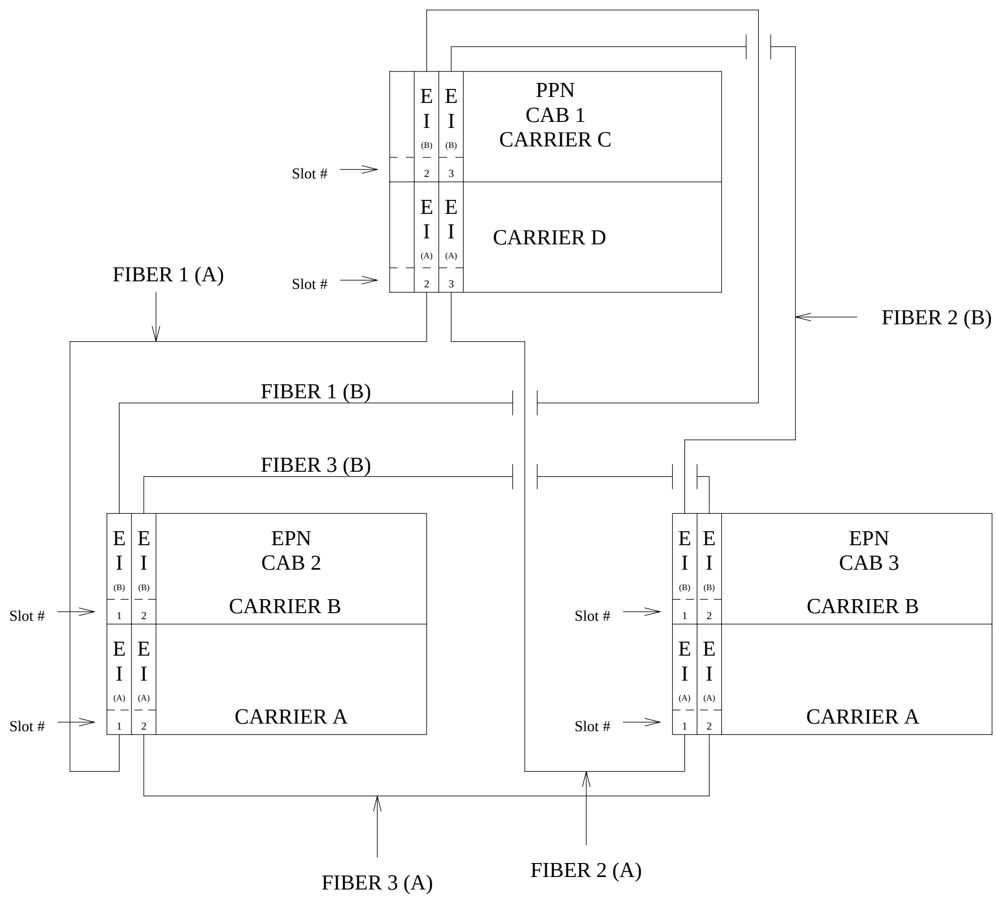
Figure 25: Direct Connect Configuration with Unduplicated PNC



Each PN in a direct-connect configuration must be connected to the other PNs through a fiber link. Each PN has one EI that functions as an Archangel. This EI must be connected with fiber to an EI. If an EI is functioning as an Archangel (bus master), its amber LED will be flashing at a rate of 2 seconds on and 200 ms off.

Figure 26: Direct Connect Configuration with Duplicated PNC shows the location of EI circuit packs in a typical duplicated PNC, direct-connect configuration.

Figure 26: Direct Connect Configuration with Duplicated PNC



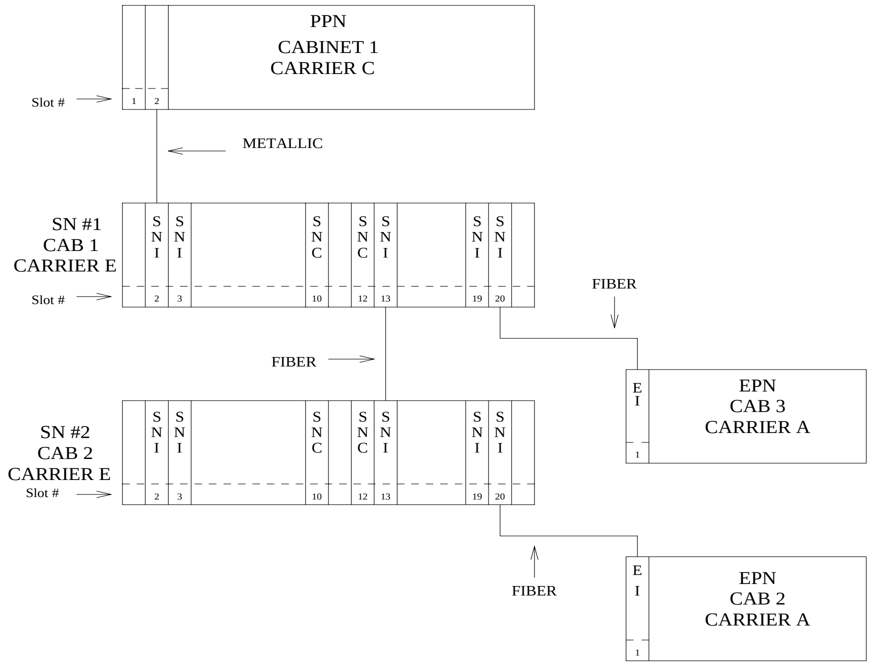
In a duplicated PNC there is an A-side and a B-side PNC. Every EI in this diagram is labeled with an A or a B designating to which PNC it belongs. Note that a PNC's designation (A or B) does not relate directly to the carrier where its EIS reside. Again, only one of a PN's EIs can function as the Archangel (TDM-bus master). A PN's EI that is:

- On the active PNC
- Logically connected to the server

is the only one that can function in this mode. In normal operation, its amber LED should be blinking at a rate of 2 seconds on and 200 ms off.

Figure 27: Center Stage Switch Configuration with Unduplicated PNC shows the location of EIs in a typical center stage switch configuration with unduplicated PNC.

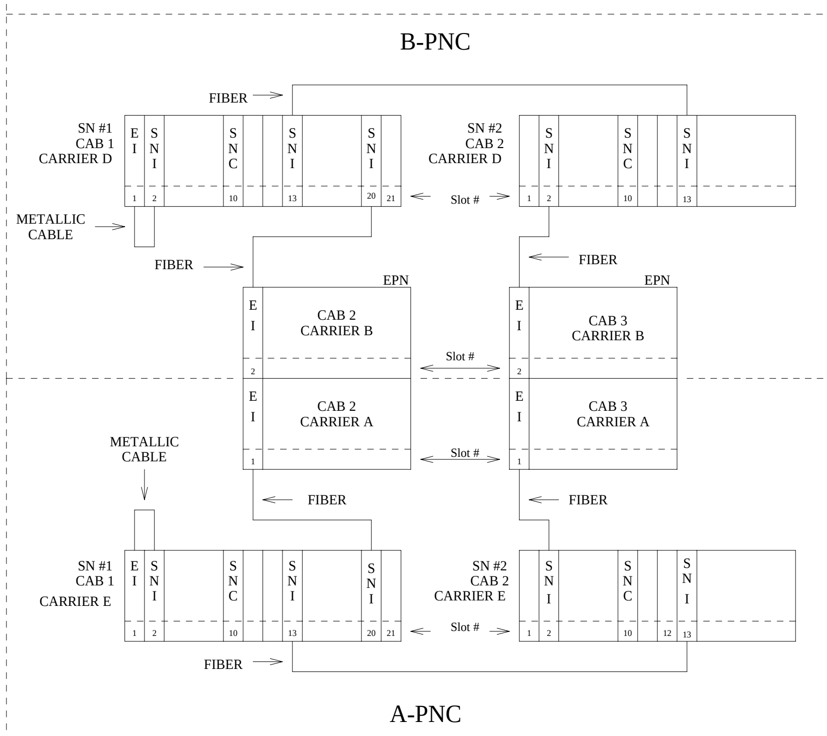
Figure 27: Center Stage Switch Configuration with Unduplicated PNC



For an unduplicated center stage switch configuration, only one EI is needed in each PN. Notice that there is no direct connection between the PNs, rather every inter-PN connection is made through the center stage switch. Each SNI in the switch node carriers can be connected to a PN through an EI circuit pack.

Figure 28: Center Stage Switch Configuration with Duplicated PNC shows the location of EIs in a typical two Switch Node Center Stage Switch configuration with duplicated PNC.

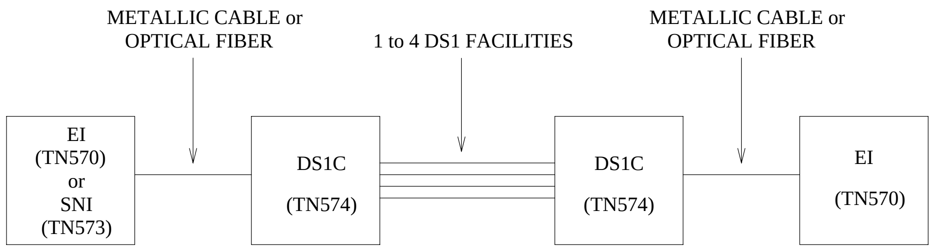
Figure 28: Center Stage Switch Configuration with Duplicated PNC



In a duplicated center stage switch configuration, two EIs are needed in each PN. One resides in the PNC's A side and one in the B side. Note that a PNC designation (A or B) does not directly designate the carrier where an EI resides. The active PNC's EI is the one acting as the PN's Archangel (TDM bus master). This EI's amber LED should be blinking at a rate of 2 seconds on and 200 ms off. Whereas, the amber LED on standby PNC's EI should be off.

A PN (and thus, the EIs contained within it) can be remoted via a DS1 Converter complex. This requires that a fiber link (providing connectivity to the remoted PN) be administered with an associated DS1 Converter complex. This complex consists of two TN574 DS1 Converter (DS1C-BD) circuit packs connected by from 1 to 4 DS1 facilities. Figure 29: Fiber Link with DS1 Converter Complex shows where the DS1 converter complex fits into an EI-to-SNI or EI-to-EI fiber link. For more information, see DS1C-BD (DS1 Converter Circuit Pack).

Figure 29: Fiber Link with DS1 Converter Complex



EI In-Service Mechanism

In order for calls to be routed through a given PN, the EI that is part of the connectivity to that PN must be put into service. In order for an EI to be put into service, the following criteria must be met:

1. The EI must be recognized by software (inserted). Use **`list config carrier`** to verify that the board is recognized by software.
2. The EI must have a fiber link administered to it. Use **`list fiber-link`** to verify that this EI circuit pack has a fiber administered to it.
3. The EI must have established a LAPD link to its neighbor (the circuit pack on the “other end” of the fiber link). This neighbor can be another EI or an SNI.

CAUTION:

If previous requirements 1 and 2 have been met, and the amber LEDs are flashing in a mer that appears to confirm that the EI circuit pack has established a LAPD link to its neighbor, the circuit pack still may not be “in service”. The requirement is that it must have the CORRECT neighbor on the other end of the fiber. Care must be taken when connecting the fibers to the back of the carriers so that fibers are connected to the correct circuit packs. In a Center Stage Switch configuration, run the “configuration audit” test against the SNI circuit pack that is the neighbor of the EI circuit pack in question (see SNI-BD (SNI Circuit Pack) for more details).

Once an EI has been put into service, if any of the previously listed in-service criteria become untrue, the EI is taken out of service, and service to that PN is not available.

In a system that is configured with PNC duplication active, taking an EI out of service that is on the active PNC will, if all other things on the active and standby PNC are equal (i.e., both PNCs are equally healthy, the standby PNC is not busied out, the PNC is not locked by software), result in a PNC interchange.

Survivable Remote EPN

Note:

This feature is viewed as a “disaster recovery operation” capability rather than as an additional reliability option.

The SREPN allows a remote EPN cabinet to provide processor capabilities to the EPN in the event of a failure. A logic switch circuit pack (TN2301) located in the SRPPN detects when the link to the server is down and switches to a link from the local SRPPN (TN790B-based processor). When the links to the server are restored and verified to be stable, the logic switch is manually reset, and the EPN is reconnected to the links from the server.

Note:

The SREPN feature is not available when an ATM-PNC/EI circuit pack is used to replace the TN570 EI circuit pack in a direct-connect configuration, or an ATM Switch is providing the Center Stage (PNC) connectivity.

SREPN Feature Active

Every call within the SREPN is terminated when the SREPN feature is activated, and the SRPPN takes control of the SREPN.

The SREPN feature is activated when the Maintenance circuit pack (TN775C or later and located in the SREPN) detects a problem with the SREPN’s EI (TN570B) LAPD link to its counterpart in an EPN. The TN775C Maintenance circuit pack notifies the co-located SRPPN of the problem, and the TN2301 / circuit pack in the SRPPN carrier switches the EI LAPD link connection from the Port Network to its counterpart in the SRPPN. The SREPN is now in the Survivable Remote mode and has the capabilities of an EPN that has been pre-translated with a *Disaster Recovery* configuration.

Note:

When the SREPN feature is active, the EI circuit pack that is assigned to the SREPN and located in the PN is put in loopback mode.

Restoring Normal Service to the SREPN

Every call within the SREPN is terminated when the SREPN feature is returned to normal service.

To restore normal connections to the SREPN EI circuit pack in the PN, you must:

1. Clear every error logged against the SREPN EI circuit pack by using the suggested repair procedures outlined in this MO.
2. At the SRP flip the 3-position switch on the TN2301 to the RSTR (restore) or top position for at least 1 second and return the switch to the AUTO, or middle position.

3. After the SREPN slide switch has been restored to the normal position, test the connectivity to EI LAPD link, by using the suggested procedures outlined in this MO.
4. After normal service is returned to the SREPN, the SRPPN will be in an *alarmed state*. This is *normal* for an SRPPN and indicates that the:
   - SRSwitch (TN2301) has disconnected it from its neighbor (EI in the SREPN)
   - SRPPN is no longer in control.

Connectivity has been re-established between the EI in the SREPN and its counterpart EI circuit pack in the PN. The system is now in a normal EI configuration.

LEDs

SREPN Expansion Interface

The EI circuit pack has red, green, and amber LEDs. The red and green LEDs display the standard conditions:

- Red indicates an alarm condition.
- Green indicates maintenance testing in progress.

The amber LED provides useful visual status information:

- Active EI circuit packs:
  – Have their amber LED on solid (for an inter-EPN EI in a direct connect system)
  – Blink a pattern of 2 seconds on and 200 ms off.
- The standby PNC EI circuit packs should have their amber LEDs off.

Another way to determine which PNC (and therefore, which EIs in an EPN) is active and which is standby, use **`status port-network`** and **`status PNC`**.

See Table 107: Expansion Interface Circuit Pack Amber LED Flashing States for the possible EI amber LED states.

Table 107: Expansion Interface Circuit Pack Amber LED Flashing States *1 of 2*

Condition	LED On	LED Off
Fiber Out-of-Frame (a)	0.1 second	0.1 second
In Frame-No Neighbor (b)	0.5 second	0.5 second
Expansion Interface Active (c)	2 second	0.2 second
Expansion Interface Active (d)	solid on	never off
		1 of 2

Table 107: Expansion Interface Circuit Pack Amber LED Flashing States ***2 of 2***

Condition	LED On	LED Off
Expansion Interface Standby (e)	never on	solid off
		2 of 2

Notes:

a. This flashing state corresponds to error codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes are usually accompanied by error code 1281 (no EI or SNI detected on opposite end of fiber). This condition may be caused by the absence of the neighbor EI or SNI circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either endpoint (EI or SNI circuit packs).

b. This corresponds to error code 1281 from the Hardware Error Log and indicates a failure of Expansion Interface Neighbor Query Test (#237). This condition is usually due to the failure of this EI circuit pack or a failed EIEI or SNI circuit pack counterpart.

c. This is the normal state for an active PN EI circuit pack that is also the bus master (Expansion Archangel) in the EPN.

d. This is the normal state for an active EI circuit pack that is not the bus master (Expansion Archangel) for a PN. This applies only in the direct-connect configuration where the EI circuit pack in a PN is connected via a fiber link to an EI circuit pack in the other PN.

e. This is the normal state for a standby EI circuit pack in a PN.

Note:

In a PN, its TN775C Maintenance (MAINT) circuit pack monitors the sanity of the EI circuit pack. If the EI circuit pack should cycle between sane and insane several times, the Maintenance circuit pack will hold the EI circuit pack reset. If a new EI circuit pack is installed in the PN, and the red LED remains lit, the PN's Maintenance circuit pack should be removed because it may be holding the new EI circuit pack reset. This condition could present itself if there is a link problem to the PN, and the PN experiences several PN restarts. The Maintenance circuit pack may be reinstalled after the EI circuit pack has been physically inserted and the EI circuit pack's red LED has gone off.

The link between two active EI circuit packs or between an active EI circuit pack and an active SNI circuit pack is involved in synchronization. The EI circuit pack reports slip errors if synchronization is not operating properly. When diagnosing synchronization problems, the EI circuit packs should be examined as a possible cause.

Expansion Interface LEDs

The EI circuit pack has the standard red, green, and amber LEDs. The red and green LEDs have the traditional uses: red means some alarm condition and green indicates maintenance testing in progress. The amber LED provides useful visual status information. The state of the amber LED is very important when executing the Expansion Interface Manual Loopback Procedure. The possible amber LED states are shown in Table 108: Expansion Interface Circuit Pack Amber LED Flashing States.

Upon power-up, the red and green LEDs turn on and off. The amber LED goes to its appropriate state.

To determine which PNC (and which EIs in a PN) is active and which is standby, use **`status port-network`** and **`status pnc`**. Alternately, visual inspection will show that the active EI circuit packs will have their amber LED on solid (for an inter-PN EI in a direct connect system) or blink a pattern of 2 seconds on and 200 ms off. The standby PNC EI circuit packs will have their amber LEDs off. See Table 108: Expansion Interface Circuit Pack Amber LED Flashing States for the possible EI amber LED states.

Table 108: Expansion Interface Circuit Pack Amber LED Flashing States

Condition	LED On	LED Off
Fiber Out-of-Frame (a)	0.1 second	0.1 second
In frame-No Neighbor (b)	0.5 second	0.5 second
Expansion Interface Active (c)	2 second	0.2 second
Expansion Interface Active (d)	solid on	never off
Expansion Interface Standby (e)	never on	solid off

Notes:

a. Fiber Out-of-Frame - This flashing state corresponds to error codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes will usually be accompanied by error code 1281 (no Expansion Interface or SNI detected on opposite end of fiber). This condition may be caused by the absence of the neighbor EI or SNI circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either endpoint (EI or SNI circuit pack).

b. In frame-No Neighbor - This flashing state corresponds to error code 1281 from the Hardware Error Log and indicates a failure of Expansion Interface Neighbor Query Test (#237). This condition is usually due to the failure of this EI circuit pack or a failed EI or SNI circuit pack neighbor.

c. This is the normal state for an active PN EI circuit pack that is also the bus master (Expansion Archangel) in the PN.

d. This is the normal state for an active EI circuit pack that is not the bus master (Expansion Archangel) for a PN. This applies only in the Direct Connect configuration where the EI circuit pack in a PN is connected via a fiber link to an EI circuit pack in the other PN.

e. This is the normal state for a standby EI circuit pack in a PN.

Note:

In a PN, its TN775C Maintenance (MAINT) circuit pack monitors the sanity of the EI circuit pack. If the EI circuit pack should cycle between sane and insane several times, the Maintenance circuit pack will hold the EI circuit pack reset. If a new EI circuit pack is installed in the PN, and the red LED remains lit, the PN's Maintenance circuit pack should be removed because it may be holding the new EI circuit pack reset. This condition could present itself if there is a link problem to the PN, and the PN experiences several PN restarts. The Maintenance circuit pack may be reinstalled after the EI circuit pack has been physically inserted and the EI circuit pack's red LED has gone off.

The link between two active EI circuit packs or between an active EI circuit pack and an active SNI circuit pack is involved in synchronization. The EI circuit pack will report slip errors if synchronization is not operating properly. When diagnosing synchronization problems, the EI circuit packs should be examined as a possible cause.

EI and Tone-Clock Interactions

The viability of the EI fiber link depends upon the system clock that is provided by the active Tone-Clock circuit pack on each network (see TDM-CLK (TDM Bus Clock) and TONE-BD (Tone-Clock Circuit Pack)). Each EI circuit pack transmits over the fiber at a rate derived from the system clock on its network. If the active Tone-Clock is defective in such a way that the frequency of system clock it produces is out of the specified range ("out of spec"), an EI fiber link might go down. This affects an Expansion Archangel Link (EAL), a Remote Neighbor Link (RNL), and/or a Local Neighbor Link (LNL), even though the EI circuit packs are healthy. When the PNC is duplicated, both fiber links could go down if there is a defective active Tone-Clock.

Whether or not a fiber link goes down, depends on certain characteristics of the EI circuit packs. An EI circuit pack should not be replaced if the fiber link on which it resides goes down because of a defective active Tone-Clock circuit pack. The defective Tone-Clock circuit pack should be replaced instead. The EI circuit packs are more sensitive to a defective system clock than the rest of the components of the system. Therefore, testing of the Tone-Clock circuit pack might not reveal a problem.

The symptoms of the problem in which an invalid system clock causes an Expansion Link to go down are as follows:

- If the Tone-Clock in the PN provides the current on-line synchronization reference (see **`status synchronization`**), is providing an invalid system clock:

  Any EI or SNI circuit pack has a Fiber Out-of-Frame condition or a No Neighbor condition.

  An EI circuit pack amber LED blinks quickly when a Fiber Out-of-Frame condition exists (0.1 seconds on, 0.1 seconds off) and the Expansion Interface Fiber Out-of-Frame Query Test (#238) fails on the EI circuit pack that is out-of-frame.

  An SNI circuit pack with a Fiber Out-of-Frame condition blinks its amber LED quickly (0.1 seconds on, 0.1 seconds off) and Test #989 fails on the SNI circuit pack that is out-of-frame.

  An EI circuit pack amber LED blinks slowly when a No Neighbor condition exists (0.5 seconds on, 0.5 seconds off) and the Expansion Interface Neighbor Query Test (#237) fails on this EI circuit pack, but Test #238 passes.

  An SNI circuit pack with a no neighbor condition blinks its amber LED slowly (0.5 seconds on, 0.5 seconds off) and Configuration Audit (#759) fails on this SNI circuit pack, but Test #989 passes.

- If a Tone-Clock in a PN that does not provide the current on-line synchronization reference (see **`status synchronization`**) is providing an invalid system clock:

  In a direct connect configuration, the PN EI circuit pack amber LED will blink quickly (Fiber Out-of-Frame condition **–** 0.1 seconds on, 0.1 seconds off).

  Expansion Interface Fiber Out-of-Frame Query Test (#238) fails on this EI circuit pack.

  In a CSS *configuration*, the SNI connected to the PN EI circuit pack blinks its amber LED quickly (Fiber Out-of-Frame condition **–** 0.1 seconds on, 0.1 seconds off).

  The PN EI circuit pack amber LED blinks slowly (In-frame, No Neighbor condition **–** 0.5 seconds on, 0.5 seconds off).

  If the PN is in service, Expansion Interface Neighbor Query Test (#237) fails on this EI circuit pack, but Test #238 passes.

These symptoms can also be the result of other problems (for example, one half of the fiber being unable to transmit data). If the system exhibits these symptoms, execute the following procedure:

1. Verify that the PN stays down for at least 1 minute.

   If the EAL comes back in service after a short time, without switching the active Tone-Clock, the problem was probably that the on-line synchronization source became invalid. See SYNC (Port Network Synchronization) for more information.

   However, if the EAL(s) have not come back into service after a minute, the synchronization source is not the cause of the problem. Proceed to step 2.

2. Check for errors via **display errors** with the Category field set to **tone** and the Active Alarms field set to **n**. Some of the alarms on PN objects might have been resolved if the PN went down. Refer to the appropriate MO Maintenance documentation for descriptions of any of the errors occurring at about the same time as the EXP-PN errors, SYS-LINK errors against EAL s, RNLs, or LNLs, or FIBER-LK (769, 1025, or 1281) errors. Resolve any active alarms. Also, if Error Type 18 was logged against the SYNC MO when the PN went down, the problem was probably that the synchronization on-line reference became invalid. Since reference switching was disabled, the Tone-Clock did not switch from the invalid reference. Therefore, the Tone-Clock circuit pack put out a system clock that was “out of spec.” Enter **enable synchronization-switch**. If the PN is down, reseat the Tone-Clock circuit packs on the PN. This action should restore the PN to service.

   Execute Steps 3 and 4 in the order most convenient to you and least destructive to the customer.

3. Check to see if the fiber-optic cable is transmitting properly via the following procedure on one of the out-of-service links, or use the Fiber link fault isolation in *Maintenance Procedures (03-300432)*.

   a. Carefully record the symptoms (amber LED pattern and test failing) that were occurring on the PN EI circuit pack and the PN EI circuit pack or the connected CI circuit pack in the case of a Center Stage system. Clearly indicate what symptoms are occurring on which EI/SNI circuit pack.

   CAUTION:

   Before proceeding, note which is the current transmit fiber and which is the current receive fiber for proper re-connection.

   b. Disconnect the transmit and receive fiber pair from the lightwave transceiver on the back of one of the EI circuit pack slots that is exhibiting symptoms.

   c. Connect what was formerly the transmit fiber to the receive jack.

   d. Connect what was formerly the receive fiber to the transmit jack.

   e. Perform steps b, c, and d on the opposite end of the fiber and the lightwave transceiver on the back of the connected EI or SNI circuit pack slot.

   f. If the symptoms that were formerly occurring on the EI circuit pack that was exhibiting these symptoms are now occurring on the connected EI or SNI circuit pack and vice versa, the fiber is defective and should be replaced.

4. Determine whether the problem is due to a defective active Tone-Clock circuit pack. Refer to the preceding list of symptoms to decide which network contains the suspect active Tone-Clock.

CAUTION:

If you remove the PN EI circuit pack that is active or that was active when the PN was last in service, the Tone-Clock lead will revert to the default value which will cause the Tone-Clock circuit pack located in the A carrier to become the active Tone-Clock. This characteristic can be deceiving. Replacing or reseating the active PN EI circuit pack might restore the link(s) temporarily. However, if the Tone-Clock circuit pack located in the B carrier was really the source of the problem and not the EI circuit pack, then the link(s) will go down again the next time a Tone-Clock switch to the Tone-Clock in the B carrier is attempted (probably when the scheduled Tone-Clock switch occurs).

CAUTION:

If, after every link is restored, you suspect the problem might have been due to a defective Tone-Clock circuit pack, switch to this Tone-Clock at an appropriate time. If the Tone-Clock circuit pack was the cause of the problem and the same EI circuit packs are in place, the same link(s) will go down again.

a. When the suspect Tone-Clock circuit pack resides in an in-service pot network (PN) with duplicated Tone-Clock circuit packs:

   Switch to the standby Tone-Clock in this PN. If the suspect Tone-Clock is defective, the link(s) should be restored at this point. (Switching back to the defective Tone-Clock should take the same link(s) out of service.) This Tone-Clock is defective and should be replaced as soon as possible. If switching Tone-Clocks does not bring up the PN, then this Tone-Clock is not the source of the problem. Be sure to switch back to the original Tone-Clock.

CAUTION:

If a defective Tone-Clock circuit pack is left as the standby Tone-Clock, then a scheduled Tone-Clock switch will cause the same link(s) go out of service again.

b. When the suspect Tone-Clock resides in an out-of-service PN:

   Replace the active Tone-Clock circuit pack in this PN. In a PN with duplicated Tone-Clock circuit packs, the active Tone-Clock’s amber LED is flashing. If both amber LEDs are flashing, the active Tone-Clock’s LED is blinking slower.

CAUTION:

If a defective Tone-Clock circuit pack is left as the standby Tone-Clock, then a scheduled Tone-Clock switch will cause the same PN to go out of service again.

If replacing this circuit pack restores the link(s), then the circuit pack should be replaced as soon as possible. If not, then it was not the source of the problem.

Replacing an EI Circuit Pack—Unduplicated PNC

Do not power down a Switch Node carrier to replace a circuit pack.

Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface, or DS1 Converter circuit pack in a standard-, duplex-, or high-reliability system disrupts service. This service effect can range from an outage of a single PN to an outage of the entire system.

Step	Action	Explanation / Caution
1.	Enter **busyout board location**.	location = cabinet-carrier-slot location of the circuit pack to be replaced.
2.	Replace the circuit pack.	
3.	Wait for the circuit pack to reset.	Red and green LEDs light and then go out. If the red LED remains lit, see the previous note under Expansion Interface LEDs.
4.	Enter **release board location**.	CAUTION: Do not busyout any EI circuit packs after this point.
5.	Enter **test alarms long clear** for category **exp-intf**.	
6.	Wait 5 minutes for SNI-BD, FIBER-LK, and DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc.**	

Replacing an EI Circuit Pack— Duplicated PNC

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WARNING alarm against TDM-CLK with Error Type 2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

Step	Action	Explanation / Caution
1.	Enter **status pnc**.	Verify that the component to be replaced is on the standby PNC.
		1 of 2

Step	Action	Explanation / Caution
2.	Enter **busyout pnc**.	
3.	Enter **busyout board location**.	location represents the cabinet-carrier-slot location of the circuit pack to be replaced.
4.	Replace the circuit pack.	
5.	Enter **release board location.**	CAUTION: Do not busyout any EI circuit packs after this point.
6.	Enter **test alarms long clear** for category **exp-intf**.	
7.	Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc or b-pnc**.	Use the letter designation of the PNC that holds the replaced component (the standby PNC).
8.	Enter **status pnc**.	If either PNC's state of health (SOH) is not "functional," consult PNC-DUP (PNC Duplication).
9.	Enter **release pnc**.	
		2 of 2

If the red LED remains lit, see the previous note under Expansion Interface LEDs.

Expansion Interface Manual Loopback Procedure

This procedure is to be used when an EI circuit pack cot be tested by software. This occurs when the EI circuit pack resides in an out-of-service PN. A short length of optical fiber is required for this procedure.

If this procedure is run on both endpoints of a fiber link (EI circuit packs or SNI circuit packs), and both check out fine, then the failure is most likely in the fiber itself, assuming neither endpoint circuit pack is busied out and the link remains inactive.

1. Busyout the circuit pack (EI or SNI) with **busyout board location**.
2. Disconnect the transmit and receive fiber pair from the lightwave transceiver on the back of the circuit pack (EI or SNI) slot.

Note:

The fiber connected to the transmit side of the lightwave transceiver on one EI circuit pack should be connected to the receive side of the lightwave transceiver on the circuit pack on the opposite end of the fiber.

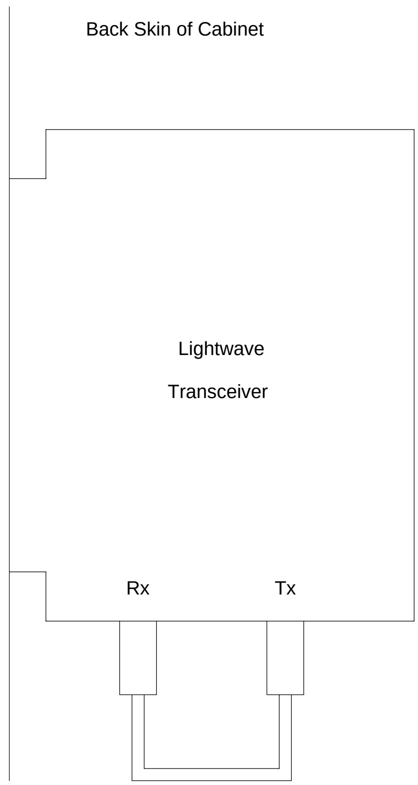
3. Using a fiber jumper cable, interconnect the transmit and receive jacks of the lightwave transceiver as shown in Figure 30: Interconnection of Lightwave Transceiver Transmit/ Receive Jacks.

   Note:

   Make sure that the total length of the fiber jumper cable does not exceed the maximum length recommended for the fiber link connections between cabinets. Using cable lengths not within connectivity guidelines can adversely affect test results.

4. Go to the front of the cabinet and inspect the amber LED.
   - If the amber LED flashes on at a rate of once per second, the (EI or SNI) circuit pack or transceiver should be replaced.
   - If the amber LED flashes on at a rate of five times per second, the circuit pack (EI or SNI) or the lightwave transceiver may need replacement. This condition may also be due to a faulty system clock on the network containing this EI circuit pack.
   - If the amber LED is not blinking, this circuit pack (EI or SNI) and the lightwave transceiver are functioning properly.
5. Replace faulty components and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in step 3. If there is a problem with the PN after re-connecting the fiber, and the PN is connected to a Center Stage Switch, run the Configuration Audit via **`test board`** on the SNI circuit pack to which the intervening fiber is connected. See the SNI-BD section for instructions on interpreting results.
6. Release EI circuit pack or SNI circuit pack with **`release board`** ***`location`***.

Figure 30: Interconnection of Lightwave Transceiver Transmit/Receive Jacks



Error log entries and recommended actions

Table 109: EXP-INTF Error Log Entries ***1 of 3***

Error Type	Aux Data[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[2]	0	Any	Any	Any	`test board location`
1	Any	EI Local TDM Looparound (#240)	MAJ	ON	`test board location r 2`
					1 of 3

Table 109: EXP-INTF Error Log Entries ***2 of 3***

Error Type	Aux Data[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
2		EI Local TDM Looparound (#240)	MAJ	ON	`test board location r 2`
18 (a)	0	`busyout board location`	WRN	OFF	`release board location`
23 (b)	0		WRN	OFF	
125 (c)			MIN	ON	
131 (d)			MIN	ON	
257 (e)	Any		MIN	OFF	
513 (f)	5–7		MAJ	ON	
769 (g)	113	EI FOOF Query test (#238)	WRN	OFF	`test board location r 1`
770		EI FOOF Query test (#238)	WRN	OFF	`test board location r 1`
1025	Any	EI Control Channel test (#316)	MAJ	ON	`test board location r 1`
1281 (h)		EI Neighbor Query test (#237)	MIN	OFF	`test board location r 1`
1537		EI 2-way Transmission test (#241)	MAJ	OFF	`test board location r 4`
1538 (i)			MIN	ON	
1793		EI Lightwave Transceiver Looparound test (#242)	MAJ	ON	`test board location l r 3`
2049 (j)	117		WRN	OFF	
2305 (k)	118		WRN	OFF	
2306 (l)	3		WRN	OFF	
	112				
2561 (m)	Any		MIN	ON	
					2 of 3

Table 109: EXP-INTF Error Log Entries ***3 of 3***

Error Type	Aux Data[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
2817 (n)	Any		MIN	ON	
3073 (o)	Any	EI Packet Interface test (#589)	MAJ	OFF	**test board location r 3**
3074 (p)	2	EI Packet Interface test (#589)	MAJ	OFF	**test board location r 3**
3075 (p)	1	EI Packet Interface test (#589)	MAJ	OFF	**test board location r 3**
3076		EI Packet Interface test (#589)	MAJ	OFF	**test board location r 3**
3330 (q)	Any		WRN	ON	
3585 (r)	0		WRN	OFF	
3841(t,v)	Any		MIN	OFF	**(s)**
3842(u,v)	Any		MIN	OFF	**(s)**
10001 (w)	0				
					3 of 3

1. Aux Data 32767 for any error log entry indicates that an alarmed EI was busied out and then released. When this occurs, existing service affecting alarms must be preserved. As is typical, when the EI is released every alarm is resolved. Therefore the alarm and error logs must be repopulated with the alarms present at time of busyout. This error code is an indication that existing aux data and error log time stamps are no longer valid because they were lost when the alarms were resolved upon release of the circuit pack.

2. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a. **Error Type 18**: the EI circuit pack has been busied out via **busyout board *location***. To resolve this error, release the EI circuit pack via **release board *location***.

b. **Error Type 23**: the EI circuit pack has been administered on the Circuit Pack screen, but has not been physically inserted into the system. Insert the circuit pack.

c. **Error Type 125**: A different circuit pack occupies the slot where this circuit pack is logically administered. To resolve this problem, either:

   1. Replace the incorrect circuit pack with the logically assigned circuit pack.

2. Use **change circuit-pack** to reassign the slot to match the existing circuit pack. If a fiber is assigned for the existing circuit pack, remove the fiber from translations before changing the circuit pack's translations.

d. **Error Type 131**: an EI circuit pack has been removed from a slot for 5 minutes. The alarm will be resolved when the EI circuit pack is physically inserted into this slot and becomes recognized by software.

   Another way to resolve this alarm is to use **change circuit pack** to remove the EI circuit pack administrative entry for this slot after the EI circuit pack has been removed from the slot.

   It is also possible that the EI could be held in reset by the PN's Maintenance board (MAINT) and is not inserted in the system. Enter **test maint *P* long** on the Maintenance board in the same PN.

e. **Error Type 257:** this EI circuit pack is detecting incorrect data on the incoming fiber bit stream. The data is originating at the connected circuit pack (DS1 converter circuit pack, EI circuit pack, or SNI circuit pack).

   1. Enter **display errors** and save a copy of the error log for use in later steps. Intervening repair procedures are likely to alter the contents of the error log and this information may be needed in later steps.
   2. Perform the Fiber link fault isolation procedures described in *Maintenance Procedures (03-300432)*.
   3. If errors are still present or if this error occurs intermittently, replace the EI circuit packs, SNI circuit packs, DS1 converter circuit packs, or the transceivers on this link.
   4. These errors could result from a bad timing reference on the network or switch node that contains the DS1 converter, EI, or SNI circuit pack on the opposite end of the fiber. Refer to the error log that was saved in step 1 and follow the associated repair procedure for EXP-INTF (Expansion Interface Circuit Pack) error 2305 to resolve this error. If there are any TONE-BD (Tone-Clock Circuit Pack), TDM-CLK (TDM Bus Clock), or SYNC (Port Network Synchronization) errors, resolve these errors as well.

f. **Error Type 513 with Aux Data 5–7**: an ON BOARD hardware failure of the circuit pack's RAM or ROM. Replace the EI circuit pack.

g. **Error Type 769**: Besides running the test sequence and following procedures outlined for Expansion Interface Fiber Out-of-Frame Query Test (#238), perform the Fiber link fault isolation procedures described in *Maintenance Procedures (03-300432)*.

h. **Error type 1281**: The link to the neighbor circuit pack is broken or the fibers have been connected incorrectly. Enter **test board *location*** and follow repair procedures for the tests.

i. **Error Type 1538:** a hyperactive EI circuit pack is generating an abnormal amount of control messages to the Processor. When this error was generated, the EI was automatically reset by the system. If this system does not have duplicated Port Network Connectivity, service to the PN will have been disrupted. If this system does have duplicated Port Network Connectivity, the system should have switched to the standby Port Network Connectivity.

1. Enter **`reset board location`** for this EI circuit pack.
2. If error 1538 is detected again, replace the EI circuit pack.

j. **Error Type 2049 with Aux Data 117:** there is a problem with the fiber optic interface (FOI), that is generating bit errors. Sometimes these bit errors may be constant. This error could be caused by a crimped fiber, a fiber that is not seated correctly in the transceiver, or a defective transceiver.

k. **Error Type 2305 with Aux Data 118:** the EI circuit pack has detected slips on the incoming fiber data stream. That is, a PN in a Direct Connect configuration, or a PN and a Switch Node in a Center Stage Switch configuration, are not synchronized.

1. Enter **`display errors`** and follow the repair procedures for non-slip errors against any of the following:

   SYNC (Port Network Synchronization)
   TDM-CLK (TDM Bus Clock)
   TONE-BD (Tone-Clock Circuit Pack)
   DS1C-BD (DS1 Converter Circuit Pack)
   EXP-INTF (Expansion Interface Circuit Pack)
   SNC-BD (Switch Node Clock Circuit Pack)
   SNI-BD (SNI Circuit Pack)

   Non-slip errors are those not listed below:

Circuit Pack Name	Name in Error Log	Log Entry (for Slips)
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
SNI	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160
DS1 converter circuit pack	DS1C-BD	3329

2. For slip errors, see SYNC (Port Network Synchronization).

l. **Error Type 2306** indicates on-board failures related to system timing and synchronization. Perform the Fiber link fault isolation procedures described in Chapter 4: General troubleshooting of *Maintenance Procedures (03-300432)*.

m. **Error Type 2561** indicates an on-board failure of EI circuitry related to handling packet data from the fiber interface and from the packet bus interface.

1. If this error has generated a minor alarm, the EI circuit pack should be replaced.

n. **Error Type 2817**: on-board failure of EI circuitry related to transmission of data to the fiber interface. If this error has generated a minor alarm, the EI circuit pack or transceiver should be replaced.

o. **Error Type 3073**: Perform the following steps for Error Type 3073:

1. Execute **`display errors`** and resolve any errors on the following: PKT-BUS, PKT-INT, BRI-BD, BRI-PT, BRI-SET/ASAI, UDS1-BD.
2. Enter **`test board location r 3`** for this circuit pack. If this error continues to appear, replace the EI circuit pack.

p. **Error Types 3074 and 3075**: failures of the EI circuit pack Packet Path test. The packet path test exercises circuitry on the EI circuit pack, the neighbor EI or SNI circuit pack, and any intervening DS1 converter circuit packs (if the PN is remoted).

1. Certain packet bus faults can cause these errors without the EI being defective. Check if PKT-BUS errors are also present. If they are, see PKT-INT (Packet Interface) and Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)* to diagnose the problem.
2. If Error Type 3075 is present without Error Type 3074, replace the EI circuit pack.
3. If Error Type 3074 exists with or without 3075, run **`test board`** ***`location`*** on the EI, and follow the repair procedures for any test that does not pass.
4. If PKT-BUS errors are absent and replacing the EI does not resolve the problem, there may be a packet bus fault. See Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)*.

q. **Error Type 3330:** failure of a diagnostic component on the EI circuit pack. The failed component will not impair service, but it may leave the EI circuit pack in a state where the EI circuit pack cot detect errors.

1. Replace the EI circuit pack at a time when it is most convenient for the customer (this may cause service outages).

r. **Error Type 3585:** the EI circuit pack experienced a series of very short out-of-frame conditions within several minutes. This may indicate transmission difficulties over the fiber link. If this condition ceases, the warning alarm should be resolved within 15 minutes.

1. Enter **`display errors`** and resolve any SNC-BD (Switch Node Clock Circuit Pack), TDM-BUS (TDM Bus), TDM-CLK (TDM Bus Clock) or SYNC (Port Network Synchronization) errors.

s. Perform the Fiber link fault isolation procedures described in Chapter 4: General troubleshooting of *Maintenance Procedures (03-300432)*.

1. If the alarm is not resolved within the next 15 minutes, replace the lightwave transceiver on the EI circuit pack reporting the problem and on the connected EI circuit pack, SNI circuit pack, or DS1 converter circuit pack.
2. If the alarm is not resolved within the next 15 minutes, replace the EI circuit pack reporting the alarm.
3. If the alarm is not resolved within the next 15 minutes, replace the connected EI circuit pack, SNI circuit pack, or DS1 converter circuit pack.

t. **Error Type 3841:** the EI has reported a loss of lock with the backplane system clock.

u. **Error Type 3842:** the test that queries the EI for the state of the lock to the system clock has failed. A loss of lock condition is present.

v. The counter associated with Error Types 3841 and 3842 is cleared when the query for the state of the clock-to-system-clock passes. Once the alarm is raised, this test is run every five minutes. However, the test is not part of any sequence that can be run on demand. See previous Note p for the repair procedure.

w. **Error Type 10001:** the EI circuit pack dropped one control message to the PN. This condition may have been observed as a call that did not complete correctly. No action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

When testing EI circuit packs to investigate problems, tests should always be run on both circuit packs on the associated fiber link, whether the circuit packs are both EI circuit packs, or one is a SNI circuit pack. This will provide a better indication of where a problem is located.

When testing of the EI is not possible, (for example, when the PN is down), see the Expansion Interface Manual Loopback Procedure.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Expansion Interface Fiber Out-of-Frame Query Test (#238)	X	X	ND
Expansion Interface Lightwave Transceiver Looparound Test (#242)		X	D
Expansion Interface Control Channel Test (#316)	X	X	ND
Expansion Interface Neighbor Query Test (#237)	X	X	ND
Expansion Interface Local Looparound (#240)	X	X	ND
Expansion Interface 2-Way Transmission Test (#241)	X	X	ND
Expansion Interface Packet Interface Test (#589)	X	X	ND
The following test is executed as part of the **`reset board`** command			
Expansion Interface Reset Test (#336)			D

1. D = Destructive, ND = Nondestructive

EXP-PN (Expansion Port Network)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
EXP-PN	MAJ	`display errors`[1]	Expansion Port Network

1. Investigate errors against EXP-PN and EXP-INTF (Expansion Interface Circuit Pack).

The EXP-PN MO is responsible for overall maintenance of an Expansion Port Network (EPN) and monitors cross-cabinet administration for compatible companding across the circuit-switched connection. The focus of EPN maintenance is on the EI, the ATM's EI, or the IP Server Interface (IPSI) circuit pack that is acting as the Expansion Archangel link in an EPN. EXP-INTF or ATM-EI or IP-SVR covers maintenance of the EI, ATM EI, or IPSI circuit pack, while EXP-PN covers a much broader area of activities and problems on an EPN. The alarming strategy for EXP-PN is fairly simple and does not make use of any failure analysis routine for spawning maintenance actions. EXP-PN alarming is based on the availability of an EPN for service and the EPN's response to various recovery actions.

When investigating alarms logged against an EPN, problems involving the EI, an ATM EI, or an IPSI circuit pack acting as the Expansion Archangel; problems that may involve loss of communication between the EPN and the server should be investigated. This could ultimately include fiber links (FIBER-LK), DS1 converter circuit packs (DS1C-BD), SNI circuit packs (SNI-BD) and Switch Node Configurations (SN-CONF) for CSS. For ATM, this could include the PN ATM EI (ATM-EI) circuit pack, the ATM switch (ATM-NTWK), and EPN ATM EI (ATM-EI) circuit pack. For TN2312 IPSI circuit packs this could include IP-SVR or IPSV-CTL maintenance objects.

PN Restarts

While not an exhaustive discussion of PN recovery actions, this section describes at a high level the causes and effects of PN restarts so that these Error Log events can be understood.

PN Warm Restarts

PN Warm Restart (PN Reset Level 1) is generally performed on a PN when the recovery of that PN can be accomplished in less than 30 seconds. When possible, Warm Restart minimizes the work required to reinitialize a PN and reduces the impact of a PN failure by avoiding the longer and highly-destructive PN Cold Restart. The primary cause of PN restarts is failure of the link from the server to the PN due to a hardware fault in the link's path. For most hardware failures this link (and thus the PN) cot be recovered until the failed hardware is replaced. However, several failure modes provide hardware redundancy, allowing the link to be recovered quickly. For instance in duplicated systems, the failure of a Packet Interface circuit pack causes an IPSI interchange that allows the link to be recovered quickly over the newly-active Packet Interface. Or on a Center Stage Switch with multiple fibers interconnecting the switch nodes, a link carried on one fiber can be rerouted over another fiber.

If the Expansion Archangel Link (EAL) is recovered quickly, the PN Warm Restart returns the PN to service with minimal effects on user service. If the EAL cot be recovered quickly, the PN is taken out of service and a PN Reset Level 2 (PN Cold Restart) is required to return it to service.

PN Cold Restarts

If the server-to-PN link has failed and has not been recovered within 30 seconds, the PN is taken out of service and can be brought back into service only with a PN Reset Level 2 (PN Cold Restart). Effects of a PN Cold Restart include a reset of every circuit pack in the PN and the disconnection of every call to or from the PN. Calls with both endpoints within the PN are dropped upon recovery.

PN Restart Escalation

PN restarts follow an escalation strategy controlled by maintenance software. Whenever a request for a PN Reset Level 1 (PN Warm Restart) is made, software checks to see if the restart should be escalated to a PN Reset Level 2 (PN Cold Restart). If any of the following are true, the restart is escalated:

- At least two level 1 restarts have occurred and less than 30 minutes has elapsed since the last occurrence.
- Current PN conditions do not allow a level 1 restart, such as when the PN is out of service.
- Less than 3 minutes has elapsed since the last PN Cold Restart, indicating that the PN is unstable.

If two PN Cold Restarts have been executed in less than an hour and the link is functional, but the PN has not recovered to an in-service state, a MAJOR alarm is raised against EXP-PN, and the PN is put into Emergency Transfer by system software. (Software can invoke PN Emergency Transfer only when the link to the PN is up. If the link is down, the hardware automatically invokes Emergency Transfer 1 minute after it detects a link failure).

Connectivity Alarming

When a PN is out of service, a MAJOR EXP-PN alarm is raised against that PN. A PN can only be alarmed if it is out of service *and* the fiber between the server and the PN is up.

For ATM, a Port Network can only be alarmed if it is out of service and the connections to the server, the ATM switch, and the EPN are up. If the connection from the server to the ATM switch is down (by removing it from administration, for example), every Port Network is lost but not alarmed, since they are not the cause of the problem.

Error log entries and recommended actions

Table 110: EXP-PN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	0	None	None		
257 (b)	0	None	None		
513 (c)	0	None	MAJ	OFF	
769 (d)	0	None	MAJ	OFF	
1025 (e)	Any	None	MAJ	OFF	

Notes:

a. **Error Type 1**: informational entry only, indicating that a PN Reset Level 1 (PN Warm Restart) has been executed on this PN.

b. **Error Type 257**: informational entry only, indicating that a PN Reset Level 2 (PN Cold Restart) has been executed on this PN. This does not include restarts done at system initialization time.

c. **Error Type 513**: indicates that a PN is not in service when it is expected to be. The value specified in the port field of the error log, is the PN number of the affected PN. When this condition occurs, examine every system link error and EXP-INTF or ATM-PNC error to aid in resolving the alarm (examples of system link errors are errors logged against PKT-INTF, EXP-INTF, SNI-BD, FIBER-LK, and PKT-BUS and for ATM, PKT-BUS, ATM-EI, ATM-NTWK). Also check that all fiber connectivity matches that have been administered for the system. This alarm and error is resolved and removed from the logs only when the PN comes back into service.

d. **Error Type 769**: This alarm is raised when PN maintenance has attempted to execute a Cold Restart recovery action two times, and both restarts failed. This will cause the PN to be placed in Emergency Transfer. Examine every EXP-INTF or ATM-EI error that, when cleared, may aid in resolving this alarm. Also check for any SNI-BD, SNI-PEER, FIBR-LK, SN-CONF, or DS1C-BD errors or for ATM, ATM-EI or ATM-NTWK errors that may indicate a communication problem between the processor and the PN. Make sure that the physical fiber connectivity matches that of system administration.

e. **Error Type 1025**: If two cabinets are DS1-C connected and their companding modes differ, the system raises a major alarm only if the **Multinational Locations** field is **y** on the **Customer Options** form. See *Administering Avaya Aura™ Communication Manager* for more information about administering multiple locations, particularly the **Locations** form in Screen Reference section.

Demand test descriptions and error codes

There are no demand tests for EXP-PN. Two reset tests, PN Cold Restart Test (#955) and PN Warm Restart Test (#956) can be executed to reset a PN.

The PN Warm Restart Test (#956) restarts a PN that has not been taken out of service. It is the least severe of the PN restart levels and is used in an attempt to preserve the state of the system as much as possible, thereby reducing user impact. The command for this type of restart is **`reset port-network P level 1`** where P is the port network number.

The PN Cold Restart Test (#955) is used as a recovery mechanism for a PN that has been taken out of service. It is executed as a result of PN recovery escalation when a Warm Restart is not possible, or as a result of a system technician demanded PN restart. Once a PN has gone out of service, a PN Cold Restart is required to bring it back into service. This is the most severe of the PN restarts, and users will experience a service outage. The command for this type of restart is **`reset port-network P level 2`** where P is the port network number.

EXT-DEV (External Device Alarm)

G650

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
EXT-DEV	MIN	**test environment** ***location***	External Device Alarm
	MAJ	**test environment** ***location***	
EXT-DEV	MIN	**test eda-external-device-alrm** ***location***	External Device Alarm
	MAJ	**test eda-external-device-alrm** ***location***	

A TN2312BP IPSI, in a G650 with a carrier address set to A, has two alarm ports that connect to external devices. An example of an external device is an uninterruptible power supply (UPS). Refer to Figure 66: G650 Cabinet Environmental Hardware Components on page 824 for further information.

Conditions can occur on the external device that close the contacts on the alarm leads. This notifies the switch to originate an EXT-DEV alarm. One set of leads generates a major alarm, the other set generates a minor alarm.

These leads are labeled Major and Minor alarm. The designation of major or minor refers to the lead, not to the severity of the alarm associated with the connection. For example, the major lead can be administered as a major, minor, or warning alarm, and the minor lead can be administered as a major, minor, or warning alarm. Analog line ports can also be administered as external device alarms in the same mer.

If the External Device Alarm feature is enabled on the **change system-parameters customer-options** form, the alarm level and the text string for the alarm condition for each external alarm lead can be administered on the SAT screen using the **add eda-customer-alarm** command. The alarm leads are tested using the **test eda-external-device-alrm** ***location*** command.

If the External Device Alarm feature is not enabled on the **change system-parameters customer-options** form on the SAT, a contact closure to ground for the Major Alarm lead will generate a Major alarm for EXT-DEV, and a contact closure to ground for the Minor Alarm lead will generate a Minor alarm for EXT-DEV. The alarm leads are tested using the **test environment** ***location*** command.

Error log entries and recommended actions

Table 111: Test to clear with external device alarm administration enabled

Error Type	Aux Data	Associated test	Alarm Level	On/Off Board	Recommended Action
1		External Device Alarm Query Test (#120)	MAJ MIN	OFF	**`test eda-external-device-alm`** ***`location`*** **`major | minor`**

Table 112: Test-to-clear without external device alarm administration enabled

Error Type	Aux Data	Associated test	Alarm Level	On/Off Board	Recommended Action
1		External Device Alarm Query Test (#120)	MAJ MIN	OFF	**`test environment`** ***`location`***

Demand test descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND
External Device Alarm Query Test (#120)	X	X	Nondestructive

EXT-DEV ADMIN? N (External Device Alarm)

S8700 | S8710 | S8720 / S8500

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
EXT-DEV	MAJ MIN	**test environment *UU***	External Device Alarm

1. Where ***UU*** is the cabinet number in the PORT field from the Alarm or Error Log.

Note:

Use this Maintenance Object when the **External Device Alarm Admin** field on the **change system-parameters customer-options** form is **n**.

S8700 | S8710 | S8720 | S8500: The IPSI monitors the EXT-DEV alarm leads.

The system only recognizes pairs connected to the 1M and 1m (ALARM MONITOR) leads. Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring* (555-204-111) for more details.

Error log entries and recommended actions

Table 113: EXT-DEV ADMIN?N Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test environment UU r 2 or 6**
1 or 5	Any	External Device Alarm Query Test (#120)	MAJ MIN[2]	OFF	**test environment UU r 2 or 6**

1. Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2. One port generates a MAJOR alarm; the other port generates a MINOR alarm.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Table 114: EXT-DEV ADMIN?N Demand Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Single-Carrier Cabinet Power Query Test (#79)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Device Alarm Query Test (#120) (MAJOR port)	X	X	ND
External Device Alarm Query Test (#120) (MINOR port)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND

1. D = Destructive; ND = Nondestructive

EXT-DEV ADMIN? Y (External Device Alarm)

S8700 | S8710 | S8720 / S8500

MO Name in Log	Alarm Level	Initial Command to Run [1]	Full Name of MO
EXT-DEV	MAJ MIN WRN	**test eda-external-device-alrm *UU***	External Device Alarm

1. ***UU*** is a cabinet number determined in the `Port` field of the Alarm or Error Log.

Note:

Use this MO when the `External Device Alarm Admin` field on the **change system-parameters customer-options** screen is **y**. You must have INADS or INIT login permissions to administer EXT-DEV Alarm.

S8700 | S8710 | S8720 / S8500

Each PN's Maintenance circuit pack has two alarm ports that connect to such external devices as uninterruptible power supplies (UPSs) or adjuncts (e.g., AUDIX).

Certain conditions on the external device close the contacts on the alarm leads to notify the switch that in turn originates an EXT-DEV alarm. One set of leads generates a major alarm; the other set generates a minor alarm.

The special locations ***UUmajor*** and ***UUminor*** designate the major or minor Maintenance board's alarm connection for cabinet UU. The major/minor designation specifies the port, not the alarm level associated with the connection; *for example,* the "major" port can be administered as a major, minor, or warning alarm, and the "minor" port can be administered as a major, minor, or warning alarm. In addition Analog line ports can also be administered as external device alarms.

Note:

An un-administered Maintenance board's external device alarm port, that is sensing a contact closure will have an entry in the Error Log and in the Alarm Log. The alarm receiver will not receive warning alarms.

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	`test eda-external-device-alrm physical-location r 2 | 6`
1 or 5	Any	External Device Alarm test (#120)	Any	OFF	`test eda-external-device-alrm physical-location r 2 | 6`

Note:

The loss of -48 volt power prevents detection of an external device alarm. AC-POWER, CARR-POW, and DC-POWER alarms could indicate the loss of the external device alarm -48 volt power source. ALARM-PT alarms may also indicate a loss of power. When analog line ports are administered as analog line external device alarms loss of -48 volts prevents detection of an external device alarm.

Demand tests descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
External Device Alarm Query Test (#120) (MAJOR port)	X	X	ND
External Device Alarm Query Test (#120) (MINOR port)	X	X	ND
External Device Alarm Query Test (#120) (WARNING port)	X	X	ND

1. D = Destructive; ND = Nondestructive

FIBER-LK (Fiber Link)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
FIBER-LK	MAJ MIN WRN	**test fiber-link *F pnc* s**	Fiber Link

1. ***F*** is the fiber link number; ***pnc*** is either “a-pnc” or “b-pnc” (always “a-pnc” for a standard-, high-, or critical-reliability system).

A fiber link consists of the endpoint boards that are connected via the optical fiber, the lightwave transceivers or metallic connections on the endpoint boards, and, if administered, the DS1 Converter (DS1 converter) complex that exists between the two fiber endpoints. The fiber endpoints are EI circuit packs and/or SNI (SNI) circuit packs.

Three types of fiber links exist in the system:

EI-to-EI fiber	This type of fiber is an EI-to-EI connection and is only used in direct connect PNC.
EI-SNI fiber	This type of fiber is an EI-to-SNI connection and is only used in Center Stage Switch (CSS) PNC.
SNI-SNI fiber	This type of fiber is an SNI-to-SNI connection and is only used in CSS PNC when two switch node carriers are connected in a 2- or 3-switch node configuration.

Fiber link errors and alarms are generated only on fibers that have at least one SNI endpoint. Fiber errors for fibers that have EIs as both endpoints are detected by the EI circuit pack, thus generating off-board EXP-INTF errors and alarms. Fiber errors and alarms on EI-SNI fiber links generate FIBER-LK and/or off-board EXP-INTF errors and alarms.

Fiber links are administered via **add fiber-link F** or **add fiber-link next**, where F is the fiber link’s number. The 2 endpoints of the fiber are administered (EI and EI, EI and SNI, or SNI and SNI). In a duplicated PNC configuration, both the A- and B-PNC’s fiber links are assigned with the same fiber link’s number. The fiber links are designated by ***F P***, where ***F*** is the fiber link’s number and ***P*** is the PNC, A-PNC or B-PNC. In addition, a DS1 converter complex may be assigned to the fiber link. In a duplicated PNC configuration, both the A- and B-PNC’s DS1 converter complexes are administered with the same fiber link’s number. DS1 facilities and parameters can be modified via **change fiber-link F P**.

Use **display fiber-link F** to see an individual fiber link. Use **list fiber-link** to see every fiber link.

The following terms are used in the error descriptions:

Control Path	The path between the two fiber endpoints that is necessary for the two endpoint circuit packs to communicate.
Circuit Path	The path between the two fiber endpoints that is necessary for circuit switched phone calls to work.
Neighbor	The circuit pack on the other end of the fiber.
Out of Frame	A circuit pack reports fiber out of frame if it cot detect valid data coming from the fiber.
Packet Path	The path between the two fiber endpoints that is necessary for packet-switched messages to be sent between the two fiber endpoints.

LEDs for Circuit Packs on a Fiber Link

The amber LEDs on the three types of boards, SNI (TN573), EI (TN570), and DS1 Converter (TN574 or TN1654), that may be a part of the fiber link can help in diagnosing problems with the fiber link. The amber LED states are as follows. The flashing LED patterns take precedence over the active or standby LED patterns.

If both endpoints of a fiber link (EI and/or SNI) are flashing with a fiber out of frame pattern, a fast amber LED pattern (0.1 second on and 0.1 second off), check the lightwave transceivers (if present). Both lightwave transceivers on the fiber link must be of the same type. The 9823a shortwave transceiver and the 9823b longwave transceiver must never be combined on the same fiber link because a fiber out-of-frame condition will exist. The 9823a lightwave transceiver should be used for distances up to 4900 feet and the 9823b lightwave transceiver should be used for distances up to 25,000 feet.

Table 115: SNI Amber LED Flashing Codes

Condition	LED on	LED off
Fiber out of Frame	0.1 second	0.1 second
In Frame, No Neighbor[1]	0.5 second	0.5 second
SNI active	Solid on	Never off
SNI standby	Never on	Solid off

1. The fiber is in frame, but no communication exists to the neighbor

Table 116: Expansion Interface Circuit Pack Amber LED Flashing Codes

Condition	LED on	LED off
Fiber Out-of-Frame	0.1 second	0.1 second
In frame-No Neighbor (a)	0.5 second	0.5 second
Expansion Interface Active (b)	2 second	0.2 second
Expansion Interface Active (c)	Solid on	Never off
Expansion Interface Standby (d)	Never on	Solid off

Notes:

a. The fiber is in frame, but no communication exists to the neighbor.

b. This is the normal state for an active PN EI circuit pack that is also the bus master (expansion Archangel) in the PN.

c. This is the normal state for an active EI circuit pack that is not the bus master (expansion Archangel) for a PN. This applies only in the direct connect configuration where the EI circuit pack in a PN connects via a fiber link to an EI circuit pack in the other PN. This state also applies for an active EI circuit pack located in the PN.

d. This is the normal state for a standby expansion Interface circuit pack in the PN.

For more details about how the EI circuit pack error codes relate to the LED states, see EXP-INTF (Expansion Interface Circuit Pack).

Table 117: DS1 Converter Amber LED Flashing Codes

Condition	LED on	LED off
Fiber out of Frame (a)	0.1 second	0.1 second
In frame, fiber channel is down (b)	0.5 second	0.5 second
In frame, DS1 channel down (c)	1 second	1 second
DS1 converter, no response from server (d)	2 second	0.2 second
DS1 converter active	Solid on	Never off
DS1 converter standby	Never on	Solid off

Notes:

a. A Fiber is out of frame or a fiber loss-of-signal condition exists.

b. DS1 converter/fiber endpoint communication is down.

c. The DS1 channel is down between the two DS1 converters in the DS1 converter complex.

d. The server is not acknowledging messages from the DS1 converter circuit pack or the DS1 converter circuit pack does not have a processor route. This pattern indicates a probable software problem.

In addition to the traditional red, green, and amber LEDs, the DS1 converter circuit pack has four green LEDs that indicate whether a receive signal is present for each DS1 facility.

Error log entries and recommended actions

Table 118: FIBER-LK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test fiber-link F P**
1 (b)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**
18 (c)	0	**busyout fiber F P**	WRN	OFF	**release fiber F P**
257 (d)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**
513 (e)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**
769 (f)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**
1025 (g)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**
1281 (h)	any	Failure audit (#777) (a)	MAJ MIN WRN	OFF	**test fiber-link F P**

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a. The Failure Audit (#777) should be run to confirm whether the error still exists.

b. **Error Type 1**: problem with the control path to the neighbor. See Repair procedures.

c. **Error Type 18**: the fiber link has been busied out via **`busyout fiber-link F P`**. To resolve this error, use **`release fiber-link F P`** to release the fiber link.

d. **Error Type 257**: problem with the circuit path to the neighbor. See Repair procedures.

e. **Error Type 513**: problem with the packet path to the neighbor. See Repair procedures.

f. **Error Type 769**: problem with the control path from the neighbor. See Repair procedures.

g. **Error Type 1025**: problem with the circuit path from the neighbor. See Repair procedures.

h. **Error Type 1281**: problem with the packet path from the neighbor. See Repair procedures.

Repair procedures

For Note b and Notes d through h, perform the following steps:

1. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
2. Enter **`display errors`** and if any of the listed slip errors exist, follow the associated repair procedures in SYNC (Port Network Synchronization) for slip errors.

Table 119: Error Log Entries for Slip Errors

Circuit Pack Name	Error Log Name	Number of Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
SNI	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Table 120: Tests Run for an EI-to-EI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
Expansion Interface Fiber Out-of-Frame Query Test (#238)	X	X		ND
Expansion Interface Neighbor Query Test (#237)	X	X		ND
Fiber Link Reset Test (#768)			X	D

1. D = Destructive; ND = Nondestructive

Table 121: Tests Run for an EI-to-SNI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
Expansion Interface Fiber Out-of-Frame Query Test (#238)	X	X		ND
Expansion Interface Neighbor Query Test (#237)	X	X		ND
Configuration Audit (#759)	X	X		ND
Failure Audit (#777)	X	X		ND
SNI Fiber Out of Frame Query Test (#989)	X	X		ND
SNI Destructive Facility On-board Test (#757)		X		D
SNI Destructive Facility Off-Board Test (#756)		X		D
Fiber Link Reset Test (#768)			X	D

1. D = Destructive, ND = Nondestructive

Table 122: Tests Run for an SNI-to-SNI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
Configuration Audit (#759)	X	X		ND
Failure Audit (#777)	X	X		ND
SNI Fiber Out of Frame Query Test (#989)	X	X		ND
SNI Destructive Facility On-board Test (#757)		X		D
SNI Destructive Facility Off-Board Test (#756)		X		D
Fiber Link Reset Test (#768)			X	D

1. D = Destructive; ND = Nondestructive

FW-DWNLD (Firmware Download)

MO Name in Log	Alarm Level	Initial command to run	Full Name of MO
FW-DWNLD	MINOR[1]	**test firmware download *location***	Firmware Download

1. MINOR alarms can be downgraded to WARNING by using the **set options** command.

Firmware Download provides the capability to download new firmware to one or more programmable circuit packs of the same type residing within the same system. Programmable circuit packs have a "P" in their suffix. For example, the TN799DP is programmable, but the TN799C is not. This programmable capability reduces the need to physically remove circuit packs and return them to Avaya for firmware updates.

Check availability for circuit packs on the Avaya Support Web Site at http://support.avaya.com

See Firmware Download Instructions for the firmware download procedures.

Reason codes and fwdlreason command

The SAT command **status firmware download *schedule*** displays reason codes for firmware download failures and aborts, where ***schedule*** is **1**, **2**, **3**, **4**, or **last**, which displays the most recent status of a specific schedule.

The bash command **fwdlreason -c *code*** displays an explanation of the reason code. For example, **fwdlreason -c 6266** will display an explanation regarding digital signature validation and that an error occurred during the firmware image unpack.

Error log entries and recommended actions

Table 123: FW-DWNLD Error Log Entries shows the error log entries and tests which apply to self- and C-LAN distributed downloads, *not to IPSI downloads*.

Table 123: FW-DWNLD Error Log Entries *1 of 2*

Error Type	Aux Data	Cause of Error	Alarm Level	On/Off Board	Recommended Action
257 (a)	See note	Download failure	MIN	OFF	**test firmware download *location***
					1 of 2

Table 123: FW-DWNLD Error Log Entries ***2 of 2***

Error Type	Aux Data	Cause of Error	Alarm Level	On/Off Board	Recommended Action
258 (b)	See note	Download failure	MIN	OFF	**test firmware download** ***location***
259 (c)	See note	Download failure	MIN	OFF	**test firmware download** ***location***
513 (d)	See note	Download failure	MIN	OFF	**test firmware download** ***location***
769 (e)	See note	Firmware download request	MIN	OFF	**test firmware download** ***location***
					2 of 2

Notes:

a. **Error Type 257** — System resources error. This error is caused by either the source board, target board, or the firmware image itself. To resolve the error, use the **test firmware download** command. The Aux Data specifies the resource that caused the error. See Table 124: Aux Data for Error Type 257 for more details.

Table 124: Aux Data for Error Type 257 ***1 of 2***

Aux Data	Description of Failure
1	Source board query failed. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
2	Target board query failed. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
3	Could not allocate resources for download. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
	1 of 2

Table 124: Aux Data for Error Type 257 ***2 of 2***

Aux Data	Description of Failure
4	Firmware Download Information table query failed. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
5	Header information message failed. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
6	Download Map timer expired. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
7	Download schedule information query failed. 1. Check for system-wide problems. 2. Clear every error. 3. Retry the download.
	2 of 2

b. **Error Type 258** — An error indicating that a source board-related error occurred. The download schedule can also abort/fail. To resolve the error, use the command **`test firmware download`**. The Aux Data specifies the error. See Table 125: Aux Data for Error Type 258 for more details.

Table 125: Aux Data for Error Type 258 ***1 of 6***

Aux Data	Description of Failure
1	The Download image file specified on the **`change firmware download`** screen is not present on the source board. 1. Use the **`list directory board`** ***`location`*** command to verify the image exists in the file system's directory. 2. Retry the download command. 3. If the error recurs, escalate the problem.
2	The image on the source board has an invalid header. 1. Retry the download command. 2. If the error recurs, escalate the problem.
	1 of 6

Table 125: Aux Data for Error Type 258 ***2 of 6***

Aux Data	Description of Failure
3	Bad CRC on image file on source board. 1. Retry the download command. 2. If the error recurs, escalate the problem.
4	File name too long. 1. Rename the file, and retry the download command 2. If the error recurs, escalate the problem.
5	This is one of two different errors. On the SAT, enter **`status firmware download`** ***`location`*** to determine the reason code. **Reason Code 6207**: The TN code on the **`change firmware download`** screen does not match the TN code of the image on the source board. 1. Verify the TN code on the **`change firmware download`** screen and make sure the correct image is being used. 2. Retry the download command. 3. If the error recurs, escalate the problem. **Reason Code 6264**: The digital signature on the firmware image is invalid. Possible corrupt firmware file. 1. Re-copy the firmware file from the Avaya support website. 2. Retry the download. 3. If the error recurs, escalate the problem.
	2 of 6

Table 125: Aux Data for Error Type 258 ***3 of 6***

Aux Data	Description of Failure
6	This is one of two different errors. On the SAT, enter **`status firmware download`** ***`location`*** to determine the reason code. **Reason Code 6208**: The suffix on the **`change firmware download`** screen does not match the suffix of image on the source board. 1. Verify that the suffix is correct, and make sure the correct image is being used. 2. Retry the download command. 3. If the error recurs, escalate the problem. **Reason Code 6265**: The Certificate Chain of Trust is invalid. Possible corrupt firmware file. 1. Re-copy the firmware file from the Avaya support website. 2. Retry the download. 3. If the error recurs, escalate the problem.
7	This is one of three different errors. On the SAT, enter **`status firmware download`** ***`location`*** to determine the reason code. **Reason Code 6201**: The source board is not inserted. 1. Compare the board's entered location on the **change firmware download** screen with its actual location. 2. Verify that the source board is inserted. 3. Retry the download. 4. If the error recurs, escalate the problem. **Reason Code 6263**: No source board available for download. 1. Wait until a source board is available 2. Retry the download. 3. If the error recurs, escalate the problem. **Reason Code 6266**: An error occurred attempting to unpack the verification information in the firmware image. Possible corrupt firmware file. 1. Re-copy the firmware file from the Avaya support website. 2. Retry the download. 3. If the error recurs, escalate the problem.
	3 of 6

Table 125: Aux Data for Error Type 258 ***4 of 6***

Aux Data	Description of Failure
8	This is one of two different errors. On the SAT, enter **`status firmware download`** ***`location`*** to determine the reason code. **Reason Code 6202**: Invalid source board. 1. Verify that the source board has a valid TN code and suffix (for example, AP). 2. If the source board is a TN799, verify that the suffix is C or greater. 3. Retry the download command. 4. If the error recurs, escalate the problem. **Reason Code 6267**: The digital signature is missing. Possible corrupt firmware file. 1. Re-copy the firmware file from the Avaya support website. 2. Retry the download. 3. If the error recurs, escalate the problem.
9	PPP ports not available 1. Use another source board, or reschedule the download for off hours.
10	Download Setup message to source board failed. 1. Retry the download. 2. If the error recurs, then escalate.
11	Invalid IP address 1. Enter a valid IP address on the **change firmware download** screen. 2. Retry the download. 3. If the error recurs, escalate the problem.
12	Invalid login or password 1. Verify that the login and password entered on the **change firmware download** screen are correct. 2. Retry the download command. 3. If the error recurs, escalate the problem.
	4 of 6

Table 125: Aux Data for Error Type 258 ***5 of 6***

Aux Data	Description of Failure
13	Invalid firmware image name 1. Verify that the file image name entered on the **change firmware download** screen is correct. 2. Retry the download command. 3. If the error recurs, escalate the problem.
14	Login to the file server failed 1. Check that the login works on the file server. 2. Retry the download command. 3. If the error recurs, escalate the problem.
15	Source board could not reach the file server specified 1. Verify that the IP address is correct. 2. Check that the source board is able to reach the file server. 3. Retry the download command. 4. If the error recurs, escalate the problem.
16	File does not exist on the file server specified 1. Verify that the file exists on the file server and in the directory that was specified on the **change firmware download** screen (image name field) 2. Retry the download command. 3. If the error recurs, escalate the problem.
17	Could not retrieve the file from the file server 1. Verify that the file image is present on the file server and in the directory that was specified on the **change firmware download** screen 2. Verify that the source board is able to reach the file server. 3. Verify that the login and password work on the file server. 4. Verify that the file server is configured correctly. 5. Retry the download command. 6. If the error recurs, escalate the problem.
18	Invalid header information - No flash time for download.
19	IP address message was not acknowledged by the source board
20	Login/password messages not acknowledged by the source board
21	Failed to send login and password messages to the source board
	5 of 6

Table 125: Aux Data for Error Type 258 ***6 of 6***

Aux Data	Description of Failure
22	Failed to send image name message to the source board
23	No response to image name message from the source board
24	Downlink for file retrieval failed to the source board
25	Source board did not respond to file retrieval message
26	Downlink for IP address failed 1. Retry the download command. 2. If the error recurs, escalate the problem.
27	Attempt to store download data failed. This is a system error. 1. Check for system-wide errors. 2. Retry the download command. 3. If the error recurs, escalate the problem.
	6 of 6

c. **Error Type 259** — problem on the target board. To resolve the error, use the command **`test firmware download`**. The Aux Data specifies the error. See Table 126: Aux Data for Error Type 259 for more details.

Table 126: Aux Data for Error Type 259 ***1 of 3***

Aux Data	Description of Failure
1	Target board is not present or not responding. 1. Check board's location and translations. 2. Retry the download.
2	Incorrect target board for download schedule. 1. Verify board's location and download schedule. 2. Retry the download.
3	Target failed to go into Download Mode. 1. Retry the download.
4	Target received bad file header. 1. Get a new image. 2. Retry download.
	1 of 3

Table 126: Aux Data for Error Type 259 ***2 of 3***

Aux Data	Description of Failure
5	Bad checksum on source board's image. 1. Get a new image. 2. Retry download.
6	TFTP protocol error – One reason for this type of failure may be that the target board is located in a DS1-C remote PN using ami-zcs line coding to communicate with the server. To have a successful firmware download you must have a clear channel between the source and target board, or the source and target must reside in the remote PN. Some examples of the correct type of line coding for this feature are: b8zs and hdb3.
7	File transfer timer expired. 1. Check the board's location and translations. 2. Retry download. 3. If the error recurs, escalate the problem.
8	Target failed to reset after transfer. 1. Check the board's location and translations. 2. Retry download. 3. If the error recurs, escalate the problem.
9	Could not allocate resources for the target board. 1. Retry the download command. 2. If the error recurs, escalate the problem.
10	Download of target failed. 1. Check the board's location and translations. 2. Retry download.
13	The target board rejected the download image. 1. Check the board's translations. 2. Verify the image file. 3. Retry the download command. 4. If the error recurs, escalate the problem.
20	Could not open the requested file – firmware error on target board.
21	Problem reading the requested file – firmware error on target board.
22	The download file has a bad CRC – firmware error on target board.
24	A download is already in progress – firmware error on target board.
	2 of 3

Table 126: Aux Data for Error Type 259 ***3 of 3***

Aux Data	Description of Failure
30	Download sequence error – firmware error on target board.
32	The file name is too long – firmware error on target board.
40	FLASH programming failed – Internal firmware error on target board. 1. Retry the download, and escalate if it still fails.
	3 of 3

d. **Error Type 513** — the schedule has failed. A schedule failure can result from:

- Any of the previously mentioned log-only errors (257 – 259)
- An expiration of the schedule timer
- An execution of `disable firmware download` command

To resolve the error and clear the alarm, use the `test firmware download` command. The Aux Data specifies the reason why the schedule failed. See Table 127: Error Type 513 Aux Data for more details.

Table 127: Error Type 513 Aux Data

Aux Data	Description of Failure
1	Software resources not available; see Error Type 257 (a).
2	Source board-related failure; see Error Type 258 (b).
3	A target board failed. See Error Type 259 (c). 1. Check the image, translations and retry the download
4	Two consecutive target boards failed, download schedule aborted. 1. Verify the download image and translations. 2. Retry the download
5	Schedule timer expired 1. Schedule unfinished target boards. 2. Retry the download.
6	`disable firmware download` command was executed.

e. **Error Type769** — a downloadable board image is bad and a good image needs to be downloaded. This error may be a result of a failed download attempt or a board that is unstable. The Aux Data indicates the location of the circuit pack requesting the firmware download and is in the form UUAAA, where UU is the port network number (cabinet) and AAA is the Angel number.

The Angel number can be converted into the carrier and slot number by using the EPN Angel Address/Slot Mapping Table. For example, with an Aux Data value of 1080, look for the Angel number 80 in Table 7: EPN Angel Address/Slot Mapping. It can be found in the column of carrier B and in the row of slot 15, so the target board is located in 1B15.

Demand test descriptions and error codes

The FW-DWNLD maintenance object has only one demand test.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Firmware Download Test (#1413)	X	X	D

1. D = Destructive; ND = Nondestructive

FW-STDL (Firmware Station Download)

MO Name	Alarm Level	Initial Command To Run	Full Name of MO
FW-STDL	WRN	**test firmware station-download**	Firmware Station Download

The Firmware Station Download feature provides the ability to download new firmware to one or more DCP stations of the same type residing in the same system.

The download image is copied from a tftp file server into Communication Manager memory through the **change tftp** command. The transfer of the download image from Communication Manager memory to the target station is done under switch software control. The image is downloaded to the target stations flash through the **change firmware station-download** command. The target stations must be connected and in service to receive the firmware image.

Firmware station download commands

The following is a list of commands associated with the Firmware Station Download feature.

- **change tftp-server** - copies the firmware image from the FTP file server into Communication Manager memory.
- **change firmware station-download** - set up a station download schedule.
- **disable firmware station-download** - cancel an exisiting station download schedule while allowing any active terminal downloads to complete.
- **display firmware station-download** - displays information for the current download schedule.
- **status firmware station-download** - displays the status of the current scheduled download or the one that has just finished if there were errors in any of the downloads. Use the following tables for details on the schedule status and interpretation of error codes:
  - Table 131: Schedule States of status firmware station-download on page 486
  - Table 132: Reason Codes for status firmware station-download on page 487
- **status firmware station-download last** - displays the status of the previously completed scheduled download.
- **test firmware station-download** - resolves any alarms/errors associated with firmware station download (FW-STDL).

Downloading firmware to DCP stations

Updated firmware can be downloaded to up to 1000 Avaya DCP stations. This eliminates the need to use a FAC (feature access code) to perform the firmware update for each station. To download firmware to these stations, Communication Manager requires:

- A valid firmware image loaded into Communication Manager memory through the **`change tftp`** command.
- Avaya Communication Manager 2.0 or greater software.
- Craft login.

The high-level process for downloading the firmware is to:

1. Download the firmware image
2. Read the image into memory
3. Schedule the download

The target stations are automatically taken out of service before the firmware is downloaded to them and automatically returned to service after the download is completed. Once a download has started, the station cot be used until the download completes. If a station is in use at the time that it is scheduled to be downloaded, the download to that station will be aborted and the call will not be affected. The **`status firmware station-download`** command and the error log will provide information on aborted downloads.

Download the firmware image

Customers can access and download the firmware image on site using the Avaya Customer Support Web site.

1. Go to the Avaya Customer Support Web site (http://support.avaya.com/).
2. From the Support menu, select **Software & Firmware Downloads**.
3. Select the firmware image(s) needed from the list provided.
4. Download the file(s) to a temporary directory on a PC that has FTP and network access to the Avaya server.

Read the image into memory

Before the firmware can be downloaded to the target stations, the image file must first be read into Communication Manager memory:

1. On the System Access Terminal (SAT) using the craft login and password, enter **`change tftp-server`**

   The **TFTP Server Configuration** form displays the following:

```
change tftp-server                                         Page   1 of   1

                            TFTP Server Configuration


       Local Node Name: clan1
 TFTP Server Node Name: tftpserv1
      TFTP Server Port: 69
      File to Retrieve: 2420v01.bin

           File Status:
             File Size:
    Filename in Memory:

          Station Type:
```

2. Enter the node name of the C-LAN that connects over the LAN to the FTP file server in the **Local Node Name** field.
3. Enter the host name of the FTP file server in the **TFTP Server Node Name** field.
4. Enter the port number in the **TFTP Server Port** field.
5. Enter the name of the **File to Retrieve** from the FTP file server and submit the command.
6. Enter **`display tftp-server`**

```
display tftp-server

                            TFTP Server Configuration


       Local Node Name: clan1
 TFTP Server Node Name: gingerale
      TFTP Server Port: 69
      File to Retrieve: 2420v015.bin

           File Status: File download successful
             File Size: 236
    Filename in Memory: 2420v015.bin

          Station Type: 2420
```

7. Verify the file download was successful by checking the **File Status** field.

Schedule the download

The new firmware image can be downloaded immediately or scheduled for a later time. Due to the potentially large volume of switch activity as a result of the firmware download, Avaya recommends that the download be scheduled for a time when the system will be at its lowest possible occupancy level. This will also limit the number of stations that are aborted because they were in use at the scheduled download time.

To schedule a station firmware download:

1. On the System Access Terminal (SAT) using craft login and password, enter **change firmware station-download**

   The **Firmware Station-Download** form displays the following:

```
change firmware station-download                          Page   1 of   1
                             FIRMWARE STATION-DOWNLOAD


   Source File: 2420v01.bin

   Schedule Download? y
   Start Date/Time: 10/15/2006 20:00    Stop Date/Time: 10/15/2006 23:00
   Continue Daily Until Download Complete? y

   Download Station Type: 2420


   Beginning Station: 85001             Ending Station: 86000
```

2. Select parameters for the download:
   - Enter the firmware filename in the **Source File** field.
   - If you want to schedule the download for a later date/time, enter **y** in the Schedule Download Field.
     – Enter a start time in the **Start Date/Time** field.
     – Enter a stop time in the **Stop Date/Time** field.
     – If you want to stop the firmware download at the scheduled stop date/time and resume the next day at the scheduled start time, enter **y** in the **Continue Daily Until Download Complete** field.
   - Enter extension numbers in the **Beginning Station** and **Ending Station** fields (maximum 1,000 stations). Only administered stations within this range with a set type matching the **Station Type** (in this case, Avaya 2420 DCP sets) displayed on this page are available for download.
3. Submit the command.

Troubleshooting firmware download problems

You cot start a station download while there are active FW-STDL alarms. To clear all active FW-STDL alarms, use **`test firmware station-download`**. In the event of an FW-STDL alarm, you can find more details by using the **`status firmware station-download`** command.

```
status firmware station-download                                Page   1 of   1
                              STATUS FIRMWARE STATION DOWNLOAD

Image File: 2420v01.bin
Schedule Download? y                        Continue daily until completed?: y
Start Date/Time: 10/15/2006  20:00          Stop Date/Time: 10/15/2006  23:00
                                            Status for this download: Active
Terminal type for download: 2420
Extension Range: 85001   to: 86000          Number of stations in range: 35

Stations completed: 0                       Stations unsuccessful: 1

Extension Status Error   Extension Status Error   Extension Status Error

85001     ABRT  513
85002     ACTV
85017     ACTV
85034     ACTV
```

This command displays the **Extension** of the terminal, the **Status**, and a **Error** code if applicable. All aborted (ABRT), failed (FAIL), and actively downloading (ACTV) terminals are listed on this screen; pending or completed downloads are not listed. See Table 132: Reason Codes for status firmware station-download on page 487 for a list of these errors and their descriptions.

Error log entries and recommended actions

Table 128: FW-STDL Error Log entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (a)	1		WRN	OFF	**`test firmware station-download`**
257	2		WRN	OFF	**`test firmware station-download`**
257	3		WRN	OFF	**`test firmware station-download`**
					1 of 2

Table 128: FW-STDL Error Log entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257	4		WRN	OFF	**`test firmware station-download`**
257	12		WRN	OFF	**`test firmware station-download`**
257	13		WRN	OFF	**`test firmware station-download`**
257	14		WRN	OFF	**`test firmware station-download`**
257	15		WRN	OFF	**`test firmware station-download`**
258 (b)	5		WRN	OFF	**`test firmware station-download`**
513 (c)	4		MIN	OFF	**`test firmware station-download`**
513	8		MIN	OFF	**`test firmware station-download`**
513	11		MIN	OFF	**`test firmware station-download`**
513	13		MIN	OFF	**`test firmware station-download`**
513	14		MIN	OFF	**`test firmware station-download`**
513	15		MIN	OFF	**`test firmware station-download`**
					2 of 2

Notes:

a. **Error Type 257**: The problem originated with the target terminal. Resolve the alarm with the **`test firmware station-download`** command. The Aux Data values associated with Error Type 257 are described in Table 129: Error Type 257 Aux Data descriptions.

Table 129: Error Type 257 Aux Data descriptions *1 of 2*

Aux Data	Description
1	Terminal failed to erase its program flash.
2	Target image file checksum is bad.
3	Target image is incompatible with the terminal (Avaya 2420 DCP sets only).
4	Target terminal rejected image as invalid.
12	Target terminal fails to go into the download mode, timeout occurred.
13	Station firmware download engine timed out waiting for download to complete.
	1 of 2

Table 129: Error Type 257 Aux Data descriptions *2 of 2*

Aux Data	Description
14	Station firmware download to a terminal had too many retries, timeout occurred.
	2 of 2

b. **Error Type 258 with Aux Data 5**: one or more terminals in the download list were skipped and not downloaded because the terminal was not in the appropriate state (in-service and idle). Resolve the alarm with the **`test firmware station-download`** command. This error can be caused by any of these problems:

- One or more target terminals were busied out by craft
- One or more target terminals were in use when the download attempt was made.
- One or more target terminals were out of service for an unknown reason.

Use the **`status firmware station-download`** command in conjunction with Table 132: Reason Codes for status firmware station-download to determine the specific cause of the failure to download.

c. **Error Type 513**: indicates a firmware download error that is not necessarily caused by the target terminal. This error will cause the firmware download process to be stopped. Resolve the alarm with the **`test firmware station-download`** command. The Aux Data values associated with Error Type 513 are described in Table 130: Error Type 513 Aux Data descriptions.

Table 130: Error Type 513 Aux Data descriptions *1 of 2*

Aux Data	Description
4	Two consecutive terminals failed to download with a failure indicating that the terminals did not accept the firmware image. It is likely that any remaining terminals will also fail, so the scheduled download is stopped and any terminals in the download list that are not yet downloaded are aborted.
8	The download image file is not present. The **`change firmware station-download`** form requires that the image file be present before the form can be brought up. This error indicates a problem with the image file. As a result of this failure, the schedule cot continue, and any terminals in the download list that are not yet downloaded are aborted.
11	There was a system error in the download process, possibly due to interprocess calls. Escalate the problem.
	1 of 2

Table 130: Error Type 513 Aux Data descriptions ***2 of 2***

Aux Data	Description
13	Two consecutive terminals failed to download due to internal timeouts. It is likely that all terminals will fail as well so the schedule is stopped and any remaining terminals in the download list are aborted.
14	Could not build a list of terminals from the range specified on the **`change firmware station-download`** form. Check the administered stations for exact extension numbers.
15	The scheduled stop time was reached without completion of all scheduled terminals. The **`status firmware station-download`** command indicates all terminals not downloaded with a status of ABRT and a Reason Code of 3 (see Table 132: Reason Codes for status firmware station-download). If the **Continue daily until completed** field is **y**, this error will not occur because the continuation option causes the schedule to resume the next day at the scheduled start time (see Table 131: Schedule States of status firmware station-download).
	2 of 2

Table 131: Schedule States of status firmware station-download ***1 of 2***

State	Schedule Done?	Description
Idle	No	There are no downloads Pending or Active, or there are no unresolved errors/alarms for the last download
Pending	No	Download has been scheduled but not yet started. Check the start time to see when it is scheduled to start.
Active	No	Download is currently active. Actively downloading terminals should be listed with a status of ACTV. If the schedule has just started and no downloads are listed, the system may be waiting for a FAC requested or terminal requested download to complete before it begins.
Resume-pending	No	Download was stopped at the Stop Date/Time but not all of the terminals have been attempted. Downloading will resume at the scheduled Start Date/Time listed on the screen.
Aborted	Yes	Download was aborted for the entire range of terminals. This could happen if the firmware image was bad, damaged or disappeared.
		1 of 2

Table 131: Schedule States of status firmware station-download ***2 of 2***

State	Schedule Done?	Description
Failed	Yes	At least two terminals rejected the firmware as invalid. As a result, the download was aborted to avoid problems with any further terminals. Check the Reason Codes of the failed terminals in the list to find the reason why the download failed (Table 132: Reason Codes for status firmware station-download).
Completed	Yes	The scheduled download has completed either due to all terminals in the range of extensions having completed or due to the stop timer.
Disabled	Yes	An Active schedule was disabled with the **`disable firmware station-download`** command. After an active schedule is disabled, the Schedule state remains Active until all currently active terminal downloads have completed.
No Image	Yes	The download was stopped because there was no firmware image present in memory.
Restart	Yes	The download was stopped due to a system restart. You must schedule a new download for any Aborted terminals.
Sys Fail	Yes	The download was stopped due to a system error.
Sys Occ	No	The download has been suspended due to the system's occupancy level. The schedule will resume when the occupancy level drops to a safe level.
Dnld Timeout	Yes	While the scheduled download was running, two or more consecutive terminals failed to respond to the download process.
		2 of 2

Table 132: Reason Codes for status firmware station-download ***1 of 2***

Reason Code	Status	Description
1	ABRT	The firmware image that was noted on the change firmware station-download form has disappeared. The download schedule had to be stopped.
2	ABRT	The terminal could not be downloaded due to an internal discrepancy relating to the maximum number of downloads allowed.
		1 of 2

Table 132: Reason Codes for status firmware station-download *2 of 2*

Reason Code	Status	Description
3	ABRT	The terminal was not downloaded before the scheduled stop time occurred. Schedule a new download with adequate time for the downloads to complete, or select the continue daily option to allow the schedule to resume the following day.
4	ABRT	The terminal could not be downloaded because the schedule aborted for an unknown reason.
5	ABRT	The terminal did not respond to the download request.
6	ABRT	The terminal that was added to the download list at the scheduled start time no longer exists. This can occur when a station is removed during an active download schedule. Download to this terminal was aborted.
18	ABRT	The terminal was busied out by craft and could not be downloaded.
32	ABRT	Download to the terminal timed out due to an internal error in the station firmware download process.
1000	ABRT	Terminal was in use at the time that it was to be downloaded. Download to this terminal was aborted.
1012	ABRT	An internal error occurred while preparing to download to this station.
3841	ABRT or FAIL	The system restarted during an active download. As a result, all terminals that were not downloaded are marked with a status of ABORT with this reason code. All terminals that were actively downloading when the reset occurred are marked with a status of FAIL with this reason code.
128	FAIL	The terminal rejected the firmware because the firmware image failed the checksum test.
129	FAIL	The terminal rejected the firmware because the firmware image failed the image validity test. The firmware image may not be the right image for the hardware being downloaded to.
130	FAIL	The terminal being downloaded could not write its flash memory.
131	FAIL	A terminal in the range was translated to be a valid terminal for this download schedule. However, the terminal is not a valid receiver of the download.
513	FAIL	The terminal was not in service at the time that it was to be downloaded. Download to this terminal failed.
3584	FAIL	The terminal rejected the firmware image.
		2 of 2

GPTD-PT (General-Purpose Tone Detector Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
GPTD-PT	MAJ MIN	**test port *location***	General-Purpose Tone Detector Port
	WRN	**release port *location***	

The GPTD (General-Purpose Tone Detector) ports are also known as CPTRs (Call-Progress Tone Receivers).

Tests on the GPTD port perform level measurements of test tones and detect call-progress tones. Examples of call-progress tones are dial tone, ring back, busy, alert, confirmation, and recall dial.

For Tone Detector circuit pack errors (DETR-BD), see XXX-BD (Common Port Circuit Pack/ Media Module).

Error log entries and recommended actions

Table 133: GPTD-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (b)	0	Any	Any	Any	**test port *location***
1	17664	Tone Detector Audit/ Update (#43)	MAJ MIN(a)	ON	**test port *location* r 2**
18	0	**busyout port *location***	WRN	ON	**release port *location***
130 (e)			WRN	ON	**test port *location* r 2**
257 (c)	17666	Tone Detector Audit/ Update (#43)	MAJ MIN (a)	ON	**test port *location* r 3**
513 (d)	Any	Tone Detection Verification (#42)	MAJ MIN (a)	ON	**test port *location* r 3**

Notes:

a. A Major or a Minor alarm may be logged with this error. A Major alarm is raised when the total number of GPTD ports currently in service is less than or equal to 1/2 of the threshold number administered via **`change system-parameters maintenance`**. Otherwise, a Minor alarm is raised. In either case, run the short test sequence on the alarmed GPTD port and follow procedures for the individual test results.

b. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

c. **Error Type 257:** the GPTD port lost its translation. Testing the GPTD port is sufficient to reload its translation. If testing the GPTD port does not clear the error, then replace the Tone Detector circuit pack containing the defective GPTD port.

d. **Error Type 513**: the GPTD port is having problems detecting call-progress tones. If this error is logged constantly, replace the Tone Detector circuit pack containing the defective GPTD port.

e. **Error Type 130:** the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification Test (#42)	X	X	ND
Tone Detector Audit/Update Test (#43)	X	X	ND

1. D = Destructive; ND = Nondestructive

H323-BCH (H.323 B-Channel)

No maintenance diagnostic tests exist for this maintenance object.

H.323 signaling is similar to ISDN Q.931 signaling. In order to take advantage of existing ISDN Avaya™ Communication Manager, H.323 trunk Avaya Communication Manager software includes H.323 signaling groups, H.323 D-Channels and H.323 B-Channels. H.323 signaling groups are similar in concept to ISDN PRI signaling groups. H.323 D-channels are an artificial fabrication created only to allow maximum re-use of system ISDN code. H.323 B-Channels are also an artificial fabrication.

No physical hardware components make up the H.323 B-Channel object discussed here. Along with the D-Channel, these objects allow existing ISDN Communication Manager software to be re-used for H.323 trunking. The H.323 signaling group is not a collection of physical D-channels that exist on one or more DS1 facilities. The H.323 signaling group can be considered to be one D-Channel that physically rides on a C-LAN port (IP-PROCR port in an S8300 system) and the IP network. Unlike ISDN D-channels, the H.323 D channel may come up and down on a call-by-call basis. So, the H.323 D-Channel is actually a TCP/IP signaling channel. Layer 1 and 2 of this signaling channel may be monitored by IP PING testing.

Performance in terms of voice latency for a signaling group is monitored by background measurements collected by the Media Processor board.

H.323 B-Channels use Media Processor ports to carry the actual bearer. The Media Processor port is a service circuit. On a call-by-call basis, any port of a media processor may be serving an H.323 station or an H.323 B-Channel. Status information may exist for a specific H.323 B-Channel, and an H.323 B-Channel may be busied out and released, but no maintenance diagnostic tests will exist for the object.

Errors are logged for *craft* busyout conditions. The system receives service state updates for *craft*-driven busyout/release. Under normal conditions the system automatically places H.323 B-Channels into or out of service when it receives an H.323 signaling-group service state update. *Craft* busyout drops active calls.

Error log entries and recommended actions

Table 134: H323-BCH B-Channel Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Service State
18 (a)	Any	B-Channel busied out	Warning	off	*OOS*

Note:

a. **Error Type 18**: This specific H.323 trunk group member has been busied-out by command. Enter **`release port`** ***`location`*** to put the port in the in-service state.

System Commands

The following commands are available:

- **busyout port** ***location***: on a specific H.323 B-Channel, drops any active call on that B-Channel and reduces the trunk group’s capacity by one. No physical piece of hardware is removed from service.
- **release port** ***location***: on a specific H.323 B-Channel, increases the trunk group’s capacity by one. No physical piece of hardware is actually added to service.
- **status trunk** ***grp#/mem#*****:** finds the current status of the specific B-Channel. Additional status for an H.323 B-Channel shows near- and far-end IP signaling addresses, near- and far-end H.245 addresses, tunneling status, call-reference value for an active call, and the H.323 conference ID.
- **test port** ***location***: displays `No tests applicable to this object.`

H323-SGR (H.323 Signaling Group)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
H323-SGR	MIN WRN	**test signaling-group *grp#***	H323 Signaling Group

The H.323 Signaling Group (H323-SGR) MO supports a signaling channel (D-Channel) for H.323 Trunk connections. The MEDPRO TN802 circuit pack provides audio connectivity, working in concert with a C-LAN (TN799DP) circuit pack that provides control signaling to support an H.323 connection.

The H.323 signaling group (H323-SGR) is a Signaling channel that physically resides on a C-LAN port (socket) and the IP network. Unlike ISDN D-channels, the H.323 channel may actually come up and down on a call by call basis. The H.323 channel is actually a TCP/IP signaling channel. Layers 1 and 2 of this signaling channel are monitored by IP PING testing.

Error log entries and recommended actions

Table 135: H323-SGR Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any		**test signaling-group *grp#***
1 (b)	Any	Ethernet Port Status test (#1386)	MIN	OFF	**test signaling-group *grp#***
18 (c)	0	**busyout signaling-group grp #**	WRN	OFF	**release signaling-group *grp#***
257 (d)	Any	Signaling Group Ping (#1387)	MIN	OFF	**test signaling-group *grp#***
513 (e)	Any	Signaling Group Ping (#1387)	WRN	OFF	**test signaling-group *grp#***
770 (f)	Any		WRN	OFF	
1025 (g)	Any	MEDPRO Status test (#1392)	MIN	OFF	**test signaling-group *grp#***
1281 (h)	Any	MEDPRO Status test (#1392)	MIN	OFF	
1537 (i)	Any				
1794 (j)		MEDPRO Status test (#1392)	MIN	OFF	**test signaling-group *grp#***
2049 (k)		Keep Alive Failure	MIN	OFF	
2305 (l)		Gateway Unregistered Inline Error	MIN	OFF	
					1 of 2

Table 135: H323-SGR Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2561(m)	Any	Registered to Survivable Remote Server Inline Error	MIN	OFF	
2817 (n)		T303 Timer timed out			
3585 (o)		Layer 3 Test (#1673)	MIN	OFF	
3841 - 3942 (p)	Any				
					2 of 2

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: Failure of the C-LAN hardware (IP-PROCR in S8300 systems) carrying the signaling group channel. To determine which C-LAN had been administered for this signaling group, find the near-end node name on the **`signaling group`** form, then find the C-LAN or IP-PROCR with the same node name on the **`ip-interfaces`** form.

   Check for errors against the CLAN-BD MO.

c. **Error Type 18**:The signaling group in question has been busied out by command. Release the signaling group, if appropriate, with **`release signaling-group`** ***`grp#`***.

d. **Error Type 257**: Tracks failures of the H.323 signaling-group PING test. See Signaling Group Ping Test (#1387) for test failure information.

e. **Error Type 513**: Tracks excessive round-trip delay of the H.323 signaling-group PING test, if the round-trip delay exceeds 4 seconds. See Signaling Group Ping Test (#1387) for test failure information.

f. **Error Type: 770:** Tracks excessive latency and packet-loss from background IP measurements collected by the Media Processor Board. Indicates that test packets sent from a media processor circuit pack to the far-end IP address specified on the signaling group form have exceeded the IP latency and loss thresholds, as administered on the **`system-parameters ip-options`** form. Exceeding these thresholds indicates that the IP network may not be providing sufficient quality of service for adequate transmission of voice. If the signaling group has been administered to enable BYPASS, then Error Type 1025 also occurs.

g. **Error Type 1025**: The signaling group has been placed into a BYPASS condition because of IP network congestion. The signaling group accepts incoming calls, but every outgoing call is denied. The system routes these calls over a secondary route, if one has been administered.

h. **Error Type 1281**: No media processor resources are in service to provide VoIP connections for the trunk members of the signaling group.

   Check for errors against the MEDPRO and MEDPROPT maintenance objects. This error causes all H323 B-Channels to be in an out-of-service near-end state.

i. **Error Type 1537**: The far end of the signaling group is not ready to handle audio bearer. If the other end of this signaling group is also a Communication Manager server, this error means the server on the other end does not have MEDPRO in-service for its signaling group.

   This error places the H323 B-Channels into an out-of-service far-end state.

j. **Error Type 1794**: The Signaling Group reported that the far end has detected excessive packet latency or loss. This error places the H323 B-Channels into an out-of-service far-end state.

k. **Error Type 2049**: A Keep-Alive timer is set for every registered endpoint on the Remote Office, and the switch expects Keep-Alive updates within that timer's time period. If the update does not occur, an error is logged against REM-OFF as well as H323-SGR. The error against H323-SGR generates a Minor alarm. This error is only valid if the **`change signaling-group`** screen has the `RRQ` field set to **y**. The Keep-Alive Error Type 2049 clears only after a registration occurs and Error Type 2305 clears.

l. **Error Type 2305**: The Gateway (signaling group on the Remote Office) is unregistered. The error against H323-SGR generates a Minor alarm when this failure occurs. This error is valid only if the **`change signaling-group`** screen has the `RRQ` field set to **y**.

m. **Error Type 2561**: The signaling group is registered to a Survivable Remote Server.

n. **Error Type 2817**: The T303 timer timed out. Notification only, no action is necessary.

o. **Error Type 3585**: Layer 3 test failed. The far-end is not available. See H.323 Signaling Layer 3 Test (#1673) for more information.

p. **Error Types 3842 - 3942:** These Error Types report certain error messages received by the H.323 Signaling Group for the D-Channel. The aux data field shows for which D-Channel the message was received.

   The error code generated equals 3840+*x*, where "*x*" is a cause value. There is no recommended action for these Error Types. No direct action or alarming is performed. They provide added data that may be useful when tracking down obscure networking and routing problems. Table 136: Descriptions and Recommendations for Error Types 3842-3942 provides more information.

Table 136: Descriptions and Recommendations for Error Types 3842-3942 *1 of 4*

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cot be accessed.	The equipment sending this cause event does not recognize the transit network. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
3843	No route to destination. Request received to route call through a transit network that is recognized but not allowed to carry the call or not able to serve the destination.	
3846	The far-end switch has indicated that the B-Channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate an administration problem (for example, the local switch and the far-end switch have different B-Channels administered), or could reflect the occurrence of a normal race condition (for example, the local switch has requested use of a B-Channel that the far-end switch had just reserved for use on another call). 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Enter **`status trunk`** for the indicated trunk. Refer to DS1 ISDN Trunk Service States and ISDN-PRI Trunk Service States sections of ISDN-TRK for recovery suggestions.
3858	Similar to Error Type 1. The switch sent a message to the far-end switch or terminal adapter that did not respond in the time allowed.	Follow same recommendations as for Error Type 1.
		1 of 4

Table 136: Descriptions and Recommendations for Error Types 3842-3942 ***2 of 4***

Error Code	Description	Recommendation
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	Network is out of order. 1. From the circuit pack or media module and port number (in the Aux Data field, determine the trunk group against which the error was reported. 2. Consult with the network provider to determine the nature and expected duration of the out of service condition. 3. Consider modifying every routing pattern containing this trunk group to route calls around the network that is out of service.
3890	A request to use a network service has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Display the trunk group form: If the trunk group is Call-by-Call (Service Type is “cbc”), check every routing pattern form containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
		2 of 4

Table 136: Descriptions and Recommendations for Error Types 3842-3942 ***3 of 4***

Error Code	Description	Recommendation
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	First, eliminate any transitory state mismatch problems by entering **test port** ***location*** for the trunk port shown in the Aux Data field. Service State Audit Test (#256) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3902	FRANCE ONLY: Service not authorized.	
3903	Service or option not available, unspecified. This cause reports a “service or option not available” event only when no other cause in the “service or option not available” class applies.	
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the previous recommendation for Error Type 3890.
3910	Only restricted digital BC available.	
		3 of 4

Table 136: Descriptions and Recommendations for Error Types 3842-3942 ***4 of 4***

Error Code	Description	Recommendation
3919	Service or option not implemented, unspecified. Used when no other cause in this class applies.	
3928	A call was denied because of a basic incompatibility existed between the type of call and either the facilities selected by the routing pattern or the called user.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone. Determine the trunk group from the circuit pack or media module and port number (in the Aux Data field) and then check the BCC fields of the pertinent routing patterns. Also, investigate whether or not the calling and called endpoints are compatible (for example, some switches may not allow a voice station to call a data extension).
3942	Timer expiry: T310 time-out, no answer to CALL PROCEEDING.	
		4 of 4

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
C-LAN Ethernet Port Status Test (#1386)	X	X	ND
MedPro Status Test (#1392)	X	X	ND
Signaling Group Ping Test (#1387)	X	X	ND
H.323 Signaling Layer 3 Test (#1673)	X	X	ND

1. D = Destructive; ND = Nondestructive

H323-STN (H.323 IP Station)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
H323-STN	WRN	**test station *extension***	H.323 IP Station

H323-STN covers implementation of the maintenance for native mode H.323 endpoints. Native mode H.323 applications such as Netmeeting or Proshare provide only what is needed to support the H.323 standard. Communication Manager can invoke very little in the maintenance area. Communication Manager reports errors as they are detected via the RAS registration and keep-alive mechanism. Communication Manager PINGs the endpoint via the signaling path, for example via C-LAN, and via the media path, for example, via Medpro.

The H.323 station type is not attached to a port board. Insertion of the station is not driven by board insertion, it is driven by successful registration of the endpoint. The H.323 station is maintained via a set of explicit TCP/IP ping requests and errors reported by the switch software, which terminates the H.323 signaling portion of each endpoint. H323-STN follows standard maintenance methodology and supports test, busyout, release and status commands.

Error log entries and recommended actions

Table 137: H323-STN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any		**test station *extension***
1 (a)		Registration Status Inquiry test (#1372)	WRN	OFF	
257 (b)		Signaling Path PING test (#1373)	WRN	OFF	
513 (c)		Media Path PING test (#1374)	WRN	OFF	

Notes:

a. **Error Type 1** reports the registration status of the endpoint. If Communication Manager claims the endpoint is registered and receives keep-alive handshakes from the endpoint, the test passes. If keep-alive handshaking fails, the test fails. If the user has intentionally un-registered the station from the server, the station is basically an AWOH station and is no longer being maintained; no tests will run for this station.

b. **Error Type 257** tracks failures of the signaling path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with the C-LAN board through which the endpoint is registered. If the PING response packet is received, the test passes. If the **ping** response packet times out, the test fails.

c. **Error Type 513** tracks failures with the media path **ping** test. The test attempts to send a **ping** packet to the endpoint IP address, as reported during registration. The **ping** packet originates with a Media Processor board. Any Media Processor board may be used as long as it is administered to be in the same network region as the C-LAN board through which the endpoint is registered. If the **ping** response is received, the test passes. If the **ping** response packet times out, the test fails.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Registration Status Inquiry Test (#1372)	X	X	ND
Signaling Path PING Test (#1373)	X	X	ND
Media Path PING Test (#1374)	X	X	ND

1. D = Destructive; ND = Nondestructive

HYB-BD (Hybrid Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
HYB-BD	MIN WRN	**test board *location***	Hybrid Line circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack errors.

See also HYB-LINE (Hybrid Line) for related line information.

HYB-LINE (Hybrid Line)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
HYB-LINE	MIN WRN	**test port *location* long**	Hybrid Line

Hybrid Line is another term for the MFAT (Multi-Function Analog Telephone). The Hybrid Line set is also known as an SCS (Small Communications System).

The TN762B Hybrid Line circuit pack supports eight of these multifunction analog telephone sets. The Hybrid Line sets use three pairs of wires: an analog voice pair, a transmit/receive pair, and a power pair.

This section describes HYB-LINE (Hybrid Line) maintenance. HYB-LINE maintenance is closely related to, and sometimes interacts with, HYB-BD (Hybrid Line circuit pack) maintenance. This interaction should be kept in mind when troubleshooting Hybrid Line problems.

This section occasionally refers to a station's service state. These service states are defined as follows:

Out-of-Service	The port, and thus the station, have been removed from service. A busyout of a port will cause it to be out of service.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally, but it can also be forced into the in-service state if it goes off-hook.

Use **status station** to determine terminal service state. Status is reported as either out of service, in service, or disconnect. The latter is equivalent to the ready-for-service state.

Error log entries and recommended actions

Table 138: HYB-LINE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	`test port` *`location`*
1 (a)	40987		WRN	OFF	
15 (b)	Any	Analog Line Audits test (#61)			
18 (c)	0	`busyout port` *`location`*	WRN	OFF	`release port` *`location`*
130 (d)			WRN	ON	`test port` *`location`*
257 (e)	40988		MIN WRN	OFF	
513 (f)	40965	Analog Line Audits test (#61)	WRN	OFF	`test port` *`location`* `r 4`
769 (g)		Remote Digital Looparound (#59)	WRN	OFF	`test port` *`location`* `r 3`
1025		Hybrid Circuit & Conf. Circuit (#57)	MIN WRN	ON	`test port` *`location`* `l r 3`
1281(g) (h)		Local Digital Looparound (#58)	WRN	ON	`test port` *`location`* `l r 3`
1537 (h) (i)	40968		WRN	OFF	
1793		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	`test port location l r`
2049 (i) (j)	32770				
2049 (j)	40967				

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2. Major or minor alarms may be downgraded to Warning alarms based on the value used in the set options command.

Notes:

a. **Error Type 1**: The data link between the port and the terminal is not operational. (An off-board problem was detected by port circuit). Verify that the Hybrid set is connected and that the Electronic Power Feed (EPF) test passes. If data transmission problems are experienced, check for defective wiring or a defective voice terminal, or move terminal closer to the switch (reduce the length of the wiring between the terminal and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined delay.

b. **Error Type 15**: a software audit error that does not indicate any hardware malfunction. Run the short test sequence and investigate any errors.

c. **Error Type 18**: the port is busied out. Release the port with **`release port`** ***`location`***.

d. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 257**: the EPF has been turned off due to an overcurrent condition at the voice terminal. Check for defective wiring or a damaged jack, and make sure the voice terminal is a Hybrid set. Once the problem has been resolved, the alarm will be retired after a predetermined delay.

f. **Error Type 513**: the voice terminal has been disconnected or there is a problem in the wiring to the terminal. Make sure that the voice terminal is connected or check for defective wiring to the voice terminal.

g. **Error Type 769 and Error Type 1281**: by themselves create Warning alarms. If both are present, a Minor alarm is logged.

h. **Error Type 1281 or 1537**: the port has reported a problem with the data link to the voice terminal. Ignore this error if there are no complaints about the voice terminal. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and decrease the length of the wiring between the voice terminal and the switch. If the problem persists, replace the circuit pack.

i. The voice terminal went off-hook while in the disconnect state. Use **`status station`** to determine the state of the terminal. The off-hook should have moved the terminal to in service. No repair action is necessary.

j. **Error Type 2049**: the link between the circuit pack and the voice terminal has been successfully reset. No repair action is necessary.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Analog Electronic Power Feed Test (#56)		X	ND
Hybrid Circuit and Conference Circuit Test (#57)		X	ND
Hybrid Line Local Digital Looparound Test (#58)		X	ND
Hybrid Line Remote Digital Looparound Test (#59)	X	X	ND
Analog Line Station Lamp Update Test (#60)	X	X	ND
Analog Line Audits Test (#61)	X	X	ND
Analog Line Ringer Update Test (#62)	X	X	ND

1. D = Destructive, ND = Nondestructive

INADS (INADS Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
INADS	none	**test inads-link**	INADS Link

The INADS Link MO represents the software and communications link used by the switch to call an alarm receiver. The purpose of the INADS Link MO is to:

- Check the communications link between the system and the alarm receiver
- Verify that the alarm notification process works correctly

To verify that alarms will be reported to the alarm receiver, either a centralized technician can remotely test the process, or an on-site technician can test the connection either during an installation or a subsequent service call.

Although the INADS Link MO never alarms, its errors are logged, and these errors are only logged by entering **test inads-link**.

Demand test descriptions and error codes

The **test inads-link** command is different from other test commands:

- There is no **long** or **short** option.
- Resulting test does not have an associated test number.

When a user enters **test inads-link**, the system immediately returns either the `Command successfully completed` or `Command failed` message.

INADS Link Test (No Test Number)

The INADS Link test attempts to call an alarm receiver (in the background) to verify the communications link with the alarm receiver. When a user enters **test inads-link**, the system immediately returns either a `Command successfully completed` or `Command failed` message.

The “Command successfully completed” message means the switch will attempt to call the alarm receiver in 2 minutes. (This test runs even if Alarm Origination is disabled.) The 2-minute delay provides enough time for a remote technician to hang up the call and thus free up the alarm receiver’s line so that the customer’s switch can call the alarm receiver back. The “Command failed” message appears when either:

- A previously entered **test inads-link** is in progress
- The system is attempting to report active alarms to the alarm receiver

As any error conditions are encountered during the test, they are logged against the INADS Link MO.

- If the initial test result was `Command successfully completed`, any logged error codes would range from 1–9.
- If the initial test result was `Command failed`, any logged error codes would be 10 or 11.

An error is logged at the alarm receiver even if the call to the alarm receiver finally succeeds. The alarm receiver's software:

1. Recognizes this special "test inads" alarm type
2. Automatically opens and closes a trouble ticket

   Within the trouble ticket, a field containing the description `TESTING INADS LINK` indicates that the ticket was initiated by **`test inads-link`**.

After entering the command, up to 9 minutes can elapse before the switch places the call and the alarm receiver responds. To determine whether the call was successful, the Error Log should be examined by using the **`inads`** category 10 minutes after successfully entering the command. Table 139: INADS Link Test Error Log Entries explains the error codes.

Error log entries and recommended actions

Table 139: INADS Link Test Error Log Entries ***1 of 3***

Error Code	Test Result	Description / Recommendation
1	0	A test call was successfully placed to the alarm receiver. No trouble found.
2	0	Informative error indicating that alarm origination was disabled at the time of the test. The test runs even though alarm origination is disabled. 1. If desired, enable Alarm Origination via the Maintenance-Related System Parameters screen. 2. Repeat the test.
3	0	The alarm receiver's connection is currently in use. 1. Wait 10 minutes, and retry the command.
		1 of 3

Table 139: INADS Link Test Error Log Entries *2 of 3*

Error Code	Test Result	Description / Recommendation
4	0	The alarm receiver did not answer the test call. 1. Verify that the alarm receiver is up. 2. Verify the accuracy of the alarm receiver's phone number and the system's product ID using the **Maintenance-Related System Parameters** screen. 3. Enable alarm origination using the **Maintenance-Related System Parameters** screen. 4. Test the SYSAM (System Access Maintenance) by entering **`test maintenance a	b`**. 5. Retry the command.
5	0	The alarm receiver's phone number is not assigned. 1. Assign the alarm receiver's phone number via the Maintenance-Related System Parameters screen. 2. Retry the command.
6	0	The alarm receiver did not return an acknowledgment for the "test inads alarm" message. 1. Verify the accuracy of the alarm receiver's phone number and the system's product ID via the **Maintenance-Related System Parameters** screen. 2. Verify that the alarm receiver is up. 3. Retry the command.
7	0	The alarm receiver returned a negative acknowledgment for the `TESTING INADS LINK` message. 1. Verify that the product IDs match in the customer's switch and the alarm receiver's database. Use the **Maintenance-Related System Parameters** screen to identify the product ID of the switch. 2. Rerun the test.
8	0	Internal system error. System received an invalid return code. 1. Retry the command at 1-minute intervals up to 5 times.
9	0	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 139: INADS Link Test Error Log Entries *3 of 3*

Error Code	Test Result	Description / Recommendation
10	0	A **`test inads-link`** is already in progress. 1. Wait 10 minutes for the current command to finish. 2. Review the current command's results by viewing the Error Log and selecting the category **inads-link**.
11	0	The switch is trying to report alarms to the alarm receiver. The test cot be run at this time. 1. Wait 10 minutes, and retry the command.
		3 of 3

IPMEDPRO (IP Media Processor)

The IPMEDPRO maintenance object applies to the TN2302 IP Media Processor and the TN2602AP IP Media Resource 320 circuit packs.

To identify which type of circuit pack is alarmed, use **list configuration board *location*** for the location recorded in the error log. Check the board code, then use the appropriate link below to diagnose the problem.

For the TN2302, see IPMEDPRO (TN2302 IP Media Processor)

For the TN2602, see IPMEDPRO (TN2602AP IP Media Resource 320)

IPMEDPRO (TN2302 IP Media Processor)

If the circuit pack type is TN2602AP, see IPMEDPRO (TN2602AP IP Media Resource 320).

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
IPMEDPRO	MAJ MIN	`test board location l`	IP Media Processor
	WRN	`test board location`	

The TN2302 (IP Media Processor) circuit pack is the next generation VOIP platform. The TN2302 includes a 10/100 BaseT Ethernet interface to support IP audio for IP trunks and H.323 endpoints. The TN2302 can perform echo cancellation, silence suppression, DTMF detection, and conferencing. It supports the following codecs, fax detection for them, and conversion between them:

- G.711 (mu-law or a-law, 64 kbps)
- G.723.1 (6.3-kbps or 5.3-kbps audio)
- G.729A (8-kbps audio)

The TN2302 circuit board provides voice over IP connectivity. The TN2302 acts as a service circuit to terminate generic RTP streams which carry packetized audio over an IP network. As part of the overall H.323 implementation, the TN2302 circuit pack handles the audio streams while the TN799DP C-LAN handles the TCP/IP signaling channels.

Error log entries and recommended actions

Table 140: TN2302 IPMEDPRO Error Log Entries *1 of 3*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test board location**
1 (a)	0	Circuit pack removed or SAKI test (#53) failed	MIN	ON	
18 (b)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (c)	0	Board administered but not inserted	WRN	OFF	**insert the board into the system**
					1 of 3

Table 140: TN2302 IPMEDPRO Error Log Entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
125 (d)		Wrong board	MIN	ON	
257 (e)	65535	Control Channel Looparound Test (#52)	MIN	ON	`test board location l r 20`
513 (f)	4352 4353 4355 4356 4358	TN2302 on-board hardware errors	MIN	ON	
769 (g)		IP 2-Way Transmission tests (#1505 & 1506)	MIN	OFF	
770 (h)					
1025 (i)	Any	MP Diagnostic test (#1406)	MIN	ON	
1281 (j)	Any	MP Diagnostic test (#1406)	MIN	ON	
1538 (k)	Any	Circuit pack is hyperactive	MIN	ON	
1793 (l)	Any	Network Connectivity Query (#1383)	MIN WRN[2]	OFF	`test board location l r 2`
2049 (m)	Any	PPC Sanity Query test (#1402)	MIN	ON	
2305 (n)	Any	IP Address Update (#1371)	MIN	ON	
2561 (o)		Ping Test (#1379)	MIN	OFF	
2817 (p)	Any	MP Diagnostic Test (#1406)	MIN	ON	
3073 (q)	Any	Circuit pack reset test (#53) failed	MIN	ON	
3329 (r)	Any	IP Address Update (#1371)	MIN	OFF	
					2 of 3

Table 140: TN2302 IPMEDPRO Error Log Entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3585 (s)	1 or 2	Verify NIC Options Test (#1511)	MIN	OFF	
3841(t)		Inconsistent downlink			
3841(u)	4283	RTCP Monitor Server error			
3999 (v)	Any	None			
					3 of 3

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2. Minor alarms on this MO may be downgraded to warning alarms based on values set in **set options**.

Notes:

a. **Error Type 1:** the circuit pack has been removed from the system or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed, or 11 minutes after the SAKI test (#53) fails.

To be fully administered, an IPMEDPRO circuit pack must meet four conditions:

- Have an entry in the circuit pack screen (**`change circuit-pack`**)
- Have the MedPro IP address administered (**`change node-names ip`**)
- Be enabled (**`change ip-interface`**)
- Be physically inserted into the correct slot

If the circuit pack has an entry on the circuit pack screen and any of the other conditions are NOT met, a MINOR alarm is logged. To resolve the error:

- Make sure every condition for administration is met, and that a functioning MedPro circuit pack is inserted in the correct slot.
- Completely remove the IPMEDPRO from the system:
  a. Remove the administered IP-Interface associated with the circuit pack.
  b. Physically remove the circuit pack from the slot.

b. **Error Type 18:** The IPMEDPRO interface circuit pack has been busied out by a **`busyout board`** ***`location`*** command. Release the circuit pack with **`release board`** ***`location`***.

c. **Error Type 23:** The IPMEDPRO circuit pack is not completely administered. To be fully administered, an IPMEDPRO circuit pack must meet ***all*** of these four conditions:

- Have an entry in the circuit plan (**`change circuit-pack`**)

- Have the IPMEDPRO IP address administered (**`change node-names ip`**)
- Be enabled (**`change ip-interface`**)
- Be physically inserted into the correct slot.

A TN2302 differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered.

d. **Error Type 125:** the wrong circuit pack is inserted in the slot where this circuit pack is logically administered. Do one of the following:

- Remove the wrong circuit pack and insert the logically administered circuit pack.
- Re-administer this slot to match the circuit pack inserted (**`change circuit-pack`**).

e. **Error Type 257:** failure of the Control Channel Looparound Test (#52). See Control Channel Looparound Test (#52) for more information.

f. **Error Type 513:** transient hardware device problems on the board. These include an external RAM failure, internal RAM failure, ROM checksum failure, message corruption, and program logic inconsistency. If the board detects only one of these hardware problems it may be alarmed. The error will disappear when none of these faults are detected for 10 minutes. There are no associated tests for these inline errors. If they continue to happen, the circuit pack should be replaced.

g. **Error Type 769:** failed attempts to verify IP network connectivity between a specified IP Media Processor and other IP Media Processor/s in the system. See Short IP 2-Way Transmission Test (#1505) for Short IP 2-way transmission test failures and Long IP 2-Way Transmission Test (#1506) for Long IP 2-way transmission test failures.

h. **Error Type 770:** DSP overallocation error. Since this error causes the DSP audit to run, the condition is cleared and no action is necessary. No alarms are generated.

i. **Error Type 1025:** Field Programmable Gate Array (FPGA) failure associated with a the FPGA device located on the TN2302. Communication Manager will take the resources associated with every DSP out of service and attempt to reset the FPGA. For the repair procedure, see MP Diagnostic Test (#1406)

j. **Error Type 1281:** TSI failures. There are potentially 2 different TSI failures that can occur: one is a TSI DSP failure, and the other is a TSI FPGA failure. The switch will take the resources associated with every DSP out of service and attempt to reset the TSI. For the repair procedure, see MP Diagnostic Test (#1406).

k. **Error Type 1538:** this error indicates hyperactivity on the board. Hyperactivity means the circuit pack is sending too many uplink messages to switch software. The circuit pack will be taken out of service. See (v) for Error Type 3999.

l. **Error Type 1793:** no electrical signal is detected on the Ethernet cable. Either the Ethernet cable is unplugged or there is a problem with a connection to the network interface.

m. **Error Type 2049:** the processor hardware is failing. The PPC provides the Angel functionality as well as the UDP/IP interface. An attempt is made to reset the board automatically. For the repair procedure, see MP Diagnostic Test (#1406). If the reset fails, the board is probably bad and should be replaced.

n. **Error Type 2305:** There is an IP address inconsistency between switch software and the IPMEDPRO board. If this error occurs, an attempt will be made to download the IP address again. If the board still refuses the IP address, the board will be reset. See IP Address Update Test (#1371).

o. **Error Type 2561:** the ping test has failed. See MP Diagnostic Test (#1406).

p. **Error Type 2817:** Ethernet hardware failure on the TN2302 circuit pack. The switch will take resources associated with every DSP out of service and then attempt to reset the Ethernet hardware. There are several error conditions that can cause this problem. They will all be treated as the same failure by switch software. See MP Diagnostic Test (#1406).

q. **Error Type 3073:** circuit board reset failed. The switch will take resources associated with every DSP out of service and then attempt to reset the board, as the failure of a Scotch is severe enough to warrant a board reset. After the reset, a query is made again for the health of the SCOTCH devices to verify whether they are working properly or not. If they are working properly, the alarm and error counters are cleared. If they are not working properly, the alarm will continue, every DSP will be left out of service, and maintenance diagnostics will stop. If the board continues to fail with this Error Type, replace the TN2302.

r. **Error Type 3329:** an IP address update (Test #1371) was sent to the circuit pack, which detected that this IP address is a duplicate of an existing network IP address. Duplicate IP addresses can cause problems with calls on the IPMEDPRO circuit pack. It is not possible to determine where the other duplicate address is located. See the repair procedure for IP Address Update Test (#1371).

s. **Error Type 3585:** The NIC parameters on the board do not match those in administration.

Aux Data = 1: The speed is set for auto-negotiate in administration. The board is reporting half-duplex. See the repair procedures for Verify NIC Options Test (#1511).

Aux Data = 2: The board is reporting different options than what is administered. Software tried to correct the options, but the board did not accept the option update. See the repair procedures for Verify NIC Options Test (#1511).

t. **Error Type 3841:** Aux Data = None: Inconsistent downlink message. The board was sent a message it did not understand. These errors are not service affecting. No action is required.

u. **Error Type 3841:** Aux Data = 4283: The RTCP monitor server is not connected. There is a network problem between the monitor server and the server or the RTCP monitor server is mis-administered. Use the **`change system-parameters ip-options`** command to verify administration of RTCP monitor server parameters.

v. **Error Type 3999:** the circuit pack sent a large number of control channel messages to the switch within a short period of time.

- If Error Type 1538 is also present, the circuit pack was taken out of service due to hyperactivity.

- If Error Type 1538 is not present, the circuit pack has not been taken out of service, but it has generated 50 percent of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
IP Address Update Test (#1371)	X	X	D
Network Connectivity Query Test (#1383)	X	X	ND
Ping Test (#1379)	X	X	ND
Short IP 2-Way Transmission Test (#1505)	X		ND
Long IP 2-Way Transmission Test (#1506)		X	ND
Verify NIC Options Test (#1511)	X	X	ND
MP Diagnostic Test (#1406)		X	ND
PPC Sanity Query Test (#1402)		X	ND

1. D = Destructive; ND = Nondestructive

IPMEDPRO (TN2602AP IP Media Resource 320)

If the circuit pack type is TN2302, see IPMEDPRO (TN2302 IP Media Processor)

See MEDPRO-C (Media Processor Control) for additional information on the TN2602AP IP Media Resource 320.

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
IPMEDPRO	MAJ MIN	`test board location l`	IP Media Resource 320
	WRN	`test board location`	

The TN2602AP IP Media Resource 320 enables IP port network connectivity. The TN2602AP allows bearer traffic to be moved from the traditional Center Stage Switch (CSS) or ATM network to the IP network. Together with the TN2312BP IPSI-2 circuit pack, the TN2602AP is intended to be a traditional CSS replacement for port network connectivity.

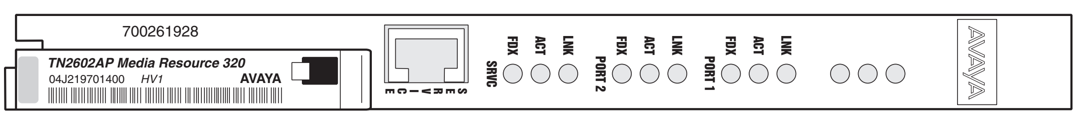
The TN2602AP includes a 10/100 BaseT Ethernet interface to support IP audio for IP trunks and H.323 endpoints.

The TN2602AP IP Media Resource 320 provides high-capacity voice over Internet protocol (VoIP) audio access to the switch for local stations and outside trunks. The TN2602AP provides audio processing for the following types of calls:

- TDM-to-IP and IP-to-TDM
- IP-to-IP

See Figure 31 for an example of the IP Media Resource 320 faceplate

Figure 31: IP Media Processor faceplate



ckdf2602 KLC 020305

The TN2602AP IP Media Resource 320 circuit pack has two capacity options, both of which are determined by the license file installed on Communication Manager:

- 320 voice channels, considered the standard IP Media Resource
- 80 voice channels, considered the low-density IP Media Resource

Up to two TN2602AP circuit packs may be installed in a single port network for load balancing. The TN2602AP circuit pack is also compatible with and can share load balancing with the TN2302 circuit pack. Actual capacity may be affected by a variety of factors, including the codec and fax support.

Actual capacity may be affected by a variety of factors, including the codec used for a call and encryption usage and the echo cancellation tail length and fax support.

TN2602AP features

The TN2602AP supports hairpin connections and the shuffling of calls between TDM connections and IP-to-IP direct connections. The TN2602AP can also perform the following functions:

- Echo cancellation
- Silence suppression
- Dual-tone multifrequency (DTMF) detection
- AEA Version 2 and AES media encryption
- Conferencing
- 802.1p and 802.Q layer 2 QoS mechanisms
- RSVP protocol

The TN2602AP IP Media Resource 320 circuit pack supports the following codecs for voice, conversion between codecs, and fax detection:

- G.711, A-law or Mu-law, 64 kbps
- G.726A, 32 kbps
- G.729 A/AB, 8 kbps audio

Error log entries and recommended actions

Table 141: TN2602AP IPMEDPRO Error Log Entries ***1 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test board location**
1 (a)	0	Circuit pack removed or sanity failure	MIN	ON	
18 (b)	0	**busyout board** ***location***	WRN	OFF	**release board** ***location***
					1 of 3

Table 141: TN2602AP IPMEDPRO Error Log Entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
23 (c)	0	Board administered but not inserted	WRN	OFF	`Insert the T2602 circuit pack`
125 (d)		Wrong board	MIN	ON	
257 (e)	65535	Control Channel Looparound Test (#52)	MIN	ON	`test board location l r 20`
513 (f)	4352 4353 4355 4356 4358	TN2602 on-board hardware errors	MIN	ON	
769 (g)		IP 2-Way Transmission tests (#1505 & 1506)	MIN	OFF	
770 (h)					
1025 (i)	16641 to 16895	Critical error from Test #1652 (State of Health)	MIN	ON	
1026 (j)	16385 to 16639	Non-critical error from Test #1652 (State of Health)	WRN	ON	
1281 (k)	20481 to 20493	PPC Sanity Query Test (#1402)	MIN	ON	
1538 (l) (y)	Any	Circuit pack is hyperactive	MIN	ON	
1793 (m)	Any	Network Connectivity Query (#1383)	MIN WRN[2]	OFF	`test board location l r 2`
2049 (n)	Any	Packet Count Query (#1630)	MIN	ON	
2305 (o)	Any	IP Address Update (#1371)	MIN	ON	
					2 of 3

Table 141: TN2602AP IPMEDPRO Error Log Entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2306 (p)	Any		MIN	ON	
2561 (q)		Ping Test (#1379)	MIN	OFF	
2817 (r)	Any	Ethernet Hardware Query test (#1405)	MIN	ON	
3073 (s)	Any	Aggregator Hardware Query (#1629)	MIN	ON	
3329 (t)	Any	IP Address Update (#1371)	MIN	OFF	
3330(u)	Any	IP Address Update (#1371)	MIN	OFF	
3585 (v)	1 or 2	Verify NIC Options Test (#1511)	MIN	OFF	
3841(w)	None	Inconsistent downlink or board error			
3841(x)	4283	RTCP Monitor Server error			
3999 (y)	Any	None			
					3 of 3

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2. Minor alarms on this MO may be downgraded to warning alarms based on values set in **set options**.

Notes:

a. **Error Type 1:** the circuit pack has been removed from the system or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed, or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a TN2602AP must:

- Have an entry on the circuit pack screen (**`change circuit-pack`**)
- Have the IP Media Resource 320 IP address administered (**`change node-names`**)
- Be enabled (**`change ip-interface`**)

- Be physically inserted into the correct slot

If the circuit pack has an entry on the circuit pack screen and any of the other conditions are not met, a MINOR alarm is logged. To resolve the error:

- Make sure every condition for administration is met, and that a functioning Media Processor is inserted in the correct slot.
- Completely remove the IP Media Resource 320 from the system:
  a. Remove the administered IP-Interface associated with the circuit pack.
  b. Physically remove the circuit pack from the slot.

b. **Error Type 18:** The TN2602AP was busied out by a **`busyout board`** ***`location`***.

- Release the circuit pack (**`release board`** ***`location`***).

c. **Error Type 23:** The IP Media Resource 320 is not completely administered. To be fully administered, a TN2602AP must:

- Have an entry in the circuit plan (**`change circuit-pack`**)
- Have an administered IP address (**`change node-names ip`**)
- Be enabled (**`change ip-interface`**)
- Be physically inserted into the correct slot.

A TN2602AP differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered.

d. **Error Type 125:** The wrong circuit pack is inserted in the slot where this circuit pack is logically administered. Do one of the following:

- Remove the wrong circuit pack and insert the logically administered circuit pack.
- Re-administer this slot to match the circuit pack inserted (**`change circuit-pack`**).

e. **Error Type 257:** failure of the Control Channel test (#52). See Control Channel Looparound Test (#52) for the repair procedures.

f. **Error Type 513:** transient hardware device problems on the board. They include an external RAM failure, internal RAM failure, ROM checksum failure, message corruption, and program logic inconsistency. There are no associated tests for these errors; if they continue to happen, an alarm will occur.

g. **Error Type 769:** failed attempts to verify IP network connectivity between a specified TN2602AP and other IP Media Processors in the system. See Short IP 2-Way Transmission Test (#1505) for Test #1505 failures and Long IP 2-Way Transmission Test (#1506) Test for #1506 failures.

h. **Error Type 770:** DSP overallocation error. Since this error causes the DSP audit to run, the condition is cleared and no action is necessary. No alarms are generated.

i. **Error Type 1025:** a module on the board failed. Aux Data values between 16641 and 16895 indicate a critical problem. See Board Health Query Test (#1652).

j. **Error Type 1026:** a module on the board failed. Aux Data values between 16385 and 16639 indicate a non-critical error. See Board Health Query Test (#1652)

k. **Error Type 1281:** certain firmware modules or components on the board failed to initialize properly. This test verifies that the embedded software (firmware) applications on the board are working properly. If the test fails, it is immediately run a second time. If the test fails a second time, an alarm is raised. See Ethernet Hardware Query Test (#1405) for more information.

l. **Error Type 1538:** hyperactivity on the board. The circuit pack is sending too many messages to switch software. The circuit pack will be taken out of service. See (y) for Error Type 3999.

m. **Error Type 1793:** no electrical signal is detected on the Ethernet cable. The Ethernet cable is unplugged or there is a problem with a connection to the network interface.

n. **Error Type 2049:** There is aa problem with the packet bus. See Packet Count Query Test (#1630).

o. **Error Type 2305:** There is an IP address inconsistency between switch software and the IP Media Resource 320. If this error occurs, an attempt will be made to download the IP address again. If the board still refuses the IP address, the board will be reset. See IP Address Update Test (#1371).

p. **Error Type 2306:** Packet link did not come up during board initialization. See the Packet Count Query Test (#1630) and the IP Address Update Test (#1371).

q. **Error Type 2561:** the ping test has failed. The diagnostics that are run by this failure start up analysis testing and rerun the test. Testing will continue until the problem is cleared. For the repair procedure, see Ping Test (#1379).

r. **Error Type 2817:** Ethernet hardware failure on the TN2602AP IP Media Resource 320. The switch takes resources associated with every DSP out of service and attempts to reset the Ethernet hardware. There are several failure conditions that can cause this error. They will all be treated as the same failure by switch software. For the repair procedure, see Ethernet Hardware Query Test (#1405).

s. **Error Type 3073:** there is a problem with the Aggregator Hardware on the TN2602AP. See the repair procedure for Aggregator Hardware Query (#1629).

t. **Error Type 3329:** duplicate IP address detected. Administration of the TN2602AP contains an IP address that is a duplicate of an existing network IP address. Duplicate IP addresses can cause problems with calls on the TN2602AP. It is not possible to determine where the duplicate address is located. See the repair procedure for IP Address Update Test (#1371).

u. **Error Type 3330:** A virtual duplicate IP address was detected. Administration of the TN2602AP contains an IP address that is a duplicate of an existing network IP address. Duplicate IP addresses can cause problems with calls on the TN2602AP. Its is not possible to determine where the duplicate address is located. See the repair procedure for IP Address Update Test (#1371).

v. **Error Type 3585:** The administered NIC interface options (auto-negotiate, speed, and duplex) do not match the TN2602AP administration. On the **`change ip-interface`** form, if **auto** is **y**, set **speed** to **100** and **duplex** to **full**. Submit the form.

Aux Data = 1: The speed is set for auto negotiate in administration. The board is reporting half-duplex. See the repair procedures for Verify NIC Options Test (#1511).

Aux Data = 2: The board is reporting different options than what is administered. Software tried to correct the options, but the board did not take the option update. See the repair procedures for Verify NIC Options Test (#1511).

w. **Error Type 3841:** Aux Data = None: Inconsistent downlink message. The board was sent a message it did not understand. These errors are not service affecting. No action is required.

x. **Error Type 3841:** Aux Data = 4283: The RTCP monitor server is not connected. There is a network problem between the monitor server and the server or the RTCP monitor server is mis-administered. Use the Communication Manager administration command **`change system-parameters ip-options`** to verify administration of RTCP monitor server parameters.

y. **Error Type 1538 and 3999:** the circuit pack sent a large number of control channel messages to the switch within a short period of time.

- If Error Type 1538 is also present, then the circuit pack was taken out of service due to hyperactivity.
- If Error Type 1538 is not present, then the circuit pack has not been taken out of service, but it has generated 50 percent of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ethernet Hardware Query Test (#1405)	X	X	ND
Control Channel Looparound Test (#52)	X	X	ND
IIP Address Update Test (#1371)	X	X	CD
Verify NIC Options Test (#1511)	X	X	CD
Network Connectivity Query Test (#1383)	X	X	ND
			1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ping Test (#1379)	X	X	ND
Short IP 2-Way Transmission Test (#1505)	X		ND
Long IP 2-Way Transmission Test (#1506)		X	ND
Aggregator Hardware Query (#1629)	X	X	ND
Board Health Query Test (#1652)	X	X	ND
Packet Count Query Test (#1630)	X	X	ND
PPC Sanity Query Test (#1402)		X	ND
			2 of 2

1. D = Destructive; ND = Nondestructive; CD = Conditionally destructive

IPSV-CTL (IP Server Interface Control)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
IPSV-CTL	NA	**`set ipserver-interface`**	Ipserver Interface Control

The TN2312AP IPSI and TN2312BP IPSI circuit packs are duplicated in a high- or critical-reliability system. As part of duplicated IPSIs, PKT-INTs, Archangels, and Tone-Clocks are also duplicated. However, only one IPSI can be “active” in a given PN. The only exception to this rule is the IPSI’s tone-detection module. Both IPSIs may have active tone detectors.

Note:

The TN2312BP IPSI is a replacement for the TN2312AP IPSI and can be used anywhere a TN2312AP is used.

During an IPSI interchange, the IPSI’s PKT-INTs, Archangels, and Tone-Clocks are temporarily distributed between the two IPSIs. During stable operation, the active PKT-INT, Archangel, and Tone-Clock must all reside on the same IPSI.

S8700-series IP-PNC: Every PN has its own IPSI, unlike Fiber-PNC, which can share IPSI resources through the CSS/ATM network.

Each IPSI’s state of health (SOH) is based on the following elements in descending order of priority:

Table 142: Fault classes and IPSI interchanges

Fault Class	Circuit pack function that is monitored	Priority
Clock	Clocking signal for the TDM bus	1 (highest)
PKTINT	Sending and receiving packet control messages	2
EAL	Noting the state of the expansion archangel link (up or down)	3
Generation	Generating tones	4 (lowest)

Note:

A low priority fault indicates a better state-of-health than a high priority fault. For example, a clock fault on an IPSI is more severe that a PKTINT fault on an IPSI.

The active server’s maintenance software is responsible for maintaining the SOH of both the active and standby IPSI in each PN. If an active IPSI’s SOH is lower than the standby’s, IPSI interchange is initiated. The following list contains failures and actions that cause an interchange.

Active IPSI has a faulty Tone-Clock.

1. IPSI’s hardware detects loss of clock, and its firmware initiates clock interchange.

2. IPSI's firmware notifies software of loss of clock.
3. Software interchanges Archangel.
4. Software interchanges PKT-INT.
5. The port-network is COLD started.

Active IPSI has a faulty PKT-INT.

1. Software detects faulty PKT-INT.
2. Software interchanges PKT-INT.
3. Software interchanges Archangel.
4. Software interchanges Tone-Clock.

Active IPSI has a faulty Archangel.

1. PKT-INT detects dead EAL and reports it to software.
2. Software interchanges Tone-Clock.
3. Software interchanges Archangel.
4. Software interchanges PKT-INT.

Both IPSIs are healthy (pled interchange sequence).

1. Software interchanges Tone-Clock.
2. Software interchanges Archangel.
3. Software interchanges PKT-INT.

If both of a PN's IPSIs have faulty Tone-Clock, then the PN is out of service.

If both of a PN's IPSIs have faulty EAL and/or PKT-INT, then the PN "falls back" to EI-EAL mode of operation, where:

- The PN's Expansion Interface circuit pack (EI) provides Archangel functionality
- Another PN's IPSI provides PKT-INT functionality

For details, see EXP-INTF (Expansion Interface Circuit Pack).

The following tables show the valid combinations of IPSIs and EIs providing Tone-Clock, PKT-INT, and Archangel function:

- Table 143: IPSI A is Active
- Table 144: IPSI B is Active
- Table 145: IPSI A Provides Tone-Clock; Fall-Back to EI-EAL
- IPSI B Provides Tone-Clock; Fall-Back to EI-EAL

Table 143: IPSI A is Active

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock	X			
PKT-INT	X			
Archangel	X			

Table 144: IPSI B is Active

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock		X		
PKT-INT		X		
Archangel		X		

Table 145: IPSI A Provides Tone-Clock; Fall-Back to EI-EAL

Function	IPSI A	IPSI B	EI	IPSI in another PN
Tone-Clock	X			
PKT-INT				X
Archangel			X	

Table 146: IPSI B Provides Tone-Clock; Fall-Back to EI-EAL

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock		X		
PKT-INT				X
Archangel			X	

System Configurations with Duplicated IPSIs

Figure 32: Duplicated IPSI Duplicated Direct Connect PNC Connectivity shows a critical-reliability system with duplicated IPSIs and directly connected PNCs.

Figure 33: Duplicated IPSI Duplicated PNC with Center Stage Switch Connectivity shows a critical-reliability system with duplicated IPSIs and CSS-connected PNCs.

Table 147: Cabinets that support IPSI and IPSI duplication shows a complete list of cabinets.

Figure 32: Duplicated IPSI Duplicated Direct Connect PNC Connectivity

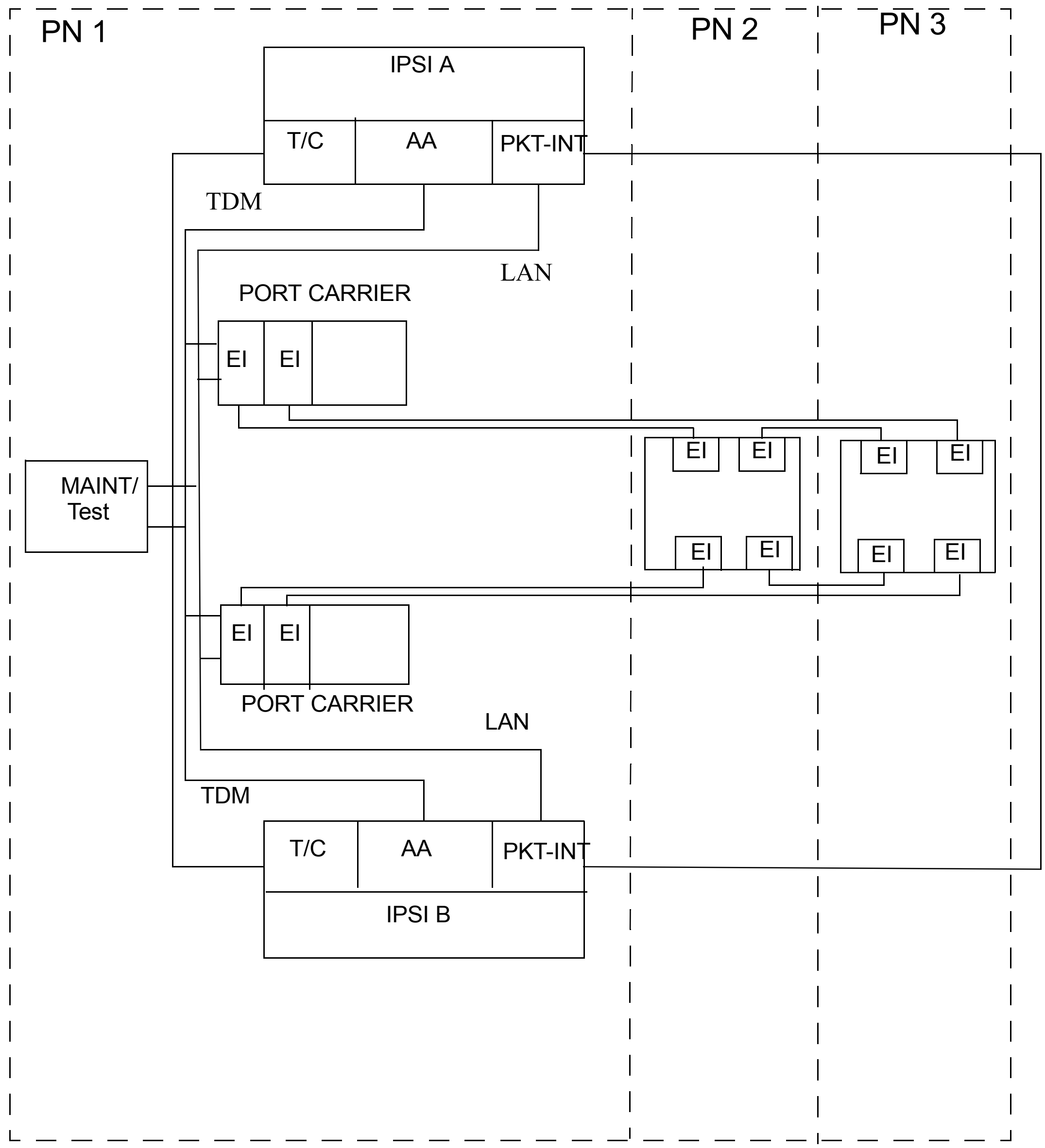


Figure 33: Duplicated IPSI Duplicated PNC with Center Stage Switch Connectivity

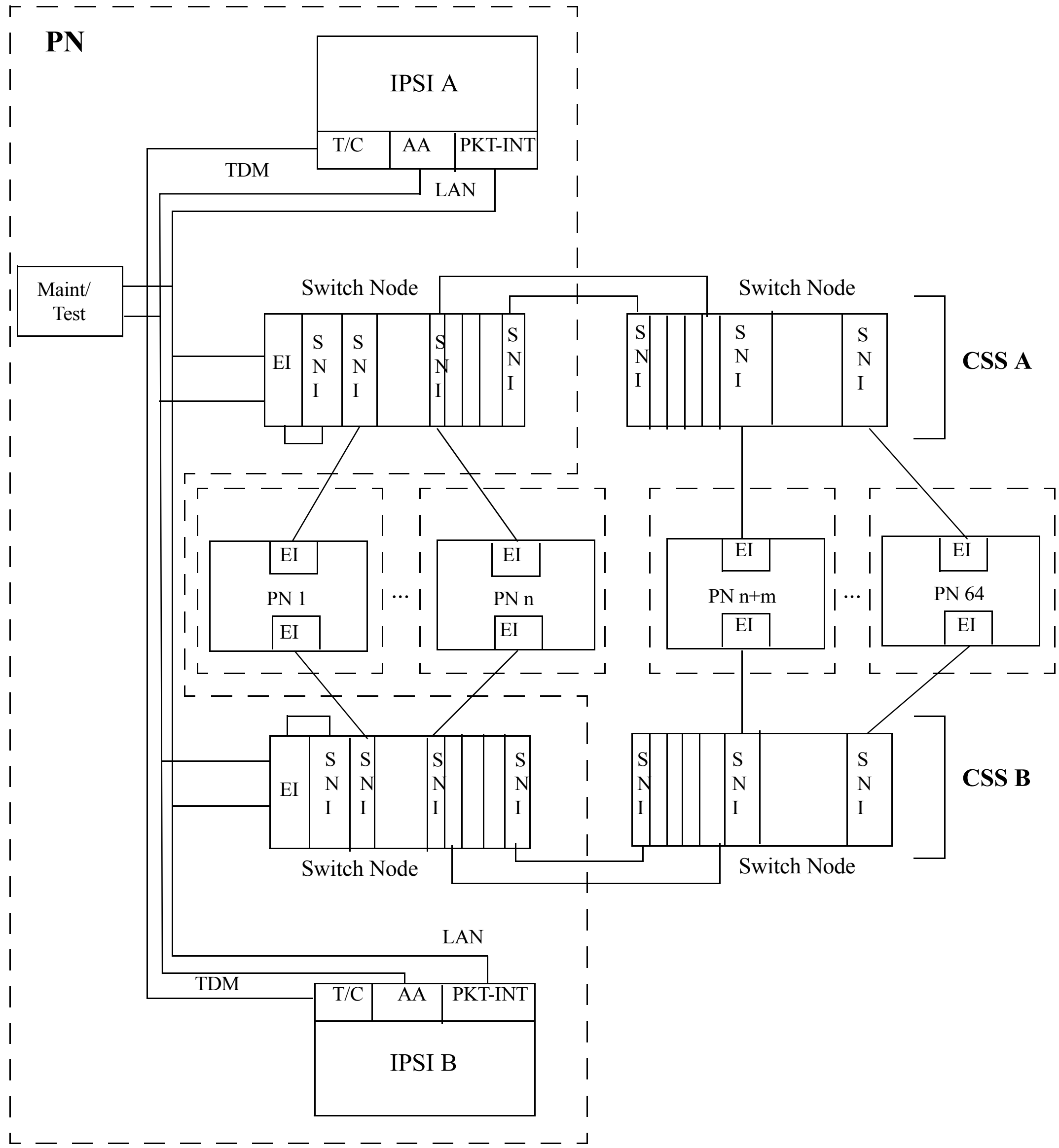


Table 147: Cabinets that support IPSI and IPSI duplication

Cabinet type	Supported IPSI		Duplication	
	TN2312AP	TN2312BP	Primary slot	Secondary slot
SCC1 EPN Stack	Y	Y	A00	B01
MCC1 EPN - 1 PN	Y	Y	A00	B01
MCC1 EPN - 2 PNs	Y	Y	A00	B01
			E02	D01
MCC1 EPN - 3 PNs	Y	Y	A00	N/A
			B02	N/A
			D02	N/A
MCC1 EPN - 4 PNs	Y	Y	A00	N/A
			B02	N/A
			C02	N/A
			D02	N/A
MCC1 EPN - 5 PNs	Y	Y	A00	N/A
			B02	N/A
			C02	N/A
			D02	N/A
			E02	N/A
G600	Y	Y	A02	N/A
CMC1 PN	N	Y	A02	N/A
G650 Stack	N	Y	A01	B01

Error Log Entries

Whenever an IPSI interchange takes place, an error is logged against IPSV-CTL with a code that conveys information about the cause of the interchange and which IPSI became active.

See the following tables to identify areas of the Alarm Log to help find the source of the problem:

- Encoding of Error Codes for Software Requested IPSI interchange
- Aux Data Descriptions for Software-Requested Interchange,
- Error codes for set ipserver-interface

Table 148: Error Code Descriptions and Aux Data

Error Code	Description	Aux Data
3wxyz[1]	Software requested IPSI interchange / control change[2]	See Table 150
50000	Craft demand interchange of IPSI to A side	See Table 150
51000	Craft demand interchange of IPSI to B side	See Table 150
60000	Daily interchange of IPSI to standby failed	0
61000	Daily interchange of IPSI back to previous active failed	0

1. See Table 149 for encoding of the wxyz digits of the error code.

2. Control change is moving the Archangel's functionality to or from the IPSI.

Error Codes for Software-Requested Interchanges

Table 149: Encoding of Error Codes for Software Requested IPSI interchange ***1 of 2***

Field	Variable Name	Value	Description
w	Active IPSI post action	0	The A-side IPSI is active after the interchange.
		1	The B-side IPSI is active after the interchange.
			1 of 2

Table 149: Encoding of Error Codes for Software Requested IPSI interchange ***2 of 2***

Field	Variable Name	Value	Description
x	Control (Archangel) pre and post action	0	Control on IPSI before and after the interchange.
		1	Not in IPSI control before and after the interchange.
		2	Control leaves IPSI.
		3	Control moves to IPSI.
y	Fault class/stimulus causing software action	1	EAL fault class
		2	PKT-INT fault class
		3	TONE-BD fault class (not TDM-CLK)
		4	TDM-CLK fault class (loss of clock)
		7	Preference migration to A-side IPSI
z	Fault or improvement	0	This is an improvement in the previous fault class (y).
		1	This is a degradation of the previous fault class (y).
			2 of 2

AUX Data Descriptions

Table 150: Aux Data Descriptions for Software-Requested Interchange

Aux Data	Description
0	No specific extra information is available
1	An IPSI interchange only took place
2	A control change only took place
3	Both an IPSI interchange and a control change took place

Examples:

Error Code of 30320 with Aux Data 2 software requested the archangel move to the A-side IPSI as a result of a PKT-INT fault class improvement.

Error Code of 31041 with Aux Data 1 indicates a software requested interchange from the A-side IPSI to the B-side IPSI leaving the archangel on the IPSI due to a loss of TDM clock.

IPSI Interchange (Duplicated IPSIs)

Software will take action upon any fault that affects the IPSI and attempt to interchange to the healthier IPSI. In addition, when neither IPSI is completely healthy to provide clock, packet interface and archangel, one IPSI will be chosen to be the clock, and the archangel will move to the EI. Moving the archangel's functionality to the EI requires another port network to have a healthy IPSI, and this port network to have an EI. The exact order of action taken will vary depending on the fault being processed, as well as the existing state of health (SOH) of the IPSIs in the PN. An IPSI interchange (if necessary) will always happen before a control change (moving of the archangel to/from IPSI/EI). If both IPSIs are equally healthy, software preferentially migrates to the A-side IPSI. However, this preferential migration is not done if craft has set to a B-side IPSI.

Craft can also demand an interchange of IPSIs in one or every PN. The command **set ipserver-interface *Uc*** interchanges a specific IPSI. In addition, **set ipserver-interface a-all | b-all** can be used to interchange every IPSI in the system to the A-side or B-side respectively. This is particularly useful if preparing for a control-network outage. For a pled interchange of IPSIs, the following steps occur. The:

1. Going active IPSI is marked as active, the going standby is marked as standby.
2. Tone-Clock is migrated. This includes tone generation as well as TDM clock.
3. Archangel is migrated to the newly active IPSI.
4. PKT-INT on the newly active IPSI is made active. Every link is migrated between IPSIs.

See Table 151: Error codes for set ipserver-interface for ABORT/FAIL codes associated with **set ipserver-interface**:

Table 151: Error codes for set ipserver-interface

Error Code	Command Result	Description
2343	ABORT	Interchange not permitted. The anti-thrashing timer has not yet expired. 1. Retry command in 30 seconds.
2338	FAIL	The SOH of the set-to IPSI is bad. Use **list ipserver-interface** to display the current IPSI's SOH.
2341	FAIL	An error occurred during the interchange. This indicates an internal problem. Use **list ipserver-interface** to see if the interchange actually occurred.
2342	FAIL	The set-to IPSI has been busied out. 1. Run **release ipserver-interface *Uc***.
	PASS	The interchange was successful, or the set to IPSI was already active. If set to a B-side IPSI, it will be marked as "craft set" and will not preference switch back to the A-side by software.

An example of the output of the **`list ipserver-interface`** command is:

```
list ipserver-interface

                         IP SERVER INTERFACE INFORMATION

Port Pri/    Primary/          Primary/          Primary/                  State Of
Ntwk Sec     Secondary         Secondary         Secondary Serv   Control Health
Num  Bd Loc IP Address        Host Name         DHCP ID   State State   C P E G
---- ------ ---------------   ----------------- --------- ----- ------- -------
  2   2A01  172.18.18.181     172.18.18.181     ipsi-A02a  IN   actv-aa 0.0.0.0

  3   3A02  172.18.18.182     172.18.18.182     ipsi-A03a  IN   actv-aa 0.0.0.0

  8   8A02  192.168.18.40     192.168.18.40     ipsi-A08a  IN   actv-aa 0.0.0.0

 15  15A02  172.18.18.34      172.18.18.34      ipsi-A15a  IN   actv-aa 0.0.0.0

 45  45A02  172.17.17.60      172.17.17.60      ipsi-A45a  IN   actv-aa 0.0.0.0

 51  51A02  172.18.18.81      172.18.18.81      ipsi-A51a  IN   actv-aa 0.0.0.0
```

The **State of Health** information contains the fault class information in the far right columns as follows:

- C = Clock
- P = Packet Interface
- E = Expansion Archangel Link
- G = Tone Generation

IP-SVR (IP Server Interface)

S8700 Series S8400| S8500

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
IP-SVR	WRN	`busyout ipserver-interface` `release ipserver-interface`	IP Server Interface

There are three IP Server Interface (IPSI) circuit packs:

- TN2312 IP Server Interface Circuit Pack
- TN2312BP IP Server Interface Circuit Pack
- TN8412AP S8400 IP Server Interface Circuit Pack (SIPI)

Note:

The TN8412AP is the same as the TN2312BP, except that it can only run in an S8400 system.

The IP Server Interface (IPSI) circuit packs report the following settings to Communication Manager:

- 802.1p value
- DiffServ value
- Ethernet auto-negotiate
- Ethernet Duplex
- Ethernet Speed

Communication Manager compares the values of these settings with the Communication Manager administered values and raises an alarm if discrepancies are found. This alarm is reported against MO_IPSI_BD with an Error Type of 1.

TN2312 IP Server Interface Circuit Pack

Note:

The only Error Type reported against this MO is error Type 18. All other Error Types will be reported against MOs supporting the IPSI circuit pack functional modules: PKT-INT, IPSV-CTL, ETR-PT, TDM-CLK, TONE-PT, TONE-BD, SER-BUS, CAB-EXFR, EXT-DEV, CAB-PFL, POW-SUP, CAB-TEMP, PS-RGEN, CAB-CALM, and CAB-MTCE.

The TN2312 IPSI circuit pack connects the port networks to the servers via an IP network and provides port-network control functions.

The TN2312 IPSI is inserted into the PN's Tone-Clock slot and provides interface back to the servers via the Ethernet. The IPSI circuit-pack provides the following functions:

- PKT-INT packet bus interface
- Archangel TDM-bus interface
- Tone-Clock functionality (equivalent to TN2182C Tone-Clock circuit pack)
- Ethernet interface for connectivity to the servers
- Ethernet interface for connectivity to Services' laptop PCs
- Maintenance-board interface for communication with the PN's TN775 Maintenance board (TN2312AP)
- Environmental maintenance (TN2312BP)

The processors, and the PKT-INTs reside in different cabinets, connected to each other via the control networks. All communication between the servers and the IPSIs are done over TCP/IP Socket connections. Other than the Ethernet that connects the servers to the IPSIs, there are no other leads for signaling and resets. All communication between the servers and the IPSIs must be done via messages over the socket connections.

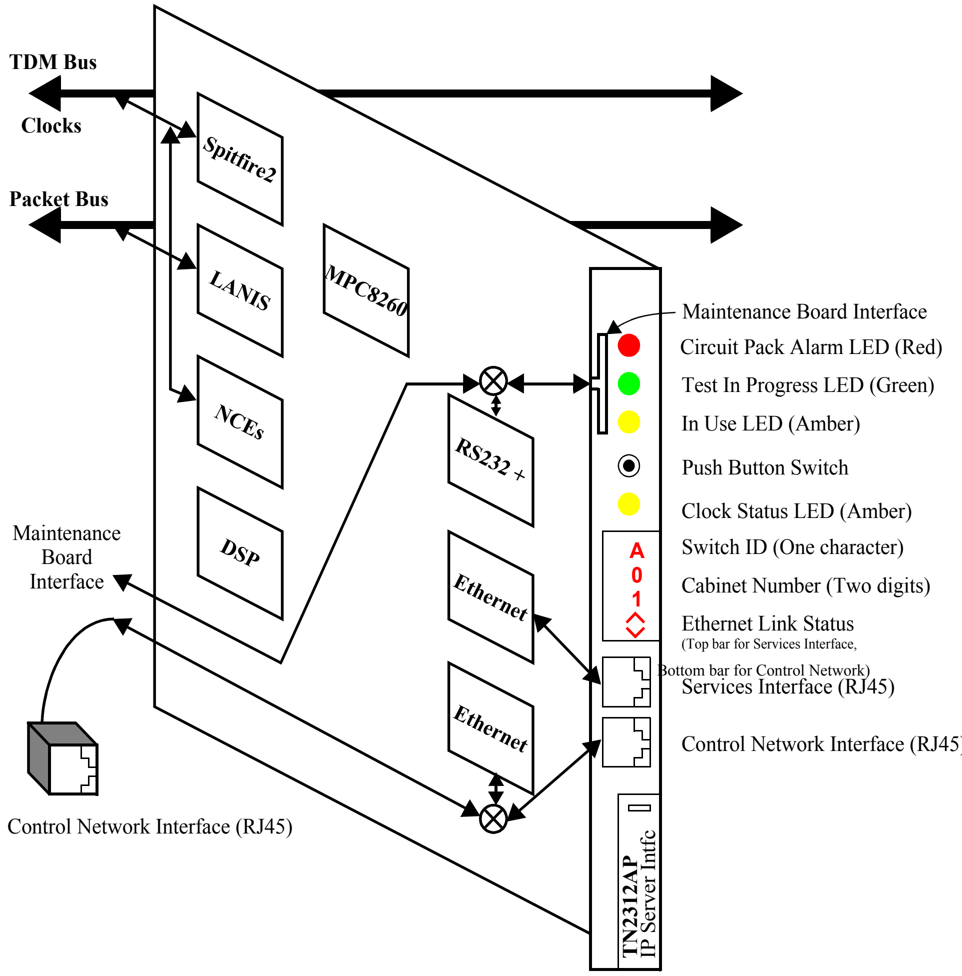
Each IPSI's state of health (SOH) is kept with the following elements in descending order of priority:

Table 152: IPSI state-of-health components

Fault Class	Circuit pack function that is monitored	Priority
Clock	Clocking signal for the TDM bus	1 (highest)
PKTINT	Sending and receiving packet control messages	2
EAL	Noting the state of the expansion archangel link (up or down)	3
Generation	Generating tones	4 (lowest)

TN2312AP IP Server Interface (IPSI)

Figure 34: TN2312AP IPSI



Control Network Interface

This is a 10/100 BaseT Ethernet interface used to connect to the Control network. This interface is available through the backplane I/O as well as through the faceplate. When the IPSI I/O adapter is plugged onto the Amphenol connector, located on the rear of the carrier, the backplane connections will be selected, otherwise, connectivity to the faceplate will be selected. For the PN control carriers, the backplane connections are available only when the new PN control carriers are used.

Services Interface

This is a 10/100 BaseT Ethernet interface accessible from the faceplate for services personnel to configure the IPSI firmware (IP address settings), access the SAT, and to debug the control network connectivity (ping, traceroute, etc.).

PN's Maintenance Board Interface (TN2312AP)

This interface consists of RS232 transmit and receive leads and reset leads that connect to the PN's TN775D Maintenance board via the faceplate or the backplane. Communication Manager talks to the Maintenance board via the IPSI's archangel through this interface for cabinet maintenance (cabinet temperature, voltage, emergency transfer and etc.). This interface also allows the Maintenance board to reset the IPSI board when it detects insanity of the IPSI's archangel. When the ribbon cables are connected between the IPSIs and the PN's TN775D Maintenance board, the faceplate connections are selected, otherwise the backplane connections are used. The backplane connections are available only when the new backplane is used. This connection will not support the RS-232 SAT connection via the PN's Maintenance board.

Environmental maintenance (TN2312BP)

The TN2312BP IP Server Interface (IPSI) provides environmental maintenance and is the only IP server interface that is supported in the G650. A TN2312BP can only be placed in a G650 with a carrier address set to A or B. Only a TN2312BP in a G650 with a carrier address set to A provides environmental maintenance. The TN2312BP is backward compatible with the TN2312AP, but provides environmental maintenance only when used in a G650. The TN2312BP always provides tone detection, call classification, tone generation, and clock functions.

When the TN2312BP is used in an MCC1 or SCC1, a TN775D provides the environmental maintenance.

The TN2312BP provides environmental maintenance for the G650. This includes:

- External device alarm detection
- Emergency transfer control
- Customer-provided alarm device control

The TN2312BP and the 655A power supply provide the following information to the G650:

- **Environment maintenance**
  - Inlet temperature - Inlet temperature of the G650 (sensor is in the 655A power supply)
  - Exhaust temperature - G650 carrier exhaust air sensor
  - Hot Spot temperature status- 655A power supply sensor
  - Voltage
    - +5VDC
    - -5VDC
    - -48VDC
  - Fan Control - The speed at which the fans are operating:
    - Under indicates that the fan voltage is under 12VDC.
    - Mid (normal) indicates that the fan voltage is +12VDC.
    - High indicates that the fan voltage is +14VDC.
    - Over indicates that the fan voltage is above 14 to 15VDC.
  - Fan Alarm - Detection of a blocked or failed fan
  - Ring Status - OK, overload, shorted, or failed
  - Ring Control - Active, standby, disabled, off (shorted or failed)
  - Ringer Setting - 20Hz, 25Hz, or other
  - Ring Detection - Reports if the power supply detects ring on the backplane ring leads
  - Input Power - Indicates the type of power present and in use, AC or DC
- **External device alarm detection**

  The external device alarm detection uses two external leads. External devices such as an uninterruptible power supply (UPS) or voice messaging system can use these leads to generate alarms using the Communication Manager alarm reporting capability. Ground potential on either of these leads results in an alarm being generated. The alarm level (major, minor, or warning), product ID, alternate name, and alarm description can be administered for each lead.
- **Emergency transfer control**

  Emergency transfer control provides -48VDC to operate an external emergency transfer panel. The Communication Manager controls the state of the emergency transfer. (Note that, in the past, hardware boards or alarm panels provided a three-position physical switch to control emergency transfer.) An emergency transfer status red LED shows when emergency transfer is active.

The following Communication Manager SAT commands can be used for emergency transfer:

- **`set emergency-transfer on|off|auto`** - Use this to set emergency transfer to **`on`** (not in emergency transfer), **`off`** (in emergency transfer), or **`auto`** (emergency transfer is controlled by Communication Manager).
- **`status cabinet`** ***`nn`*** - Use this to verify the current setting of emergency transfer.

When the emergency transfer is set to other than **auto** an alarm is generated.

- **Customer provided alarm device (CPAD) control**

  CPAD provides a contact closure across a pair of external leads that can be used to control a customer-provided alarm device or an alarm indicator. The level of alarm (major, minor, warning, or none) that causes a contact closure can be administered system wide. When the alarm level matches the alarm level that was administered, the TN2312BP closes this contact. When the TN2312BP is in emergency transfer, this contact is closed to activate the CPAD.

- **Tone Detection / Call Classification**

  The TN2312BP provides eight ports of tone detection and call classification. The TN2312AP provides the same functionality.

- **Tone/Clock functions**

  The TN2312BP generates tones and provides clock functions for the port network in which it is placed. (The TN2312AP provides the same functionality.) This functionality is equivalent to the TN2182B Tone/Clock circuit pack.

TDM-Bus Interface

The TDM bus is used by four different functions on the IPSI board:

1. When the Archangel module is activated, it uses the Spitfire2 device to be the bus master of the TDM bus. The Archangel uses this interface to talk to the other port boards' angels on the TDM bus.
2. In Angel mode, the Tone-Clock Angel uses the Spitfire2 device to talk to an off-board Archangel.
3. The Tone Generator uses the Spitfire2 device to put tones on the TDM bus.
4. The Tone Detector uses the NCE device to receive TDM bus time slots for tone detection.

Packet Bus Interface

When the PKT-INT module is activated, it uses the LANIS device to talk and listen on the packet bus.

System Clock Interface

The Clock module uses the Spitfire2 device to generate clock pulses for the backplane.

IPSI Circuit Pack Faceplate

The faceplate view of the TN2312AP IPSI is shown in Figure 34: TN2312AP IPSI and is described in the following sections.

IPSI LEDs

There are four LEDs on the TN2312AP IPSI faceplate, and five LEDs on the TN2312BP IPSI and TN8412AP SIPI (S8400 IP Interface) faceplate. The top three are the standard LEDs found on most TN circuit packs. The fourth LED indicates that the Tone-Clock function is active and imitates the TN2182B Tone-Clock's amber LED. In addition, the TN2312BP and TN8412AP have a fifth LED that shows the emergency transfer control status. Table 153: IPSI LEDs describes the operation of the IPSI's LEDs.

Table 153: IPSI LEDs ***1 of 2***

Function	LED	State	Description
Standard circuit pack status	Red	On	Power up in progress or alarm is present
	Green	On	Test in progress
	Amber	Off	Circuit pack not in use
		Flashing 2 sec on 0.2 sec off	Circuit pack in use
			1 of 2

Table 153: IPSI LEDs ***2 of 2***

Function	LED	State	Description
Clock status TN2312BP, (same as TN2182B)	Amber	Flashing 2.7 sec on 0.3 sec off	Active: Master clock, using offboard synchronization source.
		Winking 0.3 sec on 2.7 sec off	Active: Master clock, using its local reference source.
		Steady on	Active: Board has been reset and is providing clocks but has not been told which synchronization source to use.
		Steady off	Standby: Applying no tones to the network.
		"Jingle Bells" Green and Amber 0.1 sec on, 0.2 sec off, 0.1 sec on, 0.4 sec off, 0.4 sec on, 0.4 sec off	Standby: Tone generator is being used.
		Double blink Amber 0.3 sec on, 0.3 sec off, 0.3 sec on, 2.4 sec off	Active: Lost all external references and is in holdover mode.
		Random	Standby: This LED may come on and off intermittently as ETR-PTs on the board are used for tone-detection services.
Emergency transfer (TN2312BP)	Red	On	Emergency transfer is active.
		Off	Emergency transfer is inactive.
			2 of 2

Push-Button Switch

The push-button switch is used to administer the switch ID and the cabinet number of the IPSI. This button can also be used to erase the manually programmed IP address. Inserting the IPSI board with the button pressed or just resetting it while the button is pressed will keep the IPSI in boot mode.

4-Character LED

The 4-character LED displays the circuit pack status related to the Ethernet interfaces. If automatic IP address assignment via DHCP is enabled, the top character displays the Switch ID and the next two characters display the Cabinet Number. The last character is used to display the link status of the two Ethernet interfaces.

Services Interface

The top RJ45 jack is the services interface. This is a 10/100 BaseT Ethernet interface.

Control Network Interface

The bottom RJ45 jack is the control network interface. This is a 10/100 BaseT Ethernet interface. This interface is active only when the IPSI I/O adapter is not plugged onto the Amphenol connector, located on the rear of the carrier.

PN's Maintenance Board Interface

The PN's Maintenance board interface is a header on the IPSI circuit pack with a slit on the faceplate of the IPSI for the ribbon cable to connect to the PN's TN775D Maintenance board.

Error log entries and recommended actions

Table 154: IP-SVR Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18 The IPSI circuit pack is busied out by maintenance personnel.	0	**busyout ipserver-interface location**	WRN	OFF	**release ipserver-interface location**

Demand tests descriptions and error codes

There are no demand tests for IP-SVR.

ISDN-PLK (ISDN-PRI Signaling Link Port)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
ISDN-PLK	MIN	**test port** ***location*** **l**	ISDN-PRI Signaling Link port
	WRN	**test port** ***location***	

1. *location* refers to the port board location and port number. The port number is either **24** for 24-channel interfaces or **16** for 32-channel interfaces.

This MO was formerly known as “ISDN-LNK (ISDN-PRI Signaling Link Port)”.

Note:

See the figures in ISDN-SGR (ISDN-PRI Signaling Group) for an illustration of the principles described below.

The ISDN-PRI interface uses out-of-band signaling (as opposed to robbed-bit, in-band signaling) to transmit control messages between two endpoints. User information channels carry digitized voice and digital data and are known as bearer channels (B-Channels). B-Channels are assigned to DS1 ISDN trunks or PRI endpoints. Call-control signaling for the B-Channels is combined and carried over the separate ISDN-PRI Signaling Link Port D-Channel.

The ISDN-PRI Signaling Link Port (ISDN-PLK) is a port on a TN464C or higher suffix UDS1 Interface circuit pack that has a direct interface to the packet bus that carries D-channel messages to the processor. The associated B-Channels can use ports on the same circuit pack or ports on other TN464C or higher suffix or TN767 DS1 Interface circuit packs. The TN722 cot be used for this application. The B-Channels are connected to the TDM Bus.

Two types of DS1 interfaces exist:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

The TN767 DS1 interface is used for 24 channel 1.544 Mbps systems. The TN464F/GP can be used for either 24 or 32 channel systems. The 32-channel (31 DS0 channels + 1 framing channel on a 2.048 Mbps link) are only supported on TN464 series circuit packs. A description of these circuit packs appears in DS1-BD or UDS1-BD maintenance documentation.

On 24-channel interfaces, the B-Channels may use any of the first 23 ports. The signaling link is assigned to the 24th port.

On 32-channel interfaces, the DS1 ISDN Trunks (B-Channels) may use any of the ports 1 to 15 and 17-31. The signaling link is assigned to the 16th port. The 32nd channel (port 0) is used for framing.

In NFAS configurations, the 16th or 24th ports on some of the DS1 circuit packs may be used for B-Channels. Refer to ISDN-SGR (ISDN-PRI Signaling Group) for further details.

A problem with the ISDN-PLK will affect every associated B-Channel since no call control information can be conveyed to the far-end switch or terminal adapter. Stable calls may remain operational, but no new calls can be placed. In turn, the ISDN-PLK depends on:

- For systems supporting circuit packs:
  - the UDS1 Interface circuit pack where it resides
  - the packet bus that provides the link to the processor
- For systems supporting media modules:
  - the DS1 Interface Media Module that provides the link to the processor

If there are problems with the ISDN-PLK, also investigate UDS1-BD (UDS1 Interface Circuit Pack) and PKT-BUS (Packet Bus) for systems supporting circuit packs, or investigate MG-DS1 (DS1 Interface Media Module) for systems supporting media gateways.

Error log entries and recommended actions

Table 155: ISDN-PLK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***[1]
18 (b)	0	**busyout port** ***location***[1]	WRN	OFF	**release port** ***location***[1]
130 (c)			WRN	ON	**test port** ***location***[1]
1537 (d)	46210		WRN	OFF	
1793 (e)					**test board** ***location*** **l**
3585 (f)	46222		MIN	ON	
3841 (g)	46211				
3842 (h)	46223				
3843 (i)		Signaling Port LAN Loopback (#939)			**test port** ***location***[1] **l**

1. location is **24** for 24-channel interfaces and **16** for 32-channel interfaces.

Notes:

a. **Error Type 0:** run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 18:** The D-Channel is demand busied out by command. No calls can be made over this D-Channel.

c. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

d. **Error Type 1537:** Link error. This error occurs when the port receives an invalid frame over the D-Channel. This error normally indicates an off-board problem usually related to transmission errors on the DS1 facility. Enter **`list measurements ds1-log`** for the UDS1 TN464 circuit pack or DS1 Media Module where the D-channel resides. If the UDS1 or MG-DS1 is reporting errors, the DS1 facility has experienced transmission problems that could have caused the ISDN-PLK to report a Link Error.

   If the UDS1 or MG-DS1 is not reporting errors, execute the long test sequence for the D-Channel. Investigate any errors. If there are none, execute a long test sequence for the UDS1 circuit pack (UDS1-BD) or DS1 Media Module (MG-DS1). Investigate any errors.

   If no errors could be found by testing, the Link Error is probably not affecting service. However, if this Link Error continues to be logged, follow normal escalation procedures.

e. **Error Type 1793:** UDS1 Interface circuit pack or DS1 Interface Media Module is out of service. Look for and resolve UDS1-BD or MG-DS1 errors in the Hardware Error Log.

f. **Error Type 3585:** transmit FIFO Overflow error. The circuit pack is having problems transmitting data to the packet bus, thus affecting the conveyance of signaling information over the D-Channel. Specifically, this error occurs when the packet bus transmit buffers overflow. This condition probably indicates a hardware problem.

   The actual alarming level will depend on the options chosen via the **`set options`** command. ISDN-PRI Signaling Link port alarms are treated as Station alarms, and their default alarming option is to downgrade every alarm to Warning. The value shown in the preceding table indicates the normal, unfiltered case (option “y” on the **`set options`** screen).

g. **Error Type 3841:** Bad DLCI error. This error occurs when a LAPD frame is received across the DS1 facility that contains a DLCI that does not have a valid entry in the on-board translation memory. This error normally indicates an off-board problem usually related to a broken endpoint or a state mismatch between a remote endpoint and the local call-processing software. Maintenance will not start any testing or generate any alarms in response to this error.

h. **Error Type 3842:** Receive FIFO Overflow error. This error occurs when the circuit pack or media module detects an overflow of its receive buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch between the two endpoints of a packet-switched connection. LAPD should be able to recover from this problem, but it may degrade the performance of the LAN bus. Maintenance will not start any testing or generate any alarms in response to this error.

i. **Error Type 3843:** The Signaling Port LAN Loopback test (#939) failed. Run the long test sequence and note the results of the Signaling Port LAN Loopback Test (#939).

Demand test descriptions and error codes

The command to test the ISDN-PLK MO is **`test port`** ***`location`*** where ***`location`*** is the port board location and either **24** for 24-channel interfaces or **16** for 32-channel interfaces. For example, **`test port`** 8E0524.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Board Check (#643)	X	X	ND
Signaling Port LAN Loopback Test (#939)		X	D

1. D = Destructive; ND = Nondestructive

ISDN-SGR (ISDN-PRI Signaling Group)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
ISDN-SGR	MIN WRN	**test signaling-group *grp#***	ISDN-PRI Signaling Group

1. ***grp#*** is the signaling group number (1–166); the test sequence can be either short or long.

An ISDN-PRI Signaling Group is a collection of B-Channels for which a given ISDN-PRI Signaling Channel Port (D-channel) carries signaling information. B-Channels carry voice or data and can be assigned to DS1 ISDN trunks (ISDN-TRK) or PRI endpoint ports (PE-BCHL).

Note:

Throughout this discussion, the term "B-Channel" refers to an ISDN-TRK or PE-BCHL, depending on the application under investigation.

The following circuit packs/media modules are supported in the implementation of ISDN-PRI:

Circuit Pack/ Media Module	Channel Types	Interface
MM710	B- and D-Channels	24 or 32 channel
TN464B	B-Channels	32 channels
TN464C/D/E	B- and D-Channels	24 or 32 channel
TN464F/GP/HP	B- and D-Channels	24 or 32 channel
TN767	B-Channels only	24 channels

. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

The following discussion describes 24-channel interface signaling groups. The 32-channel interface works the same way, except that only port number 16 is used for signaling instead of port number 24. Ports 1 through 15 and 17 through 31 are used for B-Channels. The 32nd channel (port 0) is always used for framing.

ISDN-PRI D-channel signaling can be combined with a group of B-Channels in three basic ways:

- FAS (facility-associated signaling)
- NFAS (non-facility-associated signaling)
- Backup NFAS signaling

In a FAS signaling group, the 24th port of the TN464 UDS1 Interface circuit pack or DS1 Interface Media Module carries D-channel signaling for up to 23 B-Channel ports on the same circuit pack or media module.

In an NFAS signaling group, the 24th port of one TN464C or higher suffix UDS1 Interface or DS1 Interface Media Module can carry D-channel signaling for B-Channels on several other DS1 circuit packs or DS1 Media Modules, as well, including TN767s and TN464Bs. The 24th port on the other circuit packs or media modules can be used as a B-Channel. A D-Channel in an NFAS group can signal for B channels on a total of 20 DS1 circuit packs or media modules.

D-channel backup provides increased reliability, which is highly desirable since NFAS permits a D-Channel to signal for many more B-Channels. NFAS allows the administration of a backup D-Channel that remains in a standby state until the active D-Channel goes down. If so, the backup D-Channel takes over and provides signaling for every B channel in the signaling group.

The operation of the entire ISDN-PRI signaling group depends on several other entities:

- The ISDN-PRI signaling channel ports, the TN464 UDS1 Interface circuit pack or DS1 Interface Media Module, on which the D-Channels reside, and the system link that is carried over the packet bus to the processor.

When there are problems with the ISDN-PRI signaling group, also investigate ISDN-PLK (ISDN-PRI Signaling Link Port), UDS1-BD (UDS1 Interface Circuit Pack), MG-DS1 (DS1 Interface Media Module), SYS-LINK (System Links), and PKT-INT (Packet Interface), as appropriate.

Error log entries and recommended actions

Table 156: ISDN-SGR Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any		`test signaling-group grp#`
1 (b)	Any				
257 (c)	Any				`test signaling-group grp#`
513 (d)	Any				`test signaling-group grp#`
769	Any	Primary Signaling Link Hardware Check (#636)			`test signaling-group grp#`
					1 of 2

Table 156: ISDN-SGR Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1025	Any	Secondary Signaling Link Hardware Check (#639)			**test signaling-group** ***grp#***
1793 (e)	Any	Layer 2 Status Test (#647)	WRN	OFF	**test signaling-group** ***grp#***
2049 (f)	Any	Layer 2 Status Test (#647)	WRN	OFF	**test signaling-group** ***grp#***
2305 (g)	Any	Remote Layer 3 Query (#637)	MIN	OFF	**test signaling-group** ***grp#***
3585 (h)	Port number				
3842 – 3942 (i)	Port number				
					2 of 2

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** this switch sent a message to the far-end switch or terminal adapter, and the far end did not respond in the allotted time. Possible causes include link failure and congestion or outage at the far end. The Aux Data field contains layer-3 protocol information used by internal counters.

   If no other symptoms are present, no action is required. If layer-3 communication is down, there should be indications in the screen of alarms and errors for link components. Check for other errors against ISDN-SGR, ISDN-TRK, and other hardware components on the link.

   There is no test to clear these errors. An error counter is decremented by 1 every 15 minutes, and the error eventually will be cleared by the system.

c. **Error Type 257:** the primary signaling channel connection has been lost for more than 90 seconds. If a secondary signaling channel does not exist or is not in service, the associated B-Channels will be placed in the ISDN Maintenance/Far-End state. The B-Channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Check the results of the Primary Signaling Link Hardware Check (#636) in the test sequence. When the link does recover, the B-Channels will be negotiated back to the In-Service state and their alarms will be retired.

When this error occurs, the state of the Signaling Group is changed to out of service. Verify this with **`status signaling-group`** ***`grp#`***.

d. **Error Type 513:** the secondary signaling channel connection has been lost for more than 90 seconds. If the primary signaling channel is not in service, B-Channels will be placed in the ISDN Maintenance/Far-End state. The B-Channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Note the results of the Secondary Signaling Link Hardware Check (#639). When the link does recover, the B-Channels will be negotiated back to the In-Service state and their alarms will be retired.

When this error occurs, the state of the Signaling Group is changed to out of service (verify using **`status signaling-group`** ***`grp#`***).

e. **Error Type 1793:** The Layer 2 Query Test failed for the primary signaling channel. See Layer 2 Status Query Test (#647)

f. **Error Type 2049:** The Layer 2 Query Test failed for the secondary signaling channel. See Layer 2 Status Query Test (#647)

g. **Error Type 2305:** The Remote Layer 3 Query (#637) failed. A specific message was sent to the far-end switch, and it did not respond within the time allowed. Investigate elements of the ISDN PRI D-Channel(s) ISDN-PLK (ISDN-PRI Signaling Link Port) for both this switch and the far-end switch. If Test #637 fails twice in a row, the B-Channels will be alarmed and made unavailable for outgoing calls (although incoming calls will still be accepted). When Test #637 succeeds and the far-end switch starts responding properly, the DS1 ISDN Trunk (B-Channels) will be placed back into normal operation, and their alarms will be retired.

h. **Error Type 3585:** A SERV or SERV ACK ISDN D-channel message has been received by a non-US-type interface (country option other than `1` on the DS1 Administration screen). However, these messages are used only for NFAS D-channel backup signaling that is supported only by country protocol 1.

Thus, there may be a mismatch in administration between the local and far-end switches. Consult with the customer's network provider to determine whether the D-Channel is set up correctly at the far-end switch.

i. **Error Types 3842 - 3942:** These Error Types report certain error messages received by the ISDN-PRI Signaling Group for one of its associated B-Channels. The aux data field shows for which B-Channel (port number) the message was received.

The error code generated equals 3840+*x*, where "*x*" is a cause value defined by the ISDN-PRI Specification. Note that there is no recommended action for these Error Types; selected ISDN cause values are placed in the log when they are received, but no direct action or alarming is performed solely in response to receiving them. They provide added data that may prove useful when tracking down obscure networking and routing problems. Table 157 provides more information.

Table 157: Descriptions and Recommendations for Error Types 3842-3942 ***1 of 4***

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cot be accessed.	The equipment sending this cause event does not recognize the transit network. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
3843	No route to destination. Request received to route call through a transit network that is recognized but not allowed to carry the call or not able to serve the destination.	
3846	The far-end switch has indicated that the B-Channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate an administration problem (for example, the local switch and the far-end switch have different B channels administered), or could reflect the occurrence of a normal race condition (for example, the local switch has requested use of a B-Channel that the far-end switch had just reserved for use on another call). 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Enter **`status trunk`** for the indicated trunk. Refer to the "DS1 ISDN Trunk Service States" and "ISDN-PRI Trunk Service States" sections of ISDN-TRK for recovery suggestions.
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch or terminal adapter that did not respond in the time allowed.	Follow same recommendations as for Error Type 1.
		1 of 4

Table 157: Descriptions and Recommendations for Error Types 3842-3942 *2 of 4*

Error Code	Description	Recommendation
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	Network is out of order. 1. From the circuit pack or media module and port number (in the Aux Data field, determine the trunk group against which the error was reported. 2. Consult with the network provider to determine the nature and expected duration of the out of service condition. 3. Consider modifying every routing pattern containing this trunk group to route calls around the network that is out of service.
3890	A request to use a network service (e.g., SDN) has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Display the trunk group form: If the trunk group is Call-by-Call (Service Type is “cbc”), check every routing pattern form containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
		2 of 4

Table 157: Descriptions and Recommendations for Error Types 3842-3942 ***3 of 4***

Error Code	Description	Recommendation
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	First, eliminate any transitory state mismatch problems by entering **test port** ***location*** for the trunk port shown in the Aux Data field. Service State Audit Test (#256) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3902	FRANCE ONLY: Service not authorized.	
3903	Service or option not available, unspecified. This cause reports a “service or option not available” event only when no other cause in the “service or option not available” class applies.	
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the previous recommendation for Error Type 3890.
3910	Only restricted digital BC available.	
		3 of 4

Table 157: Descriptions and Recommendations for Error Types 3842-3942 ***4 of 4***

Error Code	Description	Recommendation
3919	Service or option not implemented, unspecified. Used when no other cause in this class applies.	
3928	A call was denied because of a basic incompatibility existed between the type of call and either the facilities selected by the routing pattern or the called user.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks or PRI endpoints. Determine the trunk group from the circuit pack or media module and port number (in the Aux Data field) and then check the BCC fields of the pertinent routing patterns. Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).
3942	Timer expiry: T310 time-out, no answer to CALL PROCEEDING.	
		4 of 4

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Primary Signaling Link Hardware Check (#636)	X	X	ND
Secondary Signaling Link Hardware Check (#639)	X	X	ND
Layer 2 Status Query Test (#647)	X	X	ND
Remote Layer 3 Query (#637)	X	X	ND

1. D = Destructive; ND = Nondestructive

ISDN-TRK (DS1 ISDN Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
ISDN-TRK	MAJ[1] MIN	`test port location long`	DS1 ISDN Trunk
	WRN	`test port location`	

1. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options**.

Note:

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. See *Administering Avaya Aura™ Communication Manager.* Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

Note:

See the figures in the ISDN-SGR (ISDN-PRI Signaling Group) maintenance object for an illustration of the principles described below. Throughout this section, the general term DS1 circuit pack refers to TN464 and TN767 series circuit packs for systems supporting circuit packs and DS1 Interface Media Modules for systems supporting media modules.

For additional repair information, see also DS1-BD (DS1 Interface Circuit Pack) for TN767 ports, UDS1-BD (UDS1 Interface Circuit Pack) for TN464C or higher suffix ports, and MG-DS1 (DS1 Interface Media Module) for Media Module ports.

A DS1 ISDN trunk is a 64-kbps bearer channel used to transmit digitized voice or data traffic. These trunks, or B-Channels, use a separate channel, the D-Channel for call-control signaling. This mode of operation is known as out-of-band signaling, as opposed to in-band robbed-bit signaling, in which signaling is carried in the same channel as the voice or data traffic. One D-Channel, or ISDN signaling link (ISDN-PLK), carries signaling messages for several B-Channels, forming an ISDN signaling group (ISDN-SGR).

A B-Channel may be a port on a TN464 series UDS1 circuit pack, a TN767 series DS1 Interface circuit pack, or an DS1 Interface Media Module.

Two types of DS1 interfaces exist:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

On 24-channel interfaces, any of the first 23 ports on the DS1 circuit packs or media modules can be a B-Channel. On the TN464C or higher suffix UDS1 circuit pack or DS1 Media Module, the 24th port may be used as a B-Channel or as a D-Channel depending on the type of ISDN-PRI signaling group (FAS or NFAS) implemented on the circuit pack or media module. For more details, see ISDN-SGR (ISDN-PRI Signaling Group). On the TN767 DS1 circuit pack, all 24 ports are used as B-Channels since D-channel signaling is not supported on the TN767 circuit pack. The signaling for these B-Channels is done over a D-Channel located on a UDS1 TN464C or higher suffix board.

On 32-channel interfaces, any of ports 1 – 15 and 17 – 31 on the DS1 interface circuit pack or media module can be a B-Channel. The 16th port may be used as a B-Channel or as a D-Channel depending on the type of ISDN-PRI signaling group (FAS or NFAS) to which it belongs. For more details, see ISDN-SGR (ISDN-PRI Signaling Group) and DS1-BD (DS1 Interface Circuit Pack) or MG-DS1 (DS1 Interface Media Module).

For interfaces using country protocol 1 on the DS1 circuit pack or media module administration form (including US), the signaling protocol used for the maintenance of the B-Channel is defined by the Avaya ISDN-PRI specification. For interfaces using country protocols other than 1, the signaling protocol used for the maintenance of the B-Channel is defined by the CCITT ISDN-PRI Specification.

There are five possible service states for a B-Channel. The service state is negotiated with the far-end switch, changes over time, and may have far-end and near-end components. The service state is initialized to Out-of-Service/Far-End, and an attempt is made to negotiate it to In-Service.

Note:

The service state of a particular DS1 ISDN Trunk B-Channel can be displayed by entering **status trunk** ***grp#/mem#*** on the system access terminal.

When a call is present, the specification defines the permissible call states, as well. There are tests in the short and long test sequences for DS1 ISDN Trunk designed to audit these states and ensure agreement between both ends of the PRI connection.

Alarming Based on Service States

A warning alarm is logged against a DS1 ISDN B-Channel trunk when it is placed in the Maintenance/Far-End or Out-Of-Service/Far-End states, during which the trunk is unusable for outgoing calls. When a warning alarm is present, use the **`status trunk`** ***`grp#/mem#`*** command to determine the exact state. Other alarms can be diagnosed by using the short and/or long test sequences.

An ISDN B-Channel trunk can be placed in a Far-End service state by either action taken by the far-end switch or by failure of the far-end switch to respond. For example, if the far end does not respond to a Remote Layer 3 Query test (#637) for ISDN-SGR, the associated DS1 ISDN trunk B-Channels will be placed in the Maintenance/Far-End service state.

As a port on a DS1 circuit pack (DS1-BD or UDS1-BD), or a DS1 Media Module (MG-DS1), and as part of a signaling group dependent on a D-Channel (ISDN-PLK) for signaling, operation of the ISDN-TRK is dependent on the health of these other MOs. In turn, the ISDN D-Channel depends on the packet bus (PKT-BUS) for transmission through the system. Keep this hierarchy of dependencies in mind when diagnosing problems.

DS1 ISDN Trunk Service States

The **`status trunk`** command shows the following possible service states for ISDN trunks. Table 158: Service States gives recommended procedures for each state.

- In-Service (INS)

  The B-Channel is in its normal operating state.

- Out-of-Service/Far-End (OOS/FE)

  A B-Channel is initialized to this state when administered. The switch sends messages to the far end to negotiate the B-Channel into service. If the far end does not respond to the messages within a certain time period, then the service state remains out of service and maintenance will periodically resend the messages. The trunk is unusable for incoming and outgoing calls.

  On US interfaces, the trunk is unusable for incoming calls, but on non-US interfaces, incoming calls will be accepted.

- Out-of-Service/Near-End (OOS/NE)

  This is the state of the trunk when the NPE Crosstalk Test fails or when the trunk is busied out by the system technician. In this state, the trunk is unusable for incoming or outgoing calls. No messages are sent to the far end until the signaling link comes back into service or the trunk is released by the system technician.

- Maintenance/Far-End (MTC/FE)

  This state is reached when the far end does not respond after a certain amount of time to messages sent over the signaling link for a particular trunk. This state is different from OOS/FE since the signaling link must have initially been up and the B-Channels in service. The switch will periodically send messages to the far end to try to negotiate the trunk (B-Channel) into service. The trunk is unusable for outgoing calls but will service incoming call requests from the far end. Note that transitions into MTC/FE do not drop stable calls. Therefore, if the service state changes from in service to MTC/FE, then stable calls are unaffected.

- Maintenance/Near-End (MTC/NE)

  The trunk (B-Channel) is in this state if the signaling channel (ISDN-PLK) is busied out by the system technician. The trunk (B-Channel) is also temporarily in this state if the system technician enters **`test trunk`** ***`grp#/mem#`*** **`long`**. This command executes the ISDN-PRI test call. This test changes the state of the trunk member to MTC/NE for the duration of the test unless a call request comes in from the far end. In that case, the test would abort. Note that transitions into MTC/NE do not drop stable calls. In this state, the B-Channel is not usable for new incoming or outgoing calls.

- Pending States

  In addition to one of the previous components, the service state may have a *pending* component, indicating that the switch is waiting for a reply from the far end. These service states remain in effect until either a response is received or the allotted waiting time expires.

  - Pending-in-Service

    The near end is awaiting a far-end response to a B-Channel maintenance message requesting that a B-Channel be transitioned to in service.

    The far-end has a certain amount of time to respond to the message. The service state will be PINS until either a response is received or the timer expires.

  - Pending-Maintenance

    This state is supported only by systems using country protocol 1 (including US). The near end is awaiting a far-end response to a maintenance message requesting that a B-Channel be transitioned to the maintenance service state. The far-end has a certain amount of time to respond to the message. The service state will be PMTC until either a response is received or the timer expires.

- Call Activity States

  The in-service state also has a call activity component.

  - Active

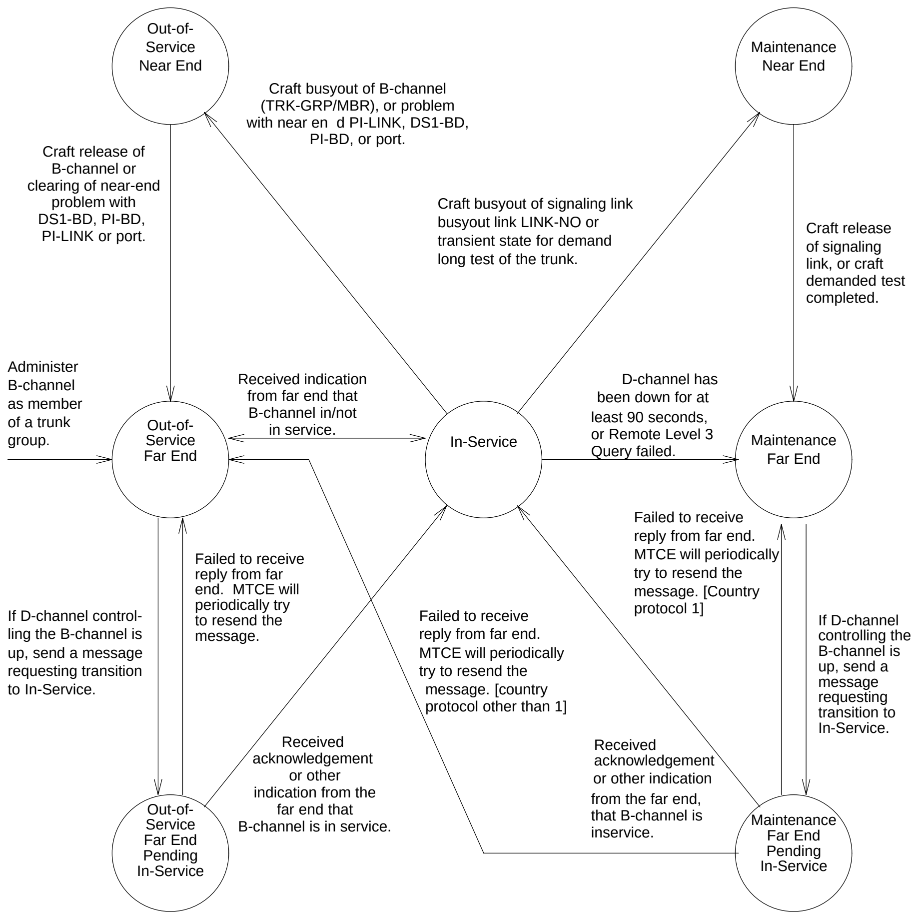
    A call is connected over the B-Channel (for example, *in service active*).

  - Idle

    There is no call currently on the B-Channel (for example, *in service*).

The following diagram of the DS1 ISDN Trunk service states shows the common progression from one service state to another and the event that caused the change of state.

Figure 35: Common Progressions in Service States



ISDN-PRI Trunk Service States

Use **`status trunk`** ***`grp#/mem#`*** to see DS1 ISDN Trunk service states, as shown in Table 158: Service States.

Note:

Refer to Troubleshooting ISDN-PRI in *Maintenance Procedures (03-300432)* for a layered approach to processing ISDN-PRI problems.

Table 158: Service States ***1 of 2***

Service State	Alarm[1]	Possible Cause	Possible Solution
out-of-service/NE	WRN	Trunk is demand busied out.	Enter **`release trunk`** ***`grp#/mem#`***.
	MIN	NPE Crosstalk test (#6) failed.	Replace DS1/UDS1 circuit pack.
	None	DS1 or UDS1 circuit pack or DS1 Media Module lost its signal.	Is the DS1/UDS1 circuit pack, DS1 Media Module, or cable removed? Is the far-end switch restarting? Check circuit pack or media module using procedures in DS1-BD, UDS1-BD, or MG-DS1.
out-of-service/FE	WRN	Unadministered far end	Administer corresponding trunk on far-end switch.
	WRN	The far-end trunk is busied out.	Check the status of the far-end switch.
pending-in-service pending-maint	None	Maintenance message was sent and the switch is waiting up to 2 min. for a reply from the far end.	Wait 2 minutes and check service state after the pending state has cleared.
maint/NE	None	ISDN test call in progress (**`test trunk long`** and **`status isdnpri-testcall`**)	Wait several minutes for test to finish and check status again.
	None	System link has been busied out by command.	Check link status. Release link with **`release link`** ***`lnk#`***.
			1 of 2

Table 158: Service States ***2 of 2***

Service State	Alarm[1]	Possible Cause	Possible Solution
maint/FE	WRN	Signaling channel has been down for over 90 sec.	Consult ISDN-SGRP and/or ISDN-PLK. Far-end signaling channel may be busied out, or the far-end switch may currently be restarting.
	WRN	Repeated failure of far end to respond to messages.	Maintenance software will periodically try to resend messages. You can speed the process with **`test trunk grp#/mem#`** and/or **`test signaling-group`** ***`sig-grp#`***.
	WRN	The far-end trunk is being tested.	Check status of the far-end switch. Wait for testing to finish.
in-service	None	Normal operating state	
			2 of 2

1. ISDN-TRK alarms; alarms against other objects may also be present.

Error log entries and recommended actions

Table 159: ISDN-TRK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**`test port`** ***`location`***
1 (b)	Any				**`test port`** ***`location`***
15 (c)	Any	Port Audit and Update Test (#36)			
18	0	**`busyout trunk`** ***`grp#/mem#`***			**`release trunk`** ***`grp#/mem#`***
19 (d)	0				
129 (e)			WRN	OFF	**`test port`** ***`location`***
130 (f)			WRN	ON	**`test port`** ***`location`***
257 (g)	Any				**`test port`** ***`location`***
					1 of 2

Table 159: ISDN-TRK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (h)	Any		WRN	OFF	**test port** ***location***
769 (g)	Any				**test port** ***location***
1025 (i)	0				
1281	Any	Conference Circuit Test (#7)	MAJ MIN WRN[1]	ON	**test port** ***location*** **l r 4**
1537	Any	NPE Crosstalk Test (#6)	MAJ MIN WRN	ON	**test port** ***location*** **l r 3**
1793 (j)	Any				**test port** ***location***
3073 (k)	Any	Service State Audit (#256)			**test port** ***location***
3585 (l)	Any				
3841 (m)	Any		WRN	OFF	
					2 of 2

1. Major or minor alarms may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** Disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN call state of the DS1 ISDN Trunk. This switch will automatically try to recover by clearing the call, (that is, call will be torn down). You can use **status trunk** ***grp#/mem#*** to determine the state of the trunk.

When running the short test sequence, note the results of the Call State Audit Test (#257).

c. **Error Type 15:** Software audit error and does not indicate a hardware malfunction. Run the short test sequence, and investigate associated errors.

d. **Error Type 19:** Possible protocol mismatch or far end may be out of service.

e. **Error Type 129:** The far-end switch changed its ISDN service state to either *out of service* or *maintenance*. This may be either a temporary condition due to far-end testing of that trunk or a hardware problem with the trunk. Outgoing calls will not be allowed over the trunk. To investigate the status of the trunk, enter **status trunk** ***grp#/mem#***.

f. **Error Type 130:** The circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

g. **Error Types 257 and 796:** Disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN service state of the DS1 ISDN Trunk. This switch will automatically try to recover by performing a service state audit. You can use **`status trunk`** ***`grp#/mem#`*** to determine the state of the trunk.

   When running the short test sequence, note the results of the Service State Audit Test (#256).

h. **Error Type 513:** This trunk is not recognized by the far-end switch. Investigate the trunk administration for both switches and make changes as necessary.

i. **Error Type 1025:** An unexpected SERVICE or SERVICE ACK was received. Possibilities include:

   - Translations conflict
   - Protocol differences
   - Survivable Core Server may be using NI3 protocol, not currently implemented in Communication Manager.
   - B-Channel negotiation problem (glare)

j. **Error Type 1793:** failure of the DS1/UDS1 Interface circuit pack. When running the short test sequence, the results of the Signaling Link State Audit Test (#255) are important.

k. **Error Type 3073:** Service State Audit Test (#256) failed. The trunks will not be usable for any outgoing calls (although incoming calls will be accepted) until the test passes and the trunk state is changed to in service (use **`status trunk`** ***`grp#/mem#`*** to investigate trunk status).

l. **Error Type 3585:** the switch receives an ISDN RESTART message for an ISDN trunk. Calls are cleared with the RESTART message. Therefore, this Error Type may be associated with a dropped call report from a user.

   The following Aux Data values for **Error Type 3585** represent the trunk's ISDN call state at the time the unexpected request to restart the channel was received from the remote switch. This information can be useful if dropped calls (cutoffs) are reported by users of the ISDN-PRI trunks.

The meanings of Aux Data values are shown below; ignore any others.

Table 160: ISDN Trunk - Error 3585 Aux Data Values

Aux Data	Cause
0	A idle trunk received a restart.
10	A call in a stable, talking state was cleared unexpectedly by the far end with an ISDN RESTART message. This state is called the “active” state.
4, 7, 8, 260, 263	A call that has not reached the active state, but has at least reached a ringing state, was cleared unexpectedly by the far end with an ISDN RESTART message.
1, 3, 6, 9, 265	A call that has not yet reached a ringing state was cleared unexpectedly by the far end with an ISDN RESTART message.
11, 12, 19, 531, 267, 268	A call that was in the process of clearing anyway has been cleared by the far end with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far end is attempting to clear trunks that it thinks are in a “hung” state. The RESTART message brings the trunk to an idle condition.

m. **Error Type 3841:** An ISDN trunk selected by the near end has been rejected 10 times by the far end without a successful call. This may indicate a service-state mismatch between the near and far ends for this trunk that is affecting the end user (that is, customer receives unexpected intercept tones when accessing ISDN trunks). This may indicate that the ISDN trunk is not administered at the far end.

The Aux field contains the physical name of the ISDN trunk in decimal. Using this decimal name, verify that the far end has this trunk administered.

The Warning alarm will be retired automatically whenever an outgoing or incoming call that uses this trunk is answered by the called endpoint. If problems persist, then busyout the ISDN trunk to take it out of the hunt group.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit And Update Test (#36)	X	X	ND
Signaling Link State Audit Test (#255)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND
ISDN Test Call Test (#258)		X	ND

1. D = Destructive, ND = Nondestructive

JNL-PRNT (Journal Printer Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
JNL-PRNT	MIN WRN	**`test journal wakeup-log`**	Journal Printer Link

The maintenance strategies for JNL-PRNT (Journal Printer Link) and PMS-PRNT (PMS Printer Link) are the same. Refer to PMS-PRNT (PMS Printer Link) for more information.

LGATE-AJ (Ethernet ASAI Endpoint)

See BRI-SET, Various Adjuncts.

LGATE-BD (ISDN-BRI Line Circuit Pack)

See BRI-BD (ISDN-BRI Line Circuit Pack).

LGATE-PT (Ethernet Adjunct Port)

See BRI-PORT (ISDN-BRI Port).

LIC-ERR (License Error Mode)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
LIC-ERR	MAJ	**test license**	License Error Mode

The LIC-ERR MO works with the NO-LIC MO to look for any errors and violations associated with a License File. Once a License File error occurs, a LIC-ERR error is logged, an alarm is raised, and the following SAT login message is displayed:

"System Administration Will Be Blocked in Approximately XXX hours.
Contact Your Service Representative."

The License File is loaded onto a server during initialization of Communication Manager software, restoration of translations, and periodically during normal operation. After initialization, a query is made to WebLM, a license server plug-in that

- Reads the serial number in a License file.
- Compares this file's serial number to a serial number in hardware.
- Compares the file's serial number with a running software version.

If a match occurs, the Web License Generator (WebLM) that resides on a designated server in the enterprise delivers a new feature mask, an information set that controls which features are enabled or not on the Customer Options and Special Applications screens.

Entry into License Error mode starts a timer that, when expired, causes the system to enter No-License mode (see Figure 36: License mode algorithm).

Figure 36: License mode algorithm

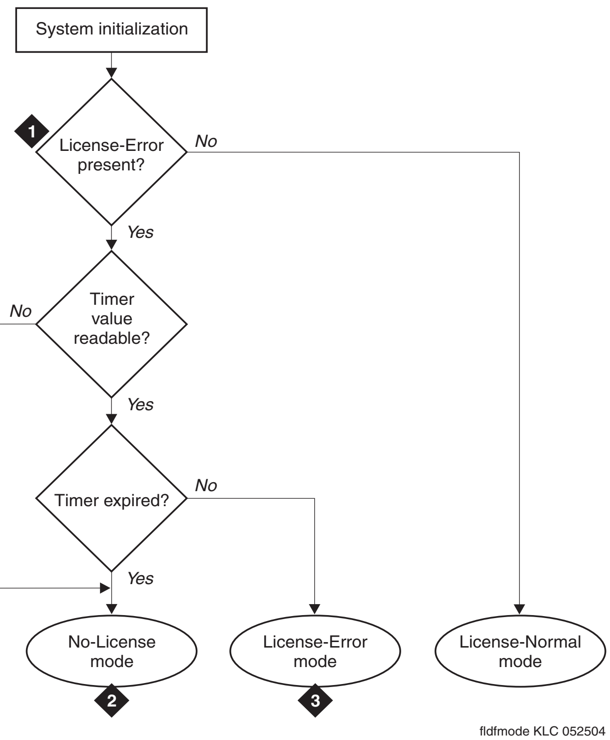


Figure notes:

1. See Troubleshooting License File errors.
2. See NO-LIC (No License).
3. See Troubleshooting License File errors

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)			MAJ	OFF	See footnote[1]
513 (b)			MAJ	OFF	See footnote[1]
769 (c)			MAJ	OFF	See footnote[1]
1537 (d)			MAJ	OFF	See footnote[1]
1793 (e)			MAJ	OFF	See footnote[1]
2305(f)			MAJ	OFF	See footnote[1]

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2561 (g)			MAJ	OFF	See footnote[1]
2817 (h)			MAJ	OFF	See footnote[1]
3073 (i)			MAJ	OFF	See footnote[1]
3074 (j)			MAJ	OFF	See footnote[1]
3329 (k)			MAJ	OFF	See footnote[1]
3335 (l)			MAJ	OFF	See footnote[1]
3391 (m)			MAJ	OFF	See footnote[1]
3584 (n)			MAJ	OFF	See footnote[1]
3585 (o)			MAJ	OFF	See footnote[1]
3586 (p)			MAJ	OFF	See footnote[1]
3841 (q)			MAJ	OFF	See footnote[1]

1. These Error Types can be cleared by installing the correct License File.

Notes:

a. **Error Type 1**: S8700 Series S8400| S8500: The reference IPSI is not responding.
S8300: The motherboard on which the serial number resides is not responding.

Either the reference is not responding or its serial number does not match the one in the Licence file, and the 30-day timer begins. When the 30-day timer expires, the system enters No-License mode (see NO-LIC (No License), Error Type 1).

b. **Error Type 513**: The license has expired, and the 30-day timer has started. When the 30-day timer expires, the system enters No-License mode (see NO-LIC (No License), Error Type 513).

c. **Error Type 769**: Feature use exceeds limits if the license has expired and the 30-day timer begins. When the timer expires, the system enters No-License mode

d. **Error Type 1537**: The License file is missing or corrupt. A countdown timer for a license error starts only if the previous state was License-Normal.

e. **Error Type 1793**: The current software version does not match the software version in the License File, and the countdown timer has started. When the timer expires, the system enters No License mode.

f. **Error Type 2305**: The Offer Category in translation does not match the Offer Category in the License File, and the countdown timer has started. When the timer expires, the system enters No-License mode (see NO-LIC (No License)).

g. **Error Type 2561**: The license server did not respond in time during the last attempted License File audit.

h. **Error Type 2817:** Timer response timed out.

i. **Error Type 3073**: This Survivable Remote Server (the one reporting the LIC-ERR) has gone active because one or more media gateways have registered with it. Follow standard practices to repair the primary server(s) or control network.

j. **Error Type 3074**: This Survivable Core Server is controlling one or more port networks. Follow standard practices to repair the Main server(s) or control network.

k. **Error Type 3329**: Platform type/offer type mismatch.

l. **Error Type 3335**: Platform type does not match hardware.

m. **Error Type 3391**: Platform type does not match server configuration.

n. **Error Type 3584**: Invalid Allocation License.

o. **Error Type 3585**: The Allocation License has an ESID/SID/MID mismatch.

p. **Error Type 3586**: Allocation License expired.

q. **Error Type 3841**: Application not found.

Demand test descriptions and error codes

Use **`test license`** to initiate a License File test.

Table 161: License File Test (#1484)

Error Code	Test Result	Description / Recommendation
1	FAIL	The system is in License-Error mode. See Troubleshooting License File errors.
2	FAIL	The system is in No-License mode. See NO-LIC (No License).
1014	ABORT	Within the first 30 minutes after a system restart, the system cot test the License file. 1. Enter **`display initcauses`** to find out when the system last restarted. 2. Wait for the remaining time plus 2 minutes, and retry the test.
	PASS	The system is in License-Normal mode.

Troubleshooting License File errors

The License file enables the switch's software category, release, features, and capacities. License Files are created using SAP order information and/or current customer configuration information.

Without a valid license installed or with a mismatched license, the system:

1. Generates a major alarm.
2. Starts a 30-day countdown timer (call processing continues)

The License file requires a serial number from either the reference IPSI circuit pack or media gateway motherboard.

The License file includes a license serial identification number that is matched against the hardware in the system as well as information about the Communication Manager software version and Call Center features, Offer Category, and capacities. Once installed or initialized, every hour the system compares these parameters to determine the system status:

- License-Normal mode
  - License file was installed successfully
  - Feature use is within prescribed limits
  - License file's serial number matches the serial number of the reference IPSI
- License-Error mode
  - The License file's serial number reference source is not responding, or its serial number does not match the hardware
  - Communication Manager software versions do not match
  - Feature use exceeded prescribed limits
  - License expired
  - After a system had a valid license, the License file is missing or corrupt.

Note:

System resets do not reset the 30-day timer. If a system in License-Error mode is reset and the license error remains, the timer picks up the countdown where it left off.

To clear LIC-ERR alarms, the License file must match the switch hardware and administered parameters.

- No-License mode
  - System software versions do not match.
  - License file is missing or could not be installed.
  - Offer categories do not match.

- A condition that caused the system to enter License-Error mode has not been corrected or resolved, and the countdown timer has expired.
- The switch returns to License-Normal mode when every license error is cleared.

Login Warning Messages

Anyone logging onto the SAT (System Administration Terminal) when the system is in License-Error or No-License mode, receives a warning message stating the system's Licence mode, depending on the conditions. Table 162: Error messages and repair procedures shows the 3 license modes, the warning message, describes the error conditions, and lists the recommended repair procedures.

Table 162: Error messages and repair procedures

License Mode	Description	Explanation and repair procedure
License-Normal	No mismatches between license and hardware	Stable running condition
License-Error	Warning mode; Communication Manager supported, 30-day countdown timer begins.	If you log in to the server through the SAT, a message reads: *"System Administration Will Be Blocked in Approximately XXX hours. Contact Your Service Representative."* Communication Manager functions normally for 'XXX' hours, at which time the system goes into No-License mode. One of the following conditions is present: ● Serial number reference source not responding. ● The License file expired. ● Feature use does not match the License file.
No-License	Warning period has expired.	If you log in to the server through the SAT, a message reads: *"System Administration Is Blocked. Contact Your Service Representative Immediately."* One of the following conditions is present: ● No License file is installed in the system. ● The License-Error timer expired.

Initialization and Periodic Checking

Within the License file is the feature mask, an information set that controls which features are enabled or not on the Customer Options and Special Applications screens. Each of the approximately 150 feature mask entries is one of three types (examples in parentheses):

- **Type I**: features with a simple on/off state (DCS Call Coverage)
- **Type II**: features with an alphanumeric setting values associated with them (Logged-in ACD Agents)
- **Type III**: includes the product ID (license serial identification number), release number, and capacities.

  Type III features cot be changed by any login under any circumstances (applies to IP Telephones, IP Softphones, and IP Agents).

Table 163: License error messages *1 of 2*

If the system goes into this mode...	And reports this error message...	It means that...
No-License	License File is Missing or Corrupted	License could not be decrypted. Checksum did not match, data possibly lost. Mismatched settings: • Offer Category • Version • Call Center Release • Model Min. and Max. values of “* and # in vector collect step” do not match the License file. IP product defined in translations but not defined in the License file.
No-License	The License has Expired	The License has expired.
No-License	Software Version Mismatch	The current software version does not match the software version in the License file.
No-License	Offer Category Mismatch	The Offer Category in translation does not match the Offer Category in the License file.
		1 of 2

Table 163: License error messages *2 of 2*

If the system goes into this mode...	And reports this error message...	It means that...
License-Error	S8700 Series S8400| S8500: Golden IPSI Not Responding S8300: G250/G350/ G430/G450/G700 Motherboard Not Responding	The reference source's serial number does not match the serial number in the License file, or the reference source is not responding.
License-Error	Feature Usage Exceeds Limits	The value of the `Used` field for any TYPE II or TYPE III field on the Customer Options forms (pages 1, 5, 6, and 9) is greater than the value of the field. To more quickly identify which of these TYPE II and TYPE III features is causing the error, compare the `Used` field with the value of the field itself (the License file value). Before usage is checked, if the value of the field is not between the upper and lower values in the License file, the value of the field is changed in translation to the lower value in the License file.
		2 of 2

LOG-SVN (Login Security Violation)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
LOG-SVN	MAJ	**`enable login`** ***`loginID`***[1]	Login Security Violation

1. Where ***`loginID`*** is the Avaya services login ID for which the security violation was detected. The `Alt Name` field indicates the login ID associated with the security violation and the major alarm.

The Security Violation Notification (SVN) feature provides notification when the number of failed attempts to access the system administration/maintenance interface meets or exceeds customer administered threshold parameters.

A major alarm is logged whenever a security violation is detected involving an Avaya services login ID and that login ID has been disabled as a result of detection of the security violation. The capability to disable a login ID following detection of a security violation involving that login ID is administrable on a per login ID basis.

Refer to the *Administering Avaya Aura™ Communication Manager,* for information about administration required for the Security Violation Notification feature, and the option to disable a login ID following detection of a security violation involving the affected login ID.

Error log entries and recommended actions

Table 164: LOG-SVN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1–15	None	None	Major	OFF	**`enable login`** ***`loginID`***

General Information about log-svn error log entries:

1. The number (1–15), that appears in the Error Type field, corresponds to the location of the login in the internal login data structure.
2. The **Alt Name** field on the alarm report indicates the login ID associated with the security violation and major alarm.
3. These errors/alarms are associated with a number of failed attempts to access the system management/maintenance interface using an Avaya services login ID that meet or exceed the customer administered threshold parameters. The associated alarm is immediately raised as a major alarm.
4. The affected login ID will be disabled as a result of detection of the security violation, unless it is the system's last enabled INADS-type login. The provision to disable a login ID following detection of a security violation involving that login ID is administrable on a login ID basis.

5. Use **`enable login`** to enable a login that has been disabled, and to retire any login security violation alarms associated with the login ID.
6. To use **`enable login`** to enable a login and/or retire alarms, use a login ID with greater service level hierarchy permissions.
7. Access to **`enable login`** is controlled through the **Administer Permissions** field on the **Command Permission Categories** screen. Set the **Administer Permissions** field to **y** to access **`enable login`**.
8. The **Port** alarm report field identifies the port where the final invalid login attempt, involving the alarmed login ID, was detected.
9. The **Svc State** alarm report field will be set to **OUT** if the login ID is in the disabled state as a result of detection of a security violation involving the login ID. Once the login ID has been enabled, the field will be set to **IN**.
10. The source or reason of the failed login attempts should be identified and the cause corrected prior to re-enabling a login ID and/or retiring any alarms associated with the login ID. The cause may be something as innocuous as the failure of Avaya services automatic login software, to something as insidious as a hacker attempting to gain access to the switch system management interface.

Prior to retiring an SVN alarm and enabling the associated login ID, use **`monitor security-violations login`** to access information about the invalid login attempts that caused the security violation. This information can be useful in determining the source of the invalid attempts and analyzing why they occurred.

Use **`list logins`** to see status information about logins on the system. If a login has been disabled as a result of a security violation, the status is **svn-disabled**.

Procedure to Retire SVN Alarm

To retire a SVN alarm:

1. Enter **`enable login`** ***`loginID`***.

   The login ID associated with that alarm is displayed in the *Alt Name* field of the alarm report and the alarm is retired.

MAINT (PN Maintenance Circuit Pack)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MAINT	MAJ	`test maintenance long`	PN's Maintenance circuit pack
	MIN	`test maintenance`	

The TN775D Maintenance circuit pack monitors and supports environmental maintenance for PN multicarrier or single-carrier cabinets. The PN's Maintenance circuit pack provides switch software with a mechanism to activate or deactivate Emergency Transfer in the PN. Control by the system of Emergency Transfer can be overridden by the Emergency Transfer switch on the faceplate of the circuit pack. The PN's Maintenance circuit pack invokes Emergency Transfer when the PN loses contact with the server or when the PN's Maintenance circuit pack loses contact with every Expansion Interface circuit pack. The PN's Maintenance circuit pack handles loss of AC power in the PN multicarrier cabinet by supplying battery power for 15 seconds to the PN cabinet and then an additional 10 minutes of power to just the control carrier in the PN. When power fails in a single-carrier PN cabinet, no such power holdover is available. In the event that an Expansion Interface circuit pack goes insane and is reset six times within 15 minutes, the PN's Maintenance circuit pack will hold the Expansion Links reset preventing the Expansion Interface circuit pack from running.

The PN's Maintenance circuit pack has alarm LEDs which indicate the presence of Major, Minor, and Warning alarms. A flashing LED indicates the presence of an alarm within the cabinet. A continuously lit LED indicates the presence of an alarm elsewhere in the system.

See CAB-MTCE (Media Gateway Maintenance) for an explanation of emergency transfer operation in a G650 Media Gateway port network.

Customer-provided alarming device (CPAD)

The system provides customers a way to connect their own alarm indication device to a switch. The CUST-ALM MO represents this customer-provided alarming device (CPAD).

The customer administers the level of alarm for which the CPAD will be activated using the **change system-parameter maintenance** screen (**CPE Alarm Activation Level** field). The customer sets this field to: **none**, **warning**, **minor**, or **major** depending on the level of alarm at which the CPAD should be activated. When an alarm occurs of at least the level to which the CPAD is administered, the CPAD in the PN will be activated. The CPAD will also be activated within a cabinet whenever Emergency Transfer is invoked within that cabinet.

The CPAD is connected to the PN's Maintenance circuit pack. The CUST-ALM MO is not maintained by the system, and will not generate any alarms. If a problem is suspected with the CPAD, it may be tested using **`test customer-alarm`**, which will activate the device by closing the relay on either the PN's Maintenance circuit pack (whichever is specified) for 1 minute. The repeat parameter may be used to close the relay for a longer length of time where the number of the repeat is the number of minutes for which the device will be activated (5 minutes is the suggested repeat value).

Note:

S8700-series servers and S8500 servers equipped with G650 carriers will differ from this MO, in that the IPSI board provides the CPAD leads. The intent for the feature is in other ways the same.

The **`test customer-alarm`** ***`location`*** command is provided to allow a technician to check if the customer-provided alarming device is correctly installed and functional. See Customer-Provided Alarming Device Test (#115) for a description of the test. It is recommended that this test be run at least once after both the switch and the customer alarm have been installed.

Connectivity paths

The server communicates with a PN's Maintenance circuit pack via the following path. (Uplink messages back from this Maintenance circuit pack to the server take the reverse path.) Messages flow from the server's processor to an IPSI connected PN's TN2312AP IPSI circuit pack's Packet Interface circuit, over this PN's LAN bus to its Expansion Interface circuit pack, across the fiber link to the active PN's Expansion Interface circuit pack, and over a serial link to the PN's Maintenance circuit pack.

The PN's Maintenance circuit pack must be physically inserted into the dedicated slot marked Maintenance in the A carrier of the PN. The serial links from the PN's Maintenance circuit pack to the Expansion Interface circuit packs are physically connected from this dedicated slot to slots 2A01 and 2B02 (2B02 is used only if there is duplicated Port Network Connectivity). The serial link from slot 2A01 to the maintenance slot is hard-wired into the backplane of carrier A, whereas the serial link from slot 2B02 to the maintenance slot is a ribbon cable connecting the two slots. The serial link from the PN's Maintenance circuit pack to the terminal is also a ribbon cable which plugs into a connector labeled TERM on the back of carrier A.

The maintenance strategy for the PN's Maintenance circuit pack consists of checking the integrity of the communications path to/from the PN's Maintenance circuit pack, testing individual hardware components on the PN's Maintenance circuit pack, and keeping the alarm LEDs up-to-date. The individual hardware components include the serial interfaces which handle the serial links connected to the PN's Maintenance circuit pack. There are three serial interfaces, one for each possible Expansion Interface circuit pack and one for the terminal.

Since the PN's Maintenance circuit pack supports environmental maintenance in the PN, trouble with the PN's Maintenance circuit pack can cause environmental maintenance to falsely detect problems. In a multicarrier cabinet PN, these environmental MOs include: POWER (Battery and Battery Charger), CARR-POW (Carrier Port Power Unit), AC-POWER (AC Power), CABINET (Cabinet Sensors), EMG-XFER (Emergency Transfer), EXT-DEV (External Device Alarm), and CUST-ALM (Customer-Provided Alarming Device). In a single carrier cabinet PN, these environmental MOs include DC-POWER (Single Carrier Cabinet Power), EMG-XFER (Emergency Transfer), EXT-DEV (External Device Alarm), and CUST-ALM (Customer-Provided Alarming Device).

TN775D Maintenance Circuit Pack Used with a TN2312AP IPSI Circuit Pack

Connectivity when installed in an Existing System

There is no backplane connectivity from the TN775D Maintenance circuit pack to the TN2312AP IPSI circuit pack in existing pre-R11 carrier backplanes. To achieve connectivity for pre-R11 carriers, a faceplate cable must be used. The faceplate cable runs between the TN775D and the TN2312AP IPSI circuit packs faceplates.

Note:

The TN775D maintenance circuit pack is located in slot one of Control Carrier A. The associated TN2312AP IPSI circuit pack is located in slot two of Control Carrier A.

Backplane Connectivity when Installed in a New System

New systems PN Control Carriers have backplane connectivity between the TN775D Maintenance circuit pack located in slot one of the new PN Control Carrier and the TN2312AP IPSI circuit pack located in slot two. No face plate cable is needed.

Error log entries and recommended actions

Table 165: MAINT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test maintenance`
1 (b)	0 1	PN Maintenance Circuit Pack Reset (#306)	MIN	ON	`test maintenance long`
					1 of 2

Table 165: MAINT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (b)	0 1	MGR I Channel Loop test (#228)	MIN	ON	**`test maintenance r 3`**
769 (c)	Any	Sanity Handshake test (#106)			
1537 (d)	0 1	Sanity Maze test (#303)	MIN	ON	**`test maintenance r 3`**
2049 (d)	Any	Battery Holdover Vintage Verification Test (#311)	WRN	ON	**`test maintenance`**
2561 (b)	0 1	Sanity Handshake test (#106)	MIN	ON	**`test maintenance r 3`**
2817 (b)	0 (c) 1	Serial Channel Loop test (#229)	MIN	ON	**`test maintenance r 3`**
3329 (e)	Any	Serial Link Test (#337)	MIN WRN[1]	OFF	**`test maintenance r 3`**
3585 (f)	Any	Serial Link Test (#337)	MIN WRN[2]	OFF	**`test maintenance r 3`**
					2 of 2

1. Major and Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1, 513, 2561, 2817**: a value of 0 indicates that PNC-A (and therefore, the Expansion Interface circuit pack located on PNC-A) was active when this error occurred. A value of 1 indicates that PNC-B (and therefore, the Expansion Interface circuit pack located on PNC-B) was active when this error occurred. To clear this problem, make sure the active PNC is the same as that indicated by the Aux Value.

c. **Error Type 769**: multiple values can appear in the `Aux Data` field. There will be other errors in the log if there is a real problem. Use these other errors to troubleshoot the problem.

d. **Error Type 1537, 2049**: the PN's Maintenance circuit pack hardware vintage does not support battery holdover for all carriers. This failure indicates that the cabinet administration is set for battery holdover for all carriers.

e. **Error Type 3329, Aux Data 0**: the serial link between the Expansion Interface circuit pack in the A carrier and the PN's Maintenance circuit pack is defective. Aux data of 10 indicates that the serial link between the IPSI circuit pack in the A carrier and the PN's Maintenance circuit pack is defective.

f. **Error Type 3585, Aux Data 1**: indicates that the serial link between the Expansion Interface circuit pack in the B carrier and the PN's Maintenance circuit pack is defective. Aux data of 11 indicates that the serial link between the IPSI circuit pack in the B carrier and the PN's Maintenance circuit pack is defective.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Sanity Handshake Test (#106)	X	X	ND
PN Maintenance Circuit Pack Reset Test (#306)		X	D
Serial Channel Local Looparound Test (#229)	X	X	ND
MTP SAT Channel Local Looparound Test (#228)		X	D
PN Maintenance Circuit Pack Sanity Maze Test (#303)	X	X	ND
PN Maintenance Circuit Pack Serial Link Test (#337)	X	X	ND
Battery Holdover Hardware Verification Test (#311)	X	X	ND
The following test is not part of the above test sequences:			
Customer-Provided Alarming Device Test (#115)			ND

1. D = Destructive, ND = Nondestructive

MAPD-BD (MAPD Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MAPD-BD	MAJ MIN	**test board** ***location*** **l**	MAPD Interface circuit pack
	WRN	**test board** ***location***	

The TN802 Multiple Application Platform (MAP-D) circuit pack allows sending voice and fax from a Communication Manager server through the Internet to another Communication Manager server also having this feature or to other PBXs that are equipped with the Internet Telephony server (ITS-E).

Be sure to observe these special considerations for the TN802:

- Port alarms on this circuit pack display as “TIE-DS1” in the Alarm and Error logs.
- The **reset board** command reboots the MAPD PC CPU, but **busyout board** only busies out every emulated port on the board.
- Switch resets that take the switch out of service for more than 20 seconds also cause the MAPD's PC to reboot, which takes several minutes to complete.

Because of overheating, the TN802 circuit pack should not be placed directly above or below another MAPD circuit pack.

Switch-demanded diagnostic tests on the TN802 do not run unless the Internet trunking application is running on Windows NT, located on the circuit pack.

An uninterruptable power supply (UPS) protection is strongly recommended for a PN containing a TN802 circuit pack.

Backing Up to the PCMCIA Disk

Table 166: Backing up TN802 administration data details how to back up administration data for the IP trunk application to and restored from the local PCMCIA disk and the Ethernet port. Before backing up, be sure to shut down the application running on the circuit pack, following the procedures in Shutting Down NT on the TN802.

Table 166: Backing up TN802 administration data

Step	Description	Comments
1.	Busyout circuit pack	On the S8700 Media Server terminal, enter **busyout board** ***location*** (the address of the TN802 circuit pack)
2.	Backup administration TN802 to disk	At the Windows 2000 desktop, double-click on the **IP Trunk Backup Restore** icon. The **IP Trunk Backup/Restore Utility** screen appears.
3.	Select utility	In the IP Trunk Backup/Restore Utility dialog screen, click on **Files > Backup**. The **IP Trunk Backup** screen appears.
4.	Select backup	In the IP Trunk Backup screen, click on the **Backup** button.
5.	Wait	Backup can take as much as 20 minutes to complete.
6.	Release circuit pack	On the S8700 Media Server terminal, enter **release board** ***location*** (the address of the TN802 circuit pack)

Note:

Local restore of a complete system from the PCMCIA disk should not require more than 20 minutes assuming that a replacement MAPD pack is available and pre-loaded with the IP trunk application software.

Restoring Data from the PCMCIA Disk

Before You Start

1. Shut down the application running on the circuit pack. See Shutting Down NT on the TN802.
2. Remove the defective IP Trunk circuit pack from the switch (if applicable).
3. Install the replacement IP Trunk circuit pack in the switch (if applicable).

4. Insert the backup diskette into the IP Trunk circuit pack.

Table 167: Restore TN802 administration data

Step	Description	Comments
1.	Restore IP Trunk administration	At the Windows 2000 desktop, double-click on the **IP Trunk Backup/ Restore** icon. The **IP Trunk Backup/Restore Utility** screen appears.
2.	Select utility	In the IP Trunk Backup/Restore Utility dialog screen, click **Files> Restore**. The **IP Trunk Backup** screen appears.
3.	Select restore	In the IP Trunk Backup screen, click on the **Restore** button.
4.	Wait	Wait until the amber Disk-In-Use LED (Note 5 in Figure 42: TN802 faceplate) light turns off.

Faceplate

Figure 42: TN802 faceplate shows the TN802 faceplate.

Figure 37: TN802 faceplate

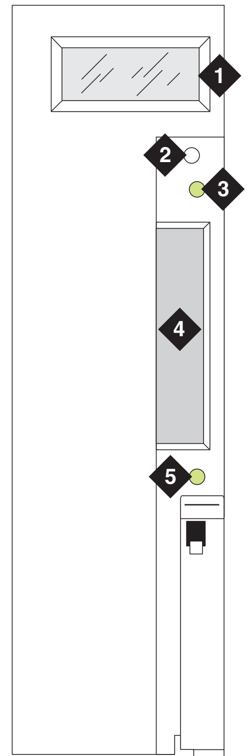


Figure notes:

1. LCD display (see Table 172: TN802 LCD messages for IP trunks)
2. Reset button (recessed)
3. Red board-status LED
4. PCMCIA card slot
5. Amber PCMCIA disk-in-use LED

Table 172: TN802 LCD messages for IP trunks lists the TN802 LCD messages that you might see if installing or servicing an IP Trunk.

Table 168: TN802 LCD messages for IP trunks ***1 of 2***

Display	Explanation
PC BOOT	The TN802 MAPD PC is booting up.
IP TRK #	IP Trunk application is running (# character blinks).
IML DWN #	Internal error on the IP Trunk. System shuts down and sends an error message to the board.
	1 of 2

Table 168: TN802 LCD messages for IP trunks ***2 of 2***

Display	Explanation
MSHUT #, where both MSHUT and # are blinking	The system is in the process of shutting down due to a front panel button press. Do not attempt to remove board.
MSHUT #, where # is blinking	The system has shut down gracefully.
	2 of 2

Support for Laptop PCs

Field technicians can access the TN802 circuit pack through:

- pcAnywhere client software
- A directly-connected keyboard, monitor, and mouse

pcANYWHERE Client Software

1. Attach a male-to-male serial cable and a NULL modem connector (if not built into the cable you use) to the COM2 connector (Note 8 in Figure 38: TN802 external cable assembly). Attach the other end to the serial port of your laptop.
2. Launch the pcANYWHERE application.
3. Click on Add Remote Control Item.
4. In the Properties window, choose the communication port to which you connected the cable in Step 1.
5. Click on Details and configure the settings (Table 169: Remote connection settings):

Table 169: Remote connection settings ***1 of 2***

Field	Value
Speed	38,400
Parity	None (default)
Flow Control	RTS/CTS
	1 of 2

Table 169: Remote connection settings ***2 of 2***

Field	Value
Started by	Carrier detect (DCD)
Ended by	Carrier detect (DCD)
	2 of 2

6. Click on the new item icon, and the laptop connects to the host pcANYWHERE application on the TN802 circuit pack.

Figure 38: TN802 external cable assembly

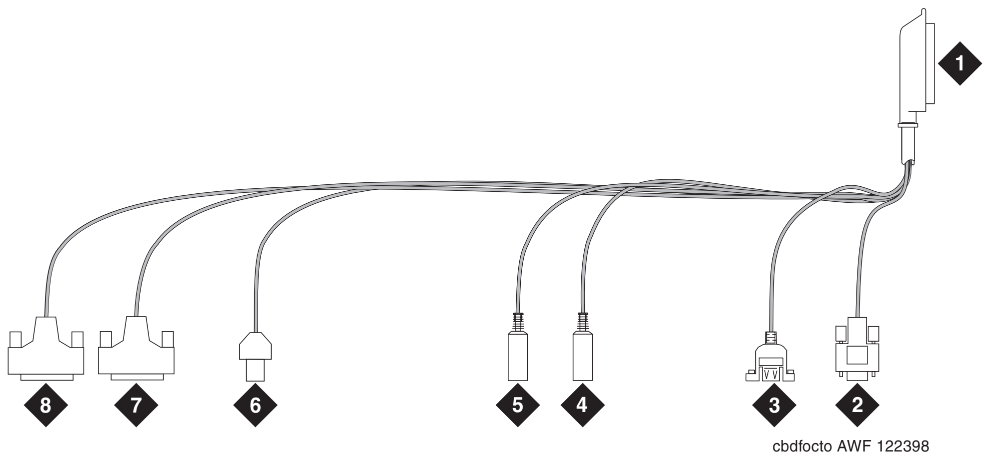


Figure notes:

1. To TN802 cabinet backplane
2. VGA monitor
3. USB (Universal Serial Bus)
4. Keyboard
5. Mouse
6. Ethernet
7. 25-pin modem connection
8. 25-pin COM2 connection

Directly-Connected Keyboard, Monitor, Mouse

You need 2 power sources for the monitor and the modem in order to complete this procedure.

The TN802 circuit pack must be booted with a local mouse and keyboard connected to it for these devices to work.

1. Connect the VGA monitor to the VGA connector of the TN802 external cable.
2. Plug the monitor into an AC power receptacle, and turn it on.
3. Attach the keyboard to the keyboard connector of the TN802 external cable assembly.

4. Attach the mouse to the mouse connector of the TN802 external cable assembly.
5. Insert the circuit pack to cause it to boot.

Troubleshooting LAN Connections

This section contains information for troubleshooting

- External Connections to the LAN
- Internal Connections to the LAN

External Connections to the LAN

Test the external connections to the LAN by pinging the local host, the external IP trunk server, and another device connected to the network.

1. Click **Start** in Windows (lower left-hand corner), then select **Programs**, then **Command Prompt**.

   This starts a DOS command-line session.
2. At the command prompt, enter **`ping`** ***`127.0.0.1`*** (the local host's default address).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###

   If there is no reply, escalate the problem or replace the circuit pack. The problem is not with the external network but within the circuit pack.
3. At the command prompt, enter **`ping`** ***`nnn.nn.nn.nn`*** (the external IP trunk server's address).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###

   If there is no reply, verify the IP address and check the physical connections to and from the TN802 circuit pack.
4. At the command prompt, enter **`ping`** ***`nnn.nn.nn.nn`*** (the IP address of another computer on the network).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###

   If there is no reply:

   a. Verify the IP address.
   b. Check the physical connections to and from the TN802 circuit pack.

c. Check the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 40: TN802 board assembly and cables (side view)).

d. Try pinging another device in the same subnet.

e. Try pinging the gateway to the rest of the network from the subnet.

f. Try pinging a device outside the local subnet but inside the network or another subnet.

5. When finished, enter **exit** at the command prompt.

Internal Connections to the LAN

Test the internal connections to the LAN by pinging the local host, an internal IP trunk server, and another device connected to the network.

1. Click **Start** in Windows (lower left-hand corner), then select **Programs**, then **Command Prompt**.

   This starts a DOS command-line session.

2. At the command prompt, enter **`ping`** ***`127.0.0.1`*** (the local host's default address).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time <##ms TTL=###

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 40: TN802 board assembly and cables (side view) have not worked loose.

   b. Otherwise, replace the circuit pack.

3. At the command prompt, enter **`ping`** ***`10.32.64.97`*** (the internal IP trunk server's address).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time <##ms TTL=###

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 40: TN802 board assembly and cables (side view)) have not worked loose.

   b. Otherwise, replace the circuit pack.

4. At the command prompt, enter **`ping`** ***`10.32.64.96`*** (the IP address of the internal Motorola MPC860 processor).

   If configured correctly, the system displays:

   Reply from nnn.nn.nn.nn: bytes=32 time <##ms TTL=###

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 40: TN802 board assembly and cables (side view)) are not loose.

b. Otherwise, replace the circuit pack.

5. Ping the gateway: at the command prompt, enter **`ping`** ***`XX.XXX.XXX.XXX`*** (the IP address of the gateway).

When finished, enter **exit** at the command prompt.

Board Assembly and Cables

Figure 39: TN802 board assembly shows the circuit pack with the two additional boards connected through the side plane.

Figure 39: TN802 board assembly

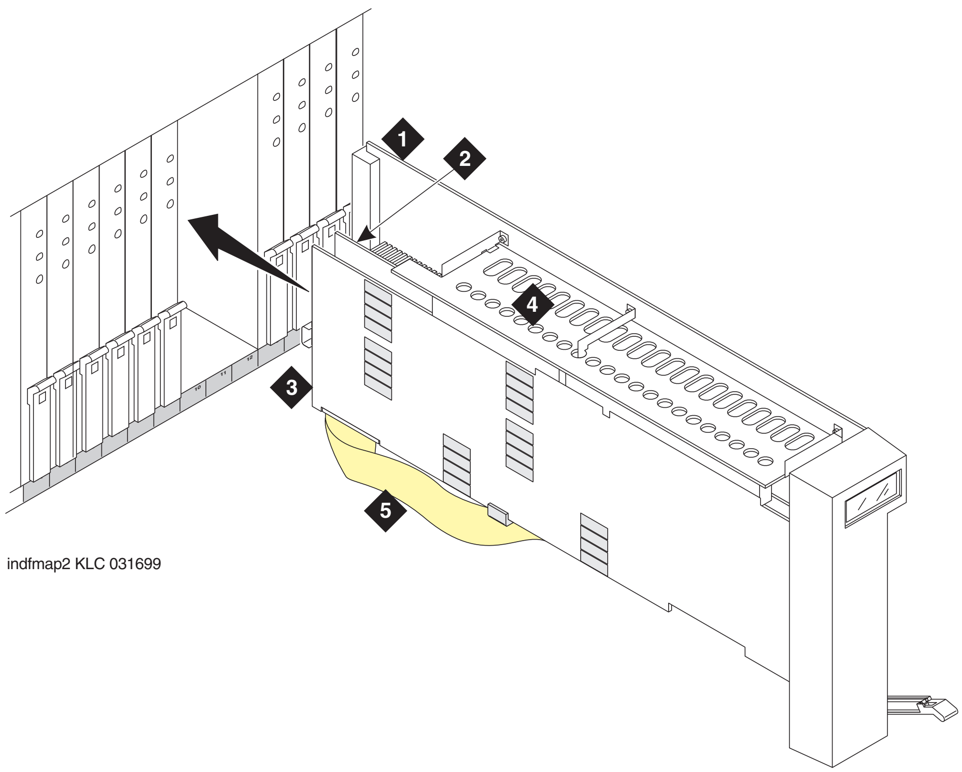


Figure notes:

1. Main TN802 board
2. Texas Microsystems Inc. (TMI) board
3. Analogic board
4. Side plane
5. SCSA (Signal Computing System Architecture) ribbon cable

Figure 40: TN802 board assembly and cables (side view) shows a side view of the three boards and interconnecting cables that make up the TN802.

Figure 40: TN802 board assembly and cables (side view)

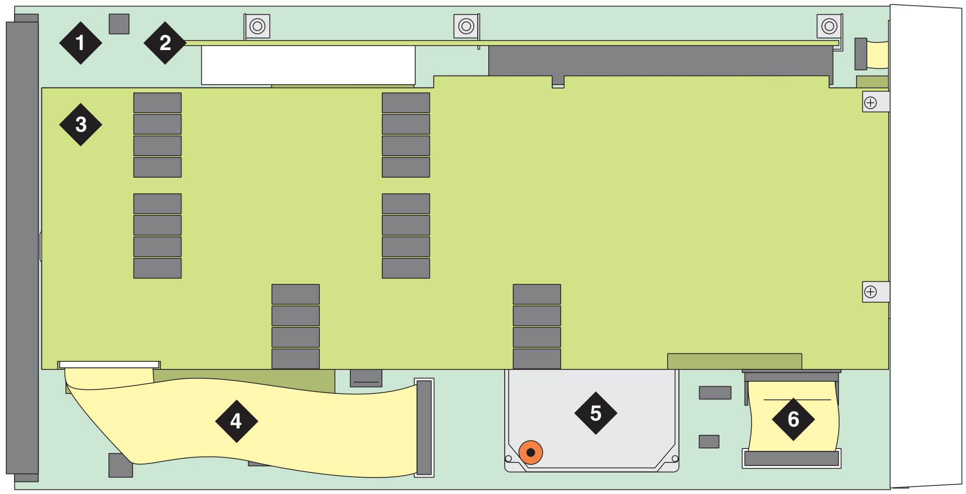


Figure notes:

1. Main TN802 board
2. Side plane
3. Analogic board
4. SCSA (Signal Computing System Architecture) ribbon cable
5. Hard drive
6. Processor I/O ribbon cable

Figure 41: TN802 board assembly and cables (end view) shows the end view of the three boards and interconnecting cables on the TN802.

Figure 41: TN802 board assembly and cables (end view)

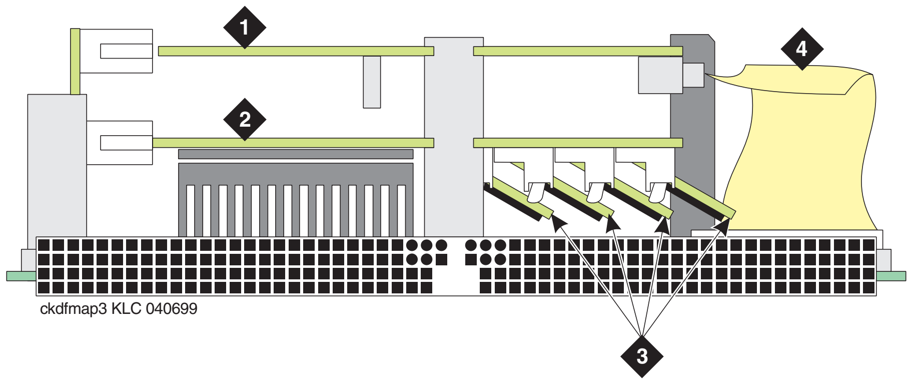


Figure notes:

1. Analogic board
2. TMI (Texas Microsystems Inc.) board
3. SIMMs (memory)[1]
4. SCSA (Signal Computing System Architecture) ribbon cable

1. If the board is seated and you hear fast beeping, it means that one of the small boards containing the memory chips is dislodged. Secure the memory board firmly in the receptacle and reseat the circuit pack.

Replacing the Hard Disk

The TN802 hard drive (Note 5 in Figure 40: TN802 board assembly and cables (side view)) can be replaced in the field.

Table 170: Replacing the TN802 hard drive *1 of 2*

Step	Description	Comments
1.	Shut down Windows 2000.	Shut down Windows 2000 by either method described in Shutting Down NT on the TN802.
2.	Remove the circuit pack.	Unlatch the circuit pack, and remove it from the carrier.
3.	Remove the hard drive.	Remove the 2 screws, and lift the hard drive out of its mounting bracket.
4.	Replace the hard drive.	Position the new hard drive in the mounting bracket, and replace the 2 screws (Step 3).
		1 of 2

Table 170: Replacing the TN802 hard drive ***2 of 2***

Step	Description	Comments
5.	Replace the circuit pack.	Slide the circuit pack into the slot, and lock the latching lever.
6.	Wait for initialization.	Wait for: ● the circuit pack to reseat (faceplate LEDs light go out). ● Windows 2000 boots (PC BOOT appears on the faceplate LCD). ● IP Trunk application to run (**IP TRK #** appears on the faceplate LCD).
		2 of 2

Error log entries and recommended actions

Table 171: MAPD-BD Error Log entries ***1 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board** ***location***
1 (b)	0	Circuit pack removed or SAKI Test failed (#53)	MIN WRN[1]	ON	
2 (c)					
18 (d)	0	**busyout board** ***location***	WRN	OFF	**release board** ***location***
23 (e)	0		WRN	OFF	**add ds1** ***location***
125 (f)			MIN WRN[2]	ON	
257 (g)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board** ***location*** **l r 20**
257 (g)	Any				
					1 of 3

Table 171: MAPD-BD Error Log entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (h)	Any		MIN WRN[3]	ON	
514 (i)	46086		MIN WRN[3]	ON	
769 (j)	46085		MIN WRN[3]	ON	
770 (k)	46096		MIN WRN[3]	ON	
1025 (e)	4363	NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN[3]	OFF	`test board` ***`location`***
1537 (l)	46082		MIN WRN[3]	ON	
1538 (m)	Any		MIN WRN[3]	ON	
1793	Any	Blue Alarm Inquiry test (#139)	MAJ MIN WRN[3]	OFF	`test board` ***`location`***
2049	Any	Red Alarm Inquiry test (#140)	MIN WRN[3]	OFF	`test board` ***`location`***
2305	Any	Yellow Alarm Inquiry test (#141)	MIN WRN[3]	OFF	`test board` ***`location`***
2306	Any	Yellow Alarm Inquiry test (#141)	MIN WRN[3]	OFF	`test board` ***`location`***
2561	Any	Major Alarm Inquiry test (#142)	MIN WRN[3]	OFF	`test board` ***`location`***
2817		Minor Alarm Inquiry test (#143)	MIN WRN[3]	OFF	`test board` ***`location`***
3073 to 3160 (n)	Any	Slip Alarm Inquiry test (#144)	MIN WRN[3]	OFF	`test board` ***`location`*** `r 6`
3330 (o)	46083		MIN WRN[3]	ON	
					2 of 3

Table 171: MAPD-BD Error Log entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3585 to 3601 (p)	Any	Misframe Alarm Inquiry test (#145)	MIN WRN[3]	OFF	**`test board`** ***`location`*** **`r 6`**
3840 (q)	Any				
3841 (r)	4358				
3842 (s)	46097				
3843 (t)	46081				
3999 (u)	Any				
					3 of 3

1. If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.
2. Minor alarms on this MO may be downgraded to warning alarms based on values set in **`set options`**.
3. Major alarms on this MO may be downgraded to minor or warning based on values set in **`set options`**.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: the circuit pack has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a MAPD circuit pack must:

- Have an entry in the circuit plan (**`change circuit-pack`**)
- Be administered (**`add ds1`** ***`location`***)
- Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit plan and the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error:

- Make sure the circuit pack is properly administered and that a functioning MAPD circuit pack is inserted in the correct slot

  or

- Completely remove the MAPD-BD from the system:
  1. Shut down Windows 2000. See Shutting Down NT on the TN802.
  2. Remove any administered DS1 trunks, access endpoints, or PRI endpoints associated with the circuit pack from their respective trunk groups.

3. Remove the DS1 (**`remove ds1`** ***`location`***) and circuit pack (**`change circuit-pack`** ***`location`***) administration.

If the circuit pack is properly administered and the red LED is still on, follow the instructions for LED alarms without Alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

c. **Error Type 2**: Windows 2000 is down and the system attempts to reset the board. If the reset fails, the board may be bad.

1. Replace the circuit pack.

d. **Error Type 18**: The circuit pack has been busied out.

1. Release the board (**`release board`** ***`location`***).

e. **Error Type 23 and 1025**: The MAPD-BD circuit pack is not completely administered.

To be fully administered, a MAPD circuit pack must:

- Have an entry in the circuit plan (**`change circuit-pack`**)
- Be administered (**`add ds1`** ***`location`***)
- Be physically inserted into the correct slot

The MAPD circuit pack differs from others in that inserting it into the switch backplane is not enough to make the board usable.

f. **Error Type 125, no Aux Data**: A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem:

- Remove the wrong circuit pack and insert the logically administered circuit pack

  or

- Re-administer the slot (**`change circuit-pack`**) to match the circuit pack inserted.

g. **Error Type 257** see Control Channel Looparound Test (#52) for repair procedures.

h. **Error Type 513:** Transient hardware problem.
Aux Data 4352 - External RAM failure
Aux Data 4353 - Internal RAM failure
Aux Data 4355 - Internal ROM failure

1. If the same Error Type/Aux Data value occurs more than once in a 24-hour period, the circuit pack should be replaced. See Shutting Down NT on the TN802 before removing the circuit pack.

If the MAPD board detects only one of these hardware problems, then the error is resolved when none of these faults are detected for 10 minutes.

i. Error Type 514: LAN External RAM Error; hardware fault in the PPE external RAM, used for message buffering to and from the packet bus. This error should not occur regularly.

1. If this error occurs 10 times within 30 minutes, replace the circuit pack. See Shutting Down NT on the TN802 before removing the circuit pack.

j. **Error Type 769**: Transmit FIFO Underflow (threshold is 3 errors within 10 minutes); the circuit pack cannot find the “end of frame” bit when transmitting a frame to the packet bus.

1. Clear the alarm with:

   a. **busyout board** ***location***

   b. **reset board** ***location***

   c. **test board** ***location*** **long clear**

   d. **release board** ***location***

2. If the error recurs within 10 minutes, replace the circuit pack. See Shutting Down NT on the TN802 before removing the circuit pack.

k. **Error Type 770**: Unable to Write LAN Translation RAM (threshold is 2 errors within 10 minutes); a call is aborted because there are no available translation RAM locations for the call connection attempt.

1. Clear the alarm with:

   a. **busyout board** ***location***

   b. **reset board** ***location***

   c. **test board** ***location*** **long clear**

   d. **release board** ***location***

2. If the error recurs within 10 minutes, replace the circuit pack. See Shutting Down NT on the TN802 before removing the circuit pack.

l. Error Type 1537: There was a LAN Bus Timeout because the circuit pack transmitted too many bytes on the LAN bus for a single frame. This condition may be caused by:

- an on-board fault
- faulty data received on one of the circuit pack’s external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those MOs.

If the error occurs 3 times within 10 minutes, the system raises the board alarm and isolates it from the packet bus.

1. Clear the alarm and restore the board to the packet bus:

   a. **busyout board** ***location***

   b. **reset board** ***location***

   c. **test board** ***location*** **long clear**

   d. **release board** ***location***

2. If the problem persists, and there are no PKT-BUS alarms or port alarms, replace the circuit pack. See Shutting Down NT on the TN802 before removing the circuit pack.

m. **Error Type 1538**: Hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:
   - The common circuit pack tests (for example, Test #50 and/or Test #52) abort with Error Code 2000.
   - Port tests on this circuit pack return NO-BOARD.
   - A busyout/release of the circuit pack has no effect on test results.
   - A **`list configuration`** shows that the circuit pack and ports are properly installed.

   The circuit pack is isolated from the system, and every trunk or port on this circuit pack is placed into the out-of-service state. The system attempts to restore the circuit pack within 20 – 30 minutes. When no faults are detected for 20 – 30 minutes, the MAPD Interface circuit pack is restored to normal operation, and every trunk or port on the MAPD Interface circuit pack returns to the in-service state.

   1. If the board is not restored to normal operation or the error recurs after the board is restored to normal operation, escalate the problem.

n. **Error Types 3073 – 3160**: Board is reporting slip errors. Aux Data shows the last reported slip count.

o. Error Type 3330: LAN Critical error; critical failure in the packet bus interface to the circuit pack. This failure may be due to an on-board or a packet bus fault.

   1. If the packet bus is alarmed, see PKT-BUS (Packet Bus) or PKT-INT (Packet Interface) for repair procedures.

      If the packet bus is not alarmed, clear the alarm and restore the board to the packet bus using:

      a. **`busyout board`** ***`location`***

      b. **`reset board`** ***`location`***

      c. **`test board`** ***`location`*** **`long clear`**

      d. **`release board`** ***`location`***

   2. If the problem persists, and there are no PKT-BUS alarms, replace the circuit pack. See Shutting Down NT on the TN802 before removing the circuit pack.

p. **Error Types 3585–3601**: The board received misframe errors. Aux Data shows the last reported misframe count.

q. **Error Type 3840**: The circuit pack received a bad control channel message from the switch. This error is not service-affecting, and requires no action. The value in the **Aux Data** field indicates the cause of the error event.

r. **Error Type 3841**: The circuit pack detected a transient hardware logic error (for example, program logic inconsistency). This error resolves when no faults are detected for 100 minutes. The value in **Aux Data** field indicates the type of hardware problem.

s. **Error Type 3842**: Bad Translation RAM Location Found error. The call continues by using another translation location. This error is not service-affecting and requires no action.

t. **Error Type 3843**: LAN Receive Parity error. The circuit pack detected an error in a received frame from the packet bus. These errors are most likely caused by a packet bus problem, but may be due to a circuit-pack fault.

   1. Determine whether the problem is isolated to this circuit pack or the problem is caused by packet bus faults (see PKT-BUS (Packet Bus)).

u. **Error Type 3999**: The circuit pack sent a large number of control-channel messages to the switch within a short period of time.

Error Type 1538 (hyperactivity) also present?	**Then the system:**
Y	Takes the circuit pack out-of-service due to hyperactivity.
N	Does not take the circuit pack out-of-service, but the circuit pack has generated 50% of the messages necessary to be considered hyperactive. This may be normal during heavy traffic periods.

TN802 Faceplate

Figure 42: TN802 faceplate shows the TN802 faceplate.

Figure 42: TN802 faceplate

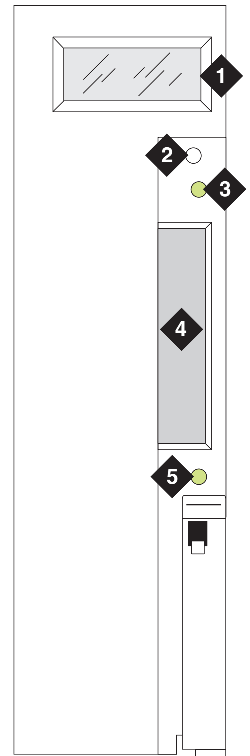


Figure notes:

1. LCD display (see Table 172: TN802 LCD messages for IP trunks)
2. Reset button (recessed)
3. Red board-status LED
4. PCMCIA card slot
5. Amber PCMCIA disk-in-use LED

Table 172: TN802 LCD messages for IP trunks lists the TN802 LCD messages that you might see if installing or servicing an IP Trunk.

Table 172: TN802 LCD messages for IP trunks ***1 of 2***

Display	Explanation
PC BOOT	The TN802 MAPD PC is booting up.
IP TRK #	IP Trunk application is running (# character blinks).
IML DWN #	Internal error on the IP Trunk. System shuts down and sends an error message to the board.
	1 of 2

Table 172: TN802 LCD messages for IP trunks ***2 of 2***

Display	Explanation
MSHUT #, where both MSHUT and # are blinking	The system is in the process of shutting down due to a front panel button press. Do not attempt to remove board.
MSHUT #, where # is blinking	The system has shut down gracefully.
	2 of 2

Shutting Down NT on the TN802

Before removing the TN802 circuit pack from the carrier, shut down Windows NT on the TN802 by following the procedure described in Table 173: Windows NT TN802 shutdown procedures:

Table 173: Windows NT TN802 shutdown procedures

Step	Faceplate button
1.	Push the recessed button on the front faceplate and hold it in.
2.	“M shut” flashes on the LCD display
3.	When shutdown is complete, “MSHUT #” displays (“#” is blinking).
4.	Remove the circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Apply to TN802?[1]	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[2]
NPE Audit Test (#50)	Y		X		ND
Control Channel Looparound Test (#52)	Y		X		ND
Loss of Signal Alarm Inquiry Test (#138)	N	X	X		ND
Blue Alarm Inquiry Test (#139)	N	X	X		ND
Red Alarm Inquiry Test (#140)	N	X	X		ND
Yellow Alarm Inquiry Test (#141)	N	X	X		ND
Major Alarm Inquiry Test (#142)	N	X	X		ND
Minor Alarm Inquiry Test (#143)	N	X	X		ND
Slip Alarm Inquiry Test (#144)	N	X	X		ND
Misframe Alarm Inquiry Test (#145)	N	X	X		ND
DS1 Translation Update Test (#146)	N	X	X		ND
SAKI Sanity Test (#53)	Y			X	D

1. N = No; this test either passes or ABORTS with Error Code 2000 (problem with NT)

2. D = Destructive; ND = Nondestructive

MEDPRO (Media Processor MAPD Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MEDPRO	MAJ MIN	**test board *location* l**	Media Processor MAPD circuit pack
	WRN	**test board *location***	

The TN802B MedPro circuit board provides voice over IP connectivity. The TN802B can run either the:

- IP Trunk application allows the TN802B to emulate a DS1 circuit pack. In this mode, the circuit pack is maintained as a standard DS1 board with its associated Tie trunk ports. The TN802B operates as an integrated Internet Telephony server (ITS). It communicates with other ITS boxes or IP trunk boards.
- Media Processor (MedPro) application allows the TN802B to act as a service circuit to terminate generic RTP streams which carry packetized audio over an IP network. As part of the overall H.323 implementation, the TN802B or later circuit pack handles the audio streams while the TN799DP C-LAN handles the TCP/IP signaling channels. This maintenance plan applies only to a TN802B MedPro running the Media Processor application.

The MedPro hardware combines an Angel complex, a Windows 2000 PC and a TAP802 DSP card in a 3-slot package. When operating as an IP trunk circuit pack, the MedPro emulates a DS1 Tie Trunk circuit pack and blindly responds to DS1 trunk maintenance requests. Actual maintenance is accomplished via the Windows 2000 interface and the ITS software diagnostics.

The Media Processor application is built upon the existing ITS software, and as such is not administered in Communication Manager as a DS1 trunk, and does not emulate a DS1 for maintenance purposes. Use the following Maintenance procedures for this application.

Error log entries and recommended actions

Table 174: MEDPRO Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	0	Circuit pack removed or SAKI test failed (#53)	MIN WRN[1]	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (d)	0		WRN	OFF	**add ip-interface board *location***
125 (e)	None	None	MIN WRN[2]	ON	
257 (f)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* l r 2**
1538 (g)	Any	Hyperactivity	MIN WRN[2]	ON	
1793	Any	NIC Loss Of Signal	MIN WRN[2]		**test board *location* l r 2**
2049 (h)	Any	NT PC Failure	MIN WRN[2]		**reset board *location***
2305	Any	IP Address Inconsistency			**test board *location* l r 2**
2561	Any	Ping Error	MIN WRN[2]		**test board *location* l r 5**
3841 (i)	4358				
3999 (j)	Any				

1. If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

2. Minor alarms on this MO may be downgraded to warning based on values in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the circuit pack stopped functioning or is not fully administered. The alarm is logged approximately 15 minutes after the circuit pack has been removed or 11-minutes after the SAKI test (#53) fails.

   To be fully administered, a MedPro circuit pack must:

   - Be physically inserted into the correct slot
   - Have an entry in the circuit pack screen (**`change circuit-pack`**)
   - Have the MedPro IP address administered (**`change node-names`**)
   - Be enabled (**`change ipserver-interface`**)

   If the circuit pack has an entry in the circuit pack screen and the other conditions are not met, a MINOR alarm is logged. To resolve the error:

   - Make sure every condition for administration is met and that a functioning MedPro circuit pack is inserted in the correct slot.

     or

   - Completely remove the MedPro from the system using the following steps:
     1. Remove the administered IP-Interface associated with the circuit pack.
     2. Physically remove the circuit pack from the slot.
     3. Execute **`remove medpro`** ***`location`*** and **`change circuit-pack`** ***`location`***.

c. **Error Type 18**: The MedPro Interface circuit pack has been busied out by **`busyout board`** ***`location`***.

   1. Release the circuit pack (**`release board`** ***`location`***).

d. **Error Type 23**: The MedPro circuit pack is not completely administered.

   To be fully administered, a MedPro circuit pack must:

   - Be physically inserted into the correct slot
   - Have an entry in the circuit pack screen (**`change circuit-pack`**)
   - Have the MedPro IP address administered (**`change node-names`**)
   - Be enabled (**`change ipserver-interface`**)

   A MEDPRO differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered.

e. **Error Type 125**: No Aux Data: The wrong circuit pack is inserted in the slot where this circuit pack is logically administered.

   - Remove the wrong circuit pack and insert the logically administered circuit pack

     or

   - Re-administer this slot to match the circuit pack inserted (**`change circuit-pack`**).

f. **Error Type 257**: See Control Channel Looparound Test (#52) for repair procedures.

g. **Error Type 1538**: hyperactivity on a circuit pack. Hyperactivity occurs when the Angel is sending too many CCMS messages uplink, 400 per ten seconds for the TN802B, to switch software. The circuit pack will be taken out of service. See error Type 3999.

h. **Error Type 2049**: the operating system is down. An attempt is made to reset the board automatically. If the reset fails, the board is probably bad and should be replaced.

i. **Error Type 3841**: Inconsistent downlink message. This error is not service-affecting. No action is required.

j. **Error Type 3999**: the circuit pack sent a large number of control channel messages to the switch within a short period of time.

   If **Error Type 1538** is also present, the circuit pack was taken out-of-service due to hyperactivity.

   If **Error Type 1538** is absent, the circuit pack has generated 50% of the messages necessary to be considered hyperactive but was not taken out-of-service. This may be completely normal during heavy traffic periods.

   If this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Control Channel Looparound Test (#52)		X		ND
IP Address Update Test (#1371)	X	X		D
Network Connectivity Query Test (#1383)	X	X		ND
Ping Test (#1379)	X	X		ND
SAKI Sanity Test (#53)			X	D
Windows 2000 Reset Test (#1381)			X	D

1. D = Destructive; ND = Nondestructive

MEDPRO-C (Media Processor Control)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MEDPRO-C	This MO is not hardware-based. There will be no alarms, commands to run, or tests to clear. Events appear in **display event** logs.		Media Processor Control

The TN2602AP IP Media Resource 320 provides high-capacity voice over Internet protocol (VoIP) audio access to the switch for local stations and outside trunks. MEDPRO-C is logged in the Event Log when:

- the TN2602AP becomes active
- the TN2602AP goes into standby
- the TN2602AP peer-link comes up or goes down
- there is a demand interchange between duplicated TN2602AP circuit packs

See IPMEDPRO (TN2602AP IP Media Resource 320) for more information on the TN2602AP.

MEDPRO-C Error Log Entries

The aux data value contains the Angel address of the TN2602AP which caused the event. For information to map the Angel to the carrier/slot location, see EPN Angel Address/Slot Mapping.

Table 175: MEDPRO-C Error Log Entries ***1 of 2***

Error Type	Aux Data	Description
1 (a)	Angel	The board was taken out of service
10001	Angel	No interchange, no error. No action required.
10002	Angel	No interchange, no error. No action required.
10012 (b)	Angel	Board transition to the active state
10021 (c)	Angel	Board transition to the standby state
10022 (c)	Angel	Board transition to the active state
10031 (d)	Angel	Demand interchange to the standby state
10032 (d)	Angel	Demand interchange to the active state
		1 of 2

Table 175: MEDPRO-C Error Log Entries ***2 of 2***

Error Type	Aux Data	Description
10041 (e)	Angel	Spontaneous interchange to the standby state
10042 (e)	Angel	Spontaneous interchange to the active state
10051 (f)	Angel	Spontaneous interchange to the standby state
10052 (f)	Angel	Spontaneous interchange to the active state
10061 (g)	Angel	Spontaneous interchange to the standby state
10062 (g)	Angel	Spontaneous interchange to the active state
10110 (h)	Angel	The firmware needs to be upgraded
10991 (i)	Angel	Spontaneous interchange to standby state
10992 (i)	Angel	Spontaneous interchange to active state
11yy1 (j)	Angel	Spontaneous interchange to standby state
11yy2 (j)	Angel	Spontaneous interchange to active state
20001	Angel	Craft demand interchange to the standby state
20002	Angel	Craft demand interchange to the active state
30000	Angel	Active board failure - no interchange to standby. The board will be taken out of service and calls will be dropped.
40000	Angel	Peer link to this board is down. Board problem. To isolate the problem, see IPMEDPRO (IP Media Processor).
40001	Angel	Peer link to this board is up
50000	Angel	The inter-board "hellos" have failed. This is a network issue.
50001	Angel	The inter-board "hellos" are OK
		2 of 2

Notes:

a. **Error Type 1:** the circuit pack has been removed from the system or is not fully administered. The error is logged immediately after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be fully administered, an IP Media Resource must:

- Have an entry on the circuit pack screen (**`change circuit-pack`**)
- Have the Media Resource IP address administered (**`change node-names`**)
- Be enabled (**`change ip-interface`**)

- Be physically inserted into the correct slot

If the circuit pack has an entry on the circuit pack screen and any of the other conditions are not met, a MINOR alarm is logged. To resolve the error:

- Make sure every condition for administration is met, and that a functioning Media Resource is inserted in the correct slot.
- Completely remove the IP Media Resource from the system:
  a. Remove the administered IP-Interface associated with the circuit pack.
  b. Physically remove the circuit pack from the slot.

b. **Error Type 10012**: Simplex mode downlink. The reason for the state interchange to active was a Simplex mode downlink to the circuit pack. When the board is inserted and before it is used for any bearer traffic, the server configures the board to operate either in Simplex or Duplex mode via a downlink message. That operation may trigger the interchange.

c. **Error Type 10021** and **10022**: Duplex mode downlink. The reason for the state interchange (active/standby) was a Duplex mode downlink to the circuit pack. When the board is inserted and before it is used for any bearer traffic, the server configures the board to operate either in Simplex or Duplex mode via a downlink message. That operation may trigger the interchange.

d. **Error Type 10031** and **10032**: Demand interchange. A demand interchange caused the state change (active/standby) in response to the `set media-processor` command.

e. **Error Type 10041** and **10042**: Free token. The reason for the interchange (active/standby) was that the standby circuit pack detected the availability of a token. Boards operating in duplex mode arbitrate to determine which will be the active board. A hardware-supported soft token supports this operation. The standby circuit pack monitors the token and initiates an interchange if the peer has ceased to be the active board.

f. **Error Type 10051** and **10052**: Abdicate Request. The state interchange (active/standby) was caused by the board receiving a request to give up the active state. Boards operating in duplex mode exchange health information and other details of duplicated operation. If the standby board determines it must become the active board because it was commanded to do so or because the active board is less healthy than the standby, the standby board sends an abdicate request to the active board.

g. **Error Type 10061** and **10062**: Abdicate Received. The state interchange (active/standby) was caused by the standby board receiving a notification that the other board was leaving the active state. As part of normal operation, the boards monitor their components and internal state to verify their ability to perform their function. If the board determines it can no longer fulfill the requirements of being the active board, or because it was commanded to do so, it will send an abdicate notification to the standby board.

h. **Error Type 10110**: The board was configured by CM software to be duplicated but the firmware version of the board does not have this capability. Upgrade the board firmware.

i. **Error Type 10991** and **10992**: Transient Error. The state interchange (active/standby) was caused by a fault condition that was cleared by the time the state transition was complete.

j. **Error Type 11yy1** and **11yy2**: Health change. The state interchange (active/standby) was caused by a fault condition in the Health parameter indicated by the code (yy). See Table 176 for a description of the Health Parameters monitored by the board and their values.

Table 176: Health Parameter Index Codes for MEDPRO-C

1yy Value	Description
100	Hardware problem
101	Aggregator communication problem
102	No DSPs
103	Firmware resource failure
104	Task monitor
105	Critical Link (Eth or MPCL) fault
119	Board out of service
120	MPCL Relative Fault
124	DSP 0
125	DSP 1
126	DSP 2
127	DSP 3
128	Software State of Health
129	DoS Attack
130	IP Conflict
131	Network Configuration

MEDPROPT (MEDPRO DSP PORT)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MEDPROPT	MIN WRN	**test port** ***location***	TN802/TN2302/TN2602 MEDPRO DSP PORT

The Media Processor Port (MEDPROPT) MO monitors the health of the Media Processor (MEDPRO) digital signal processors (DSPs). This maintenance object resides on the TN802/ TN2302/TN2602 Media Processor circuit packs.

The TN802B MAP-D (Multi-Application Platform for DEFINITY) Media Processor circuit pack, the TN2302, and TN2602 Media Processor circuit packs provide the audio bearer channels for H.323 voice over IP calls.

- One TN802B circuit pack has one MEDPROPT media processing resource; that one TN802B MEDPROPT can handle 31 channels, for a total of 31 channels per TN802B. Note that the TN802B has 11 physical DSP devices but they are treated as one logical MEDPROPT by Communication Manager software. If the **list ip-codec-set** screen specifies only G.711 mu-law or G.711 a-law as the audio codecs, the TN802B MEDPROPT can service 31 channels. If any other codec type (G.723-5.3K, G.723-6.3K, or G.729) is administered, the TN802B MEDPROPT can service 22 channels.
- One TN2302AP has 8 MEDPROPTs. Each TN2302 MEDPROPT has the processing capacity to handle 8 G.711 coded channels, for a total of 64 channels per TN2302. Note that early TN2302AP boards have eight physical DSP devices. Vintage 11 and later TN2302AP boards have two physical DSP devices. Both board configurations provide eight MEDPROPTs and a total of 64 channels.

  When only G.711 codecs are in use the TN2302AP has the processing capacity to handle 64 channels. If only G.723/G.729 codecs are in use the TN2302AP has the processing capacity to support 32 channels. If a combination of G.711 and G.723/G.729 codecs are in use the number of channels supported will fall somewhere between 32 and 64. Use the **list ip-codec-set** command to display the administered codecs.
- The capacity provided by the TN2602 is controlled by the Communication Manager license file and may be set at either 80 G.711 channels or 320 G.711 channels. Depending on the codecs used by individual calls the number of simultaneous calls supported will vary. The TN2602 supports G.711, G.729A, G.729AB, and G.726 codecs.

If individual DSPs on the TN802B or TN2302AP or TN2602 fail, the board remains in-service at lower capacity.

The MEDPROPT is a shared service circuit. It is shared between H.323 trunk channels and H.323 stations. An idle channel is allocated to an H.323 trunk/station on a call-by-call basis.

Error log entries and recommended actions

Table 177: MEDPROPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	Any	DSP Capacity test (#1382)		ON	**test board *location* l r 5**
18 (c)	0	**busyout port *location***	WRN	OFF	**release port *location***
258 (d)	Any	DSP Capacity test (#1382)	WRN	ON	**test board *location* l r 5**
513 (e)		DSP Capacity test (#1382)	MIN	ON	**test port *location***
515 (f)	Any	DSP Capacity Query test (#1382)	MIN	ON	**test board *location* l r 5**
769	Any	TDM NIC Looparound test (#1380)	MIN	ON	**test port *location* l r 10**
770 (g)					
1025 (h)	Any				

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: For the TN802B only, less than three DSPs are OOS (out of service), and no alarm is raised. The **Aux Data** field contains the number of DSPs that are OOS.

c. **Error Type 18**: the MEDPRO has been busied out by **busyout port *location***.

   1. Release the port (**release port *location***).

d. **Error Type 258**: For the TN802B only, more than three, but less than 9 DSPs are OOS (out of service), and a WARNING alarm is raised. The **Aux Data** field contains the number of DSPs that are OOS.

e. **Error Type 513**: For the TN2302 and TN2602 only, the port is OOS (out of service) because an associated DSP is bad.

f. **Error Type 515**: For the TN802B only, this Error Type indicates that every DSP is OOS (out of service), and a MINOR alarm is raised. The **Aux Data** field contains the number of DSPs that are OOS.

g. **Error Type 770**: DSP overallocation error. Since this error causes the DSP audit to run, the condition is cleared and no action is necessary. This error is logged only. No alarms are generated.

h. **Error Type 1025**: The port is OOS (out of service) because of a board-level failure. Check for errors/alarms against the board, in particular ping problems, IP address inconsistency, or board sanity problems.

1. Verify correct administration.
2. Check cabling and customer network before replacing circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
DSP Query Test (#1382)	X	X	ND
DSP Port TDM Looparound Test (#1380)	X	X	ND
DSP Port Status Query Test (#1407)	X	X	ND

1. D = Destructive; ND = Nondestructive

MED-GTWY (MEDIA GATEWAY)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MED-GTWY	MAJ MIN WRN	**test media-gateway *location***	Media Gateway

The MED-GTWY maintenance object monitors the H.248 link to the Media Gateway. It logs errors when there are H.248 link problems or when hyperactive H.248 link bounce occurs.

Error log entries and recommended actions

Table 178: MED-GTWY Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)			MAJ	OFF	
257 (b)			MAJ	OFF	
513 (c)			MAJ	ON	
769 (d)			MIN	OFF	
1025 (e)			WRN	OFF	
1281 (f)		Media Gateway Hyperactive Audit (#1659)	MIN	OFF	

Notes:

a. **Error Type 1**: failure of the H.248 link keep alive messages between the server and the Media Gateway. This is an indication that the LAN or the platform is down.

b. **Error Type 257**: If the server is a Survivable Remote Server, at least one Media Gateway is registered with the Survivable Remote Server.

c. **Error Type 513**: there is a problem on the Media Gateway. Log on to the Media Gateway and check the error log for problems using the MGP CLI.

d. **Error Type 769** is a transient error, indicating that the link has unregistered with the Media Gateway. If the Media Gateway re-registers, the alarm is resolved. If the Link Loss Delay Timer (LLDT) on the primary server expires, Error Type 1 is logged.

e. **Error Type 1025**: Due to high traffic, the media gateway socket control process turned off board and port periodic maintenance. When traffic levels decline, periodic maintenance will be turned on again and the alarm resolved.

f. **Error Type 1281**: This error indicates that there has been a repetitive sequence of unregistration and subsequent re-registration of a media gateway from a call server. The call server may be a primary server, a Survivable Remote Server, or a Survivable Core Server. This error and alarm can only be generated if **Enable Detection and Alarms for Hyperactive Media Gateway Registration** has been enabled on the **system-parameters ip-options** form. This alarm is most likely caused by an IP network problem which causes the gateway to unregister and re-register multiple times to a server within an interval that is less than the link bounce time. If a Survivable Remote Server is present, and if the interval is greater than the link bounce time, the media gateway and affected IP phones would most likely fail over to the Survivable Remote Server, and this MED-GTWY alarm would not be generated. The **`disable/enable nr-registration`** ***`network-region`*** commands can be used to deny registration of media gateways and IP phones from a server in order to cause the media gateways and IP phones to search for an alternate server. The alarm is resolved if there is no activity for 15 minutes. See NR-REG (Network Region Registrations).

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link State Audit Test (#1527)	X	X	ND
Media Gateway Hyperactivity Audit Test (#1659)	X	X	ND

1. D = Destructive; ND = Nondestructive

MET-BD (MET Line Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MET-BD	MIN WRN	**test board *location***	MET Line circuit pack

See XXX-BD (Common Port Circuit Pack/Media Module) for Multibutton Electronic Telephone circuit pack errors.

See MET-LINE (MET Line) for related line information.

MET-LINE (MET Line)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MET-LINE	MIN	**test port *location* l**	MET Line
	WRN	**test port *location***	

The TN735 MET Line circuit pack supports four Multibutton Electronic Telephone (MET) station sets. Each MET set uses three pairs of wires: an analog voice pair, a transmit pair, and a receive pair. Power is sent over the transmit and receive pairs. The MET Line circuit pack supports every 10-, 20-, and 30-button set.

This section describes MET-LINE (MET Line) maintenance. MET-LINE maintenance is closely related to, and interacts with, MET-BD (MET Line circuit pack) maintenance. This interaction should be kept in mind when troubleshooting MET Line problems.

This section occasionally refers to a station's *service states*. The service states are defined as follows:

Out-of-Service	The port, and thus the station, have been removed from service. A busyout of a port will cause it to be out-of-service.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally, but it can also be forced into the in-service state if it goes off-hook.

Use **status station** to determine terminal service state. Status is reported as out-of-service, in-service, or disconnect, which means the station is in the ready-for-service state.

Error log entries and recommended actions

Table 179: MET-LINE Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
					1 of 2

Table 179: MET-LINE Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (b)	40987				
18 (c)	0	**busyout port *location***	WRN	OFF	**release port *location***
130 (d)			WRN	ON	**test port *location***
257 (e)	40988		MIN WRN[1]	OFF	
513 (f)	40965	Analog Line Audits (#61)	WRN	OFF	**test port *location* r 4**
769		Port Diagnostic Test (#35)	MIN WRN[1]	ON	**test port *location* l r 3**
1025		Hybrid and Conf. Circuits (#57)	MIN WRN[1]	ON	**test port *location* l r 3**
1537 (g)	40968		MIN WRN[1]	OFF	
1793		NPE Crosstalk Test (#6)	MIN WRN[1]	ON	**test port *location* l r 3**
2049 (h)	32770				
2049 (h)	40967				
3840 (i)	40989				
					2 of 2

1. Major or Minor alarms MO can be downgraded to Warning based on the values in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: the data link between the port and the terminal is not operational (that is, the port circuitry has detected an off-board problem). Verify that the MET set is connected and that the EPF (Electronic Power Feed) test passes. If data transmission problems are experienced, check for defective wiring or a defective voice terminal, or move terminal electrically closer to the switch (that is, reduce the length of the wiring between the terminal and the switch). If the problem persists, replace the circuit pack. Once the problem is resolved, the system retires the alarm after a predetermined time delay.

c. **Error Type 18**: is logged when maintenance personnel busyout the port. The port is released from busyout using **release port *location***.

d. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 257**: the EPF has been turned off due to an overcurrent condition at the voice terminal. Check for defective wiring or a damaged jack, and verify that the voice terminal is an MET set. Once the problem is resolved, the system retires the alarm after a predetermined time delay.

f. **Error Type 513**: the EPF inquiry audit has returned “epf-no-load” messages. This usually indicates that the voice terminal has been disconnected or that there is a defect in the wiring to the terminal. Check out both possibilities.

When the EPF inquiry audit subsequently receives an “epf-on-ok” or an “epf-off-ok” message, the system will take action to retire the alarm.

g. **Error Type 1537**: the port has reported a problem with the data link to the voice terminal. Ignore this error if there are no complaints about the voice terminal. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and decrease the length of the wiring between the voice terminal and the switch. If the problem persists, replace the circuit pack.

h. **Error Type 2049, Aux Data 32770**: the voice terminal went off-hook while it was in the ready-for-service state. Use `status station` to determine the state of the voice terminal. The off-hook should have moved the station to in-service. No repair action is necessary.

Error Type 2049, Aux Data 40967: this code is generated when the link between the circuit pack and the voice terminal is successfully reset. No repair action is necessary.

i. **Error Type 3840**: the hardware sent an uplink message indicating that the Electric Power Feed (EPF) is not loaded, that is, it is not currently supplying power to a voice terminal. No repair action is necessary.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Port Diagnostic Test (#35)		X	ND
Analog Electronic Power Feed Test (#56)		X	ND
Hybrid Circuit and Conference Circuit Test (#57)		X	ND
			1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Line Station Lamp Update Test (#60)	X	X	ND
Analog Line Audits Test (#61)	X	X	ND
Analog Line Ringer Update Test (#62)	X	X	ND
			2 of 2

1. D = Destructive, ND = Nondestructive

MG-ANA (Analog Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-ANA	MIN	`test board location long`	Analog Media Module
	WRN	`test board location`	

The MG-ANA maintenance strategy supports the following:

- MM711 (8 port analog line media module)
- MM714 (4 analog line ports + 4 analog trunk ports media module)
- MM716 (24 port analog media module)
- TIM508 (8 analog line ports for Juniper Media Gateways)
- TIM514 (4 analog trunk ports + 4 analog line ports for Juniper Media Gateways)
- TIM516 (16 analog line ports for Juniper Media Gateways)
- TIM518 (8 analog line ports and 8 analog trunk ports for Juniper Media Gateways)
- VMM_ANA (1 analog trunk port + 2 analog line virtual ports)
- VMM_42ANA (4 analog trunk ports + 2 analog line virtual ports)

Note:

Too many MM711 Analog Media Modules in a G700 might trip the G700 electronic breaker and cause the power supply for the entire G700 to shut down.

Error log entries and recommended actions

Table 180: MG-ANA Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test board location`
1 (b)	0	Board removed or SAKI Sanity Failure (#53)	MIN	ON	
18 (c)	0	`busyout board location`	WRN	OFF	`release board location`
23 (d)	0		WRN	OFF	
125 (e)			MIN	ON	
					1 of 2

Table 180: MG-ANA Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (f)	65535	Control Channel Looparound Test (#52)	MIN	ON	`test board` *`location`* `r 20`
513 (g)	Any	Angel Background Error	MIN	ON	`test board` *`location`*
769 (h)		Program Logic Failure			
1025 (i)	4363	NPE Audit Test (#50)			
1281 (j)		Ringing Application Test (#51)			
1538 (k)	Any	Hyperactive Angel	WRN MIN	ON	
3840 (l)	Any	Inconsistent Downlink Message			
					2 of 2

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: The media module stopped functioning or has been physically removed from the system. The alarm is logged approximately 11 minutes after removal of the board or failure of the SAKI Sanity Test (#53). Check for the physical presence of the media module in the slot indicated by the alarm. If the board is absent, insert one of the proper type. If the media module is present and its red LED is lit, see LED alarms without Alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*

c. **Error Type 18:** The media module has been busied out. Release the media module using **`release board`** ***`location`***.

d. **Error Type 23:** The media module has been logically administered but not physically installed. The alarm should clear when the media module is installed.

If the media module is already installed:

1. Run **`test board`** ***`location`*** **`long`** and look at any test failures or Error Codes generated.
2. If the test does not clear error 23, then execute **`reset board`** ***`location`*** and run the long test again.
3. If the reset/test does not clear error 23, replace the media module.

e. **Error Type 125:** the media module that is physically installed in the slot does not match the type that is administered for that slot. Do one of the following:

- Remove the incorrect media module and replace it with one of the type that is administered for that slot.

- Use **change media-module** to re-administer the slot so that it matches the board that is installed, then enter **reset board *location***.

f. **Error Type 257:** transient communication problems between the switch and this media module. Execute **test board *location*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

g. **Error Type 513:** there is an on-board hardware failure. The system will continuously test the media module and report the results approximately every 10 minutes. If the hardware problem is resolved, the alarm will clear in approximately 30 minutes. If the alarm does NOT clear in 30 minutes, then the media module should be replaced.

h. **Error Type 769:** This error can be ignored, but look for other errors on this media module.

i. **Error Type 1025:** This error is not service-affecting and no action is required.

j. **Error Type 1281:** This error is not service-affecting and no action is required.

k. **Error Type 1538:** The hyperactive media module is out-of-service and may exhibit one or more of the following symptoms:

   1. The tests such as Test #51 and/or Test #220 are aborting with Error Code 2000.
   2. The tests run on the ports of this media module are returning NO-BOARD.
   3. A busyout/release of the media module has no effect on test results.
   4. A **list configuration** command shows that the media module and ports are properly installed.

   If this error happens again within 15 minutes, replace the media module.

l. **Error Type 3840:** This error is not service-affecting and no action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Ringing Application Test (#51)	X	X		
Control Channel Looparound Test (#52)	X	X		ND
NPE Audit Test (#50)		X		
SAKI Sanity Test (#53)			X	D

1. D = Destructive; ND = Nondestructive

MG_ANN (Media Gateway Announcement Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-ANN	MIN	**test board**	Media Gateway Announcement
MG-ANN	WRN	**test board**	Media Gateway Announcement

Error log entries

Table 181: MG–ANN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
18	0	Busyout board	WRN	ON	**release board**
257	Any	Test # 52	MIN	ON	**test board**
2561 (a)	Any	Test # 1683	MIN	OFF	**test board**
2562 (b)	Any	Test # 1683	MIN	OFF	**test board**
2564 (c)	Any	Test # 1683	MIN	OFF	**test board**
2563	Any	Test # 1683	MIN	OFF	**test board**
2565	Any	Test # 1683	MIN	OFF	**test board**
2566	Any	Test # 1683	MIN	OFF	**test board**
2567 (d)	Any	Test # 1683	MIN	OFF	**test board**
2592 (e)	Any		MIN	OFF	

Notes:

a. **Error Type 18**: the media module has been busied out. Release the media module using release board location.

b. **Error Type 257**: transient communication problems between the switch and this circuit pack or media module. Execute test board location and refer to the repair procedures for the Control Channel Looparound Test (#52).

c. **Error Type 2561**: during the last attempted License File audit, the license server did not respond in time.

d. **Error Type 2562**: retry Failure error. This error is only logged. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

e. **Error Type 2563**: The 2563 is a combination of 2561 and 2562.

f. **Error Type 2565**: The 2565 is a combination of 2564 and 2561.

g. **Error Type 2566**: The 2566 is a combination of 2562 and 2564.

h. **Error Type 2567**: The 2567 is a combination of all the preceding errors. This error indicates that the Media Gateway registered and an "enable file systems" message was sent to the gateway to enable the file system with Compact Flash. The Media Gateway refused the message because there is insufficient RAM to support the Compact Flash.

MG-ANN (Voice Announcements)

The MG-ANN (Voice Announcements) maintenance object provides per board announcement storage time of up to 20 minutes (15 playback ports and 1 recording port that can also be used as a playback port), and allows for announcement file portability via LAN connectivity. MG-ANN also allows for LAN backup and restore of announcement files and the use of customer provided waveform (.WAV) files.

Note:

The S8300 does not support standard port networks and TN type boards.

Communication Manager supports the MG-ANN by using a virtual board concept to allow for board insertion and maintenance testing. The virtual slot location is V9.

Announcement times and ports vary according to the media gateway type.

Table 182: Media Gateway Announcement Times/Ports

Media Gateway	Ports	Minutes
G700	15/1 = 16	20
G350	7	20
G250	7	10
G430	7	15
G450	63/1 = 64	45/240
J4350	16	10
J6350	16	10

Demand test descriptions and error codes

There are no demand tests for MG-ANN.

MG-BRI (BRI Trunk Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-BRI	MIN	**test board** ***location***	BRI Trunk Media Module

The following is a list of supported BRI Media Modules:

- MM720 (8-port 4-wire BRI Trunk/Line Media Module)
- MM722 (2-port 4-wire BRI Trunk Media Module)
- TIM521 (4-port BRI Trunk Media Module in a Juniper Media Gateway)
- VMM_2BRI (2 port trunk-side integrated BRI Media Module)

Error log entries and recommended actions

Table 183: MG-BRI Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0		Any	Any	**test board** ***location***
1 (b)	Any	Sanity Failure	MIN	ON	
18		Media Module is busied out			**release board** ***location***
257 (c)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board** ***location*** **r 20**
513 (d)	4352 to 4357	Angel Background Errors		ON	**test board** ***location***
769 (e)	4358	Program Logic Error			
1291 (f)	4359	Clear Error Counters (#270)	MIN	ON	
3586 (g)			MIN	OFF	
3840 (h)	4096 to 4101	Inconsistent Downlink Message			
					1 of 2

Table 183: MG-BRI Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3842 (i)	46095	Receive FIFO Overflow			
3843 (j)	46097	Bad LAN Translation RAM			
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the media module stopped functioning or is physically removed from the system. This alarm is logged approximately 11 minutes after removing the media module and/or the SAKI Sanity Test (#53) fails. If the media module is not in the system, insert a media module in the same slot as the error indicates. See note (f).

c. **Error Type 257**: there are transient communication problems between the switch and this media module. Execute the **`test board`** ***`location`*** command and refer to the repair procedures for the Control Channel Looparound Test (#52).

d. **Error Type 513**: on-board hardware failure. Aux data values correspond to the following detected errors:

Aux Value	Detected Error
4352	External RAM error
4353	Internal RAM error
4355	ROM checksum error
4357	Message Corruption error

Reset the media module with the **`busyout board`** ***`location`*** and **`reset board`** ***`location`*** commands. When reset, the media module executes a set of tests to detect the presence of any of the faults listed above. Detection of one of these errors during initialization causes the media module to lock-up and appear insane to the system.

e. **Error Type 769**: the media module detects a program logic error. No action is required. However, this error can lead to other errors against this media module.

f. **Error Type 1291**: the BRI Media Module detected a parity error while accessing its dynamic RAM which stores the board's translation information and downloadable application firmware. Maintenance software resets the media module.

g. **Error Type 3586**: the system detected an excessive number of uplink messages from the Media Module. To prevent the faulty board from flooding the switch with data, the switch software takes the board out of service and alarms it.

When the board is alarmed due to this error, the switch software periodically puts the board back in service and tells the Archangel to process uplink messages from the board. If the problem still exists, the software takes the media module out of service again. If the media module does not exhibit the problem for a certain time period, then maintenance software resolves the alarm and the media module is left in service.

h. **Error Type 3840**: the media module received an inconsistent down-link message (a bad header, port number, data, sub-qualifier, or logical link) over the Control Channel. This is a notification only, and no action is required.

i. **Error Type 3842**: the board is receiving data from the bus faster than it can distribute the data to its endpoints, causing the FIFO RAM buffer to overflow. This error can occur occasionally due to the statistical sizing of the buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch. LAPD should recover from this problem, but it may degrade the performance of the LAN bus.

j. **Error Type 3843**: bad translation RAM detected during call connection. The media module marks the location as bad and reports it. The call continues on a different port.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND

1. D = Destructive; ND = Nondestructive

MG-DCP (Digital Line Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-DCP	MIN WRN	**test board *location***	Digital Line Media Module

The following is a list of supported DCP Media Modules:

- MM312 (24 port DCP Media Module)
- MM712 (8 DCP port Media Module)
- MM717 (24 DCP port Media Module)
- IMM_DCP (Integrated DCP Media Module)

Maintenance software monitors and test ports on digital Media Modules and the hardware connected to those ports for lines administered as a digital station.

Error log entries and recommended actions

Table 184: MG-DCP Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test board *location***
1 (a)	0	Media Module removed or SAKI Sanity Failure (#53)	MIN	ON	
18 (b)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (c)	0	None	WRN	OFF	
125 (d)		None	MIN	ON	
257 (e)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* r 20**
513 (f)	Any	Angel Background Error	MIN	ON	**test board *location***
769 (g)	4358	None			
1025 (h)	4363	NPE Audit Test (#50)			
1281 (i)		Ringing Application Test (#51)	MIN	ON	**test board *location* r 2**
1538 (j)	Any	None	WRN MIN	ON	

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a. **Error Type 1:** the media module stopped functioning or has been physically removed from the system. The alarm is logged approximately 11 minutes after removal of the media module or failure of the SAKI Sanity Test (#53).

   Check for the physical presence of the media module in the slot indicated by the alarm. If the media module is absent, insert one of the proper type. If the media module is present and its red LED is lit, see LED alarms without Alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

b. **Error Type 18:** the media module has been busied out. Release the media module using **`release board`** ***`location`***.

c. **Error Type 23:** the media module has been logically administered but not physically installed. The alarm should clear when the media module is installed.

   If the media module is already installed:

   1. Run **`test board`** ***`location`*** **`long`** and look at any test failures or Error Codes generated.
   2. If the test does not clear error 23, then execute **`reset board`** ***`location`*** and run the long test again.
   3. If the reset/test does not clear error 23, replace the media module.

d. **Error Type 125:** the media module physically installed in the slot does not match the type that is administered for that slot. Do one of the following:

   - Remove the incorrect media module and replace it with one of the type that is administered for that slot.
   - Use **`change circuit-pack`** or **`change media-module`** to re-administer the slot so that it matches the board that is installed, and follow with **`reset board`** ***`location`***.

e. **Error Type 257:** transient communication problems between the switch and this circuit pack or media module. Execute **`test board`** ***`location`*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

f. **Error Type 513:** an on-board hardware failure was detected. The system will continuously test the media module and report the results approximately every 10 minutes. If the hardware problem is resolved, the alarm should clear in approximately 30 minutes. If the alarm does NOT clear in 30 minutes, then the media module should be replaced.

g. **Error Type 769:** this error can be ignored, but look for other errors on this media module.

h. **Error Type 1025:** this error is not service-affecting and no action is required.

i. **Error Type 1281:** this error is not service-affecting and no action is required.

j. **Error Type 1538:** the hyperactive media module is out-of-service and may exhibit one or more of the following symptoms:

1. The media module level tests such as Test #51 and/or Test #220 are aborting with Error Code 2000.
2. The tests run on the ports of this media module are returning with a NO-BOARD.
3. A busyout/release of the media module has no effect on test results.
4. A **`list configuration`** command shows that the media module and ports are properly installed.

Check the alarm level. If the alarm level is a WARNING, users are probably causing the hyperactivity by adjusting or changing their digital stations. If the media module is very hyperactive, this alarm will be upgraded to a MINOR alarm within 1 hour. If the alarm level is a MINOR alarm, then replace the media module.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND

1. D = Destructive; ND = Nondestructive

MG-DS1 (DS1 Interface Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-DS1	MAJ MIN	**test board *location* long**	DS1 Interface Media Module
	WRN	**test board *location***	

The following is a list of supported DS1 Media Modules:

- MM710 Universal DS1 Interface Media Module (1 T1/E1 ISDN PRI trunk port)
- IMM_DS1 Integrated DS1 Media Module
- TIM510 DS1 Media Module for use in Juniper media gateways (1 T1/EI port)

Error log entries and recommended actions

Table 185: MG-DS1 Error Log Entries *1 of 3*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	Any	Media Module removed or SAKI Test failed(#53)	MIN WRN[1]	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (d)	0		WRN	OFF	**add ds1 *location***
125 (e)	none 3		MIN WRN[1]	ON	
257	65535	Control Channel Looparound (#52)	MIN	ON	**test board *location* l r 20**
257 (f)	Any				
513 (g)	Any	Angel Background Error	MIN WRN[1]	ON	
514 (h)	46086		MIN WRN[1]	ON	
					1 of 3

Table 185: MG-DS1 Error Log Entries ***2 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
769 (i)	46085		MIN WRN[1]	ON	
770 (j)	46096		MIN WRN[1]	ON	
1025 (k)		NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN WRN[1]	OFF	`test board` ***`location`***
1320	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN WRN[1]	OFF	`test board` ***`location`***
1321	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN WRN[1]	OFF	`test board` ***`location`***
1322	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN	ON	`test board` ***`location`***
1323	Any	Loss of Signal Alarm Inquiry (#138)	MIN WRN[1]	OFF	`test board` ***`location`***
1324	Any	Loss of Signal Alarm Inquiry (#138)	WRN	OFF	`test board` ***`location`***
1400 1401 (l)	Any	Loss of Signal Alarm Inquiry (#138) and Echo Cancellation (#1420)	MIN	ON	`test board` ***`location`***
1537 (m)	46082		MIN WRN[1]	ON	
1538 (n)	Any		MIN WRN[1]	ON	
1793	Any	Blue Alarm Inquiry (#139)	MAJ MIN WRN[2]	OFF	`test board` ***`location`***
1794	Any	Blue Alarm Inquiry (#139)	MAJ MIN WRN[2]	OFF	`test board` ***`location`***
					2 of 3

Table 185: MG-DS1 Error Log Entries ***3 of 3***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1795	Any	Blue Alarm Inquiry (#139)	MAJ MIN WRN	OFF	**test board** ***location***
2049	Any	Red Alarm Inquiry (#140)	MIN WRN[1]	OFF	**test board** ***location***
2305	Any	Yellow Alarm Inquiry (#141)	MIN WRN[1]	OFF	**test board** ***location***
2306	Any	Yellow Alarm Inquiry (#141)	MIN WRN[1]	OFF	**test board** ***location***
2561	Any	Major Alarm Inquiry (#142)	MIN WRN[1]	OFF	**test board** ***location***
2817		Minor Alarm Inquiry (#143)	MIN WRN[1]	OFF	**test board** ***location***
3073 to 3160 (o)	Any	Slip Alarm Inquiry (#144)	MIN WRN[1]	OFF	**test board** ***location*** **r 6**
3585 to 3601 (p)	Any	Misframe Alarm Inquiry Test (#145)	MIN WRN[1]	OFF	**test board** ***location*** **r 6**
3840 (q)	Any				
3841 (r)	4358				
3842 (s)	46097				
3999 (t)	Any				
					3 of 3

1. If ports are assigned to the Media Module, then a minor alarm is raised. If no ports are assigned to the Media Module, then a warning alarm is raised. The alarm is raised after the Media Module has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the Media Module.
2. Major alarms on this MO may be downgraded to minor or warning alarms, and minor alarms on this MO may be downgraded to warning alarms based on values set in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If all tests pass, run the long test sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 1**: the Media Module has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the Media Module has been removed or 11-minutes after the SAKI Test (#53) fails. To be fully administered, a Media Module must meet all three of the following conditions:

- Have an entry in the circuit plan using the **change media module** command

- Be administered using the **add ds1** ***location*** command
- Be physically inserted into the correct slot

If the Media Module has an entry in the circuit plan and either of the other two conditions are *not* met, a MINOR alarm is logged.

1. To resolve the error do either of the following:
   - Make sure that all conditions for administration are met and that a functioning Media Module is inserted in the correct slot.
   - Completely remove the Media Module from the system using the following steps.
2. Remove any administered DS1 trunks, access endpoints or PRI endpoints associated with the Media Module from their trunk groups.
3. Execute **remove ds1** ***location*** and **change media module** ***location***.

c. **Error Type 18**: the Media Module has been busied out by a **busyout board** ***location*** command. Release the Media Module with the command **release board** ***location.***

d. **Error Type 23**: the Media Module is not completely administered. To be fully administered, the Media Module must:

- Have an entry in the circuit plan using the **change media module** command
- Be administered using the **add ds1** ***location*** command
- Be physically inserted into the correct slot

A DS1 Media Module differs from most Media Modules in that inserting the DS1 Media Module into the media gateway is not enough to make the board usable. It must also be administered with the **add ds1** command.

e. **Error Type 125:** An incorrect Media Module is inserted in the slot where the Media Module is logically administered.

To resolve this problem, either:

- Remove the incorrect Media Module and insert the logically administered Media Module.
- Use the **change circuit-pack** command to re-administer this slot to match the Media Module inserted.

f. **Error Type 257**: Refer to Control Channel Looparound Test (#52) for details.

g. **Error Type 513**: the Media Module has detected a transient hardware problem.

The value in the Aux Data field indicates the type of hardware problem:
Aux Data 4352: External RAM failure
Aux Data 4353: Internal RAM failure
Aux Data 4355 Internal ROM failure

If the board detects only one of these hardware problems, the error will disappear when none of these faults are detected for 10 minutes. If the same Aux Data value is logged more than once in a 24 hour period, the Media Module should be replaced.

h. **Error Type 514**: LAN External RAM Error.

This error occurs when there is a hardware fault in the PPE external RAM. The RAM is used for message buffering to and from the Packet Bus. This error should not occur frequently. If does (at least 10 times within 30 minutes), the Media Module should be replaced.

i. **Error Type 769**: transmit FIFO Underflow Error.

This error occurs when the Media Module cannot find the end of frame bit when transmitting a frame to the Packet Bus. An alarm is raised if this error occurs three times within 10 minutes. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***. If the error recurs within 10 minutes, replace the Media Module.

j. **Error Type 770**: Unable to Write LAN Translation RAM Error.

This error occurs when there are no available translation RAM locations for a call connection attempt. An alarm is raised if this error occurs twice within 10 minutes. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***. If the error recurs within 10 minutes, replace the Media Module.

k. **Error Type 1025**: This error is not service-affecting and no action is required.

l. **Error Types 1400, 1401**: Echo Cancellation error.

Echo Cancellation errors are logged when:

- Error 1400 -The Echo Canceller Function Test failed.
- Error 1401 -The Echo Canceller Memory Test failed.

This error indicates that Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***. If Test #1420 (Echo Canceller Test) fails, replace the Media Module.

m. **Error Type 1537**: LAN Bus Timeout Error.

This error occurs when the Media Module transmits too many bytes on the LAN bus for a single frame. This condition may be caused by an on-board fault or by faulty data received on one of the Media Module's external ports. If any of the ports on this Media Module are alarmed, refer to the repair procedures for those maintenance objects.

If the error occurs three times within 10 minutes, the board is isolated from the Packet Bus and the board is alarmed. To clear the alarm and restore the board to the Packet Bus, use the commands **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***.

If the problem persists and there are no PKT-BUS alarms or port alarms, replace the Media Module.

n. **Error Type 1538**: The hyperactive Media Module is out-of-service and may exhibit one or more of the following symptoms:

- The common Media Module level tests such as Test #50 abort with Error Code 2000.
- The tests run on the ports of this Media Module return NO-BOARD.
- A busyout/release of the Media Module has no affect on test results.
- A `list configuration` command shows that the Media Module and ports are properly installed.

The Media Module is isolated from the system and all trunks or ports on this Media Module are placed into the out-of-service state. The system will try to restore the Media Module within 20-30 minutes. When no faults are detected for 20-30 minutes, the Media Module is restored to normal operation. All trunks or ports of the Media Module are then returned to the in-service state.

If the board is not restored to normal operation, or the error recurs after the board was restored to normal operation, escalate the problem.

o. **Error Types 3073 to 3160**: the Media Module is receiving slips. The Error Type displays the value of the last slip count reported.

p. **Error Types 3585 to 3601**: the Media Module is receiving misframes. The Error Type displays the value of the last misframe count reported.

q. **Error Type 3840**: is not service-affecting. No action is required.

These errors are reported by the Media Module when it receives a bad control channel message from the switch. The Aux Data identifies the cause of the error event.

r. **Error Type 3841:** The Media Module has detected a transient hardware logic error. This error will disappear when no faults are detected for 100 minutes.

s. **Error Type 3842:** Bad Translation RAM Location Found. This error is not service-affecting. No action is required. The call continues by using another translation location.

t. **Error Type 3999:** the Media Module sent a large number of control channel messages to the switch within a short period of time.

If **Error Type 1538** is also present, the Media Module was taken out-of-service due to hyperactivity. If Error Type 1538 is not present, the Media Module has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the Media Module is being lightly used, it may indicate a problem with the Media Module or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND[1]
Echo Canceller Test (#1420)		X			D
Control Channel Looparound Test (#52)		X			ND
NPE Audit Test (#50)		X			ND
Loss of Signal Alarm Inquiry Test (#138)	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND
Misframe Alarm Inquiry Test (#145)	X	X			ND
DS1 Translation Update Test (#146)	X	X			ND
ICSU Status LEDs Test (#1227)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Looparound Test (#135)			X		D

1. D = Destructive; ND = Nondestructive

MG-IAMM (Integrated Analog Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-IAMM	MIN	**test board *location* long**	Integrated Analog Media Module
	WRN	**test board *location***	

The MG-IAMM Maintenance Object resides on the Integrated Analog Media Module (IAMM) which is located on the main board of the G250, G250-BRI, G250-DCP, G250-DS1, G350, and TGM550 media gateways.

The Integrated Analog Media Module is not field-replaceable.

For the G250, the Integrated Analog Media Module consists of six (6) fixed configuration analog ports:

- Ports 1 through 4 are fixed as loop start CO trunk ports.
- Ports 5 and 6 may be administered as analog stations, DID trunks, or external alarm ports.
- Ports 4 and 5 are used by the media gateway processor for emergency transfer relay (ETR) purposes.

The Integrated Analog Media Module is a non-field-replaceable module. Slot #3 is virtual and designated as the integrated analog media module slot. Slot #3 supports the IAMM exclusively.

For the G250-BRI and G350, the Integrated Analog Media Module consists of three (3) fixed configuration analog ports:

- Port 1 is fixed as an analog trunk port.
- Ports 2 and 3 are fixed as analog line ports.
- Ports 1 and 2 are used by the media gateway processor for emergency transfer relay (ETR) purposes.

On a G250-BRI, slot #3 is virtual and designated as the integrated analog media module slot.

On a G350, slot #7 is virtual and designated as the integrated analog media module slot.

Administration will only allow port one to be administered as a loop start CO trunk. Ports 2 and 3 may only be administered as analog stations, DID trunks, or external alarm ports. Ports 1 and 2 are used by the emergency transfer relay (ETR).

The TGM550 is the Media Gateway blade which is integrated with the Juniper Networks Services Routers. It provides an internal interface to the Juniper chassis backplane, 2 analog lines, and 2 analog trunks.   Ports 2 and 3 are used by the emergency transfer relay (ETR).

The G250-DCP allows 4 trunks and 2 analog lines. Ports 4 and 5 are used by the ETR.

The G250-DS1 allows 1 trunk and 2 analog lines. Ports 1 and 2 are used by the ETR.

See XXX-BD (Common Port Circuit Pack/Media Module) for media module level errors.

For individual port problems see the relevant MO:

- If the port is administered as a CO trunk, see CO-TRK (Analog CO Trunk).
- If the port is administered as a DID trunk, see DID-TRK (Direct Inward Dial Trunk).
- If the port is administered as a CAMA/E911 trunk, see DIOD-TRK (DIOD Trunk).
- If the port is administered as an analog line, see AN-LN-PT (Analog Line Port).
- If the port is administered as an external device alarm, see ALARM-PT (Alarm Port).
- If the port is administered as an analog endpoint, see ANL-LINE (8-Port Analog Line).

Error log entries and recommended actions

Table 186: MG-IAMM Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	0	Sanity Failure	MIN	ON	
18 (b)	0	busyout location		OFF	**release** ***location***
23 (c)			WRN	OFF	
257 (d)	65535	Control Channel Looparound Test	MIN	ON	**test board** ***location*** **r 20**
513 (e)	Any		MIN	ON	
769 (f)	4358				

Notes:

a. **Error Type 1:** the Integrated Analog Media Module (IAMM) has stopped functioning or was physically removed from the system. This alarm is logged 11 minutes after removing the media module or the SAKI Sanity Test fails. NOTE: The IAMM is not removable. This error indicates that there may be a firmware or hardware problem with the media gateway.

1. Reset the Integrated Analog Media Module with **reset board** ***<location>***.
2. Retest the board using **test board** ***location***.
3. If this error persists, replace the media gateway.

b. **Error Type 18:** the indicated Integrated Analog Media Module circuit has been made unavailable with the **busyout** ***location*** command. To resolve this error, enter **release** ***location*** for the alarmed media module.

c. **Error Type 23**: the media module has been administered but is not inserted. Because this is an integrated media module, there may be a hardware or firmware problem with the media gateway main board.

1. Reset the Integrated Analog Media Module with **`reset board <location>`**. Use **`list configuration media-gateway`** ***`location`*** to verify whether or not the IAMM is inserted.
   - For the G250, the code field for slot 3 should indicate **4T2LIM**
   - For the G250-BRI, the code field for slot 3 should indicate **1T2LIM**
   - For the G350, the code for slot 7 should indicate **1T2LIM**
   - For the TGM550, any slot may indicate the code **TGM550**
2. Verify that the latest version of firmware is present on the media gateway main board. Use **`show mg list_config`**. Upgrade the firmware if necessary.
3. If the problem persists, replace the media gateway.

d. **Error Type 257:** test #52 failed. This error will clear when the test passes.

e. **Error Type 513:** the IAMM circuitry detected a memory error during its background self-test diagnostics (External RAM failure, Internal RAM failure, ROM checksum failure, Message corruption). This error indicates the IAMM is running corrupted code.

1. Download and install the appropriate firmware on the media gateway.
2. If the problem persists, replace the media gateway.

f. **Error Type 769:** the integrated analog media module detected an internal consistency. This error can be ignored and no action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Audit Test (#50)		X	ND
Ringing Application Test (#51)	X	X	ND
Control Channel Looparound Test (#52)	X	X	ND

1. D = Destructive; ND = Nondestructive

MG-IBRI (Integrated BRI Trunk Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-IBRI	MIN	**test board *location* long**	Integrated BRI Trunk Media Module

The MG-IBRI maintenance object resides on the virtual ISDN trunk-side BRI media module. It has two ports which can either be administered as a trunk-side BRI port or BRI trunk.

MG-IBRI has the same maintenance strategy as the MG-BRI media module. See MG-BRI (BRI Trunk Media Module) for the error codes, tests, and recommended actions.

MG-VOIP (MM760 VoIP Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MG-VOIP	MIN WRN	**test board *location***	Voice Over IP Media Module

The MM760 Media Module provides the audio bearer channels for Voice over IP calls, and is under control of the G700. One MM760 Media Module has one VoIP-MM media processing resource. Based on system administration of audio codecs, a VoIP-MM can handle either 64 or 32 simultaneous channels of H.323 audio processing. The VoIP-MM can service 64 channels if the **IP Parameters** form specifies only G.711 mu-law or G.711 a-law as the audio codecs. If any other codec type (G.723-5.3K, G.723-6.3K, or G.729) is administered, the VoIP-MM can only service 32 channels.

Error log entries and recommended actions

Table 187: MG-VOIP Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
257 (b)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* l r 2**

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 257**: refer to Control Channel Looparound Test (#52) and follow the recommended procedures.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Control Channel Looparound Test (#52)	X	X	ND

MIS (Management Information System)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MIS	WRN	**release mis**	Management Information System

Use the Management Information System (MIS)/Call Management System (CMS) to monitor MIS busyouts during administration of MIS translations. There are no hardware failures associated with this MO.

The MIS/CMS is an adjunct processor that collects Automatic Call Distribution (ACD) data sent from the switch. In order to change MIS translations, enter **busyout mis** at the G3-MT. When the MIS is busied out, the switch stops sending ACD data to the MIS, and a Warning alarm is raised.

When the **busyout mis** is complete, enter **release mis** at the terminal. This clears the Warning alarm and allows the switch to send ACD data to the MIS.

Error log entries and recommended actions

Table 188: MIS Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**release mis**
18 (b)	0	**busyout mis**	WRN	ON	**release mis**

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 18**: with busyout mis, no data is sent to the MIS/CMS regardless of the link state. To allow data to be sent to MIS/CMS, use **release mis** at the terminal.

MMI-BD (Multimedia Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MMI-BD	MAJ MIN	**test board *location* long**	Multimedia Interface circuit pack
MMI-BD[1]	WRN	**test board *location***	

1. Refer to XXX-BD (Common Port Circuit Pack/Media Module).

Two circuit packs can be used for multimedia connections:

- TN787D (or later)
- TN2207/Expansion Services Module

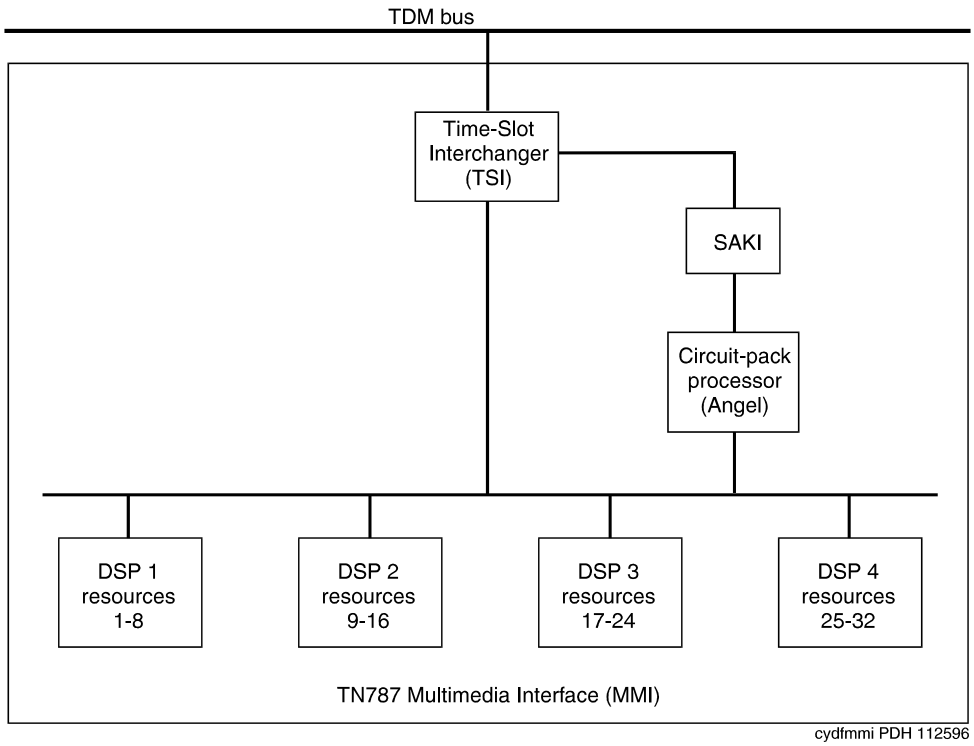
TN787D (or later)

The Multimedia Interface circuit pack (TN787D or later, also called the MMCH circuit pack) provides a number of H.221 protocol terminations for bit streams received from the TDM bus. The Multimedia Interface de multiplexes the H.221 bit stream (audio, video, data, control, and indication signals) and transmits the bit streams onto the TDM bus so that the appropriate circuit packs can process them.

The Multimedia Interface circuit pack is commonly referred to as the MMI pack for H.221 protocol termination. There are 32 ports (also called resources) on the circuit pack. See MMI-PT (Multimedia Interface Port) for maintenance of these resources.

The MMI circuit pack contains 4 digital signal processors that manage the 32 resources.

Figure 43: TN787 Multimedia Interface (MMI) Circuit Pack



TN2207/Expansion Services Module

The TN2207 circuit pack permits connecting an ESM (Expansion Services Module). See Figure 44: Typical ESM connections for connectivity.

- The TN2207 circuit pack provides T.120 data-sharing capability on a MMCH multipoint H.320 video conference
- Each conference participant must have endpoints administered and a personal computer with the H.320 video application installed.
- The S8700 Media Server configuration must have an expansion service module installed.

Figure 44: Typical ESM connections

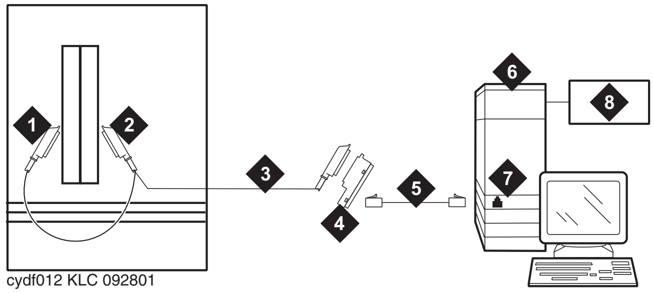


Figure notes:

1. Port B Y-cable connector to a TN787 MMI (Multimedia Interface) circuit pack
2. Port A Y-cable connector to a TN2207 PRI circuit pack
3. 25-pair Y-cable
4. 356A adapter
5. D8W cord connected to 356A adapter port 1
6. Expansion Service Module (ESM)
7. Port B on compatible PRI (primary rate interface) card

CAUTION:

The TN2207 circuit pack is the only pack that allows connection of an ESM to S8700 Media Server configurations.

Error log entries and recommended actions

Table 189: MMI-BD Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	Any		MIN	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
217 (d)	0		WRN	ON	
257 (e)	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* r 3**
513 (f)	4352 to 4357	Uplink error from circuit pack			
					1 of 2

Table 189: MMI-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
769 (g)	Any	MMI Update Sync Status (#1123)			
1281 (h)	Any	Circuit Pack Restart test (#594)	MAJ	ON	
1538 (i)	Any	Software detected error	MIN	ON	
1793 (j)	Any	NPE/TSI Crosstalk Test (#6)	MIN	ON	**test board *location* l r 3**
2049 (k)	Any	TSI Loop (#1108)	MAJ	ON	**test board *location* l r 3**
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the circuit pack stopped functioning or it was physically removed from the system. The alarm logs approximately 11 minutes after the circuit pack has been removed and/or the SAKI Sanity test (#53) fails.

   If the circuit pack is in the system and the red LED is on, follow the instructions for a red alarm in the Circuit Pack LEDs section of *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

c. **Error Type 18**: the circuit pack was busied out using **busyout board *location***.

d. **Error Type 217**: there are more than four MMI circuit packs in the system. Remove the circuit pack that generated the error in the error log by locating the slot indicated by the error.

e. **Error Type 257**: there are transient communication problems between the switch and this circuit pack. Execute **test board *location*** and see the repair procedures for the Control Channel Looparound Test (#52).

f. **Error Type 513**: the circuit pack detected an Angel on-board hardware failure. The reported Aux Data values correspond to the following detected errors:

   4352 — External RAM error
   4253 — Internal RAM error
   4355 — ROM Checksum error
   4357 — Instruction set error

Use **busyout board *location***, **reset board *location***, and **release board *location***. When reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one these errors during initialization causes the circuit pack to lock up and appear insane to the system. See the repair procedures in Note (b) for Error Type 1.

g. **Error Type 769**: this MMI circuit pack reported a loss of MMI synchronization. Refer to MMI Update Synchronization Status Test (#1123) for repair procedures.

h. **Error Type 1281**: a failure of the time slot interchanger was detected. Reset the circuit pack using **busyout board *location***, **reset board *location***, and **release board *location***. If the reset passes, then the on-board circuitry is healthy. Retire the alarm using **test board *location* long clear** followed by **release board *location***.

i. **Error Type 1538**: the circuit pack is hyperactive and it is flooding the switch with messages sent over the control channel. The circuit pack is taken out-of-service when a threshold number of these errors is reported to the switch. Clear the alarm using **busyout board *location***, **reset board *location***, **test board *location* long clear**, and **release board *location***. If the error recurs within 10 minutes, replace the circuit pack.

j. **Error Type 1793**: the NPE/TSI Crosstalk test (#6) failed. See NPE Crosstalk Test (#6), and follow its repair procedures.

k. **Error Type 2049**: the TSI Looparound test (#1108) failed. See TSI Looparound Test (#1108), and follow its repair procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X		ND
TSI Looparound Test (#1108)		X		ND
MMI Update Synchronization Status Test (#1123)	X			ND
MMI Synchronization Status Test (#1122)		X		ND
Control Channel Looparound Test (#52)	X	X		ND
SAKI Sanity Test (#53)			X	D

1. D = Destructive, ND = Nondestructive

MMI-LEV (Multimedia Interface Resource Level)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MMI-LEV	MAJ	See Resolving MMI-LEV Errors/Alarms.	Multimedia Interface Resource Level

The Multimedia Interface Resource Level MO monitors MMI efficiency by tracking the number of MMI ports that are in-service and comparing that number with the value entered in the **MMIs** field on the System-Parameters Maintenance screen. This **MMIs** field is located under the Minimum Maintenance Threshold section. The **MMIs** field contains the minimum number of MMI ports needed for the Multimedia Call Handling (MMCH) feature to run efficiently and is an administrable field. This field must contain a minimum threshold number for MMI port capacity of between 0-128. The MMCH feature must be enabled on the System-Parameters Customer-Options screen before the **MMIs** field can be changed to a number greater than zero.

Each MMI circuit pack contains up to 32 ports. If the number of in-service MMI ports falls below the minimum port capacity, an MMI-LEV error is logged. If this outage continues for 15 minutes, a MAJOR alarm is raised.

Resolving MMI-LEV Errors/Alarms

MMI ports are a key part of the MMCH feature, and any loss in the number of ports available for use degrades the MMCH customer-defined service level.

If a MMI circuit pack or port is busied out using `busyout board` or `busyout port`, these out-of-service ports are not included in the MMI level calculation, thus allowing a technician to busyout a MMI circuit pack for maintenance reasons without causing a MAJOR alarm to be raised. However, if every port on the MMI circuit pack is not made busy and the circuit pack is removed, an alarm is raised.

Note:

When diagnosing a MMI-LEV problem, begin by resolving any alarms raised against MMI-BD or MMI-PT MOs. Clearing MMI-BD or MMI-PT alarms may clear the MMI-LEV alarm.

The MMI circuit pack can be removed and reinserted in any port board slot without administration. Similarly, if a MMI circuit pack is removed from service logically by failing the Archangel sanity scan test or is removed from service physically by removing the circuit pack from the carrier, no error/alarm is raised against either the MMI-BD or the MMI-PT MOs. If a MMI-LEV error/alarm exists, yet no alarms have been raised against MMI-BD or MMI-PT MOs, a MMI circuit pack may have been removed from service, causing the MMI-LEV error/alarm. To resolve a MMI-LEV MAJOR alarm, restore the number of MMI ports available for service to be equal to or greater than the calculated port capacity.

To determine how many MMI circuit packs are needed for the MMCH feature:

1. Using **display system-parameters maintenance**, locate the number listed in the Minimum Maintenance Thresholds (**MMIs**) field and record this number.
2. Use **list configuration** to verify the number of MMI ports.
3. Compare this number with the value listed in the **MMIs** field on the **System-Parameters Maintenance** screen (number listed in step 1: minimum thresholds number for MMI ports of between 0-128). Each MMI circuit pack contains up to 32 ports. If this number in the **MMIs** field is less than or equal to 32, one MMI circuit pack is needed. If this number is 64, then two MMI circuit pack are needed.
4. Use **list configuration** to verify that the number of MMI circuit packs listed agrees with the required minimum port capacity (from step 1). If the number of MMI circuit packs listed in the step 2 differs from the calculated number, restore the number of MMI circuit packs to the correct value, in order to resolve the MMI-LEV alarm.

Error log entries and recommended actions

Table 190: MMI-LEV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	Any	None	MAJ	OFF	

Notes:

a. **Error Type 1**: The number of MMI resources in the system that are in service has fallen below the calculated minimum value. If the number of in-service MMI ports falls below the MMCH port capacity (value entered in the Minimum Maintenance Thresholds for **MMIs** field) on the System-Parameters Maintenance screen, an MMI-LEV error is logged. If this outage continues for 15 minutes, a MAJOR alarm is raised.

1. See MMI-PT (Multimedia Interface Port) and MMI-BD (Multimedia Interface Circuit Pack) and resolve any associated alarms.
2. If an MMI-LEV error/alarm exists and none has been raised against MMI-BD or MMI-PT MOs, an MMI circuit pack may have been removed from service causing the MMI-LEV error/alarm. Restore the number of MMI ports available for service to be equal to or more than the calculated port capacity. See Resolving MMI-LEV Errors/ Alarms for details.
3. If this error continues, escalate the problem.

Demand test descriptions and error codes

There are no demand tests for MMI-LEV.

MMI-PT (Multimedia Interface Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MMI-PT	MAJ MIN WRN	`test port` *`location`* `long`	Multimedia Interface Port

Note:

Refer to Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)* for MMCH troubleshooting information.

The Multimedia Interface circuit pack provides a number of H.221 protocol terminations for bit streams received from the TDM bus. The Multimedia Interface demultiplexes the H.221 bit stream (audio, video, data, control, and indication signals) and transmits the bit streams onto the TDM bus to be processed by the appropriate circuit packs.

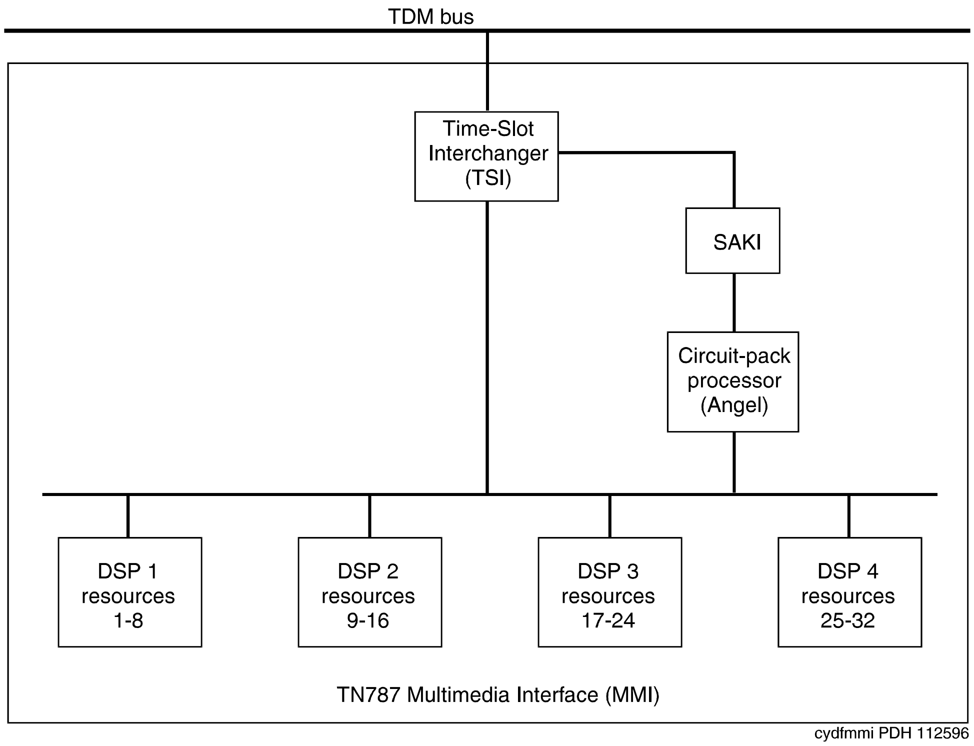
Each Multimedia Interface circuit pack contains 32 separately maintained “ports,” more commonly referred to as “resources.” MMI-PT represents one of these 32 resources. At system boot or when the circuit pack is inserted, 32 resources are inserted into the system.

The MMI circuit pack contains 4 Digital Signal Processors (DSPs) which manage the 32 resources. These resources are directly mapped to DSPs:

Resource	Direct Map
1–8	DSP1
9–16	DSP2
17–24	DSP3
25–32	DSP4

All 8 resources that the circuit pack controls may be placed out of service by the failure of one of these DSPs.

Figure 45: TN787 MMI (MULTIMEDIA INTERFACE) CIRCUIT PACK



Error log entries and recommended actions

Table 191: MMI-PT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
1 (b)	Any	Uplink error from pack			
18 (c)	0	**busyout port** ***location***	WRN	OFF	**release port** ***location***
130 (d)	Any	Software generated	WRN	ON	
257 (e)	Any		MAJ MIN	ON	
					1 of 2

Table 191: MMI-PT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (f)	Any	Resource Loopback test (#1111)	MIN	ON	`test port location r 3`
1025 (g)	Any	Uplink error from pack			
3841 to 3844 (h)	Any	Uplink error from pack			
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: the customer endpoint connected on a conference sent too many messages to the VSP-MCU in a specified amount of time. Check **`status conference`** to correlate which customer had the problem. This is a customer endpoint problem, not a VSP-MCU problem.

c. **Error Type 18**: this port was busied out by **`busyout port`** ***`location`***.

d. **Error Type 130**: the circuit pack was removed or has been insane for more than 11 minutes. To clear the error, replace or reseat the circuit pack.

e. **Error Type 257**: the MMI circuit pack detects a DSP Error. Maintenance software resets the DSP when this error is received. This error is logged for all 8 resources connected to this particular DSP. If this DSP continues to fail sanity, a Minor alarm is raised. Replace the circuit pack.

f. **Error Type 513**: the Resource Loopback test (#1111) fails. Run the long test sequence, and note the results of the Resource Looparound Test (#1111).

g. **Error Type 1025**: either the MMI or Voice Conditioner (VC) circuit packs reports a loss of framing on the service channel between these two circuit packs. When a customer endpoint establishes a call to the VSP-MCU, a channel is established between the MMI resource and the VC port. If this channel is detected to go down by either circuit pack, an uplink message is sent. This error is then forwarded to maintenance for both circuit packs. Run the long test sequence for this MMI resource, and if any of the tests fail, follow the repair procedures for that test. If every test passes, the cause of the problem might be with the VC pack. See the repair procedures in VC-DSPPT (Voice Conditioner DSP Port).

h. **Error Types 3841 - 3844**: are not related to VSP-MCU. They could be caused by network problems or from the customer endpoints. They are presented here for logging purposes only.

Code	Description
3841	CRC4 Error (Frame checksum error)
3842	Correctable BAS (Control msg bit error – 1- or 2-bit error, correctable)
3843	Uncorrectable BAS (Control msg bit error – 3-bit error or more, not correctable)
3844	Protocol Error (H.221 Protocol error from endpoint detected)

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Resource Looparound Test (#1111)	X	X	Destructive

MMI-SYNC (MMI Synchronization)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MMI-SYNC	MIN	**test board *location* long**	Multimedia Interface circuit pack

Note:

Refer to Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)* for MMCH troubleshooting information.

Each Port Network (PN) must have a TN787D or later MMI circuit pack assigned as the Multimedia Interface (MMI) master synchronization source for that PN. If one or more MMI circuit pack is administered in a PN, one MMI circuit pack is designated as the master synchronization source for every MMI circuit pack within that PN.

The MMI circuit pack generates a synchronization signal and puts that signal on the TDM bus. Other MMI packs or any other circuit pack within a PN can listen to this signal and "synchronize up" to it. The first MMI circuit pack inserted in a PN is normally designated as the master. As subsequent MMI packs are inserted, they are instructed to listen and synchronize to the time-slot of the master MMI. In the unlikely case of an MMI losing this reference, an uplink message is sent from the MMI circuit pack that lost the signal to maintenance, which also clears the "event" counter on this MMI with a downlink message. This forces the MMI circuit pack to return the current state of the synchronization signal. If the signal is still lost, then the recovery algorithm is entered. Note that during this time, the MMI circuit pack synchronizes to its internal clock, and there should be no service disruption. A loss of synchronization is usually the result of a circuit pack failure. The maintenance strategy is to switch the master source away from the bad pack to another healthy MMI circuit pack within the PN.

A synchronization switch takes place if half or more of the MMI circuit packs in a PN report a loss of synchronization. For example, a PN with two MMIs reporting a loss of sync source switches immediately, three and four MMIs switch if two report the loss, and so forth. A healthy MMI circuit pack becomes the master synchronization source providing the signal on a new timeslot. The other MMI circuit packs within the PN are instructed to listen to this new signal, and the old master stops providing the signal and now listens to the new master MMI. If an MMI is physically removed from the system, then the remaining MMIs report the loss of synchronization. The first MMI with no alarms present becomes the new master of that PN. Once a synchronization switch has occurred, another switch is not allowed for 15 minutes to avoid hyperactive switching. If every MMI has an alarm, then no switch is made.

If the MMI circuit pack that provides synchronization is craft busied out, it will not affect the PN synchronization. The signal is still provided by the busied-out pack. There is no effect on synchronization if the technician enters a release of the busied-out MMI. Synchronization is not affected by a warm start of the system (reset system 1). For every other restart (reboot through cold 2), MMI synchronization recovers during board insertion.

Error log entries and recommended actions

Table 192: MMI-SYNC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	Any	None			
257 (b)	Any	None	MIN	OFF	

Notes:

a. **Error Type 1**: an MMI synchronization switch was successful.

1. Refer to MMI-BD (Multimedia Interface Circuit Pack) errors for the reason for the switch.

b. **Error Type 257**: the requested MMI synchronization switch failed.

1. Resolve every MMI-BD (Multimedia Interface Circuit Pack) alarm.

Demand tests descriptions and error codes

There are no demand tests for MMI-SYNC.

MODEM-BD (Modem Pool Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MODEM-BD	MIN WRN	**`test board`** ***`location`***	Modem Pool circuit pack

Refer to XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors.

See MODEM-PT (Modem Pool Port) for related port information.

MODEM-PT (Modem Pool Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
MODEM-PT	MIN	**test port *location***	Modem Pool Port

The Modem Pool Port provides an interface for digital and analog data communication devices or ports connected to the PBX. It may be thought of as a PBX data communications “conversion resource” because it converts analog modem signals typically used in the telephone network into digital signals that are compatible with the internal PBX network and vice versa.

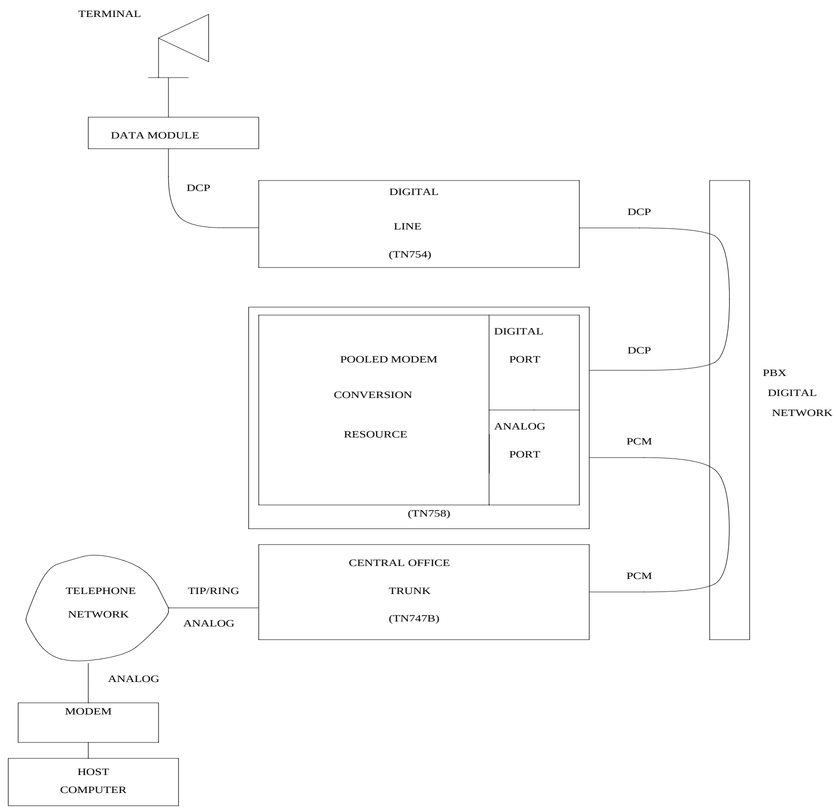
There may be a number of these conversion resources available in the PBX, each assigned to an available Modem Pool Group. Only one conversion resource is used per data connection. The PBX software usually adds the conversion resource into a data connection if it determines that it is necessary for the call. Typical connections that include Modem Pool conversion resources include data calls from Analog Line or Central Office Trunk ports to any digital port or Digital Line or Trunk ports to any analog port. An example of a Data Module to Central Office Trunk connection using a Modem Pool conversion resource is shown in Figure 46: Typical Modem Pool Switched Connection with Integrated Pooled Modem. In the case where a local data call originates from an analog port normally used for voice service only and terminates on a digital port, a Data Origination access code must be dialed before the extension number for the Modem Pool conversion resource to be included in the connection.

Each Modem Pool conversion resource contains two ports. One of these, an analog port, is connected (via the PBX network) to the analog line or trunk port that is the source of the modem signal. The second port is referred to as the digital port and is connected (again through the PBX network) to the digital line or trunk port associated with the Data Module in the connection. The analog modem signals enter the analog port of the conversion resource in standard Pulse Code Modulation (PCM) format, but are converted into Data Communications Protocol (DCP) format before going to the digital line or trunk in the connection.

Integrated Modem Pools

There are two primary types of Modem Pool conversion resources available: an Integrated Pooled Modem and a Combined Modem Pool. The integrated TN758 Pooled Modem circuit pack contains two independent 300- or 1200-bps conversion resources. Each conversion resource contains two interfaces to the PBX digital network: an analog port and a digital port. The analog port is connected through the PBX network to the analog line or trunk port containing the analog modem signals. The digital port connects through the PBX network to the digital line or trunk port in the call. Figure 46: Typical Modem Pool Switched Connection with Integrated Pooled Modem on page 668 shows a typical end-to-end connection using a conversion resource on the integrated Pooled Modem circuit pack.

Figure 46: Typical Modem Pool Switched Connection with Integrated Pooled Modem

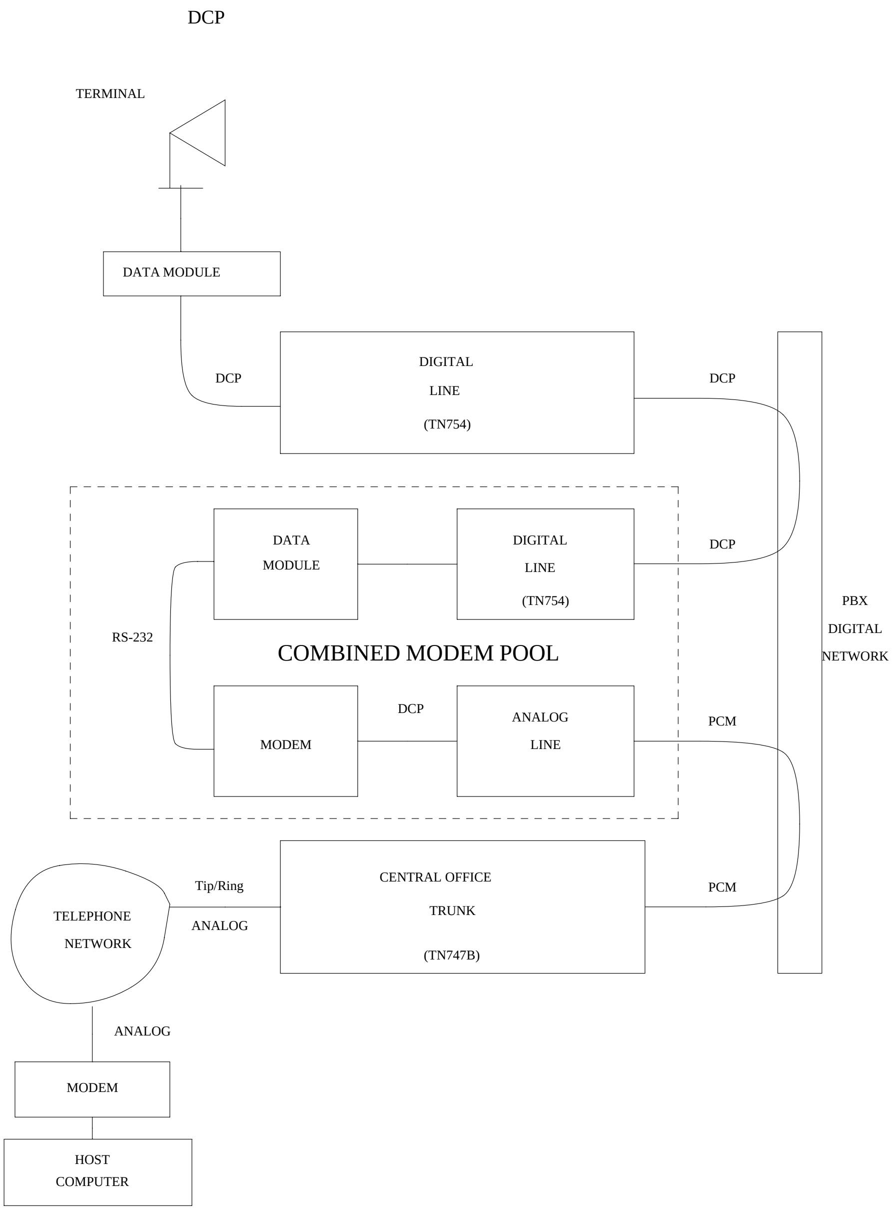


Combined Modem Pools

The Combined Modem Pool conversion resource is the second type available. The function served by the Combined Modem Pool is similar to that of the integrated Pooled Modem circuit pack, but the physical implementation is much different. It has the advantage of supporting any speed the external modem can support. The integrated Pooled Modem circuit pack can only support 300- or 1200-bps transmission rates. The Combined Modem Pool conversion resource consists of a port on an Analog Line circuit pack, an external modem, a Data Module, and a port on a TN754 Digital Line circuit pack. The tip and ring interface of the Analog Line is connected to the modem, the RS-232C interface of the modem connects to the Data Module, and the DCP interface on the Data Module is connected to the Digital Line port.

The analog modem signals pass through the Analog Line port to the modem. The modem converts these to RS-232C signals which are passed on to the Data Module. The Data Module further converts the signals to the DCP protocol for the Digital Line port which passes the signals on to the PBX network.

Figure 47: Typical Modem Pool Switched Connection with Combined Modem Pool



Troubleshooting Modem-Pool Symptoms

Certain customer-reported troubles may provide important information for troubleshooting Modem Pool problems. For example, if the customer tries to make a data call requiring a Modem Pool conversion resource, and the Modem Pool and Data Module speeds or other options do not match, they may receive a **CHECK OPTIONS** error message on the terminal. In this case, check the Modem Pool administration and Data Module option settings. If the Modem Pool is a Combined type, check also the option settings on the external Modem and Data Module, and cabling and connections between the Digital Line port, Data Module, Analog Line port, and Modem.

Testing Modem Pools

There are three types of commands that can be used to test Modem Pool circuits: **`test port`**, **`test modem-pool #`**, and **`test board`**. The **`test port`** command is generally the first test to run after the Error Log is evaluated and an entry is found for a Modem Pool port. The **`test modem-pool #`** command runs the same tests as **`test port short`** performed on a Modem Pool port. However, **`test modem-pool #`** can automatically test every port in the Modem Pool group number specified in **#**. The **`test board`** command performs the same tests as **`test port`** and **`test modem-pool #`** plus additional tests for circuits common to the entire circuit pack.

If the Modem Pool port or group being tested with **`test modem-pool #`** contains Combined Modem Pools, the ports on the associated Analog Line circuit pack and the TN754 Digital Line circuit pack are tested as a group. Note, however, that Combined Modem Pools are not tested and the repair information related to Tests #96, 97, 98, and 99 is not applicable. The Analog port of the Combined Modem port is tested with Analog port tests, and the Digital port of the Combined Modem port is tested with TDMODULE/PDMODULE tests. Therefore, use the repair procedures outlined in the ANL-LINE, ANL-16-L, ANL-NE-L, and TDMODULE/PDMODULE Maintenance documentation when interpreting the results of the execution of **`test modem-pool #`** on Combined Modem Pools.

Error log entries and recommended actions

Table 193: MODEM-PT Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**`test port`** ***`location`***
					1 of 2

Table 193: MODEM-PT Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18	0	**busyout port *location***	WRN	OFF	**release port *location***
130 (b)			WRN	ON	**test port *location***
257		Conversion Resource Loop (#98)	MIN	ON	**test port *location* r 3**
513		Modem Conference (#97)	MIN	ON	**test port *location* l r 3**
769		Modem NPE Crosstalk (#96)	MIN	ON	**test port *location* l r 3**
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 130**: the circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Modem Pool NPE Crosstalk Test (#96)		X	D
Modem Pool Conference Test (#97)		X	D
Modem Pool Conversion Resource Looparound Test (#98)	X	X	ND
Modem Pool Audit Test (#99)	X	X	ND

1. D = Destructive, ND = Nondestructive

Note:

The tests do not apply to Combined Modem Pool conversion resources. The standard Digital Line and/or Analog Line port tests are run on the ports associated with the Combined Modem Pool. Consult the test descriptions for those MOs when repairing Combined Modem Pool arrangements.

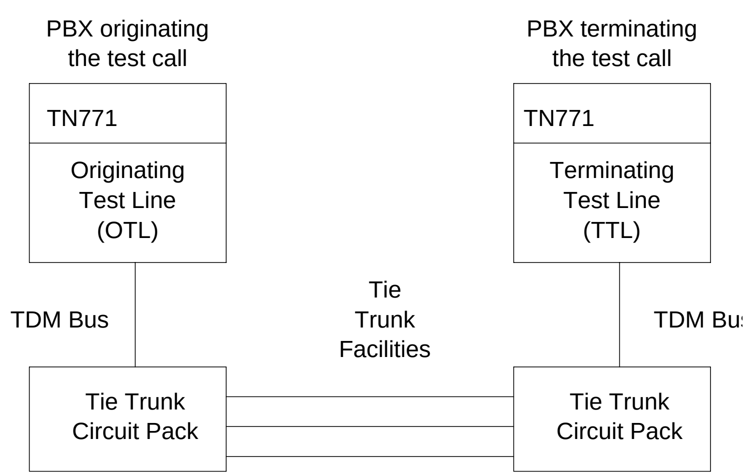
M/T-ANL (Maintenance/Test Analog Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
M/T-ANL	MIN	**test port** ***location*** **l**	Maintenance/Test analog port
	WRN	**release port** ***location***	

The Maintenance/Test analog port is port number 1 on the TN771D Maintenance/ Test circuit pack. This port is used by the Automatic Transmission Measurement System (ATMS) as an Originating Test Line (OTL) or Terminating Test Line (TTL) for test calls over analog trunks. For more details, see Automatic Transmission Measurement System in *Maintenance Procedures (03-300432)*. Figure 48 shows a typical ATMS configuration.

M/T-ANL maintenance ensures that the analog trunk's testing function is operating correctly. Although an M/T-ANL alarm can reduce service, it will not block service. To accurately measure the performance and health of analog trunks, replace an alarmed TN771D when a new circuit pack is available.

Figure 48: ATMS Tie Trunk Test Call



Error log entries and recommended actions

Table 194: M/T-ANL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
1 (b)	41018		MIN	ON	**test port** ***location*** **l r 3**
18	0	**busyout port** ***location***	WRN	OFF	**release port** ***location***
257	Any	GPP NPE Crosstalk Test (#9)	MIN	ON	**test port** ***location*** **l r 3**
513	Any	Analog Port Sanity test (#963)	MIN	ON	**test port** ***location*** **r 2**
769	Any	Analog Port Digital Looparound (#13)	MIN	ON	**test port** ***location*** **r 3**
3840 (c)	Any	Hook State Inquiry test (#566)			

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures. This Error Code appears in the Error Log only if the MTB circuit pack has been removed since the Error Log was last cleared. Verify that the circuit pack has been reinserted.

b. **Error Type 1**: a hardware failure on the Analog Port circuitry. Replace the Maintenance/Test circuit pack if the command does not resolve the alarm.

c. **Error Type 3840**: call processing records did not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test analog port. This error is not service-affecting and no action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Port Sanity Test (#963)	X	X	ND
Local Loop Test (#13)	X	X	ND
GPP NPE Crosstalk Test (#9)		X	ND
Hook State Inquiry Test (#566)	X	X	ND
Clear Error Counters Test (#270)		X	ND

1. D = Destructive, ND = Nondestructive

M/T-BD (Maintenance/Test Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
M/T-BD	MIN	**`test board`** ***`location`*** **`long`**	Maintenance/Test circuit pack
	WRN	**`release board`** ***`location`***	

The Maintenance/Test circuit pack (TN771D) supports packet bus fault detection and bus reconfiguration for the port network where it is installed. The circuit pack also provides Analog Trunk testing, and data loopback testing of DCP Mode 2 endpoints and Digital (ISDN) Trunk facilities via the TDM bus.

Port 1 of the Maintenance/Test board is the Analog Test port which provides the Analog Trunk testing function for Automatic Transmission Measurement System (ATMS). ATMS is a feature in which calls are made from a device called an Originating Test Line (OTL) over a specific trunk to a device called a Terminating Test Line (TTL). The OTL and TTL can then send tones over the trunk under test and determine the quality of the connection. Ports 2 and 3 are the digital ports which provide the digital (ISDN) trunk-testing functions. Port 4 is the packet port which provides the packet bus maintenance function. For more information, see *Maintenance Procedures (03-300432)*.

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit pack-level errors. See also related maintenance/test information for analog, digital, and packet bus ports:

- MG-ANA (Analog Media Module)
- M/T-DIG (Maintenance/Test Digital Port)
- M/T-PKT (Maintenance/Test Packet Bus Port)

Every port except the analog port (Port 1) of the Maintenance/Test board is automatically administered when the circuit pack is inserted into the system and automatically removed when the circuit pack is unplugged from the system. The Analog port however, is administered using the **station** screen with the type “105TL” for an OTL or a TTL. This port remains administered even after the circuit pack is physically removed from the system. Care should be taken to remove the OTL or the TTL before unplugging the circuit pack.

Error log entries and recommended actions

Table 195: M/T-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level[1]	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	0	SAKI Sanity test (#53)	MIN	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
36 (d)	0				
217 (f)			WRN	ON	
257 (e)	0	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* r 3**
267 (f)			WRN	ON	
513 (g)	4352 to 4357				
769 (h)	4358				
1025 (i)	4363	NPE Audit Test (#50)			**test board *location* l**
1538 (j)	0		MIN	ON	
3840 (k)	4096 to 4101				
3999 (l)	Any	None			

1. Major or Minor alarms on this MO may have been downgraded to Warning based on the values in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the circuit pack has stopped functioning. Reset the circuit pack using **busyout board *location***, **reset board *location***, and **release board *location***. If the SAKI Sanity test (#53) passes, the on-board circuitry is healthy. If the SAKI Sanity test (#53) fails, replace the circuit pack.

c. **Error Type 18**: the circuit pack has been busied out by the command **`busyout board`** ***`location`***. Execute **`release board`** ***`location`***.

d. **Error Type 36**: a port processor on the circuit pack failed to initialize. Reset the circuit pack using **`busyout board`** ***`location`***, **`reset board`** ***`location`***, and **`release board`** ***`location`***. If the problem does not go away, replace the circuit pack.

e. **Error Type 257**: a Control Channel Protocol error has occurred. This may be due to the circuit pack detecting an on-board hardware failure. Execute **`busyout board`** ***`location`*** and **`reset board`** ***`location`*** to reset the circuit pack. Any such problem will be detected during initialization, because the circuit pack locks up and appears insane to the system.

f. **Error Type 217, 267**: an extra TN771D circuit pack has been inserted into the port network.

g. **Error Type 513**: an on-board hardware failure has been detected by the circuit pack. Enter the **`busyout board`** ***`location`***, **`reset board`** ***`location`***, and **`release board`** ***`location`*** commands to reset the circuit pack. If the SAKI Sanity test (#53) passes, the circuitry is healthy. If not, replace the circuit pack.

h. **Error Type 769**: program logic error; no action is required. This error may lead to errors of other types being reported against this circuit pack.

i. **Error Type 1025**: the circuit pack cannot update NPE memory and read it back. This Error Type can be ignored, but might lead to errors of other types being reported against this circuit pack.

j. **Error Type 1538**: excessive number of messages have been received from the Maintenance/Test circuit pack. This may be due to a hardware problem on the circuit pack. The switch takes the board out of service and periodically puts it back into service to see if the problem has disappeared. If the problem persists, replace the circuit pack.

k. **Error Type 3840**: the circuit pack received a bad control channel message from the switch. This error is not service affecting and no action is required.

l. **Error Type 3999**: the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type 1538 is absent, then the circuit pack was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Control Channel Looparound Test (#52)	X	X	Nondestructive
NPE Audit Test (#50)		X	Nondestructive

M/T-DIG (Maintenance/Test Digital Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
M/T-DIG	MIN	**test port *location* l**	Maintenance/Test Digital Port
	WRN	**release port *location***	

The Maintenance/Test digital port is a port on the TN771D circuit pack. Ports 2 and 3 are digital ports. The Maintenance/Test digital port provides the ability to perform digital (i.e., ISDN-PRI) trunk testing via the TDM bus. For an ISDN-PRI test call, connections are set up in the system as shown in Figure 49: ISDN-PRI Outgoing Test Call.

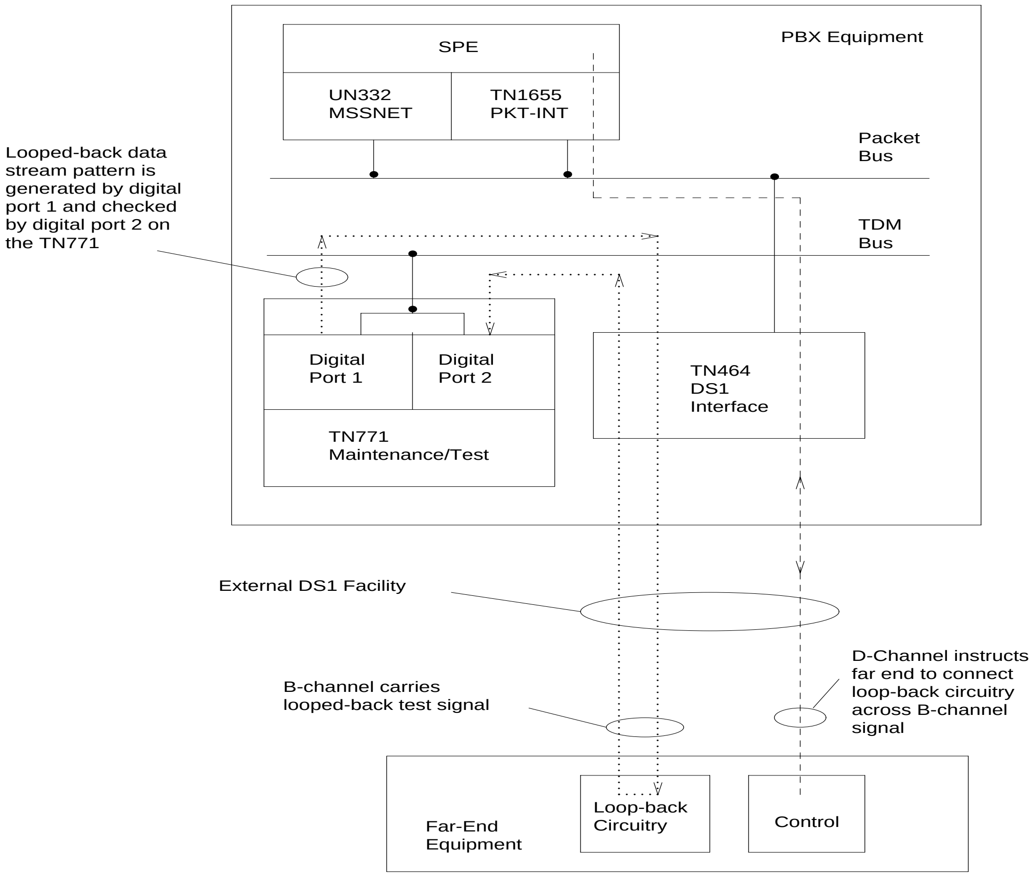
When the Maintenance/Test digital port is participating in an ISDN-PRI test call, the port sends a stream of pseudo-random data along the connected B-Channel. The far end loops back this data, and the Maintenance/Test digital port compares the data to that which was sent. Errors are recorded on a bit and block basis. Refer to ISDN-TRK (DS1 ISDN Trunk) for more information about ISDN-PRI test calls.

The Maintenance/Test digital port maintenance ensures that the digital trunk testing function is operating correctly. The Maintenance/Test digital port is alarmed if maintenance determines that the digital port is operating incorrectly.

Note:

An alarm on the Maintenance/Test digital port reduces service, but does not block it since the ISDN-TRK has other means to determine the health of the ISDN-PRI trunk facility. However, to accurately measure the error performance and to ensure accuracy of the health of the ISDN-PRI trunk, the Maintenance/Test circuit pack should be replaced when a new circuit pack is available.

Figure 49: ISDN-PRI Outgoing Test Call



Error log entries and recommended actions

Table 196: M/T-DIG Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *`location`*
1 (b)	41018		MIN	ON	`test port` *`location`* `l r 3`
18 (c)	0	`busyout port` *`location`*	WRN	OFF	`release port` *`location`*
					1 of 2

Table 196: M/T-DIG Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (d)	Any	GPP NPE Crosstalk Test (#9)	MIN	ON	**test port *location* l r 3**
513 (e)	Any	Digital Port Sanity test (#565)	MIN	ON	**test port *location* r 2**
769 (f)	Any	Digital Port Looparound Test (#13)	MIN	ON	**test port *location* r 3**
3840 (g)	Any	Hook State Inquiry test (#566)			
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: there was a hardware failure on a digital port's circuitry. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the command above.

c. **Error Type 18**: the port was busied out by **busyout port *location***. Release the port using **release port *location***.

d. **Error Type 257**: the Maintenance/Test digital port is talking on more than just its assigned time slot. Replace the Maintenance/Test circuit pack.

e. **Error Type 513**: the Maintenance/Test digital port has failed its self-test. Because the Digital Port Sanity test runs only on port 2, but tests both ports 2 and 3, both ports are alarmed when the test fails. The command indicates to test port 2, even if the error is logged against port 3.

f. **Error Type 769**: the Maintenance/Test digital port was unable to successfully loop data from a tone generator to a tone detector.

g. **Error Type 3840**: call processing records do not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test digital port. This error is not service-affecting and no action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Port Sanity Test (#565)	X	X	ND
Local Loop Test (#13)	X	X	ND
GPP NPE Crosstalk Test (#9)		X	ND
Hook State Inquiry Test (#566)	X	X	ND
Clear Error Counters Test (#270)		X	ND

1. D = Destructive, ND = Nondestructive

M/T-PKT (Maintenance/Test Packet Bus Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
M/T-PKT	MIN	**test port *location* long**	Maintenance/Test Packet Bus port
	WRN	**release port *location***	

The Maintenance/Test packet bus port (M/T-PKT) is Port #4 on the TN771D Maintenance/Test circuit pack. The packet bus port provides the following packet bus maintenance functions:

- Packet bus fault detection

  The ability to detect faults (for example, shorts, open leads) on the packet bus autonomously (i.e., without Communication Manager involvement).

- Packet bus re-configuration

  The ability to swap faulty leads with spare leads autonomously so that the packet bus remains operational. This is accomplished by sending a message to every circuit pack using the packet bus (for example, TN556 ISDN-BRI), telling it which spare leads to use on the bus.

M/T-PKT maintenance ensures that these maintenance functions are operating correctly. The Maintenance/Test packet bus port is alarmed if maintenance determines that the port's maintenance functions are operating incorrectly.

When M/T-PKT maintenance determines that the packet bus port is defective, the packet bus fault-detection and re-configuration functions provided by the port will be turned off.

M/T-PKT maintenance interacts with packet bus maintenance. Therefore, there may be alarms on the packet bus when there is a fault on the M/T-PKT. For further information, refer to the PKT-BUS MO's section.

Error log entries and recommended actions

Table 197: M/T-PKT Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	41018		MIN	ON	**test port *location* l r 3**
					1 of 2

Table 197: M/T-PKT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18 (c)	0	**busyout port *location***	WRN	OFF	**release port *location***
257 (d)	Any		MIN	ON	
513 (e)	Any	Packet Bus Port Health Inquiry (#567)	MIN	ON	**test port *location* r 3**
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: hardware failure with the port circuitry that provides the packet bus maintenance functions. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the test command above.

c. **Error Type 18**: the port has been busied out by **busyout port *location***. Release the port with **release port *location***.

d. **Error Type 257**: the Maintenance/Test packet bus port reconfigured the packet bus by swapping a bad lead to a spare. Note that this error is sent up whenever the Maintenance/Test packet bus port is initialized since the packet bus port reconfigures the packet bus to whatever state it determines the packet bus is in. This will occur if the circuit pack is inserted, if the system is restarted, or if the port is released from a busyout state. Therefore, it is normal for this error to be present in the error log.

   If the M/T-PKT reconfigures the packet bus 6 times within 15 minutes, a Minor alarm is raised indicating that either:

   - Packet bus maintenance functions are not operating correctly
   - Many changes are taking place on the packet bus (insertions or removals of circuit packs)

   If the system has been in a stable state for more than 15 minutes, try the following procedure:

   1. Reset the Maintenance/Test circuit pack from a SAT session as follows:
      a. Enter **busyout board *location***.
      b. Enter **reset board *location***.
      c. Enter **release board *location***.
   2. Wait 15 minutes.

3. If the error recurs, replace the Maintenance/Test circuit pack.

When this alarm is active, the amber LED will be in one of three states:

- An unlit amber LED indicates no activity on the Maintenance/Test circuit pack. You can replace the Maintenance/Test circuit pack.
- If there is an indication of an uncorrectable fault on the packet bus, the amber LED will be blinking at a rate of 1 Hz. It is OK to replace the Maintenance/Test circuit pack. Ignore the packet bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.
- If there is other activity on the Maintenance/Test circuit pack (i.e., ISDN test call), or if there is an indication of a correctable fault on the packet bus, the amber LED will be on steady. If there is an ISDN test call in progress, it must be halted using **`clear isdnpri-testcall`** ***`grp#/mem#`*** prior to replacing the circuit pack. Ignore the packet bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.

e. **Error Type 513**: the Packet Bus Port Health Inquiry test failed. Either the packet bus port has reported a self-test failure, or Communication Manager can communicate with the Maintenance/Test circuit pack but not with the Maintenance/Test circuit pack packet bus port. Refer to the description of the Packet Bus Port Health Inquiry Test (#567), and follow the instructions indicated for the failure code that matches the **Aux Data** field.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Bus Port Health Inquiry Test (#567)	X	X	ND
Clear Error Counters Test (#270)		X	ND

1. D = Destructive, ND = Nondestructive

NO-LIC (No License)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
NO-LIC	MAJ	None	NO License

Note:

The NO-LIC MO is non-traditional in that there are no associated tests or commands that can be executed. There are no demand tests to run.

How systems go into No-License mode

The NO-LIC MO works with the LIC-ERR MO to find any errors/violations associated with the License File. Once a License File error occurs, LIC-ERR logs the error, raises an alarm, and generates the following SAT login message:

"System Administration Will Be Blocked in Approximately XXX hours.
Contact Your Service Representative."

Entry into License-Error mode starts a timer that, when expired, causes the system to enter No-License mode (see Figure 50: License mode algorithm). When Communication Manager enters No-License mode, the following SAT warning message displays:

"System Administration Is Blocked.
Contact Your Service Representative Immediately."

The system also responds with these conditions:

- "LICENSE ERROR" displays on all stations and consoles when they go off-hook, but disappears when the first digit is pressed. This display message does not interfere with the normal use of any station or console.
- All terminal-login sessions are terminated.
- Any subsequent terminal-login sessions are limited to
  - Maintenance commands.
  - License File installation command.

Figure 50: License mode algorithm

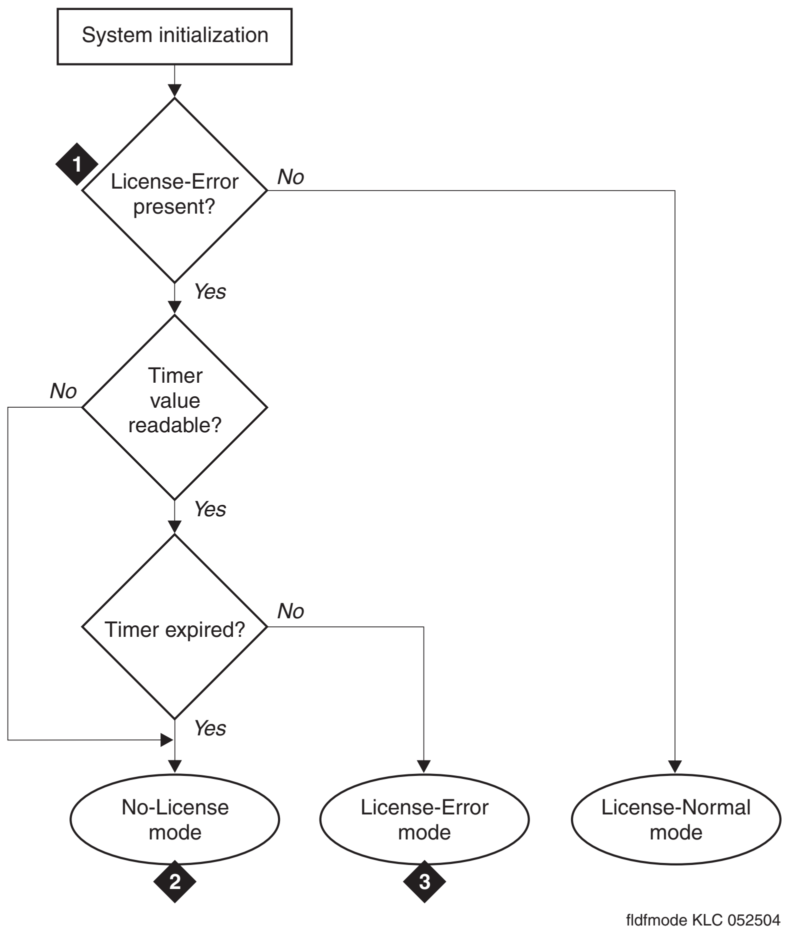


Figure notes:

1. See Troubleshooting License File errors.
2. See How systems go into No-License mode.
3. See Troubleshooting License File errors.

The License File feature is loaded onto a switch during initialization of the switch software, restore of translations, and periodically thereafter. After initialization, a query is made to a software module called the license server. This module reads the License File, compares a serial number in the License File to a serial number in hardware, and compares the software version in the license with the running software version. If a match occurs, the license server delivers a new feature mask, an information set that controls which features are enabled or not on the **Customer Options** and **Special Applications** screens.

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action[1]
1 (a)			MAJ	OFF	
513 (b)			MAJ	OFF	
769 (c)			MAJ	OFF	
1537 (d)			MAJ	OFF	
1793 (e)			MAJ	OFF	
2305 (f)			MAJ	OFF	
2561 (g)			MAJ	OFF	

1. These errors are cleared by installing a valid License File that matches the hardware ID(s).

Notes:

a. **Error Type 1**: There is a serial number mismatch caused by:

- S8700 | S8710 | S8720 | S8500: reference IPSI not responding.
  S8300: motherboard not responding.
- Expiration of the timer.

The system enters No-License mode.

b. **Error Type 513**: the license has expired and:

- A License Error failure has occurred.
- The timer has expired.
- The system enters No-License mode.

c. **Error Type 769**: the system is in the Feature Usage Exceeds Limits mode, and a License Error failure has occurred. System feature use has exceeded limits, and the timer has expired. The system enters No-License mode.

d. **Error Type 1537**: the License File is missing or corrupted. The system enters No-License mode.

e. **Error Type 1793**: a Software Version Mismatch has occurred. The system enters No-License mode.

f. **Error Type 2305**: the Offer Category of the License does not match the Offer Category in translations. The system enters No-License mode.

g. **Error Type 2561**: during the last attempted License File audit, the license server did not respond in time.

Demand tests descriptions and error codes

There are no demand tests for NO-LIC.

NR-CONN (Network-Region Connect)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
NR-CONN	MIN WRN	**test failed-ip-network-region**	Network-Region Connect

A network region is a logical grouping of IP endpoints (including IP stations, IP trunks, and media gateways) sharing the same transmission characteristics and/or VoIP and signaling resources, such as a Media Processor board or a C-LAN. The Network-Region Connect (NR-CONN) MO monitors VoIP connectivity between network regions and raises a:

- Warning alarm for a single failure.

  This alarm is in response to one failed background ping test between IP endpoints in separate network regions. This test is part of the background Network Region Interconnectivity Test (#1417).

- Minor alarm for multiple failures.

  Once a single failure is detected, Test #1417 is re-executed between different IP endpoints in the same pair of network regions. If the test still fails between these network regions:

  – Maintenance software marks the connectivity between them as “failed.”

  – Communication Manager denies every attempted call between them.

As a background operation during each 2-minute interval, Test #1417 checks the translated connections between 50 pairs of network regions until every translated connection has been tested, and then repeats. (The Communication Manager translation table’s maximum capacity for network-region connections is 31,250. Testing every possible connection would require 625 2-minute test intervals during about 21 hours.)

Repair strategies

- Use **display failed-ip-network-region** to display pairs of network regions with failed connectivity. In descending order of severity, this command lists up to 100 network regions with the most severely broken connectivity.
- Use **status ip-network-region** to see the status of connections from a particular network region.
- As an on-demand operation, **test failed-ip-network-region** retests every network-region connection marked as “failed.” Those connections that:

  – Pass are returned to service.

  – Fail are remarked as “failed” and remain on the list of bad connections.

Error log entries and recommended actions

Table 198: NR-CONN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1(a)	0	Network Region Connectivity Test (#1417)	MIN	ON	

Note:

a. **Error Type 1**: one or more network-region connections have failed.

1. Enter **`display failed-ip-network-region`** to verify that connections between pairs of network regions are failing.
2. If so, enter **`test failed-ip-network-region`** to retest these paths.
3. For each affected network region, check the error log for failures to related MOs, such as:
   - IPMEDPRO (IP Media Processor Circuit Pack)
   - MEDPRO (Media Processor MAPD Circuit Pack)
   - CLAN-BD (Control LAN Circuit Pack)
   - DIG-IP-S (Digital IP Station)
   - RDIG-STA (Remote Digital Station)

   and resolve any problems.
4. Enter **`test failed-ip-network-region`** to retest these paths.
5. If errors persist, escalate.

Demand test description and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Network Region Interconnectivity Test (#1417)		X	Nondestructive

NR-REG (Network Region Registrations)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
NR-REG	MIN	none	Network Region Registrations
	WRN	**enable nr-registration** ***network-region***	

The NR-REG maintenance object generates alarms when:

- there has been hyperactive registration of gateways within a network region
- registration from media gateways and IP phones is being denied because the **disable nr-registration** ***network-region*** command was executed.

It is assumed that a Survivable Remote Server is provided for the network region and that the gateways and IP phones will register with the Survivable Remote Server based on the primary search list for gateways and the alternate gatekeeper list for IP phones.

NR-REG alarms will only be generated if hyperactive link bounce detection is enabled on the **system-parameters ip-options** screen. Registration will be denied only if the **disable nr-registration** ***network-region*** command is entered from the SAT.

The hyperactive NR-REG alarms and the associated **disable/enable nr-registration** ***network-region*** commands should only be used for situations where IP network problems cause media gateways and IP phones to repeatedly register and unregister to a server at a rate that is too fast for the normal link bounce strategy to cause the gateways and phones to fail over to a Survivable Remote Server.

The system detects hyperactivity by monitoring the number of link down failures reported to the MED-GTWY maintenance object. When enough link down failures are detected within the administered time frame, an alarm is raised against the offending media gateway. Using this data, a percentage of hyperactive media gateways is calculated and checked against the administered system-wide limit. If the limit is exceeded, a minor alarm is generated for the network region. The system does not try to recover from hyperactivity. It only generates an alarm.

If a certain period of time passes without any additional link down events, the hyperactivity alarm is cleared. The alarm is resolved if less than 50% of the media gateways required to raise an alarm are out of hyperactive mode.

Error log entries and recommended actions

Table 199: NR-REG Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)			MIN	OFF	
257 (b)			WRN	OFF	**enable nr-registration *network-region***

Notes:

a. **Error Type 1**: The percentage of hyperactive media-gateways in a network region exceeds the administered percentage.

1. Enter **disable nr-registration *network-region*** so that gateways and IP phones in the specified network region will register to a Survivable Remote Server. The registration of the IP network endpoints to a server is being disabled, not the IP network region itself. The use of this command is a temporary recovery action, not a corrective action.
2. After the network problem has been corrected, enter **enable nr-registration *network-region*** to enable registration of the IP network endpoints to a server. This will allow them to re-register with the main server depending upon the administered **Recovery Rule** specified on the **change media-gateway** form.

b. **Error Type 257**: Registrations for the network region are currently disabled. Enter **enable nr-registration *network-region*** to enable registration of the ip-network endpoints to a server.

Demand tests descriptions and error codes

There are no demand tests for NR-REG.

OPS-LINE (DS1 Off-Premises Station Line)

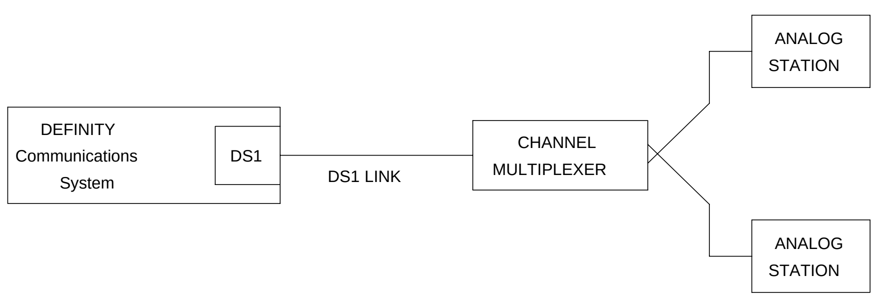
MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
OPS-LINE	MIN	**test station *extension* l**	DS1 OPS Line
	WRN	**test station *extension***	

An analog Off-Premises Station (OPS) can be connected to the system through a DS1 link. A TN767 DS1 Interface circuit pack or a TN464 UDS1 Interface circuit pack can support up to 24 DS1 OPS lines. Since the DS1 OPS is an analog telephone set, a channel multiplexer is necessary as the remote DS1 endpoint converts the digital signal of a DS1 port to the OPS Line and vice versa.

The DS1 OPS Line Maintenance provides a strategy to maintain an OPS Line via a trunk port of the TN767 DS1 Interface circuit pack or the TN464 UDS1 Interface circuit pack. (Throughout this section, the term DS1 Interface can apply to either of these circuit packs.) The strategy covers initialization tests, periodic tests, scheduled tests, demand tests, and alarm resolution and escalation. Two service states are specified in a DS1 OPS Line maintenance. They are: *out-of-service*, in which the line is in a deactivated state and cannot be used for either incoming or outgoing calls; or *in-service*, in which the line is in an activated state and can be used for both incoming and outgoing calls. If the DS1 Interface circuit pack is out-of-service, then every line on the DS1 Interface circuit pack is put into the out-of-service state, and a Warning alarm is raised.

For maintenance of the remote DS1 endpoint (for example, a Channel Division Multiplexer or D4 Channel Bank), refer to the vendor's maintenance documentation for details.

Figure 51: DS1 OPS Line Interactions



Error log entries and recommended actions

Table 200: OPS-LINE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test station *ext***
15 (b)	Any	Port Audit and Update Test (#36)			
18 (c)	0	**busyout station *ext***	WRN	OFF	**release station *ext***
130 (d)			WRN	ON	**test station *ext***
1281		Conference Circuit Test (#7)	MIN	ON	**test station *ext* l r 4**
1537		NPE Crosstalk Test (#6)	MIN	ON	**test station *ext* l r 3**
1793 (e)					**test board *location* l**

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 15**: software audit error which does not indicate a hardware malfunction. Run the short test sequence and investigate associated errors (if any).

c. **Error Type 18**: the DS1 OPS Line was busied out by **busyout station *ext***. No calls can be made on this line. Release the line with **release station *ext***.

d. **Error Type 130**: the circuit pack was removed or was insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 1793** there is a problem with the DS1 Interface circuit pack. Because there is no error against the OPS-LINE port, no alarm is raised against the OPS-LINE port. However, there should be errors logged against the DS1 Interface circuit pack. Look for DS1-BD/ UDS1-BD errors in the Error Log, and follow the procedures in DS1-BD (DS1 Interface Circuit Pack).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 OPS Switchhook Inquiry Test (#312)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

PDMODULE (Processor Data Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PDMODULE[1]	MIN	**test port *location* long**	Processor Data Module
	WRN	**test port *location***	
TDMODULE [2]	MIN	**test port *location* long**	Trunk Data Module
	WRN	**test port *location***	

1. Digital Terminal Data Modules (DTDM), and Data Adaptors (DA) in linked mode are considered part of the Digital Line MO. See the DIG-LINE section for maintenance of these devices. DAs in stand-alone mode are included in PDMODULE.

   Some of the alarms that are logged due to PDMODULE and TDMODULE test failures may be related to circuit-pack problems reported during DIG-BD testing. See XXX-BD (Common Port Circuit Pack/Media Module).

Error log entries and tests also apply to TDMODULE.

The PDMODULE and TDMODULE MOs monitor and test Digital Line circuit pack ports that are connected to Data Communications Equipment (DCE) or Data Terminal Equipment (DTE). DCE include processor data modules (MPDM) and Data Adaptors (DA). DTE include trunk data modules (DTE). These stand-alone data modules provide interfaces between DCP ports on the Digital Line circuit packs and data equipment such as terminals, host computers, and data modems. (See the following list and figure.) Data modules are used for dial-up and permanent circuit-switched data calls.

Digital Line circuit packs also connect to digital terminal data modules (DTDMs), which work in conjunction with a voice terminal. Those configurations are covered by the DIG-LINE MO. Circuit pack-level maintenance is covered by DIG-BD whose strategy is described in the XXX-BD (Common Port Circuit Pack/Media Module).

Digital line circuit packs include the TN754, TN754B, TN413, TN2136. See DIG-LINE (Digital Line) for more information about the characteristics of these circuit packs.

Note:

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

Stand-Alone DCP Data Modules

There are two types of stand-alone DCP data modules as shown in Table 201.

Table 201: Stand-Alone DCP Data Modules

Type	Name[1]	Interfaces to:
MPDM	Modular Processor Data Module	DTE (data terminals, host computers, printers, etc.)
MTDM	Modular Trunk Data Module	DCE (modems, data modules, etc.)

1. Early versions of these data modules were referred to as PDMs and TDMs, respectively. Later models are designed to provide a variety of interfaces by using interchangeable modules and are thus called modular data modules.

Data Adapters

TN2136 circuit packs use IDCP signaling and a DAA2 Data Adaptor (DA) to interface to DTE. DAs can operate in either of two modes which are covered by different MOs:

Table 202: Data Adaptor Modes

DA Mode	Administered as:	Endpoint	Maintenance Object
Stand-Alone	PDM	data endpoint only	PDMODULE
Linked	DTDM	IDT1/2[1] and optional data terminal	DIG-LINE

1. IDT1/2: Italtel Digital Telephone, Model 1 or 2 (also known as Digital Telephones TD7210 and TD7206).

Configurations and Maintenance

The MPDM provides an interface for Data Terminal Equipment (terminals), and the MTDM (see Note) provides an interface for Data Communications Equipment (transmission equipment such as modems).

Note:

Early versions of these data modules were referred to as PDMs and TDMs, respectively. Later models are designed to provide various customer interfaces through the use of interchangeable interface modules and, therefore, are called modular data modules.

In the following discussion, the general term data module refers to MPDMs, MTDMs, and DAs. The PBX loop or digital link between a data module and the Digital Line port supports two logical information channels and one signaling channel. Data modules generally use the primary information channel for data communications and the signaling channel for dialing and call supervision. With 4-wire DCP, the secondary information channel can be used to support a second data module on a shared port.

Besides being used for data calls between terminals, computers, and data communications equipment, data modules also serve as interfaces to equipment associated with system features such as System Administration, Station Message Detailed Recording, Message Center Service, Automatic Call Distribution, Distributed Communications System, and Audio Information Exchange. Maintenance for data modules associated with these latter services are covered by other MOs such as PMS-PRNT, JNL-PRNT, and PMS-LINK.

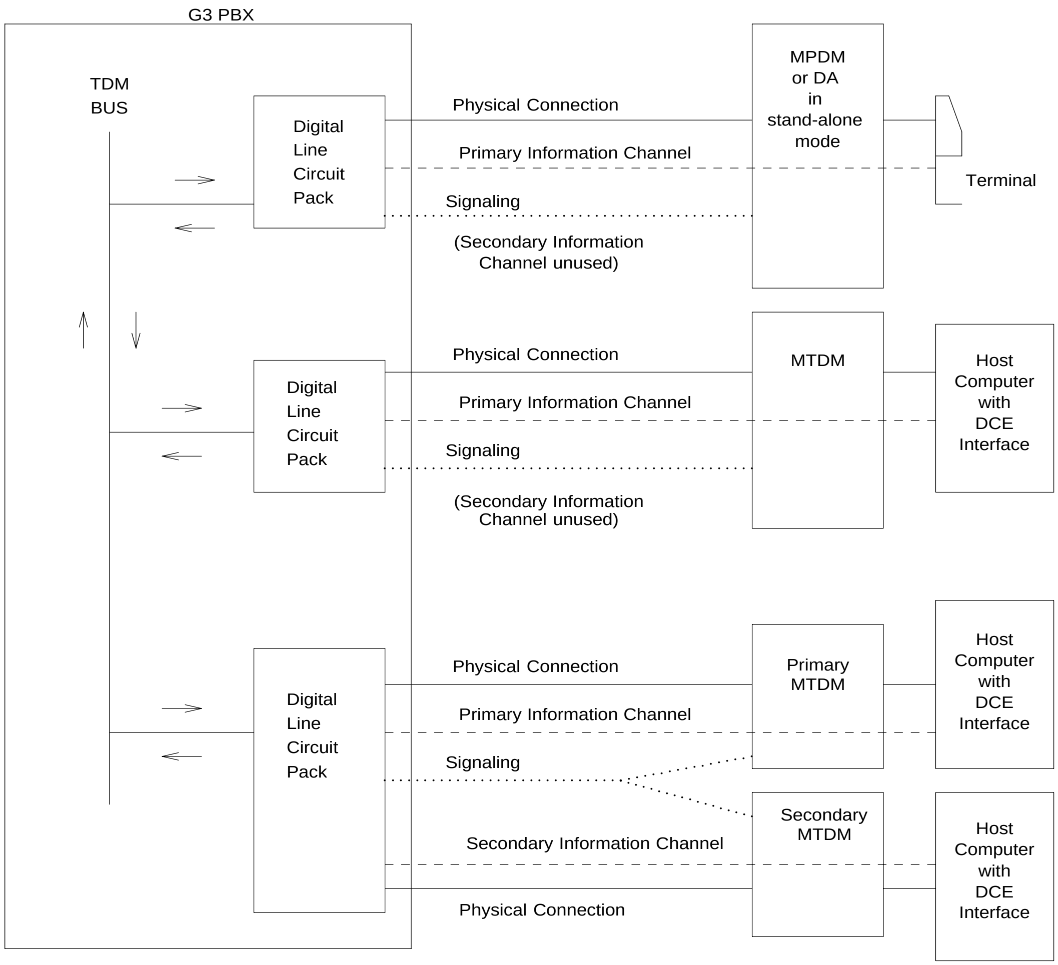
Maintenance of data modules is closely related to and interacts with Digital Line circuit pack maintenance, and test results for data modules can be affected by the health of the Digital Line circuit pack. Keep this interaction in mind when investigating customer-reported problems with data modules.

Data modules provide a variety of option switches to allow the customer to select data rates, parity, keyboard dialing, local, and remote loopback, etc. (The DAA2 Data Adaptor has an AT (Hayes) type interface that allows selection of the above parameters as well as mode linked or stand-alone.) An incorrect selection will not necessarily cause errors, alarms or test failures, but it can result in service disruption. See the installation manual provided with the data module for more information about those options.

This discussion occasionally refers to a station's service state, defined as:

Out-of-Service	The port, and thus the data module, have been removed from service. Causes for this include busyout of the port, removal of the Digital Line circuit pack, and failure of the GPP NPE Crosstalk Test (#9).
Disconnected	The port is administered but the associated digital link does not respond. An administered port is put in a disconnected state after a system reboot or circuit pack insertion. This state persists until a link-reset-pass message is received from firmware on the circuit pack.
In-Service	When switch software receives a link-reset-pass message from the port, the port is placed in service. If the link-reset-pass message is missed, and an off-hook message is received while the port is in the disconnected state, maintenance software will run an ID request test and put the port into service upon receiving a correct response.

Figure 52: Typical Data Module Configurations



Error log entries and recommended actions

Table 203: PDMODULE, TDMODULE Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0				
1 (b, n)	40987		WRN	OFF	
1 (c, n)	1 – 20		WRN	OFF	
					1 of 2

Table 203: PDMODULE, TDMODULE Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
15 (d)	Any				
18 (e)	0	**busyout port *location***	WRN	OFF	**release port *location***
257 (f)	40971				
513	0	Digital Station Audits (#17)	WRN	OFF	**test port *location* r 6**
769 (g, n)	40988		WRN	OFF	
1281	Any	Digital Station Audits (#17)	WRN	OFF	**test port *location* r 4**
1537 (h, n)	40968		WRN	OFF	
1793		Information and Control Channel Looparound (#13)	MIN	ON	**test port *location* l r 3**
2049		GPP NPE Crosstalk (#9)	MIN	ON	**test port *location* l r 3**
2304 (i)					
2305 (j)	32770				
2305 (k)	40967				
2561 (l)	Any	Data Module Internal Looparound (#175)	WRN	OFF	**test port *location* l r 5**
2817 (m)		Link GPP Loop (#183) Against Links	MAJ	ON	
3841 (n)					
					2 of 2

Notes:

a. **Error Type 0:** a Digital Line circuit pack that has ports administered has been removed since the Error Log was last cleared. Make sure that the circuit pack has been re-inserted.

b. **Error Type 1, Aux Data 40987:** an off-board problem was detected by the port circuit, and may result in a noisy port or link. See Note (n) for recommendations.

Note:

Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring*.

c. **Error Type 1, Aux Data 1 - 20** is logged when at least 15 off-board problems have been detected with the link to the data module. Each error detected increments an on-board counter. The aux data gives the value of this counter divided by 15. The user could experience a noisy port or link. See Note (n) for recommendations.

Note:

Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring*.

d. **Error Type 15:** an internal error that occurs when an audit request fails.

e. **Error Type 18:** the port in question is demand busied out. Release the port with `release port` *`location`*.

f. **Error Type 257:** problems with transmitting to the data module. This is usually an on-board problem and can be ignored if no user complaints are received. Otherwise, check for faulty wiring.

g. **Error Type 769**: EPF has been turned off due to the overcurrent condition at the data module. See the recommendations in note *n*. This may also be caused by the PTC being in the "tripped" position due to a short on the power line. You can correct this by removing the short, unplugging the data module from the wall for about 30 seconds, and plugging it back in.

Note:

Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring*.

h. **Error Type 1537**: there is a problem with the link to the data module. This can be ignored if no user complaints are received. Otherwise, see Note (n) for recommendations.

Note:

Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring*.

i. **Error Type 2304**: internal error. No action is necessary.

j. **Error Type 2305, Aux Data 32770**: the data equipment went off-hook while the associated link was being initialized (in a disconnected state). Use `status data-module` to determine the state of the data module. The off-hook should have changed the service state to in-service. No action is necessary.

k. **Error Type 2305, Aux Data 40967**: the link between the circuit pack and the data module has been reset successfully. The link is normally reset when the circuit pack associated with an administered port is first plugged in (assuming that the data module is already in place and connected to the associated port), when a port is first administered (assuming the associated circuit pack is plugged in and that the data module is connected to the associated port), or when a data module is first connected to an administered port. No action is necessary.

l. **Error Type 2561**: the downlink buffer on the circuit pack has overflowed. No action is necessary.

m. **Error Type 2817**: a DCP endpoint may have been disconnected.

n. **Error Type 1, 769, 1537, 3841**: make sure the data module is connected and operating properly. Check for faulty wiring. If necessary, reduce the length of the cable between the data module and the switch to 5000 ft. for 24-gauge wire or 4000 ft. for 24-gauge wire.

   If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired in 60 minutes (90 min. for error 1537).

   The DA module is not phantom-powered from the port. Thus when it is in linked mode, its range is limited by the Italtel digital phone's limit: 0.7 Km (2300 ft.) on 26-gauge wire or 1.8 Km (5900 ft.) on 22-gauge (0.6 mm) wire. If in stand-alone mode, it is limited by the maximum length of loop allowed from the Digital Line Interface (DLI) component: up to 3.5 km (2 miles) on 22-gauge (0.6 mm) wire.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Data Module Internal Looparound Test (#175)		X	ND
GPP NPE Crosstalk Test (#9)		X	ND
Local Loop Test (#13)		X	ND
Digital Station Audits Test (#17)	X	X	ND

1. D = Destructive; ND = Nondestructive

_PE (Processor Ethernet) Alarms

The _PE alarms are raised for the following servers:

- S8720
- S8730

PE interface alarms

_PE 1 Minor alarm: PE Health Check device is not responding.

MO name in log	Alarm level	Alarm text	Description
_PE 1	MIN	`Can't ping the PE Health Check device.`	Processor Ethernet (PE) Health Check device is not responding. Cannot ping the PE Health Check device.

Resolution:

1. Log on to System Management Interface.
2. From the Installation menu, click **Configure Server**. The Configure Server wizard opens.
3. On the Configure Interfaces screen, verify if **IP address for PE Health Check** is set to the gateway address.
4. Execute the Ping diagnostics test to verify that the endpoint used for the PE Health Check device (the gateway) responds to a ping request. For more information about the Ping diagnostics test, see the System Management Interface **Help**.

_PE 2 Minor alarm: PE on other server is not responding.

MO name in log	Alarm level	Alarm text	Description
_PE 2	MIN	`Can't ping the other server over the network used by the PE Interface.`	Processor Ethernet (PE) on the other server is not responding. Cannot ping the other server over the network used by the Processor Ethernet interface.

Resolution:

1. Log on to the System Management Interface.
2. Click the **Administration** tab and select **Server (Maintenance)**.
3. On the left navigation menu, click **Status Summary**. The Status Summary screen appears.
4. Verify that the other server in the duplicated server pair is running and that the Processor Ethernet status is not **Down**.
   - If the other server in the duplicated server pair is not running, the status of Mode is **Not Ready** and the display of items such as "Alarms" are blank.
   - If he Processor Ethernet status is not **Down**, run the troubleshooting procedures for the alarms on the other server.
     For more information about the troubleshooting procedures, see *Avaya Aura™ Communication Manager Server Alarms, (03-602798)*.
5. Execute the Ping diagnostic test to verify that the other server responds to a ping test. If it does not, execute the Ping diagnostics test from the other server to verify that it is connected to the corporate LAN.

_PE 3 Major alarm - Processor Ethernet service is down

MO name in log	Alarm level	Alarm text	Description
_PE 3	MAJ	`Can't ping the device used for the PE Health Check or the IP interface used for the PE on the other server.`	Processor Ethernet service is down. Cannot ping the PE Health Check device and the IP interface used for the PE on the other server.

Resolution:

1. Run the tests listed for the alarms associated with _PE 1 and _PE 2.
2. Verify if that the server is connected to the corporate LAN.
3. If NIC alarms are present, follow the troubleshooting procedures for those alarms. For more information, see Verify NIC Options Test (#1511) on page 1676.
4. Verify that the corporate LAN is working.

PE Interchange Priority Mismatch Alarm

_PE 4 Minor alarm: PE Priority configuration mismatch between servers

MO name in log	Alarm level	Alarm text	Description
_PE 4	MIN	None	The PE Interchange Priority setting on the Configure Interfaces page of the System Management Interface of one of the servers of a duplicated pair of server does not match the PE Interchange Priority setting on the Configure Interfaces page of the System Management Interface of the other server.

Resolution:

1. On the Status Summary screen of System Management Interface, verify that the PE Interchange Priority setting on the active server is the same as the PE Interchange Priority setting on the standby server.
2. On the Configure Interface screen of System Management Interface (that displays the incorrect value) change the incorrect value of the PE Interchange Priority setting.

Note:

Make sure that the server on which you are changing the settings on the Configure Interface screen is on the standby server.

PE-BCHL (PRI Endpoint Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PE-BCHL[1]	MIN	**test port *location* long**	PRI Endpoint Port
PE-BCHL	WRN	**test port *location***	PRI Endpoint Port

1. For additional repair information, see also UDS1-BD (UDS1 Interface Circuit Pack) and Troubleshooting ISDN-PRI endpoints (wideband) in *Maintenance Procedures (03-300432)*.

A PRI endpoint provides ISDN-PRI (Primary Rate Interface) connections application equipment or terminal adapters that terminate ISDN PRI. The equipment or terminal adapters are connected to the switch via the TN464C/D UDS1 interface circuit pack. This MO monitors the PRI endpoint's port hardware on the UDS1 circuit pack by:

- Logging hardware errors
- Running tests for port initialization
- Running periodic and scheduled maintenance
- Executing demand tests

Wideband Switching

Wideband switching supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. Switching capabilities support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

Wideband switching is designed for ISDN application equipment such as ISDN video codecs, but can also interface to non-ISDN application equipment by using PRI terminal adapters. In the same sense that a data module acts as a DCP or BRI terminal adapter between endpoint data, such as V.35 and dialing interfaces such as RS-366 and a DCP interface, a PRI terminal adapter acts as a wideband terminal adapter between endpoint data and dialing interfaces and a line-side ISDN-PRI interface. Wideband switching introduces PRI endpoints on line-side interfaces.

A PRI endpoint has a unique extension number and consists of one or more contiguous B-Channels on a line-side T1 or E1 ISDN-PRI facility. Endpoints initiate and receive calls via ISDN SETUP messages indicating the data rate and specific B-Channels to be used, and communicate all other call status information via standard ISDN messages. Any ISDN signaling set such as Avaya, CCITT, or ECMA may be used for a line-side ISDN-PRI facility.

Multiple PRI endpoints on one line-side facility are separate and distinct within the facility. Non-overlapping contiguous sets of B-Channels are associated with each PRI endpoint, and the endpoint equipment is expected to initiate calls within these boundaries. The endpoint application equipment must:

- Use standard ISDN-PRI signaling
- Adhere to the administered PRI endpoint boundaries when initiating calls
- Handle incoming calls appropriately, based on the originating PRI endpoint

Signaling and B-Channel States

PRI ports use a separate channel called the D-Channel for call-control and signaling messages. This is called out-of-band signaling. The D-Channel associated with the set of B-Channels is an ISDN-PRI signaling link's port (ISDN-PLK). The signaling protocol used on the ISDN-PRI signaling-link port's D channel is defined by one of the four selectable ISDN-PRI Specifications: Avaya, CCITT, ECMA, and ANSI.

The ISDN-PRI Specification defines the possible service states for a B-Channel. The service state is negotiated with the far-end terminal adapter, changes over time, and can have far- and near-end components. The service state is initialized to Out-Of-Service/Far-End, and an attempt is made to negotiate it to In-Service. Use **`status pri-endpoint`** ***`extension`*** to display the service state of a particular PRI endpoint port's B-Channel.

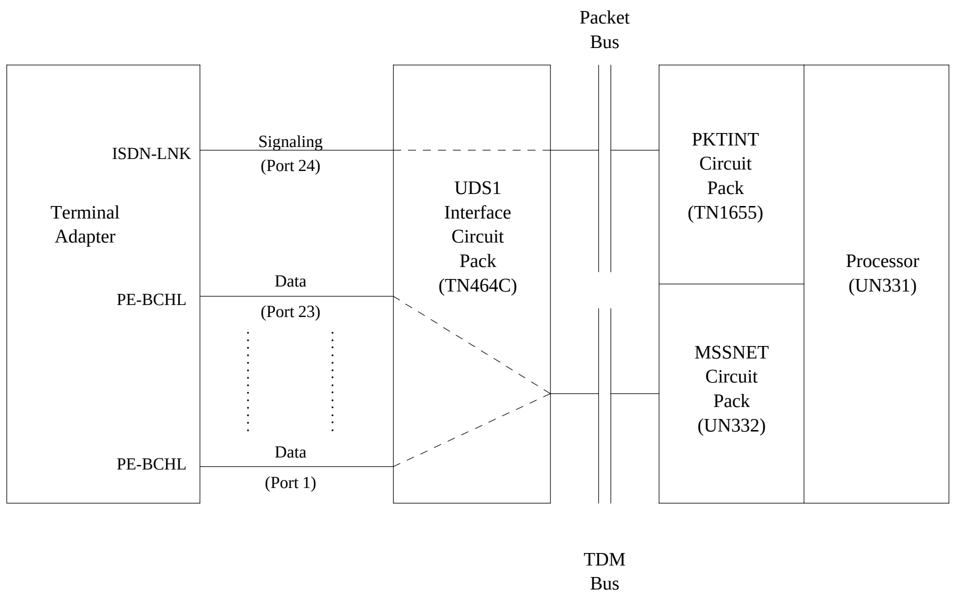
If a call is present, the Specification defines the permissible call states as well. There are tests in the short and long test sequences for the PRI endpoint port designed to audit these states and ensure agreement between both ends of the PRI wideband connection.

Alarming Based on Service States

A PRI endpoint port's B-Channel logs a warning alarm when it is placed in a Maintenance/ Far-End or Out-Of-Service/Far-End state. While in such a state, the port is unusable for calls to the terminal adapter. However, the user can still use the other remaining ports in the PRI endpoint to make calls to and from the terminal adapter. When a warning alarm is raised, use **`status pri-endpoint`** ***`extension`*** to determine the exact state of the port. Other alarms can be diagnosed by using the short and long test sequences. Note that a PRI endpoint port's B-Channel can be placed in a far-end service state by direct action by the far-end terminal adapter or by inaction of the far-end terminal adapter. For example, if it does not respond to a Remote Layer 3 Query (see Remote Layer 3 Query (#637) for ISDN-PLK) the associated PRI endpoint port's B-Channels will be placed in the Maintenance/Far-End service state.

A PRI endpoint port is a port on a UDS1 interface circuit pack and thus depends on the health of the circuit pack for proper operation (see the following figure). A problem on the associated ISDN-LNK's (ISDN-PRI signaling-link port's) D-Channel can also affect the PRI endpoint. In turn, the ISDN-PLK depends on the SYS-LINK (system link) to the packet interface. Keep this hierarchy of dependencies in mind when diagnosing problems.

Figure 53: PRI Endpoint Port Interactions



PRI Endpoint Port Service States

The **status pri-endpoint** ***extension*** command displays the following possible service states for PRI endpoint ports. The table that follows gives recommended procedures for each state. The figure following that shows typical progressions from one service state to another. Refer also to Troubleshooting ISDN-PRI endpoints (wideband) in *Maintenance Procedures (03-300432)* for a layered approach to addressing PRI endpoint problems.

- In-Service (INS)

  The B-Channel is in its normal operating state.

- Out-of-Service/Far-End (OOS/FE)

  A B-Channel is initialized to this state when first administered. The switch then sends messages to the far-end terminal adapter to negotiate the B channel into service. If the far-end terminal adapter does not respond to the messages within a certain time period, the port remains out of service, and maintenance will periodically resend the messages. The port is unusable for incoming and outgoing calls, although other ports in the PRI endpoint can still be used.

- Out-of-Service/Near-End (OOS/NE)

  This is the state of the port when a hardware failure exists on the signaling link, the NPE Crosstalk test fails, or when the port is busied out by command. In this state, the port is unusable for calls coming into the switch or going out to the terminal adapter, although other ports in the PRI endpoint can still be used for incoming and outgoing calls. No messages are sent to the far-end terminal adapter until the signaling link comes back into service or the port is released by command.

- Maintenance/Far-End (MTC/FE)

  This state is reached when the far-end terminal adapter does not respond to messages sent over the signaling link for a particular port within a certain amount of time. This state is different from OOS/FE since the signaling link must have initially been up and the B-Channels in service. The switch will periodically send messages to the far-end terminal adapter to try to negotiate the port (B-Channel) into service. The port is unusable for outgoing calls to the terminal adapter but will service incoming call requests from the far end. Other ports of the PRI endpoint can still to place outgoing calls to the terminal adapter. Transitions into MTC/FE do not drop stable calls. If the service state changes from in-service to MTC/FE, stable calls are unaffected.

- Maintenance/Near-End (MTC/NE)

  Use **`busyout`**, **`test port l`** or **`test pri-endpoint l`** to busy out the signaling link (SYS-LINK). Transitions into MTC/NE do not drop stable calls. The **`busyout link`** ***`lnk-no`*** command does not drop stable wideband calls. In this state, the B-Channel is not usable for new incoming calls to the switch or new outgoing calls to the terminal adapter.

- Pending States (PEND)

  If the near end is expecting a timed response from the far end for a request to change the service state of a port, a *pending* state is in effect. For example, if the port is out-of-service/far-end and an in-service message was sent to the far end, then the service state of the port is OOS/FE-PEND/INS meaning out-of-service/far-end, pending/in-service. The service state will reflect this pending state until the far end responds or the timer expires.

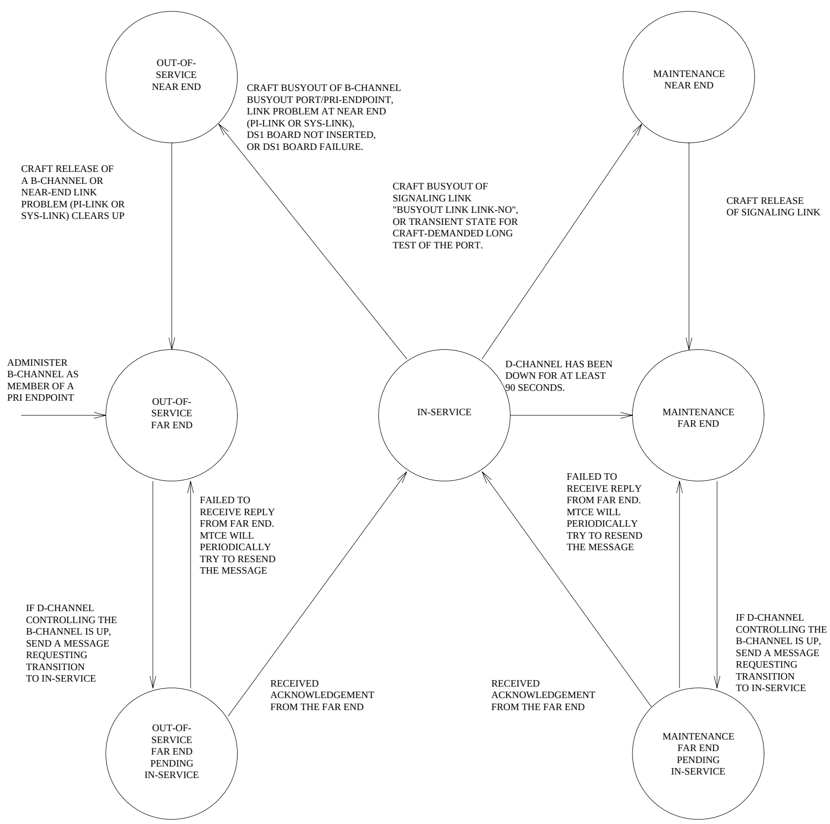
Table 204: PRI Endpoint Port Service States *1 of 2*

Service State	Alarm	Possible Cause	Possible Solution
OOS/NE	WRN	Port has been busied out by command.	Enter **`release pri-endpoint`** ***`extension`***.
	MIN	NPE Crosstalk test (#6) failed.	Replace UDS1 circuit pack.
		UDS1 circuit pack lost its signal.	Is the UDS1 circuit pack removed? Is the UDS1 cable disconnected? Is the far-end terminal restarting or experiencing problems? Check circuit pack using UDS1-BD procedure.
OOS/FE	WRN	Far-end problems or incompatibility	Check administration and status of the corresponding port on the terminal adapter.
	WRN	The far-end port is busied out.	Check the status of the far-end terminal adapter.
OOS/FE PINS		Service message was sent and the switch is waiting up to 2 minutes for a reply from the far-end terminal adapter.	Wait 2 minutes, and check service state after the PINS state has cleared.
MTC/NE		System link demand busied out	Check link status. Release with **`release link`** ***`link#`***.
MTC/FE	WRN	Signaling channel has been down for over 90 sec.	Consult ISDN-SGRP, ISDN-SLK and/or SYS-LINK. Far-end terminal adapter may currently be restarting.
	WRN	Repeated failure of far end to respond to messages.	Maintenance software will periodically try to resend messages. You can speed the process with **`test port`** ***`location`*** (Test #256).
	WRN	The far-end port is being tested.	Check status of the far-end terminal adapter.
			1 of 2

Table 204: PRI Endpoint Port Service States *2 of 2*

Service State	Alarm	Possible Cause	Possible Solution
MTC/FE PINS		Service message was sent, and the switch is waiting up to 2 minutes for a reply from the far-end terminal adapter.	Wait 2 minutes, and check service state after the PINS state has cleared.
INS		Normal operating state. ISDN wideband calls are completing.	
			2 of 2

Figure 54: Common Progressions in PRI Endpoint Service States



Error log entries and recommended actions

Table 205: PE-BCHL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	Any				**test port *location***
15 (c)	Any	Port Audit and Update test (#36)			
18 (d)	0	**busyout pri-endpoint *extension*** **busyout port *location***			**release pri-endpoint *extension*** **release port *location***
129 (e)			WRN	OFF	**test port *location***
130 (f)			WRN	ON	**test port *location***
257 (g)	Any				**test port *location***
513 (h)	Any		WRN	OFF	**test port *location***
769 (g)	Any				**test port *location***
1281 (i)	Any	Conference Circuit Test (#7)	MIN	ON	**test port *location* l r 4**
1537 (j)	Any	NPE Crosstalk Test (#6)	MIN	ON	**test port *location* l r 3**
1793 (k)	Any				**test port *location***
3073 (l)	Any	Service State audit (#256)			**test port *location* r 2**
3585 (m)	Any				

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: disagreement between this switch and the terminal adapter at the other end of the connection with regard to the ISDN call state of the PRI endpoint port. This switch will automatically try to recover by clearing the call (the call will be torn down). Use **status pri-endpoint *extension*** to determine the state of the port.

When running the short test sequence, note the results of the Call State Audit Test (#257).

c. **Error Type 15**: software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors.

d. **Error Type 18**: the PRI endpoint port has been busied out by **busyout pri-endpoint *extension*** or **busyout port *location***. No wideband calls can be made to this port, although wideband calls can still be made to other ports within this PRI endpoint if they are in service. Release the port with **release port *location***.

e. **Error Type 129**: the far-end terminal adapter changed its ISDN *service* state to out-of-service or maintenance. This may be a temporary condition due to testing of this port by the far-end terminal adapter or a hardware problem with the port. Outgoing calls to the terminal adapter will not be allowed over the port, although calls can still be made to other ports that are in service within the same PRI endpoint. To investigate the status of the port, enter **status pri-endpoint *extension***.

f. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

g. **Error Types 257**, **769**: disagreement between this switch and the terminal adapter at the other end of the connection with regard to the ISDN service state of the PRI endpoint port. The switch will automatically try to recover by performing a service state audit. Use **status pri-endpoint *extension*** to determine the state of the port.

When running the short test sequence, note the results of the Service State Audit Test (#256).

h. **Error Type 513**: This port is not recognized by the far-end terminal adapter. Investigate the PRI endpoint administration for both the switch and the terminal adapter, and make sure they agree.

i. **Error Type 1281**: The Conference Circuit test (#7) failed on this port. See Conference Circuit Test (#7) for repair procedures.

j. **Error Type 1537**: The NPE Crosstalk test (#6) failed on this port. See NPE Crosstalk Test (#6) for repair procedures.

k. **Error Type 1793**: failure of the UDS1 Interface circuit pack. Run the short test sequence and note the results of the Signaling Link State Audit Test (#255).

l. **Error Type 3073**: Two Service State audit attempts have failed (see Service State Audit Test (#256)). The port will not be usable for any outgoing calls to the terminal adapter until the test passes and the port state is changed to in-service. Incoming calls from the terminal adapter *will* be accepted over this port, and other ports in the PRI endpoint can still be used for both incoming and outgoing calls to and from the terminal adapter.

m. **Error Type 3585**: the switch received an ISDN RESTART message for an ISDN port that is not idle. Because calls are not typically cleared with the RESTART message, this Error Type may be associated with a dropped call report from a user.

The following Aux Data values for Error Type 3585 represent the port's ISDN call state at the time the unexpected RESTART request was received from the terminal adapter. This information can be useful if dropped calls are being reported by users of the PRI endpoint. Aux Data values that do not appear below can be ignored.

Table 206: PE-BCHL - Error 3585 Aux Data Values

Aux Data	Meaning
10	A call in a stable, talking state (the *active* state) was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
4 7 8 260 263	A call that has not reached the active state, but has at least reached a ringing state, was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
1 3 6 265	A call that has not yet reached a ringing state was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
11 12 19 267 268 531	A call that was already in the process of clearing has been cleared by the far-end terminal adapter with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far-end terminal adapter is attempting to clear ports that it thinks are in a "hung" state. The RESTART message puts the port in an idle condition.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit And Update Test (#36)	X	X	ND
Signaling Link State Audit Test (#255)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND

1. D = Destructive; ND = Nondestructive

PKT-BUS (Packet Bus)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
PKT-BUS	MAJ	**test pkt *P* long r 2**[1]	Packet Bus
	MIN WRN	**test pkt *P* long**	

1. ***P*** is the port-network number indicated in the PORT field from the Alarm or Error Log.

The packet bus consists of a single bus, and one such bus appears in each port network. The packet bus in each port network is physically independent from those in other port networks, so each port network has a separate PKT-BUS MO. This bus supports the following types of connections:

- Logical control links between the server and every PN
- ISDN-BRI D-channel transport (signaling)
- ASAI D-channel transport (signaling)
- ISDN-PRI D-channel (signaling)
- System Access Ports

The TN2312AP IPSI circuit pack's Packet Interface circuit provides an interface to the packet bus for the server. Packet bus testing depends on the TN771D Maintenance/Test circuit pack. Packet Bus tests will abort if the TN771D circuit pack is not inserted in the port network.

The interactions between the packet bus and the circuit packs that use the bus are complex. Circuit pack failures can alarm the packet bus, while packet bus faults can alarm or interrupt service to one or more circuit packs and their ports and endpoints. The Isolating and repairing packet-bus faults section in *Maintenance Procedures (03-300432)* describes packet bus maintenance and interactions with circuit packs. That section should be referenced for all troubleshooting and repairs. The flowchart is the normal starting point for experienced technicians.

This section on the PKT-BUS MO is limited to a description of the Error and Alarm Log entries and the test sequence for the packet bus. The following list summarizes some of the important points to consider when working with the packet bus.

- The Maintenance/Test circuit pack (TN771D) is a critical tool for isolating packet bus faults. This circuit pack resides in each port network of a critical-reliability system (duplicated servers *and* PNC). If a TN771D is absent, *one must be taken to the customer site* to allow for proper fault isolation. Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)* describes the Packet Bus testing facilities of the TN771D and when one must be taken to the customer site.

- Certain catastrophic packet bus faults have an effect on maintenance software activities relating to packet circuit packs, ports, and endpoints:
  - Packet circuit pack (BRI-BD, UDS1-BD) inline errors indicating possible Packet Bus test failures are logged in the error log, but are not acted upon.
  - Port-level (BRI-PORT, ABRI-PORT) inline errors on Packet circuit packs which indicate possible Packet Bus failures are not logged or acted upon.
  - Circuit pack and port inline errors that are not relevant to the Packet Bus, or that indicate a circuit pack failure, are acted upon in the normal fashion.
  - Periodic and scheduled background maintenance are not affected.
  - Foreground maintenance (for example, a **`test board`** command executed at a terminal) is not affected.

  The actions in the previous list serve to reduce the system load, which could become excessive if many MOs are affected by a packet bus failure. However, such an excessive load should in no way impede the isolation and the correction of the faults.

  When the above actions are implemented, Error Type 3329 is logged against PKT-BUS, and a Warning alarm is raised. Other Packet Bus errors may raise more severe alarms, thereby overriding the Warning alarm.

- S8700-series Fiber-PNC: Since all packet traffic requires communication with the IPSI's PKT-INT circuit in an IPSI connected PN, a PKT-BUS failure in the IPSI connected PN causes packet traffic in this PN, and every PN controlled by the IPSI connected PN, to fail. In the S8700 Fiber-PNC configuration where some PNs are non IPSI connected, an IPSI connected PN PKT-BUS fault should be investigated first whenever PKT-BUS problems occur in multiple PNs.

Error log entries and recommended action

Table 207: PKT-BUS Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Recommended Action
0 (a)	0	Any	Any	Any	**`test pkt port-network`**
1 (b)	1–2	Packet circuit pack Audit (#570)	MAJ	ON	**`test pkt port-network`** ***`P`*** **`l r 2`**
513 (c)	1–2 4	Maintenance/Test Circuit Pack Query test (#572)	MAJ	ON	**`test pkt port-network`** ***`P`*** **`l r 2`**
1793 (d)	Any				
					1 of 2

Table 207: PKT-BUS Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Recommended Action
2049 (e)	1–3	Maintenance/Test Circuit Pack Query test (#572)	MIN	ON	**test pkt port-network *P* 1 r 2**
2305 (f)	1–2 4	Maintenance/Test Circuit Pack Query test (#572)			**test pkt port-network *P* 1**
3329 (g)	1–7		WRN	ON	**test pkt port-network *P* 1**
3585 (h)	Any		MIN	ON	**test pkt port-network *P* 1**
3841 (i)	Any		MIN	OFF	
					2 of 2

1. ON-BOARD indicates a problem with the packet bus itself.

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

b. **Error Type 1**: Within the last minute, packet circuit packs have reported errors that indicate a possible packet bus failure. The Aux Data value is 1 or 2, indicating that only one or more than one Packet circuit pack (respectively) have reported a possible packet bus failure.

c. **Error Type 513**: The Maintenance/Test packet bus port (M/T-PKT) for this port network has determined that there are more packet bus faults than the port can correct. The Aux Data value indicates the number of faulty leads.

d. **Error Type 1793**: Packet circuit packs have detected possible packet bus failures via inline error or via background test failure. Examine the Error and Alarm logs for more specific PKT-BUS errors.

e. **Error Type 2049**: **S8700-series Fiber-PNC**: The Maintenance/Test packet bus port (M/T-PKT) has detected a Packet Bus fault and has taken corrective action by swapping to spare leads. This error appears only in high/critical-reliability systems (duplicated PNC). The Aux Data value indicates the number of faulty leads. If this is the only active error against the packet bus, *the packet bus is still in service*. Due to the disruptive nature of the packet bus Fault Isolation and Correction procedures, repairs should be deferred until a time when the least interruption in service would result. This should be determined by consultation with the customer. However, do not delay repairs for too long, since the switch cannot recover from another packet bus failure until the current one is resolved. Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)* contains a sub-section, *A Special Precaution Concerning the TN771D* that describes how to ensure that the TN771D is providing correct information. A new TN771D may need to be taken to the customer site.

f. **Error Type 2305**: The Maintenance/Test packet bus port (M/T-PKT) has detected open leads on the packet bus. The Aux Data value indicates the number of open leads.

g. **Error Type 3329**: Packet circuit pack, port, and endpoint maintenance has been disabled due to a packet bus failure. The Aux Data value indicates the cause:

Aux Data	Cause
1	inline errors from packet circuit packs
2	Uncorrectable packet bus fault reported
	Maintenance/Test packet bus port (M/T-PKT)
3	Both of the above
100*x*	Packet-related circuit pack, port, and endpoint maintenance in the PN has been disabled due to a packet bus failure in the PN. The last digit has the same meaning as the single digits listed above.

Keep in mind that although only packet circuit packs can detect and report packet bus problems, such problems can be caused by any circuit pack.

h. **Error Type 3585**: Packet circuit pack, port, and endpoint maintenance has been disabled due to more than one circuit pack reporting inline errors. If this occurs more than three times in 15 minutes a Minor alarm is raised against the packet bus. This happens when maintenance is disabled due to errors and is then re-enabled because no more errors are reported.

This error may still be present in the error log even though the Packet Circuit Pack Audit Test (#573) indicates that only one circuit pack is reporting a problem. This happens when more than one circuit pack has reported errors in any 1-minute interval since the packet bus fault occurred.

i. **Error Type 3841**: The Maintenance/Test packet bus port (M/T-PKT) for this port network is not in service. This alarm does not appear for PNs in standard- or high-reliability systems since a TN771D is not required there. The error indicates one or more of the following:

- The packet bus port has been busied out (indicated by Error Type 18), and a Warning alarm is active against M/T-PKT in the same port network. Release the port by entering **`release port`** ***`location`*** **`04`**.
- The packet bus port has failed. Look for alarms against M/T-PKT, and attempt to resolve these alarms.
- The Maintenance/Test circuit pack was not recognized by the system at the last system restart. Replace the Maintenance/Test circuit pack.
- There is no Maintenance/Test circuit pack in this port network. One must be installed.

The TN771 must be installed before other packet bus alarms can be resolved. (Alarms against a given MO are not resolved until every alarm-generating condition has been cleared).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Packet Circuit Pack Audit Test (#573)	X	X	Nondestructive
Maintenance/Test Circuit Pack Query Test (#572)	X	X	Nondestructive

PKT-INT (Packet Interface)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PKT-INT	MAJ MIN WRN	**reset packet-interface *location***	Packet Interface

The Packet Interface (PKT-INT) MO resides on the TN2312 IP Server Interface (IPSI) circuit pack and serves as an interface between the server and the packet bus.

The functionality of the TN1655 PKT-INT and TN2182 Tone-Clock circuit packs are on the TN2312 IPSI circuit pack. The IPSI circuit pack also provides:

- PKT-INT packet bus interface
- Archangel TDM-bus interface
- Tone-Clock functionality
- Ethernet interface for connectivity to servers
- Ethernet interface for connectivity to services laptop PCs
- **S8700-series Fiber-PNC**: Maintenance board interface for communication with the PN's Maintenance board, in Carrier A or B only

The TN2312 IPSI circuit pack is inserted into a PN's Tone-Clock slot and provides an Ethernet interface back to the servers. The PKT-INT interface module on the IPSI is similar to TN1655 PKT-INT boards. However, the IPSI's PKT-INT module does not support DMI Mode-2/-3 data links.

The PKT-INT supports links used for call setup of each port located in a PN. Packet Interface failure prevents call set-up and tear-down from telephones and trunks connected to PNs.

In addition to affecting telephone service, a Packet Interface failure affects the service provided by circuit packs that connect to the Packet bus. For example, ISDN-PRI or ISDN-BRI service, service provided by the C-LAN or VAL or IPMEDPRO circuit packs, etc.

S8700 | S8710 | S8720: If the active IPSI's Packet Interface module causes a MAJOR alarm in a high- or critical-reliability system (with duplicated IPSIs), an IPSI interchange occurs if the standby IPSI's state of health (SOH) is high enough to permit the interchange. A MAJOR alarm due to a failure of the standby IPSI's Packet Interface module lowers the standby's state of health (SOH), preventing a subsequent interchange.

The links that pass through the Packet Interface are identified as application links or system links as follows:

- Application links are endpoints that require connectivity to the server via the C-LAN board's Socket interface. These links pass over the packet bus, and through C-LAN ports. The following system features use application links:
  - Call Detail Recording (CDR)
  - Dial-up administration
  - Property Management System (PMS)
  - Journal printer
  - Wake-up log printer
  - Announcement circuit pack upload/download of recorded messages
  - IP phones
- System links
  - Expansion Archangel links (signaling links for call setup of a PN's endpoints)
  - Center Stage Control Network (CSCN) links
  - ISDN-PRI D-channel signaling links
  - ISDN-BRI D-channel broadcast and point-to-point signaling links
  - Adjunct Switch Application Interface (ASAI) links
  - Remote Socket Control Link (RSCL) (C-LAN, VAL)
  - BRI (TRK and STA)

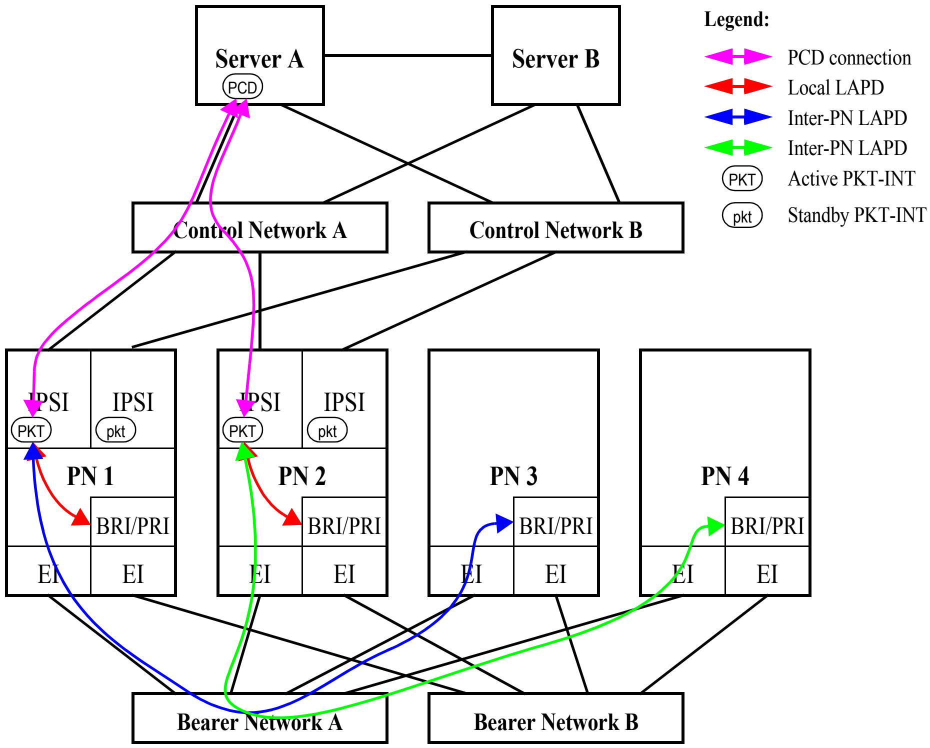
Distributed PKT-INTs

LAPD links are terminated by the PKT-INT modules within IPSIs that are distributed out to the PNs, or out to every PN for the S8700 IP-PNC.

S8700-series Fiber-PNC: As shown in Figure 55: Distributed PKT-INTs, PNs 1 and 2 have IPSIs that terminate LAPD links. PNs 3 and 4 do not have local IPSIs, so their LAPD links are terminated by IPSIs in PNs 1 and 2.

S8700-series IP-PNC: All port networks must have IPSI/PKT-INTs. They can be all simplex (one IPSI per PN) or all duplex (two IPSI per PN).

Figure 55: Distributed PKT-INTs



S8700-series Fiber-PNC

PKT-INT Interchange

PKT-INT interchange is independent of server interchange, and a PKT-INT interchange can occur without a server interchange and vice versa. The active server's packet control driver (PCD) has sockets to both active and standby IPSIs and exchanges heartbeats with both. The active PCD is responsible for bringing up the active PKT-INT, and for bringing up the standby PKT-INT into the standby mode. The standby PCD also has sockets to both active and standby IPSIs and exchanges heartbeats with both. The standby PCD only talks to the IPSI SIM, and does not communicate with the PKT-INTs. The active server communicates directly with both active and standby PKT-INTs and performs maintenance activities on both PKT-INTs without the standby server getting involved.

There is no dedicated hardware to keep the standby PKT-INT up-to-date. Instead, the PCD refreshes the standby PKT-INT prior to an interchange.

Executing a PKT-INT Interchange

There are two ways to interchange PKT-INTs, spontaneous and planned.

- A spontaneous interchange is usually caused by a fault, and:
  - Stable calls are retained
  - LAPD links are restarted
  - Some data may be lost
- A planned interchange can be requested by Services' personnel or by software for maintenance or periodic testing.
  - LAPD links are migrated from the active to the standby PKT-INT
  - No data is lost during the interchange

The active server's PCD has socket connections to both active and standby IPSIs. server interchange and IPSI interchange are independent of each other. IPSIs in a PN can be interchanged independently of IPSIs in other PNs.

Spontaneous PKT-INT Interchange

The standby PKT-INT is not kept up-to-date with the links terminated by the active PKT-INT. During a spontaneous interchange of PKT-INTs, the standby PKT-INT is refreshed with the link information by the active PCD and the standby PKT-INT is activated with a warm reset. A spontaneous interchange of PKT-INTs may result in loss of some up-stream and down-stream data.

- PCD maintains socket connections to the active and the standby PKT-INTs, via the SIM.
- server sends control and data packets only to the active PKT-INT.
- Standby PKT-INT has no information about the LAPD links.
- On a spontaneous interchange, the standby PKT-INT is "refreshed" by the PCD. That means the LAT and the LCT are sent to the PKT-INT, and the standby PKT-INT is made active by a warm interrupt.

Planned PKT-INT Interchange (Link Migration)

A planned interchange of PKT-INTs uses link migration to assure that no data is lost during the interchange. On a planned interchange of PKT-INTs, software initiates the link migration by sending commands to the active and standby PKT-INTs to make a peer link between the PKT-INTs and to start the link migration process. Down-stream and up-stream messages can be processed by the PKT-INTs during the link migration process. As long as the PKT-INT interchange has not been completed, PCD should continue to send down-stream messages to the active PKT-INT. If a down-stream data packet is for a link that has not yet been migrated over to the standby PKT-INT, the active PKT-INT processes it and sends it out.

If a down-stream data packet is for a link that has already migrated over to the standby PKT-INT, the peer link forwards the down-stream data packet to the standby PKT-INT, and the standby PKT-INT processes it and sends it out. Up-stream messages during migration are handled by both PKT-INTs as with the down-stream messages. The PKT-INT that controls the link (the active PKT-INT if the link has not yet been migrated, and the standby PKT-INT if the link has been migrated) processes the up-stream data packet and sends it up to the PCD. During the migration process, both the active and the standby PKT-INTs can send up-stream messages to the PCD.

On S8700, all down-stream packets go to the active PKT-INT, but the up-stream packets can come from the active and the standby PKT-INTs during the migration process.

- Link migration is performed to prepare the standby PKT-INT for a hot reset.
- RNRs are not sent to the endpoints at the start of the link migration.
- PCD tells the active and standby PKT-INTs that a link migration is starting.
- LAPD links are migrated from the active-mig PKT-INT to the standby-mig PKT-INT in the order they appear in the internal list.
- Active-mig PKT-INT continues to accept up-stream messages for the links that are not yet migrated. The standby-mig PKT-INT starts accepting up-stream messages for the links that are migrated. Both the active-mig and the standby-mig PKT-INTs send up-stream messages to the PCD.
- PCD accepts up-stream messages from both the active-mig and standby-mig PKT-INTs.
- PCD sends every down-stream message to the active-mig PKT-INT and has the active-mig PKT-INT send it out for those links that have not been migrated or forward it to the standby-mig PKT-INT for those links that have been migrated.
- At the end of the migration, the active-mig PKT-INT tells the PCD that the migration is finished, and PCD tells the standby-mig PKT-INT to go active (hot interrupt). Some coordination verifies that every up- and down-stream message has been flushed from the active-mig PKT-INT before completing the interchange.

PKT-INT and System Reliability

S8700-series IP-PNC

A PKT-INT module resides on each IPSI board. On an S8700 IP-PNC system, there is a duplicated server. One server is in active mode and one server is on standby. The control network(s) may be implemented in a simplex, see Figure 56: IP-PNC Duplex Reliability - Simplex Control Network, or a optional duplicated configuration. There is only one PKT-INT per port network.

Note:

Duplicated control networks require G650 media gateways (not G600) because the G600 does not support duplicated clocks. The clock is a component of the TN2312 IPSI.

Figure 56: IP-PNC Duplex Reliability - Simplex Control Network

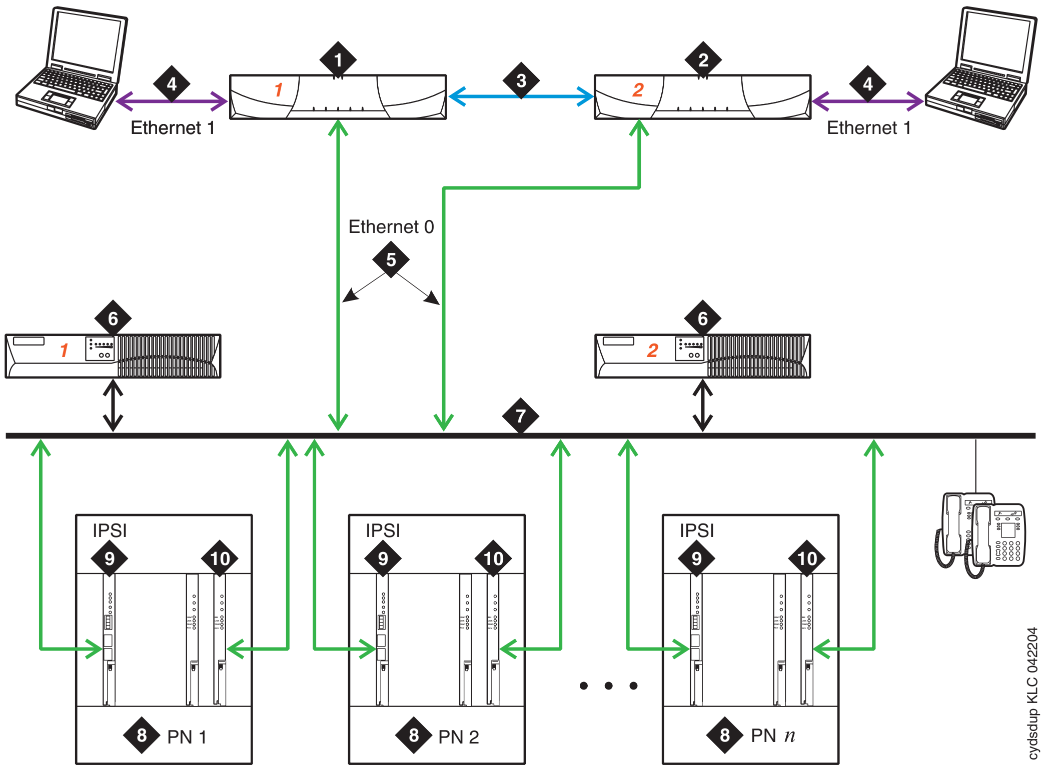


Figure notes:

1. S8700 Server 1 – two are always present, one in an active mode and one on standby.
2. S8700 Server 2 – two are always present, one in an active mode and one on standby.
3. Duplication Interface – the Ethernet connection between the two S8700 servers.
4. Services Interface – the S8700 servers dedicated Ethernet connection to a laptop. This link is active only during on-site administration or maintenance, and the services interface can link to the non-active server through a Telnet session.
5. Connection from the Servers to the Local Area Network (LAN).
6. UPS units – two required.
7. Local Area Network
8. Port Network – optional configuration of media gateways that provides increased switch capacity.
9. IPSI – provides transport of CCMS messages over IP, allowing the S8700 server to communicate with the port networks.
10. Media Processor - Provides conversion between Time Division Multiplexed (TDM) and Internet Protocol (IP) voice signals.

S8700-series Fiber-PNC

A PKT-INT module resides on each IPSI board. LAPD links are terminated by the PKT-INT modules in the IPSIs that are distributed out to the port networks. The non IPSI connected port networks do not have their own PKT-INT capability, so their LAPD links are terminated by IPSIs in the IPSI connected port networks.

Three items can be duplicated for increased reliability: server, IPSI, and PNC. They can be duplicated independently. Duplicated control networks and duplicated IPSIs go together, so that when the IPSIs are duplicated, the control networks must be duplicated. The set of items in your configuration that are duplicated depend on the reliability option chosen for your system: duplex, high or critical. See Table 208: Reliability Options.

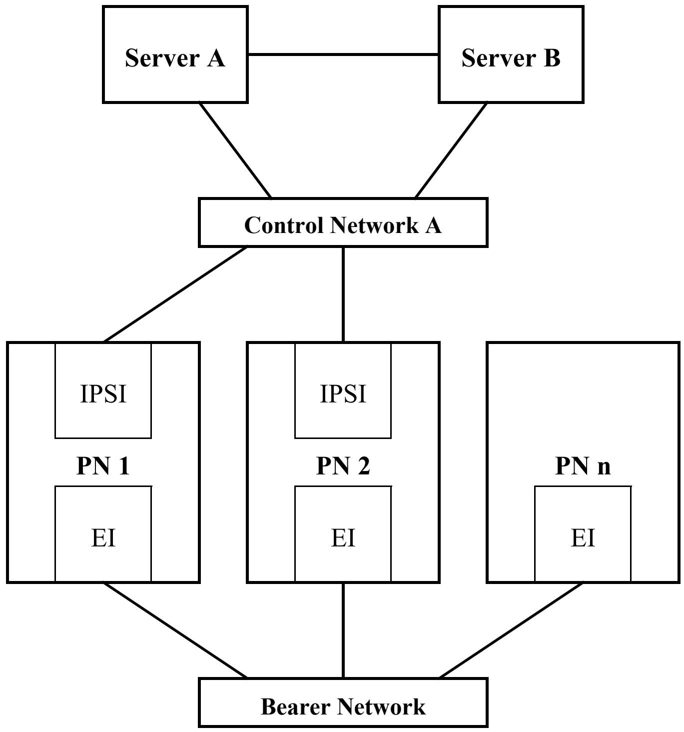
Table 208: Reliability Options

Configurations	Servers	Control Networks and IPSIs	Bearer Networks
Duplex Reliability	Duplicated	Unduplicated	Unduplicated
High Reliability	Duplicated	Duplicated	Unduplicated
Critical Reliability	Duplicated	Duplicated	Duplicated

Duplex-Reliability Configuration

The duplex-reliability configuration shown in Figure 57: Duplex-Reliability Configuration has duplicated servers, an unduplicated control network, unduplicated IPSIs in the IPSI connected PNs, and an unduplicated bearer network. Because the IPSIs are not duplicated, the PKT-INT modules contained within them are not duplicated.

Figure 57: Duplex-Reliability Configuration



High-Reliability Configuration - Fiber-PNC

The high-reliability configuration shown in Figure 58: High-Reliability Configuration - Fiber-PNC has duplicated servers, duplicated control networks, and duplicated IPSIs in the IPSI connected PNs. With this configuration, every IPSI connected PN must have duplicated IPSIs. The duplicated control network prevents a single fault in the control network, such as a bad Ethernet switch, from bringing the whole system down. Because the IPSIs are duplicated in this configuration, the PKT-INT modules are duplicated.

High-Reliability Configuration - IP-PNC

The IP-PNC high reliability configuration is similar to the Fiber-PNC configuration. There are no expansion interface circuit packs in the IP-PNC configuration. There are duplicated IPSI circuit packs in each port network. Port networks must use the G650 rack mounted carrier to accommodate the duplicated clock circuits located on the IPSI circuit packs. See Figure 59: High-Reliability Configuration - IP-PNC.

Figure 58: High-Reliability Configuration - Fiber-PNC

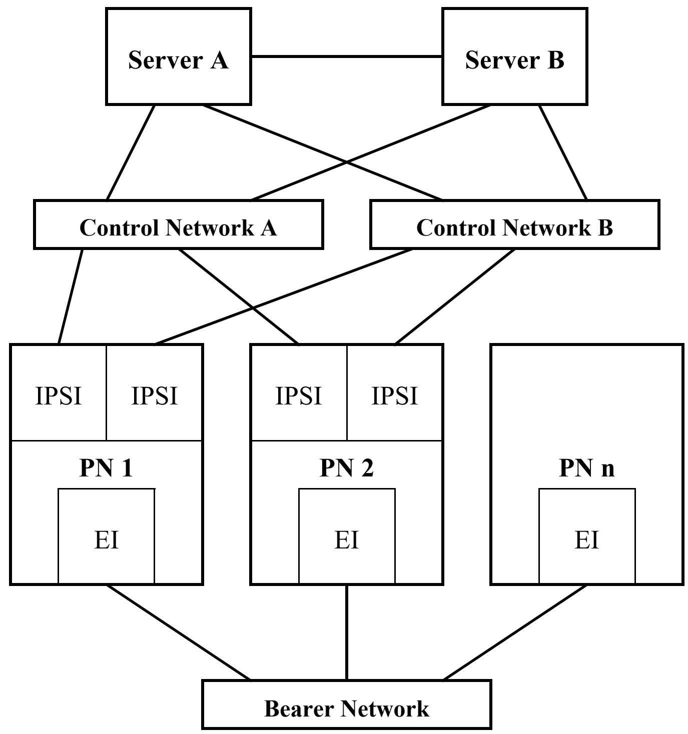
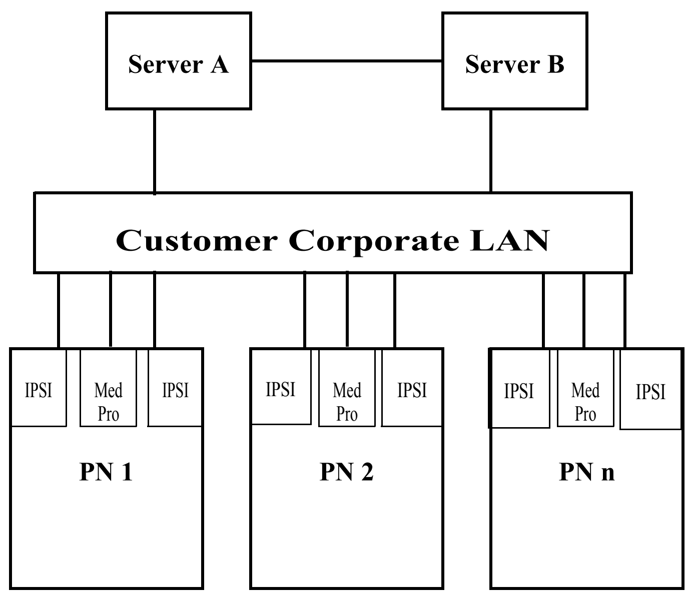


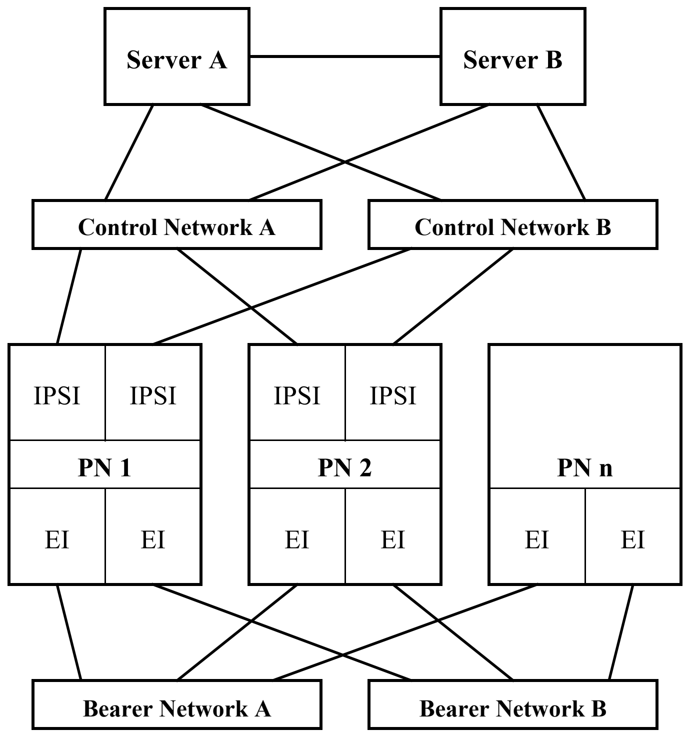
Figure 59: High-Reliability Configuration - IP-PNC



Critical-Reliability Configuration - Fiber-PNC

The critical-reliability configuration shown in Figure 60: Critical-Reliability Configuration - Fiber-PNC has full duplication of the following options: servers, control networks, IPSIs and PNCs (bearer networks). As with the high-reliability configuration, this configuration requires that IPSI connected PNs have duplicated IPSIs. Because the IPSIs are duplicated in this configuration, the PKT-INT modules are duplicated.

Figure 60: Critical-Reliability Configuration - Fiber-PNC



Packet Interface Service Operations

The following sections provide more background information about service operations for the Packet Interface.

Administration

PKT-INT modules are automatically administered as a component of an IPSI circuit pack. See **`add/remove ipserver-interface`** and **`test/status/reset packet-interface`** in *Maintenance Commands Reference (03-300431)*.

Packet Interface Circuit Replacement

To replace a Packet Interface module that is part of a TN2312AP IPSI circuit pack, follow the procedure for replacing an IPSI circuit pack.

Demand Reset of a Packet Interface

System software denies a demand reset of an active IPSI's Packet Interface (**`reset packet-interface`**) if the Packet Interface is in service and has not been placed in an out-of-service state by background maintenance software. A reset of an in-service Packet Interface causes severe service disruption, including the loss of all existing calls, and dropped links to adjuncts such as AUDIX. As part of the automatic recovery action initiated when a fatal hardware-fault condition is detected, the software that controls Packet Interface maintenance puts a Packet Interface module in the out-of-service state if that IPSI circuit pack has been reset three times within the last 15 minutes.

A demand reset of a standby Packet Interface is not disruptive and is allowed regardless of the service state of the associated maintenance software.

Service States

Packet Interface maintenance software maintains a state variable to monitor the service state of each Packet Interface. To determine the state of a Packet Interface, use **`status packet-interface`**. A Packet Interface can be in the service states:

- *in-service* - in service and active
- *standby* - in service and standby
- *out-of-service* - active or standby Packet Interface not in service
- *standby-disabled* - IPSI circuit pack with Packet Interface module is present and administered, but duplication is disabled
- *craft-busy* - Packet Interface has been demand busied out by craft
- *uninstalled* - Packet Interface is administered but not physically present

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If the circuit pack's diagnostic tests do not pass in a standard- or duplex-reliability system (unduplicated IPSIs), the failing Packet Interface is placed in an out-of-service state. Every link handled by that IPSI goes down, and may be re-established using other Packet Interface resources. Calls associated with these links may drop.

If the standby IPSI (in a high- or critical-reliability system with duplicated IPSIs) has an acceptable state of health, maintenance software interchanges the IPSIs, instead of resetting the active IPSI's Packet Interface module. This is less disruptive than a reset.

An IPSI's Packet Interface module goes out-of-service if the IPSI has been reset by background maintenance 3 times in the last 15 minutes, whether or not reset succeeded. Various errors will lead to a Packet Interface reset. See the Error log entries and recommended actions section.

An extensive set of diagnostic tests is run when the circuit pack is reset.

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Duplication Impact

The Packet Interface module is a single point of failure in a standard- or duplex-reliability system, with unduplicated IPSIs. If not acceptable, an S8700 customer can upgrade to a high- or critical-reliability system with duplicated IPSIs. Figure 55: Distributed PKT-INTs shows an S8700 Fiber-PNC configuration with duplicated IPSIs. The following concepts apply to duplicated IPSIs:

- Packet bus connection

  In a high- or critical-reliability system (duplicated IPSIs), the standby IPSI's Packet Interface module cannot access the packet bus to write data, except during a planned IPSI interchange or when the Active-Standby Peer Link Test (#888) is run. The Packet Interface Maintenance Looparound Test (#886), which requires access to the packet bus, is not run on the standby IPSI's Packet Interface module.

- IPSI interchange

  Severe Packet Interface module faults that cause system and application links to go down are detected within 1 second. A fatal fault error message is generated, and the Packet Interface maintenance software attempts to run the Packet Interface Reset test. In a high- or critical-reliability system, this results in a requested IPSI interchange, instead of a Packet Interface reset, since stable calls are preserved across the interchange.

Maintenance Object Interactions

- Packet Bus maintenance

  A Packet Interface physically interacts with the PKT-BUS. It may be difficult to isolate faults to one or the other component for certain types of Packet Interface errors. In each of these cases, Packet Interface maintenance forwards an error report to packet bus maintenance, where it records a packet bus fault in the error log and runs Packet Bus tests.

- Packet Interface maintenance

The operation of the IPSI circuit pack's Packet Interface module affects the operation and maintenance of other circuit packs connected to the packet bus. This includes:

1. BRI applications (BRI-PT)
2. Universal DS1 applications (UDS1) for ISDN/PRI applications
3. **S8700-series Fiber-PNC**: Expansion Interface circuit pack maintenance (EXP-INTF)

Some packet errors require examination of the Packet Interface's operating status. To obtain this information:

- Examine the Error and Alarm Logs for PKT-INT entries and determine which PKT-INT the link is accessing.
- Use **status sys-link** to identify the PKT-INT location in this PN, or use **status sys-link** to find the PKT-INT hardware used by the faulted link.
- Use **test sys-link** to troubleshoot the component.
- Use **status packet-interface** to determine the:
  - service state of the Packet Interface, for example, in service/out of service
  - total number of Packet Interface links assigned to a Packet Interface.

  For a standby IPSI's Packet Interface module in a high- or critical-reliability system (duplicated IPSIs), the module is shown in standby mode if it is not out-of-service because of a failure condition. The number of links for a standby Packet Interface module is always zero.

In general, if every link for an active IPSI's Packet Interface module is shown as a Failed Link, there may be a fault on either the Packet Interface module or the packet bus that caused every link to go down. If only a small percentage of the links are shown as Failed Links, then the Packet Interface is probably not the source of the problem. Some typical sources of individual link failures include:

- failed BRI telephone set
- disconnected cord to a BRI set, causes three link failures
- **S8700-series Fiber-PNC**: failed or removed EI circuit pack in a PN, causes one link failure

For a case where not every link appears in the Failed Links category, examine the alarm and error logs for failures of the following circuit packs, and follow the repair procedures for those circuit packs before considering replacing the associated IPSI circuit pack:

- S8700-series Fiber-PNC: TN570 Expansion Interface circuit pack (EXP-INTF)
- S8700-series Fiber-PNC: TN573 Switch Node Interface circuit pack (SNI-BD)
- S8700-series Fiber-PNC: TN572 Switch Node Clock circuit pack (SNC-BD)
- S8700-series Fiber-PNC: TN2305, TN2306 ATM
- ISDN-BRI Line circuit packs, ports, and stations (BRI-BD, BRI-PORT, BRI-SET)
- Universal DS1 circuit packs and ports (UDS1-BD, TIE-DS1)
- TN464, TN2207, TN2464 Universal DS1 circuit pack — ISDN-PRI service
- TN556, TN2198, TN2185 ISDN-BRI Line circuit pack — ISDN-BRI service
- TN799DP Control LAN (C-LAN) circuit pack
- TN2501 Voice Announcements over the LAN (VAL)
- TN2602 IP Media Processor (IPMEDPRO)

Use **`test sys-link`** with the faulted path option to test all components in the faulted link.

Error log entries and recommended actions

Table 209: PKT-INT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	ON	**`test packet-interface`** ***location*** **`l r 2`**
1 (b)	Any		WARNING	OFF	**`reset packet-interface`** ***location***[1]
10 (c)	0				
50 (d)	0				
257 (e)	Any		MIN	OFF	**`reset packet-interface`** ***location***
513 (f)	Any		MAJ	ON	**`reset packet-interface`** ***location***
769 770 (g)	Any	Maintenance Looparound test (#886)	MAJ	ON	**`test packet-interface`** ***location*** **`r 2`**
					1 of 2

Table 209: PKT-INT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1025 (h)	Any	Private Looparound (#885)	MAJ	ON	**reset packet-interface *location*** [1]
1281 (i)	Any		MAJ	ON	**reset packet-interface *location*** [1]
1537 (j)	Any	Memory Checksum (884)	MIN	ON	**test packet-interface *location* l r 2**
1793 (k)	Any	Memory Checksum (#884)	MIN	ON	**test packet-interface *location* l r 2**
2049 (l)	Any		WRN	ON	**test packet-interface *location* r 25**
2305 (m)	Any				**test packet-interface *location* r 2**
2561 (n)	Any	Active-Standby Peer Link (#888)	MIN	OFF	**test packet-interface *location* r 2**
2817 (o)	Any	Read and Clear test (#887)	MIN MAJ	ON	**test packet-interface *location***
3074 3073 3072 (p)	Any	Maintenance Looparound (#886)	WRN	OFF	**test packet-interface *location* r 2**
3585 (q)	Any		WRN	OFF	**reset packet-interface *location*** [1]
3841 (r)	Any		MAJ	OFF	**reset packet-interface *location*** [1]
					2 of 2

1. You can reset a Packet Interface module on an active IPSI if it has been taken out of service by the background maintenance software. A Packet Interface module on a standby IPSI can be reset independent of its service state.

Notes:

a. **Error Type 0**: an alarm was raised but an associated error was not entered into the error log due to a momentary overload condition caused by a burst of hardware or software error reports. Run the long test sequence. Refer to the test description and follow the recommended procedures.

b. **Error Type 1**: background maintenance software has reset the Packet Interface module on an IPSI circuit pack as a fault recovery action. It is used to keep track of the number of times that the Packet Interface is reset, independent of whether or not the Reset test passed. When 3 of these errors occur in 15 minutes, maintenance places the Packet Interface into an out-of-service state, and raises a WARNING off-board alarm on the Packet Interface (PKT-INT).

1. See if Error Codes 257, 513, 769, 1025, 1281, or 3841 are present in the error log. If one or more are present, follow the repair procedures for those errors.
2. If no other Packet Interface errors appear in the error log, and if the Packet Interface is not in a held reset state as indicated by the absence of a MAJOR or MINOR alarm with a Service State of OUT, you do not have to take any action. If a Packet Interface MAJOR or MINOR alarm is present and no other Packet Interface Error Codes are in the error log, use reset packet-interface location to execute a demand reset, and refer to the repair procedures for Packet Interface Reset Test (#889).

c. **Error Type 10**: the Packet Interface maintenance software caused an escalating system WARM restart as part of a recovery action for certain Packet Interface failures. A present SYSTEM Error Type 10 indicates that a software-initiated WARM restart occurred.

1. See if Error Types 513, 1025, or 3074 are present in the error log. If any are present, follow the repair procedures for those errors.

d. **Error Type 50**: the server is sending more downlink messages than the Packet Interface module can process. This is an inline error not produced by any test. When this error is reported, application software is slowed down to allow the module to process existing downlink messages. If there is a hardware problem, the Packet Interface test causes other errors to be logged. In rare cases when no other PKT-INT errors are logged but error 50 occurs more than 10 times in the last hour, follow normal escalation procedures.

e. **Error Type 257:** the Packet Interface module on the IPSI circuit pack detected a fatal failure. This error is very serious. Maintenance software immediately escalates testing to the Packet Interface Reset Test (#889). This error can be caused by network connectivity loss between the Server and the IPSI where the packet interface Module resides.

1. If the Packet Interface module has a WARNING alarm: the alarm is caused by the connectivity loss between the server and the IPSI.
2. If the Packet Interface module has a MINOR alarm: verify the network reachability of IPSI from the server.
   - If the network is out: try to restore the network connectivity.
   - If connected to IPSI: use the reset packet-interface location to reset the Packet Interface. Refer to the repair procedures for the Packet Interface Reset Test (#889).
3. If the Packet Interface is not alarmed: you do not have to take any action.

f. **Error Type 513**: Message Handshake failure. A failure with the message protocol between the server's software and the Packet Interface was detected.

1. If the Packet Interface has a MAJOR alarm:
   a. Use **`reset packet-interface`** ***`location`*** to reset the Packet Interface.
   b. Refer to the repair procedures for the Packet Interface Reset Test (#889).

2. If the Packet Interface is not alarmed, take no action.

g. **Error Type 769 and 770:** failure in the Packet Looparound test. A maintenance looparound link cannot be established or the Packet Interface cannot send and receive data correctly as part of the Packet Interface Maintenance Looparound Test (#886). If the number of errors exceeds a defined threshold, a Major alarm is raised.

   In a high- or critical-reliability system (duplicated IPSIs), a failure of the Maintenance Looparound test may have caused an IPSI interchange. This results in an alarm associated with Error Code 769 or 770 being reported against the standby IPSI's Packet Interface module.

   Test 886 can be run only on the active IPSI. Enter **`busy ipserver-interface`** followed by **`release ipserver-interface`** to clear the error on the standby IPSI. Then enter **`set ipserver-interface`** to force an IPSI interchange.

   Error code 770 indicates that old firmware on the IPSI does not support new software operation.

   For more information, refer to the repair procedures of the Packet Interface Maintenance Looparound Test (#886)

h. **Error Type 1025:** failure of the Packet Interface Private Looparound Test (#885).

   1. If the Packet Interface has a MAJOR alarm:

      a. Use **`reset packet-interface`** ***`location`*** to reset the Packet Interface.

      b. Refer to the repair procedures for Packet Interface Reset Test (#889).

   2. If the Packet Interface is not alarmed, take no action.

i. **Error Type 1281**: the Packet Interface has Translation RAM failures. PKT-INT Translation RAM is used to convert the addresses of a packet to the destination endpoint address.

   1. If the Packet Interface has a MAJOR alarm:

      a. Use **`reset packet-interface`** ***`location`*** to reset the Packet Interface.

      b. Refer to the repair procedures for the Packet Interface Reset Test (#889).

   2. If the Packet Interface is not alarmed, take no action.

j. **Error Type 1537**: Boot PROM memory failure. The Packet Interface module may still be operational if no other errors are reported. However, the module may report a fatal fault during board initialization. This may occur during a system recovery level more severe than a WARM restart. For more information, refer to Packet Interface Memory Checksum Test (#884).

k. **Error Type 1793**: FLASH Memory test failure. The Packet Interface module may still be operational if no other errors are reported. However, the module may report a fatal fault during board initialization. This may occur during a system recovery level more severe than a WARM restart. For more information, refer to the repair procedures of Packet Interface Memory Checksum Test (#884).

l. **Error Type 2049**: LAPD Received Buffer Overflow error. The Packet Interface's packet bus receive buffer overflowed. For more information, refer to the repair procedures of Packet Interface Read and Clear Counters (#887).

m. **Error Type 2305**: parity failure was detected by the packet bus interface. The Packet Interface received packets with parity errors from the packet bus.

   1. Check for errors logged against the packet bus and Maintenance/ Test circuit pack. Refer to repair procedures to clear those errors first.
   2. Check every other circuit pack connected to the packet bus in the same cabinet. Packet bus failures may be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane.
   3. If the problem still exists, use **`test packet-interface`**, and follow repair procedures described for Packet Interface Read and Clear Counters (#887).

n. **Error Type 2561**: Active-Standby Peer Link test failure indicating a possible failure of the:

   - Active IPSI's Packet Interface
   - Standby IPSI's Packet Interface

   If the number of errors exceeds a defined threshold, a Minor alarm is raised. For more information, refer to the repair procedures of Active-Standby Peer Link Test (#888).

o. **Error Type 2817**: Standby Packet Interface Translation RAM failure. A MINOR alarm is raised when there are 1 to 5 bad locations and a MAJOR alarm is raised when there are 5 or more bad locations. Use **`test packet-interface`**, and follow repair procedures described for Packet Interface Read and Clear Counters (#887).

p. **Error Types 3074, 3073, and 3072**: PKT-INT Transmit Buffer Overflow, the number of transmit buffers required by software exceeded the number available. **Error Type 3074** is generated when the PKINT sends an inline hardware error to maintenance software, indicating transmit buffer overflow. As part of the background recovery action for this error, maintenance software automatically runs the Packet Interface Maintenance Looparound Test (#886). If that test fails, maintenance software generates **Error Types 3073 and 3072**, and it requests a system WARM restart. If, after the WARM restart, transmit buffer overflow errors continue to be reported, maintenance software generates Error Code 100 and it resets the PKT-INT. These errors may be the result of system overload due to a problem with communication between the PKT-INT and the PNs.

   1. Check for errors logged against the Expansion Interface circuit pack, the Switch Node Interface circuit pack, Packet Gateway circuit pack, the Packet Data Line circuit packs associated with the System Ports, BRI Line circuit packs and BRI endpoints, and the Universal DS1 circuit packs supporting PRI service. Clear errors against those components first.
   2. Use **`test packet-interface short`** against the Packet Interface associated with the error. If the Packet Interface Maintenance Looparound Test (#886) passes, the alarm will clear. If the test fails, repeat the test 5 times.
   3. If it continues to fail, follow normal escalation procedures.

q. **Error Type 3585**: a packet bus failure has been detected and that the packet bus is alarmed. Refer to the packet bus maintenance documentation for further action.

r. **Error Type 3841:** the Packet Interface reported a fatal fault failure condition that might be caused by a packet bus fault on the PN containing the failed PKT-INT.

- If Error Type 3585 has also been reported, see PKT-BUS (Packet Bus). After the packet bus fault has been corrected, use **`reset packet-interface`** to bring the Packet Interface back into service.
- If Error Type has not been reported, use **`reset packet-interface`**, and follow the repair steps associated with Packet Interface Reset Test (#889)

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Interface Private Looparound Test (#885)		X	ND
Packet Interface Maintenance Looparound Test (#886)	X	X	ND
Packet Interface Memory Checksum Test (#884)		X	ND
Packet Interface Read and Clear Counters (#887)	X	X	ND
Active-Standby Peer Link Test (#888)	X	X	ND
The following test is run as a result of **`reset board`** ***`location`***			
Packet Interface Reset Test (#889)			D

1. D = Destructive; ND = Nondestructive

PLAT-ALM (Platform Alarms)

The PLAT-ALM is a virtual MO used by Communication Manager to keep track of its server and media gateway alarms.

Note:

"CMG" can be seen in some media gateway traps.

If there is an alarm against PLAT-ALM, do the following:

1. Access the server's Linux command line by entering the SAT command **go shell**.
2. Log into the server's Linux shell.
3. View the server's current list of alarms by entering **almdisplay -v**.
   See *Avaya Aura™ Communication Manager Server Alarms (03-602798)*.

Note:

If the **almdisplay** command returns a failure message, such as:
almdisplay: 4: Unable to connect to Multifilament
enter **man almdisplay** for command-related information.

4. Troubleshoot and clear the problems by following the procedures for the maintenance object listed under either:
   - *Avaya Aura™ Communication Manager Server Alarms (03-602798)*
   - *Gateway Traps for the G250/G350/G430/G450/G700 Avaya S8xxxx Servers (03-602803)*

An alternative procedure for an alarm against PLAT-ALM requires the following steps:

1. Log into the server's Web interface.
2. View the server's current list of alarms by clicking on the **Display Alarms** option.
3. Troubleshoot and clear the problems by following the procedures for the appropriate MOs listed in the display.

Note:

After repairing the server or media gateway, use the Linux command **almclear** to manually clear every server or media gateway alarm. This action will also clear any alarms associated with PLAT-ALM. See Clearing Server Alarms in *Avaya Aura™ Communication Manager Server Alarms (03-602798)*.

Demand test descriptions and error codes

There are no demand tests for PLAT-ALM.

PMS-LINK (Property Management System Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PMS-LINK	MIN	**`test pms-link long`**	PMS Link
	WRN	**`test pms-link`**	

Property Management System (PMS) is a stand-alone computer system that environments such as hotels or hospitals use for services such as reservations, registration, messaging, housekeeping, night audit, billing, and inventory. The PMS Link provides a communications channel between the switch and the customer-owned PMS so that the PMS can interrogate the system for information related to the following features:

- Message Waiting Notification
- Controlled Restriction
- Housekeeping Status
- Check-in/Check-out
- Room Change/Room Swap

The PMS device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack which is administered as a data extension. The PMS link to the processor is via a TN799 C-LAN port. For information about C-LAN connectivity, refer to CLAN-BD (Control LAN Circuit Pack).

PMS Link maintenance provides a strategy for maintaining the link between the switch and a PMS device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Link Maintenance uses a “try-and-wait” mechanism for maintaining the PMS Link. If a PMS Link is torn down due to an error, PMS Link Maintenance attempts to bring up the link immediately. If the Link Setup fails, PMS Link Maintenance will wait for five minutes before the next retry. If the number of retries reaches a threshold (12), a Minor alarm is raised for service attention.

PMS Link Maintenance does not cover the maintenance of the elements composing the PMS physical link (the external PMS device, Data Module (PDM/MPDM/DTDM), Digital Line Port of a TN754 Digital Line circuit pack, ADU, or Data Line Port of TN726B Data Line circuit pack). If PMS Link Maintenance cannot restore the PMS Link, then the maintenance tests of these individual components of the PMS Link must be executed to diagnose faults. If **`test pms-link`** fails, no alarm will be generated.

The **`list pms-down`** command lists every meaningful event to the PMS that occurred while the link between the switch and the PMS was down. For example, any room status codes entered by hotel housekeeping staff during a time of PMS outage would be shown in this report.

Procedures for Restoring the PMS Link

1. Determine the status of the PMS Link.

   Enter **`status pms-link`**, and make sure that the PMS Link is not busied out for maintenance. If the link is “down,” then continue with the next step.

2. Where does the PMS Link connect?

   Enter **`display system-parameters hospitality`**, and find out the destinations of the PMS Link.

3. Determine the status of the data extension.

   Enter **`status data`** ***`extension`***, and verify whether the data extension is in the in-service/idle state. If the data extension is not available, then look for the extension number in `Alt Name` field of the Error Log. See XXX-BD (Common Port Circuit Pack/ Media Module) for resolutions.

4. Is the external PMS device available?

   Make sure that the PMS device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the PMS device.

5. If the problem is not found in the above steps, check the C-LAN board for any problems. For a description about the C-LAN board and its connectivity, refer to Downloading License and Authentication files from RFA in *Maintenance Procedures (03-300432)*.

When restoring the PMS link, it is necessary to execute maintenance test on different objects that comprise the PMS link. It is recommended that you busyout the PMS link before trying to restore the link. When the PMS Link is busied out, every PMS Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Error log entries and recommended actions

Table 210: PMS-LINK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**`test pms-link`**
18 (b)	0	**`busyout pms-link`**	WRN	OFF	**`release pms-link`**
257 (c)	Any	Link Retry test (#215)	MIN WRN[1]	OFF	**`test pms-link l`**
513 (d)	Any				**`test pms-link`**
769 (e)	Any				
					1 of 2

Table 210: PMS-LINK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1025 (f)	40–49				
1281 (g)	10–19				
1537 (h)	N0–N9				
1793 (i)	Any				**test pms-link**
2049 (j)	Any				
2305 (k)	50–59				**release pms-link**, or **test pms-link**
2561 (l)	Any				**test pms-link**
2817 (m)	100–109 200–209 300–309				
3073 (n)	70–79				
3841 (o)	20–29				
					2 of 2

1. Minor alarms on this MO may be down graded to Warning alarms based on the value in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 18**: the PMS Link has been busied out with **busyout pms-link**. The link is torn down. Enter **release pms-link** to restore the link.

c. **Error Type 257**: the Link Retry test (#215) fails. An error was detected when setting up the link. Refer to the Procedures for Restoring the PMS Link above.

d. **Error Type 513**: the PMS physical link is down for one of the following reasons:

- Cable to the PMS device is disconnected.
- The PMS device is powered off.
- The data extension to which the PMS device connects has been busied out.

Check the connectivity of wire and cable among wall jacket, data module, and the PMS device. Enter **status data *extension*** and verify that the data extension of the PMS device is in the in-service/idle state. If the data extension is not available, then see Procedures for Restoring the PMS Link.

e. **Error Type 769**: there has been no communication between the switch and the PMS for a period of time specified in “system hospitality” administration. The PMS Link is torn down. To clear this error, see Procedures for Restoring the PMS Link.

f. **Error Type 1025**: The link was taken down because the switch could not receive an incoming message from the PMS. The message from the PMS repeatedly had corrupted data or the switch received requests for acknowledgment but never received a message to be processed. If this Error Type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log.

g. **Error Type 1281**: the link was taken down because the switch could not send an outgoing message. The message, which was sent but not acknowledged, was flushed. If this Error Type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log.

h. **Error Type 1537**: the PMS has been busied out for maintenance at the request of the PMS. The PMS Link is torn down. The reason code (N), if present, is that supplied by the PMS in the request message. If this Error Type recurs frequently (that is, more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log. No alarm is raised against this error.

i. **Error Type 1793**: due to heavy call traffic, or the PMS protocol message rate being faster than the PMS/PBX protocol specifications allow, the PMS Link is torn down. PMS Link maintenance software will wait for five minutes before attempting to set up the link again. If this Error Type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log. The PMS should be checked for adherence to message rate defined in the PMS/PBX protocol specifications. No alarm is raised against this error.

j. **Error Type 2049**: The attempt to swap the database between PBX and PMS failed three times consecutively due to excessive PMS/PBX protocol violations, buffer overflows, or PMS Link outages. The PMS Link is NOT torn down. If this Error Type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log. No alarm is raised against this error.

k. **Error Type 2305**: The PMS Link was busied out with **`busyout pms-link`**, or it was brought down with **`test pms-link long`**. The PMS Link is torn down, and PMS Link maintenance stops attempts to reestablish the link in the case where the **`busyout pms-link`** was used. When **`test pms-link long`** has been used, PMS Link maintenance continues trying to reset the link. To restore the PMS Link after use a **`busyout pms-link`**, enter **`release pms-link`**. To restore the PMS Link after a **`test pms-link long`**, enter **`test pms-link`**.

l. **Error Type 2561**: the PMS Link is physically established, but the protocol has not been started by the PMS before the protocol timer expires. The PMS Link is NOT torn down. If this Error Type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log. The PMS should be checked to make sure that it will attempt to start the protocol according to the PMS/PBX protocol specifications. No alarm is raised against this error.

m. **Error Type 2817**: look for the following Aux Data:

10x	The PMS violated the application protocol. The first message after a request to initiate a database exchange was not the start of a database exchange. The message is processed. If this Error Type with this aux data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log.
20x	The PMS violated the application protocol. The start of a database exchange was received in a state in which it was not expected. The message is ignored. If this Error Type with this Aux data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log.
30x	The PMS violated the application protocol. The end of a database exchange was received when no exchange was in progress. The message is ignored. If this Error Type with this Aux Data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Error Log. No alarm is raised against this error.

The PMS should be assessed for adherence to the PMS/PBX protocol specifications.

n. **Error Type 3073**: the link was taken down by the switch because the threshold for application protocol violations has been exceeded by the PMS. The protocol never started and messages were received and/or messages were received in a state in which they were not expected. (Refer to Error Type 2817 for recommended strategy.)

o. **Error Type 3841**: link was taken down by the switch because the threshold for link protocol violations has been exceeded by the PMS. PMS is sending “garbage” to the switch.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Link Tear Down Test (#213)		X	Destructive
Link Retry Test (#215)	X	X	Nondestructive

PMS-PRNT (PMS Printer Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PMS-PRNT JNL-PRNT	MIN	`test journal [pms-log | wakeup-log] long`	PMS Printer/ Journal Printer
	WRN	`test journal [pms-log | wakeup-log]`	

The errors and tests for PMS-PRNT also apply to JNL-PRNT.

A journal printer is a printer to which Emergency Access to Attendant, Wakeup and Property Management System (PMS) events are printed as they occur. The PMS-log printer is used as a backup of the PMS output device to print an audit trail of every PMS transaction and Housekeeping Status Change event when the PMS Printer Link is not available. There may be one or two journal printers. If there is one, every event is printed there. If there are 2, then emergency access, wakeup events, and scheduled reports are printed at one printer (JNL-PRNT), and PMS events are printed at the other (PMS-PRNT).

The scheduled report printer is where summaries of daily wakeup activity and emergency access activity are printed. If the customer requests a summary report, the report will be printed exactly once per day.

The distinction between Journal and Scheduled report printers is logical rather than physical. Whether or not there are two printers, the scheduled reports are always sent to the printer that journals the wakeup and emergency access events. A scheduled report will temporarily suspend the journal activity. Upon completion of the scheduled report, journaling will be resumed after the printing of every withheld event.

The journal printer device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack that is administered as a data extension. A journal printer device can also be connected through an ADU to a port on TN726B Data Line circuit pack. The journal printer's link to the processor is via a C-LAN port. For information about C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack).

PMS/JOURNAL Printer Link Maintenance provides a strategy for maintaining the link between the system and a PMS device (an external Journal Printer device). The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Printer Link Maintenance uses a try-and-wait mechanism. If a PMS Printer Link is torn down due to an error, PMS Printer Link Maintenance will try to bring the link up immediately. If the link setup fails, PMS Link Maintenance will wait for five minutes before the next trial. If the number of retries reaches a threshold (15), a Minor alarm is raised for service attention.

PMS Printer Link Maintenance does not cover the maintenance of the elements composing the journal printer physical link (for instance, the external printer device, Data Module (PDM/MPDM/DTDM), Digital Line Port or ADU and Data Line Port). If PMS Printer Link maintenance cannot restore the PMS Printer Link, then the maintenance tests of individual components of the PMS Link must be executed to diagnose faults.

The **`list pms-down`** command lists every meaningful event to the PMS that occurred while the link between the switch and the PMS was down. For example, any room status codes entered by hotel housekeeping staff during a time of PMS outage would be reflected in this report.

Procedures for Restoring the PMS Printer Link

1. Determine the status of the PMS Printer Link.

   Enter **`status journal-printer wakeup-log | pms-log`** and make sure that the journal printer link is not busied out for maintenance. If the link is down, then continue to the next step.

2. Where does the journal printer link connect?

   Enter **`display system-parameters hospitality`** and find out the destinations of the PMS Printer Link.

3. Determine the status of the data extension.

   Enter **`status data`** ***`extension`*** and verify that the data extension is in the in-service/idle state. If the data extension is *not* available, look for the extension number in the **Alt Name** field of the Error Log. See XXX-BD (Common Port Circuit Pack/Media Module) for resolutions.

4. Is the external printer device available?

   Make sure that the printer device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the printer device.

5. If the problem is not found in the above steps, check the C-LAN board for any problems. For a description of C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack).

It should be noted that when restoring the PMS printer link, it is necessary to execute tests on different MOs that comprise the link; it is recommended that you busyout the PMS printer link before trying to restore the link. If the PMS printer Link is busied out, then every PMS printer Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Error log entries and recommended actions

Table 211: PMS-PRNT/JNL-PRNT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test journal wakeup-log | pms-log**
18 (b)	0	**busyout journal wakeup-log | pms-log**	WRN	OFF	**release journal wakeup-log | pms-log**
257 (c)	Any	Link Retry test (#215)	MIN[1] WRN	OFF	**test journal wakeup-log | pms-log long**
513 (d)	Any				**test journal wakeup-log | pms-log**
769 (e)					

1. Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures. Both PMS Printer and Journal Printer are administered to the same extension, and the printer is not connected. Refer to the Procedures for Restoring the PMS Printer Link for resolution.

b. **Error Type 18**: the Journal Printer Link has been busied out and the link is torn down. Enter **release journal wakeup-log | pms-log** to restore the link.

c. **Error Type 257**: Link Retry test (#215) failed. Physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. See Procedures for Restoring the PMS Printer Link.

d. **Error Type 513**: physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. The PMS Printer Link physical link is down due to the following causes: cable to the printer device is disconnected, the printer device is powered off, or the data extension where the printer device connects to has been busied out. Check the connectivity of wire and cable among wall jacket, data module, and the printer device. Enter **status data *extension*** and verify that the data extension of the printer device is in the in-service/idle state. If the data extension is not available, see Procedures for Restoring the PMS Printer Link.

e. **Error Type 769**: link idle timer, link comes down. The printer device is in an off-line state, for example, paper jam or paper out. Check the printer device and act promptly to put it back to on-line state. Enter **`test journal wakeup-log | pms-log`** to set up the printer link.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Link Tear Down Test (#213)		X	Destructive
Link Retry Test (#215)	X	X	Nondestructive

PNC-DUP (PNC Duplication)

S8700-series Fiber-PNC **only**

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PNC-DUP	NA	`status pnc`	PNC duplication

In systems with the Critical Reliability option, the following components, which together comprise the Port Network Connectivity (PNC), are duplicated:

- Expansion Interface (EI) TN570 circuit packs in the port networks (PNs)
- Switch Node Interface (SNI) TN573 circuit packs in switch nodes
- DS1 Converter (DS1C) TN574 circuit packs for remote PN connections
- Fiber-optic cables (metallic in certain cases) connecting the above circuit packs
- DS1 facilities between the DS1Cs
- Switch Node Clock (SNC) TN572 circuit packs
- IP Server Interface (IPSI) TN2312AP circuit packs

Although not part of the PNC, Tone-Clock circuit packs are also duplicated in each PN. The PNC is available in two different configurations: direct connect, in which each port network is connected directly by fiber optic links to each other PN; and Center Stage Switch (CSS) which utilizes one or two switch nodes to interconnect the PNs. Direct connect systems can have up to two PNs. CSS systems with one switch node can have up to 15 PNs. CSS systems with three switch node can have up to 44 PNs. See Figure 61: Duplicated Direct Connect PNC Connectivity and Figure 62: Duplicated PNC with Center Stage Switch Connectivity.

PNC duplication architecture utilizes an active/standby duplication scheme, in which one complete set of PNC components supports call processing, while the duplicate PNC is held in reserve. All calls on the active PNC are simultaneously set up, or shadowed, on the standby PNC in order for it to be capable of instantly assuming active status when necessary, allowing for interchanges without service disruption (in the case of single faults).

The PNC-DUP MO tracks the health of the active and standby PNCs, controls planned and spontaneous interchanges, and manages related functions such as double call refresh and unrefresh, anti-thrashing, and so on. The main responsibility of PNC-DUP is to recover the system to full service in the event of a fault. In the event of multiple faults PNC-DUP will do its best to maximize service continuity.

PNC duplication does not introduce any additional types of hardware or hardware faults, and there are no tests associated with the PNC-DUP MO. Instead, error log entries are used to log useful information about the occurrence and causes of interchanges. This is done in order to facilitate diagnosis of problems, which can then be addressed by using the documentation for the individual MO involved.

PNC-DUP Related Commands

The following commands are described in *Maintenance Commands Reference (03-300431)*.

`status pnc`	Lists information about the operational status of both PNCs including state of health, alarms, busyouts and locks.
`reset pnc interchange`	Initiates a demand PNC interchange. If the standby is healthy with state of health indexes all 0, there is no effect on service. Otherwise, calls may be dropped.
`set pnc`	Locks or unlocks the active PNC, preventing interchanges. It does not interfere with double call setup.
`busyout pnc`	Removes the standby PNC from service. See also Busyouts and PNC-DUP.

Busyouts and PNC-DUP

The **`busyout pnc`** command puts the standby PNC in the busyout state, and call set up is turned off.

- The standby PNC is unrefreshed; existing duplicate call connections are removed.
- PNC interchanges are prevented.

Upon release, interchanges are re-enabled and a global refresh of double call setup on the standby is performed.

When PNC duplication is in effect:

- An active PNC component cannot be busied-out.
- A standby PNC component can only be busied-out when the standby PNC is first busied-out.
- The standby PNC cannot be released unless all standby PNC components are released.

Figure 61: Duplicated Direct Connect PNC Connectivity

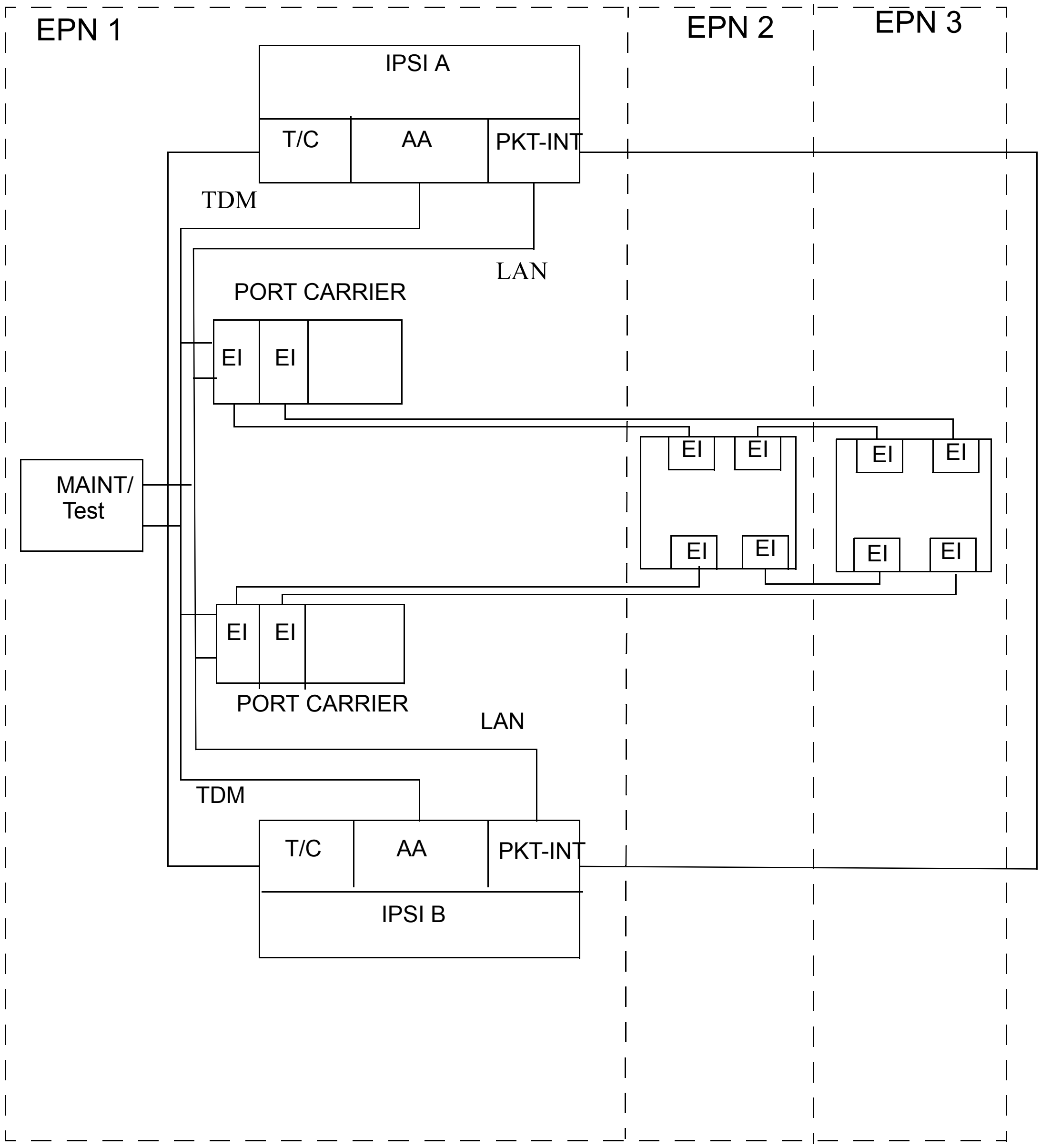
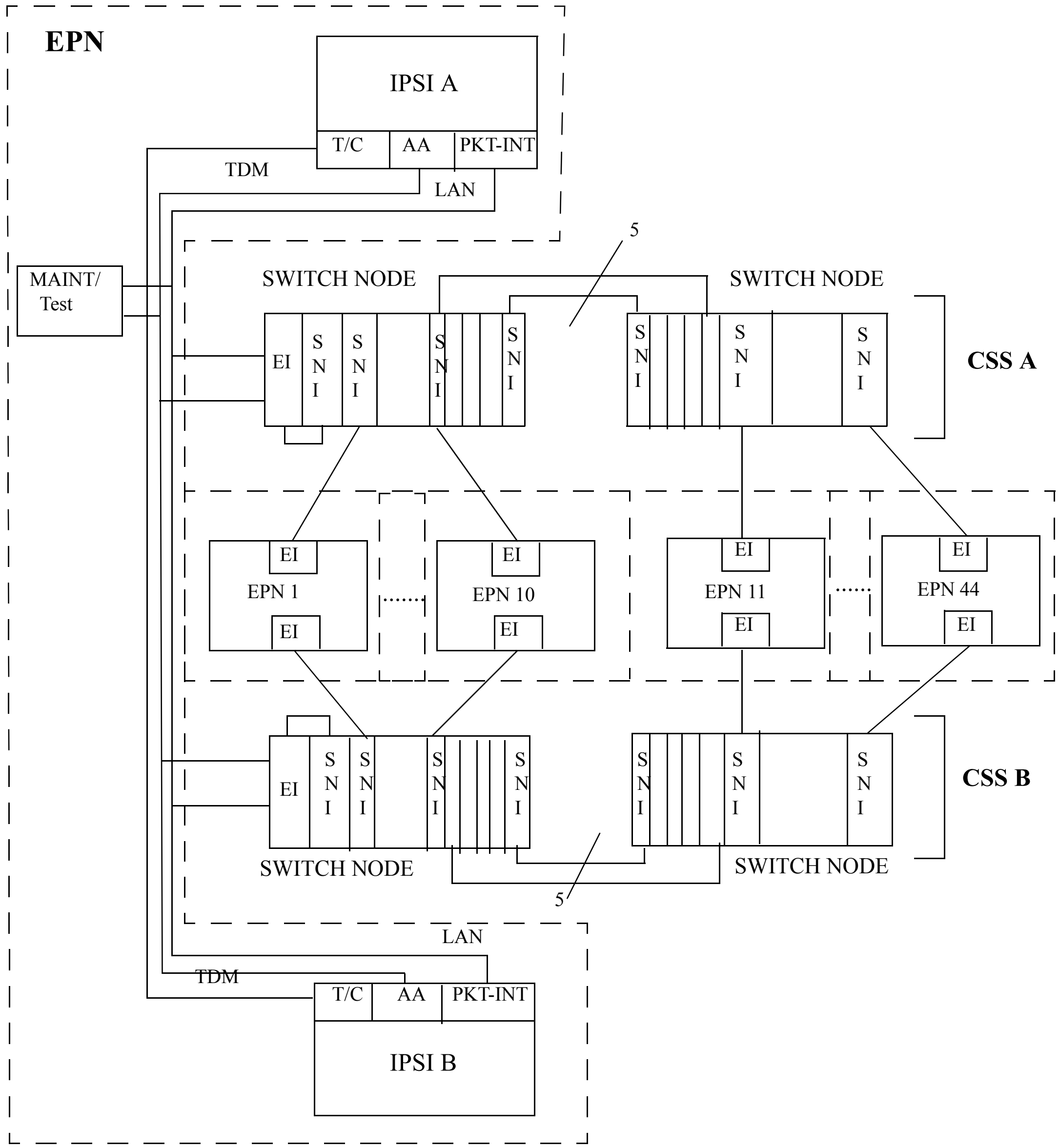


Figure 62: Duplicated PNC with Center Stage Switch Connectivity



Enabling and Removing PNC Duplication

Note:

PNC duplication requires IPSI duplication.

To Enable PNC Duplication

To enable PNC duplication:

1. Enable PNC-DUP on the **`change system-parameters customer-options`** screen.
2. Fully administer duplicate fiber link connectivity. Verify by entering **`list fiber-link`**. For IP Duplication go to Step 3.
3. Fully administer IPSI duplication (**`ipserver-interface duplication`**). Verify by using **`list ipserver-interface`**.
4. Turn on PNC-DUP using the **`change system-parameters duplication`** screen. This is not allowed if any component of either PNC (A or B) is busied out.
5. The system must insert all connectivity-related components for both standby and active PNC. For CSS configurations this takes up to 5 minutes depending upon CSS circuit pack insertion. For Direct Connect configurations this is declared complete at 5 minutes after the first appearance of the terminal login prompt.
6. The PNC-DUP initialization anti-thrashing timer must expire (this occurs 5 minutes after completion of board insertion, PNC interchange, or system reset of level 2 or higher).

To Disable PNC Duplication

To disable PNC duplication perform the following sequence of steps:

1. Verify that the A-PNC is active. A forced interchange may be required. See **`reset pnc`** in Chapter 8.
2. Busyout the standby PNC (B-PNC).
3. Turn off the system parameter for PNC-DUP using **`change system-parameters duplication`**.

   After PNC duplication has been removed, configuration audits generate the alarm shown below and possibly others. To clear this alarm, the B-PNC fibers, circuit packs in switch node carriers (EIs, SNIs, SNCs, and DS1Cs), and switch node carriers must be removed as outlined in the following steps.

   `01D     SN_CONF        5000   255`

   In this case, 01D is the B-PNC switch node from which duplication was removed.

4. Remove the B-PNC fibers by removing the Endpoint Board Locations on the **`change fiber-link`** screen for all fibers. For fibers using DS1Cs, remove the B-PNC DS1C Board Locations on the **`change fiber-link`** screen.
5. Remove the B-PNC circuit packs starting with the switch node carrier most distant from the server complex. Use **`change circuit-pack`** ***`location`***, page to the B-PNC carrier and remove all of the circuit packs there. Remove all circuit packs in the other B-PNC switch node carriers.

   If the Expansion Interface circuit pack associated with the PN is located in the switch node carrier closest to the server, it cannot be removed from translation until it has been busied-out and disconnected from the carrier slot.

   When SNI, SNC, or DS1C circuit packs are removed from a B-PNC carrier, any alarms against them should be resolved.
6. Remove the B-PNC switch node carriers. Use **`change cabinet`** ***`location`*** and enter **not-used** for B-PNC carriers.

   Any alarm against the carrier such as 01D SN-CONF should be resolved. The B-PNC carriers and associated circuit packs should not be alarmed.
7. Disable PNC duplication on the **`change system-parameters customer-options`** screen by changing **PNC Duplication** to **no**.

   If an alarm exists against any Expansion Interface circuit pack connected to a B-PNC carrier, use **`test board`** ***`location`*** **`long clear`** to clear the alarm.

Alterations to PNC which involve only the *addition* of fiber connectivity can be done with PNC-DUP operational. Alterations requiring the *removal* of fiber connectivity must be done with PNC-DUP removed. PNC-DUP must be removed and translations should be saved before any hardware changes are made.

Steady State LEDs

The LEDs of PNC components in a stable duplicated system should appear as follows:

- The active IPSIs are functioning as archangels in IPSI port networks.
- The active EIs in the PNs are functioning as archangels. Their LEDs flash in a pattern of 2 seconds on 200 milliseconds off (PN *without* an IPSI).
- The PN standby EIs amber LEDs are off (PN *without* an IPSI).
- The PN active EI amber LED is on solid (PN *with* an IPSI).
- The PN standby EI amber LED is off (PN *with* an IPSI).
- The SNIs on the active switch node(s) have amber LEDs on solid.
- The SNIs on the standby switch node(s) have amber LEDs off.
- Active DS1Cs amber LEDs are on solid.

- Standby DS1Cs amber LEDs are off.
- DS1C facility green LEDs are on if the corresponding facility is equipped.

PNC State of Health

PNC-DUP software monitors the health of the two PNCs as determined by their state of health (SOH) vectors, and initiates an interchange when the health of the active falls below that of the standby (unless prevented from doing so by a PNC lock, busyout, or anti-thrashing mechanism). Potentially service-disrupting faults which occur in PNC components are reported to PNC-DUP and incorporated in the state of health for the affected PNC. The SOHs of both PNCs are displayed on the **status pnc** screen.

Figure 63: Status PNC Screen with Standby PNC Fully In-Service

```
status pnc                                              page 1 of 1
                           PORT NETWORK CONNECTIVITY

                             Duplicated? yes
                        Software Locked? no
                         Standby Busied? no
                         Direct Connect? no
                      Standby Refreshed? yes
                   Interchange Disabled? no

              A-PNC                                B-PNC

           Mode:  active                        Mode:  standby
State of Health:  functional         State of Health:  functional
 Inter PN Index:  00.00.00.00.00.00   Inter PN Index:  00.00.00.00.00.00
 Inter SN Index:  00.00               Inter SN Index:  00.00
   Major Alarms:  0                     Major Alarms:  0
   Minor Alarms:  0                     Minor Alarms:  0
 Warning Alarms:  0                   Warning Alarms:  0
   SN Locations:  01E                   SN Locations:  01D
```

PNC State-of-Health Indexes

The Inter-PN and Inter-SN Indexes form the state of health vector, which is used to track and compare the states of health of both PNCs. The fields making up the indexes are two digit numbers separated by periods (.), with each field representing a different class of faults. The fault class fields are arranged in order of decreasing importance from left to right. In other words, each field in the index supersedes the following fields in determining which PNC is healthiest. A fault class drives an interchange only when all of the higher priority fault classes are equal. A zero entry indicates no faults in that class. Increasing numbers indicate increasingly higher numbers of faults present in that class.

The Inter-PN Index contains six fields (XX.XX.XX.XX.XX.XX), and the Inter-SN Index has two (XX.XX). The Inter-PN Index reports faults in connectivity between port networks and supersedes the Inter-SN Index, which reports faults in connectivity between switch nodes. (The Inter-SN Index is only meaningful for systems with a center stage switch having two switch nodes, each of which is duplicated).

The meaning of each fault class field is given in Table 212: PNC State-of-Health Fault Classes. A zero entry indicates that there are no such faults reported. Higher numbers indicate increasing number of faults. All zeros indicates perfect state of health. Unless the PNCs are locked, the active PNC's state of health should always be equal to or better than the standby's. (Otherwise, the system would perform a spontaneous interchange.)

After a PNC-related alarm is cleared, the system performs a partial refresh of the standby PNC. The corresponding fault class field is not updated to reflect the improved state of health until the refresh is done. The state of health indexes will not agree with the current alarm status during this period.

Table 212: PNC State-of-Health Fault Classes

Fault Class	Priority	Description	MOs
FC_EAL	1	Number of PNs with EALs down	EXP-PN
FC_INL	2	Number of PNs with LINL, RINL, or EI-SNI neighbor link faults	EXP-PN, SN-CONF
FC_BFD[1]	3	Number of PNs with BFDL (Bearer Fault Detection Link) faults	SYS-LINK
FC_HW	4	Number of PNs affected by hardware faults in a link having an EI as an endpoint (Endpoints can be determined with **`list fiber-link`**.)	EXP-INTF, SN-CONF, FIBER-LK, SNI-BD, DS1C-BD
FC_PER	5	Number of PNs affected by SNI peer link faults for SNIs connected to EIs	SNI-PEER
FC_DS1	6	Number of PNs affected by DS1C facility faults	DS1FAC

Table 212: PNC State-of-Health Fault Classes

Fault Class	Priority	Description	MOs
FC_SNIL	7	Number of inter-switch-node fibers affected by peer or neighbor link faults	SNI-PEER
FC_SNIHW	8	Number of interswitch-node fibers affected by hardware faults	SN-CONF, SNI-BD, FIBER-LK

1. BFDLs only exist in Port networks that have an IPSI. Port networks that do not have an IPSI will have the EI as Archangel and no BFDL faults.

In multi-node CSS configurations FC_DS1 is considered less critical that FC_SNINL since DS1C constraints affect only one PN and indicate restricted bandwidth. However FC_SNINL can indicate problems for all PNs on the far end switch node (the one downlink from the PN) If the DS1C problem is critical (for example, loss of all bandwidth to the affected PN) a constraint with a higher order fault class will be reported to PNC DUP.

Resolving Poor State of Health

When the SOHs for both PNCs are not all zeros, identify and repair the problem:

1. Look for PNC component alarms (major or minor) for the PNC side whose SOH is not all zero. First repair the standby PNC.
2. Busy-out the standby PNC.
3. Follow the diagnostic and repair procedures for the alarmed PNC components just as with a unduplicated PNC. Examine the alarm logs and error logs to isolate the fault.
4. Verify that the related PNC SOH is restored to all zeros.
5. Release the standby PNC for busy-out.

Refresh and Unrefresh of the Standby PNC

In a fully functional PNC with healthy standby and active sides, the standby PNC has a complete set of call connections corresponding to those in the active PNC. If, however, the state of health of the standby PNC degrades, a selective unrefresh of those connections which utilize the faulted component(s) is performed. If the health of the standby PNC improves, a selective refresh of connections on the affected route is performed, so that call setup is consistent between the active PNC and the healthy parts of the standby PNC.

The **Standby Refreshed** field on the **status pnc** screen does not refer to the selective type of refresh. It refers only to a global refresh that is performed when:

- The system is initialized and PNC duplication is enabled.

- There has been a spontaneous PNC interchange.
- The standby PNC has been released from busy-out.
- A system reset of level 2 or higher has taken place.

The **Refreshed** field may show **y** when the standby is partially unrefreshed. An interchange into an incompletely refreshed standby results in dropped calls. This can happen when a more severe fault occurs on the active PNC, or when **`set pnc interchange`** is used with the override option.

PNC Interchanges

PNC spontaneous interchanges occur when PNC duplication software determines that the SOH of the standby PNC is better than that of the active PNC. PNC-DUP executes a spontaneous interchange only when a message from a PNC component MO sends a message indicating that either a fault has occurred on the active PNC, or a fault has been resolved on the standby PNC such that the state of health of the active PNC is now lower than that of the standby.

This message will usually indicate the type and location of the failed connectivity component. A corresponding major or minor alarm is logged by the reporting MO, stimulating an alarm report.

In the less common situation when the resolution of a fault on the standby renders it more healthy than a simultaneously faulted active PNC, the message will indicate the type and location of the *improved* component.

Once the interchange completes, the failed component will be on the standby PNC. A demand interchange can be requested in the presence or absence of standby PNC faults. The following sequence of actions can be observed during a fault-free interchange:

1. The Expansion Interfaces currently acting as archangels in the PNs are deactivated as indicated by the amber LEDs going from flashing to on solid.
2. The EIs in IPSI port networks are interchanged as indicated by the new standby EI amber LED off and the new active EI amber LED on solid.
3. One by one the EIs in non IPSI port networks are interchanged as indicated by new standby EI amber LED turning off and the new active EI amber LED flashing (2 seconds on, 200 milliseconds off). At this point the interchange is functionally complete.
4. The SNIs amber LEDs are updated. so that the SNIs on the active SN have amber LEDs on, while the standby SN's SNIs amber LEDs turn off.

Certain conditions may interfere with the normal execution of the interchange:

1. In a faulted spontaneous interchange it is possible the PN directly affected by the fault will be the last to interchange.
2. A user directly affected by the single fault instigating a PNC interchange can experience a momentary outage of voice path connectivity during the switch.

3. If faults exist on both the standby and active PNC, it is possible to have some PNs go out of service while others are returned to service.
4. The new standby SNIs amber LED my not be off due to a fault in the line of communication path to the standby SNIs. In a multi-fault interchange, LEDs on the new active SNIs may not be on for the same reason.

In any multi-fault situation, use **`status pnc`** to determine which is the active PNC.

PNC duplication informs Timing Synchronization maintenance when a PNC interchange has been completed and indicates which PNC is active. This causes Synchronization to audit and insure that the primary source for synchronization of Tone-Clocks in each PN is supplied by a path associated with the active PNC.

Antithrashing and PNC Interchanges

Following a spontaneous PNC interchange, subsequent PNC interchanges are prevented for 5 minutes. This condition is indicated by a **y** in the **Interchange Disabled** field of the **status PNC** screen. After 5 minutes, the anti-thrashing, timer expires, interchange decisions are re-enabled, and the field entry is **n**.

Note:

Should a catastrophic failure occur on the active PNC during the period when **Interchange Disabled?** is set to **y**, there will be no spontaneous PNC interchange.

Demand PNC interchanges also invoke anti-thrashing, but only for a period of 30 seconds. During anti-thrashing mode, demand interchanges are also prevented unless the override option is specified. Use of this option will cause a service disruption.

Repairs on the Standby PNC Components

CAUTION:

If there is a TDM-CLK alarm, system timing may be routed through part of the standby PNC, and circuit switched data may be affected by the following repair procedures. This can happen, for example, when a slave tone/clock circuit pack experiences a loss of signal and switches to receive timing from the standby EI. In this case TDM-CLK 2305 error will be logged, and the clock problem should be addressed first, if possible.

To repair PNC components in a duplicated PNC:

Most repairs involve fixing a single fault on the standby PNC.

1. Use **`set pnc lock`** or **`busyout pnc`** to prevent an interchange into the PNC being repaired.

   If a faulty component exists on the currently active PNC, the standby PNC is more severely faulted. Normally the standby PNC is repaired first because it is the most severely impaired.

2. To repair the active PNC, use **`reset pnc interchange override-and-lock`** to request an interchange and ensure that no subsequent interchange occurs during the repair of the standby PNC.

   The demand interchange may not be necessary if the following conditions drive a spontaneous interchange:

   - The anti-thrashing period from the last interchange has expired.
   - The global refresh from releasing the standby PNC has completed.

   The standby PNC SOH is better than the active.

3. At this point, the faulty component is on the standby PNC, and the PNCs are locked in their current active/standby state. Busy-out the PNC.
4. Use fault isolation and component testing procedures for the individual PNC components. Replacement of components will not disrupt operation of the active PNC.
5. Once the failed component is replaced, test the standby PNC component from the terminal to ensure the replacement is functioning properly.
6. When the problem is resolved as indicated by a state of health with all zeros, (**`status pnc`**), unlock and release the pnc.

No further PNC interchange is required because you can test the standby PNC as thoroughly as the active.

Interactions: Server Resets and PNC Interchanges

- A system reset of level 1 (warm), 2 (cold2) or 4 (reboot) does not change which PNC is active. If a PNC interchange was in progress when the reset took place, the PNC interchange still goes to completion.
- If a system reset level 1 (warm) takes place during a PNC interchange, the reset is escalated to level 2 (cold2).

Fault Isolation Using Duplicated PNC

PNC duplication, can, in some cases aid in the isolation of faults. PNC interchanges can be used to help indict the faulty hardware. Following are two examples demonstrating this technique.

- There is a fault which can occur in either an IPSI port network's EI or the PKT-INT which cannot be readily attributed to one board or the other. If the packet bus transceivers on the PKT-INT or EI fail, it will be apparent that the two boards cannot communicate, but it will not be clear which board is at fault. In this case, a planned interchange of the PNC can be used to indict one of the two boards. If the interchange cures the problem, the EI was at fault. If the interchange does not cure the problem, the PKT-INT is suspect, provided there are no PKT-BUS faults.
- A similar relationship exists for the PN Archangel (active EI) and certain TDM bus problems. If the EAA cannot communicate with a port board over the TDM bus, then the EAA has a fault, the port board has a fault, or there is a problem with the TDM bus itself.
  - If TDM bus maintenance tests find no problems with the bus, then it is either the port board or the EAA. It may be simpler to replace the port board than to request a PNC interchange.
  - If it is not clear which port board may be at fault, or maintenance is being performed remotely, verify that the EAA is not at fault by executing a PNC interchange. If the interchange solves the problem, then the EAA is faulty.
  - If the problem persists after the interchange, but TDM bus maintenance finds no problem, then the port board is faulty.

Error Log Entries

When a PNC interchange takes place, an error is logged against PNC-DUP with a code that conveys information about the cause of the interchange and which PNC became active. There are no alarms associated with PNC-DUP errors. There should be an alarm against the PNC component that drove the interchange.

There are no PNC-DUP test sequences. Use **`status pnc`** to see information regarding the status of the PNCs.

The information in the following tables helps identify areas of the Alarm Log to investigate in order to find the source of the problem.

Error Type	Aux Data		Error Code	Aux Data
00000 (a)	None		20200 – 20263 (s)	[1]
10000 – 10063 (b)	[1]		20300 – 20363 (t)	[1]
10100 – 10163 (c)	[1]		20400 – 20463 (u)	[1]
10200 – 10263 (d)	[1]		20500 – 20563 (v)	[1]
10300 – 10363 (e)	[1]		20601 – 20664 (w)	[1]
10400 – 10463 (f)	[1]		20701 – 20764 (x)	[1]
10500 – 10563 (g)	[1]		21000 – 21063 (y)	[1]
10601 – 10664 (h)	[1]		21100 – 21163 (z)	[1]
10701 – 10764 (i)	[1]		21200 – 21263 (aa)	[1]
11000 – 11063 (j)	[1]		21300 – 21363 (ab)	[1]
11100 – 11163 (k)	[1]		21400 – 21463 (ac)	[1]
11200 – 11263 (l)	[1]		21601 – 21664 (ad)	[1]
11300 – 11363 (m)	[1]		21701 – 21764 (ae)	[1]
11400 – 11463 (n)	[1]		51000 (af)	[1]
11601 – 11664 (o)	[1]		52000 (ag)	[1]
11701 – 11764 (p)	[1]		53000 (ah)	[1]
20000 – 20063 (q)	[1]		60801 (ai)	[1]
20100 – 20163 (r)	[1]		60800 (aj)	[1]

1. The Aux Data indicates which PNC became active after the PNC interchange: “0” denotes PNC-A; “1” denotes PNC-B.

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
18	None	`busyout pnc-dup`	WRN	ON	`release pnc-dup`

Notes:

a. **Error Type 0**: an error took place in generating the Error Code.

b. **Error Type 10000-10063**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_EAL. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10003 points to port network 4) Use **`list config port-network`** to show the cabinet number associated with a port network.

c. **Error Type 10100-10163**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_INL. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10003 points to port network 4). Use **`list config port-network`** to show the cabinet number associated with a port network.

d. **Error Type 10200-10263**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_HW. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10203 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

e. **Error Type 10300-10363**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_PER. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10303 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

f. **Error Type 10400-10463**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_DS1. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10403 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

g. **Error Type 10500-10563**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_BFD. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (10203 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

h. **Error Type 10600-10664**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_SNIL. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the Error Code indicate the fiber-link number of the fiber that reported the retired alarm. Use **`list fiber-link`** to show the location of the fiber.

i. **Error Type 10700-10764**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_SNIHW. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms.

The last two digits of the Error Code indicate the fiber-link number (01-64) of the fiber that reported the retired alarm. Use **`list fiber-link`** to show the location of the fiber.

j. **Error Type 11000 – 11063**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_EAL. This indicates that one or more Expansion Archangel Links are down. Investigate any EXP-PN alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (11003 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

k. **Error Type 11100 – 11163**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_INL. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (11103 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

l. **Error Type 12000 – 11263**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_HW. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (11203 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

m. **Error Type 11300 – 11363**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_PER. This indicates one or more faults on peer links that connect SNIs to EIs. Investigate any alarms against SNI-PEER. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (11303 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

n. **Error Type 11400 – 11463**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_DS1. This indicates faults on one or more DS1C facilities. Investigate any alarms against DS1-FAC. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (11403 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

o. **Error Type 11601 – 11664**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_SNIL. This indicates one or more faults on peer or neighbor links between SNIs on different switch nodes. Investigate any alarms against SNI-PEER. The last two digits of the Error Code indicate the fiber-link number of the fiber that reported the retired alarm. Use **`list fiber-link`** to show the location of the fiber.

p. **Error Type 11701 – 11764**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_SNIHW. This indicates one or more faults on hardware connecting SNIs on different switch nodes.

Investigate any alarms against SN-CONF, SNI-BD, FIBER-LK. The last two digits of the Error Code indicate the fiber-link number of the fiber that reported the retired alarm. Use **list fiber-link** to show the location of the fiber.

q. **Error Type 20000 – 20063**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_EAL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20003 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

r. **Error Type 20100 – 20163**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_INL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20103 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

s. **Error Type 20200 – 20263**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_HW. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20203 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

t. **Error Type 20300 – 20363**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_PER. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20303 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

u. **Error Type 20400 – 20463**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_DS1. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20403 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

v. **Error Type 20500 – 20563**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_BFD. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the retired alarm. (20203 points to port network 4.) Use **list config port-network** to show the cabinet number associated with a port network.

w. **Error Type 20600 – 20664**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_SNIL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the Error Code indicate the fiber-link number (01-27) of the fiber that reported the retired alarm. Use **list fiber-link** to show the location of the fiber.

x. **Error Type 20700 – 20764**: a spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_SNIHW. Use **`status pnc`** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the Error Code indicate the fiber-link number (01-27) of the fiber that reported the retired alarm. Use **`list fiber-link`** to show the location of the fiber.

y. **Error Type 21000-21063**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_EAL. This indicates that one or more Expansion Archangel Links are down. Investigate any EXP-PN alarms. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (21003 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

z. **Error Type 21100-21163**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_INL. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (21103 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

aa. **Error Type 21200-21263**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_HW. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (21203 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

ab. **Error Type 21300-21363**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_PER. This indicates faults on peer links that connect SNIs to EIs. Investigate any alarms against SNI-PEER. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (21303 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

ac. **Error Type 21400-21463**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_DS1. This indicates faults on one or more DS1C facilities. Investigate any alarms against DS1-FAC. Adding 1 to the last two digits of the Error Code gives the PN number of the port network that reported the alarm. (21403 points to port network 4.) Use **`list config port-network`** to show the cabinet number associated with a port network.

ad. **Error Type 21600-21664**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_SNIL. This indicates faults on peer or neighbor links between SNIs on different switch nodes. Investigate any alarms against SNI-PEER. The last two digits of the Error Code indicate the fiber-link number (01-27) of the fiber that reported the alarm. Use **`list fiber-link`** to show the location of the fiber.

ae. **Error Type 21700-21764**: a spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_SNIHW. This indicates faults on hardware connecting SNIs on different switch nodes. Investigate any alarms against SN-CONF, SNI-BD, FIBER-LK. The last two digits of the Error Code indicate the fiber-link number (01-27) of the fiber that reported the alarm. Use **`list fiber-link`** to show the location of the fiber.

af. **Error Type 51000**: a spontaneous PNC interchange took place upon the expiration of the anti-thrashing timer.

ag. **Error Type 52000**: a spontaneous PNC interchange took place upon the unlocking of the PNCs with the **`set pnc unlock`** command.

ah. **Error Type 53000**: a spontaneous PNC interchange took place upon the completion of a global refresh of the standby.

ai. **Error Type 60801**: a demand interchange was executed with **`reset pnc interchange`**.

aj. **Error Type 60800**: a demand interchange was executed with **`reset pnc interchange`** using the **`override-and-lock`** option.

POWER

S8700-series Fiber-PNC

This section covers maintenance for:

- Battery and Charger for AC-Powered Systems
- Battery and Charger for DC-Powered Systems

Battery and Charger for AC-Powered Systems

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
POWER	MIN	`test environment C` [1]	Battery and Battery Charger

1. ***C*** is the cabinet number indicated in the PORT field from the Alarm or Error Log.

Two different cabinet types: multicarrier and single carrier. Single carrier cabinets are used only for PNs. Both cabinet types may be powered by AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

AC-powered multicarrier cabinets can be equipped with rechargeable batteries that provide backup power during short power outages. Battery backup is optional on cabinets powered by an uninterruptable power supply (UPS), and is required on those that are not. DC-powered cabinets and single-carrier cabinets do not have battery backup, and this MO is not valid for those cabinets.

The battery backup for the J58890CH unit consists of one battery assembly and charger. The battery backup for the J58890CE unit consists of three 48V batteries and a battery charger. Each cabinet so equipped has its own independent battery backup unit. When power to the cabinet is interrupted, a warning alarm is logged against AC-POWER and the system draws power from the backup batteries. This is known as Nominal Power Holdover (NPH). If power is restored before the NPH time expires, the alarm is resolved. If power does not return, error logs are saved to the Mass Storage System. The nominal power holdover provided is as follows:

PN cabinet	Holdover
All carriers	15 seconds
Expansion control carrier	10 minutes

When AC power is restored after an outage, the battery charger fully recharges the batteries within 30 hours.

In a multicarrier-cabinet system, the Battery and Battery Charger MO represents the battery charger and the battery which are located in the lower left corner of the cabinet. Should anything go wrong with the battery or charger, they must be replaced using the procedure described in Replacing the Battery and Battery Charger (J58890CE). The system will detect one of the following three problems with the batteries or charger:

- Reserve Fault: the charger has detected a problem within itself or the batteries and has notified the system.
- High Charge Rate: the batteries have been charging at a high charge rate for an excessively long period of time. This indicates that there is a short in the batteries or the charger.
- Prepare to Disconnect (Low Battery): the batteries are in danger of being drained to a point where the batteries would be damaged. This warning often occurs after multiple power failures.

  The batteries take 30 hours to fully charge after being drained. A fully charged battery pack should bridge two power failures without causing a low battery warning to occur.

Replacing the Battery and Battery Charger (J58890CE)

1. Move the power switch on the battery charger to OFF.

   Always turn off the battery charger before replacing the batteries. Failure to do so will result in damage to the 397C battery charger.
2. Disconnect the cord from the outlet on the front of the battery charger.
3. Remove the screw at the top left of the cover and open the cover to access the charger.
4. Check the battery voltages at the test points. Check all 3 batteries wired in series (the voltage should be 144 Volts, 3 X 48 Volts = 144 Volts).

   Note:

   An ordinary voltmeter can be used to check battery voltages at the test points, but it may not produce valid results. If the battery voltage readings are below 48 Volts (the voltages at test points should read 144 Volts, 3 x 48 Volts = 144 Volts), the battery is probably defective. However, a normal voltage reading does not necessarily mean the battery is good; under load, a defective battery with a normal reading on the voltmeter may discharge rapidly.
5. Check the battery dates and the preventive maintenance log. Replace the batteries if they are more than 2.5 years old.

   Note:

   If any defective batteries are found, replace all of them. Batteries are ordered in sets of three and should be replaced as such.
6. If no defective batteries are found, replace the entire charger.
7. Close the cover and secure it with the screw.
8. Reconnect the cord and move the power switch to ON.

Replacing the Battery Assembly (J58890CH)

The batteries are replaced as an entire assembly.

1. Check the battery voltages at the test points on the BIU (Battery Interface Unit).
2. Remove the BIU from the power distribution unit.
3. Disconnect the battery plug from the power distribution unit (J20).
4. Remove the battery assembly from the rear of the cabinet.
5. Install the new battery assembly in the reverse order.
6. Plug the BIU back into the power distribution unit.

Battery and Charger for DC-Powered Systems

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
POWER	MIN	`test environment` ***UU*** [1]	Battery and Battery Charger

1. ***UU*** is the cabinet number indicated in the PORT field from the Alarm or Error Log.

Note:

This MO applies to the J58890CE and the J58890CH-1 with large battery holdover.

This MO represents the battery backup unit found in AC-powered multicarrier cabinets. Because the system does not recognize the type of external power, this MO exists in DC-powered multicarrier cabinets but serves no functional purpose. In such cabinets, every POWER test should always pass or abort, and no POWER alarms should be raised.

Two different types of PN cabinets are supported: multicarrier and single-carrier. Both cabinet types may be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

Battery Holdover (Large Batteries)

The large batteries are mounted inside a separate battery cabinet and can supply holdover times of 2 to 8 hours depending on the size of the battery. The batteries are circuit breaker protected and are charged by the J58890CH-1. The batteries also contain a thermal sensor that change the charging voltage depending on the battery temperature.

Error log entries and recommended actions

Table 213: POWER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test environment` *UU*
1	Any	Battery and Power Supply Query (#5) (Error Code 8)	MIN	ON	`test environment` *UU*
257	Any	Battery and Power Supply Query (#5) (Error Code 4)	MIN	ON	`test environment` *UU*
769	Any	Battery and Power Supply Query (#5) (Error Code 2)	MIN	ON	`test environment` *UU*
3840 (b)	1005 1028	Battery and Power Supply Query (#5)			`test environment` *UU*

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 3840**: this error is valid only for AC-powered multicarrier cabinets with battery backup. For DC-powered cabinets, ignore the error; it cannot be cleared.
For AC-powered cabinets, see if the battery charger is connected. If the cabinet is powered by a UPS, there is no battery backup and this error can be ignored.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
			1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND
			2 of 2

1. D = Destructive, ND = Nondestructive

POW-SUP (Power Supply)

G650

MO name in Log	Alarm level[1]	Initial Command to Run	Full name of MO
POW-SUP	MAJ MIN WRN	**test board *location* long**	Power Supply

1. This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

The POW-SUP maintenance object notes the presence of each power supply and the voltage of each power supply in the G650.

This MO:

- Verifies that a power supply that is administered is physically present
- Verifies that each output voltage (+5V, -5V, and -48V for the power supplies and +12V for the fan) is within tolerance
- Is used with the **recycle carrier** command to momentarily turn off and on the power to a specified power supply or to a specified carrier
- Is used to turn off output voltages from one power supply to verify that the other supply can support the entire load of the G650 (This is used only when a G650 has redundant power supplies.)

There is one instance of this MO for each 655A power supply equipped in a G650 stack. Refer to G650 Cabinet Environmental Hardware Components for further information.

If you have redundant power supplies, and both are operating, you can unplug one power supply and leave it unplugged for ten minutes without causing an alarm. If the remaining operating power supply has an alarm, the system does not wait ten minutes to generate an alarm. It generates an alarm immediately. If the power supply is unplugged for more than ten minutes, the system generates a warning alarm with an Error Code 23. If you need the power supply to be unplugged for more than ten minutes, and you do not want the system to generate an alarm, use the **change circuit-pack** command to un-administer the power supply.

Recycle carrier

The **recycle carrier** command is useful for three different troubleshooting actions:

- To verify that a redundant power supply can carry the full load. This is done by entering **recycle carrier *location*** with the slot number of the power supply that is to be momentarily shut down.

  Each power supply monitors the voltage on the backplane and not the voltages from the power supply itself. Therefore, when redundant power supplies are present, the only way to check the voltages from each power supply is to use the recycle power supply command with the slot number chosen to force the other power supply to be tested when it is the only supply on the backplane.

- To momentarily shut the power off for an entire carrier that is not a control carrier to force all the boards in the carrier to be power cycled. This is done by entering **recycle carrier *location***.

  Note:

  When redundant power supplies are present, this test may generate error log entries for either power supply in the carrier.

- To momentarily shut the power off for a control carrier to force the EPN to go down and back up with a port network COLD restart. This is done by entering **recycle carrier *location* override** for a G650 carrier with an active IPSI.

  For the case where duplicate IPSIs are present in a port network, the **set ipserver** command can be used to put an IPSI in the standby mode, so that a recycle of the carrier containing that IPSI will not cause a reset of the EPN.

The following test results may be obtained from the **recycle carrier** command:

Failure Code	Description
1	Output voltages for the power supply under test are out of tolerance after the power was restored.
2	When redundant power supplies are present, the output voltages for the other power supply are out of tolerance after the power was restored.
16	When redundant power supplies are present, and the slot number is specified, the output voltages for the other power supply are out of tolerance during the time that power supply is the only power supply providing power. If it is acceptable to disrupt service temporarily, remove the good power supply and run **test board** for the other power supply to verify that it has failed.

Note:

It is unlikely that failure codes 1 or 2 will occur when redundant power supplies are present, because each power supply is measuring the backplane voltage instead of the power supply voltage.

Error log entries and recommended actions

Table 214: POW-SUP Error Log

Error Type	Aux Data	Associated Test	Alarm Level [1]	On/Off Board	Recommended Action
1 (a)	Any	Power supply detection test (#1535)	MAJ MIN	ON	test environment location test board location
23 (b)		Power supply detection test (#1535)	WRN	ON	test board location
257 (c)		Power supply recycle test (#1534)	MAJ MIN	ON	recycle carrier location [override]
513 (d)		Power supply voltage test (#1536)	MAJ MIN	ON	test environment location test board location
769 (e)		Power supply voltage test (#1536)	MAJ MIN	ON	test environment location test board location
1025 (f)		Power supply voltage test (#1536)	MAJ MIN	ON	test environment location test board location
1281 (g)		Power supply voltage test (#1536)	MAJ MIN	ON	test environment location test board location
1537 (h)	Any	Power supply detection test (#1535)	MAJ MIN	ON	test board location
1793 (i)	Any	Power supply detection test (#1535)	MAJ MIN	ON	test board location
2049 (j)		Power supply detection test (#1535)	MIN WRN	ON	test board location
2305 (k)		Power supply aux sig test (#1649)	MAJ MIN	ON	test board location

1. This is a MINOR alarm if there is a redundant power supply, and a MAJOR alarm if there is only one power supply.

Notes:

a. **Error Type 1**: power supply not detected.

b. **Error Type 23**: the power supply is administered, but not present.

1. Verify that the power is plugged in.
2. Check the yellow LED to determine that the power is on.

c. **Error Type 257**: the Power Supply Recycle Test (#1534) failed. Aux Data shows the failure(s), according to the table below. Aux Data values may be added together.

Aux Data	Description
1	The power supply under test did not restore power.
2	The other power supply did not restore power.
16	The power supply under load failed when the other power supply was specified in the recycle command.

d. **Error Type 513**: the +5V is out of tolerance (4.75 to 5.25 V (+/- 5%)).

1. Run **`test board`** ***`location`***.
2. Run **`status environment`**.

e. **Error Type 769**: the -5V is out of tolerance (-4.5 to -5.5 V (+/- 10%).

1. Run **`test board`** ***`location`***.
2. Run **`status environment`**.

f. **Error Type 1025**: the -48V is out of tolerance (-44.2 to -51.8 V (+/- 8%)).

1. Run **`test board`** ***`location`***.
2. Run **`status environment`**.

g. **Error Type 1281**: the +12/14V fan voltage is out of tolerance (+11.4 to +15 V). The nominal +12V is raised to +14V when there is a hot spot warning or fan failure.

1. Run **`test board`** ***`location`***.
2. Run **`status environment`**.

h. **Error Type 1537**: internal failure.

1. Run **`test board`** ***`location`***.

Aux Data	Description
1	Analog-to-digital converter failure
2	Digital-to-analog converter failure
4	Internal Mux failure
8	EEPROM failure
64	Calibration contents CRC check failure
128	Power supply firmware CRC check failure

i. **Error Type 1793**: operational failure.

1. Run **test board** ***location***.

Aux Data	Description
1	No AC or DC input
2	The power supply is off because of a system command.
4	Failure, voltage, temperature, or internal status fault

j. **Error Type 2049**: input power failure. A warning alarm is generated when the problem is first detected. The alarm level will change to a Minor alarm after about 50 minutes if the problem does not clear.

1. Run **test board** ***location***.
2. Run **status environment**.

k. **Error Type 2305**: aux sig lead failure.

1. Run **test board** ***location***.
2. Run **status environment**.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short Test Sequence	Long Test Sequence	Reset Test Sequence	D/ND
Power Supply Recycle Test (#1534)			X	D
Power Supply Detection Test (#1535)	X	X		ND
Power Supply Voltage Test (#1536)	X	X		ND
Power Supply Aux Signal Test (#1649)	X	X		ND

PPP-PT (Control LAN Packet/Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PPP-PT	MAJ MIN	`test port` *`location`* `long`	PPP Port Maintenance
	WRN	`test port` *`location`*	

The TN799DP Control LAN (C-LAN) circuit pack provides TCP/IP connection to adjuncts applications such as CMS, INTUITY, and DCS Networking. The C-LAN circuit pack has one 100BASE-T Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. Multiple C-LAN circuit packs in a system gives additional TCP/IP capacity.

A RSCL (remote socket control link) connects the C-LAN and the server to pass call-control and other management information. Since one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit pack maintenance.

Control LAN Congestion Controls

The switch activates congestion controls on C-LAN when it detects buffers exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm
Exhausts buffers	Raises MINOR alarm
Ceases for 12 minutes	Retires MINOR alarm

Error log entries and recommended actions

Table 215: PPP-PT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *`location`*
					1 of 2

Table 215: PPP-PT Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (b)	0	SCOTCH Sync Looparound (#1275)	MIN	ON	`test port` *`location`* `l r 3`
257 (c)	0		WRN	OFF	
513 (d)	0		MIN	OFF	
769 (e)	0		WRN	OFF	
1281 (f)	0				
1537-8 (g)	See note	Session Status test (#1286)	MIN	OFF	
1793 to 1920 (h)	See note				
2305 to 2816 (i)	See note				
3329 (j)	35768	TCP/IP Ping test (#1281)	MIN WRN[1]	OFF	`test port` *`location`* `r 3`
3585 (k)	0, 1	TDM Looparound (#1285)	MAJ	ON	`test port` *`location`* `l r 3`
					2 of 2

1. Major alarms may be downgraded to Warning alarms based on the value used in **`set options`**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: SCOTCH Synchronous Looparound test (#1275) failed.

1. Test the port (**`test port`** ***`location`*** **`long`**).
2. See SCOTCH Synchronous Looparound Test (#1275) for repair procedures.

c. **Error Type 257**: C-LAN port detected overrun or underrun condition that may indicate a hardware problem.

1. Test for hardware problem (**`test port`** ***`location`*** **`long`**).
2. See SCOTCH Synchronous Looparound Test (#1275) for repair procedures to verify repair.
3. Clear the alarm (**`test port`** ***`location`*** **`long clear`**).

d. **Error Type 513**: PPP link lost end-to-end connectivity.

1. Test for hardware problem (`test port location long`).
2. Run TDM Looparound Test (#1285), and refer to its repair procedures if there is a hardware problem.

   If there is no hardware problem, the switch tries to re-establish PPP link.

e. **Error Type 769**: Port received an invalid frame, which is greater than the maximum length, contains CRC errors, and/or violates the link level protocol.

1. Test the port (`test port location long`).
2. Refer to TDM Looparound Test (#1285) to verify repair.
3. Clear the alarm (`test port location long clear`).

f. **Error Type 1281**: the far end has requested a disconnect of a session on this link. This is a log-only error.

g. **Error Type 1537, 1538**: some or all port sessions (sockets) are down:

If the switch indicates that:	Then it:
Some of the sessions are down	Raises off-board WARNING
Every session is down	Raises off-board MINOR alarm

1. Test the port (`test port location`).
2. See PPP Link Status Inquiry Test (#1279) for repair procedure to verify repair.

h. **Error Type 1793-1920**: a socket was closed due to an error. Error Type indicates the application associated with this socket; Aux Data indicates the internal application number.

Error Type	Application
1793	Unused
1794	DCS
1795	AUDIX
1796	CMS
1797	ISDN Gateway
1798–1920	Reserved for future

i. **Error Type 2305-2816**: a session is down. Aux Data indicates the session number. These are log-only errors:

- Error Types 2305–2560 are for session numbers 1–256.
- Error Types 2561–2816 are for session numbers 257–512.

j. **Error Type 3329**: TCP/IP Ping test failed. A WARNING alarm is raised if the test fails twice. A MAJOR alarm is raised if the test fails 6 times.

1. Test the port (`test port` *`location`*).
2. See TCP/IP Ping Test (#1281) for repair procedures.

k. **Error Type 3585**: TDM Looparound test (#1285) failed.

1. Test the port (`test port` *`location`* `long`).
2. See TDM Looparound Test (#1285) for repair procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TDM Looparound Test (#1285)		X	D
SCOTCH Synchronous Looparound Test (#1275)		X	D
TCP/IP Ping Test (#1281)	X	X	ND
Session Status Test (#1286)	X	X	ND
PPP Link Status Inquiry Test (#1279)	X	X	ND

1. D = Destructive, ND = Nondestructive

PRI-CDR (Call Detail Recording Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PRI-CDR SEC-CDR CDR-LNK	MIN	`test cdr primary	secondary long`	CDR Link
	WRN	`test cdr primary	secondary`	

The error entries and tests for PRI-CDR also apply to CDR-LNK and SEC-CDR.

The CDR feature records detailed call information about every incoming and outgoing call on specified trunk groups and sends this information to a CDR output device. The two physical links can be administered for connecting external CDR output devices to the system. They are identified as the primary CDR (PRI-CDR) link and the secondary CDR (SEC-CDR) link. The CDR device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack that is administered as a data extension. A CDR device can also be connected through an ADU to a port on TN726B. The CDR link to the processor is through a C-LAN board. For information about C-LAN port connectivity, see CLAN-BD (Control LAN Circuit Pack). External CDR output devices include:

- 94A Local Storage Unit (LSU)
- TELESEER CDR Unit
- Call Accounting System (CAS)
- Call Detail Recording Unit (CDRU)
- Printer
- Host computer
- Personal computer (PC)
- Customer-provided equipment

CDR Link Maintenance provides a strategy for maintaining the link between the system and an external CDR output device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. CDR Link Maintenance uses a try-and-wait mechanism for maintaining the CDR link. If the CDR link is torn down due to an error, CDR Link Maintenance tries to bring the CDR link up. If the Link Setup fails, CDR Link Maintenance will wait for 30 seconds before the next retry. If the number of retries reaches a threshold (two), a Minor alarm is raised for service attention.

CDR Link Maintenance does not cover the maintenance of the elements composing the CDR physical link:

- External CDR output device
- Data Module (PDM/MPDM/DTDM) and Digital Line Port of TN754 Digital Line circuit pack
- ADU and Data Line Port of TN726B Data Line circuit pack

If CDR Link Maintenance cannot restore the CDR link, the maintenance tests of these individual components of the CDR link must be executed to diagnose faults.

Procedures for Restoring the CDR Link

1. Determine the status of CDR links.

   Enter **`status cdr-link`** and make sure that the CDR links are not busied out for maintenance. If the link is down, continue to the next step.

2. Where does the CDR link connect to?

   Enter **`display system-parameters features`** and find out the destinations of CDR links. Continue to the next step.

3. Enter **`status data`** ***`extension`*** and verify whether the data extension is in the *in-service/idle* state. If the data extension is not available, look for the extension number in the **Alt Name** field of the Error Log and see XXX-BD (Common Port Circuit Pack/Media Module) for resolutions.

4. Is the external CDR output device available?

   Make sure that the CDR output device is on-line and ready for service. Check the physical connectivity between Data Module and the CDR output device.

5. If the problem is not found in the above steps, check the C-LAN board for any problems. For description about system port and its connectivity, see CLAN-BD (Control LAN Circuit Pack).

When restoring the CDR link it is necessary to execute maintenance test on different objects that comprise the CDR link. It is recommended that you busyout the CDR link before trying to restore the link. When the CDR Link is busied out, then every CDR Link maintenance action is deactivated, and interference to tests of other MOs is prevented.

Error log entries and recommended actions

Table 216: PRI-CDR Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test cdr-link primary | secondary**
18 (b)	0	**busyout cdr-link primary|secondary**	WRN	OFF	**release cd-link primary | secondary**
257 (c)	Any	Link Retry test (#215)	MIN[1] WRN	OFF	**test cd-link primary | secondary l**
513 (d)					**test cdr-link primary | secondary**
1025 (e)					
1281 (f)	Any				

1. Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 18**: the CDR link is busied out and the CDR link is torn down.

c. **Error Type 257**: Link Retry test (#215) failed. An error was detected when setting up the link. See the preceding section Procedures for Restoring the CDR Link for resolution.

d. **Error Type 513**: the CDR physical link is down for one of the following reasons:

- Cable to the CDR output device is disconnected.
- CDR output device is powered off.
- The data extension where the CDR output device connects to has been busied out or there is a scheduled daily interchange.

1. Check the connectivity of wire and cable among wall jacket, data module, and the CDR output device.
2. Enter **status data *extension*** and verify that the data extension of the CDR output device is in the in-service/idle state. If the data extension is not available, see Procedures for Restoring the CDR Link for resolution.
3. Use **display system-parameters maintenance** to see the start time of daily maintenance.
4. If the error occurs and is resolved during of daily maintenance, it can be ignored.

e. **Error Type 1025**: the CDR output device is in an off-line state, (for example, due to paper jam or paper out for a printer device). The CDR link is torn down.

1. Check the CDR output device and act promptly to put it back to on-line state.
2. Enter **`test cdr-link`** ***`primary | secondary`*** command to set up the CDR link.

f. **Error Type 1281**: overflow of CDR records generated in the switch due to the heavy trunk traffic and low speed CDR output device. If both primary and secondary links are ON, the secondary link is torn down temporarily for two minutes to speed up the output process to the primary link. No action is necessary for this Error Type.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Link Tear Down Test (#213)		X	Destructive
Link Retry Test (#215)	X	X	Nondestructive

PROC-SAN (Process Sanity Audits)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
PROC-SAN	none	none	Process Sanity Audits

The Process Sanity Audits MO is responsible for monitoring the sanity of software processes in the system. If the Process Sanity Audits MO detects that a process has gone insane (does not respond to a sanity message within an allotted time period), the process will be restarted. If the Process Sanity Audits MO detects that multiple processes (or a single key process) do not respond to sanity messages within an allotted time period, a system recovery action will be initiated.

The Process Sanity Audits MO has no alarms and no tests. Certain errors are logged to the Error Log for information purposes only.

Error log entries and recommended actions

Table 217: PROC-SAN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	none
10 (a)	0	none	none	none	none
204 (a)	any	none	none	none	none

Note:

a. **Error Type 10, 204**: a system recovery action was taken because one or more software processes failed to respond to a sanity audit in a timely fashion. As a result of the recovery action, the system may have temporarily suspended service for a period of time surrounding the error.

PS-RGEN (Power Supply Ring Generator)

G650

MO Name in Log	Alarm Level	Initial Command to Run	Full name of MO
PS-RGEN	MAJ MIN	**test board *location***	Power Supply Ring Generator

The PS-RGEN maintenance object monitors the ringing voltage of each 655A power supply. The TN2312BP IPSI uses the ring detection circuit on the 655A to monitor ring voltage for the G650. When the TN2312BP IPSI is used in an MCC1 or SCC1, the ring detector on the tone clock monitors ringing.

When the G650 is equipped with two power supplies, the 655A power supply on the left (slot 0) is the primary power supply (master) and the 655A power supply on the right (slot 15) is the secondary power supply. In normal operation, the primary 655A provides ringing for the G650. If the primary 655A is unable to provide ringing to the G650 because it has failed or because of a command from the TN2312BP IPSI, the secondary 655A connects ringing to the backplane using an arbitration lead.

Normally the ring voltage LED (#5) on the left power supply is ON and the ring voltage LED on the right power supply is OFF. This changes momentarily when the ringer interchange test is run. The ring voltage LED will only remain lit on the right power supply when there is a power supply failure of the left hand supply or the left hand supply is removed.

Only one 655A power supply provides ringing voltage to the backplane. The other power supply ring voltage output is isolated from the backplane through a relay contact.

Refer to Figure 66: G650 Cabinet Environmental Hardware Components for further information.

Error log entries and recommended actions

Table 218: PS-RGEN Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1	0				
1 (a)		Ring generator interchange test (#1539)	MAJ MIN[1]	ON	**test environment *location*** **test board *location* long**
					1 of 2

Table 218: PS-RGEN Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (b)		Ring generator status test (#1540)	MAJ MIN[1]	ON	**test environment *location*** **test board *location***
512	1				
513 (c)	Any	Ring generator status test (#1540)	MAJ MIN	ON	**test environment *location*** **test board *location***
769	64	Ring generator status test (#1540)	MAJ MIN	ON	**test environment *location*** **test board *location***
1025	64 65	Ring generator interchange test (#1539)	MAJ MIN	ON	**test environment *location*** **test board *location***
					2 of 2

1. This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

Notes:

a. **Error Type 1**: ring generator interchange failed. Run **test environment long**. Run **test board long**. Follow the repair procedures for any test failures.

b. **Error Type 257**: ring voltage not detected on backplane.

c. **Error Type 513**: ring generator operational status failure. Aux Data values give description (values may be added together).

Aux Data	Description
1	Overload
2	Shorted
4	Internal fault
8	Commanded off
16	When redundant power supplies are present, the standby ring generator (slot 15) is providing ringing voltage
32	No ringing voltage on backplane

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of investigation	Short test sequence	Long test sequence	D/ND
Ring Generator Interchange Test (#1539)		X	Nondestructive
Ring Generator Status Test (#1540)	X	X	Nondestructive

RANL-STA (Remote Analog Line (Station) Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RANL-STA	MIN	**test port *location* long**	Remote Analog Line Port
	WRN	**test port *location***	

The RANL-STA MO maintains the circuitry associated with a port which has been translated as analog station.

Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of common port circuit pack errors. See errors 1281 and 1793 in XXX-BD (Common Port Circuit Pack/Media Module).

Ringing Caused by Maintenance Testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it in the **Tests** field of the **change station *extension*** screen. This also disables Test 35 on that station.

Error log entries and recommended actions

Table 219: RANL-STA Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	40960 40975 40977				
15 (c)	Any	Port Audit and Update test (#36)			
18	0	**busyout station *extension***	WRN	ON	**release station *extension***
257 (d)	40973				
					1 of 2

Table 219: RANL-STA Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (e)		Ringing Application Test (#48)	WRN	OFF	`test port` ***`location`*** `r 2`
769		Port Diagnostic Test (#35)	MIN WRN[1]	ON	`test port` ***`location`*** `r 2`
2817 (f)		Hyperactive	MIN	OFF	
					2 of 2

1. Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **`set options`**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1:** inline errors, can only be resolved over time.

- Aux Data 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call will cause an inline error from the board.
- Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal does not ring, then replace it. Otherwise, enter the **`test port`** ***`location`*** command, and follow the procedure for Test #48.
- Aux Data 40977 indicates that terminal equipment was not connected when ringing was attempted. Run the short test using the **`test port`** ***`location`*** command, and follow the procedure for the results of Test #48.

c. **Error Type 15:** A software audit error that does not indicate hardware malfunction. Run the short test sequence, and investigate associated errors.

d. **Error Type 257:** An inline error and can only be resolved over time. This error indicates that ringing voltage is absent. If only one analog circuit pack in the system has this problem, then replace the circuit pack. If only analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

e. **Error Type 513:** Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the **Tests** field on the **`change station`** ***`extension`*** screen to **n**. On some software releases, this will also disable Tests #7 and 35.

f. **Error Type 2817**: the endpoint caused a large number of control channel messages to be sent to the switch within a short period of time (50 or more CCMS uplinks within 10 seconds). The station will be taken out-of-service for 30 seconds due to the hyperactivity. This may be completely normal during heavy traffic periods.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Port Diagnostic Test (#35)	X	X	ND
ONS Ringer Application Test (#48)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

RC-BD (Radio Controller Board)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RC-BD	MIN	**test board *location* long**	Radio Controller Board
	WRN	**test board *location***	

The RC-BD maintenance object is inserted into the system whenever the TN789 RC circuit pack is administered and physically inserted into a slot. Each RC circuit pack is maintained as a separate MO.

Error log entries and recommended actions

Table 220: RC-BD Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	0	Circuit pack removed or SAKI Test failed (#53)	MIN	ON	**test board *location***
18 (c)	0	**busyout station *extension***	WRN	OFF	**release board *loc***
23 (d)			WRN	OFF	
125 (e)			WRN	ON	
130 (f)			WRN	OFF	
257 (g)		Control Channel Looparound Test (#52)	MIN	ON	**test board *location* r 20**
513 (h)			MIN	ON	**test board *location* r 2**
769 (i)					
1025 (j)		NPE Audit (#50)			
					1 of 2

Table 220: RC-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1281 (k)		RC NPE Audit (#1336)	MIN	ON	
1537 (l)		Hyperactive Angel	MIN	ON	
1793 (m)		RC Tone Loopback Test	MIN	ON	
2049 (n)		RC NPE Port Loop Test (#1316)	MIN	ON	
2305 (o)		Firmware Checksum Error	MIN	ON	
2561 (p)		Firmware Upgrade Error	MIN	ON	
2817 (q)		RC Data Relations Audit	WRN	OFF	
3073 (r)			MIN	ON	
3329 (s)			MIN	OFF	
3585 (t)			WRN	OFF	
3841 (u)					
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1:** the circuit pack stopped functioning or has been physically removed from the system. The alarm is logged approximately 11 minutes after removal of the circuit pack or failure of the SAKI Sanity Test (#53).

Check for the physical presence of the circuit pack in the slot indicated by the alarm. If the circuit pack is absent, insert one of the proper type. If the circuit pack is present and its red LED is lit, see LED alarms without Alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

c. **Error Type 18:** the circuit pack has been busied out. Release the circuit pack using **`release board`** ***`location`***.

d. **Error Type 23:** the circuit pack has been logically administered but not physically installed. The alarm should clear when the circuit pact is installed.

If the circuit pack is already installed:

1. Run **`test board`** ***`location`*** **`long`** and look at any test failures or Error Codes generated.
2. If the test does not clear error 23, then execute **`reset board`** ***`location`*** and run the long test again.

If the reset/test does not clear error 23, replace the circuit pack.

e. **Error Type 125:** wrong circuit pack has been physically inserted into a slot administered for an RC circuit pack.

f. **Error Type 130:** an RC circuit pack has been physically inserted into a slot for which it has not been administered

g. **Error Type 257:** transient communication problems between the switch and this circuit pack. Execute **`test board`** ***`location`*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

h. **Error Type 513:** This error indicates an on-board hardware failure. The system will continuously test the circuit pack and report the results approximately every 10 minutes. If the hardware problem is resolved, the alarm should clear in approximately 30 minutes. If the alarm does NOT clear in 30 minutes, then the circuit pack should be replaced.

i. **Error Type 769:** this error can be ignored, but look for other errors on this circuit pack.

j. **Error Type 1025:** this error is not service-affecting, and no action is required

k. **Error Type 1281:** Execute **`test board`** ***`location`*** and refer to the repair procedures for RC NPE Allocation Test (#1336)

l. **Error Type 1537:** this error occurs when an excessive number of up-link messages have been received by the circuit pack. Switch software will take the circuit pack out of service and alarm the circuit pack. Switch software will periodically (every 15 minutes) put the circuit pack back in service. If the problem still exists, the circuit pack will again be taken out of service. If the circuit pack does not exhibit the problem for a certain amount of time, the alarm will be resolved and the circuit pack will be left in service.

m. .**Error Type 1793:** this error occurs if the RC detects a DECT protocol error.

n. .**Error Type 2049:** Execute **`test board`** ***`location`*** and refer to the repair procedures for RC NPE Port Loop Test (#1316)

o. .**Error Type 2305:** this error indicates a firmware checksum error.

p. .**Error Type 2561:** this error indicates a firmware upgrade operations error.

q. **Error Type 2817**: Execute **`test board`** ***`location`*** and refer to the repair procedures for RC Hardware Translation Audit (#1317).

r. **Error Type 3073:** this error indicates loss of SYSCLOCK.

s. **Error Type 3329:** this error indicates loss of HSCLOCK.

t. **Error Type 3585:** this error indicates a WT firmware upgrade server error.

u. **Error Type 3841:** this error indicates the RC circuit pack received an inconsistent downlink message (bad header, bad port number, bad data, etc.) over the Control Channel. This error is logged only.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
RC Hardware Translation Audit (#1317)	X	X	ND
NPE Audit Test (#50)		X	ND
RC NPE Port Audit Test (#1315)		X	D
RC NPE Port Loop Test (#1316)		X	D
RC Tone Loopback Test (#1343)		X	D
RC NPE Allocation Test (#1336)	X	X	ND
Clear Error Counters Test (#270)	X	X	ND

1. D = Destructive; ND = Nondestructive

RDIG-STA (Remote Digital Station)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RDIG-STA	MIN	`test station` *`location`* `long`	Remote Digital Station
	WRN	`test station` *`location`*	

The RDIG-STA MO maintains the circuitry associated with a port which has been translated as a digital station (or DCP Console).

Remote Digital Station maintenance software provides maintenance for a port administered as a digital station on the circuit pack. This strategy covers the inline errors log, initialization tests, periodic tests, craft-demanded tests, and alarm resolution and escalation. Each port, translated as a digital station on a digital line board, is running as a separate MO (RDIG-STA) of this type. Fault conditions discovered on one MO may or may not indicate faults on other MOs of the same type.

Maintenance testing for the port circuitry on the combo blade circuit packs is handled by on-board firmware and server-controlled tests. Maintenance software queries the firmware for error and alarm information, status, and test results. Firmware automatically reports inline error conditions, which results in server-controlled testing.

There are instances where the service state of a station is mentioned. The different service states that apply to a remote digital line station are as follows:

Out-of-Service	The port, and thus the station, have been removed from service. Busyout puts the port in the out-of-service state.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally. It can also be forced into the in-service state by going off-hook.

Downloading of Terminal Parameters

Programmable Terminals

The following information describes how maintenance software interacts with terminal parameter downloading.

Terminal Types

1. 84xx multi button digital voice terminals (8403D01A, 8410B, 8410D02A, 8434D01A) with optional expansion module.
2. 603A1 and 603D1 Callmaster terminals for telemarketing applications.
3. 302B1 and 302C1 attendant console.

Downloadable Terminal Parameters

The following parameters are downloaded to programmable terminals:

Table 221: Parameters Downloadable to Programmable Terminals

Parameter	Scope	Terminal
International Flags (A-/mu-law, display mode, DLI voltage level)	System level	84xx 603x 302B1
Primary Levels (transmission and sidetone)	System level	84xx 603x 302B1
Adjunct Levels (transmission and sidetone)	System level	84xx
Handset Expander Option	System level	84xx
Administrable Options (speakerphone and mute button)	Per-terminal	84xx
Administrable Softkeys	Per-terminal, system level	8410D 8434D

Nonvolatile Memory

Nonvolatile memory stores downloadable parameters in programmable terminals. Once the terminal is downloaded, it is not be necessary to download it again, even if power is removed from the terminal. If nonvolatile memory fails with power still present, the terminal reverts to its default factory settings except for its A-law/mu-law companding settings which are stored in RAM. If power is removed after the nonvolatile memory fails, the terminal reverts to its factory default settings.

Note:

The mu-law companding mode is assigned as a default setting at the factory. For the United States, a programmable terminal can place calls even though it has not been downloaded from the system.

Download Actions

There are several different scenarios which causes a terminal to be downloaded. These can occur as part of background maintenance activity or on demand from the SAT (System Access Terminal) or from a station.

For the background actions described below, the terminal downloads automatically if a download retry flag for the terminal is set in software. This flag is set at the time translation is loaded at boot time, when the translation that affects the parameters of a terminal is changed as part of system administration actions, or when a port is inserted in software as a result of board insertion or translation change.

Automatic Download Actions

1. System Reboot/Restart

   A global download action is initiated when periodic maintenance tests begin after a system reboot/restart, regardless of whether the parameters have been downloaded previously.

2. Periodic tests

   If the download flag is still set when periodic tests are run on a terminal, a download action occurs. This action is required in case a terminal could not be downloaded previously, because the terminal was off-hook when the:

   - system first booted

     or

   - translations associated with downloadable parameters were changed.

Note:

It may take more than an hour for periodic tests to reach the terminal that needs to be downloaded.

3. Terminal Administration

   A downloadable terminal is *automatically* downloaded when translation changes associated with downloadable parameters are made as part of system administration. As shown in the previous table, these changes can be for a specified terminal or may be system-wide. If the change is for a system-level parameter, a background global update request must be submitted to download every programmable terminal.

Note:

This global update may take more than an hour for a system with several thousand programmable terminals.

4. Port Insertion

   Whenever maintenance software initiates a request to place a port into service, a terminal download action is begun on that terminal, if that terminal is programmable. This port insertion action occurs under the following circumstances:

   - A digital line circuit pack that is physically inserted into the system and has ports currently administered for programmable terminals.
   - A station port is added to the system by add station or **`change station`**.
   - A TTI port is activated.

5. Audits

   As part of periodic maintenance, the Hardware Status Audit test queries programmable terminals to determine which levels and/or options are being used. If the reported values are not equal to the administered values, the system will initiate a terminal download action; however, this audit does NOT check the parameters used for softkeys.

6. Activation of TTI

   A terminal is downloaded automatically when it is activated using the TTI (Terminal Translation Initialization) feature. Therefore, no special user actions are required for TTI.

Note:

Plugging the station cord into a terminal does not automatically cause the terminal to be downloaded. If this terminal has factory defaults or if the terminal has been previously downloaded with parameters different than those desired, use one of the demand download actions described below to download the terminal.

Demand Download Actions

1. Busyout/Release Command

   A maintenance demand busyout/release request for a station will cause the terminal to be downloaded regardless of its previous download status.

2. Feature Access Code

   A Refresh Terminal Parameters Feature Access Code can be used to request a terminal download action. When this code is followed by a “#”, the programmable parameters for the current terminal are downloaded when the terminal goes on-hook. When this code is followed by an extension, the programmable parameters for the specified station are downloaded.

   This Refresh Terminal Parameters Feature Access Code is assigned on the third page of the **change feature-access-codes** screen.

   A confirmation is returned if the download request is accepted. A busy tone is returned if the request is made from a different station when the target station is off-hook.

   As a result of an entry of a Refresh Terminal Parameters Facility Access Code, the first three green call appearance LEDs on the 84xx 603x terminal are turned on for three seconds, if the station was successfully downloaded. This is not true for the 302B1 terminal.

   There is no visible display on a station for the other background or demand download actions. As described below, use **`status station`** and **`status attendant`** to check the download status of a specified terminal.

Status of Parameter Downloads

The **`status station`** and **`status attendant`** screens display the current download status of individual 84xx, 603, and 301B1 terminals in the **Download Status** field. The possible download states are:

Status	Terminal Download State
Complete	The terminal successfully downloaded sometime in the past.
Pending	The system is waiting to download the terminal. This may require the execution of a background periodic test, which could take more than an hour. As previously described, demand download can also be used to initiate an immediate download.
Not Applicable	Not a programmable terminal.

Possible reasons for no terminal download include:

- Terminal is off-hook.
- Terminal detected a bad checksum.
- Terminal detected a bad or missing EEPROM (refer to the Error Log).
- Terminal is busy programming data from a previous PROGRAM message.
- Terminal is in the Programming Disabled state.
- Terminal is in the Local Program Options mode.
- Terminal is disconnected or out of service (use **status station**).

Table 222: RDIG-STA Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	1 – 20, 40987		WRN	OFF	
18 (c)	0	**busyout port *location***	WRN	OFF	**release port *location***
257 (d)	40971				
513 (e)	0	Digital Station Audits #17)	WRN	OFF	**test port *location* r 6**
767 (f)	40964		WRN	OFF	
769 (g)	40963 40988		WRN	OFF	
1025 (h)			WRN	OFF	
1281	Any	Digital Station Audits (#17)	WRN	OFF	**test port *location* r 4**
1537 (i)	40968		WRN	OFF	
2304 (j)					
2305 (k)	32770 40967				
2817 (l)		Hyperactive	MIN	OFF	
3840 (m)	40965 40989				
3841 (n)	41029				

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1 with Aux Data 40987**: could be caused by a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move the voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

   Error Type 1 with Aux Data 1-20: occurs when at least 15 off-board problems have been detected with the link to the terminal. When an error with the link is detected, an on-board counter is incremented.

   The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move the voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

c. **Error Type 18**: the port in question is busied out by maintenance personnel. Make sure the port is released from busyout by **`release port`** ***`location`***.

d. **Error Type 257**: Indicates problems transmitting to the voice terminal, which can be caused by defective wiring. Defective wiring can cause varying degrees of problems on different types of sets.

e. **Error Type 513:** The result of an ID Request failure to respond to the digital endpoint audit.

f. **Error Type 767:** An inline event produces this Error Type when a favorable response is received from running the Digital Line Electronic Power Feed Test (#11). No action is necessary. This alarm will be resolved with the passing of time.

g. **Error Type 769 with Aux Data 40963**: The result of an unfavorable response to the Digital Line Electronic Power Feed Test (#11).

   Error Type 769 with Aux Data 40988: the EPF/PTC circuit has been turned off due to an overcurrent condition.

   Once the problem has been resolved, it may take up to one hour for the alarm to clear. If the problem cannot be resolved by one of the steps above, replace the circuit pack.

h. **Error Type 1025**: problem with the voice terminal EEPROM. When the voice terminal is repaired the alarm will be resolved with the passing of time.

i. **Error Type 1537**: there is a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move the voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

j. **Error Type 2304**: internal system error. No action is necessary.

k. **Error Type 2305 with Aux Data 32770**: the station went off-hook while it was in the ready-for-service state. Use the **`status station`** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No action is necessary.

Error Type 2305 with Aux Data 40967: an off-board warning was generated due to a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move the voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

l. **Error Type 2817**: the endpoint caused a large number of control channel messages to be sent to the switch within a short period of time (50 or more CCMS uplinks within 10 seconds). The station will be taken out-of-service for 30 seconds due to the hyperactivity. This may be completely normal during heavy traffic periods.

m. **Error Type 3840 with Aux Data 40965**: no terminal is connected to the board. No maintenance action is required. This is also the code that is generated when the link between the circuit pack and the voice terminal is successfully reset. No action is necessary.

Error Type 3840 with Aux Data 40989: Indicates an uplink message has been logged indicating that the Electric Power Feed (EPF) is on with no load on it. No action is necessary.

n. **Error Type 3841**: the circuit pack's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack. No action is necessary.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Line Electronic Power Feed Test (#11)		X	ND
Digital Station Lamp Update (#16)	X	X	ND
Digital Station Audits Test (#17)	X	X	ND

1. D = Destructive; ND = Nondestructive

REM-OFF (Remote Office)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
REM-OFF	MIN WRN	**ping node-name** ***node-name*** | **ip-address** ***location***	Remote Office

An instance of this MO (REM-OFF) is associated with every Remote Office box that is administered on the switch. This MO monitors keep-alive and periodic PING test failures.

Error log entries and recommended actions

Table 223: REM-OFF Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)			MIN	OFF	**ping node-name** ***node-name*** **ping ip-address** ***addr***
257 (b)			Log only	OFF	**ping node-name** ***node-name*** **ping ip-address** ***addr***

Notes:

a. **Error Type 1**: a PING test to the Remote Office has failed and a MINOR alarm has been raised. When this error is logged, as many as 26 endpoints associated with that Remote Office and several H.323 signaling groups could be out of service.

b. **Error Type 257**: The response to a keep-alive update request exceeded the time limit for an endpoint. The error is a log-only error. It is not possible to determine which entity has failed.

The aux data associated with this error indicates whether the endpoint that failed to respond was a DCP, Analog, or Signaling Group type:

- 1096 = Analog Line
- 1095 = DCP Line
- 6179 = H.323 Signaling Group

Demand test descriptions and error codes

There are no demand tests for REM-OFF. Use **ping ip-address** or **ping node-name** to ping the Remote Office.

RING-GEN (Analog Ring Generator)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RING-GEN	MAJ	**test environment *location***	Analog Ring Generator

Analog phones must be provided with a voltage that allows them to ring. The Analog Ring Generator provides the ringing voltage for every analog phone associated with a given cabinet. In a multicarrier cabinet, the ring generator resides in the power distribution unit. It is protected by a fuse located next to the main circuit breaker on the front of the unit. In single-carrier cabinets, the ring generator is part of the WP-91153 power supply.

Failure of the ring generator results in loss of ringing on analog phones. Ringing on digital and hybrid phones is not affected.

The ringing voltage is monitored by the Tone-Clock circuit pack. In a port network with duplicated Tone-Clocks, the active Tone-Clock performs this function. In a PN made up of single-carrier cabinets, the Tone-Clock monitors the ringing voltage of only the carrier where it resides.

The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins.

Error log entries and recommended actions

Table 224: RING-GEN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test environment *location***
1		Ring Generator Query (#118)	MAJ	ON	**test environment *location* r 3**

Note:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

Demand test descriptions and error codes

Investigate tests in the order presented. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND
Battery and Power Supply Query Test (#5)	X	X	ND
AC Power Query Test (#78)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier E)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier D)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier A)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier B)	X	X	ND
OLS/Power Unit Query Test (#127) (Carrier C)	X	X	ND
S8700-series Fiber-PNC: Emergency Transfer Query Test (#124)	X	X	ND
Cabinet Temperature Query Test (#122)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND

1. D = Destructive, ND = Nondestructive

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118)	X	X	ND
Single-Carrier Cabinet Power Query Test (#79)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Device Alarm Query Test (#120)	X	X	ND

1. D = Destructive, ND = Nondestructive

RMC-ENV (Power/Fan Sensors)

G600 only

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RMC-ENV	MAJ	`test environment`	Power/Fan Sensors

The AC Power Supply (650A) for a G600 media gateway (Rack-Mounted Cabinet - RMC) supports one alarm lead that indicates the state of both the power and fan. The cabinets use variable-speed fans to reduce noise. The power unit contains thermal speed control. A 3-pin connector on the variable-speed fan assembly accepts variable input power to control its fan speed and power its alarm circuitry.

Table 225: LED and Alarm Conditions shows the LED and alarm conditions.

Table 225: LED and Alarm Conditions

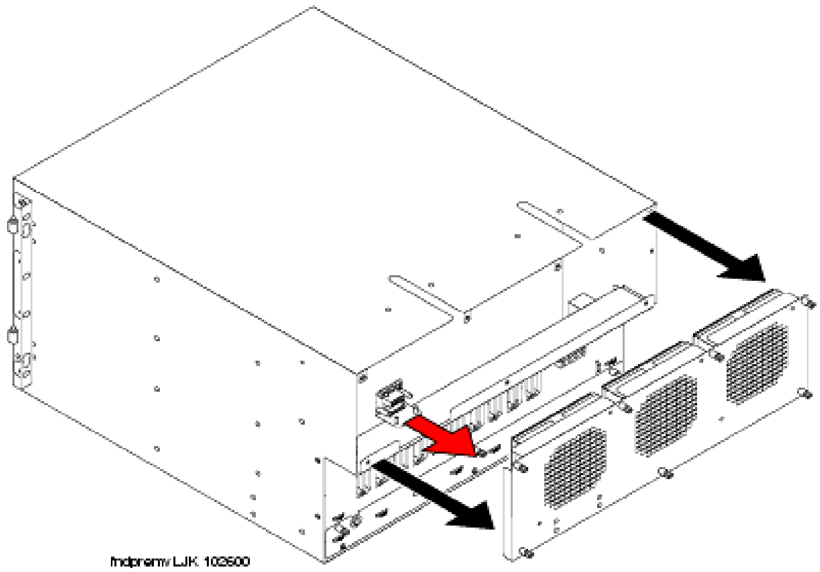
Condition	LED Status	Alarm State	Fan/Power Alarm
Normal	Red off, amber on	Open	Normal
No input power	Red off, amber off	Closed	No input power
DC output not present (except neon)	Red on, amber off	Closed	DC output not present (except neon)
Fan alarm	Red on, amber on	Closed	Fan/Power alarm

Fan Removal and Replacement

You can remove the fan assembly while the system is running, but you must replace the new assembly within 60 seconds to avoid a thermal overload.

1. Place the new fan assembly close to the G600.
2. Loosen the thumb screws on the fan assembly, and pull it straight out (unplug it) as shown in Figure 64: Fan Removal. The power for the fan automatically disconnects when the assembly is unplugged.
3. Plug in the new fan assembly. The power for the fan automatically connects when the fan assembly is plugged in.
4. Tighten every thumb screw on the fan assembly.

Figure 64: Fan Removal



Error log entries and recommended actions

Table 226: RMC-ENV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test environment**
1 (b)	Any	Cabinet Temperature Query test (#122)	MAJ	ON	**test environment**

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the power-/fan-status lead indicates that a G600 media gateway's power supply has detected an alarm condition. The condition can be caused by the failure of any fan's or any power supply's output. If more than one G600 exists, every power-/fan-status lead is tied together. (The fan and power lead is an O-ring of every cabinet's status lead.) Since an error condition on a fan's or power supply's output could be the result of a temporary overload (e.g., during board insertion) or caused by the equipment's location (e.g., fan blockage), a single event may be an anomaly that eventually clears. However, a repeating condition causes a major alarm.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
RMC Power/Fan Query Test (#77)	X	X	ND
Ring Generator Initialization Test (#117)	X	X	ND
Ring Generator Query Test (#118))	X	X	ND

1. D = Destructive; ND = Nondestructive

RSCL-PT (Remote Socket Control Link)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
RSCL-PT	WRN		Remote socket control link

The Remote Socket Control Link is the control message link between the switch software and firmware on the TN799DP C-LAN or TN2501AP VAL circuit packs.

Error log entries and recommended actions

Table 227: RSCL-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
130 (a)			WRN	ON	

Notes:

a. **Error Type 130**: The associated circuit pack has been removed or has been insane for > 11 minutes. To clear this error, make sure that the circuit pack is installed. If the circuit pack is installed, pull and re-insert the circuit pack to reset it.

Demand test descriptions and error codes

There are no demand tests associated with RSCL-PT.

S-SYN-BD (Speech Synthesis Circuit Pack)

MO name	Alarm Level	Initial Command to Run	Full Name of MO
S-SYN-BD	MIN WRN	**test board *location***	Speech Synthesis Circuit Pack

See XXX-BD (Common Port Circuit Pack/Media Module) for errors at the circuit-pack level.

See S-SYN-PT (Speech Synthesis Port) for related port information.

S-SYN-PT (Speech Synthesis Port)

MO name in Log	Alarm Level	Initial Command to Run	Full Name of MO
S-SYN-PT	MAJ MIN	**test port *location* l**	Speech Synthesis port
	WRN	**test port *location***	

The Speech Synthesis circuit pack provides four independent Speech Synthesis ports which may be connected to any of the voice time slots on the Time Division Multiplex (TDM) Bus. Each Speech Synthesis port consists of a speech synthesizer device (SSD) and is managed by a custom-coded programmable speech synthesizer (PSS) controller. The PSS controller is, in turn, controlled by the on-board microprocessor via a command interface specifically designed for this application. The PSS controller's main function is the orderly transfer of encoded speech from the speech vocabulary read-only memory (ROM) to the SSDs. The SSDs decode it and produce 64-kbps 5-255 PCM (Pulse Code Modulation) speech. The encoded speech is stored in up to 512 Kbytes of on-board ROM. In addition, each Speech Synthesis port has an associated dual-tone multifrequency receiver (DTMR) to receive touch-tone digits from a station set connected to the port via a voice time slot. The station set may be connected to the Speech Synthesis port through either a line or trunk circuit.

When there is an incoming call to a port, the "listen" network time slot is connected to the DTMF receiver input and the "talk" network time slot is connected to the SSD output. This enables the Speech Synthesis port to support speech synthesis features or touch-tone input with voice response features. Some of the features that use the Speech Synthesis port's capabilities include Leave Word Calling, Automatic Circuit Assurance, Automatic Wakeup (hotel-motel), and Do Not Disturb (hotel-motel).

The Speech Synthesis circuit pack supports different voice features than ones supported by the announcement circuit pack.

Error log entries and recommended actions

Table 228: S-SYN-PT Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
1 (b)	17672				
18	0	**busyout port *location***	WRN	OFF	**release port *location***
					1 of 2

Table 228: S-SYN-PT Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
130 (c)			WRN	ON	`test port` *`location`*
257		Speech Synthesis PSS Handshake test (#168)	MAJ	ON	`test port` *`location`* `r 2`
513	17922	Speech Synthesis Memory test (#166)	MIN	ON	`test port` *`location`* `r 2`
769	17664	Speech Synthesis DTMF Sanity Inquiry (#164)	MIN	ON	`test port` *`location`* `r 2`
1025	17670	Speech Synthesis SSD Inquiry test (#167)	MIN	ON	`test port` *`location`* `r 2`
1281		Speech Synthesis DSP Tone test (#165)	MIN	ON	`test port` *`location`* `r 2`
1537		Speech Synthesis Memory test (#166)	MIN	ON	`test port` *`location`* `r 2`
1793		Speech Synthesis DTMF Receiver test (#163)	MIN	ON	`test port` *`location`* `l r 2`
2049 (d)		Conference Circuit Test (#7)	MIN	ON	`test port` *`location`* `l r 2`
2305		NPE Crosstalk Test (#6)	MIN	ON	`test port` *`location`* `l r 2`
3840 (e)	Any				
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: an inline failure of the on-board microprocessor/PSS handshake has occurred. Refer to Speech Synthesis PSS Handshake Test (#168) for repair procedures.

c. **Error Type 130**: the circuit pack been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d. **Error Type 2049**: a transient error that does not cause an alarm can occasionally occur during a server, TDM bus, or Tone-Clock interchange. Test the port, and follow the repair procedures for the Conference Circuit Test (#7).

e. **Error Type 3840**: this error is not service-affecting, and no action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Speech Synthesis PSS Handshake Test (#168)	X	X	ND
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Speech Synthesis DTMF Receiver Test (#163)		X	ND
Speech Synthesis Memory Test (#166)	X	X	ND
Speech Synthesis DSP Tone Test (#165)	X	X	ND
Speech Synthesis SSD Inquiry Test (#167)	X	X	ND
Speech Synthesis DTMF Sanity Inquiry (#164)	X	X	ND
Speech Synthesis Parameter Update Test (#169)	X	X	ND

1. D = Destructive, ND = Nondestructive

SEC-CDR (Call Detail Recording Link)

See PRI-CDR (Call Detail Recording Link) for maintenance procedures for SEC-CDR.

SER-BUS (Serial Communication Bus)

G650

MO Name in Log	Alarm Level	Initial command to run	Full name of MO
SER-BUS	MAJ	**test environment *location* l**	Serial Communication Bus
	MIN	**test environment *location***	

Each port network of G650s has a Serial Bus that allows the TN231O2BP IPSI to communicate with the 655A power supplies. This Serial Bus uses 2 previously unused leads in the Universal Port Slot. SPARE3 (pin 055) now becomes serial data. SPARE4 (pin 155) now becomes serial clock. The serial communication bus is a two-wire bi-directional half-duplex bus that is provided on the backplane of the G650. The serial bus consists of a clock line and a data line. Data is transferred on the data line synchronously in bit-serial fashion a byte at a time. Communication on the serial bus is at speeds up to 100 kbits per second.

Older TDM/LAN cables did not have these 2 leads so the G650 required a new TDM/LAN cable. These 2 leads are not terminated on the TDM/LAN Terminators (AHF110). This is an open-collector bus where each power supply and each TN2312BP IPSI provide a pull-up resistor to +5VDC for each of the 2 Serial Bus leads. The bus will have logic pulses extending between 0V and 5V.

The TN2312BP IPSI in the A carrier will act as master of the serial bus and poll each of the power supplies based on their board address. Only a TN2312BP IPSI in the A carrier can be a bus master, even if a TN2312BP in carrier B is used for port network connectivity. Therefore, setting the TN2312BP in the A carrier or B carrier to be active will not clear a problem if the TN2312BP itself is the reason for the failure. The power supply's board address is derived from 4 board address leads in the power slot of the backplane. The G650 carrier addressing paddle card sets 3 of these 4 address leads for the power slot. A G650 can have a maximum of ten 655A power supplies on the serial bus (See Figure 65: Wiring diagram for serial bus data and clock leads).

Note:

The serial bus is provided only to a G650 equipped with TN2312BP IPSI circuit packs. The serial bus is not available on any other media gateway.

Figure 66: G650 Cabinet Environmental Hardware Components illustrates these components.

Figure 65: Wiring diagram for serial bus data and clock leads

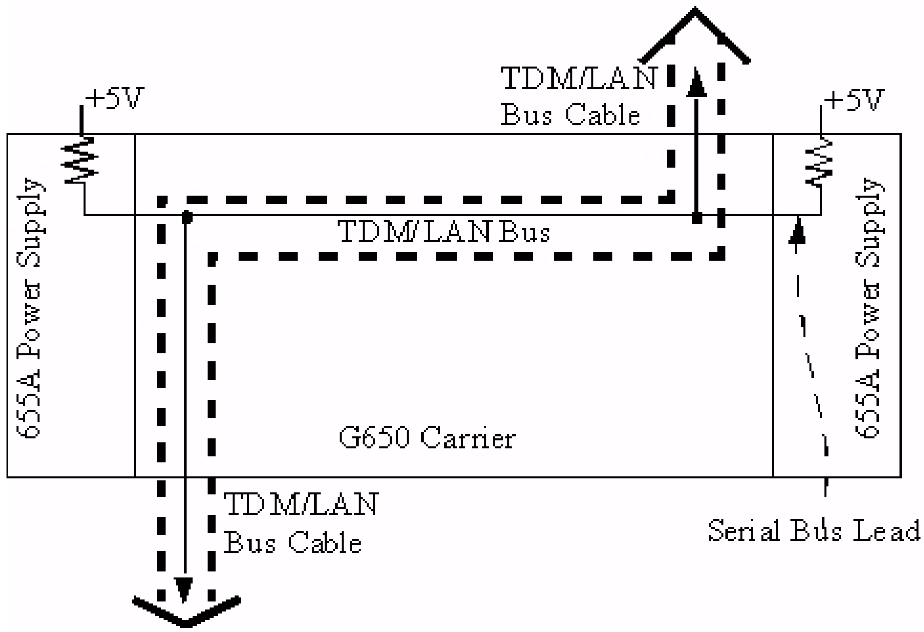
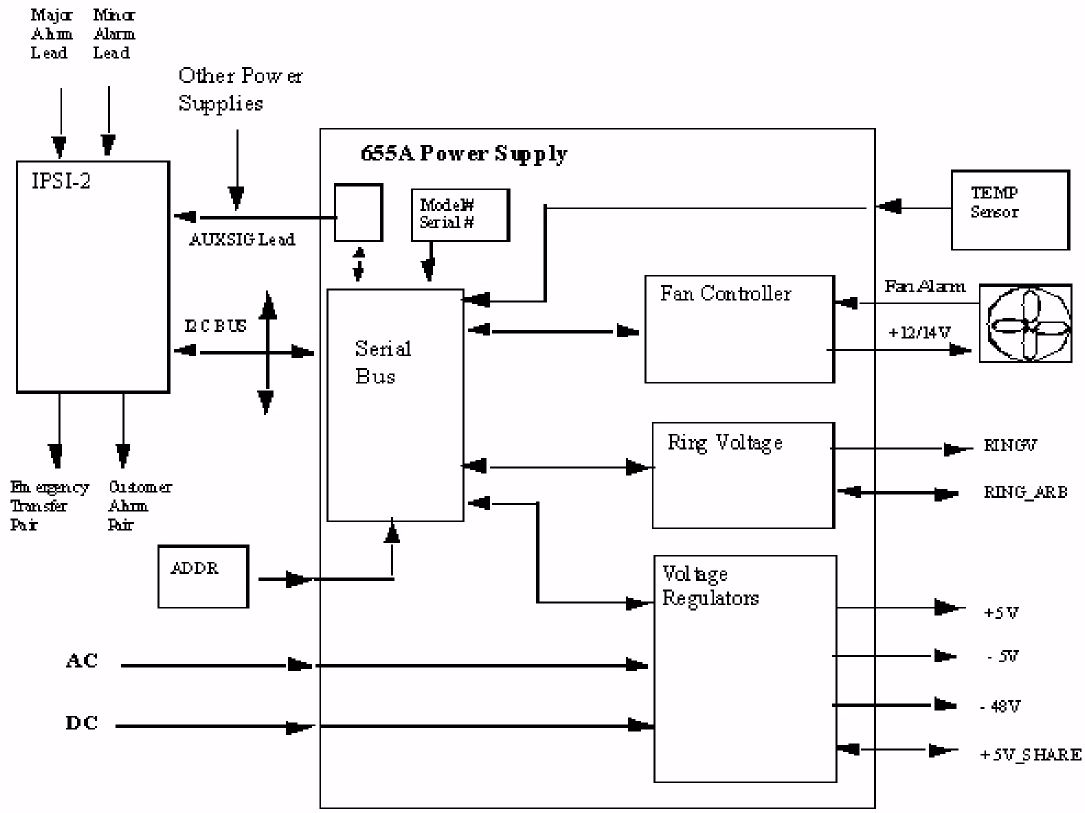


Figure 66: G650 Cabinet Environmental Hardware Components



Use **`status environment`** to obtain:

- Inlet temperature - 655A power supply sensor
- Exhaust temperature - G650 carrier exhaust air sensor
- Hot Spot temperature - 655A power supply sensor
  - The system generates a warning at 176^{o} Fahrenheit (80^{o} Celsius).
  - The power supply shuts down at 194^{o} Fahrenheit (90^{o} Celsius).
- Power supply output voltage measurements, +5VDC, -5VDC, and -48VDC
- Fan Control - The speed of the fans, either mid (normal) or high (fan failure or hot spot temperature limit exceeded).
- Fan Alarm - Detection of a blocked or failed fan
- Ring Status - OK, overload, shorted, or failed
- Ring Control - Active, standby, disabled, off (shorted or failed)
- Ringer Setting - 20Hz, 25Hz, or other
- Ring Detection - Reports if power supply detects ring on the backplane ring leads

- Source of input power - AC, DC, or both
- Input power - Indicates the type of power currently in use, AC or DC
- AuxSig signal status

Note:
If the TN 2312BP IPSI cot get data from the power supplies, the data entries for **`status environment`** will be dashed out.

Use **`recycle carrier`** to:

- Shut off all voltage output temporarily
- Shut off ringer voltage output temporarily

Use **`clear error to`**:

- Clear the non-volatile source ID cause of the last shutdown
- Clear the serial bus error and time-out counters

Serial Bus Fault Detection and Isolation

Serial Bus faults can be caused by:

- A defective circuit pack inserted into one of the G650 slots
- Bent pins on the G650 backplane
- Defective TDM/LAN bus cables
- Power supply microcontroller failure
- TN2312BP IPSI failure

It is possible that a circuit pack can cause a Serial Bus fault and still exhibit trouble-free operation. For example, insertions of any circuit pack into a G650 slot may bend the backplane pins and short two leads together. Or a circuit pack that doesn't use the Serial Bus could still have an on board short that shorts one of the Serial Bus leads. Since the Serial Bus is a shared resource that each circuit pack and power supply has access to, identification of the cause of a Serial Bus fault can be difficult.

Since the Serial Bus fault isolation procedure involves removing circuit packs and possibly disconnecting entire carriers, the procedure is extremely destructive to the port network that is being tested. If possible, arrange to perform this procedure at a time when traffic is minimal.

As circuit packs are removed or entire carriers are disconnected, any active calls terminating on those circuit packs or carriers will be dropped. If you have any hints about a particular circuit pack that may be causing the Serial Bus problem investigate those before performing this procedure (for example, look at any circuit packs that were inserted into the PN just before the Serial Bus problem appeared.) Also examine which power supplies the system is unable to show using **`list configuration power-supply`** ***`C`*** and concentrate your efforts on those carriers and their cabling.

CAUTION:

When straightening or replacing backplane pins in a carrier, power to that carrier must be shut off. Failure to follow this procedure may result in damage to circuit packs and power supplies, and can be hazardous to the technician.

Procedure 1

The procedure removes and reinserts port circuit packs (those in the purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until all circuit packs in the port network have been tried.

If the Serial Bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the Serial Bus problem. However, other simultaneous failures might also be responsible for Serial Bus faults. In Procedure 2, an option of working either with one circuit pack at a time or with multiple circuit packs simultaneously is available. In view of this capability, determine the level of service interruption that will be acceptable during the procedure. If causing a disruption to all users in the port network is deemed permissible, large groups of circuit packs should be worked with in order to get the job done quickly. However, if large service disruptions are to be avoided, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack.

Refer to the repair procedure steps given for Serial Bus Status Test (#1531).

Procedure 2

Procedure 2 attempts to isolate the Serial Bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 2 is used if the preceding procedure fails, because it can help locate multiple circuit pack failures and failures of the carrier hardware itself. In this procedure, the TDM/LAN Cable Assemblies and TDM/LAN Bus terminators are replaced. If this action does not resolve the Serial Bus fault, the carriers are reconfigured so that certain carriers are disconnected from the Serial Bus. This is done by moving the TDM/LAN Bus terminators (AHF110) on the carrier backplane. To terminate a Serial Bus at the end of a particular carrier, the Serial Bus cable that connects the carrier to the next carrier should be unplugged and replaced with the TDM/LAN Bus terminator. When the length of the Serial Bus is modified the A carrier TN2312BP IPSI circuit pack that is essential to the Serial Bus operation and Serial Bus maintenance must still be connected to the new shortened Serial Bus.

After cabling changes are made and verified, power must be restored to the port network. Circuit packs in carriers that are not part of the shortened bus are not inserted. As a result, these circuit packs are alarmed. Ignore these alarms for now. All alarms should be resolved when the cabinet is restored to its original configuration.

Procedure 2 is organized into two parts:

- Part 1 attempts to clear the Serial Bus fault by replacing all the bus cabling and terminators within a port-network.
- Part 2 attempts to isolate the fault to a particular carrier by extending the Serial Bus from the A carrier to additional carriers one at a time.

Refer to the repair procedure steps given for the Serial Bus Status Test (#1531)

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
257 (a)		Serial Bus Status Test (#1531)	MIN	Off	`test environment` *`location`*

Notes:

a. **Error type 257**: serial bus failure. There are no power supplies detected on the serial bus.

Demand test descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Serial Bus Status Test (#1531)	X	X	ND

1. D = Destructive, ND = Nondestructive

SIP-BCH (SIP B-Channel)

Session Initialization Protocol (SIP) signaling groups are similar in concept to ISDN PRI signaling groups. No physical hardware components make up the SIP B-channel or SIP D-channel objects discussed here, and no maintenance tests are run.

The SIP signaling group can be considered to be one D-channel that physically rides on a C-LAN port (IP-PROCR port on S8300 systems) and the IP network. Unlike ISDN D-channels, the SIP D-channel may come up and down on a call-by-call basis. The SIP D-Channel is actually a TCP/IP signaling channel. Layers 1 and 2 of this signaling channel can be monitored by IP PING testing.

SIP B-channels use Media Processor ports to carry the actual bearer. Any port of a media processor may serve an H.323 station or a SIP B-channel. Status information may exist for a specific SIP B-channel. A SIP B-channel may be busied out and released.

Errors are logged for *command* busyout conditions. Under normal conditions, the system automatically places SIP B-channels into or out of service when it receives a SIP signaling-group service state update. *A demand* busyout drops active calls.

Error log entries and recommended actions

SIP-BCH B-Channel Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Service State
18	Any	B-channel busied out by command	Warning	off	*OOS*

System Commands

The following commands are available:

- **`busyout port`** ***`location`*** **-** drops any active call on a specified SIP B-channel and reduces the trunk group's capacity by one. No physical piece of hardware is removed from service.
- **`release port`** ***`location`*** **-** on a specific SIP B-channel, increases the trunk group's capacity by one. No physical piece of hardware is actually added to service.
- **`status trunk`** ***`grp#/mem#`*** **-** displays the current status of the specific SIP B-channel, near and far end IP signaling addresses, near and far end H.245 addresses, tunneling status, and call-reference value for an active call.
- **`test port`** ***`location`*** **-** displays `No demand tests found for the specified physical object.`

SIP-SGRP (SIP Signaling Group)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SIP-SGRP	MIN WRN	**test signaling-group *grp#***	SIP Signaling Group

The SIP Signaling Group (SIP-SGRP) MO supports a signaling channel (D-channel) for SIP trunk connections. The MEDPRO TN802 and TN2302 circuit packs provide audio connectivity, working in concert with a C-LAN (TN799DP) circuit pack which provides control signaling to support a SIP connection.

Note:

In S8300 systems, the audio connectivity is provided through the VoIP media modules within the S8300 system. The signaling is provided through the native NIC within the S8300 system.

The SIP signaling group (SIP-SGRP) is a signaling channel that physically resides on a C-LAN port (socket), or IP-PROCR in S8300 systems, and the IP network. Unlike ISDN D-channels, the SIP channel may actually come up and down on a call by call basis. The SIP channel is actually a TCP/IP signaling channel. Layers 1 and 2 of this signaling channel are monitored by IP PING testing.

Error log entries and recommended actions

Table 229: SIP-SGRP Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any		**test signaling-group *grp#***
1 (b)	Any	Ethernet Port Status test (#1386)	MIN	OFF	**test signaling-group *grp#***
18(c)	0	**busyout signaling-group *grp#***	WRN	OFF	**release signaling-group *grp#***
257 (d)	Any	Signaling Group Ping (#1387)	MIN	OFF	**test signaling-group *grp#***
513 (e)	Any	Signaling Group Ping (#1387)	WRN	OFF	**test signaling-group *grp#***
770 (f)	Any		WRN	OFF	
1025 (g)	Any	MEDPRO Status test (#1392)	MIN	OFF	**test signaling-group *grp#***
1281 (h)	Any	MEDPRO Status test (#1392)	MIN	OFF	
					1 of 2

Table 229: SIP-SGRP Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1537 (i)	Any	MEDPRO Status test (#1392	MIN	OFF	
1794 (j)		MEDPRO Status test (#1392)	MIN	OFF	**`test signaling-group`** ***grp#***
2561 (k)	Any	Registered to Survivable Remote Server Inline Error	MIN	OFF	
3073 (l)	19	Far-end TLS Certificate Failure Inline Error	MIN	OFF	
3329 (m)	21	Near-end TLS Certificate failure Inline Error	MIN	OFF	
3585 (n)		IP Signaling Far-end Status Test (#1675)	MIN	OFF	
3841 - 3942 (o)					
					2 of 2

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: Failure of the C-LAN hardware (IP-PROCR in S8300 systems) carrying the signaling group channel.

To determine which C-LAN had been administered for this signaling group, find the near-end node name on the **`signaling group`** form, then find the C-LAN or IP-PROCR with the same node name on the **`ip-interfaces`** form.

Check for errors against the CLAN-BD MO.

c. **Error Type 18**: The signaling group has been busied out by command. Release the signaling group, if appropriate, with **`release signaling-group`** ***grp#***.

d. **Error Type 257**: Tracks failures of the SIP signaling-group PING test. See Signaling Group Ping Test (#1387) for test failure information.

e. **Error Type 513**: Tracks excessive round-trip delay of the SIP signaling-group PING test, if the round-trip delay exceeds 4 seconds. See Signaling Group Ping Test (#1387) for test failure information.

f. **Error Type: 770:** Tracks excessive latency and packet-loss from background IP measurements collected by the Media Processor Board. Indicates that test packets sent from a media processor circuit pack to the far-end IP address specified on the **`signaling-group`** form have exceeded the IP latency and loss thresholds, as administered on the **`system-parameters ip-options`** form. Exceeding these thresholds indicates that the IP network may not be providing sufficient quality of service for adequate transmission of voice. If the signaling group has been administered to enable BYPASS, then Error Type 1025 also occurs.

g. **Error Type 1025**: the signaling group has been placed into a BYPASS condition because of IP network congestion. The signaling group accepts incoming calls, but every outgoing call is denied. The system routes these calls over a secondary route, if one has been administered.

h. **Error Type 1281**: No medpro resources are in service to provide media connections for the trunk members of the signaling group.

   Check for errors against the MEDPRO and MEDPROPT maintenance objects. This error causes all SIP B-channels to be in an out-of-service near-end state.

i. **Error Type 1537**: The far end of the signaling group is not ready to handle audio bearer. If the other end of this signaling group is also a Communication Manager server, this error means the server on the other end does not have MEDPRO in-service for its signaling group.

   This error places the SIP B-channels into an out-of-service far-end state.

j. **Error Type 1794**: The Signaling Group reported that the far end has detected excessive packet latency or loss. This error places the SIP B-channels into an out of service far-end state.

k. **Error Type 2561**: The signaling group is registered to a Survivable Remote Server.

l. **Error Type 3073**: A TLS connection was established with the far-end but authentication with the far-end's TLS certificate failed. Due to this condition, the signaling group will be placed in far-end bypass state so that no outgoing calls will be allowed,. The trunks in the group will be placed in an out of service far end state (OOSFE). Incoming calls will be accepted, but until the far-end's TLS certificate is remedied, these will not be successful. Once the far-end's certificate is remedied, an incoming call can succeed and the trunk group will be put back in service.

m. **Error Type 3329**: The near end TLS certificate is bad. The trunks in the group will be placed in a near end out of service state and the signaling group will be placed in bypass. No trunk calls either incoming or outgoing will be allowed until the near end's certificate is corrected. The system is warm started (reset system 1), and the signaling groups go through a busy/ release action. If the near end certificate is bad, listen sockets fro the signaling group will not be created, so this alarm is raised at the creation of the listen socket stage (i.e., when initially bringing the signaling group into service).

   Note:

   Near end certificate authentication is the process of validating that the server certificate is OK, i.e., we have the private key and the certificate is trusted. This will only break if a user with root access has changed the certificate private key file.

n. **Error Type 3585**: IP Signaling Far-end Status Test failed. The far-end is not available. See IP Signaling Group Far-End Status Test (#1675) for more information.

o. **Error Types 3842 - 3942:** These Error Types report certain error messages received by the SIP Signaling Group for one of its associated D-channels. The aux data field shows for which D-channel the message was received.

The generated error code is represented by the value 3840+*x*, where "*x*" is the Cause Value. The Cause Value provides additional data that may be useful when tracking down obscure networking and routing problems.

Table 230: Descriptions and Recommendations for Error Types 3842-3942 provides a description of the error code and the recommended actions to troubleshoot the problem.

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***1 of 10***

Error Code	Description/Recommendation
3842	Cause Value 2. A request has been made to use a transit network or common carrier that cot be accessed. The equipment sending this cause event does not recognize the transit network. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
	1 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***2 of 10***

<table>
<tr><th>Error Code</th><th>Description/Recommendation</th></tr>
<tr><td>3843</td><td>Cause Value 3. No route to destination. Request received to route call through a transit network that is recognized but not allowed to carry the call or not able to serve the destination. The service provider cot route the call to the indicated destination. Communication Manager does not originate Cause Value 3.
The repair steps are based on Tier 4 recommendations:
1. Check the numbers sent for any missing prefixes or service values that were needed to access the network.
2. Check the Cause Information Element Location Code.
3. Check Communication Manager administration:
a. Dial plan/Location: The home NPA is administered incorrectly, causing incorrect code conversion.
b. IXC: The IXC matching pattern is administered incorrectly or not at all on the dial plan, causing incorrect IXC manipulation.
c. AAR/ARS digit conversion: The wrong digit string substitution is being made. The call is being routed into the wrong network and over the wrong route pattern. Further conversion is needed but the dial string is restricted from further conversion.
d. AAR/ARS digit analysis: Call type is incorrect for the call being made specifying the wrong type of number and/or number plan information, or it is preventing code conversion from taking place. Call is being routed to the incorrect route pattern where the incorrect digit manipulation and/or code conversion is taking place.
e. ARS toll analysis: Toll/no toll classification is incorrect, causing incorrect code conversion at the route pattern.
f. Route pattern: Incorrect code conversion due to wrong entries in NPA, prefix mark, and toll list/prefix mark fields. Deleting the wrong number of digits or inserting the wrong digits. Failing to strip IXC or international code digits, stripping a user-dialed IXC code, or IXC forcing the call to the wrong inter-exchange carrier. Number format changed to a format incorrect for the call type. The incorrect service or feature is specified for the call being made on a CBC trunk group preference.</td></tr>
<tr><td colspan="2" align="right">2 of 10</td></tr>
</table>

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***3 of 10***

Error Code	Description/Recommendation
3846	Cause Value 6. The far-end switch has indicated that the B-channel (trunk) is not acceptable for use in the call for which it was requested. This could indicate an administration problem (for example, the local switch and the far-end switch have different B-channels administered), or could reflect the occurrence of a normal race condition (for example, the local switch has requested use of a B-channel that the far-end switch had just reserved for use on another call). 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Enter **`status trunk`** for the indicated trunk. Refer to DS1 ISDN Trunk Service States and ISDN-PRI Trunk Service States sections of ISDN-TRK (DS1 ISDN Trunk) for recovery suggestions.
3858	Cause Value 18. The switch sent a message to the far-end switch or terminal adapter that did not respond in the time allowed. The remote device/endpoint did not respond with an ALERTING/PROGRESS/CONNect indication within the time administered in the T303 or T310 timers Q.931 specification. Cause Value 18 indicates high traffic conditions in the serving network or noisy conditions on the span carrying the D-channel messaging. The noise is causing the loss of messages being sent to the remote device. The remote device might also be unable to respond to the incoming SETUP message. This Cause Value has end-to-end significance and should always be passed back through the network to the user.
3878	Cause Value 38. The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful). The network is out of order. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Consult with the network provider to determine the nature and expected duration of the out-of-service condition. 3. Consider modifying every routing pattern containing this trunk group to route calls around the network that is out of service.
	3 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 *4 of 10*

Error Code	Description/Recommendation
3890	Cause Value 50. A request to use a network service has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk. This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. 1. From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. 2. Display the trunk group form: If the trunk group is Call-by-Call (Service Type is “cbc”), check every routing pattern form containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field contains the single network service purchased for this trunk. 3. If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Cause Value 52. Protocol detail; may offer a clue if customer is having calls denied with an unexpected intercept tone. If the customer is complaining of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3894	Cause Value 54. Protocol detail; may offer a clue if customer is having calls denied with an unexpected intercept tone. First, eliminate any transitory state mismatch problems by entering **test port *location*** for the trunk port shown in the Aux Data field. Service State Audit Test (#256) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3902	FRANCE ONLY: Cause Value 62. Service not authorized. Call rejected. This Cause Value has end-to-end significance and should always be passed back through the network to the user. Cause Value 62 (VN4) indicates that the call could not be completed because the user has not subscribed to the service, feature, or supplementary service requested in the SETUP message. If the user is supposed to have access to this service, feature, or supplementary service, complete the required ordering process with the service provider. Cause Value 62 (1TR6) indicates that the remote endpoint does not wish to accept this call, although it could have accepted the call because the equipment is neither busy nor incompatible. The diagnostic information in the Cause information element might contain the user-supplied condition for why the call was rejected.
	4 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***5 of 10***

Error Code	Description/Recommendation
3903	Cause Value 63. Service or option not available, unspecified. This cause value is used to report a “service or option not available” event only when no other cause in the “service or option not available” class applies. This Cause Value shall either be passed to the user or mapped to Cause Value 41 (temporary failure) when it is received at a CO as part of SS7 call handling. Communication Manager does not originate Cause Value 63.
3905	Cause Value 65. Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone. If the customer is complaining of unexpected intercept tones and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Cause Value 66. Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone. If the customer is complaining of unexpected intercept tones and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	Cause Value 69. A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented. Follow the recommendation for Error Type 3890, Cause Value 50.
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Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***6 of 10***

Error Code	Description/Recommendation
3910	Cause Value 70. Only restricted digital bearer capability available. The call could not be completed because the equipment sending this Cause Value only supports the restricted version of the requested bearer capability, and in the SETUP message, bearer capability was unrestricted. Communication Manager does not originate Cause Value 70. The repair steps are based on recommendations from Tier 4 ISDN experience: 1. Check Communication Manager administration (network generated the Cause Value): a. Route pattern: An incorrect ITC and/or BCIE specified. These fields affect how the bearer capability is encoded in the SETUP message. b. The ITC administered on the originating endpoint might be incorrect for this call and/or the speed options in the device itself might be incorrect for calls over these ISDN facilities. c. Incorrect data speed option is set in the BRI device, causing a call from a BRI endpoint tandeming through Communication Manager to create a SETUP message with the wrong bearer capability. d. A call tandeming through Communication Manager ISDN trunk group to ISDN trunk group might have a bearer capability that is not supported by the outgoing ISDN facilities or network. e. A call tandeming through Communication Manager on a non-ISDN trunk group inter-working to an ISDN trunk group might have an incorrect bearer capability assigned on the incoming trunk group. The BC and ITC fields on the incoming trunk group may be set wrong.
3919	Cause Value 79. Service or option not implemented or unspecified. The call could not be completed because the equipment sending this Cause Value has not implemented a service, feature, or supplementary service requested by the user, and none of the other Cause Values in the Service or Option Not Implemented class apply. As an implementation option, this Cause Value might be mapped to Cause Value 41 (temporary failure) when it is received at a CO as part of SS7 call handling. Communication Manager does not originate Cause Value 79.
	6 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***7 of 10***

Error Code	Description/Recommendation
3928	Cause Value 88. A call was denied because a basic incompatibility existed between the type of call and either the facilities selected by the routing pattern or the called user. This error may offer a clue if the customer complains of receiving unexpected intercept tone. 1. Determine the trunk group from the circuit pack or media module and port number (in the Aux Data field). 2. Check the BCC fields of the pertinent routing patterns. 3. Investigate whether or not the calling and called endpoints are compatible (for example, some switches may not allow a voice station to call a data extension).
	7 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***8 of 10***

Error Code	Description/Recommendation
3942	Cause Value 102. Recovery on timer expiry. No answer to CALL PROCEEDING. The equipment sending this Cause Value sent or received a Layer 3 Q.931 message. Sending or receiving this message has initiated a Layer 3 timer that has expired. This Cause Value is being generated in conjunction with Q.931 protocol error handling procedures. The ISDN network between the user and the equipment generating the Cause Value might: ● Send no cause indication through the network. ● Send a more generic Cause Value through the network. The repair steps are based on recommendations from Tier 4 ISDN experience: 1. Check the diagnostic information for the timer number that has expired. 2. Check that the protocols at each end of the interface match (for example, both sides are NI-2). If the ends of the interface are running different protocols, they might be running with different values for their Layer 3 timers. If the protocols at each end of the interface match, the Communication Manager timer might have expired because: a. The far-end never saw the message because the message was corrupted in transmission by noise on the D-channel. Check for any type of T1/E1 facility errors. b. The far-end is experiencing a high traffic condition and did not have the processing time to parse the sent message before the timer expired. c. Even though the message was seen to be generated in an internal Communication Manager trace, the message was never transmitted out onto the D-channel. Perform an external protocol capture on the D-Channel to confirm the transmission of the suspect message.
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Table 230: Descriptions and Recommendations for Error Types 3842-3942 *9 of 10*

Error Code	Description/Recommendation
3942 (cont'd)	3. To interpret the receipt of Cause Value 102 from the far-end, look at a trace/ protocol capture of the messaging taking place, and find the last message received from the far-end before Cause Value 102 is received. The timer that expired is most likely the Layer 3 timer associated with that last message. If Communication Manager generated a message in between those two events that should have stopped the timer, the cause might be: a. The far-end never saw the message because the message was corrupted in transmission by noise on the D-Channel. Check for any type of T1/E1 facility errors. b. The far-end is experiencing a high traffic condition and did not have the processing time to parse the sent message before the timer expired. c. Even though the message was seen to be generated in an internal Communication Manager trace, the message was never transmitted out onto the D-Channel. Perform an external protocol capture on the D-Channel to confirm the transmission of the suspect message. 4. If Communication Manager did not respond to the receipt of the last message from the far-end, then Communication Manager internal hardware and software become suspect, and troubleshooting the problem must proceed from that point. 5. Communication Manager administration that can contribute to seeing timer expiry errors: a. Trunk group form: Incoming call handling table. If the Per call CPN/BN field is incorrectly populated in comparison to how the CO is programmed to send CPN or BN, it causes Communication Manager to send a FACILITY message to the CO requesting CPN/BN information and the CO will never respond. Communication Manager will log many timer expiry errors against the signaling group (Error Type 1, Aux Data 13). b. DS1 form: Protocol version: If Communication Manager is running custom protocol (protocol version A) and is connected to a Nortel DMS central office running custom protocol, Communication Manager will log timer expiry errors against the signaling group for DISCONNECT problems (Error Type 1, Aux Data 4) during high traffic conditions.
	9 of 10

Table 230: Descriptions and Recommendations for Error Types 3842-3942 ***10 of 10***

Error Code	Description/Recommendation
3942 (cont'd)	6. The DMS CO custom protocol implementation uses the ANSI recommended timer values for their Layer 3 timers while Communication Manager uses the ITU recommended timer values. The T305 timer in Communication Manager is 4 seconds while the same timer in the DMS is 30 seconds. This difference causes timer expiry problems in high traffic conditions. Change Communication Manager's protocol version to "c" to line up the timers.
	10 of 10

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
C-LAN Ethernet Port Status Test (#1386)	X	X	ND
MedPro Status Test (#1392)	X	X	ND
Signaling Group Ping Test (#1387)	X	X	ND
IP Signaling Group Far-End Status Test (#1675)		X	ND

1. D = Destructive; ND = Nondestructive

SN-CONF (Switch Node Configuration)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SN-CONF	MAJ	**test board *location***	Switch Node Configuration
	MIN	**test board *location***[1]	

1. If the error and alarm logs display the switch node carrier location UUC (cabinet and carrier only), run the long test sequence on the active SNC in the carrier, (slot 10 or 12). If the error and alarm logs display a circuit pack location, run the short test sequence on the alarmed SNI.

A switch node carrier contains:

- Up to 16 Switch Node Interface (SNI) TN573 circuit packs in slots 2 through 9 and slots 13 through 20
- One or two Switch Node Clock (SNC) TN572 circuit packs in slots 10 and 12
- An Expansion Interface (EI) TN570 circuit pack, a DS1 Converter (DS1C) TN574 circuit pack, or no circuit pack in slot 1
- An optional DS1 converter circuit pack in slot 21

SN-CONF errors and alarms are generated for two types of failures:

1. Failure of a board in the switch node carrier to insert (be detected by software).
2. A problem was found by running the Configuration Audit (#759). Test 759 is executed for either an SNI or SNC circuit pack during scheduled maintenance or as part of **test board *location***.

   For SNI circuit packs, test 759 queries the SNI for SNCs in the same switch node carrier, SNI peers, DS1 converters, and EI or SNI neighbors that the SNI can communicate with and compares this data to the administered data.

   For SNC circuit packs, test 759 queries the SNC for SNCs and SNIs in the same switch node carrier that the SNC can communicate with and compares this data to the administered data.

Switch node carriers are part of port-network connectivity (PNC). For background information about PNC, refer to the Maintenance Architecture and Hardware Configurations chapters and related MOs.

Error log entries and recommended actions

Table 231: SN-CONF Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
5000 (b)	Any	Processor Route Audit (#760)	MIN	OFF	**test board *location* l**
6000 (c)	1	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6000 (c)	2	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6001 (d)	Any	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6002 (e)	1	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6002 (e)	2	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6003 (f)	Any	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6004 (g)	Any	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6005 (h)	Any	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6005 (h)	1	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6005 (h)	2	Configuration Audit (#759)	MAJ	OFF	**test board *location***
6006 (i)	Any	Configuration Audit (#759)	MIN	OFF	**test board *location***
6007 (j)	Any	Configuration Audit (#759)	MIN	OFF	**test board *location***

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 5000**: at least one administered circuit pack in this switch node carrier was not inserted, or one or more administered circuit packs in this switch node carrier did not respond to Test #760 with a “board insertion” uplink message.

   To resolve this error, run the Processor Route Audit Test (#760) using **test board *location* l** for an SNC in the same switch node carrier that has this error.

c. **Error Type 6000**: no neighbor link is administered, but the SNI has one. If the Aux Data is 1, an EI is connected as a neighbor link. If the Aux Data is 2, an SNI is connected as a neighbor link.

   To resolve Error Type 6000 with Aux Data 1, refer to FAIL code 133 for Configuration Audit (#759). To resolve Error Type 6000 with Aux Data 2, refer to FAIL code 134 for the Configuration Audit (#759).

d. **Error Type 6001**: no neighbor link exists between the SNI and its neighbor, but a neighbor link (that is, fiber link) is administered.

   To resolve this error, refer to FAIL code 135 for Configuration Audit (#759).

e. **Error Type 6002**: the physical neighbor type does not match administration. The associated Aux Data value is the location reported by the neighbor SNI that did not match the fiber link administration. If the aux data is 1, the type of neighbor administered is an SNI and the type of neighbor connected is an EI. If the aux data is 2, the type neighbor administered is an EI and the type of neighbor connected is an SNI.

   To resolve Error Type 6002 with aux data 1, refer to FAIL code 136 for Configuration Audit (#759). To resolve Error Type 6002 with aux data 2, refer to FAIL code 137 for Configuration Audit (#759)

f. **Error Type 6003**: the neighbor location does not match administration. To resolve this error, refer to FAIL code 138 for Configuration Audit (#759).

g. **Error Type 6004:** a peer link does not exist to another equipped SNI. The Aux Data equals the slot number of the SNI to which this SNI or SNC does not have a peer link. To resolve this error, refer to the FAIL code for Configuration Audit (#759) corresponding to the Aux Data on the following table:

Aux Data (slot no.)	Test 759 FAIL Code
2	102
3	103
4	104
5	105
6	106
7	107
8	108
9	109
13	113
	1 of 2

Aux Data (slot no.)	Test 759 FAIL Code
14	114
15	115
16	116
17	117
18	118
19	119
20	120
	2 of 2

h. **Error Type 6005**: a link does not exist to one of the SNCs. If the Aux Data is not 1 or 2, the link from this SNI to the active SNC does not exist. If the Aux Data is 1, the link from this SNC to the active SNC does not exist. If the Aux Data is 2, the link from this SNC to the standby SNC does not exist.

To resolve this error, refer to FAIL code 112 for Configuration Audit (#759).

i. **Error Type 6006**: the SNI is administered to be connected to a DS1C but is not.

To resolve this error, refer to FAIL code 139 for Configuration Audit (#759).

j. **Error Type 6007**: the SNI is connected to a DS1C, but no DS1C is administered.

To resolve this error, refer to FAIL code 140 for Configuration Audit (#759).

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration Audit (#759)	X	X		ND
Processor Route Audit Test (#760)		X		ND

1. D = Destructive, ND = Nondestructive

SNC-BD (Switch Node Clock Circuit Pack)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SNC-BD	MAJ MIN	**test board *location***	SNC Circuit Pack

The Switch Node Clock (SNC) TN572 circuit pack is part of the Center Stage Switch (CSS) configuration. It resides in a switch node carrier that alone or with other switch nodes make up a CSS. In a high-reliability system (duplicated server and control network, unduplicated PNC), each SNC is duplicated such that there are two SNCs in each switch node carrier. In a critical-reliability system (duplicated server, control network, and PNC), each switch node is fully duplicated, and there is one SNC in each switch node carrier. SNCs are placed in slots 10 and 12 of the switch node carrier.

The active SNC communicates with each circuit pack in the switch node carrier over the serial channel bus on the backplane. In addition, the active SNC provides timing to the circuit packs in the switch node carrier via the clock buses. The active SNC uses Timing Priority Number (TPN) links with each Switch Node Interface (SNI) and the other SNC to receive and distribute TPNs. TPNs are used for setting up the correct timing distribution for the switch node carrier. The active SNC receives timing for the switch node carrier from each SNI circuit pack in the carrier and chooses the SNI with the best timing reference for the switch node carrier timing signal the SNC puts out on the clock buses. The timing reference for each SNI is derived from the fiber signal to each SNI. The active SNC chooses the SNI to receive timing from by choosing the SNI with the lowest numbered TPN which means that the SNI is closest to the system timing source. The active SNC also verifies that the SNI reference signal is good before using that SNI as the timing reference for the switch node carrier. The active SNC then supplies this timing over the clock buses on the backplane to every SNI and SNC circuit pack in the carrier. For more information about timing synchronization (including how the SNC fits into the overall synchronization configuration), see SYNC (Port Network Synchronization).

The SNC circuit packs are associated with three MOs:

- The SNC-BD (Switch Node Clock Circuit Pack) MO covers general SNC board errors and errors with the serial communication channel between the active and standby SNCs.
- The SNC-LINK (Switch Node Clock Link) MO covers errors between the active SNC and SNIs over the serial channel (Aux Data is 1). Also, the SNC-LINK MO covers TPN Link errors between the active SNC and SNIs (Aux Data is 2).
- The SNC-REF (Switch Node Clock Reference) MO covers errors the active SNC detects with SNI reference signals.

SNC circuit packs are part of port-network connectivity (PNC). For background information about PNC, refer to the Maintenance Architecture and Hardware Configurations chapters.

Figure 67: A Center Stage Switch Configuration

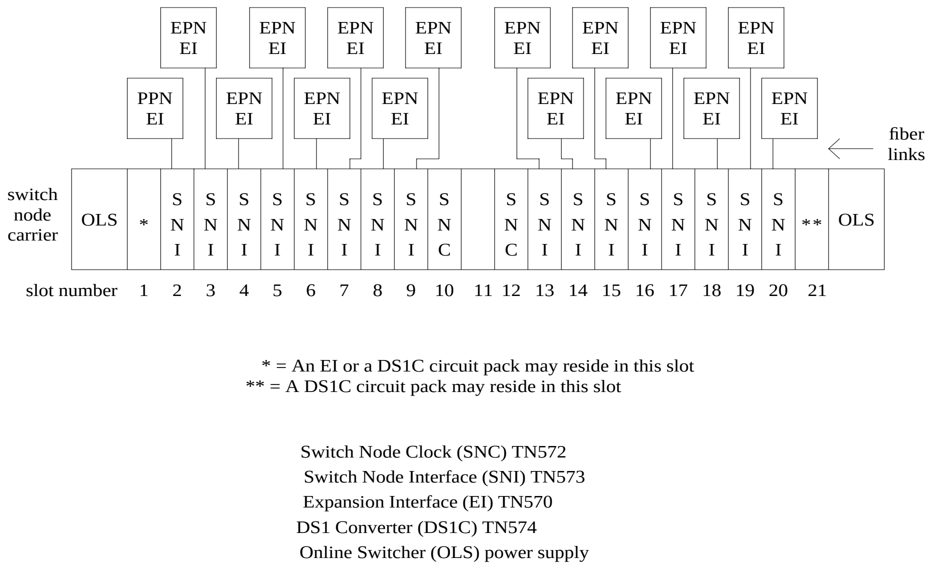
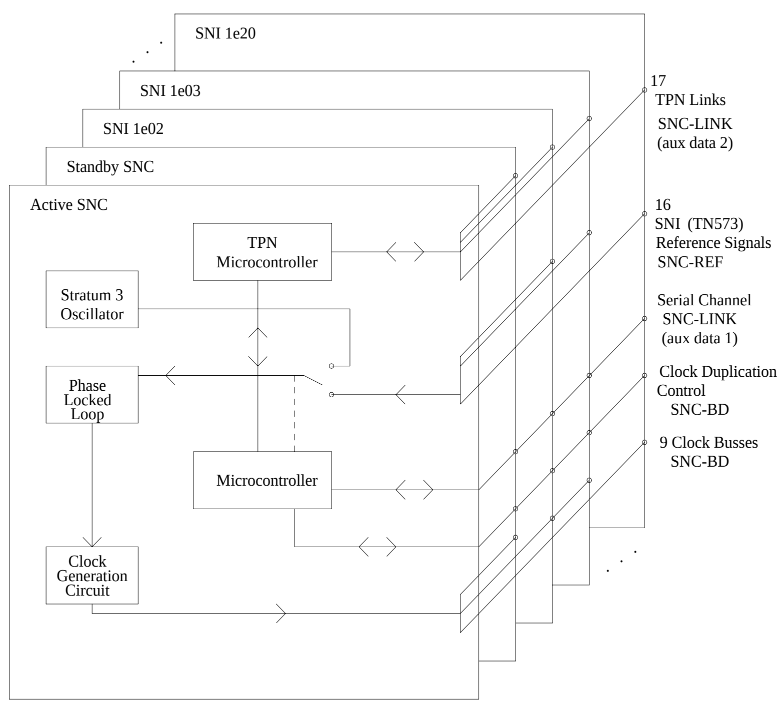


Figure 68: SNC Functions



SNC LEDs

SNC circuit packs have the standard red, green, and yellow LEDs. The red and green LEDs operate as usual: red means an alarm condition and green indicates maintenance testing in progress. If the yellow LED is lit, this indicates that the SNC is the active circuit pack, supplying timing to the carrier. In a duplex- or high-reliability system (unduplicated PNC), the standby SNC in a carrier is unlit. In a critical-reliability system (duplicated PNC), an SNC in a standby switch node carrier is lit since it is providing timing for the standby carrier.

Clear Firmware-Counters Command

SNC firmware generates error reports independently of demand tests. Therefore, **`test board`** ***`location`*** **`clear`** does not affect the error status reported by firmware. The **`clear firmware-counters`** command clears every firmware-generated error unconditionally.

Use **`clear firmware-counters`** ***`location`*** to send a downlink message to the SNC circuit pack, causing it to clear out its firmware error counters and failure database. When the firmware failure database is cleared, the Failure Audit (#777) will pass. If problems still exist, the firmware increments its error counters and the failure audit test begins failing again.

Do not use this command instead of the repair procedures associated with the error log entries. This command may be useful if a problem was fixed but the off-board alarms associated with the problem are still active.

Replacing SNC Circuit Packs

Do not power down a Switch Node carrier to replace a circuit pack. Replacing an SNC on a system with unduplicated SNCs disrupts service.

Standard-Reliability System (Unduplicated server, PNC, and SNCs)

This procedure is destructive. Any links through the switch node carrier will go down.

1. Pull out the SNC circuit pack to be replaced.
2. Insert a new SNC circuit pack.
3. Wait for the SNC to reset. (The red and green LEDs light and then go out. The yellow LED should be on solid.)
4. Use **`test alarm long clear`** category **`exp-intf`**. *Do not busyout the Expansion Interface circuit packs.*
5. Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C-BD alarms to clear, or enter **`clear firmware-counters`**.

High-Reliability System (Duplicated Server and SNCs, Unduplicated PNC)

This procedure is **non**destructive.

1. If the SNC circuit pack to be replaced is the active SNC in the switch node carrier (yellow LED is on solid), use **`set switch-node-clock`** to set the standby SNC to active.
2. When the SNC circuit pack is in standby mode (yellow LED is off), pull out the SNC circuit pack to be replaced.
3. Insert a new SNC circuit pack.
4. Wait for the SNC to reset. (The red and green LEDs light and then go out.) The yellow LED should be off because the SNC circuit pack is in standby mode.

Critical-Reliability System (Duplicated Server and PNC)

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WRN alarm against TDM-CLK with Error Type 2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

To replace an SNC circuit pack in a critical-reliability system:

1. Enter **`status pnc`**.

   Verify that the component to be replaced is on the standby PNC.
2. Enter **`busyout pnc`**.
3. Enter **`busyout board`** ***`location`***.
4. Replace the circuit pack.
5. Enter **`release board`** ***`location`***.

   CAUTION:

   Do not busyout any Expansion Interface circuit pack after this point.
6. Enter **`test alarms long clear`** for category **`exp-intf`**.
7. Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C alarms to clear, or enter **`clear firmware-counters a-pnc | b-pnc`**. Use the letter designation of the PNC that holds the replaced component (the standby PNC).
8. Enter **`status pnc`**.

   If either PNC's state of health is not "functional", consult PNC-DUP (PNC Duplication).
9. Enter **`release pnc`**.

Error log entries and recommended actions

Table 232: SNC-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board** ***location***
1 (b)	Any	Failure audit (#777)	MAJ	ON	**test board** ***location***
18 (c)	0	busyout board location	WRN	OFF	**release board** ***location***
257 (d)	Any	Failure audit (#777)	MAJ	OFF	**test board** ***location***
513 (e)	Any	Failure audit (#777)	MIN	OFF	**test board** ***location***
769 (f)	Any	Failure audit (#777)	MIN	OFF	**test board** ***location***
1025 (g)	Any	Failure audit (#777)	MAJ	ON	**test board** ***location***
1281 (h)	Any	Failure audit (#777)	MIN	OFF	**test board** ***location***
1537 (i)	Any	Failure audit (#777)	MIN	ON	**test board** ***location***
1793 (j)	Any	Failure audit (#777)	MAJ	ON	**test board** ***location***
2049 (k)	Any	Failure audit (#777)	MAJ	ON	**test board** ***location***
6008 (l)	0	SNC Release/Busy (#781)			

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: SNC on-board microcontroller error. Replace the SNC circuit pack.

c. **Error Type 18**: the SNC circuit pack was busied out using **busyout board** ***location***. To resolve this error, use **release board** ***location*** to release the SNC circuit pack.

d. **Error Type 257**: firmware detects failure of the phase-locked loop, inability to lock, or failure of the clock drivers. The problem is off-board.

1. Enter **display errors**. If SNC-BD Error Type 1793 exists in the error log, follow the repair procedures for SNC-BD Error Type 1793.
2. Enter **display errors**. If no SNI-BD 1025 errors exist in the error log, replace the active SNC.
3. Enter **display errors**. If any SNI-BD 1025 errors exist in the error log, follow the repair procedure in SNI-BD (SNI Circuit Pack) for these errors.

e. **Error Type 513**: the active SNC determines that there is a problem communicating with the standby SNC via the connecting serial channel.

If the switch node carrier is administered with duplicate SNCs:

1. If the standby SNC (the one with its yellow LED off) has this error, escalate the problem. (**`status switch-node`** also shows the active and standby SNCs.)
2. If the system originally had duplicate SNCs and the standby SNC was removed and never replaced and the active SNC has not been reset after the standby SNC was removed, this error will occur.

   If you do not intend to replace the SNC:

   a. Remove the standby SNC from circuit pack administration using **`change circuit-pack`**.

   b. If the problem persists, replace the active SNC circuit pack. Otherwise, insert an SNC circuit pack.
3. Use **`display errors`** to check the error log. If SNIs in the switch node carrier also have problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), then replace the active SNC.
4. Replace the standby SNC circuit pack.
5. Retry **`test board`**. Use **`display errors`** to check the error log. If this error is still in the error log, replace the active SNC.

If the switch node carrier is administered with only one SNC:

- If step 2 above does not apply, replace the SNC.

f. **Error Type 769**: the standby SNC determined that there is a problem communicating with the active SNC through the connecting serial channel.

1. If the active SNC (yellow LED is on) has this error, escalate the problem. (The **`status switch-node`** command also shows the active and standby SNCs.)
2. Use **`display errors`** to check the error log. If more than one SNI in the switch node carrier has problems communicating with the active SNC (that is, Error Type 257 is logged against SNI-BD), then replace the active SNC.
3. If a single SNI has SNI-BD error 257, replace the SNI circuit pack.
4. Replace the standby SNC circuit pack.
5. Retry **`test board`**. Use **`display errors`** to check the error log. If this error is still in the error log, replace the active SNC.

g. **Error Type 1025**: the firmware detects problems with the various hardware circuit monitors that verify correct operation of the reference links. Replace the SNC circuit pack.

h. **Error Type 1281**: the firmware detected problems with the interface used to track the status of both SNCs when there are duplicated SNCs in a switch node carrier. Software may have incorrect information for which SNC is active.

If the switch node carrier has only one SNC, replace the SNC.

If the switch node carrier has duplicate SNCs:

1. Replace the SNC that does not have its yellow LED lit.
2. Retry **`test board`**. Use **`display errors`** to check the error log. If the error is still in the error log, replace the SNC that has its yellow LED lit.

i. **Error Type 1537**: loss of signal from the SNC on-board Stratum-3 oscillator detected by the firmware. Replace the SNC circuit pack.

j. **Error Type 1793**: firmware detects failure of the phase-locked loop, inability to lock, or failure of the clock drivers. The problem is on-board. Replace the SNC circuit pack. If the error persists, follow normal escalation procedures.

k. **Error Type 2049**: firmware detects problems with the microcontroller used for Timing Priority Number processing. Replace the SNC circuit pack.

l. **Error Type 6008**: There is a status mismatch between software and firmware. This is a status indication and not a real problem. There is no repair action. Test #781 is not a demand test.

Demand test descriptions and error codes

Investigate tests in the order listed. Click on the link to see the full description of the test, error codes, and recommended actions. Test #983 is not an actual demand test. It reports the results of **`clear firmware-counters`**. Refer to error codes listed for Failure Audit (#777).

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration Audit (#759)	X	X		ND
Failure Audit (#777)	X	X		ND
Processor Route Audit Test (#760)		X		ND
SNC On-Board Test (#778)	X	X		ND
TPN Test (#779)	X	X		ND
Switch Node Clock Reset Test (#780)			X	D

1. D = Destructive, ND = Nondestructive

SNC-LINK (Switch Node Clock Link)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SNC-LINK	MIN	**test board** ***location***	SNC Link

The SNC-LINK MO reports errors in communications between the active Switch Node Clock and Switch Node Interfaces over the serial channel (Aux Data 1) and the TPN link (Aux Data 2). SNC-LINK errors are described on the following pages. For a complete description of SNCs and SNIs, including circuit pack replacement instructions, see SNI-BD (SNI Circuit Pack) and SNC-BD (Switch Node Clock Circuit Pack).

Error log entries and recommended actions

Table 233: SNC-LINK Error Log Entries ***1 of 2***

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0 (a)		Any	Any	Any	**test board** ***location***
1	1 (b)	2	Failure audit (#777)	MIN	OFF	**test board** ***location***
1	2 (c)	2	Failure audit (#777)	MIN	OFF	**test board** ***location***
257	1 (b)	3	Failure audit (#777)	MIN	OFF	**test board** ***location***
257	2 (c)	3	Failure audit (#777)	MIN	OFF	**test board** ***location***
513	1 (b)	4	Failure audit (#777)	MIN	OFF	**test board** ***location***
513	2 (c)	4	Failure audit (#777)	MIN	OFF	**test board** ***location***
769	1 (b)	5	Failure audit (#777)	MIN	OFF	**test board** ***location***
769	2 (c)	5	Failure audit (#777)	MIN	OFF	**test board** ***location***
1025	1 (b)	6	Failure audit (#777)	MIN	OFF	**test board** ***location***
1025	2 (c)	6	Failure audit (#777)	MIN	OFF	**test board** ***location***
1281	1 (b)	7	Failure audit (#777)	MIN	OFF	**test board** ***location***
1281	2 (c)	7	Failure audit (#777)	MIN	OFF	**test board** ***location***
1537	1 (b)	8	Failure audit (#777)	MIN	OFF	**test board** ***location***
						1 of 2

Table 233: SNC-LINK Error Log Entries ***2 of 2***

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
1537	2 (c)	8	Failure audit (#777)	MIN	OFF	**test board** ***location***
1793	1 (b)	9	Failure audit (#777)	MIN	OFF	**test board** ***location***
1793	2 (c)	9	Failure audit (#777)	MIN	OFF	**test board** ***location***
2049	1 (b)	13	Failure audit (#777)	MIN	OFF	**test board** ***location***
2049	2 (c)	13	Failure audit (#777)	MIN	OFF	**test board** ***location***
2305	1 (b)	14	Failure audit (#777)	MIN	OFF	**test board** ***location***
2305	2 (c)	14	Failure audit (#777)	MIN	OFF	**test board** ***location***
2561	1 (b)	15	Failure audit (#777)	MIN	OFF	**test board** ***location***
2561	2 (c)	15	Failure audit (#777)	MIN	OFF	**test board** ***location***
2817	1 (b)	16	Failure audit (#777)	MIN	OFF	**test board** ***location***
2817	2 (c)	16	Failure audit (#777)	MIN	OFF	**test board** ***location***
3073	1 (b)	17	Failure audit (#777)	MIN	OFF	**test board** ***location***
3073	2 (c)	17	Failure audit (#777)	MIN	OFF	**test board** ***location***
3329	1 (b)	18	Failure audit (#777)	MIN	OFF	**test board** ***location***
3329	2 (c)	18	Failure audit (#777)	MIN	OFF	**test board** ***location***
3585	1 (b)	19	Failure audit (#777)	MIN	OFF	**test board** ***location***
3585	2 (c)	19	Failure audit (#777)	MIN	OFF	**test board** ***location***
3841	1 (b)	20	Failure audit (#777)	MIN	OFF	**test board** ***location***
3841	2 (c)	20	Failure audit (#777)	MIN	OFF	**test board** ***location***
						2 of 2

1. The location of the SNI with which the SNC cot communicate.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. This error occurs when the active SNC determines that there is a problem communicating with an SNI circuit pack in the same carrier via the connecting multiprocessor serial channel used for transmitting CSCN messages. The slot location of the SNI with which the SNC cot communicate is given in SNC-LINK Error Log Entries.

1. Use **`display errors`** to check the error log.
2. If a SNI-PEER error exists in the error log, follow the repair procedures for SNI-PEER (SNI Peer Link).
3. If the SNC has SNC-LINK errors with Aux Data of 1 against other SNIs and/or has SNC-BD error 513, replace the SNC circuit pack.
4. If SNIs in the same carrier have SNI-BD error 257 logged indicating they are having trouble communicating with the SNC, replace the SNC circuit pack.
5. Use **`list configuration carrier`** to determine whether an SNI is physically present in the slot pointed to by the SNC-LINK error.
   - If the **Vintage** field indicates that a circuit pack is present, proceed to step 6.
   - If the **Vintage** field shows **no board**:

     If an SNI should not be installed in this slot:

   – Remove the SNI from circuit pack administration with **`change circuit-pack`**.

   – If the error remains, re-administer the SNI circuit pack and then remove it from administration again.

   – If the error still remains, replace the active SNC circuit pack.

     If an SNI should be installed in this slot, but is missing, insert an SNI circuit pack.
6. Replace the SNI that the SNC is complaining about.
7. Retry the command. If this error is still in the error log:
8. Replace the SNC circuit pack.
9. If a standby SNC (the one with its yellow LED off) has this error, escalate the problem. Use **`status switch-node`** to show the active and standby SNCs.

c. This error occurs when the active SNC determines that there is a problem communicating with an SNI circuit pack in the same carrier via the TPN communication channel. The slot location of the SNI with which the SNC cot communicate is given in Table 233: SNC-LINK Error Log Entries.

1. Use **`display errors`** to check the error log. If more than one SNI in the same carrier have SNI-BD errors with Error Type 769, replace the SNC.
2. Use **`display errors`** to check the error log. If the SNC has more than one SNC-LINK error with Aux Data of 2, replace the SNC.

3. Verify that the SNI the SNC is complaining about exists in the slot indicated by the error code. If the SNI does not exist:

   If you do not intend to replace the SNI:

   a. Use **`change circuit-pack`** to remove the SNI from circuit pack administration.
   b. If the error remains, re-administer the SNI circuit pack and then remove it from administration again.
   c. If the problem persists, replace the active SNC circuit pack.

   Otherwise:

   d. Insert an SNI circuit pack.
4. Replace the SNI circuit pack that the SNC is complaining about.
5. Retry the command. If this error is still in the error log, replace the SNC circuit pack.
6. If a standby SNC (the one with its yellow LED off) has this error, escalate the problem. Use **`status switch-node`** to show the active and standby SNCs.
7. Retry the command. If this error is still in the error log, escalate the problem.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration Audit (#759)	X	X		ND
Failure Audit (#777)	X	X		ND
Processor Route Audit Test (#760)		X		ND
SNC On-Board Test (#778)	X	X		ND
TPN Test (#779)	X	X		ND
Switch Node Clock Reset Test (#780)			X	D

1. D = Destructive, ND = Nondestructive

SNC-REF (Switch Node Clock Reference)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SNC-REF	MAJ	**test board** ***location***	SNC Reference

The SNC-REF MO reports errors in SNI reference signals detected by the active Switch Node Clock. Descriptions of SNC-REF errors appear on the following pages. For a complete description of SNCs and SNIs, including circuit pack replacement instructions, see MOs SNI-BD (SNI Circuit Pack) and SNC-BD (Switch Node Clock Circuit Pack).

Error log entries and recommended actions

Table 234: SNC-REF Error Log Entries ***1 of 2***

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0		Any	Any	Any	**test board** ***location***
1 (b)	Any	2	Failure audit (#777)	MAJ	OFF	**test board** ***location***
257 (b)	Any	3	Failure audit (#777)	MAJ	OFF	**test board** ***location***
513 (b)	Any	4	Failure audit (#777)	MAJ	OFF	**test board** ***location***
769 (b)	Any	5	Failure audit (#777)	MAJ	OFF	**test board** ***location***
1025 (b)	Any	6	Failure audit (#777)	MAJ	OFF	**test board** ***location***
1281 (b)	Any	7	Failure audit (#777)	MAJ	OFF	**test board** ***location***
1537 (b)	Any	8	Failure audit (#777)	MAJ	OFF	**test board** ***location***
1793 (b)	Any	9	Failure audit (#777)	MAJ	OFF	**test board** ***location***
2049 (b)	Any	13	Failure audit (#777)	MAJ	OFF	**test board** ***location***
2305 (b)	Any	14	Failure audit (#777)	MAJ	OFF	**test board** ***location***
2561 (b)	Any	15	Failure audit (#777)	MAJ	OFF	**test board** ***location***
2817 (b)	Any	16	Failure audit (#777)	MAJ	OFF	**test board** ***location***
3073 (b)	Any	17	Failure audit (#777)	MAJ	OFF	**test board** ***location***
3329 (b)	Any	18	Failure audit (#777)	MAJ	OFF	**test board** ***location***
						1 of 2

Table 234: SNC-REF Error Log Entries ***2 of 2***

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
3585 (b)	Any	19	Failure audit (#777)	MAJ	OFF	**test board** ***location***
3841 (b)	Any	20	Failure audit (#777)	MAJ	OFF	**test board** ***location***
						2 of 2

1. The slot location of the SNI with which the SNC cot communicate.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. This error occurs when the active or standby SNC detects problems in its timing reference with an SNI circuit pack in the same carrier. The slot location of the SNI with which the SNC cot communicate is given in the previous error table.

If duplicated SNCs exist in the carrier:

1. If the SNCs are duplicated in the carrier, use **display errors** to check the error log. If both SNCs have this error, replace the SNI that the SNCs are complaining about.
2. If the error occurred only on the standby SNC and the active SNC in the carrier does not have this error, use **reset board** to reset the standby SNC. Use **status switch-node** to show the active and standby SNCs. If the error returns after the standby has been reset, replace the standby SNC.
3. Retry the command. If this error is still in the error log, continue with the following steps.
4. If the active SNC has this error, use **set switch-node-clock** to set the standby SNC to active. If the new active SNC has this error, replace the SNI that the SNC is complaining about. Otherwise, replace the SNC that originally had this error.

If only one SNC exists in the carrier:

5. Replace the SNI that the SNC is complaining about.
6. Retry the command. If this error is still in the error log, continue with the following step.
7. Replace the SNC.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration Audit (#759)	X	X		ND
Failure Audit (#777)	X	X		ND
Processor Route Audit Test (#760)		X		ND
SNC On-Board Test (#778)	X	X		ND
TPN Test (#779)	X	X		ND
Switch Node Clock Reset Test (#780)			X	D

1. D = Destructive, ND = Nondestructive

SNI-BD (SNI Circuit Pack)

S8700-series Fiber-PNC

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SNI-BD	MAJ MIN WRN	**test board *location***	SNI Circuit Pack

The TN573 Switch Node Interface (SNI) circuit pack is part of the Center Stage Switch (CSS) configuration. It resides in a switch node carrier that alone or with other switch nodes make up a CSS. SNIs connect to other SNIs or Expansion Interface (EI) circuit packs via fiber links. SNI-to-EI fiber links are used to connect port networks to a switch node carrier and SNI-to-SNI fiber links are used as inter-switch node fibers. In critical-reliability systems, the fiber link connections are duplicated as part of port-network connectivity (PNC) duplication. In standard- and high-reliability systems, the PNC is not duplicated.

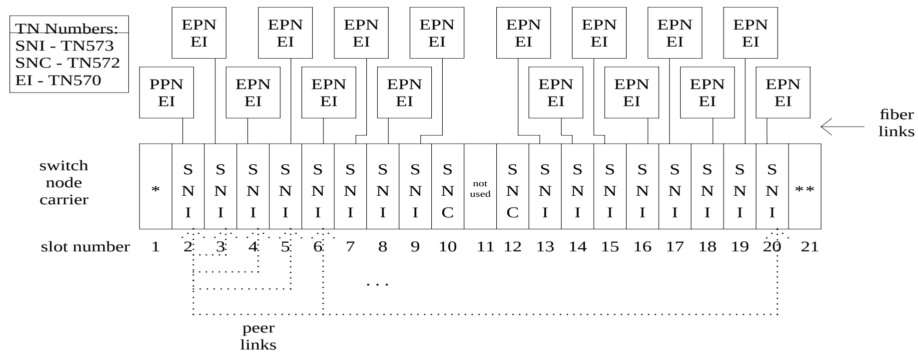
There may be up to 16 SNIs in a switch node carrier. They are located in slots 2 through 9 and slots 13 through 20. Slot 11 in a switch node carrier is not used. One or two TN572 boards (SNCs) must reside in switch node carrier positions 10 and 12. The SNIs connect to other SNIs in the same carrier via the backplane; these connections within the same carrier are referred to as peer-links. Each SNI also connects via an optical fiber or metallic connection to another SNI in another carrier or to an EI in a port network (PN). These connections are referred to as fiber links.

The Switch Node Clock (SNC) provides timing for the SNIs in the entire carrier. When two SNCs reside in the same switch node carrier, one is in active mode and one is in standby mode. The yellow LED on the active SNC will be on solid. The yellow LED on the standby SNC will be off. See SYNC (Port Network Synchronization) for an explanation of how SNIs are involved in timing synchronization.

Figure 69: CSS Configuration with Unduplicated PNC and 1 Switch Node Carrier shows an unduplicated CSS with one switch node. A single switch node can accommodate up to 16 port networks. A system with two switch nodes can accommodate up to 22 port networks.

Figure 70: CSS Configuration with Duplicated PNC and 4 Switch Node Carriers shows a two-switch node CSS with duplicated PNC (four switch node carriers). In this configuration, each PNC (A and B) contains two switch nodes. The cabinet numbers for the switch node carriers are typical cabinet numbers. The PNs on the top half of the figure (PNC A) are the same as the PNs on the bottom half of the figure (PNC B).

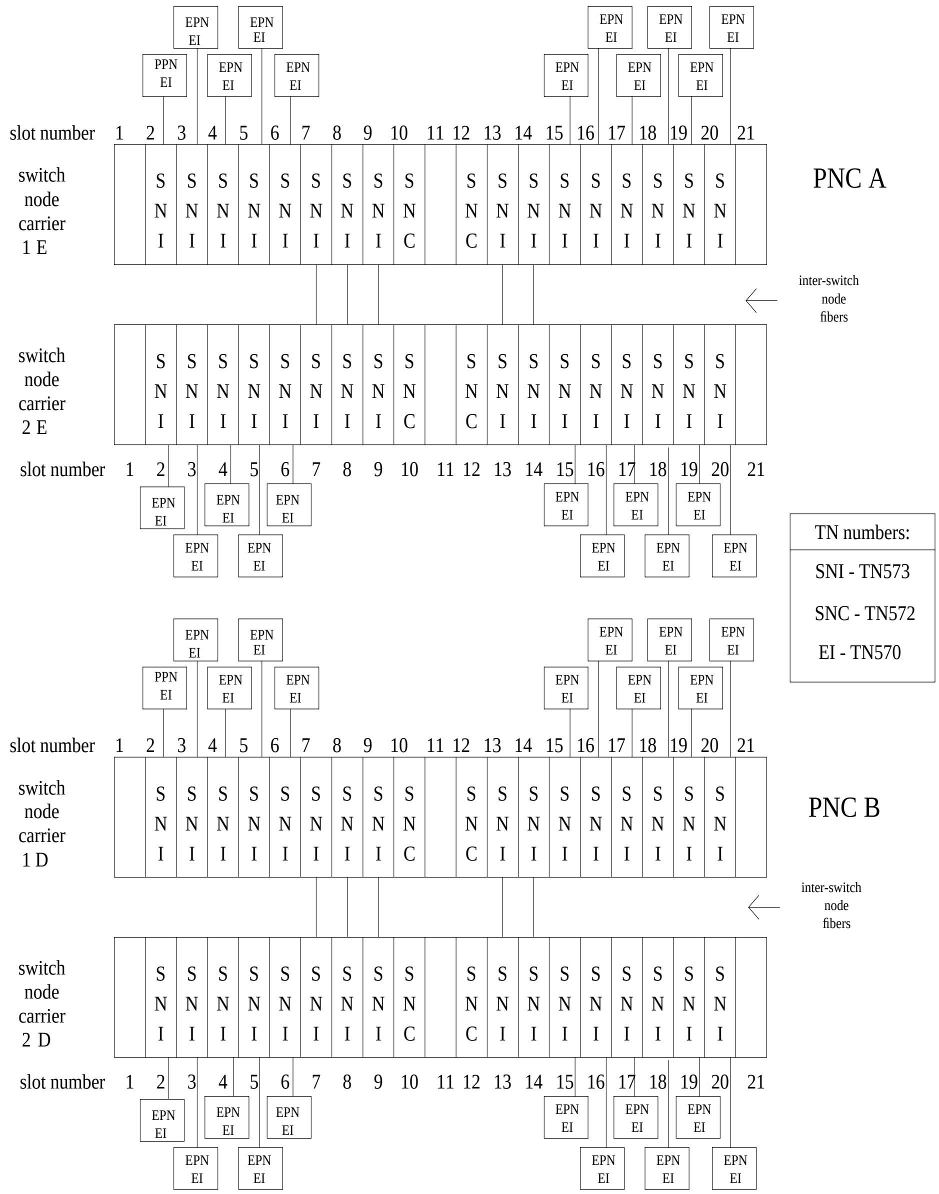
Figure 69: CSS Configuration with Unduplicated PNC and 1 Switch Node Carrier



* = An EI or a DS1C circuit pack may reside in this slot

** = A DS1C circuit pack may reside in this slot

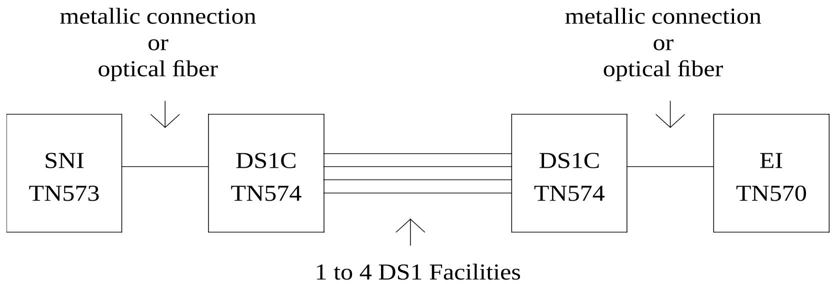
Figure 70: CSS Configuration with Duplicated PNC and 4 Switch Node Carriers



Remote PNs

A DS1 converter complex can provide connectivity to a remotely located port network. The DS1 converter complex consists of two TN574 DS1 converter (DS1C) circuit packs connected by 1 to 4 DS1 facilities. The DS1C complex is administered as a fiber link.

Figure 71: Fiber Link over a DS1 Converter Complex



SNI LEDs

The SNI circuit pack has red, green, and yellow LEDs. The red and green LEDs have the usual meaning, with red signifying an on-board alarm, and green signifying maintenance testing in progress. The red and green LEDs will come on and then turn off when the circuit pack is reset.

Note:

If the red LED is on without any alarms active against the circuit pack, replace the SNI circuit pack. This indicates that SNI firmware has detected a fault and is unable to notify software.

The yellow LED indicates status information:

Table 235: SNI Yellow LED states

Condition	LED on	LED off
Fiber out of Frame	0.1 second	0.1 second
In frame, No Neighbor [1]	0.5 second	0.5 second
SNI active	solid on	never off
SNI standby	never on	solid off

1. The fiber is in frame but a communication problem exists to the neighbor.

SNI Administration and SNI Board Insertion

The circuit packs in the switch node carrier will not function properly unless administration is performed first. For example, without fiber link administration, phone calls cot be made through the CSS, CSS circuit packs will not be inserted, and maintenance software cot test the CSS circuit packs.

For an unduplicated PNC configuration, perform the following administration, in this order, before inserting SNIs:

1. Cabinet Administration: administer the switch node carriers into the proper cabinets. When the screen is submitted, switch node numbers are assigned to the carriers. Use **`list cabinet`** to see the switch node numbers for the carriers.
2. Circuit Pack Administration: Every board in the switch node carriers must be administered.
3. Fiber-Link Administration: Use **`add fiber-link`** to administer the fibers between the TN570s and the TN573 (or TN573 to TN573), and to add a DS1C converter complex to a fiber link.

For a duplicated PNC configuration, perform the following administration, in this order, before inserting SNIs:

1. Obtain a License File to activate PNC duplication.
2. Cabinet Administration: Administer the switch node carriers and duplicate switch node carriers into the proper cabinets. When this screen is submitted, switch node numbers are assigned to the carriers. Use **`list cabinet`** to see the switch node numbers for the carriers.
3. Circuit Pack Administration: Every board in the switch node carriers must be administered.
4. Fiber-Link Administration: Use **`add fiber-link`** to administer the fibers between the TN570s and the TN573 (or TN573 to TN573), and to add a DS1C converter complex to a fiber link. If the system is being changed from an unduplicated to a duplicated PNC configuration, use **`change fiber-link`** to administer the b-pnc fiber-link endpoints on the existing fiber links.
5. Use **`change system-parameters duplication`** to administer PNC duplication.

Clear Firmware-Counters Command

SNI firmware generates error reports autonomously. This takes place independently of demand tests. Therefore, **test board *location*** clear does not affect the error status reported by firmware. The **clear firmware-counters** command clears every firmware-generated error unconditionally.

The **clear firmware-counters *location*** command sends a downlink message to the SNI circuit packs, causing them to clear out their firmware error counters and failure databases. Once the firmware failure database is cleared, the failure audit test (#777) will pass. If problems still exist, the firmware will increment its error counters and the failure audit test will begin failing again.

Do not use this command instead of the repair procedures associated with the error log entries. This command may be useful if a problem was fixed and off-board alarms associated with the problem are still active.

Replacing SNI Circuit Pack—Unduplicated PNC

Do not power down a Switch Node carrier to replace a circuit pack.

Replacing a Switch Node Interface circuit pack on an unduplicated PNC disrupts service. This service effect can cause an outage of a single PN.

To replace a Switch Node Interface circuit pack in an unduplicated PNC:

1. Enter **busyout board *location***.
2. Replace the circuit pack.
3. Wait for the circuit pack to reset.

   Red and green LEDs will light and then go out.
4. Enter **release board *location***.

   CAUTION:
   Do not busyout any Expansion Interface circuit pack after this point.
5. Enter **test alarms long clear** for category **exp-intf**.
6. Wait 5 minutes for SNI-BD, FIBER-LK, *and* DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc**.

Replacing an SNI Circuit Pack— Duplicated PNC

On a system with duplicated PNC synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WRN alarm against TDM-CLK with Error Type 2305. Repairs to standby PNC in this state may disrupt service. If the active PNC is functional, replacement of a standby component does not disrupt service.

To replace a Switch Node Interface circuit pack in an duplicated PNC:

1. Enter **status pnc**.

   Verify that the component to be replaced is on the standby PNC.
2. Enter **busyout pnc**.
3. Enter **busyout board *location***.
4. Replace the circuit pack.
5. Enter **release board *location***.

   CAUTION:

   Do not busyout any Expansion Interface circuit pack after this point.
6. Enter **test alarms long clear** for category **exp-intf**.
7. Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C alarms to clear, or enter **clear firmware-counters sp 0 a-pnc | b-pnc**.

   Use the letter designation of the pnc which holds the replaced component (the standby pnc).
8. Enter **status pnc**.

   If either PNC's state of health is not "functional", consult PNC-DUP (PNC Duplication).
9. Enter **release pnc**.

Switch Node Interface Manual Loopback Procedure

This procedure is **destructive**.

Use this procedure when an SNI circuit pack cot be tested by software. This can occur when communication between the switch node carrier and the server is down. Before using this procedure, use **test board *location*** to run the Configuration Audit (#759) on SNI circuit packs where possible. Also, use **test board *location* long** to run the Processor Route Audit Test (#760) for the active SNC in the switch node carrier. If the active SNC is not inserted, use **test hardware-group pnc *P***, where ***P*** is **a-pnc** or **b-pnc** to run Test #760.

Before using this procedure, determine if more than one SNI is unable to communicate with software. Verify SNI and SNC circuit pack insertion using the **`list configuration carrier`** ***`location`*** where ***`location`*** is the cabinet and carrier location of a switch node carrier. Check for inserted SNIs and SNCs in every administered switch node carrier.

If every SNI and SNC is not inserted, then "NO BOARD" is displayed for each board in the entire PNC (either the a-pnc or the b-pnc). The link between the IPSI connected PN's EI (on the PNC where SNI and SNC circuit packs were not inserted) and the connected SNI does not function properly. If this applies:

1. Run **`test board`** ***`location`*** on the IPSI connected PN's EI, and fix any problems.
2. Perform the Expansion Interface Manual Loopback Procedure for the IPSI connected PN's EI.
3. Perform the Switch Node Interface Manual Loopback Procedure for the SNI connected to the IPSI connected PN's EI.
4. Replace the active SNC.

If the system has a 2-level switch node carrier configuration (i.e., SNI-to-SNI fiber links exist) and the SNIs and SNCs in the second switch node carrier only (the switch node carrier that has no SNI connected to the IPSI connected PN's EI) are not inserted and at least two SNI-to-SNI fiber links exist:

1. Run **`test board`** ***`location`*** **`long`** on the SNIs in the first switch node carrier that are connected to SNIs in the second switch node carrier and fix any problems.
2. Replace the active SNC.
3. Perform the Switch Node Interface Manual Loopback Procedure for the SNIs in the second switch node carrier that are connected to SNIs in the first switch node carrier.

If software is unable to communicate with a PN's EI but can communicate with the connected SNI:

1. Run **`test board`** ***`location`*** **`long`** on the connected SNI and fix any problems.
2. Perform the Expansion Interface Manual Loopback Procedure for the PN EI.

   If the connection to the SNI circuit pack is fiber, a short length of optical fiber is required for this procedure. If a metallic cable is used in the connection, remove the metallic connector from the back of the carrier, and install a lightwave transceiver in its place. The short length of optical fiber can then be used.

   If this procedure is run on both endpoints on a fiber link (Expansion Interface circuit packs or Switch Node Interface circuit packs), and both check out fine, then the failure is most likely in the connection (fiber or metallic) itself if neither endpoint circuit pack is busied out, but the link remains inactive.

   1. Use **`busyout board`** ***`location`*** to busyout the circuit pack (Expansion Interface or SNI).
   2. Disconnect the transmit and receive fiber pair from the lightwave transceiver on the back of the circuit pack (Expansion Interface or Switch Node Interface) slot.

Note:

Note which is the transmit fiber and which is the receive fiber for proper re-connection at the end of this procedure. The fiber connected to the transmit side of the lightwave transceiver on one circuit pack should be connected to the receive side of the lightwave transceiver on the circuit pack on the opposite end of the fiber.

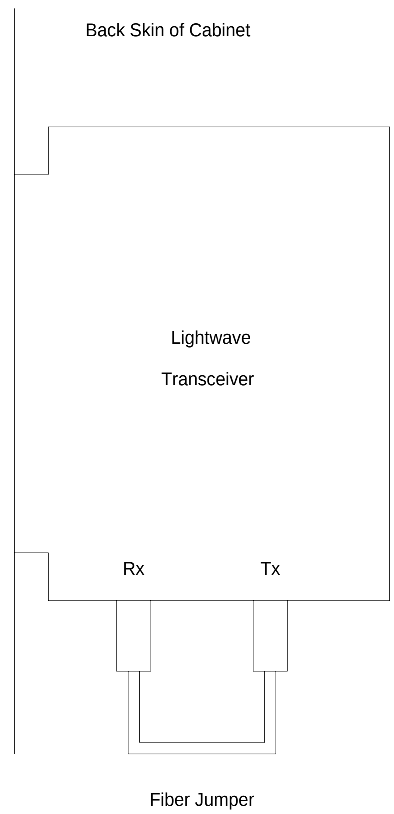
3. Using a spare fiber jumper cable, interconnect the transmit and receive jacks of the lightwave transceiver as shown in Figure 72: Interconnection of Lightwave Transceiver Transmit/Receive Jacks.

Note:

Make sure that the total length of the fiber jumper cable does not exceed the maximum length recommended for the fiber link connections between cabinets. Test the Expansion Interface or SNI circuit pack within connectivity guidelines so that test results are not influenced due to improper cable length.

4. Go to the front of the cabinet and inspect the yellow LED.
   - If the yellow LED flashes on at a rate of once per second, the Expansion Interface or Switch Node Interface circuit pack or transceiver should be replaced.
   - If the yellow LED flashes on at a rate of five times per second, the circuit pack (Expansion Interface or Switch Node Interface) or the lightwave transceiver may need replacement. This may also be due to a faulty system clock on the network containing the Expansion Interface circuit pack or in the switch node carrier containing the SNI.
   - If the yellow LED was blinking before starting this procedure and the yellow LED is not blinking now, this circuit pack (Expansion Interface or Switch Node Interface) and the lightwave transceiver are functioning properly.
5. Replace faulty component(s) and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in Step 2.
6. Use **`release board`** ***`location`*** to release the Expansion Interface circuit pack or Switch Node Interface circuit pack.

Figure 72: Interconnection of Lightwave Transceiver Transmit/Receive Jacks



Error log entries and recommended actions

Table 236: SNI-BD Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	Any	Failure audit (#777) (c)	MAJ MIN WRN	ON	**test board *location***
18 (d)	0	**busyout board *location***	WRN	OFF	**release board *location***
					1 of 2

Table 236: SNI-BD Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
125 (e)		None	MIN	ON	
257 (f)	Any	Failure audit (#777) (c)	MAJ MIN WRN	OFF	**test board *location***
513 (g)	Any	Failure audit (#777) (c)	MAJ MIN WRN	OFF	**test board *location***
769 (h)	Any	Failure audit (#777) (c)	MAJ MIN WRN	OFF	**test board *location***
1025 (i)	Any	Failure audit (#777) (c)	MAJ MIN WRN	ON/ OFF	**test board *location***
1281 (j)	Any	Failure audit (#777) (c)	MAJ MIN WRN	ON	**test board *location***
1537 (k)	Any	Failure audit (#777) (c)	MAJ MIN WRN	OFF	**test board *location***
1793 (l)		SNI Sanity Timer Test (#964)	WRN	ON	**test board *location***
2561 (m)	Any	Failure audit (#777) (c)	MAJ MIN WRN	ON	**test board *location***
2817 (n)	Any	Failure audit (#777) (c)	MAJ MIN WRN	ON	**test board *location***
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: the SNI may have trouble communicating with every other SNI and SNC circuit pack in the switch node carrier.

1. Replace the SNI circuit pack.

c. **Failure audit (#777):** The first time you see an SNI-BD error in the error log, run **`test board`** ***`location`***. If the failure audit test (#777) fails, enter **`display errors`** for this SNI circuit pack and continue with the repair procedures for SNI-BD (SNI Circuit Pack) errors.

d. **Error Type 18**: the SNI circuit pack was busied out using **`busyout board`** ***`location`***. To resolve this error, use **`release board`** ***`location`*** to release the SNI circuit pack.

e. **Error Type 125**: the SNI circuit pack is incompatible with the TN1654 DS1 Converter board. A TN573B or higher suffix SNI board must be used when connecting to a TN1654 DS1 Converter board.

   1. Replace the SNI circuit pack with a newer suffix.

f. **Error Type 257**: the SNI cot communicate with the active SNC.

   1. Use **`display errors`** to check the error log for other SNI circuit packs with the 257 SNI-BD error. If other SNI circuit packs in the same switch node carrier have error 257, replace the active SNC.
   2. Replace this SNI.
   3. Replace the active SNC in the same switch node carrier.
   4. Enter **`display errors`.** If this error is still in the error log, follow normal escalation procedures.

g. **Error Type 513**: the SNI cot communicate with the DS1-C.

   1. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*.

h. **Error Type 769**: failure communicating synchronization control data with the active SNC.

   1. Look at every SNI-BD error in the log using **`display errors`** and **`display alarms`** to determine whether to follow Procedure 1 or Procedure 2.

      Use the table below that lists pairs of adjacent SNIs:

Adjacent SNI Slot Numbers	Adjacent SNI Slot Numbers
2 & 3	13 & 14
4 & 5	15 & 16
6 & 7	17 & 18
8 & 9	19 & 20

      Use Procedure 2 if either of the following two conditions is present:

      - At least one pair of adjacent SNIs in this carrier has Error Type 769 with an off-board alarm logged against both SNIs in the pair.
      - The active SNC in this carrier has Error Type 257.

      If neither of the above is true, follow Procedure 1.

Procedure 1

Suspect TPN link or clock generation out-of-lock problem:

1. Enter **`display alarms`** and **`display errors`** and follow the procedures for any on-board SNI-BD error and alarm entries.
2. If more than one SNI circuit pack in the same switch node carrier has SNI-BD error 769 with an off board alarm, replace the active SNC in the same carrier.
3. Replace this SNI.
4. Replace the active SNC in the same carrier.

Procedure 2

Suspect clock generation out-of-lock problem:

5. If only one SNC exists in this switch node carrier, replace the SNC.
6. If two SNCs exist in this switch node carrier, set the standby SNC to active by running **`set switch-node-clock`** ***`location`*** with the standby SNC's ***`location`***.

- If the problem goes away, replace the SNC that was previously active. Then use **`set switch-node-clock`** ***`location`*** to set the SNC that was just replaced to active. If the problem returns, assume that the SNC that was just replaced is not at fault and go to Step 7.
- If the problem persists, switch back to the previously active SNC using **`set switch-node-clock`** and go to Step 7.

7. Replace the left-most SNI from the pair of adjacent SNIs.
8. Replace the right-most SNI from the pair of adjacent SNIs.
9. If none of the above steps cleared this error, this could be a switch node carrier backplane problem.

i. **Error Type 1025**: a failure communicating synchronization control data over the fiber link.

If the error is logged as an ON-BOARD error:

1. Replace the SNI circuit pack.

If the error is logged as an OFF-BOARD error:

1. Enter **`display errors`** and follow the repair procedures for FIBER-LK errors.
2. Replace the SNI with this error.
3. Replace the fiber link's other endpoint if no DS1C complex is administered on the fiber link. Use **`list fiber-link`** to determine if a DS1C complex is administered. If so, replace the circuit packs in this order:

   a. Replace the DS1C circuit pack connected to this SNI.

   b. Replace the other DS1C circuit pack.

   c. Replace the fiber link's other endpoint.

j. **Error Type 1281**: processor complex failure. Replace the SNI circuit pack.

k. **Error Type 1537**: excessive slips have occurred.

Follow the steps for diagnosing synchronization problems when slips have occurred in the SYNC section.

l. **Error Type 1793**: SNI missed sanity. Escalate the problem.

m. **Error Type 2561**: the SNI cot communicate with its neighbor. The SNI is at fault. Replace the SNI circuit pack.

n. **Error Type 2817**: the SNI cot communicate with one of its peers. The SNI is at fault. Replace the SNI circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Configuration Audit (#759)	X	X	ND
Failure Audit (#777)	X	X	ND
SNI Fiber Out of Frame Query Test (#989)	X	X	ND
Packet Neighbor Link Test (#767)	X	X	ND
SNI Circuit Path Test (#755)	X	X	ND
SNI Destructive Facility On-board Test (#757)		X	D
SNI Destructive Facility Off-Board Test (#756)		X	D
SNI Sanity Timer Test (#964)	X	X	ND
The following test is not part of a demand test sequence. It is executed with **`reset board`**			
Switch Node Interface Reset Test (#761)			D

1. D = Destructive, ND = Nondestructive

Note:

Test #982 is not an actual demand maintenance test. This test number displays the results of **`clear firmware-counters`**. Refer to error codes listed for Failure Audit (#777)

SNI-PEER (SNI Peer Link)

S8700-series Fiber-PNC **only**

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SNI-PEER	MAJ MIN WRN	**test board *location***	SNI Peer Link

SNI Peers are Switch Node Interfaces residing on the same Switch Node Carrier. SNI-PEER maintenance tests the links between SNI Peers. For a full description of SNIs, including circuit pack replacement, see SNI-BD (SNI Circuit Pack).

Error log entries and recommended actions

Table 237: SNI-PEER Error Log Entries *1 of 2*

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[2]	0		Any	Any	Any	**test board *location***
1	Any	2	Failure audit (#777)	Any	OFF	**test board *location***
257	Any	3	Failure audit (#777)	Any	OFF	**test board *location***
513	Any	4	Failure audit (#777)	Any	OFF	**test board *location***
769	Any	5	Failure audit (#777)	Any	OFF	**test board *location***
1025	Any	6	Failure audit (#777)	Any	OFF	**test board *location***
1281	Any	7	Failure audit (#777)	Any	OFF	**test board *location***
1537	Any	8	Failure audit (#777)	Any	OFF	**test board *location***
1793	Any	9	Failure audit (#777)	Any	OFF	**test board *location***
2049	Any	13	Failure audit (#777)	Any	OFF	**test board *location***
2305	Any	14	Failure audit (#777)	Any	OFF	**test board *location***
2561	Any	15	Failure audit (#777)	Any	OFF	**test board *location***
2817	Any	16	Failure audit (#777)	Any	OFF	**test board *location***
						1 of 2

Table 237: SNI-PEER Error Log Entries ***2 of 2***

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Recommended Action
3073	Any	17	Failure audit (#777)	Any	OFF	`test board` *`location`*
3329	Any	18	Failure audit (#777)	Any	OFF	`test board` *`location`*
3585	Any	19	Failure audit (#777)	Any	OFF	`test board` *`location`*
3841	Any	20	Failure audit (#777)	Any	OFF	`test board` *`location`*
						2 of 2

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2. The slot location of the SNI at the other end of the peer link indicted by the SNI reporting the error.

For every error in Table 237: SNI-PEER Error Log Entries, the SNI circuit pack reporting the error has a problem with the control path, circuit path, or packet path to the SNI peer in the slot indicated on the error table.

1. Run the Failure Audit (#777) to confirm if the error still exists.
2. If the SNI reports an SNI-PEER error against a slot that does not contain an SNI, either change circuit pack administration using **`change circuit-pack`** to un-administer the SNI, or insert an SNI into the indicated slot. Use **`list configuration carrier`** to determine if an SNI circuit pack is inserted. Otherwise, use **`display errors`** and look at every SNI-PEER error in the log. If either of the following two conditions are present, follow Procedure 2 below:
   - Do many SNIs have SNI-PEER errors pointing to the same 2 adjacent SNIs?
   - Do 2 adjacent SNIs have SNI-PEER errors pointing to many other SNIs?
3. If neither condition is present, follow Procedure 1 below. When using either procedure, see SNI-BD (SNI Circuit Pack) or SNC-BD (Switch Node Clock Circuit Pack) for circuit pack replacement instructions.

Slot Numbers of Adjacent SNIs	Point to this SNI Pair
2, 3	1, 257
4, 5	513, 769
6, 7	1025, 1281
8, 9	1537, 1793
13, 14	2049, 2305
15, 16	2561, 2817

Slot Numbers of Adjacent SNIs	Point to this SNI Pair
17, 18	3073, 3329
19, 20	3585, 3841

Procedure 1

Perform the following steps until the problem is resolved:

1. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*.
2. Replace the SNI pointed to by the SNI-PEER Error Type. See the SNI Slot column in Table 237: SNI-PEER Error Log Entries.
3. Replace the SNI reporting the SNI-PEER error.
4. Replace the active SNC.

Procedure 2

If either of the two patterns described before are present, then the clock signal between active SNC and 2 Adjacent SNIs is suspect. Proceed through the following steps until the problem is resolved:

1. If only one SNC exists in this switch node carrier, replace the SNC. If two SNCs exist in this switch node carrier, perform the following steps:
   a. Set the standby SNC to active by executing **`set switch-node-clock`** ***`location`*** with the standby SNC's location.
   b. If the problem persists, switch back to the previously active SNC using **`set switch-node-clock`** and go to Step 2 below.
   c. If the problem went away, replace the SNC that was previously active. Then set the newly replaced SNC to active. If the problem returns, assume that the SNC that was just replaced was not at fault and go to Step 2 below.
2. Replace the left-most SNI from the pair of adjacent SNIs.
3. Replace the right-most SNI from the pair of adjacent SNIs.
4. This could indicate a problem with the switch-node-carrier backplane.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Configuration Audit (#759)	X	X	ND
Failure Audit (#777)	X	X	ND
SNI Fiber Out of Frame Query Test (#989)	X	X	ND
Packet Neighbor Link Test (#767)	X	X	ND
SNI Circuit Path Test (#755)	X	X	ND
SNI Destructive Facility On-board Test (#757)		X	D
SNI Destructive Facility Off-Board Test (#756)		X	D
The following test is not part of a demand test sequence. It is executed with **`reset board`**			
Switch Node Interface Reset Test (#761)			D

1. D = Destructive, ND = Nondestructive

SP-REG-M (Survivable Processor-Main)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SP-REG-M	MAJ MIN	None	Survivable Processor-Main

The Survivable Processor object monitors keep-alive message between the main server and the survivable processor, which can be either:

- Survivable Remote Server
- Survivable Core Server

The server exchanges keep-alive messages with each of the survivable processors. If the server does not receive a predetermined number of those messages, both the server and the survivable processor alarm.
If a Survivable Remote Server does not register with a Survivable Core Server, it registers with either the main server or another Survivable Core Server and alarms are not raised.

Possible causes for SP-REG-M alarms include:

- The network is down.
- The server or survivable processor administration is incorrect.

Error log entries and recommended actions

Table 238: SP-REG-M Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	0-63		MIN	OFF	`status ess-cluster`
769 (b)	0		MAJ	OFF	

Notes:

a. **Error Type 1**: no keep-alive signal from the Survivable Core Server. The Aux Data value displays the number of unregistered and alarmed Survivable Core Server clusters (0 - 63). Possible causes include:

- The main server is down.
- The network is down.
- The server or survivable processor administration is incorrect.

1. Use the **`status ess-cluster`** command to determine which survivable processor is not registered.
2. Determine the network outage or administration problem for this processor.

b. **Error Type 769:** invalid or wrong NIC address. Unable to access the IP address of the native NIC. Use the Maintenance Web Page to verify/configure the NIC address (**Server Configuration -> Configure Server -> Configure Individual Services -> Configure Interfaces**).

SP-REG-S (Survivable Processor)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SP-REG-S	MAJ MIN	None	Survivable Processor

The Survivable Processor object monitors keep-alive message between the main server and the survivable processor, which can be either:

- Survivable Remote Server
- Survivable Core Server

The server exchanges keep-alive messages with each of the survivable processors. If the server does not receive a predetermined number of those messages, both the server and the survivable processor alarm.

Possible causes for SP-REG-S alarms include:

- The network is down.
- The server or survivable processor administration is incorrect.

Error log entries and recommended actions

Table 239: SP-REG-S Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (a)	0		MIN	OFF	
769 (b)	0		MAJ	OFF	

Notes:

a. **Error Type 513**: the survivable processor (Survivable Core Server or Survivable Remote Server) is unregistered. Possible causes include:
   - The main server is down.
   - The network is down.
   - The server or survivable processor administration is incorrect.

b. **Error Type 769:** invalid or wrong NIC address. Unable to access the IP address of the native NIC. Use the Maintenance Web Page to verify/configure the NIC address (**Server Configuration -> Configure Server -> Configure Individual Services -> Configure Interfaces**).

STRAT-3 (Stratum-3 Clock)

S8700-series Fiber-PNC **only**

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
STRAT-3	MAJ MIN	`test synchronization`	Stratum-3 clock

The *Digital Synchronization Network Plan (PUB 60110)* specifies a hierarchy of synchronization nodes consisting of Strata 1 to 4, where the public network's sole Stratum-1 clock is the most accurate. Release 5r and later systems support both Stratum-3 and -4 operations. See Stratum-4 Synchronization for details on Stratum-4 operation.

A Stratum-3 clock derives its timing from two DS1 references connected to a Stratum-3 or better source. The Stratum-3 clock provides a holdover of at least 24 hours should both DS1 references fail. After 24 hours, the Stratum-3 clock still provides service but its accuracy may be degraded. The *Digital Synchronization Network Plan (PUB 60110)* requires that the Stratum-3 clock have duplicated components.

The Stratum-3 clock can be configured with only one DS1 input if one of the Clock Input cards is removed. Also, the Stratum-3 clock can free run (use its internal clock without using DS1 inputs, if both Clock Input cards are removed).

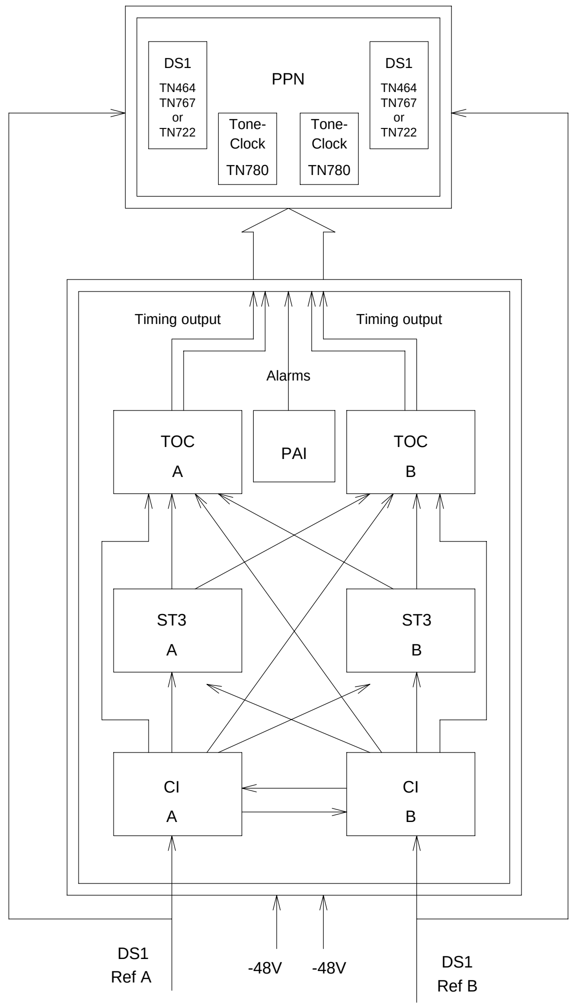
Only a TN780 Tone-Clock circuit pack recognizes and supports a Stratum-3 clock and its alarm signals. The TN780 Tone-Clock circuit pack is also backward- compatible with a TN768 Tone-Clock circuit pack. The Stratum-3 clock may be connected to a non IPSI PN where a TN780 Tone-Clock circuit pack resides. The Stratum-3 clock should never be connected to an IPSI connected PN.

The only operation that software can perform is a query of the alarm leads. The only recovery action that can be performed on a catastrophic failure of the Stratum-3 clock is using the local oscillator on the active TN780 Tone-Clock circuit pack. Neither software nor the TN780 Tone-Clock circuit pack can request additional information about the health of the Stratum-3 clock other than the information provided by the alarm leads. Furthermore, neither the software nor the TN780 Tone-Clock circuit pack can request that the external clock switch references, change configuration, disable/enable, initialize, and so forth.

In the system, the Stratum-3 clock has been implemented as an external which follows the specification in PUB 60110 for Stratum 3. The only external Stratum-3 clock that is supported is the Telecom Solutions Digital Clock Distributor for Customer Premise Timing (DCD-CPT) Stratum-3 clock. Figure 73: Stratum-3 Clock Hardware Configuration shows how the Stratum-3 hardware configuration provides clock and alarm signals to the TN780 Tone-Clock circuit pack(s). The reference DS1 facilities connect directly to the Stratum-3 clock for timing purposes, but the DS1 data may be routed into the switch by using a Y connector (H-600-274 G1 for the 50-pin DS1 end or H-600-274 G2 for the 15-pin DS1 end).

For more information about installing a Stratum-3 clock, refer to *Maintenance for the Avaya S8700 Media Server with an Avaya SCC1 Media Gateway or an Avaya MCC1 Media Gateway*.

Figure 73: Stratum-3 Clock Hardware Configuration



Stratum-3 Clock LED Strategy

Note:

When looking in the Stratum-3 cabinet, “A” card is on the left and “B” card is on the right.

The normal LED scheme is not followed for this device. Green LEDs do not indicate maintenance activity. There are no yellow LEDs, and there are more than three LEDs per circuit pack.

Removal of a card in the Stratum-3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum-3 clock to full service.

The Stratum-3 clock has the following components:

- 2 Clock Input cards (CI)

  Provides the logic to select the better DS1 reference or Clock Input card. The red FAIL LED on this card indicates a failure with the card or the DS1 reference connected to it.

- 2 Stratum-3 Cards (ST3)

  Provides 24-hour holdover. The red FAIL LED on this card indicates a failure with the card. Replace the card.

- 2 Timing Output Cards (TOC)

  Provides cable length compensation, multiple output ports, selection of the ST3, and CI outputs. This type of card has two red failure LEDs: one indicates a failure of the card, the other indicates a failure in one or more output ports. In either case, replace the card.

- 1 PBX (Private Branch Exchange) Alarm Interface (PAI)

  Filters power supplied to the clock, provides fuse protection, and provides alarm indications based on inputs supplied by other cards. The six LEDs on this card provide indications for the six alarm or status conditions as follows:

  - Loss of DS1 reference A
  - Loss of DS1 reference B
  - Loss of one clock unit
  - Loss of both clock units
  - Loss of one power supply
  - Loss of both power supplies

The output of the CI and PAI cards go directly to the TN780 Tone-Clock circuit pack via two 25-pair amphenol terminated cables. Every card has red and/or green LEDs for providing status or alarm indications. The abbreviations used in the table are defined above except for SRC (source) and PLL (Phase Locked Loop).

Table 240: Stratum-3 Clock LED Indications

Card	Name	Color	Indication
PAI	REF A	Red	Loss of input reference A or CI A failed
	REF B	Red	Loss of input reference B or CI A failed
	ST A	Red	Failed Stratum-3 clock A
	ST B	Red	Failed Stratum-3 clock B
	PWR A	Green	-48VDC A present
	PWR B	Green	-48VDC B present
CI	FAIL	Red	Card failure
	DS1	Green	DS1 source present
	CC	Green	Composite clock source[1] present
	SRC ACTIVE	Green	Card is currently on-line
ST3	FAIL	Red	Card failure
	LOCK	Red	PLL lost sync with reference or holdover mode
	REF A	Red	Timing Reference from CI A
	REF B	Red	Timing Reference from CI B
TOC	FAIL	Red	Card failure
	PORT ALM	Red	Output port alarm (one or more)
	ST	Green	Reference present from ST clock
	INPUT	Green	Reference present from CI
	500’	Green	500-foot phase advance
	1000’	Green	1000-foot phase advance

1. Composite Clock (CC) source refers to the protocol used to electrically transfer timing from the Stratum-3 clock to the switch. The Composite Clock source is not relevant to the system.

Error log entries and recommended actions

Table 241: STRAT-3 Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**`test synchronization r 4`**
1 (b)	Any	Stratum-3 Clock Alarm Query (#649)	MIN	OFF	**`test synchronization r 4`**
18 (c)	0	disable sync	WRN	OFF	**`enable sync`**
257 (d)	Any	Stratum-3 Clock Alarm Query (#649)	MIN	OFF	**`test synchronization r 4`**
513 (e)	Any	Stratum-3 Clock Alarm Query (#649	MIN	ON	**`test synchronization r 4`**
769 (f)	Any	Stratum-3 Clock Alarm Query (#649)	MIN	ON	**`test synchronization r 4`**
1025 (g)	Any	Stratum-3 Clock Alarm Query (#649)	MIN MAJ ()	ON	**`test synchronization r 4`**
1281 (h)	Any	Stratum-3 Clock Alarm Query (#649)	MIN MAJ ()	ON	**`test synchronization r 4`**
1537 (i)			MIN MAJ ()	ON	
1793 (j)			MIN MAJ ()	ON	

Notes:

a. **Error Type 0**: Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: this Error Type corresponds to FAIL code 1 of the Stratum-3 Clock Alarm Query (#649)): Either reference A failed or the CI card A failed.

c. **Error Type 18**: Synchronization Maintenance was disabled with **`disable synchronization-switch`**.

   1. Enter **`enable synchronization-switch`** to enable Synchronization Maintenance reference switching and to resolve this alarm.

d. **Error Type 257**: this Error Type corresponds to FAIL code 2 of the Stratum-3 Clock Alarm Query (#649): one power supply failed.

e. **Error Type 513**: this Error Type corresponds to FAIL code 4 of the Stratum-3 Clock Alarm Query (#649): one clock unit failed.

f. **Error Type 769**: this Error Type corresponds to FAIL code 8 of the Stratum-3 Clock Alarm Query (#649): either reference B failed or the CI card B failed.

g. **Error Type 1025**: this Error Type corresponds to FAIL code 16 of the Stratum-3 Clock Alarm Query (#649)): every power supplied failed.

A Minor alarm results if the Stratum-3 clock can still provide timing to the switch; otherwise, a Major alarm will be raised because the Stratum-3 clock is not providing timing and the switch is referencing the local oscillator on the TN780 Tone-Clock circuit pack. If only the active TN780 Tone-Clock circuit pack is faulty, the standby TN780 Tone-Clock circuit pack becomes active and remains synchronized to the Stratum-3 clock. When the system switches to the standby Tone-Clock circuit pack, the alarm is resolved, and a TDM-CLK alarm is raised to indicate a possible problem on the TN780 Tone-Clock circuit pack.

If the alarm is MINOR:

1. Look for a red LED on either or both TOC cards.
2. If there is a red LED, replace the card. If there is no red LED, use the *Stratum-3 Wiring Guide*, and check that the wiring installation is correct.
3. After replacing the card or correctly rewiring the installation, clear the alarm by entering **`disable synchronization-switch`**, followed by **`enable synchronization-switch`**. The latter procedure causes synchronization software to switch back to using the Stratum-3 clock again.
4. Wait 2 minutes and run **`status synchronization`**.
5. If **Maintenance Name** on the status screen shows "STRAT-3," the problem is resolved.

CAUTION:

The **`disable synchronization-switch`** command followed by **`enable synchronization-switch`** may cause slip alarms. The circuit packs that can experience slips and the associated error log entry for slips are listed in Table 242: Timing Slip Error Types.

Table 242: Timing Slip Error Types

Circuit Pack Name	Error Log Name	Error Log Number of Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160

If the alarm is MAJOR:

- Check connections between the Stratum-3 clock and the switch.
- If there are no loose connections, use the *Stratum-3 Wiring Guide* and check that the wiring installation is correct.
- After reconnecting the loose connection or correctly rewiring it, clear the alarm by entering **`disable synchronization-switch`**, followed by **`enable synchronization-switch`**.
- Wait 1 minute, then run **`status synchronization`**.
- If **Maintenance Name** on the status screen shows “STRAT-3,” then the problem is resolved.

If the Standby Tone-Clock circuit pack became active:

- Check the connection between the Stratum-3 clock and the TN780 Tone-Clock circuit pack from which the system has just switched.
- If there are no loose connections, then, replace the circuit pack containing the TN780 Tone-Clock circuit pack.
- Before switching back to the new TN780 Tone-Clock circuit pack, use **`test tone-clock`** ***`location`*** **`long`** to check that the Tone-Clock is receiving a signal from the Stratum-3 clock.
- If every test passes, switch to the new Tone-Clock circuit pack using **`set tone-clock`** ***`location`*** **`override`**.
- If Test #651 fails, then the original TN780 Tone-Clock circuit pack should be reinserted, and the cable between the Stratum-3 clock and the TN780 Tone-Clock circuit pack should be replaced.
- If Test #651 continues to fail, then escalate the problem.
- If slip alarms exist after following the repair procedures for any of the previous cases, clear the slip alarms by running **`test board clear`**. See Table 242: Timing Slip Error Types for a list of circuit packs and associated slip error log entries.
- This error indicates that the Tone-Clock circuit pack in the master port network is not a TN780. If duplicate Tone-Clock circuit packs exist in the master port network, this error may mean that one or both Tone-Clock circuit packs are not TN780s. Verify that the Tone-Clock(s) in the master port network are TN780s.

h. **Error Type 1281**: this Error Type corresponds to FAIL code 32 of the Stratum-3 Clock Alarm Query (#649): every clock unit failed.

i. **Error Type 1537**: An OFF-BOARD alarm on the Stratum-3 clock, indicates a DS1 facility problem; an ON-BOARD alarm indicates a fault in either the Stratum-3 clock or the connection between the Stratum-3 clock and the switch. If the Stratum-3 clock cot be referenced and the local oscillator on the TN780 Tone-Clock circuit pack must serve as the reference, a Major alarm is raised. Otherwise, a Minor alarm is raised.

j. **Error Type 1793**: this error can be caused by one of the following conditions:

- One or both TOCs (Timing Output Cards) has failed.
- The connection between the Stratum-3 clock and the TN780 Tone-Clock circuit pack is faulty.
- The TN780 Tone-Clock circuit pack is defective.

Demand test descriptions and error codes

The **`test synchronization`** command also runs the Synchronization Update Test (#417).

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Stratum-3 Clock Alarm Query (#649)	X	X	Non-Destructive

SVC-SLOT (Service Slot)

MO Name	Alarm Level	Initial Command to Run	Full Name of MO
SVC-SLOT	MIN	none	Service Slot

The Service Slot MO detects the insertion of an invalid circuit pack into a dedicated SERVICE slot. The SERVICE slot is the left-most slot in the J58890BB port carrier, and is identified as slot location “00” in commands and screen fields.

Because this slot does not provide tip and ring connectivity to the wall field, only the following circuit packs are allowed:

- TN744 Call Classifier
- TN750 Integrated Announcement
- TN771 Maintenance/Test
- TN725 Speech Synthesizer
- TN433 Speech Synthesizer
- TN457 Speech Synthesizer
- TN748 Tone Detector
- TN420 Tone Detector

When another circuit pack is inserted in a SERVICE slot, a MINOR alarm is generated against the Service Slot MO. Instead of the illegal circuit pack’s MO name, the “Service Slot” MO name is used to prevent any attempt to assign a port to the illegal pack physically residing in the SERVICE slot.

Error log entries and recommended actions

Table 243: SVC-SLOT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
600 (a)		None	MIN	ON	

Note:

a. Ian invalid circuit pack was inserted in slot 00, the SERVICE slot, of a J58890BB port carrier. See the list of valid circuit packs.

1. To see the invalid circuit pack's TN code, enter **`list configuration board`** ***`location`*** where ***`location`*** specifies the cabinet number, the carrier letter, and the slot number (always 00) of the alarmed circuit pack.
2. To retire the alarm, remove the invalid circuit pack.

SYNC (Port Network Synchronization)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SYNC	MIN	`display errors`	Port Network Synchronization
	WRN	`test synchronization`	

This section discusses synchronization problems local to the switch.

Synchronization maintenance is composed of both hardware and software components, and its purpose is to provide a common reference frequency for reliable digital communications between an servers and other PBXs, central offices (COs), or customer-premises equipment (CPE). Synchronization is implemented using several system components including:

- TN2312 IPSI
- TN722, TN767, and TN464 DS1 Interfaces (all suffixes)
- S8700-series Fiber-PNC: TN768, TN780, or TN2182 Tone-Clock
- S8700-series Fiber-PNC: TN572 Switch Node Clock
- S8700-series Fiber-PNC: TN573 Switch Node Interface
- S8700-series Fiber-PNC: TN570 Expansion Interface

Note:

If both a primary and secondary reference are administered for Stratum-4 synchronization, both references must reside in the same port network (PN).

S8700-series Fiber-PNC

Traditional Sync Operation

For an S8700 Server Fiber-PNC system, synchronization is obtained from the public circuit-switched network through:

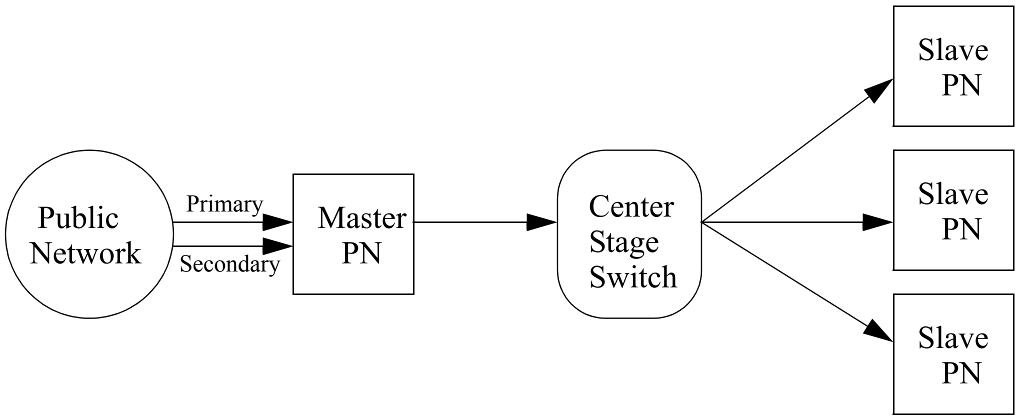
- A DS1 or BRI interface
- The ATM network

For DS1- or BRI-based synchronization, a particular DS1 or PRI interface is configured as the synchronization reference. The IPSI/Tone-Clock board in the same PN locks on to this reference and regenerates clock signals that are placed on the PN's backplane. In turn, the Center Stage Switch (CSS) components transfer this timing to every other PN. These IPSI/ Tone-Clocks then regenerate clock signals for their own PNs at the same rate as the:

- Master PN
- Public network

This creates a hierarchy where the master PN receives timing from the public network, and every other PN derives its timing from the master through the CSS. See Figure 74: Traditional Sync Operation.

Figure 74: Traditional Sync Operation



Typically, a pair of interfaces from the public network are configured — one as a primary and one as a secondary. The IPSI/Tone-Clock in the Master PN can:

- Lock onto either interface
- Switch between them in the event of a failure

In the event of a dual failure, the Tone-Clock in the master PN can generate its own timing and keep every PN synchronized. However, these PNs would not be synchronized with any other public-network interfaces that exist in any of the PNs.

When a center stage is implemented via an ATM network, it is possible to obtain timing from the ATM network. For more information, See ATM-SYNC (ATM Synchronization).

S8700-series IP-PNC

S8700-series IP-PNC Server Sync Operation

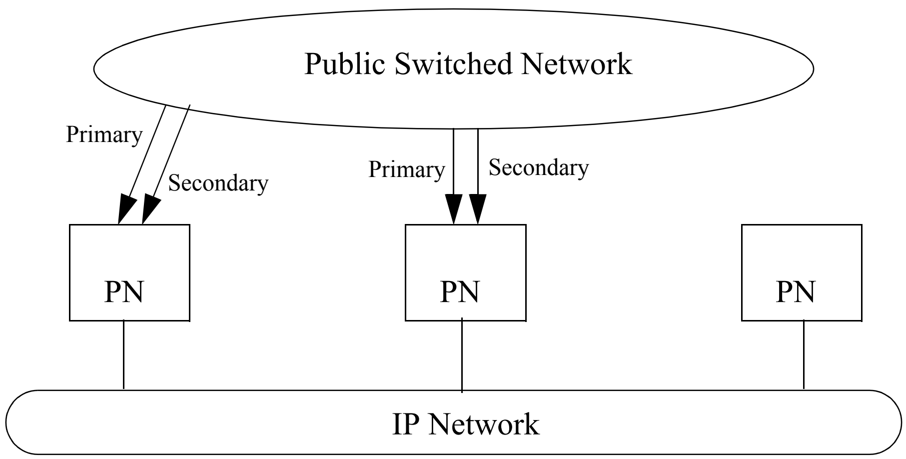
For an S8700 IP-PNC system, its port networks (PNs) are connected via the customer's IP network. This network cot be used to transmit timing information between the PNs. The complete set of PNs need not be synchronized with each other. Inter-PN bearer traffic is carried as VOIP, while the Media Processors' internal jitter buffers deal with differences in transmission rates.

Synchronization is needed for a PN with a public-network digital interface. Each PN with a DS1 or trunk-side BRI interface must be synchronized with an external timing source to prevent slips between that PN and the external circuit-switched network. Each PN needs to operate independently. Each PN:

- Potentially needs its own external synchronization reference
- Is always locked to an external public-network interface or is running locally.

A typical S8700 IP-PNC configuration is shown in Figure 75: S8700 Server IP-PNC Sync Operation.

Figure 75: S8700 Server IP-PNC Sync Operation



This figure also shows the far-right S8700 IP-PNC system's PN without public-network digital interface. A PN without public-network connectivity runs off of its local IPSI circuit pack's Tone-Clock circuit.

Clock Synchronization

Note:

S8700-series Fiber-PNC: Stratum-3 clocking is not available for a PN where the Tone-Clock function is supplied by either a:

- TN2312 IPSI circuit pack's Tone-Clock circuit
- TN2182 Tone-Clock circuit pack

This section discusses synchronization with Stratum-3 and -4 clocking devices.

Stratum-3 Synchronization

Since the clock module on the TN2312 does not support synchronization with an external Stratum-3 clocking device, you may provide Stratum-3 clocking for a S8700 Server system by using the TN780 Tone-Clock circuit pack in a non IPSI connected port network. To bring in the external Stratum-3 clocking signals into the TN780, a processor carrier is needed. This new PN control carrier will replace the processor carrier in the old PPN converted to PN 1. The Stratum-3 clocking must come into Port Network #1 because the S8700 Fiber-PNC software has the Stratum-3 clocking hard-coded to this port network.

Stratum-4 Synchronization

The system can be configured with primary and secondary synchronization references (DS1 or UDS1 Interface circuit packs) when using Stratum-4 synchronization. If this is the master synchronization source for the network, then its local oscillator is used and no DS1s are used as references.

If this system is a slave in the network, a primary reference must be used as the synchronization reference and a secondary reference is optional:

- If the primary synchronization reference is not providing a valid timing signal, the system automatically switches to the secondary synchronization reference.
- If the primary synchronization reference is invalid and secondary reference does not provide a valid timing signal or is not administered as a synchronization reference, an IPSI’s Tone-Clock circuit or a Tone-Clock circuit pack provides the PN’s timing source.
- If the system is using the local oscillator as the timing source (both the primary and secondary references are providing invalid timing signals), should either the primary or secondary reference becomes valid again, the system (PN for S8700 Server systems) switches back to the primary or secondary source.
- When both the primary and secondary source become valid, the system switches to the primary source, since the primary source is always preferred over the secondary source when both sources are equally healthy.

Synchronization Troubleshooting

For Stratum-4 operation, major and minor alarms indicate that there is a problem with the system synchronization references. These alarms will be resolved when the alarmed synchronization reference is restored.

The **change synchronization** command allows primary and secondary references to be administered per cabinet.

Use **status synchronization** to show the current synchronization reference per cabinet. Use **display synchronization** or **list synchronization** to show the primary and/or secondary synchronization references that are administered.

Other commands associated with Synchronization Maintenance are **disable synchronization-switch** and **enable synchronization-switch.** These commands disable the ability of Synchronization Maintenance to switch between synchronization references and to enable this switching ability, respectively. Use **set synchronization** only after synchronization has been disabled, to manually switch to a specific synchronization reference. Use **set synchronization** to help diagnose synchronization problems by forcing a specific reference (DS1, UDS1, or Tone-Clock) to be the system synchronization reference to determine if a specific reference is providing a valid timing signal.

Troubleshooting Approach

Slip errors are the primary symptom associated with being un-synchronized.

A correct Synchronization plan for the network keeps the systems within the network transmitting data at approximately the same rate to avoid situations where:

- One system transmits data at a rate faster than another system can receive the data (in which case data is lost).
- One system transmits data at a rate slower than another system expects to receive data (in which case data is repeated).

Either of these situations, data being lost or repeated, is a slip.

When troubleshooting synchronization problems when slips are the primary error log entry indications of a synchronization problem, requires that the problem be isolated to:

- A problem outside of the switch (That is, the switch is not properly synchronized to the rest of the network.)
- A problem internal to the switch

DS1 and UDS1 circuit packs can be administered with slip detection enabled using the **Slip Detection** field set to **y** on the **add ds1** or **change ds1** administration screens (See *Administering Avaya Aura™ Communication Manager* - 555-233-506). All DS1 and UDS1 circuit packs administered as slip enabled are counted in the following algorithm:

When over half of the DS1 and UDS1 circuit packs administered as slip enabled are experiencing slips, and the primary or secondary synchronization reference is the current synchronization reference, synchronization will try the other administered synchronization reference.

In situations where one or many circuit packs in the system are experiencing slips, the problem could be with the synchronization reference, with individual circuit packs, or with phase modulation of the transmitted digital bit streams due to environmental variations of the transmission facilities (such as temperature variations that affect the electrical length of a transmission line). The circuit packs that can experience slips and the associated error log entry for slips are as follows in Table 244:

Table 244: Error Log Entries for Slip Errors

Circuit Pack	Error Log Name	Error Log Number of Slips
DS1 Interface	DS1-BD	3073 – 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
circuit pack	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 – 3160

When slips occur on any of these circuit packs, first consult the individual circuit pack's section in this manual. If slips occur in small amounts, they may be due to environmental conditions as previously described. If no service degradation is occurring, no action is necessary. When the system switches synchronization sources, slips can be expected from DS1-BD, UDS1-BD, and EXP-INTF circuit packs. If service degradation occurs, after following the repair steps in the individual section, use the following trouble shooting techniques.

Table 245 lists circuit packs that can report slips and related circuit packs whose hardware problems that cause those slips.

Table 245: Slips and Related Circuit Packs

Circuit Pack Reporting Slips	Associated Circuit Packs that Can Cause Slips
DS1 Interface	Active Tone-Clock in same PN
Expansion Interface	Active Tone-Clock in same PN or circuit pack at opposite end of fiber or metallic connection
Switch Node Interface	Circuit pack at opposite end of fiber or metallic connection, or active Switch Node Clock circuit pack in same switch node carrier
IPSI's Tone-Clock or Tone-Clock circuit pack	Current DS1 reference
UDS1 Interface	Active Tone-Clock in same PN

Troubleshooting Synchronization Problems

The following flow chart presents a logical approach to troubleshooting synchronization problems in conjunction with the previous background information. Explanatory notes follow the charts.

Figure 76: Synchronization Troubleshooting, Fig. 1 of 5

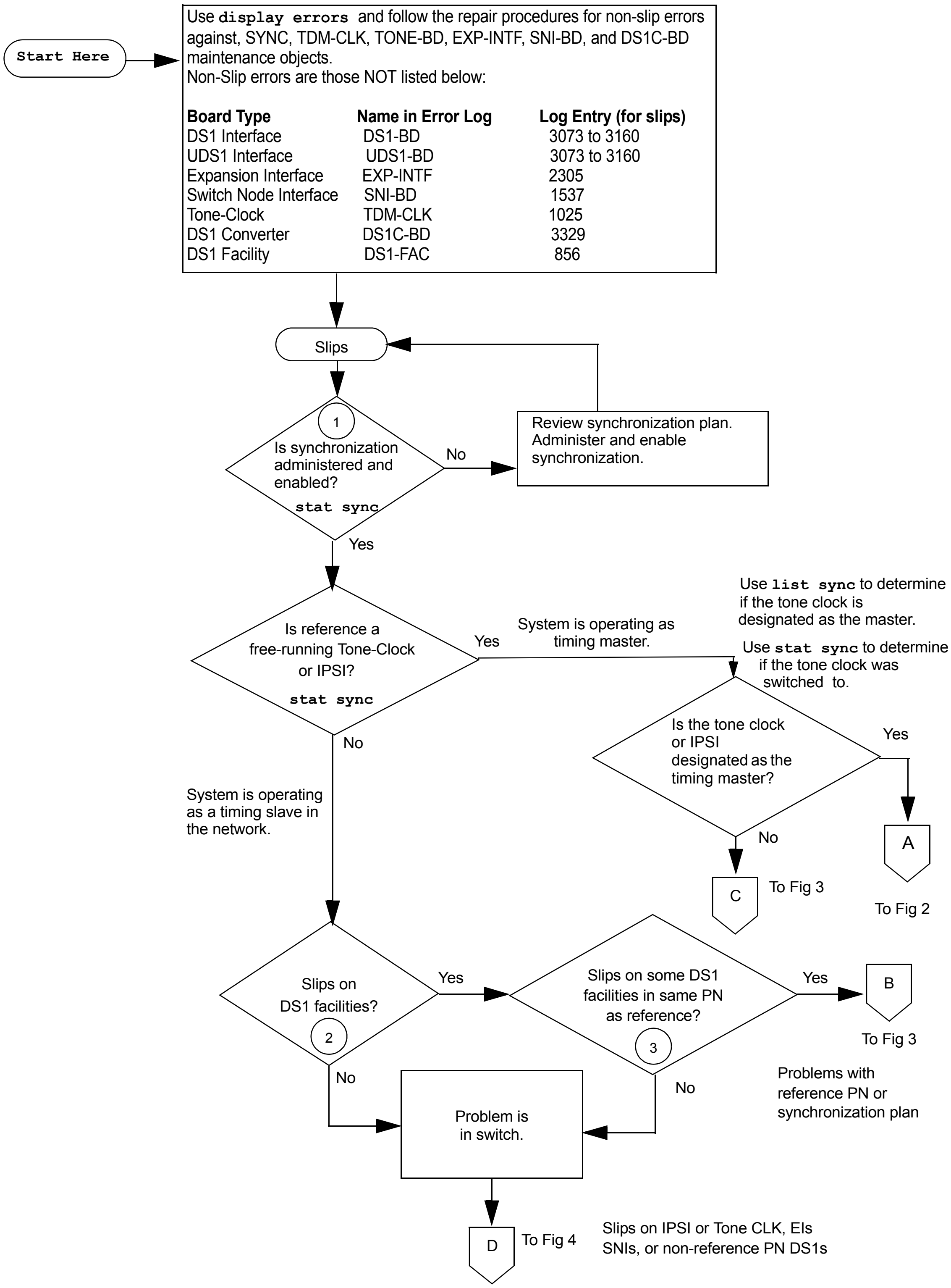


Figure 77: Synchronization Troubleshooting, Fig. 2 of 5

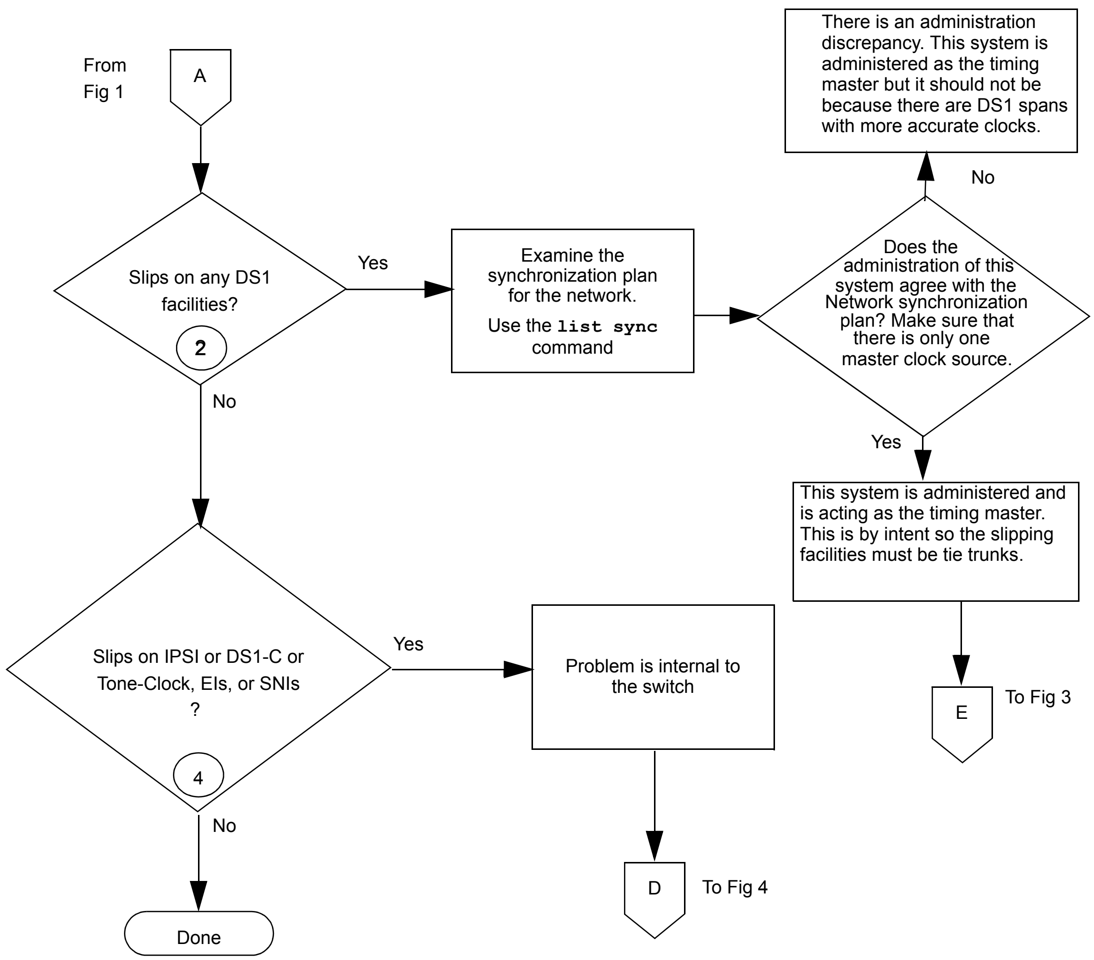


Figure 78: Synchronization Troubleshooting, Fig. 3 of 5

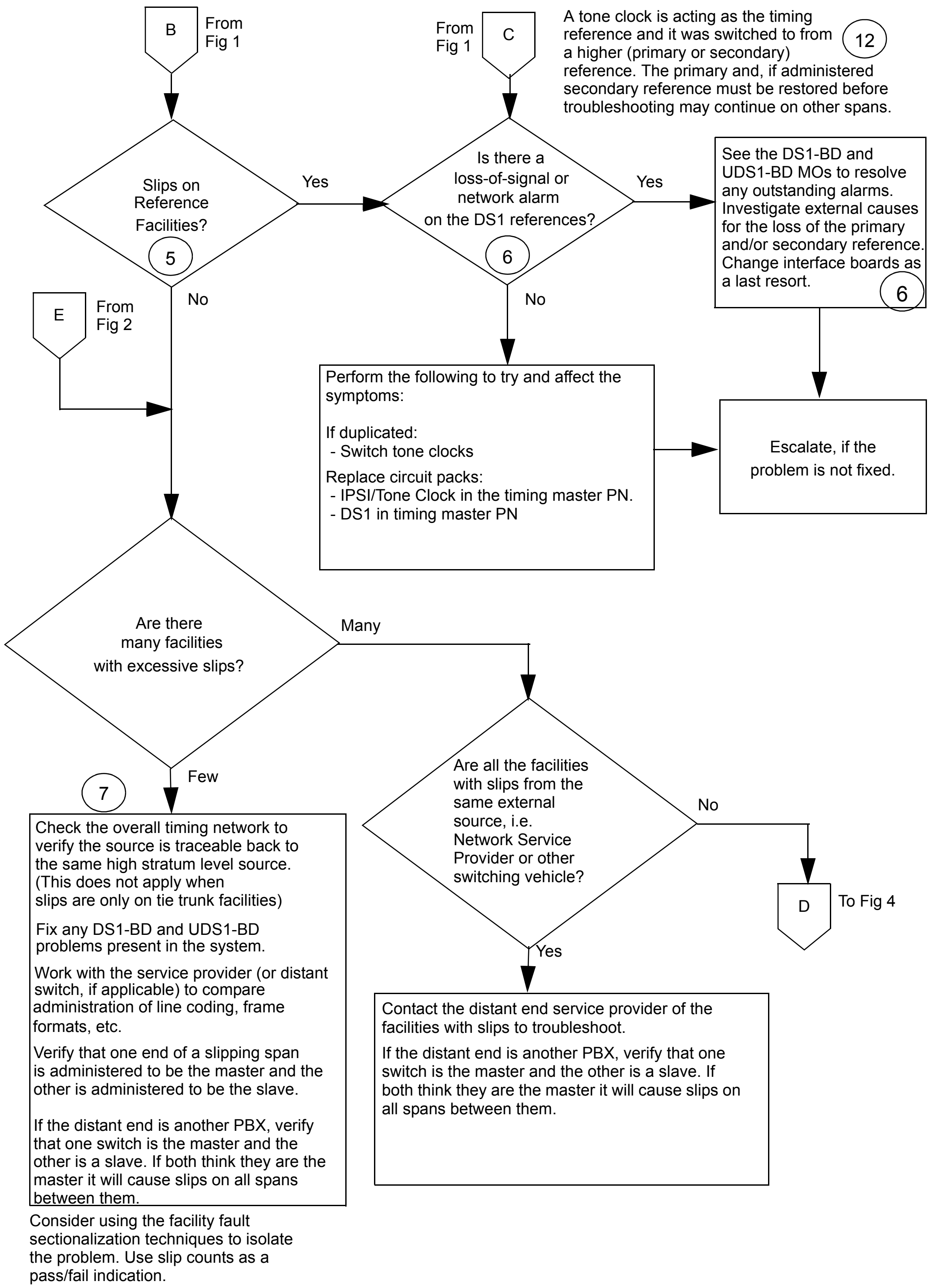


Figure 79: Synchronization Troubleshooting, Fig. 4 of 5

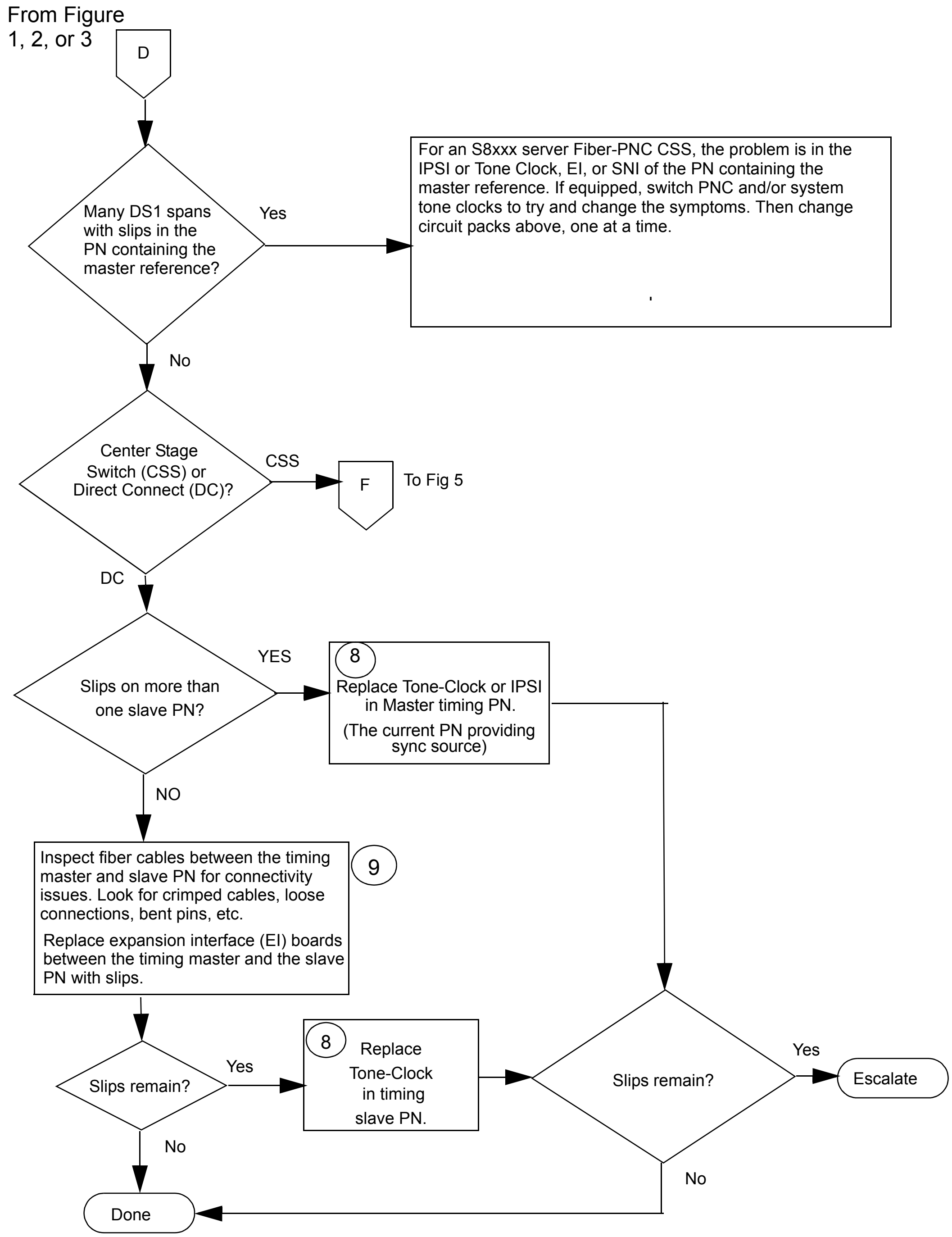


Figure 80: Synchronization Troubleshooting, Fig 5 of 5

The synchronization issue covers a large portion of the system. The problem is in a center stage switch (CSS), IPSI or Tone-Clock, EI, SNI, or DS1 spans in port networks (PN) other than the timing master PN.
This procedure attempts to isolate the problem.
When instructed to do so, perform the steps indicated while slips remain.

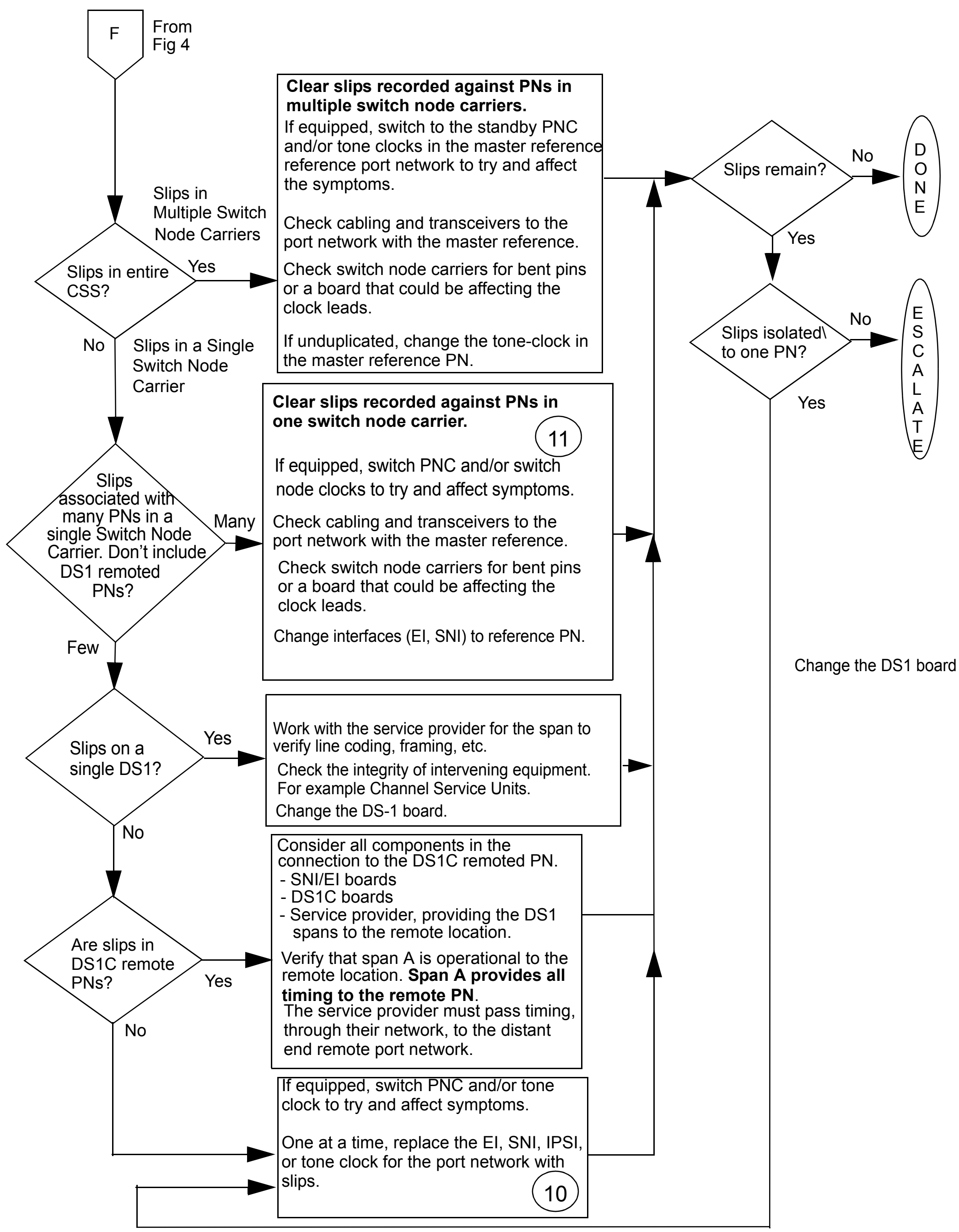


Figure 81: Synchronization Troubleshooting, Fig. 1 of 4

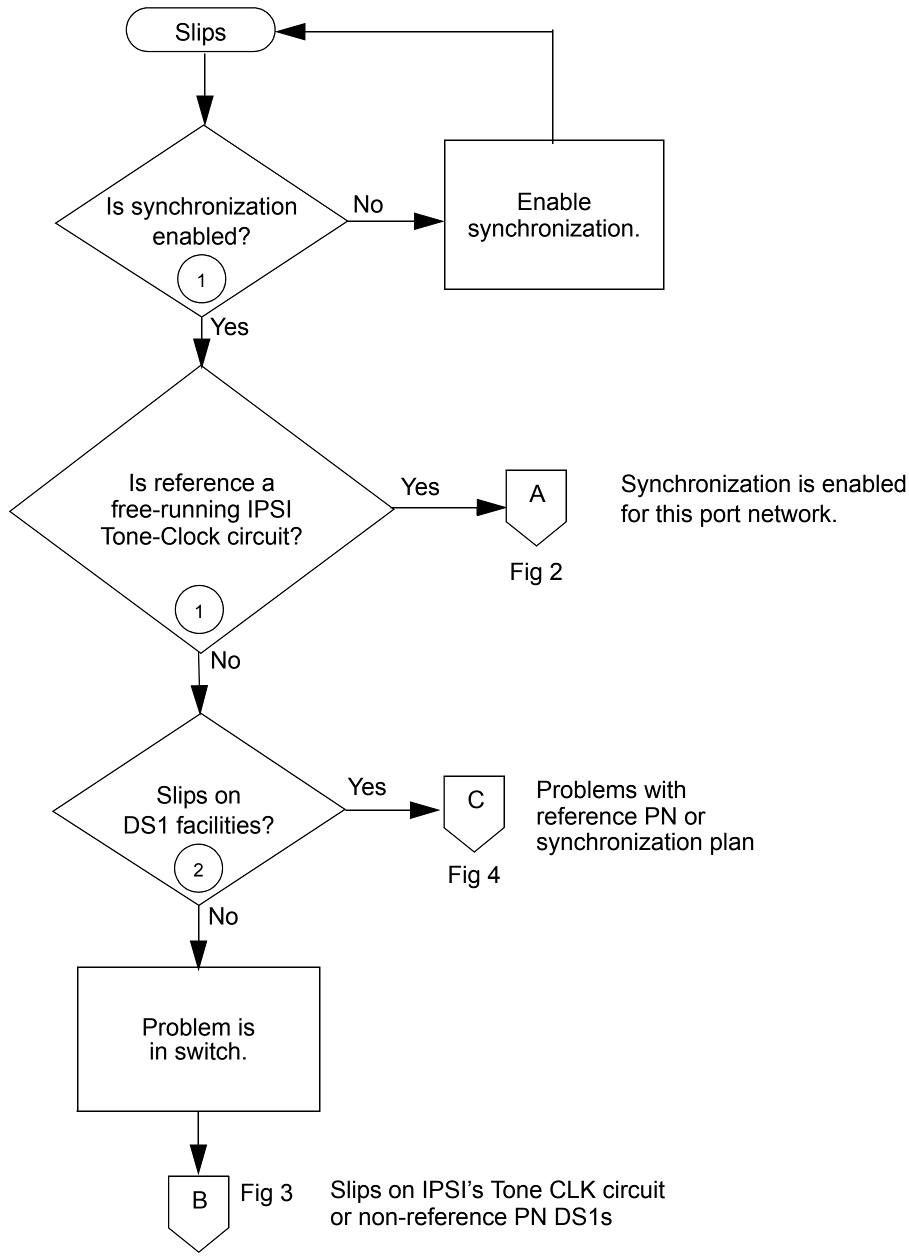


Figure 82: Synchronization Troubleshooting, Fig. 2 of 4

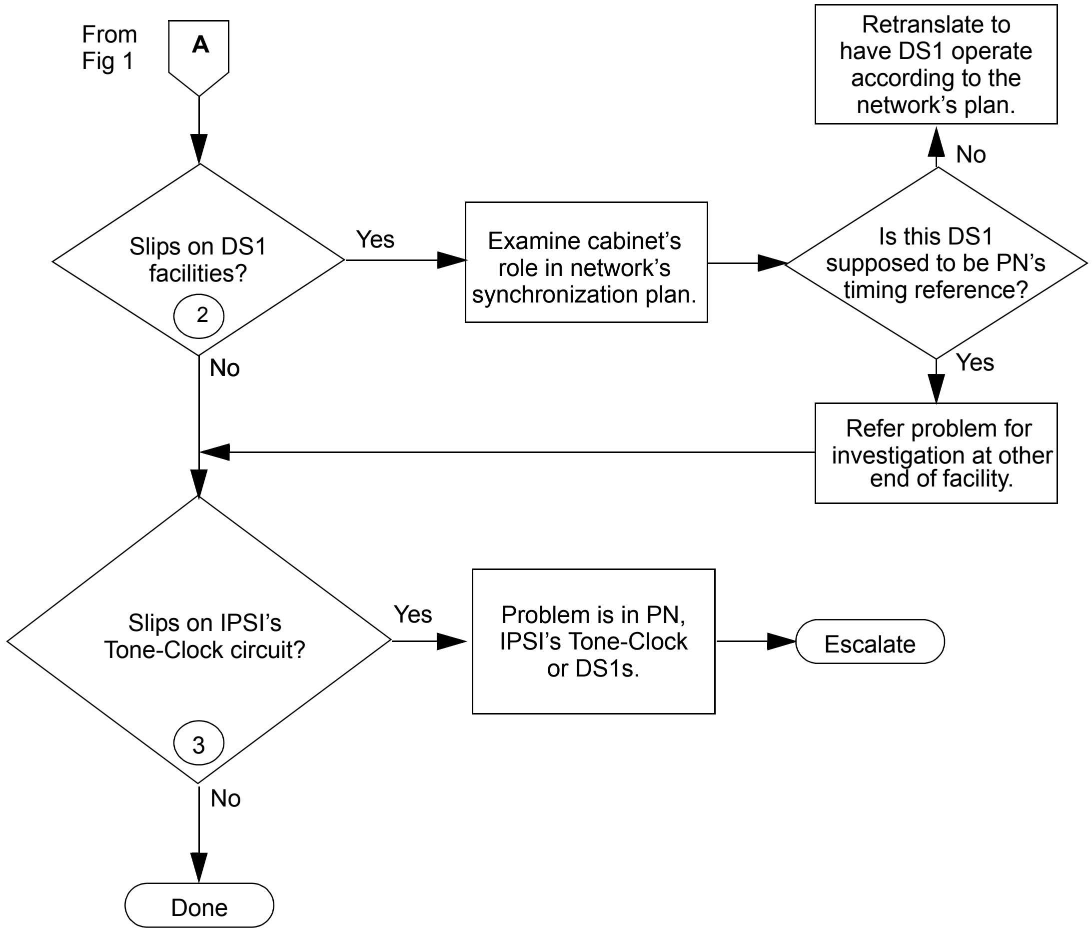


Figure 83: Synchronization Troubleshooting, Fig. 3 of 4

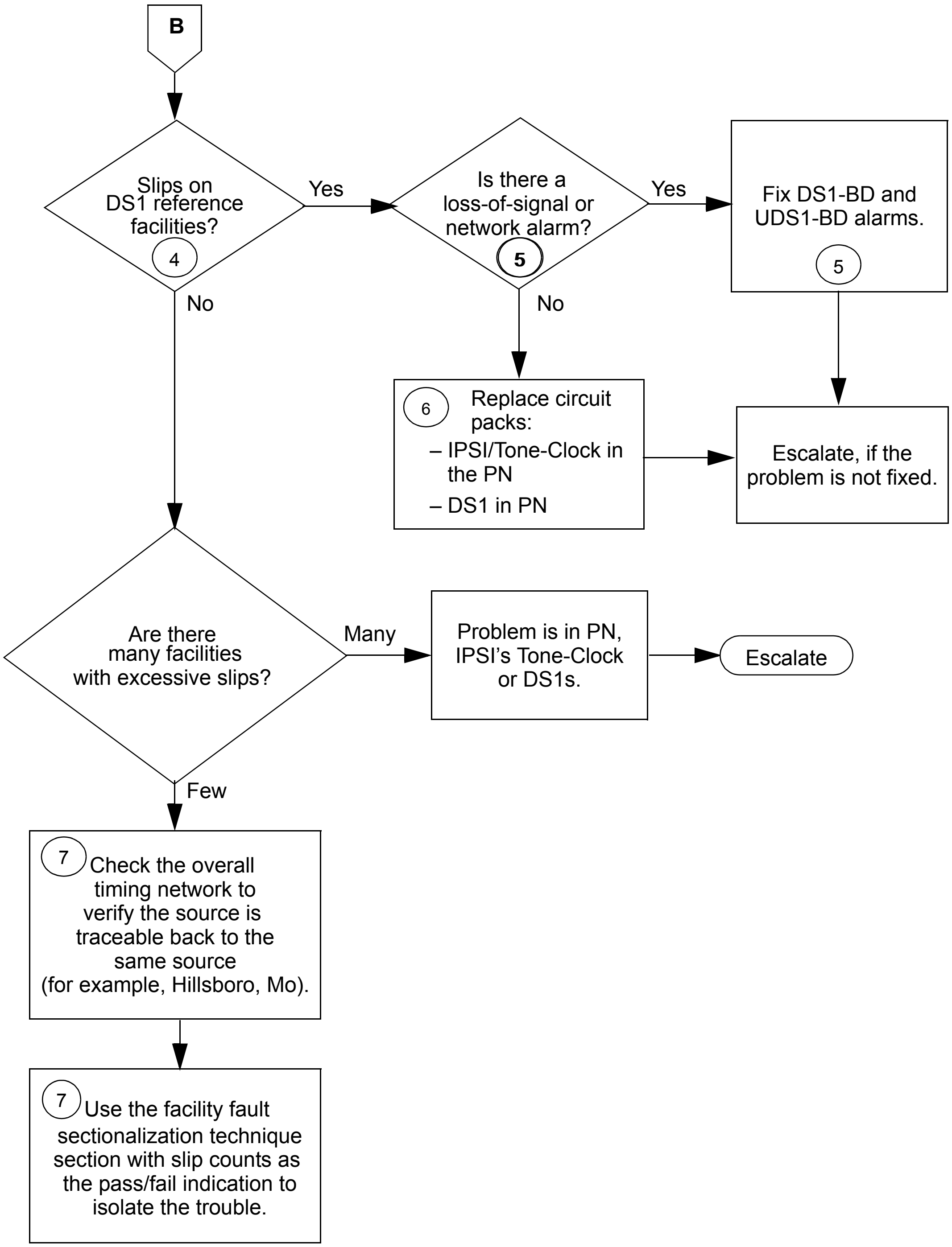
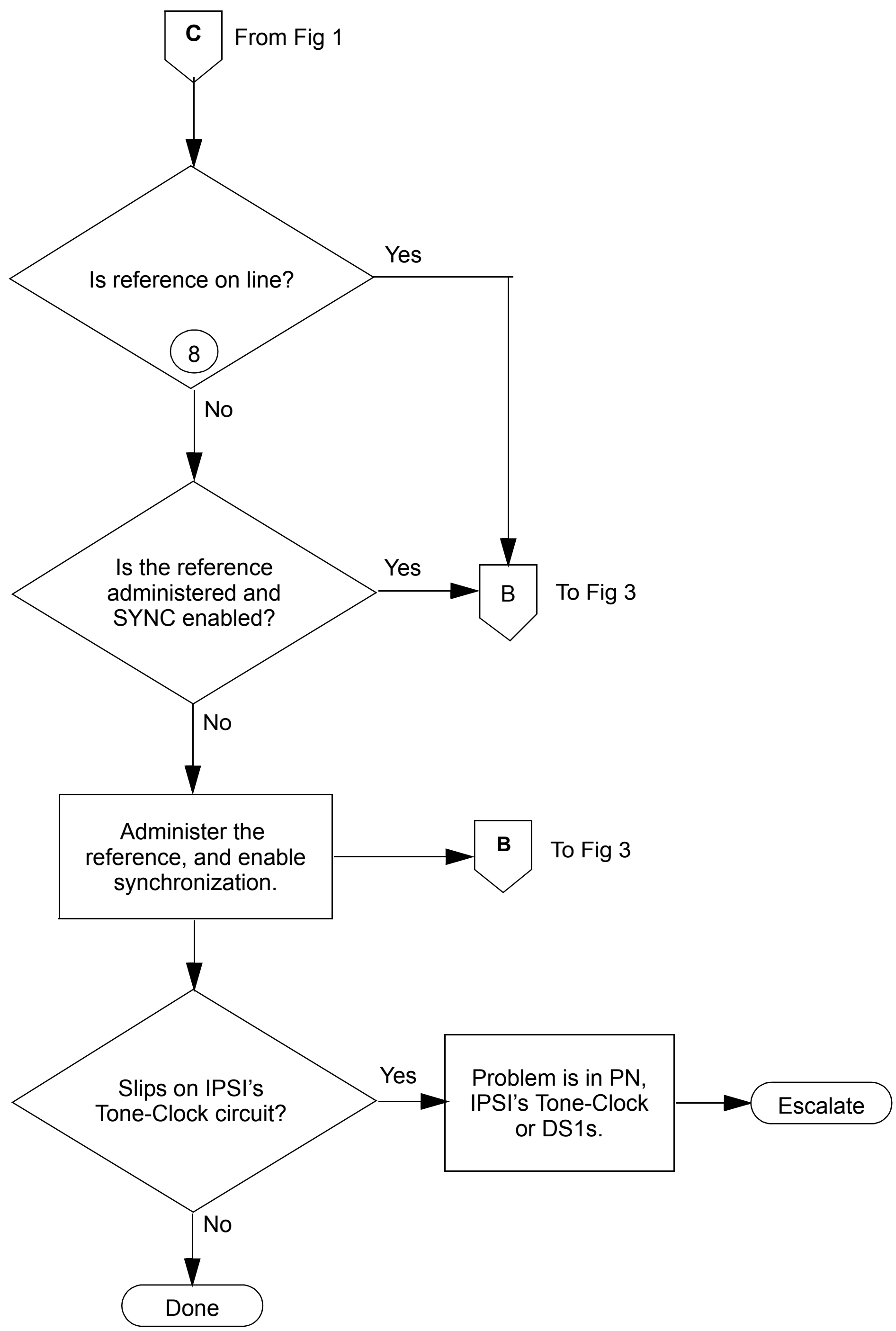


Figure 84: Synchronization Troubleshooting, Fig. 4 of 4



Notes for Sheet 1 through Sheet 5 flowcharts. (When checking for slip errors, use the previous Table 244: Error Log Entries for Slip Errors.

1. Use **status synchronization** to see if synchronization is enabled, and to determine the on-line reference. If the on-line reference is a Tone-Clock board, the switch is operating in free run mode.

   If Stratum 3 is displayed, and no DS1s are connected to the Stratum-3 clock or no DS1 connection existed to the Stratum-3 clock for over 24 hours, then the Stratum-3 clock is in free run mode.

2. Check for slip errors against DS1-BD and UDS1-BD. In the error log (**display errors**) look for the following Error Types to identify slips against these board types.

Board Type	Error log name	Log Entry (for slips)
DS1 Interface	DS1-BD	3073 - 3160
UDS1 Interface	UDS1-BD	3073 - 3160

   For slips on either of these board types, first refer to the individual board's section in this manual. Follow the test and repair steps in those sections.

3. If Stratum 3 is administered (**display synchronization**) and on-line (**status synchronization**), check for DS1-BD or UDS1-BD slip errors for the DS1(s) or UDS1(s) used as input to the Stratum-3 clock. Check the LED indications on the Stratum-3 clock to determine which DS1 is providing input to Stratum 3, and examine the cross-connect information for that DS1.

4. Check for slips errors against EXP-INTF, SNI-BD, and TDM-CLK. In the error (**display errors**) log, look for the following Error Types to identify slips against these board types.

Board Type	Error log name	Log Entry (for slips)
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
Tone Clock	TDM-CLK	1025
DS1 Converter	DS1C-BD	3329

5. Check **status synchronization** for the current DS1 reference. If a DS1 or UDS1 is the on-line reference, check for slips on that DS1 or UDS1.

6. Check for LOS, Blue, Yellow, and Red alarms on the on-line reference facility, and fix those problems first. Check for slips, misframes, minor and major error rates and fix those problems next. See the DS1-BD and/or UDS1-BD for the error log entries associated with the previously mentioned alarms. Replace the circuit packs one at a time and wait at least 1 hour to determine if the problem went away. This procedure is disruptive and should be done after hours if possible.

   If problems persist it may be useful to compare translations for line coding and frame formats with the far end service provider. Make sure the translations match.

   If high or critical reliability switch the Port Network Connectivity (PNC) to try and help isolate the problem.

   Instead of replacing the Tone-Clock circuit pack in systems where Tone-Clocks are duplicated, run **`set tone-clock`** to interchange Tone-Clocks. If the problem goes away, replace the previously active Tone-Clock.

7. If a few facilities experience slips or are unusable references, the clock source for facilities with slips or that are unusable is not traceable to the same ultimate source as the clock source for the on-line reference facility.

   Examine the overall timing network for the interconnected DS1 to determine if the:

   - Clock can be traced back to a single source.
   - Reference designations for each location in the distribution of timing is supplied in accordance with a *synchronization plan*.

   Examine the capability of the external transmission equipment to pass or provide timing.

   Verify the integrity of the on-site hardware by using Facility Fault Sectionalization. This:

   - Loops the transmit signal to the receive signal.
   - Verifies that the excessive slips or the unusable reference are no longer observed.

   This is a time-consuming process that disrupts service. Perform it after hours if the service provided by the system is acceptable as determined by the customer.

8. For a high- or critical-reliability (duplex) system, use **`set tone-clock`** to interchange IPSI circuit packs' Tone-Clock circuits or Tone Clock circuit packs, as applicable. If slips go away, replace the previously active Tone-Clock or IPSI circuit pack.

   For a standard reliability (simplex) system, change the tone clock.

9. Use **`list fiber-links`** to determine the EIs on the active PN and the EIs associated with the slave PN. If the switch does not have duplication, the EIs are all on the active PN.

10. Replace the circuit packs one at a time, and wait at least 1 hour to determine if the problem has gone away. This procedure is disruptive and should be done after hours if possible.

    Instead of replacing the EI and SNI in systems where the PNC is duplicated, perform a PNC interchange using **`reset pnc interchange`**. If the problem goes away, replace either the EI or the SNI on the previously active PNC. Replace one at a time and make the PNC active again to see if the problem is fixed.

    Instead of replacing the Tone-Clock circuit pack in systems where the Tone-Clocks are duplicated, run **`set tone-clock`** to interchange Tone-Clocks. If the problem goes away, replace the previously active Tone-Clock.

    Also, before replacing a Switch Node Clock circuit pack, use **`set switch-node-clock`** if SNCs are duplicated in the carrier. If the problem goes away, replace the previously active SNC.

11. Use the following steps to disable and enable synchronization to the same source. This may, in some instances, reset where a port network gets its timing.

    a. Use the **`status synchronization`** command to determine where synchronization is currently being obtained.

    b. Use the **`disable synchronization`** command to temporarily disable the current synchronization source.

    c. Use the **`set synchronization`** command to set synchronization source to where it was before it was disabled. See step a above.

    d. Use the **`enable synchronization`** command to enable synchronization.

    Verify whether or not slips continue.

12. Onsite personnel can determine whether an IPSI or Tone Clock is providing timing by observing the amber LED on the faceplate.

    – If the LED is on 75 percent of the time and off 25 percent of the time, the IPSI or Tone Clock is externally synchronized to a master clock source.

    – If the LED is off 75 percent of the time and on 25 percent of the time, the IPSI or Tone Clock is providing timing.

Facility Fault Sectionalization

DS1 facility fault sectionalization involves looping around the DS1 signal at on-site access points to localize the source of the problem to equipment and wiring on either the near side or far side of the looparound point.

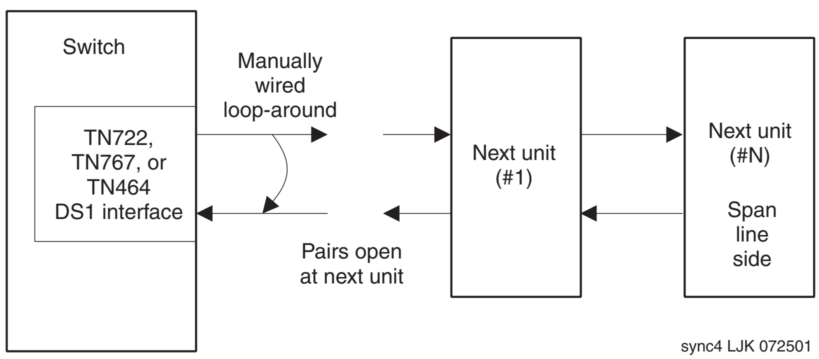
The facility fault sectionalization technique disrupts service. When you perform the looparound on a facility, make sure it is not the on-line synchronization reference or a system outage will occur.

When you use this technique to investigate problems on facilities with multiplex or DACS equipment, the technique becomes cumbersome because every 64-kbps (B-Channel) or subrate channel corresponding to the DS1 facility needs to be looped around.

Figure 85: Manual Looparound for Facility Fault Sectionalization shows a sequence of units (1 though n) that may be connected as the on-site equipment. A typical example is the case where the only on-site equipment is channel-terminating equipment designated Unit #1. A more complex, less typical example might have a DACS as Unit #1, a protection switch as Unit #2, and a DS1-level microwave radio system as Unit #3.

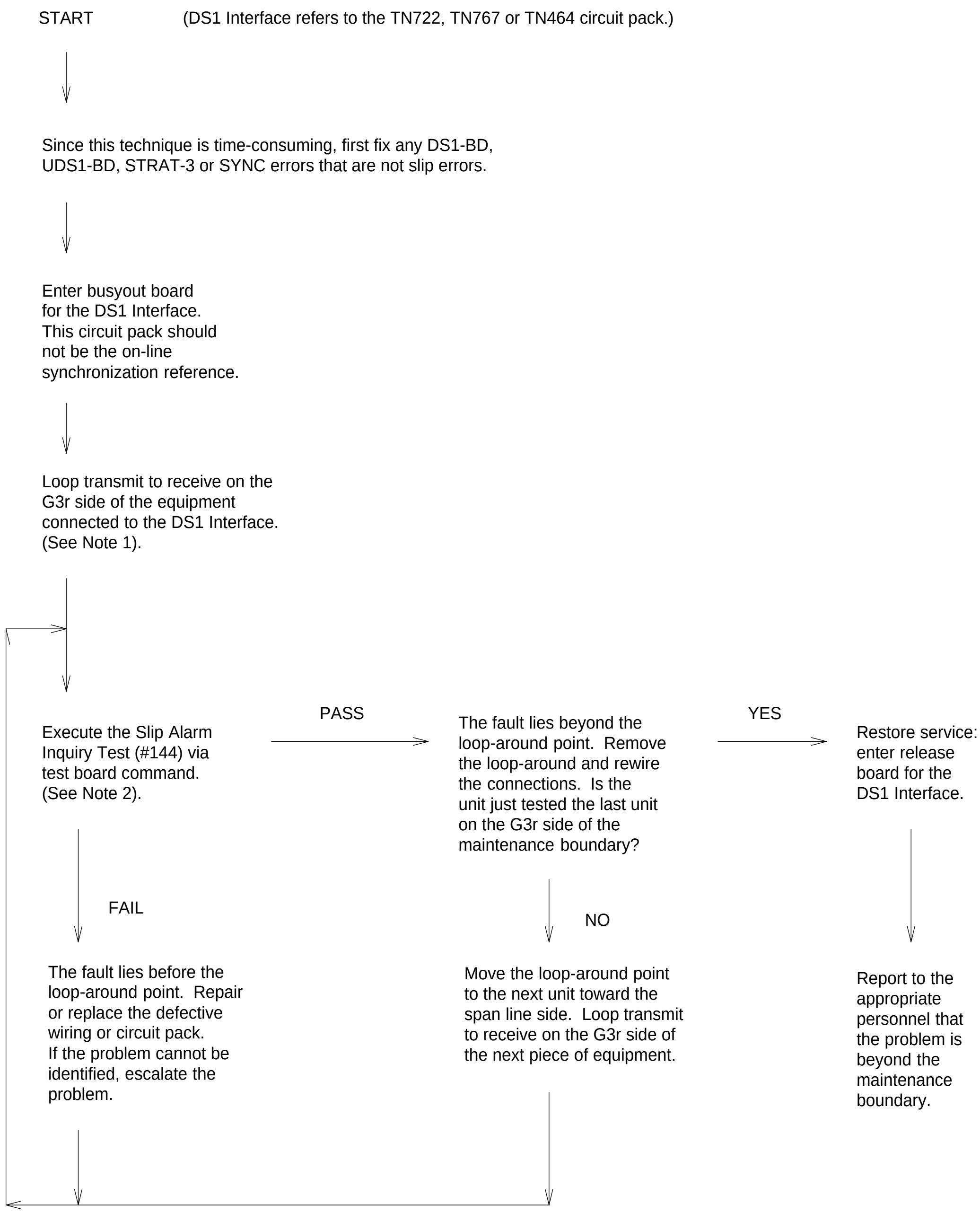
The flowchart in Figure 86: Facility Fault Sectionalization gives an overview of the facility fault sectionalization technique. It is important that you know the configuration and wiring of the equipment for the problem facility in order to support this technique.

Figure 85: Manual Looparound for Facility Fault Sectionalization



Since the technique is time consuming, fix any DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), STRAT-3 (Stratum-3 Clock), or SYNC (Port Network Synchronization) errors first that are not slip errors.

Figure 86: Facility Fault Sectionalization



Notes to Facility Fault Sectionalization Flowchart

1. Loop transmit to receive on the system side.

   Remove the transmit signal from the TN722, TN767, or TN464 circuit pack inputs and outputs and loop it around to the receive signal going toward the TN722, TN767, or TN464 circuit pack at the first unit wired to the TN722, TN767, or TN464 circuit pack.

   The looparound signal may take different forms depending on the installation.

   - In some cases, the unit connected to the system may provide a switch or a terminal interface to control the desired looparound. Make sure that the signal is looped toward the system and that the timing signal is looped.
   - In most cases, it may be necessary to temporarily rewire connections at the cross-connect fields to loop the signal back toward the switch.

   The point at which the signal is looped should be one at which physical access is easy and where the signal level is within the line compensation (i.e. equalization) range of the hardware connected. A few cases exist where access to the looparound cot be easily provided at locations where the signal level is within the line compensation range of the hardware. Use **`change ds1`** ***`location`*** to change the line compensation.

2. Execute **`test board`** ***`location`*** for the TN722, TN767 or TN464. Look at results of Test #144, the Slip Alarm Inquiry test. When this test fails, the error code gives the number of slips detected since the last Slip Inquiry test was run. If the test fails, run it at least one more time to ensure that slips have occurred since the looparound was installed.

Timing Loops

A timing loop exists when a system receives timing from another system whose timing reference is directly or indirectly derived from itself. The system synchronization pler *must avoid creating a timing loop* when administering the synchronization references in a system. Timing loops can lead to loss of digital data between systems that are exchanging data with any system within the loop. An invalid timing signal will also be generated by any system within the loop, thus propagating the invalid timing signal to any system(s) using a system within the loop as a synchronization reference.

A correctly designed network has no loops, and each piece of equipment in the network is supplied by a clock with an equal or lower stratum number. (For example, the inputs to a Stratum-3 clock should never be from a Stratum-4 device.)

CAUTION:

Synchronization administration changes should never be done without consulting the network's overall synchronization plan. If you suspect that synchronization administration changes are needed, follow normal escalation procedures.

Synchronization Switches away from Current Timing Reference

Synchronization changes away from a DS1 reference (primary or secondary) if the current DS1 reference does not provide a valid timing signal. The other DS1 reference is used if one is administered and providing a valid timing signal. Otherwise, the local oscillator of the Tone-Clock circuit pack in the same port network as the DS1 reference is used. The following conditions cause a synchronization switch:

- The current DS1 reference is not inserted (**`list configuration board`** ***`location`*** shows **no board**).
- The current DS1 reference has a loss of signal error (DS1-BD and UDS1-BD Error Type 1281), a blue alarm error (DS1-BD and UDS1-BD Error Type 1793), a red alarm error (DS1-BD and UDS1-BD Error Type 2049), or a hyperactive Angel error (DS1-BD and UDS1-BD Error Type 1538). A corresponding alarm log entry is not required.
- DS1 and UDS1 circuit packs can be administered with slip detection enabled (the **Slip Detection** field is **y**) on the **`add ds1`** or **`change ds1`** administration screens (See *Administering Avaya Aura™ Communication Manager* - 555-233-506). When over half of the DS1 and UDS1 circuit packs administered as slip enabled experience slips, and the primary or secondary synchronization reference is the current synchronization reference, synchronization tries the other administered synchronization reference if the other administered reference does not have the previous two conditions. Use **`list measurements ds1-log`** to get an historical perspective of DS1 facility operation.

The following conditions cause a change to the other DS1 reference if one exists and the other DS1 reference is more healthy:

- The current DS1 reference has a misframe error (DS1-BD Error Type 3329 to 3345 or UDS1-BD Error Type 3585-3601). A corresponding alarm log entry is not required.
- The current DS1 reference has a slip alarm (DS1-BD and UDS1-BD Error Type 3073 to 3160). A corresponding alarm log entry is required.

If the previous conditions are repaired, synchronization changes back to the primary reference.

LEDs on Tone-Clock Circuit Packs

The specific flashing pattern of a TN768, TN780, or TN2182 Tone-Clock circuit pack's amber and green LEDs indicates the circuit pack's status. For example, these flashing LED patterns indicate whether the Tone-Clock circuit pack is:

- Deriving timing from an external source
- Providing the timing signal for its PN

The amber and green LED patterns for TN768, TN780, and TN2182 Tone-Clock circuit packs are listed in Table 246:

Table 246: Tone-Clock Amber/Green LED Flashing Codes

Circuit Pack Condition	Tone-Clock State	Explanation
Flashing amber[1] 2.7 seconds on 0.3 seconds off	Active	An external timing source is being used as a synchronization reference.
Flashing amber 0.3 seconds on 2.7 seconds off	Active	The circuit pack is being used as a synchronization reference.
Steady amber on	Active	The circuit pack has been reset, but has not been told which synchronization reference source to use.
Steady amber off	Standby	The circuit pack is in standby mode (neither generating tones nor supplying clocks).
“Jingle Bells” green and amber 0.1 seconds on, 0.2 seconds off, 0.1 seconds on, 0.4 seconds off, 0.4 seconds on, 0.4 seconds off	Standby	The system is running maintenance tests on the standby Tone-Clock circuit pack. (The standby circuit pack is providing tones.)
Other green and amber	Active	The system is running maintenance tests on the active Tone-Clock circuit pack.

1. The external synchronization reference being used is a primary reference, or a secondary reference, or an external Stratum-3 clock when the Tone-Clock is in the master PN. The external synchronization reference used in a slave PN is an Expansion Interface circuit pack.

Error log entries and recommended actions

S8700 | S8710 | S8720 | S8500

Table 247: SYNC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test synchronization`
1 (b)(i)			WRN MIN (g)	OFF	
18 (c)	0	`disable sync`	WRN	OFF	`enable sync`
257 (d)(i)			WRN MIN (i)(g)	OFF	
513 (e)(i)			WRN MAJ (i)(g)	OFF	
769 (f)			MAJ	OFF	
1793 (g)[1]	0–50		MAJ	OFF	
2049 (h)	0		WRN	OFF	

1. It can take up to 1 hour for these alarms to clear.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

b. **Error Type 1**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

   This error indicates a problem with the primary DS1 reference. It is cleared when the primary reference is restored. To find the problem's source:

   1. Enter **`list configuration board`** ***`location`*** to check if the primary DS1 Interface circuit pack is inserted in the carrier.
   2. Verify that the administered primary reference matches the DS1 reference from the network synchronization plan.

3. Enter **test board *location* long** to test the primary DS1 Interface circuit pack.

   Check the Error Log for DS1-BD or UDS1-BD errors and see DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) to resolve errors associated with the primary DS1 (DS1 or UDS1) interface circuit pack.

   If the only errors against DS1-BD or UDS1-BD are slip errors, follow the procedures described in the previous troubleshooting section. If no errors are listed in the Error Log for the primary DS1 Interface circuit pack, continue with the following steps.

4. Enter **test tone-clock *location* long** to test the active Tone-Clock circuit pack in the master port network.

   Check the Error Log for TDM-CLK errors, and verify that TDM Bus Clock Circuit Status Inquiry Test (#148) passes.

   If Test #148 fails with Error Code 2–32, see TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following.

5. Use **disable synchronization-switch** and **enable synchronization-switch**. When these two commands are used together, they change the system synchronization reference to the primary DS1 Interface circuit pack.

6. Check the Error Log and use **status synchronization** to verify that the primary DS1 Interface circuit pack is still the system synchronization reference.

   If the primary DS1 Interface circuit pack is not the system synchronization reference, *and* the master port network does not have duplicate Tone-Clock circuit packs, escalate the problem.

   Otherwise, continue with the following.

7. For *duplicated* Tone-Clock circuit packs in the master port network:

   Enter **set tone-clock *location*** to interchange Tone-Clocks in the master port network, and repeat the disable/enable commands described in the previous step.

c. This error indicates that Synchronization Maintenance was disabled using **disable synchronization-switch**. Use **enable synchronization-switch** to enable Synchronization Maintenance reference switching and to resolve this alarm.

d. This error indicates a problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (b) to resolve this error substituting *secondary* for *primary* in the preceding resolution steps.

e. This error indicates that the Tone-Clock circuit pack is providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

f. **S8700-series Fiber-PNC**: This error indicates that the external Stratum-3 clock failed to provide the system's timing reference. Refer to Stratum-3 clock's Maintenance document to resolve the defective synchronization reference.

g. This error indicates excessive switching of system synchronization references has occurred. When this error occurs, synchronization is disabled and the Tone-Clock circuit pack (in the master port network) becomes the synchronization reference for the system. Execute the following steps to resolve this error:

1. Check for timing loops, and resolve any loops that exist.
2. Test the active Tone-Clock circuit pack in the master port network using **test tone-clock *location* long**.

   Check the Error Log for TDM-CLK errors, and verify that TDM bus Clock Circuit Status Inquiry test (#148) passes.

   If Test #148 fails with Error Code 2–32, see TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following.
3. For duplicated Tone-Clock circuit packs in the master port network, enter **set tone-clock *location*** to switch the Tone-Clocks.

   For unduplicated Tone-Clock circuit packs in the master port network of a Stratum-4 (not Stratum-3) system, replace the primary and secondary (if assigned) DS1 Interface circuit packs.
4. Investigate any other SYNC or STRAT-3 errors.

S8700-series Fiber-PNC

h. This error indicates that the Expansion Interface circuit packs are experiencing timing slips. This error increases the bit error rates for data transmission between port networks. The Expansion Interface circuit packs with timing slips have EXP-INTF error 2305.

1. Check the LEDs on the active Tone-Clock circuit packs in the system and verify that the system is properly synchronized.
2. Verify that all the TDM/LAN Bus cables on the backplane are marked WP-91716. Also for a Multi-Carrier Cabinet (MCC), check that the bus terminator type is a ZAHF4 TDM/LAN.

   For a Single Carrier Cabinet verify that the bus terminator type is a AHF110 TDM/LAN.
3. Check for timing loops, and resolve any loops that exist.
4. Check the Error Log for any active as well as resolved Expansion Interface circuit pack errors and see EXP-INTF (Expansion Interface Circuit Pack) to resolve any errors found.
5. Duplicated Tone-Clock circuit packs in the slave port networks:
   - Interchange Tone-Clock circuit packs in the slave port networks where EXP-INTF error 2305 also occurs using **set tone-clock *location***. The error count for this error should start to decrement once the problem is solved. If the count does not decrease in 15 minutes, the problem still exists.

- If the problem still exists, switch the Tone-Clock in the slave port network back to the previous configuration, then perform a PNC interchange using **`reset pnc interchange`**.
- If the problem still exists, switch the PNC back to the previous configuration using **`reset pnc interchange`**. Switch the Tone-Clock circuit packs in the master port network using **`set tone-clock`** ***`location`***.
- If the problem still exists, switch the Tone-Clock circuit packs in the master port network back to the previous configuration using **`set tone-clock`** ***`location`***.
- Replace the active Expansion Interface circuit pack in the master port network.
- In a CSS configuration, replace the Switch Node Interface circuit pack connected to the active Expansion Interface circuit pack in the master port network. Use **`list fiber-link`** to determine the Switch Node Interface circuit pack that is connected to the active Expansion Interface circuit pack in the master port network.
- If the system's synchronization reference is a Tone-Clock circuit pack or a Stratum-3 clock, follow normal escalation procedures.

  If the system's primary synchronization reference is a DS1 Interface circuit pack, assign a different DS1 Interface as the primary reference. If the problem persists and slip errors remain, follow the procedures in the troubleshooting section above.

6. For *unduplicated* Tone-Clock circuit packs in a slave port network:

- Enter **`set tone-clock`** ***`location`*** to switch the Tone-Clock in the master port network.
- If the problem still exists, enter **`set tone-clock`** ***`location`*** to switch the Tone-Clocks in the master port network back to their previous configuration.

  Enter **`test tone-clock`** ***`location`*** **`long`** to test the Tone-Clock in the master and slave port networks.

  Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Circuit Status Inquiry test (#148) passes.

  If Test #148 fails with an Error Code 2–32, see TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following steps.
- If the master and slave Tone-Clock circuit packs do not fail TDM Bus Clock Test #150 (TDM Bus Clock PPM Inquiry test), replace the Expansion Interface circuit packs that have EXP-INTF error 2305.
- If the system synchronization reference is a Tone-Clock circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, follow the steps listed in "TDM-CLK" to replace the master Tone-Clock circuit pack.

- If the system's synchronization reference is a DS1 Interface circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock test (#150), the primary or secondary (if administered) synchronization references are not providing valid timing signals for the system.

  If the *primary* synchronization reference is providing the system's timing, check the synchronization references administered, and follow the steps outlined in note (b). If the *secondary* reference is providing timing, follow note (d).
- If the slave Tone-Clock circuit pack fails TDM Bus Clock Test #150 but the master Tone-Clock *does not* fail this test, the master Tone-Clock circuit pack must be replaced. Follow the Tone-Clock replacement steps listed in TDM-CLK (TDM Bus Clock).
- Replace the active Expansion Interface circuit pack in the master port network.
- In a CSS configuration, replace the Switch Node Interface circuit pack connected to the active Expansion Interface circuit pack in the master port network. Use **`list fiber-link`** to determine the Switch Node Interface circuit pack that is connected to the active Expansion Interface circuit pack in the master port network.
- If the problem persists and any slip errors remain, follow the procedures described in the troubleshooting section above.

It may take up to one hour to clear the alarm after the problem has been resolved.

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i. Noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a sync problem occurs on Error Types 1, 257, or 513, a WRN alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MINOR or MAJOR alarm.

Table 248: Synchronization Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**`test synchronization`**
1 (a) (g)	Any		WRN MIN (j)[2]	OFF	
18 (b)	0	**`disable sync`**	WRN	OFF	**`enable sync`**
257 (c)(g)	Any		WRN MIN (j)[2]	OFF	
513 (d)(g)	Any		WRN MAJ (j)[2]	OFF	
769 (e)			MAJ WRN[3]	OFF	

Table 248: Synchronization Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1793[4]	0-50		MAJ WRN	OFF	**`enable sync`**
2049 (f)[4]	0		WRN	OFF	
2305 (f) [4]	0		WRN	OFF	

1. Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.
2. This Error Type initially raises a Warning alarm. If this Error Type persists and alarms are not downgraded on this MO due to the value of **`set options`**, then, after a period of time, a Minor or Major alarm is raised.
3. Major alarms on this MO may be downgraded to Warning alarms based on the value used in **`set options`**.
4. It can take up to one hour for these SYNC alarms to clear.

Notes:

a. **Error Type 1**: problem with the primary DS1 reference. It is cleared when the primary reference is restored. The following steps should give an indication of the source of the problem:

1. Check if the primary DS1 interface circuit pack is inserted in the carrier using **`list configuration board`** ***`location`***.
2. Check the connection of the cable supplying the external timing source to the primary DS1 interface circuit pack.
3. Test the primary DS1 interface circuit pack using **`test board`** ***`location`*** **`long`**. Check the Error Log for DS1-BD errors and refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation to resolve any errors associated with the primary DS1 interface circuit pack. If no errors are listed in the Error Log for the primary DS1 interface circuit pack, continue with the following steps.
4. Test the active Tone-Clock circuit pack in the master port network using **`test tone/clock`** ***`location`*** **`long`**. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following steps.
5. Execute **`disable synchronization-switch`** and the **`enable synchronization-switch`**. These two commands (when executed together) switch the system synchronization reference to the primary DS1 interface circuit pack. Check the Error Log and execute the **`status synchronization`** command to verify that the primary DS1 interface circuit pack is still the system synchronization reference. If the primary DS1 interface circuit pack is not the system synchronization reference, continue with the following step.

b. **Error Type 18**: Synchronization Maintenance has been disabled using **`disable synchronization-switch`**. Execute **`enable synchronization-switch`** to enable Synchronization Maintenance reference switching and to resolve this alarm.

c. **Error Type 257**: problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting *secondary* for *primary* in the preceding resolution steps.

d. **Error Type 513**: the Tone-Clock circuit pack is providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

e. **Error Type 769**: excessive switching of system synchronization references has occurred. When this error occurs, synchronization is disabled and the Tone-Clock circuit pack (in the master port network) becomes the synchronization reference for the system. Execute the following steps to resolve this error:

1. Check for timing loops and resolve any loops that exist.
2. Test the active Tone-Clock circuit pack in the master port network using **`test tone/clock`** ***`location`*** **`long`**. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to the TDM-CLK (TDM Bus Clock) Maintenance documentation to resolve the problem. If not, continue with the following steps.
3. Replace the primary and secondary (if administered) DS1 Interface circuit packs.
4. Check for an error logged against the primary or secondary DS1 board. If there is an error, follow the DS1 section to resolve the errors. If there is not, enter **`enable sync`**, and wait for two to five minutes for the primary sync source to come on-line.

f. **Error Type 2049**: the slave Tone-Clock circuit pack is experiencing loss of signal. Refer to note (i) for error resolution steps.

The following steps should be executed to resolve error **2049** and **2305**:

1. Check for timing loops, and resolve any loops that exist.
2. **Error 2049**:
   - Test the Tone-Clock circuit packs in the master and slave port networks using **`test tone/clock`** ***`location`*** **`long`**. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to TDM-CLK (TDM Bus Clock) to resolve the problem. If not, continue with the following steps.
   - If the system synchronization reference is a Tone-Clock circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, follow the steps listed in TDM-CLK (TDM Bus Clock) to replace the master Tone-Clock circuit pack.

- If the system synchronization reference is a DS1 interface circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, the primary or secondary (if administered) synchronization references are not providing valid timing signals for the system. Check the system synchronization references administered, and follow the steps outlined in note (a) if the primary synchronization reference is providing timing for the system or note (c) if the secondary synchronization reference is providing timing for the system.
- If the slave Tone-Clock circuit pack fails the TDM Bus Clock Test #150 but the master Tone-Clock *does not* fail this test, the master Tone-Clock circuit pack must be replaced.

  If SLIP errors remain follow SLIP ANALYSIS.

3. **Error 2305**:
   - If the problem persists, replace the Tone-Clock circuit pack in the slave port network. Follow the steps listed in TDM-CLK (TDM Bus Clock) to replace the Tone-Clock circuit pack.

g. Noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a synchronization problem occurs causing Error Types 1, 257, or 513, a WRN alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MAJOR or MINOR alarm.

Demand test descriptions and error codes

S8700-series Fiber-PNC: If Stratum 3 is administered using `change synchronization`, the Stratum-3 Clock Alarm Query (#649) also executes when `test synchronization` is run.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Synchronization Update Test (#417)	X	X	Non-Destructive

SYS-LINK (System Links)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SYS-LINK	MIN WRN	**test sys-link** ***location***	SYSTEM LINKS

System links are packet links that originate at the Packet Interface board and traverse various hardware components to specific endpoints. The hardware components involved on the forward and reverse routes can be different, depending upon the configuration and switch administration. Various types of links are defined by their endpoints:

EAL	Expansion Archangel Link terminating at an Expansion Interface board. This link carries CCMS messages.
INL	Indirect Neighbor Link terminating at a Switch Node Interface board.
PACL	PNC ATM Control Link terminating at a PNC ATM-EI board. This link carries ATM signaling commands to the remote TN2238 (ATM-EI) boards.
PRI	ISDN-PRI D-Channel Link terminating at a Universal DS1 board
RSCL	Remote Socket Control Link terminating at a C-LAN board
RSL	Remote Socket Link terminating at a C-LAN board
BFDL	Bearer Fault Detection Link terminating at an Expansion Interface board. This link provides inter-port-network bearer fault detection for port-networks that do not use an EAL terminating at the EI board.
MBL	Maintenance Board Link terminating at an IPSI board that provides Environmental maintenance for a G650 rack mounted cabinet. This replaces the Expansion Port-Network (EPN) maintenance board serial channel.
TACL	ATM control link terminating at an ATM-TRK board. This link carries ATM signaling commands to the ATM-TRK) board.

Recording System Link Events

The system records every error encountered on the system links. Most of these events are not extraordinary unless they occur very often. The events are logged as they occur, leaving a “trail” to help analyze abnormal behavior exhibited by the endpoints attached to the links or the links themselves.

When a link goes down, an alarm is raised immediately. For EAL, INL, BFDL, and PACL link types, a MINOR alarm is raised. For every other link type, a WRN alarm is raised. Other alarming conditions that do not cause the link to go down get a WRN alarm, regardless of the link type.

Identifying a System Link

In order to trace problems associated with a system link, it is necessary to find its location. Use the following methods to find the location of the system link.

Display Errors/Alarms

The output of **`display errors`** or **`display alarms`** shows the location of the system link for entries with a Maintenance Name of SYS-LINK. You can restrict the scope of the output of these commands by specifying **`sys-link`** in the **Category** field on the input screen. The link type and channel number, if any, are listed under the **Alt Name** field of the report.

List sys-link

The **`list sys-link`** command lists every system link (location, link type, and dlci number) present in the system.

Common Procedure for Repairing Link Problems

The state of a system link is dependent on the state of the various hardware components that it travels over. To resolve any problems associated with a system link, use the following procedure.

The switch maintains a list of hardware components over which the link travels, called the hardware path. There are two hardware paths: the current hardware path and the faulted hardware path for each of the system links. The current hardware path is present only for those links that are currently up. When a link is down, the current hardware path is empty. The faulted hardware path is always present once the link has gone down, and is not cleared when the link subsequently recovers. The faulted path preserves the path that the link traversed when it last went down. The time at which the faulted path was last recorded is preserved and is accessible through **`status sys-link`** ***`location`*** and **`list sys-link`**. Therefore, the focus of attention for problems which do not involve a link that is down is the current hardware path. If the link is down, faulted hardware path is the focus of attention.

The **`status sys-link`** ***`location`*** command shows the state of both the hardware paths (current and faulted) along with the state of each of the components in the hardware path. When analyzing any system link problem:

1. Look for alarms on the components listed under desired hardware path.
2. If any alarms are present, then follow the maintenance procedures for the alarmed components to clear those alarms first.

Note:

For systems using ATM-EI (TN2305/6 circuit packs) and where link alarms are present, see ATM-EI (Expansion Interface Circuit Pack).

3. When every component is alarm free, wait for 3 minutes to allow the links to recover.
4. Test the system link (**`test sys-link`** ***`location`*** **`long clear`**), and notice any tests that fail.
5. If there are any failures, fix the problems indicated by the tests and repeat the procedure.

Error log entries and recommended actions

Table 249: SYS-LINK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
13 (a)		System Link Status (#985)	MIN WRN	OFF	
257 (b)			WRN	OFF	**test sys-link *location* l cl**
513 (c)			WRN	OFF	**test sys-link *location* l cl**
772 (d)			WRN	OFF	**test sys-link *location* l cl**
1025 (e)			WRN	OFF	**test sys-link *location* l cl**
1281 (f)			WRN	OFF	**test sys-link *location* l cl**
1537 (g)			WRN	OFF	**test sys-link *location* l cl**
1793 (h)			WRN	OFF	**test sys-link *location* l cl**
2049 (i)			WRN	OFF	**test sys-link *location* l cl**

Notes:

a. **Error Type 13**: the link went down. The link may have gone down or never come up. Enter **status sys-link *location*** and check the value of the **Faulted Path** field. If the value is **default**, then the link never came up. If the value is **present**, then the link came up and then went down.

   1. Follow the information in Common Procedure for Repairing Link Problems.
   2. Wait for 3–5 minutes before checking the link state.
   3. Repeat the procedure until there are no problems.

b. **Error Type 257**: the link has experienced uplink flow control, and the endpoint may be hyperactive. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

    1. Follow the information in Common Procedure for Repairing Link Problems.
    2. Clear errors and wait for 10 minutes.

c. **Error Type 513**: the link has experienced downlink flow control, meaning that some information packets from the packet interface board have been lost. The link is reset on first occurrence and Error 1025 is also logged. The system link is alarmed if 2 or more errors of this type are detected within 10 minutes.

    1. Follow the information in Common Procedure for Repairing Link Problems.
    2. Clear errors and wait for 10 minutes.

d. **Error Type 772**: the link experienced a temporary disconnect due to excessive resets or state transitions, meaning that the link is taken down and then brought up again. The system link is alarmed if 2 or more errors of this type are detected within 10 minutes.

    1. Follow the information in Common Procedure for Repairing Link Problems.
    2. Clear errors and wait for 10 minutes.

e. **Error Type 1025**: the link has been reset, meaning that information packets queued at the time of reset are lost. The system link is alarmed if 20 or more errors of this type are detected within 10 minutes.

    1. Follow the information in Common Procedure for Repairing Link Problems.
    2. Clear errors and wait for 10 minutes.

f. **Error Type 1281**: the link has experienced slow transmit rate because the remote endpoint is busy. The effect of this error is that the endpoint location may experience slower throughput rate and/or noisy transmission. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

    1. Ensure that the remote endpoint is functioning properly.
    2. Follow the information in Common Procedure for Repairing Link Problems.
    3. Clear errors and wait for 10 minutes.

g. **Error Type 1537**: the link has experienced slow transmit rate due to excessive retransmission. Possible causes may be that the switch is overrunning the endpoint, or that the endpoint is not operating properly. The effect is that the endpoint location may experience slower throughput rate. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

    1. Follow the information in Common Procedure for Repairing Link Problems.
    2. Clear errors and wait for 10 minutes.

h. **Error Type 1793**: This error indicates that the link has experienced slow transmit rate due to unknown causes, meaning that the endpoint location may experience slower throughput rate and the Packet Interface may experience backup or congestion. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

1. Follow the information in Common Procedure for Repairing Link Problems.
2. Clear errors and wait for 10 minutes.

i. **Error Type 2049**: the link has transmitted an excess amount of packets. The transmit buffers of this link have been purged. The system link is alarmed if 4 or more errors of this type are detected within 10 min.

1. Follow the Common Procedure for Repairing Link Problems.
2. Clear errors and wait for 10 min.

Demand test descriptions and error codes

Testing for system links is different from the standard test procedures for MOs. In addition to testing the system link MO, the user can test every component in the path of the system link. There are two paths preserved for the link. The current path, if present, represents the path traversed by the link currently. This path is absent when the link is down. The other path, the faulted path, is present if the link has ever gone down or never come up. If the link came up and went down, then the **Faulted Path** is marked **present**. If the link never came up, the **Faulted Path** is marked **default**. In either case, it represents the path on which the link was attempted or established unsuccessfully.

Test command for the system links, **`test sys-link`** ***`location`***, can be specified with current or faulted as an optional argument if the user wishes to test every component in the specified path. The tests executed are the same if the user tests each component manually. In the event that the user does not specify any path, then only the tests specified for the system links are executed.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
System Link Status Test (#985)	X	X	Non-Destructive

SYS-PRNT (System Printer)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
SYS-PRNT	MIN	**`test sp-link l`**	System Printer
	WRN	**`release sp-link`**	

The Report Scheduler feature provides the capability to schedule printing of output screen selected administration commands on an asynchronous System Printer (SYS-PRNT) or a Personal Computer (PC). The System Printer device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack which is administered as a data extension. A System Printer device can also be connected through an ADU to a port on TN726B Data Line circuit pack. The System Printer link to the processor is via a C-LAN board. For information about C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack).

System Printer Link Maintenance provides a strategy for maintaining the link between the system and an external SYS-PRNT output device. The strategy includes a set of tests for detection of errors during normal operation, troubleshooting actions, and alarms for serious problems. System Printer Link Maintenance uses a try-and-wait mechanism for maintaining the SYS-PRNT link. A minor alarm is raised when the link set-up fails. A warning alarm is raised when the server has been busied out. Up to two link retry attempts are made. After the second attempt, set-up attempts are only made by the application software. (The 15-minute timer fires and jobs are printed unless an immediate job was entered.) After two unsuccessful attempts to establish the link, a MINOR alarm is raised. If the System Printer Link is torn down due to an error, System Printer Link Maintenance will raise a MINOR alarm but will not attempt to bring up the System Printer Link.

System Printer Link Maintenance does not cover the elements comprising the SYS-PRNT physical link: the external SYS-PRNT output device, the Data Module (PDM/MPDM/DTDM) and TN754 Digital Line, or the ADU and TN726B Data Line. If System Printer Link Maintenance cot restore the System Printer Link, the maintenance tests of these individual components of the System Printer Link must be executed to diagnose faults.

Procedures for Restoring the System Printer Link

1. Use **`status sp-link`** and verify that the **Maintenance Busy** field is **`n,`** which shows that the System Printer Link is not busied out for maintenance. If the System Printer Link has been busied out, use **`release sp-link`**. If the link is down, proceed to Step 2.

2. Use **`display system-parameters features`** to determine the location of the System Printer Link.

   Use **`status data-module`** ***`extension`*** and verify that the data extension is in-service/ idle. If the data extension is *not* available, refer to the `Port` field. Look for errors and/or alarms on the circuit pack with which this extension is associated. Follow repair instructions for the appropriate MO. Continue with Step 3.

3. Verify the availability of the external SYS-PRNT output device. Make sure that the output device is *on-line* and ready-for-service. Check the physical connectivity between the Data Module and the SYS-PRNT output device.
4. Verify that there is at least one C-LAN port available. The System Printer Link cot be established without an available C-LAN port. For more information about C-LAN ports, see CLAN-BD (Control LAN Circuit Pack).
5. If the problem is not found in the previous steps, check the C-LAN port for problems. For a description of C-LAN boards and connectivity, see CLAN-BD (Control LAN Circuit Pack).

When restoring the System Printer link, execute tests on different MOs that comprise the System Printer link. It is recommended that you busyout the System Printer link before trying to restore the link. When the System Printer Link is busied out, every System Printer Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Error log entries and recommended actions

Table 250: SYS-PRNT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	**test sp-link**
18 (a)	0	**busyout sp-link**	WRN	OFF	**release sp-link**
257 (b)	1, 3-6	Link Retry test (#215)	MIN[1] WRN	OFF	**test sp-link l**
513 (c)	0		MIN	OFF	**test sp-link**

1. Minor alarms can be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a. **Error Type 18**: the System Printer Link has been busied out.

b. **Error Type 257**: a failure was encountered while attempting to set up the System Printer Link. This attempt could have been initiated by either Report Scheduler software or by link maintenance during automatic link retry or as a result of a Link Retry Test (#215) request.

The Aux Data field indicates the following:

Table 251: Aux Data, Error Type 257

Aux Data	Description
1	No C-LAN port available. See CLAN-BD (Control LAN Circuit Pack) for explanation.
3, 4	Time-out during setup attempt. Most likely due to problem with physical link or printer status.
5	Internal system error. Most likely temporary/sporadic failure.
2, 6	The data module the printer is trying to use is busy with another call. Use **`status data module`** to determine when the port is available for testing.

See Procedures for Restoring the System Printer Link for recommended maintenance strategy.

c. **Error Type 513**: the SYS-PRNT was interrupted for one of the following reasons:

- The cable to the SYS-PRNT output device is disconnected
- The SYS-PRNT output device is powered off
- The data extension to which the SYS-PRNT output device connects has been busied out
- Internal software error

Check the connectivity of the wires and cables among the wall jacket, data module, and SYS-PRNT output device. Follow the instructions in Procedures for Restoring the System Printer Link.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Sequence	D/ND
Link Tear Down Test (#213)		X	Destructive
Link Retry Test (#215)	X	X	Non-Destructive

SYSTEM (System)

MO Name	Alarm Level	Initial Command to Run[1]	Full Name of MO
SYSTEM	None	None	System

1. SYSTEM has no associated alarms and thus appears only in the Error Log. There are no tests that run on SYSTEM.

The SYSTEM maintenance object logs information about system resets, including interchanges. When software encounters a problem with hardware, or with its own processes, and requests a restart to clear the problem, an error is logged under SYSTEM. For example, if there is a loss of clocking in a system with duplicated servers, the system switches to the other clock and then executes a level-2 system reset to recover from hardware problems caused by the loss of clock. Errors logged under SYSTEM can help to determine the cause of a reset. For more information about interchanges, see Troubleshooting duplicated servers in *Maintenance Procedures (03-300432).*

The `display initcauses` screen also contains information about the reset.

Error log entries and recommended actions

The Aux Data field may be 0 or the return code from a bad software call, and the following examples in no way exhaust the possibilities. Often, two errors are logged at the same time for each problem.

Table 252: SYSTEM Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	
8 (b)	0				
9 (c)	Any				
10 (d)	Any				
21 (e)					
355 (f)	Any				
356 (g)	Any				
601 (h)					
					1 of 2

Table 252: SYSTEM Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
602 (i)					
603 (j)					
					2 of 2

Notes:

a. **Error Type 0**: run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 8**: a System Restart Level 3 was requested.

c. **Error Type 9**: a System Restart Level 2 was requested. This can happen due to a loss of tones (due to a faulty Tone-Clock circuit pack).

d. **Error Type 10**: a System Restart Level 1 was requested.

e. **Error Type 21**: a process trapped.

f. **Error Type 355**: a Restart Level 2 occurred due to a power loss.

g. **Error Type 356**: a Restart Level 2 occurred due to a tone clock loss.

h. **Error Type 601**: an error occurred during initialization.

i. **Error Type 602**: an error occurred while loading translations and the system requested a Restart Level 3.

j. **Error Type 603**: a process was reset.

S8400-BD (S8400 Server)

S8400

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
S8400-BD	WRN	None	S8400 Server

The S8400 Server is a Linux-based server that occupies a single slot in a standard TN carrier. The S8400 Server provides Communication Manager processing functionality in stand alone, single port network (PN), telephony systems requiring up to 500 stations.

The S8400 Server is comprised of the:

- TN8400AP Server circuit pack
- TN8412AP S8400 IP Interface (SIPI) circuit pack

Error log entries and recommended actions

Table 253: S8400-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)		Serial Link Test #1647	WRN	ON	**test board** ***location***
513 (b)	4352 4353 4355 4356 4358		WRN	ON	
1537 (c)			WRN	ON	
3841 (d)					

Notes:

a. **Error Type 1**: Serial Link Test failure. Either the main server is down or the network is down.

b. **Error Type 513:** transient hardware device problems on the board. They include an external RAM failure, internal RAM failure, ROM checksum failure, message corruption, and program logic inconsistency. If the board detects only one of these hardware problems it may be alarmed. The error will disappear when none of these faults are detected for 10 minutes. There are no associated tests for these inline errors; if they continue to happen, the circuit pack should be replaced.

c. **Error Type 1537:** Serial Link Hyperactivity. The switch removed the hyperactive circuit pack. Attempt to clear the alarm with the **`busyout/reset/release board`** ***`location`*** commands. If the error occurs within 15 minutes, replace the circuit pack.

d. **Error Type 3841:** Inconsistent downlink message. This error is not service-affecting. No action is required.

Demanded tests descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
System Link Status (#1647)	X	X	Non-Destructive

TBRI-BD (ISDN Trunk-Side BRI Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TBRI-BD	MIN	`test board` *`location`* `long`	ISDN Trunk-side BRI Circuit Pack

The TN2185 ISDN trunk-side BRI circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb/s channels (B1 and B2) and over a 16Kb/s signaling (D) channel.

The B1 and B2 channels can be simultaneously circuit-switched or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D-channel is either circuit-switched or packet-switched. Packet switching uses the PPE to combine all D-channels into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

Error log entries and recommended actions

Table 254: TBRI-BD Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test board location`
1 (b)	Any		MIN	ON	
257 (c)	65535	Control Channel Looparound Test (#52)	MIN	ON	`test board` *`location`* `r 20`
513 (d)	4352 - 4357		None	ON	
769 (e)	4358				
1025 (f)		NPE Audit Test (#50)	None	ON	
1291 (g)	4359	Clear Error Counters (#270)	MIN	ON	
1294 (h)	46088 - 46096	SAKI Sanity test (#53)	MIN	ON	See (h)
1537 (i)	46082		MIN	ON	
1793 (j)	46080		MIN	ON	
					1 of 2

Table 254: TBRI-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1794 (j)	46094		MIN	ON	
1795 (j)	46085		MIN	ON	
2305 (k)	46104		None	ON	
2306 (k)	46081		None	ON	
3330 (k)	46083		MIN	OFF	
3586 (l)			MIN	OFF	
3841 (m)	4096 - 4101				
3842 (n)	46095				
3843 (o)	46097				
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** the circuit pack stopped functioning or was physically removed from the system. This alarm logs approximately 11 minutes after removing the circuit pack and/or the SAKI Sanity Test (#53) fails.

   If the circuit pack is not in the system, insert a circuit pack in the same slot as the error indicates. See note (h) for additional information.

c. **Error Type 257:** transient communication problems between the switch and this circuit pack. Execute **`test board`** ***`location`*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

d. **Error Type 513:** on-board hardware failure. Aux Data values correspond to the following detected errors:
   Aux Data 4352: External RAM error
   Aux Data 4353: Internal RAM error
   Aux Data 4355: ROM Checksum error
   Aux Data 4357: Instruction set error

   Use **`busyout board`** ***`location`*** and **`reset board`** ***`location`*** to reset the circuit pack. When reset, the circuit pack executes a set of tests to detect the presence of any of the faults listed above. Detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedure in Note (b).

e. **Error Type 769:** the circuit pack detects a program logic error. While no action is required, this error can lead to other errors against this circuit pack.

f. **Error Type 1025:** the circuit pack cot update and read back NPE/NCE memory. This error can be ignored, but may lead to other errors against this circuit pack.

g. **Error Type 1291:** the TN2185 board notifies maintenance software that it has detected a parity error while accessing its dynamic RAM (memory that stores the board's translation information and downloadable application firmware). Maintenance software resets the circuit pack.

h. **Error Type 1294:** unable to write LAN Translation RAM Error (internal memory access error). Translation RAM locations for the call connection attempt are not available, and one or more RAM locations are bad due to a translation RAM read-back error. Reset the circuit pack with **busyout board *location*** and **reset board *location***. If the Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm with **test board *location* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

i. **Error Type 1537:** frame overrun at Packet bus interface. This condition is due to an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack is alarmed, refer to the repair procedures for those MOs. If this error persists, maintenance software removes the board from service. Replace the circuit pack.

j. **Error Type 1792 - 1795:** the circuit pack is having problems transmitting/receiving data to/from the Packet bus.

1793	Parity errors are detected when transmitting data to the Packet bus.
1794	Packet bus transmit buffers overflow.
1795	Circuit pack cot find end of frame when transmitting to Packet bus. Clear the alarm with **busyout board *location***, **reset board *location***, **test board *location* long clear**, **release board *location***. If the error recurs within 10 minutes, replace the circuit pack.

k. **Error Type 2305, 3330:** critical failure in the Circuit Pack's Packet bus interface. Possible causes include either a Packet Bus fault or an on-board fault. If the Packet Bus is alarmed, see Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)*. The number of ISDN circuit packs displaying this error increases the probability of errors due to Packet bus problems.

1. If there are no Packet Bus alarms, reset the circuit pack with **busyout board *location***, **reset board *location*,** and **release board *location***.
2. If the Circuit Pack Restart Test (#594) passes, the on-board circuitry is healthy. Retire the alarm with **test board *location* long clear**.

3. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

Error Type 2306: This is an error in a received frame from the Packet bus, most likely caused by a packet bus problem, but may be due to a circuit pack fault. An invalid Link Access Procedure Data (LAPD) frame error occurs if the frame contains a bad Cyclical Redundancy Check (CRC). If bus parity errors occur, run the LANBIC Receive Parity Error Counter Test (#595) to determine whether the condition has cleared. Determine whether the problem is isolated to this circuit pack or is caused by Packet bus faults.

l. **Error Type 3586:** the server's software detects an excessive number of uplink messages from the TN2185 board within a certain time period. To prevent the faulty board from flooding the switch with data, the switch software takes the board out of service and alarms it. The switch software also tells the Archangel to ignore uplink messages from the board.

   When the board is alarmed due to this error, the switch software periodically puts the board back in service and tells the Archangel to process uplink messages from the board. If the problem still exists, the software takes the circuit pack out of service again. If the circuit pack does not exhibit the problem for a certain time period, then maintenance software resolves the alarm and the circuit pack is left in service.

m. **Error Type 3841:** the circuit pack received an inconsistent down-link message (a bad header, port number, data, sub-qualifier, or logical link) over the Control Channel.

n. **Error Type 3842:** the board is receiving data from the bus faster than it can distribute the data to its endpoints, causing the FIFO RAM buffer to overflow. This error can occur occasionally due to the statistical sizing of the buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch. LAPD should recover from this problem, but it may degrade the performance of the LAN bus.

   When this error is reported, maintenance reads and clears the board counter and logs the problem in the maintenance error log.

o. **Error Type 3843:** bad translation RAM detected, but the call continues by using another translation location. The circuit pack reports this error when it cot update NPE/NCE memory and read it back. This error is not service-affecting and can be ignored, but can lead to other types of errors against this circuit pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND

1. Destructive; ND = Nondestructive

TBRI-PT (ISDN Trunk-Side BRI Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TBRI-PT	MAJ MIN	**test port *location* l**	ISDN Trunk-side BRI port
	WRN	**test port *location***	

The TBRI-PT maintenance object is a port on both the TN2185 Trunk-Side BRI circuit pack and the MM720 BRI Media Module. The term ***circuit pack*** in the following description refers to both the circuit pack and the media module.

The ***location*** on the TN2185 Trunk-Side BRI circuit pack is the UUCSSpp designation.

The ***location*** on the MM720 BRI Media Module is designated by GGGVSPP. Consult local records for the location and designation of the equipment rack where the Media Gateway is mounted.

The TN2185 circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64-kbps channels (B1 and B2) and over a 16-kbps signaling (D) channel. The B1 and B2 channels can be simultaneously circuit-switched, or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D-channel is either circuit- or packet-switched. Packet switching uses the PPE to combine all D-channels into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

The MM720 BRI Media Module provides 8 S/T ISDN 2B+D ports that interface to either the central office or another PBX. The MM720 contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb/s channels (B1 and B2) and over a 16Kb/s signaling (D) channel. The B1 and B2 channels can be simultaneously circuit switched, or individually packet switched. Only one channel per trunk can be packet switched due to Packet Processing Element (PPE) limitations. The D-channel is circuit switched. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64Kb/s clear data channels.

Error log entries and recommended actions

Table 255: TBRI-PT Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port location`
1 (b)		Layer 1 Query test (#1242)	MIN	OFF	
129 (c)					
257(d)					
513 (e)	46222	XMIT FIFO Overflow	MIN	ON	
514 (f)		XMIT FIFO Overflow (TDM)	MIN	ON	
769 (g)		Traffic Hyperactivity	MIN	OFF	
1025 (h)					
1281 (i)		BRI NPE Crosstalk test (#617)	MIN	ON	
1537 (j)	46210	CRC error (D-channel)	MIN	OFF	
1538 (k)		CRC error (TDM D-channel)	MIN	OFF	
1793 (l)		BRI Port Local TDM Looparound test (#619)	MIN	ON	
2049 (m)			MIN	OFF	
2305 (n)		BRI Layer 3 Query (#1243)	MIN	OFF	
2561 (o)		BRI Layer 1 Query (#1242)	MIN	OFF	
3073 (p)		BRI Slip Query test (#1244)	MIN	OFF	
3585 (q)		Receive FIFO Overflow (TDM D-channel)		ON	
3586 (r)					
3587 (s)					
3588 (t)	46223				
3589 (u)					
3590 (v)	46211				
3591 (w)					
3592 (x)					
					1 of 2

Table 255: TBRI-PT Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3841 - 3942 (y)		See Aux Data Values for Error 3841–3942			
					2 of 2

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** loss of continuity of Layer 1 to the far end. It is assumed that Layer 1 remains active, even when both B-channels are idle.

This test determines whether Layer 1 is active or not. If Layer 1 is not active, the test attempts to activate it. If Layer 1 cot be activated, the port is taken out of service, and the test fails.

c. **Error Type 129:** the far-end switch changed the ISDN service state. The trunk is out of service on the far end. This may be a temporary condition.

d. **Error Type 257:** the D-channel failed at Layer 2. Expiration of this timer indicates that attempts to bring the failed link back into service have not succeeded and some recovery actions should be taken on the associated B-channels. Upon expiration, associated in-service B-channels are put in the out-of-service/far-end state. The timer is cleared when layer 2 is re-established.

e. **Error Type 513:** on-board hardware failure. The FIFO RAM buffers have overflowed, indicating a hardware problem. The circuit pack is having problems transmitting data to the packet bus.

f. **Error Type 514:** transmit FIFO Overflow - This error indicates that the circuit pack is having problems transmitting data to the TDM D-channel. This error only occurs on a system that switches the packet implementation of the D-channel over the TDM bus. This error indicates an on-board problem related to the packet implementation of the D-channel.

g. **Error Type 769:** the port is generating too many uplinks. The link is being suspended. If too many hyperactive events occur with a certain time, the port is alarmed and taken out of service.

h. **Error Type 1025:** an expired timer has created an unexpected event. The timer could be any of the following:

Timer	Event
T3031	ISDN T3031 timeout
T3032	ISDN T3032 timeout

T305	ISDN T305 timeout
T3081	ISDN T3081 timeout
T3082	ISDN T3082 timeout
TL3	Status Inquiry
T304	Setup ACK
T310	Call Proceeding Receive
T313	Connect SEND

i. **Error Type 1281:** this error occurs when the BRI NPE Crosstalk test (#617) has failed. The test will be repeated every 15 minutes until it passes. Follow normal trouble shooting procedures for BRI NPE Crosstalk Test (#617). If this does not fix the problem, follow normal escalation procedures.

j. **Error Type 1537:** the board received a bad Cyclical Redundancy Check (CRC) over the D-channel. This error is reported on a per-port basis. When the CRC errors exceed 5 within 15 minutes, the port is taken out of service for 5 seconds. If 5 more CRC errors are received within 15 minutes of the first set of 5 errors, the port is taken out of service for 1 minute. If 5 more CRC errors are received within 15 minutes of the previous 5, the port is taken out of service for 15 minutes.

   This error is most likely due to a problem with backplane wiring, a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

   1. Check the backplane wiring.
   2. If the problem persists escalate the problem.

k. **Error Type 1538:** this error occurs when a frame with a bad CRC is received over the TDM D-channel by the BRI trunk board. This error only occurs on a system that switches the packet implementation of the D-channel over the TDM bus. This error indicates an off-board problem related to the packet implementation of the TDM D-channel.

l. **Error Type 1793:** the BRI Port Local TDM Looparound test (#619) failed. Run the long test sequence, and check the results of the BRI Port Local TDM Looparound Test (#619).

m. **Error Type 2049:** the BRI Layer 3 Query Test (#1243) has determined that the signaling link is down (Layer 2). The test is repeated every 15 minutes until it passes.

n. **Error Type 2305:** the BRI Layer 3 Query Test (#1243) failed. The test is repeated every 15 minutes until it passes.

o. **Error Type 2561:** loss of Layer 1 in stable configuration. The BRI port is configured as stable but the Trunk-side Layer 1 Query Test (#1242) failed 6 times within one hour. Change the **layer 1 stable** field on the `change bri-trunk-board <board location>` screen to **n**.

p. **Error Type 3073:** a frame of information had to be repeated or deleted. Slips usually occur when the received bit rate is not synchronized with the TDM bus clock.

q. **Error Type 3585:** the circuit pack detected an overflow of its receive buffers. This error occurs only a system that switches the packet implementation of the D-channel over the

TDM bus. This error indicates an on-board problem related to the packet implementation of the TDM D-channel. This error is logged only.

r. **Error Type 3586:** each port can support up to three Terminal Endpoint Identifiers (TEIs). Each channel on the port can request a TEI assignment from the switch if it supports ISDN-BRI TEI assignment procedures. If switch services gets a request for a fourth TEI on a port, it reports this event to maintenance software and initiates TEI check procedures on the port. Check to see if the correct number of channels are administered for this port.

   The user side supports automatic TEI assignment by the network. Both fixed and automatic TEI assignment are supported on the network side.

s. **Error Type 3587:** Service Profile IDentifier (SPID) value is invalid or is a duplicate of another SPID that is already initialized at Layer 3 on the port. SPIDs are not used on the circuit pack. However there will be related events.

t. **Error Type 3588:** the board receives D-channel data from the bus faster than it can process the data. The FIFO RAM buffers overflowed. This error occurs occasionally due to the statistical sizing of the buffers; however, frequent occurrences may indicate a LAPD parameter mismatch between the two endpoints of a packet-switched connection. Run the long test sequence, and note the results of the Receive FIFO Error Counter Test (#625).

u. **Error Type (3589:** the BRI Port Local LAN Looparound Test (#618) failed. Run the long test sequence, and note the results of Test #618.

v. **Error Type 3590:** an activated BRI port receives a frame containing a DLCI over a D-channel for which it does not have a translation. This error normally indicates an off-board problem related to a state mismatch between the far end and the switch. This error is logged only.

w. **Error Type 3591:** the circuit pack received a frame containing a DLCI over the TDM D-channel for which it does not have a translation. This error occurs only on a system that switches the packet implementation of the D-channel over the TDM bus, and indicates an off-board problem related to the state mismatch between the board and the packet implementation of the TDM D-channel. This error is logged only.

x. **Error Type 3592:** the port is generating too many uplinks and is taken out of service for a period of time.

y. **Error Types 3841–3942:** Table 256: Aux Data Values for Error 3841–3942 contains the received ISDN cause values for Errors 3841–3942 that are recorded in the error log. Unless otherwise stated, the cause values are D-channel events. The Aux Data field shows which port caused the error.

Table 256: Aux Data Values for Error 3841–3942

Aux Data Value	Type of Problem	Meaning
2	admin	No route to specific transit network
3	admin	No route to destination (or Germany bcap not imp)
6	admin	Channel unacceptable
18	switch problems	No user responding
38	switch problems	Network failure
50	subscription	Requested facility not subscribed
52	admin	Outgoing calls barred
54	admin	Incoming calls barred
62	subscription	Service not authorized
63	admin/sub	Service/option not available
65	admin/sub	Bearer capability not implemented
66	admin/sub	Channel type not implemented
69	admin/sub	Requested facility not implemented
70	admin/sub	Only restricted digital BC available
79	admin	Service/option not implemented
88	admin	Incompatible destination
102	switch problems	Recovery on timer expired

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
BRI Port Local LAN Looparound Test (#618)		X	D
BRI Port Local TDM Looparound Test (#619)		X	D
Trunk-side Layer 1 Query Test (#1242)	X	X	D
CRC Error Counter Test (#623)	X	X	ND
Receive FIFO Error Counter Test (#625)		X	ND
BRI Layer 3 Query Test (#1243)		X	ND
BRI Port Slip Query Test (#1244)	X	X	ND
Clear Error Counters Test (#270)	X	X	ND
BRI NPE Crosstalk Test (#617)		X	D

1. D = Destructive; ND = Nondestructive

TBRI-TRK (ISDN Trunk-Side BRI Channel)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TBRI-TRK[1]	MAJ[2] MIN	**test trunk *location* long**	ISDN Trunk-Side BRI Channel
	WRN	**test trunk *location***	

1. For additional repair information for the TN2185 circuit pack, also see TBRI-BD (ISDN Trunk-Side BRI Circuit Pack) and TBRI-PT (ISDN Trunk-Side BRI Port). For additional repair information for the MM720 BRI Media Module, see MG-BRI (BRI Trunk Media Module) and TBRI-PT (ISDN Trunk-Side BRI Port)
2. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

The TBRI-TRK maintenance object is a port on both the TN2185 Trunk-Side BRI circuit pack and the MM720 BRI Media Module. The term ***circuit pack*** in the following description refers to both the circuit pack and the media module.

The ***location*** on the TN2185 Trunk-Side BRI circuit pack is UUCSSpp designation.

The ***location*** on the MM720 BRI Media Module is designated by GGGVSPP. Consult local records for the location and designation of the equipment rack where the Media Gateway is mounted.

The TN2185 circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64-kbps channels (B1 and B2) and over a 16-kbps signaling (D) channel. The B1 and B2 channels can be simultaneously circuit-switched, or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D-channel is either circuit- or packet-switched. Packet switching uses the PPE to combine all D-channels into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

The MM720 Media Module provides 8 S/T ISDN 2B+D ports that interface to either the central office or another PBX. The MM720 contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb/s channels (B1 and B2) and over a 16Kb/s signaling (D) channel. The B1 and B2 channels can be simultaneously circuit switched, or individually packet switched. Only one channel per trunk can be packet switched due to Packet Processing Element (PPE) limitations. The D-channel is circuit switched. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64Kb/s clear data channels.

Note:

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

Error log entries and recommended actions

Table 257: TBRI-TRK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port location`
513 (b)		Service State Audit (#256)	WRN	OFF	
1793 (c)	8, 9		WRN	OFF	
3073 (d)		Service State Audit (#256)			
3585 (e)					
3841 (f)			WRN	OFF	

Notes:

a. **Error Type 0**: run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

b. **Error Type 513:** the far-end has reported that this channel is not administered. The trunks are placed in the out-of-service state.

c. **Error Type 1793:** the signaling link is down:

- Aux Data 8 indicates the Signaling Link is down.
- Aux Data 9 indicates the Port is out of service.

d. **Error Type 3073:** the Service State Audit failed. The test will be run every 15 minutes until it passes.

e. **Error Type 3585:** unexpected Restart message. This error is logged only. No action is necessary.

f. **Error Type 3841:** B-channel Rejection Event. This action causes the Service State Audit, the Call State Audit, and the Test Call Audit to be executed.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link State Test (#1251)	X	X	ND
Service State Audit Test (#256)	X	X	ND
Call State Audit Test (#257)	X	X	ND
ISDN Test Call Test (#258)		X	ND

1. Destructive; ND = Nondestructive

TDM-BUS (TDM Bus)

MO Name	Alarm Level	Initial Command to Run[1]	Full Name of MO
TDM-BUS	MAJ MIN WRN	**`test tdm P`**	TDM bus

1. ***P*** is the port network number. Use **`list cabinet`** to find the port network(s) contained in a cabinet.

Description

Each port network has a pair of TDM buses, designated TDM bus A and TDM bus B, each with 256 time slots. This division allows for duplication of control channels and dedicated tone time slots. The first five time slots on each bus are reserved for the control channel, which is active on only one bus at a time in each port network. The next 17 time slots are reserved for system tones such as dial tone, busy tone and so on. As with the control channel, these time slots are active on only one bus, A or B, at a time. The rest of the time slots on each bus are for general system use such as carrying call-associated voice data. The 17 dedicated tone time slots that are inactive can also be used for call processing when every other available time slot is in use.

When the system initializes, the control channel is on TDM bus A and the dedicated tones on TDM bus B in each port network. If a failure occurs on one of the two buses, the system will switch any control, tone and traffic channels to the other bus. Service will still be provided, though at a reduced capacity.

The **`set tdm PC`** command has the effect of putting both the control channel and tone time slots on a specified bus, A or B. P specifies the port network's number, and C specifies the TDM bus, A or B. Throughout this discussion, PC refers to a specific TDM bus. References to *port circuit packs* include every circuit pack that terminates on the TDM bus, including the Expansion Interface TN570, and the following service circuit port boards: Call Classifier (TN744), Integrated announcement (TN750), Maintenance/Test (TN771), Speech Synthesizer (TN725B), Tone Detector (TN748 or TN420). Other terms used are:

- Control Channel Bus: the TDM bus carrying the active control channel
- Non-Control Channel Bus: the TDM bus with the inactive control channel
- Tone Bus: the TDM bus carrying the active tone time slots
- Non-Tone Bus: the TDM bus with the inactive tone time slots

TDM-Bus Fault Detection and Isolation

TDM-bus faults are usually caused by one of the following:

- A defective circuit pack connected to the backplane
- Bent pins on the backplane
- Defective bus cables or terminators

It is possible that a circuit pack can cause a TDM-bus fault and still exhibit trouble-free operation. For example, insertions of any circuit pack into a slot with TDM bus terminations may bend the backplane pins and short two leads together. Since the TDM bus is a shared resource, identification of the cause of a TDM-bus fault can be difficult. If a TDM-bus problem is suspected, run **`test tdm`** ***P***. If any of the resulting tests fail, you must perform a manual TDM bus isolation procedure to identify the cause of the problem.

Since the procedure for isolating TDM-bus faults involves removing circuit packs and possibly disconnecting entire carriers, the procedure is extremely destructive to the port network that contains the TDM bus being tested. If possible, arrange to perform this procedure at a time when traffic is minimal.

As circuit packs are removed or entire carriers are disconnected, any active calls terminating on those circuit packs or carriers will be dropped. If you have any hints about a particular circuit pack that may be causing the TDM bus problem investigate those before performing this procedure (for example, look at any circuit packs that were inserted into the PN just before the TDM bus problem appeared.

When straightening or replacing backplane pins in a carrier that contains a CFY1B Current Limiter, power to the *cabinet* must be removed. When straightening or replacing backplane pins in a carrier that does NOT contain a CFY1B Current Limiter, power to that *carrier* must be shut off. Failure to follow this procedure may result in damage to circuit packs and power supplies, and can be hazardous to the technician.

Note:

Maintenance software requires TN748 or TN420 Tone Detector, or TN2182 Tone Clock, or TN2312 IPSI circuit pack to test the TDM bus. Before starting these procedures, make sure that one of these is installed in the port network being investigated.

Procedure 1: Isolating TDM-Bus Faults

This procedure is an attempt to isolate the TDM-bus fault to circuit packs that are essential to the system's operation. For each of the following circuit packs in the port network where the TDM-bus fault appears, perform Procedure 1.

Circuit Pack	Error Log Names
Tone-Clock	TONE-BD, TONE-PT, and TDM-CLK
Tone Detector	DETR-BD, GPTD-PT, and DTMR-PT
Expansion Interface	EXP-INTF
Packet Interface	PKT-INT

1. Display the Alarm Log for the circuit pack using **`display alarms`**.
2. If there are alarms for the circuit pack, refer to that section and try to resolve the alarms.
3. Whether or not every alarm can be cleared, test the TDM bus again using **`test tdm`** ***`P`***.
4. If some TDM-bus tests fail, implement Procedure 1 for the next circuit pack.
5. If every TDM-bus test passes, the problem has been fixed.
6. If every circuit pack in the list has been investigated, go to Procedure 2.

Procedure 2: Removing and Reinserting Port Circuit Packs

Procedure 2 removes and reinserts port circuit packs (those in the carrier's purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until every circuit pack in the port network have been tried. To execute diagnostic procedures on the Expansion Interface and Tone-Clock circuit packs, see Procedure 3: Removing and Reinserting PN Control Circuit Packs. Although these circuit packs reside in purple slots, procedure 2 does not apply. This procedure *does* apply to the Tone Detector circuit pack.

If the TDM bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the TDM bus problem. However, other simultaneous failures might also be responsible for TDM-bus faults.

In Procedure 2, an option of working either with one circuit pack at a time or with multiple circuit packs simultaneously is available. In view of this capability, determine the level of service interruption that will be acceptable during the procedure. If causing a disruption to all users in the port network is deemed permissible, large groups of circuit packs should be worked with in order to get the job done quickly. However, *if large service disruptions are to be avoided*, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack.

1. Remove one or several circuit packs as appropriate. Any circuit packs that reside on the TDM bus that were recently inserted should be checked first.

   Remove port circuit packs which have failed the NPE Crosstalk Test (#6) first. To find which circuit packs failed this test, display the Error Log via the **`display errors`** command. Refer to the Maintenance documentation of each port circuit pack that has port errors to check if any error indicates the failure of the NPE Crosstalk Test. If no circuit pack failed the NPE Crosstalk Test (#6), remove one or several purple slot circuit packs.

   If you decide to remove multiple circuit packs, consider working with an entire carrier at a time to more quickly and reliably determine which circuit packs are not the source of trouble.

2. Run **`test tdm`** ***`P`*** to determine if the TDM-bus fault is still present.
3. If any of the TDM-bus tests fail:
   - Determine whether the backplane pins in the removed circuit pack's slot appear to be bent.
   - If the backplane pins are not bent, reinsert the circuit pack(s), and perform Procedure 2 for the next set of circuit packs.
   - If the backplane pins are bent, remove power to this carrier in the mer described previously.
   - Straighten or replace the pins and reinsert the circuit pack.
   - Restore power and repeat Procedure 2, beginning with Step 2, for the same circuit pack(s).
4. If none of the TDM-bus tests fail:
   - Reinsert the circuit pack(s) *one at a time,* and repeat the following substeps until every circuit pack has been reinserted.
   - Run **`test tdm`** ***`P`*** to determine if the TDM-bus fault has returned.
   - If any of the TDM-bus tests fail, the reinserted circuit pack is defective. Replace this circuit pack and repeat this procedure for the next circuit pack.
   - If none of the TDM-bus tests fail when every circuit pack has been reinserted, the problem has been fixed and the procedure is completed.

Continue with Procedure 3 if every port circuit pack has been checked, but the TDM-bus fault is still not resolved.

Procedure 3: Removing and Reinserting PN Control Circuit Packs

This procedure removes and reinserts a PN's control circuit packs. Use this procedure to test:

- TN570 Expansion Interface
- TN768, TN780, or TN2182 Tone Clock, or TN2312 IPSI

Check the Tone-Clock circuit pack next-to-last. Check the Expansion Interface circuit pack (TN570) last, because removing this circuit pack disconnects its PN. In a system with duplicated PNC, disruption of traffic can be minimized by following the procedure for the standby TN570 Expansion Interface circuit pack, and then entering **`reset pnc interchange`**. The formerly active Expansion Interface will be standby and can be checked without affecting the PN's service.

For instructions, at each step in a procedure that requires the removal and/or replacement of a circuit pack, refer to the documentation for the specific circuit pack's MO. Server and/or PNC interchanges may be required to complete these steps with the least amount of service disruption.

Procedure for PN with Unduplicated PNC

1. Remove the suspected circuit pack.
2. As in Procedure 2: Removing and Reinserting Port Circuit Packs, determine if the backplane pins on the back of the removed circuit pack's slot are bent.
3. If the backplane pins are bent, do the following:
    a. Power down the control carrier as described in the previous warning statement.
    b. Straighten or replace the pins.
    c. Insert the same circuit pack.
    d. Turn the power back on to reboot the system or to restart the PN.
    e. Run **`test tdm`** ***`P`*** to determine whether the TDM-bus fault still exists.
    f. If none of the TDM-bus tests fail, the procedure is complete.
    g. If some of the TDM-bus tests fail, replace the suspected circuit pack, and go to step 4.

    If not: Replace the circuit pack and turn the power back on to reboot the system.
4. Run **`test tdm`** ***`P`*** to determine whether the TDM-bus fault is still present.
5. If the TDM-bus fault is still present, the suspected circuit pack was not the cause of the TDM-bus failure. Do the following:
    a. Remove the replacement circuit pack that was just inserted and replace it with the previously suspected circuit pack.
    b. Repeat Procedure 3 for the next circuit pack on the list for this procedure.

    If none of the TDM-bus tests fail, the procedure is completed.

If Procedure 3 fails to identify the cause of the problem, go to Procedure 4: Isolating TDM-Bus Failures to Carriers.

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Procedure for PN with Duplicated PNC

In this type of configuration, the test procedure is made up of several independent parts. In a duplicated system, it is desirable to investigate whether circuit packs are causing TDM-bus problems when they are in active mode, in standby mode, or both. The procedure utilizes a PNC interchange in a PN. If the TDM-bus fault disappears after an interchange takes place, the newly standby Expansion Interface (PN), is suspect and should be replaced. If the problem still exists, the Tone-Clocks are then interchanged. If the TDM-bus failure then disappears, the newly standby Tone-Clock is suspect and should be replaced. If the TDM-bus problem still exists, then the procedure begins diagnostics on individual circuit packs and backplane pins.

Part 1 (PN Procedure)

1. Execute **status pnc** to determine which PNC is currently active.
2. Run **reset pnc interchange** to make the currently active PNC standby.
3. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone, replace the formerly active Expansion Interface circuit pack.
4. Run **reset pnc interchange** again to activate the PNC where the new Expansion Interface circuit pack resides.
5. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone, the procedure is finished.

   If not, replace the new Expansion Interface circuit pack with the originally suspected circuit pack, and continue with Part 2.

Part 2

1. Run **set tone-clock** to make the currently active Tone-Clock standby.
2. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone:

   a. Replace the formerly active Tone-Clock circuit pack.

   b. Run **set tone-clock** again to make the new Tone-Clock circuit pack active.

   c. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is still present, replace the new Tone-Clock circuit pack with the originally suspected circuit pack, and continue with Part 3.

Part 3

Use Part 3 for each individual circuit pack listed in the previous table. Run this procedure on every circuit pack in the standby PNC. If the TDM-bus failure still exists (once every standby circuit pack has been tested), execute **`reset pnc interchange`**, and **`set tone-clock`** to put the currently active circuit packs into standby mode so that this procedure can be run on each of them.

1. Remove the inactive suspected circuit pack.
2. As in Procedure 2, determine whether any backplane pins on the back of the removed circuit pack's slot are bent.
3. If the pins are bent, do the following:
   a. Remove power as described in the previous warning statement.
   b. Straighten or replace the pins.
   c. Restore power.
   d. Run **`test tdm`** ***`P`*** to determine whether the TDM-bus fault is still present.

      If the TDM-bus failure is still present, the problem is with another circuit pack. Reinsert the originally suspected circuit pack, and repeat Part 3 for the next circuit pack.
   e. If the TDM-bus failure has disappeared, reinsert the circuit pack and run **`test tdm`** ***`P`*** to see if the TDM-bus failure is still present.

      If any of the TDM-bus tests fail, replace the suspected circuit pack. The procedure is finished.

      If not, the procedure is finished.

   If the backplane pins are not bent, run **`test tdm`** ***`P`*** to determine whether the TDM-bus fault is still present.
   f. If any of the TDM-bus tests fail, the problem is with another circuit pack. Reinsert the originally suspected circuit pack, and repeat Part 3 for the next circuit pack.
   g. If not, replace the suspected circuit pack. The procedure is finished.
4. If every standby circuit pack has been tested but the TDM-bus failure still exists, execute **`reset pnc interchange`** and **`set tone-clock`** to put the currently active circuit packs into standby mode. Repeat Part 3 of this procedure for each of the newly active circuit packs.

Procedure 4: Isolating TDM-Bus Failures to Carriers

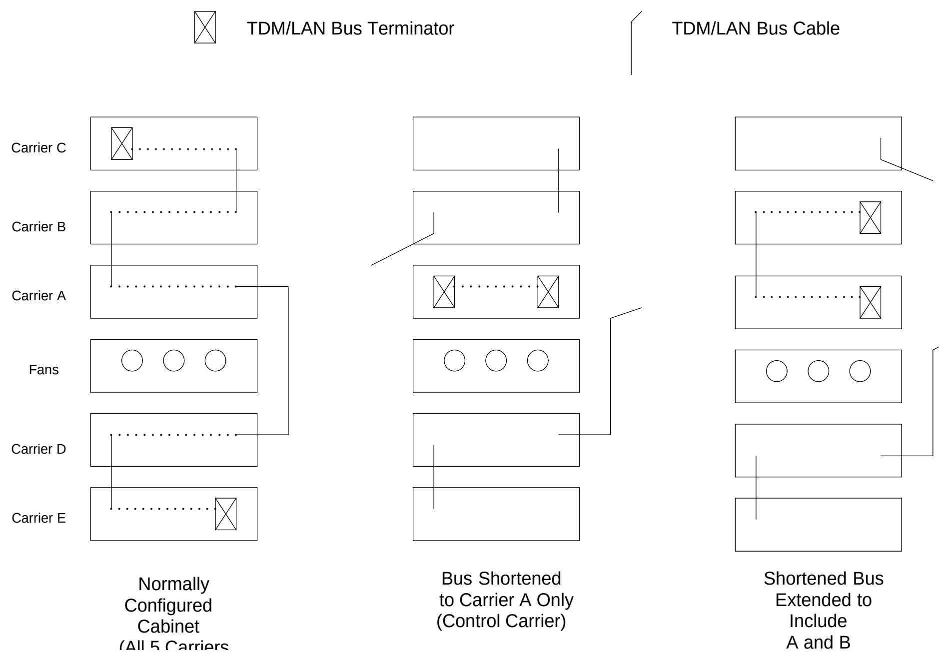
Procedure 4 attempts to isolate a TDM-bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 4 is used if the preceding procedures fail, because it can help locate failures of:

- Multiple circuit packs
- The carrier's hardware itself

In this procedure, the TDM/LAN cable assemblies and TDM/LAN bus terminators are replaced.

If replacement does not resolve the TDM-bus fault, the cabinet is reconfigured so that certain carriers are disconnected from the TDM bus. This is done by moving the TDM/LAN bus terminators (ZAHF4) on the carrier's backplane. To terminate a TDM bus at the end of a particular carrier, the TDM bus cable that connects the carrier to the next carrier should be unplugged and replaced with a TDM/LAN bus terminator (see Figure 87). As the length of a TDM bus is *modified*, any essential circuit packs to the system's operation and TDM-bus maintenance (for example, Tone-Clock), must still be connected to the *shortened* TDM bus.

Figure 87: Carrier Rewiring Example — Rear View of 5-Carrier Cabinet



After cabling changes are made and verified, power must be restored to the PN. Circuit packs in carriers outside the shortened bus are not inserted. As a result, these circuit packs are alarmed. Ignore these alarms for now. Every alarm should be resolved when the cabinet is restored to its original configuration.

Procedure 4 is organized into two parts. Part 1 attempts to clear a TDM-bus fault by replacing every bus cable and terminator within a PN. Part 2 attempts to isolate the fault to a particular carrier by extending the TDM bus from the control carrier to additional carriers one at a time.

Power must be removed from the entire PN before any cables or terminators are removed. Failure to follow this procedure can cause damage to circuit packs and power supplies, and can be hazardous to the technician.

Part 1

1. If spare TDM/LAN cable assemblies and TDM/LAN bus terminators are not available, go to Part 2 of this procedure.
2. Power down the PN.
3. Replace every TDM/LAN cable assembly and both TDM/LAN bus terminators.
4. Restore power to the PN.
5. Run **`test tdm P`** to determine whether the TDM-bus fault is still present.
6. If the TDM-bus fault is resolved, the procedure is finished. Otherwise, continue with Part 2.

Part 2

1. Terminate the TDM bus so that it extends only across the carrier that contains the active Expansion Interface.
2. Run **`test tdm P`** to determine whether the TDM-bus fault is still present.

   If the *shortened* TDM bus does not extend to a carrier continuing the Tone Detector circuit pack, the:

   - Non-control channel test (#297) will not be able to run
   - Bus that the non-control channel was on will not be tested

   If this is the case, run **`set tdm PC`** to move the control channel to the non-active bus. The **`status port-network P`** command shows which bus is currently active. After the bus switch has occurred, run **`test tdm P`** again to determine whether the newly active bus is faulted.

   Another option is to move a Tone Detector circuit pack to an empty slot, if one is available, in the carrier where the TDM bus is terminated. This would:

   - Allow both the control channel and non-control channel tests to run
   - Not require **`set tdm P`** command to be run
3. If none of the TDM-bus tests fail, extend the TDM bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, perform Procedure 2 for only the circuit packs in that carrier.
4. If any of the TDM-bus tests fail and Procedures 2 and 3 did not resolve the problem, the added carrier(s) are defective and must be replaced.

Restarting Non-Functioning Port Circuit Packs

A defective TDM-bus control channel or system-timing reference on one of the EPNs can cause port circuit packs residing outside the PN's control carrier to enter the reset state. When this situation occurs, the circuit pack will stop functioning, and its red LED will light. The system does not detect the presence of a circuit pack when it is in the reset state. Executing **`list config board`** shows that the circuit pack is absent.

If a circuit pack enters the reset state, it remains out of service until it receives a restart message from the control channel on the same TDM bus (A or B) that was active when it reset, or until it is powered up again.

To force the system to send a restart message to every circuit pack on a network, try one of the following methods, depending on the circumstances. Any normally functioning circuit pack (i.e., not in reset state) will ignore the restart message.

Procedure 1 (Nondestructive)

If the control channel is on the same TDM bus as it was when the circuit pack entered the reset state, Enter **`test tdm`** ***P*** to execute the Idle Time Slot test (#294).

Procedure 2 (Nondestructive)

If you are on-site, reseat the circuit pack. This action causes the circuit pack in the reset state to begin functioning on the control channel of the *current* bus.

Procedure 3 (Destructive)

Enter the **`reset port-network`** ***P*** **`level 2`** command to reset the PN containing the circuit pack in the reset state. During a PN reset, two restart messages (one on the control channel of each TDM bus) are sent to each circuit pack in the PN. Resetting the PN disrupts every call going to and originating from the PN.

Procedure 4 (Destructive)

Execute **`recycle carrier`** ***PC***. This command removes and restores power to the designated port carrier. Thus, any other circuit packs in this carrier will also be temporarily taken out-of-service.

Error log entries and recommended actions

Table 258: TDM-BUS Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	**`test tdm`** ***`P`***
1	0	Control Channel test (#296)	MIN	ON	**`test tdm`** ***`P`*** **`r 3`**
18 (a)	0	**`busyout tdm`** ***`PC`***	WRN	ON	**`release tdm`** ***`PC`***
35 (b)	0-1	TDM bus Corruption	MIN	ON	**`set tdm`** ***`PC`***
257 (c)	0		MAJ	ON	
513 (d)	Any	Idle Time Slot test (#294)	MIN	ON	**`test tdm`** ***`P`*** **`r 3`**
769 (e)	Any	Idle Time Slot test (#294)	WRN	ON	**`test tdm`** ***`P`*** **`r 3`**
769 (f)	Any	Idle Time Slot test (#294)			(see Notes)
1025 (g)	Any				
3872 (h)	Any				
3873 (h)	Any				
3874 (h)	Any				
3877 (h)	Any				

Notes:

a. **Error Type 18:** the TDM bus has been busied out by the technician. The error will retire when the technician releases the TDM bus.

b. **Error Type 35:** this error indicates the TDM bus is corrupted. If the corruption was on the Control Channel bus, TDM bus maintenance automatically switches the control channel and/or tones to the other bus. The same strategy applies if the corruption was on the bus carrying the tones.

An Aux Data value of 0 indicates the last reported TDM bus corruption was on the Control channel bus.

An Aux Data value of 1 indicates the last reported TDM bus corruption was on the Non-Control channel bus.

c. **Error Type 257:** this error indicates the TDM bus was switched to the other bus due to TDM bus corruption. The Aux Data value is not meaningful and no action is required. Look for other TDM-BUS errors to determine the cause of this error.

d. **Error Type 513:** some time slots are corrupted in the specified TDM bus. The Minor alarm is raised when there are more than 50 bad time slots in the bus. The Aux Data indicates the number of bad time slots found by the test.

e. **Error Type 769:** some time slots are corrupted in the specified TDM bus. The Warning alarm is raised when there are more than 10 bad time slots but less than or up to 50 bad ones in the bus. The Aux Data value indicates the number of bad time slots found by the test.

f. **Error Type 769:** the idle time slot test found less than 10 bad time slots in the TDM bus. The Aux Data value indicates the number of bad time slots found by the test. There is no alarm associated with this error.

g. **Error Type 1025:** the daily TDM bus switch was not successful. The active Expansion Interface (PN) cot talk on the bus that software was trying to switch into. There is no alarm associated with this error.

h. **Error Type 3872, 3873, 3874, and 3877:** these errors indicate communication problems which may be causing message loss. TDM bus maintenance may switch the Control channel bus and/or Tone bus to the other bus. Test the TDM bus using **`test tdm`** ***`P`*** and follow the procedures according to the Error Codes reported from the test. The Aux Data value shows the Angel ID number for which a downlink message was lost.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Test (#296)	X	X	ND
Non-control Channel Test (#297)	X	X	ND
Idle Time Slot Test (#294)	X	X	ND

1. D = Destructive; ND = Nondestructive

TDM-CLK (TDM Bus Clock)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TDM-CLK	MAJ MIN	`test tone-clock` *`location`*	TDM bus Clock
	WRN	`release tone-clock` *`location`*	

Note:

Replacing the Tone-Clock circuit pack or the IPSI requires a special procedure described in the documentation for TONE-BD (Tone-Clock Circuit Pack). That section also describes the LED displays for these circuit packs.

The Time Division Multiplex (TDM) Bus Clock resides on the Tone-Clock circuit, providing clocking signals both for the TDM bus and the LAN Bus. The Tone-Clock circuit is a critical component in the system and is necessary to ensure the operation of every port circuit pack in the system. The TDM buses of every EPNs is synchronized together. The system timing reference can be derived internally from the Tone-Clock circuit in any PN, or from an external (off-board) timing reference. Currently, the TDM bus Clock supports synchronizing the TDM bus with interface rates from Digital Signal 1 (DS1) facilities as primary or primary and secondary references, (**S8700 | S8710 | S8720**: and from Stratum-3 clock (STRAT-3) facilities. Only the TN780 tone-clock supports a Stratum-3 clock.)

Moreover, the TN2314 Processor/Tone-Clock circuit pack aids in monitoring and selecting synchronization references. The TN2314 Processor/Tone-Clock circuit pack, after detecting that the external source of timing is not valid, will automatically begin its escalation procedure, according to the facilities administered. In the following table, successive losses of signal cause escalation from left to right.

Switching back to a DS1 source is handled by synchronization maintenance, once any problems with it are corrected and tested.

S8700 | S8710 | S8720: However, once synchronization has been switched to the internal timing source of the master Tone-Clock circuit, switching back to a Stratum-3 clock must be initiated by a technician after the external reference has been repaired.

Table 259: Synchronization - Tone Clock Roles ***1 of 2***

Tone-Clock Role	Synchronization Facilities	Initial External Synchronization Source	Backup External Synchronization Source	Internal Source
S8700-series Fiber-PNC MASTER	Stratum-3 clock	Source “A”	Source “B”	Local oscillator
				1 of 2

Table 259: Synchronization - Tone Clock Roles ***2 of 2***

Tone-Clock Role	Synchronization Facilities	Initial External Synchronization Source	Backup External Synchronization Source	Internal Source
MASTER	DS1 Primary and Secondary	DS1 Primary	DS1 Secondary	Local oscillator
	DS1 Primary Only	DS1 Primary	None	
	No External Source	None	None	
S8700-series Fiber-PNC SLAVE	PNC Duplication	Active EI	Standby EI	
	No PNC Duplication	Active EI	None	
				2 of 2

See SYNC (Port Network Synchronization) for more details about the escalation plan. There is a strong interdependency among the DS1 Interface circuit pack's Maintenance, Synchronization Maintenance, and TDM Bus Clock Maintenance MOs.

S8700-series Fiber-PNC: See TONE-BD (Tone-Clock Circuit Pack) for a discussion of the relationship of Tone-Clock circuits with the various reliability options.

Error log entries and recommended actions

Table 260: TDM-CLK Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Recommended Action
0 (a)	0	Any	Any	Any	`test tone-clock` *`location`*
1 (b)	0		MIN	OFF	
18 (c)	0	busyout tone-clock location	WRN	OFF	`release tone-clock` *`location`*
130 (d)					
257 (e)			WRN	OFF	
513 (f)	Any	Clock Circuit Status inquiry (#148)	MIN[2]	OFF	`test tone-clock` *`location`*
					1 of 2

Table 260: TDM-CLK Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Recommended Action
769 (g)	Any	Clock Circuit Status inquiry (#148)	MAJ‡	ON	`test tone-clock` ***`location`*** `r 10`
1025 (h)	Any	Clock Slip inquiry (#149)			`test tone-clock` ***`location`***
1281 1282 (i)	Any		MIN	OFF	
1537	Any	Clock PPM inquiry (#150)			`test tone-clock` ***`location`***
2049 (j)	Any	Standby Reference Health Check test (#651)	MAJ[2]	ON	`test tone-clock` ***`location`***
2305 (k)	0		WRN	OFF	
					2 of 2

1. As a general rule, any *on-board* errors against the TDM Bus Clock should be resolved before pursuing any other errors against PNC components. *Off-board* clock errors may be caused by other board errors, and should be addressed after on-board errors have been resolved.

2. Major or Minor alarms on this MO may have been downgraded to Warning based on the values in set options.

Notes:

a. **Error Type 0:** run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** the IPSI or Tone-Clock circuit pack may have a clock at the edge of its specified frequency. This can cause Expansion Interface circuit packs and SNI circuit packs to go out-of-frame or report no-neighbor conditions. This can is turn cause EPNs, Expansion Archangel Links (EALs), Remote Neighbor Links (RNLs), and/or Local Neighbor Links (LNLs) to go down. When this error is alarmed, the Clock Health Inquiry test (#46) will fail with an Error Code of 1.

   1. Replace the IPSI or Tone-Clock circuit pack identified in the error log. See Replacing the IPSI or Tone-Clock Circuit Pack.

c. **Error Type 18:** the indicated Tone-Clock circuit has been made unavailable using **`busyout tone-clock`** ***`location`***. It only applies to systems with the high- or critical-reliability option administered, because only a standby Tone-Clock circuit may be made busy by that command. To resolve this error, execute **`release tone-clock`** ***`location`*** for the alarmed circuit pack.

d. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 257:** the Tone-Clock circuit pack in PN 1 is not a TN780 although Stratum-3 synchronization is administered. Either:

   1. If a Stratum-3 clock is being used, replace this Tone-Clock with a TN780.
   2. If not, change synchronization administration to Stratum 4.

f. **Error Type 513:** the tone-clock has reported an out-of-lock condition. A aux value of 1 indicates this error is an out-of-lock with the primary reference. An Aux Data value of 2 indicates that this error is an out-of-lock with the secondary reference. It could not lock onto the frequency of that synchronization reference. This will lead to a change in the synchronization reference if the condition continues.

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g. **Error Type 769**: The IPSI's Tone-Clock circuit or Tone-Clock circuit pack might be defective, however it may be a software failure that can be corrected by testing.

   1. Check to see if the board is duplicated (**`list cabinet`** and **`status port-network`**) on the affected port network.
   2. If the board is not duplicated, use **`test tone-clock`** ***`location`*** **`long`** to resolve the errors. The long test resets the board and is required to reload on-board RAM associated with the TN2182's DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds, meaning that no dial tone or touch tones are available during this interval. This will probably not affect calls in progress, but could cause a call origination to abort or a user not to get dial tone when going off-hook.
   3. If every test passes and the alarm does not resolve, retest with **`test tone-clock`** ***`location`*** **`long clear`**.
   4. If the test passes, terminate the repair process. If the test fails, replace the circuit pack at the customer's convenience.
   5. If this error was logged against the standby Tone-Clock, and if the Aux Data value was 18369, SYNC (Synchronization) maintenance acts on this error. No corrective action is required. For any other Aux Data, go to the next step.
   6. If the board is duplicated, switch to the standby side (**`set tone-clock`**).
   7. Test the alarmed board (**`test tone-clock`** ***`location`*** **`long`**). This resets the board and is required to reload on-board RAM associated with the TN2182's DSPs.
   8. If every test passes and the alarm does not resolve, retest (**`test tone-clock`** ***`location`*** **`long clear`**).
   9. If the test passes, terminate the repair process. If the test fails, replace the circuit pack at the customer's convenience.

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h. **Error Type 1025:** Processor/Tone-Clock circuit on-board maintenance has detected one or more clock slips, timing differences between its internal reference source and the synchronization signal provided by the master Tone-Clock. Although no clock slip errors are expected during normal operation, both manual and automatic interchanges of Tone-Clock circuit, synchronization references, and PNCs could result in clock slip counts.

If Error Type 1281 also is logged for the same Tone-Clock circuit, it is related to this problem and should be corrected first. Otherwise, continue with the following procedure.

1. Use **`test tone-clock`** ***`location`***, and examine the results of Test #149 to see if slip errors still appear. If no new slip errors are reported, and if these errors are not causing a TDM-CLK alarm, they may be ignored. Use **`test tone-clock`** ***`location`*** **`long clear`** to clear the errors.
2. Otherwise, enter **`display errors`**, and follow corrective procedures for any other TDM-CLK, TONE-BD, SYNC, DS1C-BD, EXP-INTF, SNC-BD, and SNI-BD errors logged, except for those in Table 261: Error Log Entries for Slip Errors.

Table 261: Error Log Entries for Slip Errors

Circuit Pack Name	Error Log Name	Error Log Number of Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface		3073 to 3160
DS1C Circuit Pack	DS1C-BD	3329

3. If Error Type 1025 errors persist, see SYNC (Port Network Synchronization).

i. **Error Type 1281:** the Processor/Tone-Clock circuit has detected a loss of timing signal from the system's synchronization reference. The Processor/Tone-Clock circuit has switched synchronization references.

1. Resolve any errors logged against the SYNC (Port Network Synchronization) or STRAT-3 (Stratum-3 Clock) MOs.
2. See SYNC (Port Network Synchronization), if the error is not resolved by step 1.

Error Type 1282: the TN2182 tone-clock was synchronized to a DS1 facility and that the reference frequency provided by the DS1 drifted beyond a range that could be tracked by the TN2182. Therefore the TN2182 is no longer synchronized to that DS1 reference. If a second DS1 is available, the tone-clock may be synchronized to that reference. If no secondary DS1 reference is available, the tone-clock will run off of its internal clock. This may result in slips being reported by the tone-clock and every DS1 facility.

j. **Error Type 2049:**

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The Tone-Clock circuit in the master port network was unable to detect the incoming synchronization signal, but the other tone-clock was able to detect the references. If the Aux Data is 0, the problem is with the signal on the primary. If the Aux Data is 1, the problem is with the signal on the secondary. The system should switch clocks in this situation.

1. If this error is against PN 1's clock board and the system is using a Stratum-3 clock, check the cabling that brings the Stratum-3 signal to this clock board.
2. Replace the current standby IPSI or Tone-Clock circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.

k. **Error Type 2305:**

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The indicated Tone-Clock circuit is an active **slave** Tone-Clock that has detected a loss of timing signal from its EXP-INTF synchronization source. (A slave Tone-Clock resides in a PN that does not contain the system's reference synchronization source.)

1. Enter **`display errors`** and **`display alarms`**, and follow the repair procedures for EXP-INTF (Expansion Interface Circuit Pack), TDM-CLK (TDM Bus Clock), and TONE-BD (Tone-Clock Circuit Pack) error log entries that have on-board alarms.
2. If the 2305 errors persist, follow the repair procedures for EXP-INTF (Expansion Interface Circuit Pack) error log entries 257, 769, or 770, or any errors logged against SNI-BD (SNI Circuit Pack), SNC-BD (Switch Node Clock Circuit Pack), or FIBER-LK (Fiber Link).
3. If the 2305 errors persist:

   a. *For Port Networks with more than one Tone-Clock circuit,* execute **`test synchronization r 10`** to see if new 2305 errors against TDM-CLK were reported. If not, execute **`reset pnc interchange`** and **`test synchronization r 10`** again, and recheck for new 2305 errors against TDM-CLK

   b. *For Port Networks with a single Tone-Clock circuit,* execute **`test synchronization r 10`** to see if new 2305 errors were reported.

   If no new instances of the 2305 errors were logged for either test, enter **`test tone-clock`** ***`location`*** **`long clear`** to clear the TDM-CLK errors. The procedure is complete.

4. *For Port Networks with more than one Tone-Clock circuit:*

   a. Enter **`set tone-clock`** ***`location`*** to interchange the Tone-Clocks.

b. Run `test synchronization r 10` to see if new 2305 errors are reported against the new active Tone-Clock circuit.

c. If not, replace the standby Tone-Clock circuit. See Replacing the IPSI or Tone-Clock Circuit Pack.

If this clears the error, the problem has been resolved.

5. Replace the EI circuit pack for the active PNC.

6. If the problem is still not cleared and the IPSI or Tone-Clock circuit pack reported in the error log has not yet been replaced, replace it. See Replacing the IPSI or Tone-Clock Circuit Pack.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
SAKI Sanity Test (#53)			X	D
Clock Health Inquiry Test (#46)	X	X		ND
Control Channel Looparound Test (#52)	X	X		ND
Tone Generator Crosstalk Test (#90)		X		ND
Tone Generator Transmission Test (#40)	X	X		ND
Tone Generator Update/Audit Test (#41)	X	X		ND
TDM Bus Clock Circuit Status Inquiry Test (#148)	X	X		ND
TDM Bus Clock Slip Inquiry Test (#149)	X	X		ND
TDM Bus Clock PPM Inquiry Test (#150)	X	X		ND
TDM Bus Clock Parameter Update Test (#151)	X	X		ND
Board Type Check Test (#574)	X	X		ND
Standby Reference Health Check Test (#651)		X		ND

1. D = Destructive; ND = Nondestructive

TDMODULE (Trunk Data Module)

See PDMODULE (Processor Data Module).

TIE-BD (Tie Trunk Circuit Pack)

MO Name in Log	Alarm Level	Initial Command To Run	Full Name of MO
TIE-BD	MIN WRN	**test board *location***	Tie Trunk Circuit Pack

See XXX-BD (Common Port Circuit Pack/Media Module) for circuit-pack level errors.

See TIE-TRK (Analog Tie Trunk) for trunk information.

TIE-DS1 (DS1 Tie Trunk)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TIE-DS1[1]	MAJ[2] MIN	**test trunk *grp#/mem#* long**[3]	DS1 Tie Trunk
	WRN	**test trunk *grp#/mem#***	

1. For additional repair information, see DS1-BD (DS1 Interface Circuit Pack) if the tie trunk is on a TN722 or TN767 DS1 circuit pack. See UDS1-BD (UDS1 Interface Circuit Pack) UDS1-BD documentation if the tie trunk is on a TN464 UDS1 circuit pack. See MG-DS1 (DS1 Interface Media Module) if the tie trunk is on a DS1 Interface Media Module.

2. A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75% of the trunks in this trunk group are alarmed.

3. For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms. Test #7 is part of the long sequence and generates on-board alarms. Before entering busyout, release, reset or test board long commands, check the vintage number of the circuit pack with **list configuration board *location***. If it is TN767B vintage 8 or 9, do not use the above commands until you ensure that Test #136 passes via test board short. Otherwise, extraneous on-board alarms may be generated.

Note:

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration form. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to the *Administering Avaya Aura™ Communication Manager* for information on how to administer trunks. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

The DS1 tie trunk provides both voice and data communications between two PBX switches. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

Note:

32-channel mode is supported only on TN464 circuit packs.

DS1 Tie Trunks are used widely in the Distributed Communications System (DCS) and Central Attendant Service (CAS) system features. A DS1 tie trunk can also be used as an access endpoint which is a non-signaling channel with bandwidth for voice-grade data, 56- or 64-kbps data. DS1 tie trunk maintenance provides a strategy to maintain a DS1 tie trunk via a port on the TN722 or TN767 DS1 Interface circuit pack, the TN464 UDS1 Interface circuit pack, or the DS1 Interface Media Module. Throughout this TIE-DS1 section, the term DS1 Interface applies to DS1 or UDS1 circuit packs, or to DS1 Interface Media Modules.

Note:

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

The DS1 tie trunk maintenance strategy covers logging DS1 tie trunk hardware errors, running tests for trunk initialization, periodic and scheduled maintenance, demand tests, and alarm escalation and resolution. Three different trunk service states are specified in DS1 tie trunk maintenance:

Out-of-service	The trunk is deactivated and cot be used for incoming or outgoing calls.
In-service	The trunk is activated and can be used for both incoming and outgoing calls.
Disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

If the DS1 Interface circuit pack or media module is out of service, every trunk on the DS1 Interface circuit pack or media module is placed into the out-of-service state and a Warning alarm is raised.

Error log entries and recommended actions

Table 262: TIE-DS1 Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test trunk` *`grp#/mem#`*
1 (b)	57476 57477 57485 57487				
15 (c)	Any	Port Audit and Update (#36)			
18 (d)	0	`busyout trunk` *`grp#/mem#`*	WRN	OFF	`release trunk` *`grp#/mem#`*[1]
19 (e)	0				
130 (f)			WRN	ON	`test trunk` *`grp#/mem#`*
257 (g)	57473 57474				
					1 of 2

Table 262: TIE-DS1 Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
513 (h)	57392	DS1 Tie Trunk Seizure (#136)	MAJ MIN[2]		
769 (i)	57393	DS1 Tie Trunk Seizure (#136)	MAJ MIN[2]		
1025		DS1 Tie Trunk Seizure (#136)	MIN WRN[2]	OFF	`test trunk` ***`grp#/mem#`*** `r 2`
1281		Conference Circuit Test (#7)	MIN WRN[2]	ON	`test trunk` ***`grp#/mem#`*** `l r 4` [1]
1537		NPE Crosstalk Test (#6)	MIN WRN[2]	ON	`test trunk` ***`grp#/mem#`*** `l r 3` [1]
1793 (j)					`test board` ***`location`*** `long` [1]
2305 (k)	50944	DS1 Tie Trunk Seizure (#136)	MAJ MIN[2]	OFF	
2562 (l)	16665				
2817 (m)	52992				
3840 (n)	Any	Port Audit and Update (#36)			
					2 of 2

1. For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms. Test #7 is part of the long sequence and generates on-board alarms. Before entering busyout, release, reset or test board long commands, check the vintage number of the circuit pack with **`list configuration board`** ***`location`***. If it is TN767B vintage 8 or 9, do not use the above commands until you ensure sure that Test #136 passes via test board short. Otherwise, extraneous on-board alarms may be generated.
2. Major or Minor alarms on this MO may have been downgraded to Warning based on the values in **`set options`**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** the DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. This error can be caused by incompatible translations. Make sure the parameters administered on the DS1 circuit pack or media module form match those administered on the far-end switch. See *Administering Avaya Aura™ Communication Manager* for details.

The Aux Data field indicates the following hardware Error Types:

57476	On-hook before wink
57477	On-hook before ready to receive digits
57485	Wink too short for valid signal
57487	The timer expired while waiting for an off-hook signal from the far end as a response at end-of-digits dialing. Check the far-end switch for related problems.

If every administration parameter between the switch and the far end match and these errors continue to recur, follow normal escalation procedures.

c. **Error Type 15:** this is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

d. **Error Type 18:** the DS1 tie trunk has been busied out with **`busyout trunk`** ***`grp#/mem#`***. No calls can be made on this trunk except for the Facility Access Test call. See *Administering Avaya Aura™ Communication Manager.*

e. **Error Type 19:** the far end may be out-of-service, or the Electronic Tandem Network may be busied out.

f. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

g. **Error Type 257:** the DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. The trunk cot communicate with the far end because it is unable to interpret digits sent from the far-end switch. The Aux Data field indicates the following:

57473	The rotary dial rate is below 8 pulses per second.
57474	The rotary dial rate is above 12 pulses per second.

Check with the far-end switch or operating company for proper trunk connection.

h. **Error Type 513:** the DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. The trunk is in-service/active and waiting for an “on-hook” from the far-end switch. No calls can be routed over the trunk while it is in this state. Aux Data 57392 indicates no external release on PBX disconnect. Check with the far-end switch or operating company for proper trunk connection.

i. **Error Type 769:** the DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. This error usually occurs after an occurrence of Error Type 513. The trunk has received the belated “on-hook” that it has been waiting for from the far-end switch. The trunk is restored to in-service/idle and can be used for calls. Aux Data 57393 indicates delayed external release on PBX disconnect. This error can be ignored.

j. **Error Type 1793:** the DS1 Interface circuit pack or media module is out-of-service. See the appropriate DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module) documentation for details.

k. **Error Type 2305:** reorder message. The trunk could not be seized. This error causes the Trunk Seizure test (#136) to run and is only a problem if the Seizure test fails (in which case Error Type 1025 also appears). In this case, the trunk may be put in “Ready-for-Service” state (shown as “disconnected” by the status command), which allows only incoming calls. Run the Trunk Seizure test (#136) and follow its procedures.

l. **Error Type 2562:** retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

m. **Error Type 2817:** glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and the far ends. Attempt to place the call again. If the error persists, execute the DS1 Tie Trunk Seizure test (#136) and follow its procedures.

n. **Error Type 3840:** Port Audit and Update test (#36) failed due to an internal system error. Enter **status trunk**, and verify the status of the trunk. If the trunk is out-of-service, enter **`release trunk`** to put it back to in-service. Retry the test command.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
DS1 Tie Trunk Seizure Test (#136)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

Note:

For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms Test #7 is part of the long sequence and generates on-board alarms. Before entering **busyout**, **release**, **reset** or **test board** ***location*** **long** commands, check the vintage number of the circuit pack with **list configuration board** ***location***. If it is TN767B vintage 8 or 9, do not use the above commands until first making sure that Test #136 passes using **test board** ***location***. Otherwise, extraneous on-board alarms may be generated.

TIE-TRK (Analog Tie Trunk)

MO Name In Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
TIE-TRK	MAJ[2] MIN	**test port *location* l**	Analog Tie Trunk
	WRN	**test port *location***	

1. If ATMS testing is enabled, check the error log for ATMS errors 3840 and 3841. If the error log indicates that measurements exceeded acceptable thresholds, and no other trouble is found with **test trunk**, run the ATMS test call with **test analog-testcall port *location* full**.
2. A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

   This alarm does not apply to TN497.

Note:

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administering Avaya Aura™ Communication Manager*. Refer to your Avaya representative for the correct settings for administrable timers and other parameters on a country-by-country basis.

The following circuit packs, including every suffix such as TN760D, support analog tie trunks:

Table 263: Analog Tie Trunk Circuit Packs

Code	Trunk Type	Signaling Leads
TN760	4-wire	E&M
TN437	4-wire	E&M
TN439	2-wire	A&B (2-way circuits only)
TN458	4-wire	E&M
TN497	2-wire	A&B
TN2140	4-wire	E&M

Each tie trunk circuit pack occupies a port circuit pack slot and contains 4 port circuits. Each port circuit supports 1 analog tie trunk used to connect the switch to another PBX across 1- or 2-way dedicated circuits (see preceding list).

A tie trunk port can also be administered as an access endpoint which is a non-signaling channel with a voice-grade data bandwidth. Tie trunk maintenance employs up to 6 tests, depending on the hardware involved, to monitor the operating condition of the trunk and its connections. The port must be idle for these tests to run. If an incoming call seizes the port while a test is in progress, the test aborts and the call proceeds (except for TN497).

The test are as follows:

1. NPE Crosstalk Test—Verifies the switch connection operation of the circuit pack. It verifies that the trunk circuitry talks only on the selected time slot on the TDM Bus and that it never crosses over to time slots reserved for other connections.
2. Looparound and Conference Circuit Test—Verifies the transmission operation of the circuit pack. It verifies that signals are transmitted to and from each port (Looparound within the port), and it tests the conference capabilities of all ports.

   This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from trunk administration test field.
3. Several seizure tests, including the following:
   - Tie Trunk Seizure Test verifies the seizure capabilities of the circuit pack. For the TN2140B circuit pack, this test activates the M lead and checks for a response from the distant end within 10 seconds. This test ABORTS on trunk ports administered as access endpoints.
   - Seizure Test (for TN497 circuit packs only)—Verifies the seizure capabilities of the circuit pack. This test seizes the trunk and outpulses a “pause.” The port reports the result of the seizure attempt uplink. The test can be disabled via Trunk Group Administration.
4. EPF, M, and E Lead Test ABORTS on trunk ports administered as access endpoints. This test consists of two parts:
   - E lead test—Checks for the proper activation and deactivation of the port’s E lead.
   - M lead test—Checks the M lead EPF current flow. The results of this test allow for distinguishing between circuit pack and external facility failures.
5. Port Audit Update Test (Audit & Update Test for the TN497 circuit pack)—Sends non-disruptive administrative updates to the circuit pack with no expected response. The test updates the translation information on individual ports of the Tie Trunk. Except for the TN497 circuit pack, these updates include:
   - Immediate, automatic, wink start, or delay dial; for the TN2140B, continuous-seize-ack
   - For the TN2140B, continuous or discontinuous.
   - Rotary or DTMF senderization in or out
   - Disconnect timing
   - DMTF time slot

Additional inline testing is performed whenever a call is in progress, logging errors that occur during operation. You can reproduce these types of errors by making a call over the trunk and then checking the Error Log.

By making translation and cross-connect changes, circuit packs (except for TN497) can be configured for back-to-back testing, also known as connectivity testing. Port operation is tested by connecting two tie trunk ports together in either E&M or simplex modes. See the section Analog tie trunk back-to-back testing in *Maintenance Procedures (03-300432)*.

Error log entries and recommended actions

Table 264: TIE-TRK Error Log Entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test port` *`location`*
1 (b)	16384		WRN	OFF	
1 (c)	57476		WRN	OFF	
1 (d)	57477		WRN	OFF	
1 (e)	57483		WRN	OFF	
1 (f)	57485		WRN	OFF	
15 (g)	Any	Port Audit and Update test (#36)			
18 (h)	0	`busyout trunk` *`grp#/mem#`*	WRN	OFF	`release trunk` *`grp#/mem#`*
130 (i)			WRN	ON	`test trunk` *`grp#/mem#`*
257 (j)	57473		WRN	OFF	
257 (k)	57474		WRN	OFF	
257 (l)	57475		WRN	OFF	
513 (m)	Any	EPF M and E Lead (#74)	MAJ MIN WRN[1]	OFF	`test port` *`location`* `r 3`
769 (m)	57481	EPF M and E Lead (#74)	MAJ MIN WRN[1]	ON	`test port` *`location`* `r 3`
					1 of 2

Table 264: TIE-TRK Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1025 (n)	Any	None	MAJ MIN WRN[1]	OFF	
1281 (m)	Any	EPF M and E Lead (#74)	MAJ MIN WRN[1]	ON	`test port` *`location`* `r 3`
1537		Looparound and Conference (#33)	MAJ MIN WRN[1]	ON	`test port` *`location`* `l r 3`
1793		Tie Trunk Seizure (#73) Dial Test #747 for TN439	MAJ MIN WRN[1]	OFF	`test port` *`location`* `r 2`
2049		NPE Crosstalk (#6)	MAJ MIN WRN[1]	ON	`test port` *`location`* `l r 3`
2305 (o)	57424 50944				
2561 (p)	0		WRN	OFF	
2562 (q)	16665				
2817 (p)	0		MIN	OFF	
2817 (r)	52992				
3073 (p)	0				
3840 (s)	8000	Transmission tests (ATMS) (#844–848)		OFF	`test analog-testcall`
3841 (s)		Transmission tests (ATMS) (#844–848)	MIN	OFF	`test analog-testcall` *`location`* `r 2`
					2 of 2

1. Minor alarms on this MO may be downgraded to Warning based on the values used in **`set options`**. If the MINOR alarm is not downgraded, the MINOR alarm is upgraded to a MAJOR alarm if 75% of the trunks in this trunk group are alarmed. These errors, if applicable, always log a MINOR alarm for TN439 and TN497.

Notes:

a. **Error Type 0:** run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** digit time-out. This occurs when the far-end PBX began transmitting digits too late (10 seconds) after receiving the signal indicating ready to receive digits (if any). This can occur on an incoming immediate, wink, or delay dial line. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

c. **Error Type 1:** rotary dial before wink. This occurs when the far-end PBX starts dialing before the PBX sends the wink on a wink-start or delay-dial trunk. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

d. **Error Type 1:** rotary dial too early. This occurs when the far-end PBX starts dialing too soon (about 50ms) after seizure on a wink start or delay dial line. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

e. **Error Type 1:** on-hook before wink. This occurs when the far end goes on-hook before a wink. Check the far-end PBX to ensure a translation match at both ends. This error applies only to TN439.

f. **Error Type 1:** on an outgoing wink-start or delay-dial trunk, the wink time was too short (less than 80ms) for a valid signal. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

g. **Error Type 15:** this is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

h. **Error Type 18:** this indicates that the trunk in question has been busied-out by maintenance personnel.

i. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack. TN439 does not alarm this error. This error does not apply to TN497.

j. **Error Type 257:** the rotary dial rate was too slow — less than 8 pulses per second. Check the far-end PBX to ensure a translation match at both ends.

k. **Error Type 257:** the rotary dial rate was too fast — above 12 pulses per second. Check the far-end PBX to ensure a translation match at both ends.

l. **Error Type 257:** the time between digits was too short (less than 300ms). Check the far-end PBX to ensure a translation match at both ends.

m. **Error Types 513, 769, 1281:** these errors do not apply to TN439 and TN497.

n. **Error Type 1025:** this indicates that the trunk is still seized with an incoming call. The far-end PBX is not releasing the trunk after the call was dropped. Check the far-end PBX for problems.

   Once the trunk is released from the call, the severity of this problem is decreased. If Error Type 1025 does not appear again, this means that the problem has been corrected. Verify that Error Type 1025 does not reappear in the Error Log.

o. **Error Type 2305:** reorder message. The trunk could not be seized. This error causes the Tie Trunk Seizure test (#73) to run and is considered a problem only if that test fails, logging error 1793. In this case, the trunk may be placed in the ready-for-service state, allowing only incoming calls. This service state shows up as **disconnected** on the Trunk Status screen. Run the Tie Trunk Seizure Test (#73), and follow recommended procedures.

   TN439 logs Aux Data 57424 or 50944. Other circuit packs log 50944. This error is associated with Tie Trunk Dial Test (#747) for TN439, Tie Trunk Seizure Test (#73) for TN497, and no test for the others.

p. **Error Type 2561, 2817:** these errors apply only to TN497.

q. **Error Type 2562:** retry failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

r. **Error Type 2817:** glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and the far ends. Attempt to place the call again. If the error persists, execute the Tie Trunk Seizure Test (#73), and follow its outlined procedures.

s. **Error Type 3840:** indicates measurements were in the marginal range. Use `list testcall detail` to examine the specific transmission parameters which are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, then the ATMS thresholds administered on page 4 of the trunk group screen should be changed.

   Error Type 3841: indicates that test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements in the unacceptable range.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Looparound and Conference Test (#33)		X	ND
Tie Trunk Seizure Test (#73)	X	X	ND
Tie Trunk Dial Test (#747)	X	X	ND
			1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tie Trunk EPF Test (#74)	X	X	ND
Port Audit And Update Test (#36)	X	X	ND
Automatic Transmission Test (#844-848)[2]			ND
			2 of 2

1. D = Destructive, ND = Nondestructive
2. ATMS tests are not part of either sequence. They are run either on demand with **`test analog-testcall`**, or by the ATMS schedule.

TIME-DAY (Time of Day)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TIME-DAY	MIN	**`set time`**	Time of Day

The time of day contains the current year, month, day of the week, day of the month, hour, minute, and second. The Time of Day MO monitors the time-of-day clock, and raises an alarm if the time-of-day clock is not set or cot be read by the software. If the time-of-day clock is not set or cot be read by the software, many features such as Time-of-Day Routing, CDR, ISDN Call-by-Call, and duplication, are inoperative or incorrect. Use **`set time`** to set the time-of-day clock when the system is initially powered up.

Use **`display time`** to read the time-of-day clock. Use **`set time`** to set the time-of-day clock. The time-of-day clock has a backup battery to save the time of day during power failures.

There are no demand tests associated with TIME-DAY.

Error log entries and recommended actions

Table 265: TIME-DAY Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0	0	Any	Any	Any	**`display time`**
247 (a)	0		MIN	OFF	**`set time`**

Note:

a. **Error Type 247:** software cot read the time-of-day clock. During this condition, every time stamp in the Alarm Log entry, Error Log entry, and Software Error Log entry is potentially inaccurate. In addition, any features that are sensitive to the time of day (such as SMDR, Time-of-Day Routing, ISDN Call-by-Call) will not function correctly.

To resolve the alarm:

1. Use **`set time`** to set the time of day.
2. Use **`display time`** to display the time of day. If the time of day is displayed correctly, wait 15 minutes and verify that the alarm is retired.

TONE-BD (Tone-Clock Circuit Pack)

MO Name	Alarm Level	Initial Command to Run	Full Name of MO
TONE-BD	MAJ MIN	**`test tone-clock`** ***`location`***	Tone-Clock circuit
	WRN	**`release tone-clock`** ***`location`***	

The TONE-BD MO supports PNs in a system using either a TN2312 IP Server Interface (IPSI) circuit pack, or non-IPSI EPNs equipped with Tone Clock circuit packs.

For IPSI-equipped EPNs, the TONE-BD MO consists of a module located on the IPSI circuit pack and provides tone generation, tone detection, call classification, clock generation, and synchronization. It replaces the TN2182B Tone-Clock board and is inserted into each PN's Tone-Clock slot. For non-IPSI EPNs, the TN2182B Tone-Clock circuit pack provides the functions.

The TN2312 IPSI circuit pack for a PN equipped with IPSIs, or the Tone-Clock circuit pack for a non-IPSI PN, contains two independent components:

- Tone Generator that provides every tone needed by the system
- Clock that generates the system clocks for both the Time Division Multiplex (TDM) bus and the packet (LAN) bus

It also aids in monitoring and selecting internal synchronization references.

When resolving an IPSI or Tone-Clock circuit pack's errors/alarms, the following sections should also be consulted:

- For non-IPSI EPNs, use the **`set tone-clock`** ***`location`*** command to establish the tone and synchronization resources for the system.
- For IPSI EPNs, use **`set ipserver-interface`** to establish the tone and synchronization resources for the system.
- TONE-PT (Tone Generator)
- TDM-CLK (TDM Bus Clock)
- SYNC (Synchronization)
- ETR-PT
- PKT-INT (IPSI only)

The TN2182 is a combined Tone-Clock/Detector circuit pack, providing Tone-Clock functionality to a non IPSI PN. It provides 8 Enhanced Tone Receiver (ETR) ports. Each of these ports combines the individual capabilities of a DTMR-PT, a GPTD-PT, and a CLAS-PT. Thus, each TN2182 port offers any tone-detection function previously provided by a TN748, TN420, or TN744 Tone Detector board.

The TN2182 also provides either Mu-law or A-law tone detection.

Since the TN2182 also provides Tone-Clock function for non IPSI port networks, only one (or two if your system is duplicated) TN2182 circuit packs may reside in a PN. If more tone-detection resources are needed, the additional resources must be provided by TN748, TN420, or TN744 circuit packs.

Tone-Clock and the Reliability Configuration

S8700-series IP-PNC

A Tone Clock circuit resides on each IPSI board. For increased reliability, there is a duplicated server, one in active mode and one on standby. However, there is only one control network and one IPSI per port network as shown in Figure 88: S8700 IP-PNC Duplex Reliability Configuration. Therefore there is only one Tone Clock circuit per port network.

Figure 88: S8700 IP-PNC Duplex Reliability Configuration

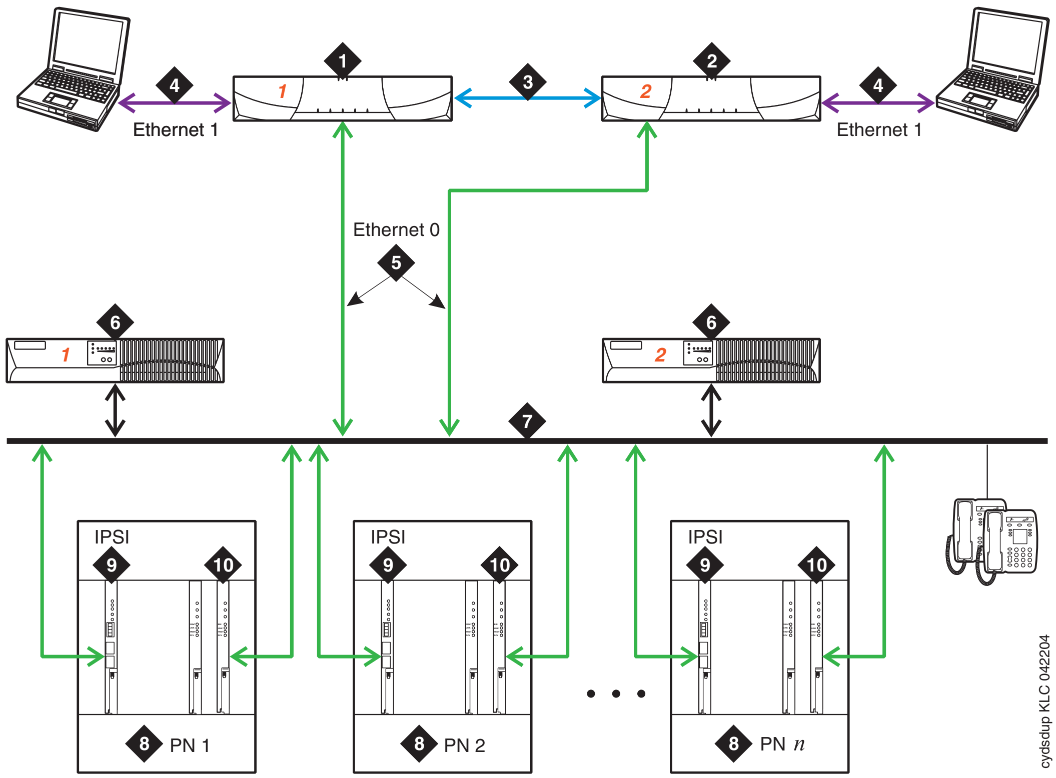


Figure notes:

1. S8700 Server 1 - two are always present, one in a active mode and the other on standby.
2. S8700 Server 2 - two are always present, one in a active mode and the other on standby.
3. Duplication Interface - The Ethernet connection between the two S8700 Servers.
4. Services Interface - The S8700 Servers dedicated Ethernet connection to a laptop. This link is active only during on-site administration or maintenance and the services interface can link to the non-active server through a telnet session.
5. Connection from the Servers to the Ethernet Switch.
6. Ethernet Switch - A device that provides for port multiplication by having more than one network segment. In an IP-PNC environment, the Ethernet Switch should support 802.1 IP/Q, VLAN and 10/100 mbps.
7. UPS units - two required.
8. Port Network - optional configuration of Media Gateways that provides increased switch capacity.
9. IPSI - provides transport of CCMS messages over IP allowing the S8700 Server to communicate with the Port Networks.
10. Customer LAN

In IPSI connected port networks, the Tone Clock circuit is found on the IPSI circuit pack. In non IPSI connected port networks, there is a Tone Clock circuit pack. The following sections describe the relationship between the various reliability options and the IPSIs or Tone Clock circuits.

Three items can be duplicated: server, IPSI, and PNC. Note that duplicated control networks and duplicated IPSIs go together; when the IPSIs are duplicated, the control networks must be duplicated. While all items can be independently duplicated, the combination of duplicated bearer networks (PNCs) and unduplicated control networks is not allowed. See Table 266: S8700 Fiber-PNC Reliability Configurations.

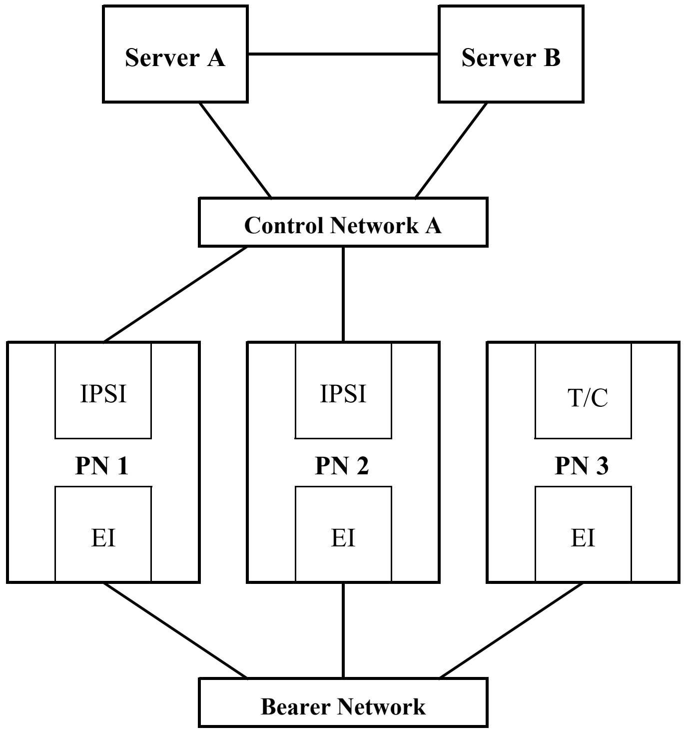
Table 266: S8700 Fiber-PNC Reliability Configurations

Configuration	Server	Control Network and IPSI	Bearer Network
Duplex Reliability	Duplicated	Unduplicated	Unduplicated
High Reliability	Duplicated	Duplicated	Unduplicated
Critical Reliability	Duplicated	Duplicated	Duplicated

Duplex-Reliability Configuration

The duplex-reliability configuration shown in Figure 89: Duplex-Reliability Configuration has a duplicated server, an unduplicated control network, unduplicated IPSIs in the IPSI connected port networks, and an unduplicated bearer network. Therefore the Tone Clock is not duplicated in the IPSI connected port network. In the non IPSI connected port network, the Tone Clock boards are also not duplicated.

Figure 89: Duplex-Reliability Configuration



Standard Reliability

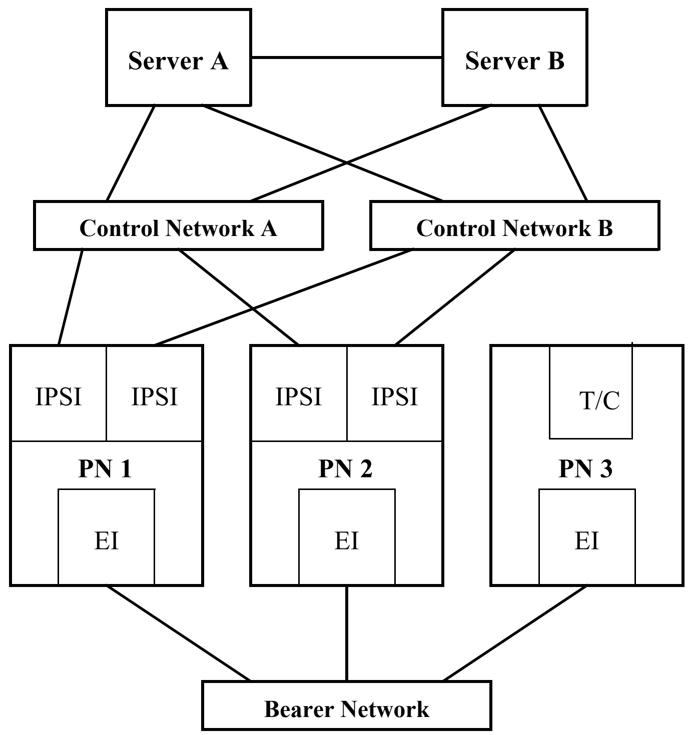
Systems with the standard-reliability option (no duplication options) have one Tone-Clock circuit pack in each port network. For the first Port Network of a cabinet this is in the A carrier. Cabinets containing a second EPN will also have a Tone-Clock circuit pack in the E carrier. This Tone-Clock circuit pack generates clocks and provides system tones for every carrier of the port network it resides in.

High Reliability

S8700-series Fiber-PNC: The high-reliability configuration shown in Figure 90: High-Reliability Configuration has a duplicated server, a duplicated control network, and duplicated IPSIs in the IPSI connected port networks. With this configuration, every IPSI connected PN must have duplicated IPSIs. The control network is duplicated so that a single fault in the control network, such as a bad Ethernet switch, won't bring the whole system down. The non IPSI connected port networks have unduplicated Tone-Clock boards.

An EPN's Tone-Clock circuit pack configuration is the same as for the standard-reliability option. Each PN's Tone-Clock circuit is active for both tones and clock signals for its port network.

Figure 90: High-Reliability Configuration



Systems with the High Reliability Option have one Tone-Clock circuit pack in each Port Network control carrier, A and B. One Tone-Clock circuit pack will be actively generating system clock signals for Port Network components, while the other will be in standby mode, ready to take over in the event of a Tone-Clock interchange. Similarly, one Tone-Clock circuit pack will be actively providing system tones for the Port Network, while the other will be in standby mode. Normally, the same Tone-Clock circuit pack will be active for both tones and clock signals, but these responsibilities may be divided if neither circuit pack is able to perform both functions. The **`status port-network`** command indicates which Tone-Clock circuit pack is actively performing each function.

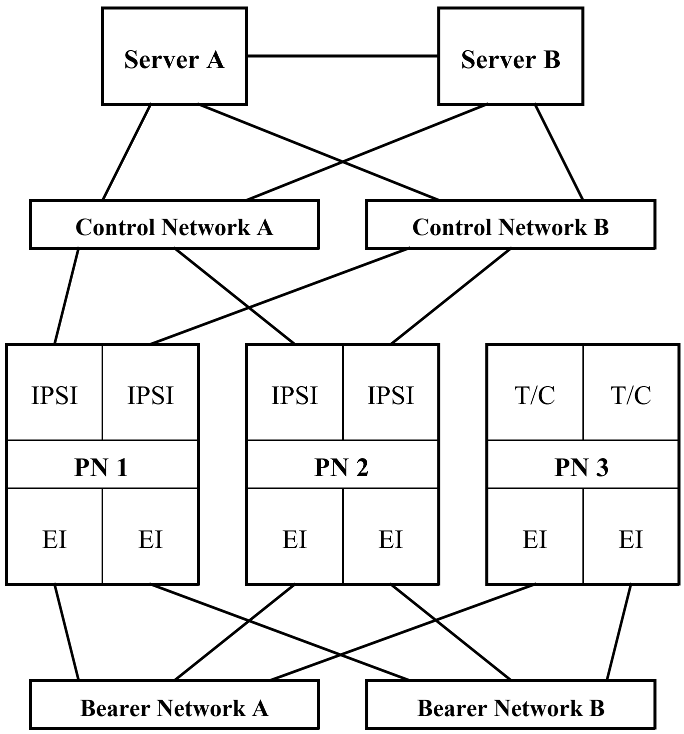
For systems using the TN2182 Tone-Clock-Detector circuit pack, tone generation and clock generation behaves the same as other clock boards with one being active and one being standby. But the tone detector ports (ETR-PTs) of the TN2182 are always considered available and in-service regardless of the active/standby state of the tones or clock for a specific circuit pack.

EPN Tone-Clock circuit pack configuration is the same as for the Standard Reliability Option. Each EPN Tone-Clock circuit pack will be active for both tones and clock signals for its port network.

Critical Reliability

S8700-series Fiber-PNC: The critical-reliability configuration shown in Figure 91 has full duplication of the following options: servers, control networks, IPSIs and PNCs (bearer networks). As with the high-reliability configuration, this configuration also requires that IPSI connected port networks have duplicated IPSIs. This configuration also requires that the non IPSI connected port networks have duplicated Tone-Clock boards (either TN2182 or TN780).

Figure 91: Critical-Reliability Configuration



Tone-Clock Interchange Strategy

There are three types of Tone-Clock interchanges:

- Autonomous interchanges initiated as a part of maintenance software strategy for the Tone-Clock or IPSI circuit packs.
- Manual interchanges initiated by `set tone-clock` or `set ipserver-interface`.
- Firmware-initiated Tone-Clock interchanges

Software Initiated Tone-Clock Interchanges

Tone-Clock interchanges may be initiated by software in two ways:

1. A scheduled Tone-Clock or IPSI circuit pack interchange occurs according to the parameters set by **`change system-parameters maintenance`**. This parameter can be disabled or set to run weekly, the default is for it to occur daily, at a time specified in the system-parameters list for scheduled maintenance to begin. This interchange will be blocked, if the non-preferred Tone-Clock or IPSI circuit pack in a PN has been selected with **`set tone-clock`** or **`set ipserver-interface`**. Also if the standby Tone-Clock or IPSI has been set to the busyout state, or if the clock generation capability is known to be impaired. When this scheduled interchange occurs, the standby Tone-Clock or IPSI circuit pack becomes active for twenty seconds to test its ability to generate clock signals. For IPSI scheduled interchanges, the other IPSI modules located on the IPSI circuit pack, i.e. the Packet interface and Archangel are also tested. After testing the IPSI is returned to standby mode.
2. **For non IPSI Port Networks**, unscheduled interchanges occur when on-board Tone-Clock circuit-pack maintenance, or ongoing switch maintenance test of the TONE-BD, TONE-PT or the TDM-CLK uncover failures serious enough to raise a MAJOR or MINOR alarm against the active Tone-Clock circuit pack.

   For IPSI Port Networks, unscheduled IPSI/Tone-Clock interchanges may occur any time as a part of an unscheduled IPSI interchange. The IPSI interchange may be the result of Tone-Clock, PKT-INT, or EAL faults.

International Settings

Note:

The following information is for **non IPSI** port networks.

The TN780 Tone-Clock circuit pack uses three firmware configuration parameters for international support. The following two are automatically set by the software load for the targeted country:

- The circuit pack's country-code (USA, ITALY, AUSTRALIA, etc.)
- The circuit pack's companding mode (mu-Law or A-Law)

The third configuration parameter is used only for Italy (country code: ITALY), and selects whether *new* versus *old* ISPT (Istituto Superiore Poste Telegrafi) tones will be used for dial and confirmation tones. Values for dial confirmation tone can be set independently on the **`change tone-generation`** form. Whenever such changes are made, the effects are immediately enforced on all TN780 Tone-Clock circuit packs without disrupting tone or timing services.

Tone	Default	Old ISPT Value
Dial	Continuous	Cadenced
Confirmation	Cadenced	Continuous

In addition the TN780 allows customization of up to six system tones in order to meet specific country needs. These changes are made using the **`change system-parameters country-options`** form.

The TN2182 allows the same International changes as the TN780 but allows the customization of up to 24 system tones in order to meet specific country needs. These changes are made using the **`change tone-generation`** form.

Manual Tone-Clock Interchange

In an EPN with duplicated Tone-Clock or IPSI circuit packs, one circuit pack is always preferred over the other. For the first port network in a cabinet, this is the Tone-Clock or IPSI circuit pack in carrier **A**. If a second port network is configured in a cabinet, its preferred Tone-Clock or IPSI circuit pack is located in carrier **E**. The intention is that if the preferred Tone-Clock or IPSI circuit pack has been replaced or repaired, the system will make it active by interchanging to it as soon as possible.

In a Port Network (PN) with more than one Tone-Clock circuit pack, the intention is to assure that the one considered most healthy is active at any given time. *This is independent of the server duplication strategy*, in the sense that the active Tone-Clock circuit pack need not change with an interchange of carriers. Rather, except for the effect of the manual intervention discussed earlier, Tone-Clock interchanges occur only as a result of changes in the health of Tone-Clock circuit packs, as perceived by maintenance software. When both Tone-Clock circuit packs are equally healthy, no preference is given to one over the other, regardless of which carrier is active.

It is possible to manually control Tone-Clock interchanges in three ways.

1. The standby Tone-Clock circuit pack may be made unavailable for most purposes by using **`busyout tone-clock`** ***`location`***. Such a Tone-Clock may not be selected with console commands, nor with normal maintenance software activities, until it has been made available again with **`restore tone-clock`** ***`location`***.

   Note:

   `busyout tone-clock` is not allowed for active Tone-Clock circuit packs.

2. The processor lock switches may be used to force a particular SPE to be active. *This method overrides all other Tone-Clock interchange controls.* If there is a Tone-Clock circuit pack in the same carrier as the active SPE, it will become active, regardless of its health. If the Tone-Clock circuit pack in the selected SPE was in the *busyout* state (see item 1 above), it will automatically be released and made active. While the lock switches are set for a particular carrier, *no manual intervention or software error detection* will cause an interchange of Tone-Clocks; the Tone-Clock circuit pack in the standby SPE carrier can never become active. If there is no Tone-Clock circuit pack in the selected SPE at the time the switches are set, but one is later installed, the system will interchange to it regardless of its health. If the Tone-Clock circuit pack is removed from an SPE while the switches are set, *no interchange will occur*; the system will have no active tone-clock. When the lock switches are restored to the neutral position, a tone clock interchange will occur only if the standby Tone-Clock circuit pack is healthier than the active one.

3. A particular Tone-Clock circuit pack can be made active by entering **`set tone-clock`** ***`location`*** **`[override]`**. If the Tone-Clock to be made active is less healthy than the currently active one, no interchange will occur unless the **`override`** option is specified; without it a message will inform the user that it is required.

   Once a Tone-Clock circuit pack is made active by the **`set tone-clock`** ***`location`*** command, it will stay active until either the **`set tone-clock`** ***`location`*** command is entered again to make the other circuit pack active, or until a fault occurs in the active Tone-Clock circuit pack, which causes the system to interchange Tone-Clocks.

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Firmware Instigated Tone-Clock Interchanges

Firmware-initiated Tone-Clock interchanges occur when the auto clock switching option is enabled, and the TN2312 IPSI circuit pack firmware detects a loss of clock or clock errors. After detecting a loss of clock/clock errors, and rather than waiting for system software to request a switch, the IPSI firmware will automatically switch the clock (when auto clock switching is enabled). The auto clock switching option is disabled during system restarts.

Note:

The auto clock switching option is required by the IPSI circuit pack since the EAL connection to the PKT-INT (one of the IPSI circuit packs many functions) is over the server packet bus which must have a good clock for proper operation.

S8700-series Fiber-PNC

Clock Synchronization

Note:

Stratum-3 clocking is not available for a port network supported by a TN2312 (IPSI) circuit pack, or a port network where the Tone-Clock function is supplied by a TN2182.

This section discusses synchronization with a Stratum-3 or -4 clocking device.

Stratum 3

Since the clock module on the TN2312 does not support synchronization with an external Stratum-3 clocking device, you may provide Stratum-3 clocking for a S8700 Server system by using the TN780 Tone-Clock circuit pack in a non-IPSI connected port network. To bring in the external Stratum-3 clocking signals into the TN780, a processor carrier is needed. This new PN control carrier will replace the processor carrier in the old Processor Port Network (PPN) converted to PN 1. The Stratum-3 clocking must come into Port Network #1 because the S8700 Fiber-PNC software has the Stratum-3 clocking hard-coded to this port network.

Stratum 4

With S8700 Fiber-PNC, PN 1 may or may not exist and thus cot be relied on as the backup synchronization source. If a S8700 Fiber-PNC system does not have an administered synchronization source, it uses the first PN that comes up as its source. If the designated master and secondary synchronization sources fail, the system uses any other PN as its source. No preference is given to PN 1.

Replacing the IPSI or Tone-Clock Circuit Pack

Replacing a TN2312 IPSI circuit pack or Tone-Clock circuit pack is a service-disrupting procedure in a PN with a single Tone-Clock, because the IPSI or Tone-Clock circuit pack is always needed to generate clocks for its PN. When the circuit pack is removed, every call is immediately dropped, the PN enters emergency transfer within one minute, and no calls can be set up from or to that PN.

However, if the Processor Port Network (PPN) Tone-Clock is removed for replacement in a Standard Reliability Option system, the System Emergency Transfer feature is activated within milliseconds, and the entire system is disrupted; no calls can be placed, and existing calls are dropped.

However, if the Processor Port Network (PPN) Tone-Clock is removed for replacement in a standard-reliability system, the System Emergency Transfer feature is activated within milliseconds, and the entire system is disrupted; no calls can be placed, and existing calls are dropped.

When replacing an IPSI or Tone-Clock circuit pack, always be sure to replace it with the appropriate IPSI or Tone-Clock circuit pack for the system.

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The following circuit-pack code(s) are supported:

S8700-series Fiber-PNC: TN768	This is a general-purpose Tone-Clock circuit pack for EPNs. It can be used in every situation, except as the Master Tone-Clock circuit pack when a Stratum-3 clock is administered.
S8700-series Fiber-PNC: TN780	The Stratum-3 clock feature requires the use of this circuit pack code in PN 1. The Stratum-3 clock will operate only with this code as the Master Tone-Clock circuit pack. The TN780 circuit pack is upward compatible with the TN768 code, and can be used in any place a TN768 would be allowed. The TN780 is used in many countries outside the U.S. where the TN768 does not provide local tones.
S8700-series Fiber-PNC: TN2182	This Tone-Clock-Detector may be used anywhere a TN768 or TN780 is used, with the exception of configurations requiring Stratum-3 clock. The TN2182 may be used in all country configurations.
TN2312	The TN2312 IPSI circuit pack supplies Tone-Clock functionality for S8700 systems.

Port Networks with a Single Tone-Clock Circuit Pack

This procedure is **destructive**.

1. Pull out the defective IPSI or Tone-Clock circuit pack. This will remove the clocks and cause the system to activate emergency measures. If this is an IPSI supported port network, use **`busyout ipserver-interface`**:
    - All calls to and from the PN will drop, and the PN will activate Emergency Transfer within about one minute. But the rest of the system should operate normally.
2. Insert a new IPSI or Tone-Clock circuit pack. The system will detect the return of the clocks and will automatically recover as follows:
    - The system will reset the PN (PN cold restart), and all of the PN's red LEDs will come on and go off within 30 seconds.
3. If the red LEDs come on but do not go off within 30 seconds, pull the circuit pack out and reseat it. If the LEDs perform as expected this time, continue with step 6. Otherwise, there may be a problem with the TDM bus; possibly a bent pin in the IPSI or Tone-Clock circuit pack's slot. Follow the directions in the TDM-BUS maintenance section.
4. If the red LEDs did light, as explained above, then go to Step 6. If the red LEDs do NOT light, as explained above, then go on to Step 5.

5. Restart the affected port network:
   - Restart the PN by resetting its Expansion Interface circuit pack using **reset port-network *P* level 2**, using the port network's number of the affected PN. (Use the **list cabinet *C*** command to determine the port network's number for a given cabinet and carrier.)
6. Test the new IPSI or Tone-Clock circuit pack to verify that it is functioning properly, using **test tone-clock *location* long**, and verify that the system is operational by placing several phone calls. Where possible, try calls into, out from, and within the affected port network.

Port Networks with Two Tone-Clock Circuit Packs

Notes:

1. Use **list cabinet *C*** to determine the port network's number of the cabinet and carrier containing the Tone-Clock circuit pack to be replaced. If both of a PN's Tone-Clock circuit packs need to be replaced, first replace and test the one in standby mode by either:
   - Entering **status port-network** to display its status
   - Making sure its amber LED is off

   Make sure it is healthy and active before replacing the second one.

The active/standby state of a Tone-Clock circuit pack may also be determined by looking at its LED. A continuously lit red LED on the Tone-Clock circuit pack indicates a reported fault on one or more of the maintenance objects on the circuit pack. Flashing patterns of the yellow and green LEDs correspond to the following service states:

Condition	Tone-Clock Circuit State	Explanation
Flashing yellow 2.7 seconds on, .3 seconds off	Active	An external timing source is being used as a synchronization reference.[1]
Flashing yellow .3 seconds on, 2.7 seconds off	Active	The local oscillator on the Tone-Clock circuit pack is being used as a synchronization reference.
Yellow on continuously	Active	The circuit pack has been reset but has not been told which synchronization source to use.
Yellow LED off	Standby	The circuit pack is in standby mode, (neither generating tones nor supplying clocks).
		1 of 2

Condition	Tone-Clock Circuit State	Explanation
“Jingle bells” green and yellow .1 sec on, .2 sec off, .1 sec on, .4 sec off, .4 sec on, .4 sec off	Standby	Maintenance software is testing the standby circuit pack (the standby Tone-Clock is providing tones).
Double blink yellow .3 sec on, .3 sec off, .3 sec on, 2.4 sec off	Active	TN2182 has lost all external references and is in holdover mode.
Other green and yellow patterns	Active	Maintenance software is testing the active circuit pack.
Random yellow	Standby	If the circuit pack is a TN2182, the yellow LED may come on and off intermittently as ETR-PTs on the board are used for tone detection services.
		2 of 2

1. For a Tone-Clock in the master port network, the external source is the primary or secondary DS1 source, or a Stratum 3 clock. For a Tone-Clock in a slave port network, the external source is the Expansion Interface circuit pack.

1. If the Tone-Clock circuit pack to be replaced is active, then switch to the other Tone-Clock circuit pack by the following procedure:

   a. **`set tone-clock`** ***`location`***, where ***`location`*** is the physical address of the standby Tone-Clock circuit pack.

   Note:

   For a critical-reliability system (duplicated PNC), the system generally expects a PN to have its “preferred” Tone-Clock circuit pack active. For the first PN in a given cabinet, this is carrier A. For a second PN in the cabinet, this is carrier E.

   b. If the interchange was not successful, the standby Tone-Clock circuit pack may be defective. In particular, if the error message **must use override** is displayed, fix the standby Tone-Clock circuit pack before attempting to replace the active one.

2. Pull out the defective Tone-Clock circuit pack. No calls should be affected. If this is a TN2182 circuit pack, some ETR-PTs may be in use and removal of the pack will affect some individual users. It may be less disruptive to busyout the standby TN2182 before removing it.

3. Insert a new Tone-Clock circuit pack of the appropriate code in the same slot where the defective Tone-Clock circuit pack was removed.

4. Test the new Tone-Clock circuit pack using **`test tone-clock`** ***`location`*** **`long`** to make sure it is functioning properly. If the Tone-Clock circuit pack is being replaced due to loss of clocks, the Clock Health Inquiry (#46) will still report a failure, proceed with the next step.

5. To verify that the new Tone-Clock circuit pack can generate clocks for the system, switch to the new Tone-Clock with **set tone-clock *location* override**, and enter **test tone-clock *location***. If the new Tone-Clock circuit pack is able to generate system clocks, there will be no system disruption.

   CAUTION:
   If the new Tone-Clock circuit pack is not able to generate system clocks, this procedure becomes destructive. The system will detect a loss of clock and recover by resetting the PN (PN cold restart).

   After the restart, the faulty Tone-Clock circuit pack will be in standby mode.

6. Place several phone calls.

IPSI/Tone Clock LED States

For the TN2312 IPSI circuit pack, there are four LEDs on the IPSI's faceplate. The top three LEDs are the standard ones found on any TN circuit pack. The fourth LED imitates the TN2182B Tone-Clock's amber LED. The active/standby state of an IPSI or Tone-Clock circuit pack may also be determined by looking at its LEDs. A continuously lit red LED on the circuit pack indicates a reported fault on one or more of its MOs. Flashing patterns of the yellow and green LEDs correspond to the following service states:

Table 267: LED Condition/Tone-Clock Circuit States *1 of 2*

Condition	Tone-Clock Circuit State	Explanation
Flashing yellow 2.7 seconds on 0.3 seconds off	Active	An external timing source is being used as a synchronization reference[1].
Flashing yellow 0.3 seconds on 2.7 seconds off	Active	The local oscillator on the IPSI or Tone-Clock circuit pack is being used as a synchronization reference.
Yellow on continuously	Active	The circuit pack has been reset but has not been told which synchronization source to use.
S8700-series Fiber-PNC: yellow LED off	Standby	The circuit pack is in standby mode, (neither generating tones nor supplying clocks).
		1 of 2

Table 267: LED Condition/Tone-Clock Circuit States ***2 of 2***

Condition	Tone-Clock Circuit State	Explanation
S8700-series Fiber-PNC:“Jingle bells” green and yellow 0.1 sec on, 0.2 sec off, 0.1 sec on, 0.4 sec off, 0.4 sec on, 0.4 sec off	Standby	Maintenance software is testing the standby circuit pack (the standby Tone-Clock is providing tones).
Double blink yellow 0.3 sec on, 0.3 sec off, 0.3 sec on, 2.4 sec off,	Active	TN2312 or TN2182 has lost all external references and is in holdover mode.
Other green and yellow patterns	Active	Maintenance software is testing the active circuit pack.
S8700-series Fiber-PNC: random yellow	Standby	If the circuit pack is a TN2182, the amber LED may come on and off intermittently as ETR-PTs on the board are used for tone-detection services.
		2 of 2

1. For a Tone-Clock in the master PN, the external source is a primary or secondary DS1 source, or a Stratum-3 clock. For a Tone-Clock in a slave PN, the external source is the Expansion Interface circuit pack.

Error log entries and recommended actions

Table 268: TONE-BD Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test tone-clock** ***location***
1 (b)	0	Circuit pack removed or SAKI Sanity test (#53)	MIN	ON	
18 (c)	0	**busyout tone-clock** ***location***	WRN	OFF	**release tone-clock** ***location***
					1 of 2

Table 268: TONE-BD Error Log Entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
23 (d)	0		WRN	OFF	
125 (e)			MIN	ON	
126 (f)			MIN	ON	
257 (g)	Any 65535	None Control Channel Looparound Test (#52)	MIN	ON	**test tone-clock** ***location*** **r 20**
513 (h)	Any				
769 (i)	4358				
1025 (j)	4363	NPE Audit test (50)			**test tone-clock** ***location***
1538 (k)	Any		MIN	ON	
2049 (l)	0	Clock Health Inquiry (#46)	MAJ	ON	**set tone-clock** ***location*** **override**[1]
2305 (l)	0	Clock Health Inquiry (#46)	MAJ	ON	**set tone-clock** ***location*** **override**[1]
2561 (m)	Any		MAJ	ON	
3329 (n)	0		MIN WRN[2]	OFF	**set tone-clock** ***location*** **override**[1]
3840 (o)	Any				
3848 (p)	0	Clock Health Inquiry (#46)			**set tone-clock** ***location*** **override**[1]
3856 (q)			MAJ	ON	**set tone-clock** ***location*** **override**[1]
3857 3858 (r)			MAJ	ON	**busyout/release ipserver-interface**
3872 (s)	0				**set tone-clock** ***location*** **override**[1]
3999 (t)	Any				
					2 of 2

1. For a TN2312 IPSI supported port network, use the command **set ipserver-interface**.

2. Minor alarms on this MO may be downgraded to Warning based on the value in **set options**.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: this error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

   Note:

   The alarm is logged approximately 11 minutes after the circuit pack is removed/ SAKI Sanity test (#53) fails.

   If the circuit pack is not present in the system, insert a circuit pack in the slot indicated by the error to resolve the error.

   If the circuit pack is present in the system, it is faulty and must be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack.

   If the faulty circuit pack is in standby mode, a MINOR alarm is raised, but no other system action is taken. If the circuit pack is the active Tone-Clock, further effects of this error depend on the system's reliability option.

Table 269: Effects of Tone-Clock Failures Depending on Reliability MTAR

Reliability Option	Effects
Standard	EPN goes down
Duplex	PN goes down.
High	IPSI interchange in IPSI connected PN non IPSI connected PN goes down
Critical	IPSI interchange in IPSI connected PN Interchange to standby Tone-Clock circuit pack in non IPSI connected PN

   If an interchange is attempted in an MCC PN *and* the system is unable to activate the standby Tone-Clock, Emergency Transfer is activated. When this happens, both circuit packs are faulty and must be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack.

   If a successful interchange occurs in response to a failure of the active Tone-Clock or if a standby Tone-Clock fails, the faulty Tone-Clock should be replaced.

c. **Error Type 18**: the indicated IPSI or Tone-Clock circuit pack has been made unavailable by **`busyout tone-clock`** ***`location`*** or **`busyout ipserver-interface`** ***`location`***. This error applies only to high- or critical-reliability systems (an active Tone-Clock may not be busied out). To resolve this error, enter **`release tone-clock`** ***`location`***, or **`release ipserver-interface`** ***`location`***.

d. **Error Type 23**: the circuit pack has been logically administered but not physically installed. Installing the circuit pack will resolve the alarm.

e. **Error Type 125**: a wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either:

   1. Remove the wrong circuit pack, and insert the logically administered circuit pack.

      or

      Use the **`change circuit-pack`** command to re-administer this slot to match the circuit pack inserted.

f. **Error Type 126**: the port network specified in the **PORT** field of the error log entry booted up without a Tone-Clock circuit pack, or with a one that cot communicate at all with the system. The error is logged five minutes after the port network is restarted. If no circuit pack is present, install one of the proper code. If there is a circuit pack present, replace it. See Replacing the IPSI or Tone-Clock Circuit Pack.

g. **Error Type 257**: this error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

h. **Error Type 513**: this circuit pack has an on-board hardware failure. Replace the circuit pack using the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack.

i. **Error Type 769**: this error can be ignored, but look for other errors on this circuit pack.

j. **Error Type 1025**: this error is not service-affecting, and no action is required.

k. **Error Type 1538**: the circuit pack was taken out of service because of an excessive rate of uplink messages. Use **`test tone-clock`** ***`location`*** **`long`** to reset the circuit pack and put it back into service. If the command is not successful, replace the circuit pack using the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack. If the alarmed circuit pack is the active Tone-Clock of a duplicated pair, first interchange Tone-Clocks using **`set tone-clock`** ***`location`*** to avoid a service outage. If the error occurs again within 15 minutes, follow normal escalation procedures.

l. **Error Type 2049 or 2305**: these errors indicate the loss of one or more clock signals from the reported IPSI or Tone-Clock circuit pack, which was active at the time of the error. The effect of any of these errors is described in the table for Error Type 1. Diagnosis of the problem is the same for all four Error Types, with the exception noted below.

   1. Examine the Error Log for errors reported against circuit packs in the same port network, especially TDM-CLK, TONE-BD, and EXP-INTF. Follow the repair or replacement procedures indicated for any such errors found.

   2. If the error is not corrected by resolving errors found in step 1, the IPSI or Tone-Clock circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack.

Note:

Replacing the circuit pack and retesting it with **`test tone-clock`** is not adequate to retire this alarm and return the IPSI or Tone-Clock circuit pack to full service; the Clock Health Inquiry test (#46) will continue to fail. Because the ability to generate clocks was considered lost, once any repairs have been made it is necessary to enter **`set tone-clock`** ***`location`*** **`override`**, forcing the circuit pack to become active. If the problem was not corrected, this action may cause a disruption in service for active digital facilities users.

3. If error **2305** or **3848** persists, all clock signals from the indicated board were lost.

   If the reported Tone-Clock circuit is in a port network with duplicated Tone-Clocks, the problem may lie with the circuit pack responsible for selecting the active Tone-Clock circuit (the t/c selector, the active EXP-INTF circuit pack).

   The t/c selector circuit pack of interest is the one which was active at the time the error was logged. This is the currently active t/c selector, unless there has been an EXP-INTF link switch. In order to determine whether an interchange has occurred since the TONE-BD error, examine the **`display initcauses`** log for EXP-LNK entries in the error log for expansion link interchanges.

   If the t/c selector circuit pack was not replaced as part of the previous step, replace it now. Follow procedures described in EXP-INTF (Expansion Interface Circuit Pack) for the Expansion Interface, or Reseating and replacing server circuit packs in *Maintenance Procedures (03-300432)*.

4. If the error has not been corrected at this point, there is a problem with the TDM bus within the port network containing the reported Tone-Clock circuit. This may include TDM bus intercarrier cables, bus terminators, bent pins on the backplane, and errors on any circuit pack plugged into the same port network. See TDM-BUS (TDM Bus).

m. **Error Type 2561**: a Tone-Clock circuit pack, with a different circuit-pack code as required for this system, has been inserted in the port slot as shown in the Error Log. To resolve this error, see Replacing the IPSI or Tone-Clock Circuit Pack for an appropriate circuit pack code and replace the Tone-Clock circuit pack according to the procedures indicated for this system. The meanings of the Aux Data values are as follows:

1002	A TN756 Tone-Clock circuit pack (instead of a TN2312) is in a standard- or duplex-reliability system's PN.
1003	Either a TN741, TN714, TN768, TN780, or TN2182 Tone-Clock circuit pack (instead of a TN2312 IPSI) is in a standard- or duplex-reliability system's PN.
1004	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN768, TN780, TN2182, or TN2312) is in a high- or critical-reliability system's PN.
1005	Same as for aux value 1004.

n. **Error Type 3329**: the system attempted but failed to interchange IPSI or Tone-Clock circuit packs. (This error occurs only in port networks with duplicated Tone-Clocks.) The fault may lie in the standby Tone-Clock or in the circuit pack that controls selection of the active Tone-Clock (the *t/c selector*). The goal of the following procedure is to ensure that both Tone-Clocks can be interchanged to while either t/c-selector circuit pack is active.

1. Examine the Error Log for errors reported against circuit packs in the same port network, paying special attention to TDM-CLK, TONE-BD, DUPINT, SW-CTL, and EXP-INTF. Follow the procedures indicated for any such errors found. After eliminating the above potential problem sources, proceed with the following steps.
2. Determine which circuit pack was controlling the choice of Tone-Clock at the time the error occurred.

   The t/c-selector circuit pack of interest is the one which was active at the time the error was logged. An EXP-LNK interchange since the time of the error may have made that circuit pack the current standby. Determine whether an interchange affecting the t/c selector has occurred since the TONE-BD error. Look for EXP-LNK entries in the error log for PNC interchanges, which would affect the EXP-INTF.
3. If the t/c selector has not undergone an interchange since the error occurred, go to the next step. If such an interchange has taken place, interchange back to the formerly active t/c selector. Use **set expansion-interface**. If the interchange attempt fails due to other errors, resolve those problems first.
4. Interchange the IPSI or Tone-Clock circuits, using **set tone-clock *location***. If the command succeeds, the interchange that previously failed has been accomplished and the problem has been satisfactorily resolved. If it fails, proceed to the next step. You may want to proceed in any case to definitively test all relevant components.
5. Interchange the t/c selector using **set expansion-interface**. If errors prevent this interchange, resolve them first.
6. Attempt again to interchange Tone-Clocks with **set tone-clock *location***.

   If the Tone-Clock interchange failed for both t/c selectors, replace the standby Tone-Clock circuit pack which could not be interchanged into and return to this step. (See Replacing the IPSI or Tone-Clock Circuit Pack.) Test the new circuit pack as follows:

   a. Enter **set tone-clock *location***.
   b. Enter **set expansion-interface**.
   c. Enter the **set tone-clock *location*** command again.

      If these commands successfully complete, the problem has been resolved.

   If these commands successfully complete, the problem has been resolved.

   If the IPSI or Tone-Clock circuit packs successfully interchange when one EXP-INTF is active, but not when the other one is, the t/c-selector circuit pack on the failing side is suspect.

d. Replace the EXP-INTF board that is active when the Tone-Clock interchange fails. For the Expansion Interface, see EXP-INTF (Expansion Interface Circuit Pack). Follow procedures in Reseating and replacing server circuit packs in *Maintenance Procedures (03-300432)*, and “Reliability Systems: A Maintenance Aid” for the DUPINT circuit pack

e. Make sure the new t/c selector is active and execute **`set tone-clock`** ***`location`***.

f. If both Tone-Clocks can be interchanged into, and interchanges succeed when either t/c selector is active, the problem has been resolved.

o. **Error Type 3840**: this error is not service-affecting and can be ignored. It indicates that the circuit pack has received a bad control message from the switch.

p. **Error Type 3848**: the IPSI or Tone-Clock circuit pack had a loss of clock. If error 2305 is also logged, see Note (k).

q. **Error Type 3856**: the IPSI or Tone-Clock circuit pack had a loss of clock. If error 2305 is also logged, see Note (l) for Error Type 2305.

r. **Error Type 3857 and 3858**: these errors are reported by software when an uplink message is received from the active IPSI’s Archangel firmware. Both Error Types indicate that a loss of one or more clock signals were detected by the archangel, and subsequently restored by changing the CLKSEL lead.

Note:

Whenever, the active archangel detects a loss of clock, it will alternate the state of the CLKSEL lead until the lost clock signals are restored.

If the IPSI archangel restores the clock signals by activating the [A] IPSI/ Tone-Clock, then Error Type 3857 is reported. If the clock signals are restored by activating the [B] IPSI/Tone-Clock, then Error Type 3858 is reported. A Cold 2 Restart should occur in a port network immediately after Error Type 3857 or 3858 is reported.

Duplex Reliability — Since there is only one IPSI in the port network, Error Type 3858 can never occur. When Error Type 3857 occurs, it means the [A] IPSI archangel experienced a loss of clock, but clocking was subsequently restored using the [A] IPSI/ Tone-Clock.

High or Critical Reliability — If the [B] IPSI is active and the [A] IPSI is healthy when Error Type 3857 is reported, then software attempts to initiate an IPSI interchange to activate the archangel and PKT-INT on the [A] IPSI, thereby ensuring that the active Tone-Clock, PKT-INT, and archangel are all on the same IPSI. If the [A] IPSI is unhealthy, then software initiates a transition to EI-Fallback mode. If the [A] IPSI is active when Error Type 3857 is reported, it means the archangel for the [A] IPSI had to switch the state of the CLKSEL lead more than once to restore the lost clock signals.

When Error Type 3858 is reported, if the [A] IPSI is active and the [B] IPSI is healthy, then software attempts to initiate an IPSI interchange to activate the archangel and PKT-INT on the [B] IPSI. If the [B] IPSI is unhealthy, then software initiates a transition to EI-Fallback mode. If the [B] IPSI is active when Error Type 3858 is reported, it means the archangel for the [B] IPSI had to switch the state of the CLKSEL lead more than once to restore the lost clock signals.

For the high and critical reliability configurations, Error Type 2305 should be logged against TONE-BD for the standby IPSI/Tone-Clock after Error Type 3857 or 3858 is reported.

s. **Error Type 3872**: an IPSI or Tone-Clock circuit pack had a loss of Data Clocks. This error will impact mainly users on station connected to Digital circuit packs. These users could be with out service. If error 2049 is also logged see Note (k).

t. **Error Type 3999**: the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out of service due to hyperactivity. If Error Type 1538 is not present, then the circuit pack has not been taken out of service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

For a system with a TN768, TN780, or TN2182 circuit pack:

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
SAKI Sanity Test (#53)			X	D
Clock Health Inquiry Test (#46)	X	X		ND
Control Channel Looparound Test (#52)	X	X		ND
Tone Generator Crosstalk Test (#90)		X		ND
Tone Generator Transmission Test (#40)	X	X		ND
Tone Generator Update/Audit Test (#41)	X	X		ND
Tone Detection Verification Test (#42)	X	X		ND
Tone Detector Audit/Update Test (#43)	X	X		ND
TDM Bus Clock Circuit Status Inquiry Test (#148)	X	X		ND
TDM Bus Clock Slip Inquiry Test (#149)	X	X		ND
TDM Bus Clock PPM Inquiry Test (#150)	X	X		ND
TDM Bus Clock Parameter Update Test (#151)	X	X		ND
Board Type Check Test (#574)	X	X		ND
Standby Reference Health Check Test (#651) (a)		X		ND

1. D = Destructive; ND = Nondestructive

Notes:

a. This test runs only on the standby IPSI or Tone-Clock circuit in a port network with duplicated Tone-Clocks (high- or critical-reliability systems). The circuit pack must be a TN780 with firmware version 2 or above.

TONE-PT (Tone Generator)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TONE-PT	MAJ MIN	`test tone-clock` *location*	Tone Generator
	WRN	`release tone-clock` *location*	

Note:

Replacing the IPSI or Tone-Clock circuit pack requires a special procedure which is described in TONE-BD (Tone-Clock Circuit Pack). That section also describes the LED display for this board.

The tone generator resides on the IPSI or Tone-Clock circuit pack and provides all system tones such as dial tone, busy tone, and so on. If an active tone generator fails, its port network may not have tones (see Tone Generator Transmission Test (#40). For instance, a user may go off-hook and hear no dial tone. This problem will affect only users on the same port network where the faulty IPSI or Tone-Clock circuit pack resides. The system will be able to process certain type of calls (that is, internal calls will succeed while outgoing calls will not).

The IPSI or Tone-Clock circuit pack also provides the clocks for the system and can serve as the synchronization reference. Therefore, when resolving alarms, use the TDM-CLK (TDM Bus Clock), SYNC (Port Network Synchronization), and TONE-BD (Tone-Clock Circuit Pack) repair procedures.

See TONE-BD (Tone-Clock Circuit Pack) for a discussion of the relationship of Tone-Clock circuit packs with the various reliability options.

Error log entries and recommended actions

Table 270: TONE-PT Error Log Entries ***1 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	`test tone-clock` *location*[1]
1 (b)	17664	Tone Generator Audit/ Update (#41)	MAJ MIN[2]	ON	`test tone-clock` *location* `r 2`
18 (c)	0	busyout tone-clock *location*	WRN	OFF	`release tone-clock` *location*
					1 of 2

Table 270: TONE-PT Error Log Entries *2 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
130 (d)			MIN	ON	**test tone-clock** ***location***
257 (e)(g)	17667		MIN	ON	
513 (f)(g)	17666	Tone Generator Audit/ Update (#41)	MIN	ON	**test tone-clock** ***location*** **r 3**
769 (h)		Tone Generator Transmission Test (#40)	MAJ MIN2	ON	**test tone-clock** ***location*** **long**
1025 (i)		Tone Generator Crosstalk (#90)	MAJ MIN2	ON	**test tone-clock** ***location*** **long**
1281 (j)	Any	Tone Generator Audit/ Update (#41)	MIN	OFF	**test tone-clock** ***location*** **r 3**
					2 of 2

1. IPSI circuit packs require the ***location*** qualifier; Tone-Clock circuit packs do not.
2. MAJOR alarm if the alarmed IPSI or Tone-Clock circuit pack is not duplicated; MINOR if it is duplicated within the same PN.

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1**: A failure in the tone generation facility on the indicated circuit pack has been detected. Replace the circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.

c. **Error Type 18**: the IPSI or Tone-Clock circuit pack has been made unavailable using **busyout tone-clock** ***location***. It only applies to systems which have the high- or critical-reliability option administered, because only a standby Tone-Clock circuit may be made busy by that command. To resolve this error, execute **release tone-clock** ***location*** for the alarmed circuit pack.

Note:

IPSI circuit packs require the ***location*** qualifier; Tone-Clock circuit packs do not.

d. **Error Type 130**: the circuit pack has been removed or has been insane for more than 11-minutes. To clear the error, reinsert or replace the circuit pack.

e. **Error Type 257**: the tone generation facility is having problems verifying that tones have been connected as requested

f. **Error Type 513**: The tone generation facility may or may not be able to generate tones.

g. **Error Types 257 and 513**: infrequent errors, at a rate which does not bring up an alarm, probably do not affect service, unless there are customer complaints of no tones, or incorrect tones which can not be explained in any other way. However, if an alarm is raised because this error is being repeatedly logged, then the circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack.

h. **Error Type 769**: The tone generator transmission test failed. See the description for Test #40.

i. **Error Type 1025**: The tone generator crosstalk test failed. See the description for Test #90.

j. **Error Type 1281**: `tone-generation` administration requires a TN780 or TN2182 Tone-Clock, or a TN2312 IPSI circuit pack, but the existing Tone-Clock circuit does not provide the needed functionality. The Base Tone Generation Set on page 1 or the custom tones beginning on page 2 of the `tone-generation` screen may have values not supported by the existing Tone-Clock.

Error Type 1281 indicates that the `tone-generation` screen has custom tones translated and that the alarmed tone board does not support the customized tones. TN768 tone boards do not support any customized tones. TN780 tone boards support up to 6 of the following customized frequencies/levels only:

Silence	404Hz at 11.0 dB
350Hz at 17.25 dB	404Hz at 16.0 dB
425Hz at 4.0 dB	480Hz + 620Hz at 24.0 dB
425Hz at 11.0 dB	404Hz + 425Hz at 11.0 dB
425Hz at 17.25 dB	375Hz + 425Hz at 15.0 dB
440Hz at 17.25 dB	404Hz + 450Hz at 11.0 dB
350Hz + 425Hz at 4.0 dB	1000Hz at 0.0 dB
350Hz + 440Hz at 13.75 dB	1000Hz at +3.0 dB
480Hz at 17.25 dB	525Hz at 11.0 dB
620Hz at 17.25 dB	1400Hz at 11.0 dB
440Hz + 480Hz at 19.0 dB	

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Sanity Test (#53)		X	D
Clock Health Inquiry Test (#46))	X	X	ND
Control Channel Looparound Test (#52)	X	X	ND
Tone Generator Crosstalk Test (#90)		X	ND
Tone Generator Transmission Test (#40)	X	X	ND
Tone Generator Update/Audit Test (#41)	X	X	ND
TDM Bus Clock Circuit Status Inquiry Test (#148)	X	X	ND
TDM Bus Clock Slip Inquiry Test (#149)	X	X	ND
TDM Bus Clock PPM Inquiry Test (#150)	X	X	ND
TDM Bus Clock Parameter Update Test (#151)	X	X	ND
Board Type Check Test (#574)	X	X	ND
Standby Reference Health Check Test (#651)		X	ND

1. D = Destructive; ND = Nondestructive

TR-LN-BD (Analog Trunk/Line Board)

See XXX-BD (Common Port Circuit Pack/Media Module).

TSC-ADM (Administered Temporary Signaling Connections)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
TSC-ADM	none	none	Administered Temporary Signaling Connections

No alarms are generated for Administered Temporary Signaling Connections (TSC-ADM, also called ADM TSCs).

Administered temporary signaling connections (TSC) provide a path through ISDN-PRI networks for supplementary D-channel messages. ISDN-PRI applications such as the Distributed Communications System (DCS) use temporary signaling connections to exchange user information across an ISDN-PRI network. What makes Administered TSCs unique is that these particular TSCs stay active for an extended period of time, similar to a permanent data connection. These ADM TSCs are used for DCS features that require Non-Call Associated (NCA) TSCs, and the ADM TSC provides the logical channel function in a DCS network.

An NCA TSC is a virtual connection established within a D-channel without associating any B-channel connections. The connection provides user-to-user service by exchanging USER INFORMATION messages without associated B-channel connections.

An Administered TSC is a special NCA TSC defined for the DCS over the ISDN-PRI D-channel. The ADM TSC has an administratively defined endpoint and is established for an extended period of time.

There are two types of ADM TSCs:

- Permanent: these are established by the originating PBX (near-end ADM TSC) or by the terminating PBX (far-end ADM TSC). Once these ADM TSCs are established, they remain active.
- As-Needed: these are established only when needed.

ADM TSC maintenance provides a strategy to verify that a far end can respond to an ISDN-PRI USER INFORMATION TSC heartbeat message, thereby indicating that user-user signaling is functioning. In addition, maintenance can retrieve the status of the ADM TSC's connection state.

Since ADM TSCs are administered on a per signaling-group basis, the health of an ADM TSC also depends on the state of the D-channel or D-channel pair administered per signaling group. See ISDN-SGR (ISDN-PRI Signaling Group) documentation for details on ISDN-PRI NFAS and D-channel backup maintenance.

The two administration commands for ADM TSCs are as follows:

- **`add signaling-group`** ***number***
- **`change signaling-group`** ***number***

The two maintenance commands for ADM TSCs are:

- **test tsc-administered** ***signaling-group-number*** **[/*tsc-index*]**
- **status tsc-administered** ***signaling-group-number*** **[/*tsc-index*]**

Error log entries and recommended actions

Table 271: TSC-ADM Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3840 to 3967 (a)	tsc index #	**test tsc-administered**			

Note:

a. **Error Types 3840 - 3967**: there is no test to clear these Error Types.

Any of these errors indicates that a TSC Heartbeat Inquiry test was run on an active far-end Administered TSC from the switch. Upon receiving the heartbeat message, the network communicated that the call was unable to complete. As a result, the error was logged.

1. Check the signaling group status of the D-channel or D-channel pair using **status signaling-group** ***grp#*** for the Administered TSC.
2. Check the status of the Administered TSC using **status tsc-administered**.
3. Also check the administration of the Administered TSC on the switch.

This error may only be affecting service for some DCS customers. Upon receipt of this error condition, the switch will tear down and re-establish the ADM TSC within 20 minutes.

The **Port** field in the error log contains the signaling group number for TSC-ADM errors.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
TSC Heartbeat Inquiry Test (#604)			Nondestructive

TTR-LEV (TTR Level)

MO Name	Alarm Level	Initial Command to Run	Full Name of MO
TTR-LEV	MAJ MIN WRN	See the Repair Procedure for TTR-LEV.	TTR Level

TN748 and TN420 Tone Detector circuit packs and TN744 Call Classifier circuit packs provide tone receivers for detecting various types of signaling tones. These circuit packs are shared resources that serve every user of the PBX. This discussion uses the following terms and abbreviations (note that the Maintenance-Related System-Parameters screen uses different names than the alarm and error logs):

Type of Tone Receiver	MO	Also Known As	Location
Dual-Tone Multifrequency Tone Receiver	DTMR-PT	Touch-Tone Receiver (TTR)	4 per TN420/TN748
General-Purpose Tone Detector	GPTD-PT	Call-Progress Tone Receiver (CPTR)	2 per TN420/TN748
Call Classifier	CLSFY-PT	Call-Classification Tone Receiver (CCTR)	8 per TN744

TN748s and TN420s each have 4 DTMR-PTs and 2 GPTD-PTs. DTMR-PTs interpret dual-tone multifrequency (DTMF) calling signals and translate them into logical digits 0 through 9, *, and #. GPTD-PTs detect call-progress tones, modem answer tones, and transmission test tones.

TN744 Call Classifier circuit packs have 8 CLSFY-PTs. These ports detect DTMF tones and classify network and MFC (multifrequency compelled) signaling tones. (That is, CLSFY-PTs can function as DTMR-PTs or GPTD-PTs, and have other additional capacities).

When a user goes off-hook to place a call, dial tone is returned to the user, indicating that a tone detector is connected and ready to receive and interpret tones. The tone detector is in use until the total number of digits needed is collected or until a time-out occurs. If every tone detector in the system is being used simultaneously, the next user to go off-hook will not receive dial tone until a tone detector becomes available. It is therefore necessary to have a sufficient number of tone detectors in the system to prevent delays in receiving dial tone. The **list measurements tone-receiver** command shows the level of tone detector usage.

In order to prevent dial-tone delays and other shortcomings in system performance, threshold levels for the 3 types of tone receivers are administered on the System-Parameters Maintenance screen. Whenever the number of tone receivers in service falls below the administered threshold for that type of tone receiver, an alarm is logged against the TTR Level MO. At this point, the system is operating properly, but call processing capacity is reduced. Another alarm is logged if the number falls to zero. At this point, system operation is severely compromised.

Typical causes of these events are:

1. The threshold for GPTD-PTs or DTMR-PTs is administered incorrectly on the Maintenance-Related System-Parameters screen.
2. Too many GPTD-PTs, DTMR-PTs, or CLSFY-PTs have been taken out of service, possibly by maintenance software or a demand busyout.
3. A tone detector circuit pack has been removed or suffered a fatal failure, resulting in the loss of all its ports.
4. The system has an insufficient number of TN748/TN744/TN420 circuit packs.

Repair Procedure for TTR-LEV

To resolve a TTR-LEV alarm:

1. Enter **`display errors`** and use the TTR-LEV Error Log Table to determine which type of tone receiver has fallen below its threshold.
2. Enter **`change system-parameters maintenance,`** and check the administered value. On the screen, TTR represents DTMR-PTs, CPTR represents GPTD-PTs, and Call Classifier represents CLSFY-PTs. If the threshold value is set too high, change it to a lower value and wait a minute for the alarm to clear.

   To determine the correct thresholds, first find the total number of TN478/TN420 Tone Detector and TN744 Call Classifier circuit packs in the system using **`list configuration`**. Then calculate the total number of tone receiver ports of each type. Each Tone Detector circuit pack has 4 TTR (DTMR) ports and 2 CPTR (GPTD) ports. Each TN744 Call Classifier circuit pack has 8 Call Classifier (CLSFY-PT) ports.

   For each type of tone receiver, if the total number of ports installed in the system is less than the administered threshold, either add more circuit packs to the system or reduce the threshold to match the number already in the system. If the TTR Level alarm is still present, proceed to Step 3.
3. Enter **`display errors`** for Error Type 18 and look for GPTD-PTs, DTMR-PTs, or CLSFY-PTs that have been busied out.

   For each of the busied-out ports:

   a. Determine why the port was busied out.

   b. If the port can be placed back into service, test the port using **`test port`** ***`location`***.

   c. If every test passes, enter **`release port`** and wait 1 minute for the TTR Level alarm to clear.

      If this does not clear the TTR Level alarm, proceed to Step 4.

4. Enter **display alarms** and determine the location of the circuit pack with the alarmed GPTD-PT, DTMR-PT, or GPTD-PT.

   Run **test board *location* l r 3** for that circuit pack.

   If this does not clear the TTR Level alarm, replace the Tone Detector or Call Classifier circuit pack with the alarmed GPTD-PT, DTMR-PT, or CLSFY-PT.

Error log entries and recommended actions

Table 272: TTR-LEV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	1				
2 (b)	2		WRN (See message below)	OFF	
3 (c)	3				
4 (d)	4		WRN	OFF	
5 (e)	5				
6 (f)	6		WRN	OFF	
7 (g)	7		MAJ	OFF	
8 (h)	8		MIN	OFF	
9 (i)	9		MIN	OFF	

The TTR-LEV Alarm is upgraded to MAJOR if the Base Tone Generator is set to 12 (France).

Notes:

a. **Error Type 1:** does not indicate a current error condition. It indicates that the number of DTMR ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

b. **Error Type 2:** the total number of DTMR ports currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV.

c. **Error Type 3:** does not indicate a current error condition. It indicates that the number of GPTD ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

d. **Error Type 4:** the total number of GPTD ports currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV.

e. **Error Type 5:** does not indicate a current error condition. It indicates that the number of Call Classifier ports (CLSFY-PT) service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

f. **Error Type 6:** the total number of Call Classifier ports (CLSFY-PT) currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV.

g. **Error Type 7:** there are currently no DTMR ports in service. To clear the alarm, see Repair Procedure for TTR-LEV.

h. **Error Type 8:** there are currently no GPTD ports in service. To clear the alarm, see Repair Procedure for TTR-LEV.

i. **Error Type 9:** there are currently no Call Classifier ports (CLSFY-PT) in service. To clear the alarm, see Repair Procedure for TTR-LEV.

UDS1-BD (UDS1 Interface Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
UDS1-BD	MAJ MIN	`test board` *location* `l`	UDS1 Interface Circuit Pack
	WRN	`test board` *location*	

The UDS1 Interface circuit pack provides an interface to the DS1 facility.

The maintenance strategy for the TN464 UDS1 Interface circuit pack (UDS1-BD) is very similar to the maintenance strategy for the TN767 DS1 Interface circuit pack (DS1-BD). The same commands are used for administering and testing the boards. The differences in maintenance strategy between the boards are due to the UDS1 circuit pack's direct interface to the Packet bus which is used for ISDN-PRI signaling (ISDN-PLK). While both the TN464 and TN767 can support ISDN-PRI B-channels, ISDN-PRI D-channel signaling applications require a TN464 UDS1 circuit pack. See the following table for a list of USD1 Interface circuit packs:

Circuit Pack Code	24-channel	32-channel	Tie Trunk Signaling	CO Trunk Signaling	DID Trunk Signaling	OPS Line Signaling
TN2242	X	X	X			
TN464C/D/E/F TN464GP	X	X	X	X	X	X (24-chl only)
TN2464	X	X	X	X	X	X

Note:

For information about other DS1 circuit packs, see DS1-BD (DS1 Interface Circuit Pack).

The UDS1 maintenance strategy includes logging inline errors reported by the UDS1 Interface circuit pack, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms.

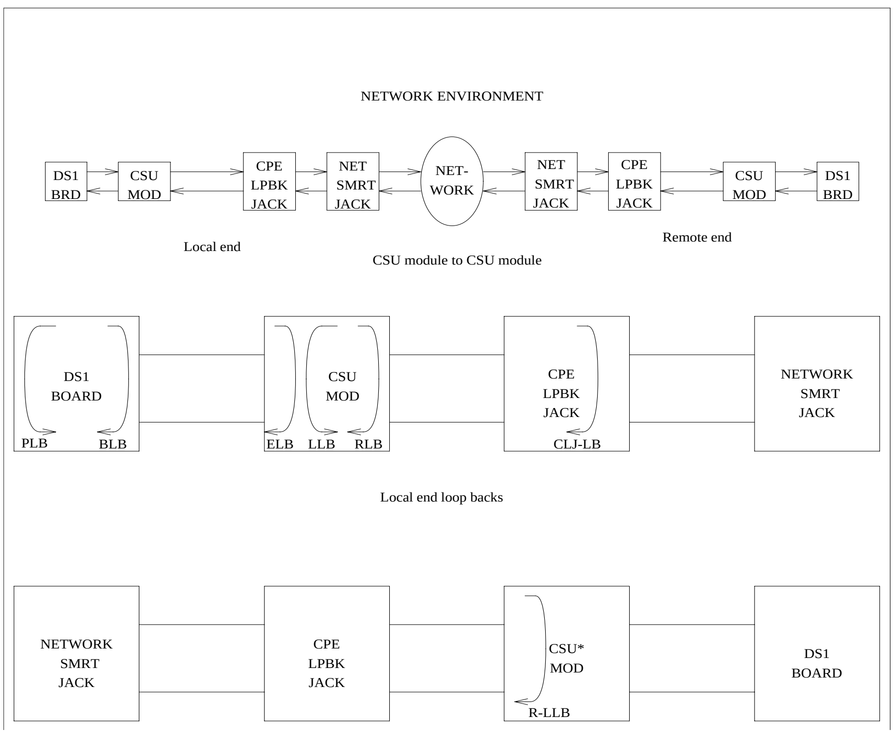
The TN464F or later circuit pack combined with an 120A1 CSU module forms an Enhanced Integrated CSU. The 120A1 CSU module, when combined with the functionality provided by the TN464F hardware and firmware, and switch software, provides functionality equivalent to an external stand-alone ESF T1 CSU. The 120A1 CSU module connects to the TN464F circuit pack on the I/O connector panel on the back of the port carrier. The CSU module thus becomes an integrated part of the system. Throughout the document, the term 120A1 will mean a 120A1 or higher suffix CSU module.

The Enhanced Integrated CSU is for use in the United States of America with 1.544-Mbps DS1 service. For further details on the 120A1 CSU module refer to *Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager*.

The UDS1-BD and 120A1 CSU module support on-demand loopback tests that assist in the detection of faults between the UDS1-BD circuit pack and the CSU module, between the Integrated CSU and the optional Customer Premises Loopback Jack, or between the Integrated CSU and remote CSU.

Figure 92: High Level Overview Of Loopback Points gives a high level overview of the loopback points.

Figure 92: High Level Overview Of Loopback Points



The following list of acronym definitions are for the Figure 92: High Level Overview Of Loopback Points:

- PLB = Payload Loopback
- BLB = Board Loopback
- ELB = Equipment Loopback
- LLB = Line Loopback
- RLB = Repeater Loopback
- CLJ = CPE Loopback Jack
- R-LLB = Remote Line Loopback

- SMRT = Smart Jack
- LPBK = Loopback

TN464GP/TN2464BP UDS1 Circuit Packs with Echo Cancellation

The TN464GP and TN2464BP UDS1 circuit packs feature an integrated echo canceller. Echo cancellation is a Software Right-To-Use feature that can be turned on as needed. Echo cancellation supports channels carrying voice and is not intended for channels that support data. The TN464GP/TN2464BP have the capability to detect modem tone and turn off echo cancellation accordingly for the duration of a data call. Echo cancellation on the TN464GP/ TN2464BP is administrable per channel. The echo cancellation circuitry on a given TN464GP/ TN2464BP is driven by administrable parameters.

The TN464GP/TN2464BP circuit packs are intended for use with ATM, IP, wideband, or other complex services which are likely to have problems with echo.

Echo cancellation on a TN464GP/TN2464BP is a right-to-use feature that is activated by means of the License File. Echo cancellation is enabled on the System-Parameters Customer-Options screen. The **Maximum Number of DS1 Boards with Echo Cancellation** field on the System-Parameters Customer-Options screen indicates the number of DS1 boards on which echo cancellation is activated for a specific customer.

The DS1 Circuit Pack screen for the TN464GP/TN2464BP circuit packs has fields to support echo cancellation: **Echo Cancellation, EC Direction**, and **EC Configuration**. The **Echo Cancellation** field appears when the Echo Cancellation feature is activated on the System-Parameters Customer Options screen. The **EC Direction** and **EC Configuration** fields appear when the **DS1 Echo Cancellation** field is enabled.

- **EC Direction** determines the direction from which echo will be eliminated, ether inward or outward.
- **EC Configuration** is the set of parameters used when cancelling echo. This information is stored in firmware on the UDS1 circuit pack.

Echo cancellation is turned on or off on a per trunk-group basis using `change trunk-group`. If the TRUNK GROUP field, **DS1 Echo Cancellation** is **y**, echo cancellation is applied to every TN464GP/TN2464BP trunk member in that trunk group. The echo cancellation parameters used for a given trunk member are determined by the Echo Cancellation Configuration Number administered on the DS1 Circuit Pack screen for that specific trunk's board.

Note:

It is not necessary to busyout a port or trunk group to change the DS1 Echo Cancellation field on the Trunk Group screen. However, the modified setting does not take effect until one of the following occurs:

- Port is busied out/released

- Trunk Group is busied out/released
- Test trunk group is executed
- Periodic maintenance runs

Echo cancellation on the TN464GP/TN2464BP is selectable per channel, even though it is administrable on a per trunk-group basis. For example, if all but two ports on a TN464GP/ TN2464BP need to have echo cancellation applied, those two ports must be put in a trunk group where the **DS1 Echo Cancellation** field is **n**. The remaining ports are in a trunk group(s) where the **DS1 Echo Cancellation** field is **y**. A user can cancel echo coming from the network (far-end echo) or coming from the switch (near-end echo).

The TN464 UDS1 Circuit Pack

The TN464C, D, E, F, and GP Universal DS1 Interface circuit packs provide an interface to the DS1 facility, and are designed to support 24 DS0 channels on a 1.544-Mbps DS1 link, or 32 DS0 channels on a 2.048-Mbps link. The DS0 channels can be administered as trunks to other switches, lines to off-premises stations, ports to line-side PRI terminating devices, or ports to other line-side non-PRI terminating devices. (DS0 channels on TN464/Bs can only be administered as trunks to other switches.) For more information about how TN464 ports can be used, see the following MOs:

- ISDN-SGR (ISDN-PRI Signaling Group)
- ISDN-TRK (DS1 ISDN Trunk)
- ISDN-PLK (ISDN-PRI Signaling Link Port)
- PE (Processor Ethernet) Alarms
- TIE-DS1 (DS1 Tie Trunk)
- CO-DS1 (DS1 CO Trunk)
- DID-DS1 (Direct Inward Dial Trunk)
- OPS-LINE (DS1 Off-Premises Station Line)
- WAE-PORT (Wideband Access Endpoint Port)

Note:

For information about other DS1 circuit packs, see DS1-BD (DS1 Interface Circuit Pack).

Note:

The TN464GP provides Echo Cancellation, and in addition, the TN464GP firmware may be updated using the firmware download feature.

Throughout this Maintenance Object (UDS1-BD), the term TN464 will mean any TN464C or higher suffix UDS1 circuit pack. If part of this section refers to a specific suffix TN464 board, it will be noted as such.

TN464 circuit packs support the following:

- Digital Tie, CO, and DID trunks
- DS1 off-premises (OPS) lines
- Narrowband and wideband access endpoint ports
- ISDN-PRI trunks and accompanying signaling channel
- PRI endpoint ports (PE-BCHL) and accompanying signaling channel

The TN464 supports digital Tie, CO, and DID trunks, and OPS lines. On-board firmware performs call control signaling for the Tie, CO and DID trunks and OPS lines. ISDN-PRI trunk and PRI-endpoint signaling (Q.921, Q.931) is received and generated by system software and is transmitted on a system link through the TN1655 Packet Interface and packet bus to the UDS1 where it is placed on the D channel. Signaling over the DS1 link has to be synchronized between the transmitting and receiving ends to ensure error-free communication. See SYNC (Port Network Synchronization) for details.

Each trunk, line, or endpoint has its own maintenance strategy, but all depend on the health of the UDS1 Interface circuit pack. See the following Maintenance Objects for details:

TIE-DS1 (DS1 Tie Trunk)
CO-DS1 (DS1 CO Trunk)
DID-DS1 (Direct Inward Dial Trunk)
OPS-LINE (DS1 Off-Premises Station Line)
ISDN-TRK (DS1 ISDN Trunk)
ISDN-PLK (ISDN-PRI Signaling Link Port)
ISDN-SGR (ISDN-PRI Signaling Group),
WAE-PORT (Wideband Access Endpoint Port)
_PE (Processor Ethernet) Alarms.

Circuit Pack Administration and Options

The DS1 configuration for each circuit pack is administered on the DS1 Circuit Pack screen. **Bit Rate** is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. **Country Protocol** is used to drive layer-3 protocol decisions based on PRI specifications for a given country (not those related to specific features). Different UDS1 circuit packs may be administered with different Country Protocols, allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations (for example, between two different countries). US systems use country protocol 1.

Set **Near-End CSU Type** to **other** for no CSU installed or for an external CSU such as an ESF T1 CSU, or set to **integrated** for the 120A1 CSU module or the 401A T1 sync splitter. Setting the field to **integrated** causes additional fields to appear for administering the Enhanced Integrated CSU module. Set **E1 Sync-Splitter** to **y** if a 402A or 403A E1 sync splitter is used to provide timing to an ATM switch. Set **Echo Cancellation** to **y** if the echo cancellation right-to-use feature is enabled and the TN464GP/TN2464BP or higher suffix board is to supply echo cancellation.

Note:

Set the **Echo Cancellation Plan** on the **EC Configuration field** of the DS1 Circuit Pack screen. Note that Plan 1 uses a 96-ms echo tail and introduces 6dB of loss for additional cancellation.

In addition, other fields define such parameters as framing modes, line coding, companding mode and so on. For further details refer to *Installing and Operating a 120A Channel Service Unit with Avaya Communication Manager.*

Two option jumpers located on the side of the TN464C/D circuit pack must be installed correctly. The figures on the following page show how to configure the circuit pack for 24- or 32-channel DS1, and for 75*W (coaxial) or 120*W trunk connections. The channel selection must match the parameters administered on the corresponding DS1 Circuit Pack screen. (US applications use 24 channels.)

Figure 93: TN464C/D DS1 Option Jumpers

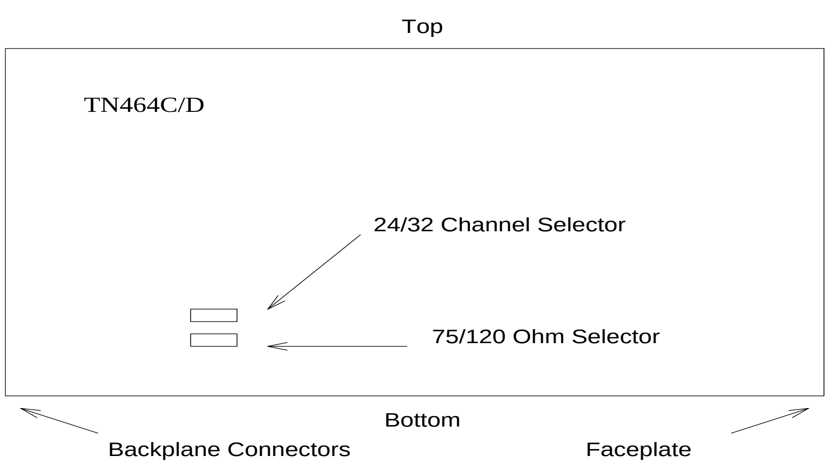
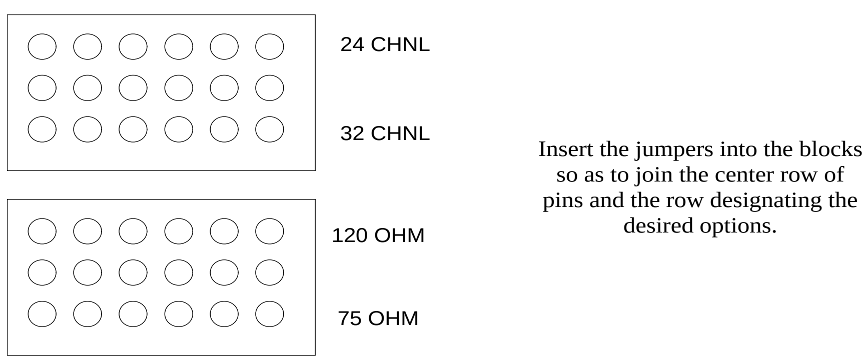
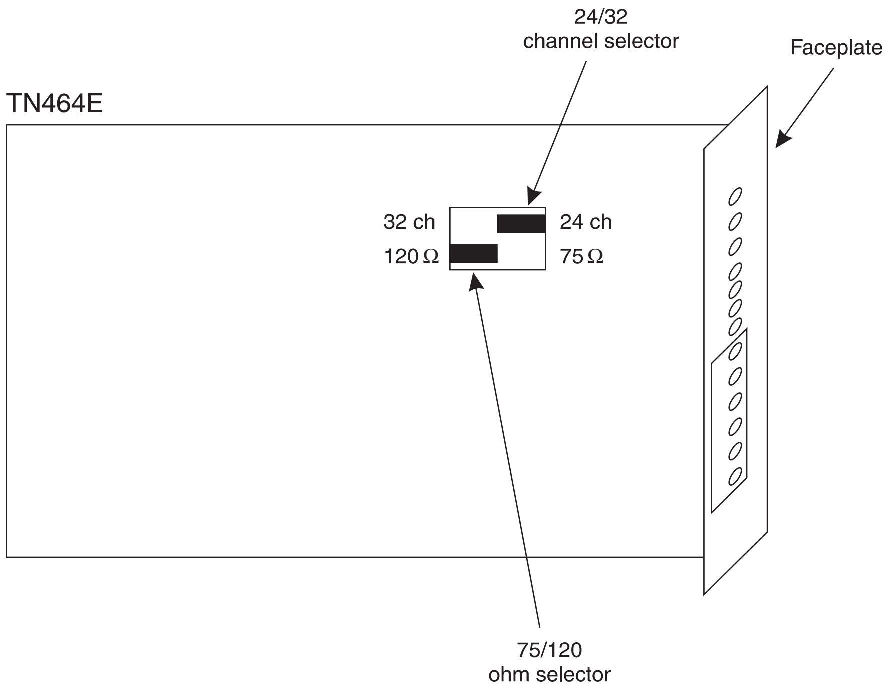


Figure 94: TN464C/D DS1 Option Jumpers (cont'd)



The option switch located on the component side of the TN464E/F circuit pack must be set correctly. Figure 95: TN464E/F DS1 Option switches shows how to configure the circuit pack for 24-channel or 32-channel DS1. The channel selection must match the parameters administered on the corresponding DS1 Circuit Pack screen. (US applications use 24 channels.)

Figure 95: TN464E/F DS1 Option switches



Error log entries and recommended actions

Table 273: UDS1-BD Error Log Entries *1 of 5*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**`test board location`**
1(a)	0	Circuit pack removed or SAKI (#53) failed	WRN[2] MIN	ON	
18(b)	0	busyout board location	WRN	OFF	**`release board location`**
					1 of 5

Table 273: UDS1-BD Error Log Entries *2 of 5*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
23(c)	0		WRN	OFF	**add ds1 *location***
125(d)	none or 3		WRN[3] MIN	ON	
257	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* l r 20**
257(e)	Any				
513(f)	Any		WRN[3] MIN	ON	
514(g)	46086		WRN[3] MIN	ON	
769(h)	46085		WRN[3] MIN	ON	
770(i)	46096		WRN[3] MIN	ON	
1025(e)	4363	NPE Audit Test (#50)			
1281	Any	Loss of Signal Alarm Inquiry (#138)	WRN[3] MIN	OFF	**test board *location***
1300(j)	Any	Loss Of Signal Alarm Inquiry (#138)	WRN	OFF	**test board *location***
1301(k)	Any	Loss Of Signal Alarm Inquiry (#138)	WRN	OFF	**test board *location***
1302(l)	Any	Loss Of Signal Alarm Inquiry (#138)	WRN[3] MIN	OFF	**test board *location***
1303 (m)	Any	Loss Of Signal Alarm Inquiry (#138)	WRN[3] MIN	ON	**test board *location***
1310(n)	Any	Board Loopback test (#1209)	MIN	ON	**test board *location*** ds1/ csu-loopback-tests
1311(o)	Any	Equipment Loopback test (#1210)	WRN[3] MIN	OFF	**test board *location*** ds1/ csu-loopback-tests
					2 of 5

Table 273: UDS1-BD Error Log Entries *3 of 5*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1312(p)	Any	Repeater Loopback test (#1211)	WRN[3] MIN	OFF	**test board *location*** ds1/ csu-loopback-tests
1313(q)	Any	CPE Loopback Jack test (#1212)	WRN[3] MIN	OFF	**test board *location*** end-loopback/span-test
1314(r)	Any	Far CSU Loopback test (#1213)	WRN[3] MIN	OFF	**test board *location*** end-loopback/span-test
1320	Any	Loss of Signal Alarm Inquiry (#138)	WRN[3] MIN	OFF	**test board *location***
1321	Any	Loss of Signal Alarm Inquiry (#138)	WRN[3] MIN	OFF	**test board *location***
1322	Any	Loss of Signal Alarm Inquiry (#138)	MIN	ON	**test board *location***
1323	Any	Loss of Signal Alarm Inquiry (#138)	WRN[3] MIN	OFF	**test board *location***
1324	Any	Loss of Signal Alarm Inquiry test (#138)	WRN	OFF	**test board *location***
1400 1401(s)	Any	Loss of Signal Alarm Inquiry test (#138) and Echo Cancellation test (#1420)	MIN	ON	**test board *location***
1537(t)	46082		WRN[3] MIN	ON	
1538(u)	Any		WRN[3] MIN	ON	
1793	Any	Blue Alarm Inquiry test (#139)	WRN MIN MAJ[4]	OFF	**test board *location***
1794	Any	Blue Alarm Inquiry test (#139)	WRN MIN MAJ[4]	OFF	**test board *location***
					3 of 5

Table 273: UDS1-BD Error Log Entries *4 of 5*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1795	Any	Blue Alarm Inquiry test (#139)	WRN MIN MAJ[4]	OFF	**test board *location***
2049	Any	Red Alarm Inquiry test (#140)	WRN[3] MIN	OFF	**test board *location***
2305	Any	Yellow Alarm Inquiry test (#141)	WRN[3] MIN	OFF	**test board *location***
2306	Any	Yellow Alarm Inquiry test (#141)	WRN[3] MIN	OFF	**test board *location***
2561	Any	Major Alarm Inquiry test (#142)	WRN[3] MIN	OFF	**test board *location***
2817		Minor Alarm Inquiry test (#143)	WRN[3] MIN	OFF	**test board *location***
3073 to 3160 (v)	Any	Slip Alarm Inquiry test (#144)	WRN[3] MIN	OFF	**test board *location* r 6**
3330(w)	46083		WRN[3] MIN	ON	
3585 to 3601 (x)	Any	Misframe Alarm Inquiry test (#145)	WRN[3] MIN	OFF	**test board *location* r 6**
3840(y)	Any	None			
3841(z	4358				
3842 (aa)	46097				
3843 (ab)	46081				
3900 (ac)	Any	CPE Loopback Jack test (#1212)			
3901 (ad)	Any	Far CSU Loopback test (#1213)			
3902 (ae)	Any	One-Way Span test (#1214)			
					4 of 5

Table 273: UDS1-BD Error Log Entries *5 of 5*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
3999 (af)	Any	None			
					5 of 5

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to the appropriate test's description, and follow its recommended procedures.
2. If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.
3. Minor alarms on this MO may be downgraded to Warning based on values on the **`set options`** screen.
4. Major alarms on this MO may be downgraded to minor or warning alarms based on values set on the **`set options`** screen.

Notes:

a. **Error Type 1:** indicates that the circuit pack has stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a UDS1 circuit pack must meet all of the following conditions:

- Have an entry in the circuit plan using **`change circuit-pack`**
- Be administered using **`add ds1`** ***`location`***
- Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit plan and either of the other conditions are not met, a MINOR alarm is logged. To resolve the error:

1. Make sure that all conditions for administration are met and that a functioning UDS1 circuit pack is inserted in the correct slot.

   or

2. Completely remove the UDS1-BD from the system:

   a. Remove any administered DS1 trunks, access endpoints or PRI endpoints associated with the circuit pack from their trunk groups.

   b. Execute **`remove ds1`** ***`location`*** and **`change circuit-pack`** ***`location`***.

If every administration condition is met for this circuit pack and the red LED is still on, follow the instructions for LED alarms without Alarm Log entry or with Error Type 1 in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*

b. **Error Type 18:** the UDS1 Interface circuit pack was busied out by **`busyout board`** ***`location`***.

c. **Error Type 23:** the UDS1-BD circuit pack is not completely administered. To be fully administered, the UDS1 circuit pack must:

- Have an entry in the circuit plan using **`change circuit-pack`**
- Be administered using **`add ds1`** ***`location`***
- Be physically inserted into the correct slot

A DS1 (UDS1-BD and DS1-BD) differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered with **`add ds1`**.

d. **Error Type 125: (no Aux Data):** an incorrect circuit pack is inserted in the slot where the USD1 circuit pack is logically administered. To resolve this problem, do one of the following:

- Remove the incorrect circuit pack, and insert the correct logically administered circuit pack.
- Use **`change circuit-pack`** to re-administer this slot to match the circuit pack inserted.

Aux Data 3: the 24-/32-channel option jumper setting on the circuit pack does not match the option set on the DS1 Circuit Pack administration screen. The circuit pack must be physically removed to see the setting of the jumper.

e. **Error Type 257:** associated with the Common Port Circuit Pack Maintenance test. See XXX-BD (Common Port Circuit Pack/Media Module) for details.

f. **Error Type 513:** the UDS1 Interface circuit pack has detected a transient hardware problem. The value in the Aux Data field indicates the type of hardware problem:

Aux Data	Problem
4352	External RAM failure
4353	Internal RAM failure
4355	Internal ROM failure

If the UDS1 board detects only one of these hardware problems, then the error will disappear when none of these faults are detected for 10 minutes. If the same Aux Data value is logged more than once in a 24-hour period, the circuit pack should be replaced.

g. **Error Type 514:** LAN External RAM Error. This error occurs when there is a hardware fault in the external RAM. The RAM is used for message buffering to and from the Packet bus. This error should not occur frequently. If it does (10 times within 30 minutes), the circuit pack should be replaced.

h. **Error Type 769:** transmit FIFO Underflow Error. This error occurs when the circuit pack cot find the “end of frame” bit when transmitting a frame to the Packet bus. An alarm is raised if this error occurs three times within 10 minutes. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***. If the error recurs within 10 minutes, replace the circuit pack.

i. **Error Type 770:** unable to Write LAN Translation RAM Error. This error occurs when a call is aborted because there are no available translation RAM locations for the call connection attempt. An alarm is raised if this error occurs two times within 10 minutes. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, **`release board`** ***`location`***. If the error recurs within 10 minutes, replace the circuit pack.

j. **Error Type 1300:** CSU module/T1 sync splitter missing or E1 synchronization splitter (E1SS) missing.

   CSU module/T1 sync splitter missing: The **Near-End CSU Type** field on the **`add ds1`** screen is **integrated** but the 120A1 CSU module or the 401A T1 sync splitter is not physically connected (or is improperly connected) to the UDS1 board on the back of the port carrier.

   If using the 120A1 CSU module or the 401A T1 sync splitter, plug (or replug) the CSU module/T1 sync splitter into the UDS1 circuit pack’s connector on the I/O connector panel on back of the carrier. Otherwise, set the **Near-End CSU Type** field using the **`change ds1`** screen to **other**.

   If this error remains after plugging the CSU module/T1 sync splitter into the board’s connector, there could be a problem with the I/O connector panel.

   E1 synchronization splitter missing: The **E1 Sync-Splitter** field on the **`add ds1`** screen is **`y`**, but the 402A or 403A E1 synchronization splitter is not physically connected (or is improperly connected) to the UDS1 board on the back of the port carrier.

   If using the 402A or 403A E1 synchronization splitter, plug (or replug) the E1SS into the UDS1 circuit pack’s connector on the I/O connector panel on back of the carrier. Otherwise, set the **E1 Sync-Splitter** field using the **`change ds1`** screen to **n**.

   If this error remains after plugging the E1SS into the board’s connector, there could be a problem with the I/O connector panel.

k. **Error Type 1301:** CSU module/T1 sync splitter not expected or E1 synchronization splitter not expected.

   CSU Module/T1 Sync Splitter not expected: The 120A1 CSU module or the 401A T1 sync splitter is physically connected to the UDS1 board on the back of the port carrier, but the **Near-End CSU Type** field on the **`add ds1`** screen is not set to **integrated**.

   If the 120A1 CSU module or the 401A T1 sync splitter is to be used, use **`change ds1`** to set the **Near-End CSU Type** field to **integrated**. Otherwise, physically remove the 120A1 CSU module or the 401A T1 sync splitter from the back of the port carrier.

E1 synchronization splitter not expected: The 402A or 403A E1 synchronization splitter is physically connected to the UDS1 board on the back of the port carrier, but the **E1 Sync-Splitter** field on the **`add ds1`** screen is not set to **y**.

If the 402A or 403A E1 synchronization splitter is to be used, use **`change ds1`** to set the **E1 Sync-Splitter** field to **y**. Otherwise, physically remove the 402A or 403A E1 synchronization splitter from the back of the port carrier.

l. **Error Type 1302:** DS1 configuration error. Attempting to use the 120A1 CSU module with a UDS1 circuit pack that is configured for 32-channel (2.048-Mbps) operation. The CSU module only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America.

m. **Error Type 1303:** DS1 circuit pack suffix incorrect for CSU module/T1 sync splitter or for E1 synchronization splitter.

DS1 circuit pack suffix incorrect for CSU module/T1 sync splitter: The **Near-End CSU Type** field on the **`add ds1`** screen is set to **integrated** but the DS1 circuit pack is not a TN464F or higher suffix UDS1 board.

If the 120A1 CSU module or the 401A T1 sync splitter is to be used, remove the circuit pack and replace it with a TN464F or higher suffix board. Otherwise, use **`change ds1`** to set the **Near-End CSU Type** field to **other**.

DS1 circuit pack suffix incorrect for E1 synchronization splitter: The **E1 Sync-Splitter** field on the **`add ds1`** screen is set to **y** but the DS1 circuit pack is not a TN464F or higher suffix UDS1 board.

If the 402A or 403A E1 synchronization splitter is to be used, remove the circuit pack and replace it with a TN464F or higher suffix board. Otherwise, use **`change ds1`** to set the **E1 Sync-Splitter** field to **n**.

n. **Error Type 1310:** BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using **`busyout board`** ***`location`***, **`test ds1-loop`** ***`location`*** **`ds1/csu-loopback-tests`**, **`release board`** ***`location`***. If the BLB test continues to fail, replace the TN464F circuit pack.

o. **Error Type 1311:** ELB failure. This error occurs when the Equipment Loopback (ELB) test fails for the Integrated CSU (I-CSU) module/T1 sync splitter or for the 402A or 403A E1 synchronization splitter. This test is executed by the I-CSU/E1SS during I-CSU/E1SS power-up/reset (i.e.- UDS1 board physically inserted and 120A1 CSU module, the 401A T1 sync splitter, or the 402A or 403A E1SS is already installed) or when the 120A1 CSU module, the 401A T1 sync splitter, or the 402A or 403A E1SS is plugged on to an already initialized UDS1 DS1 board.

Note:

For the **I-CSU/T1 sync splitter only**, the ELB test is also executed as part of **`test ds1-loop`** ***`location`*** **`ds1/csu-loopback-tests`**. Try to clear the alarm using **`busyout board`** ***`location`***, **`test ds1-loop`** ***`location`*** **`ds1/csu-loopback-tests`**, and **`release board`** ***`location`***. If the ELB test continues to fail, then either the UDS1 board, the CSU module, or the I/O cable between the backplane and the CSU module, or any combination thereof, failed. Try to isolate where the failure is occurring by re-executing the test and by replacing one piece of hardware at a time.

p. **Error Type 1312:** RLB failure. This error occurs when the Repeater Loopback (RLB) test fails for the Integrated CSU (I-CSU) module/T1 sync splitter or for the 402A or 403A E1 synchronization splitter. This test is executed by the I-CSU/E1SS during I-CSU/E1SS power-up/reset (i.e., DS1 board physically inserted and 120A1 CSU module or the 401A T1 sync splitter, or the 402A or 403A E1SS is already installed) or when the 120A1 CSU module or the 401A T1 sync splitter, or the 402A or 403A E1SS is plugged on to an already initialized DS1 board.

Note:

For the **I-CSU/T1 sync splitter** only, the RLB test is also executed as part of the **`test ds1-loop`** ***`location`*** **`ds1/csu-loopback-tests`**. Try to clear the alarm using **`busyout board`** ***`location`***, **`test ds1-loop`** ***`location`*** **`ds1/csu-loopback-tests`**, and **`release board`** ***`location`***. If the RLB test continues to fail, replace the CSU module.

q. **Error Type 1313:** CPE Loopback Jack deactivation error. This error occurs when the UDS1 circuit pack could not deactivate a CPE Loopback Jack on power-up/reset or upon software request.

Try to clear the alarm using **`busyout board`** ***`location`***, **`test ds1-loop`** ***`location`*** **`end-loopback/span-test`**, and **`release board`** ***`location`***. If the attempt to deactivate the CPE Loopback Jack continues to fail, other steps must be taken to deactivate the loopback.

r. **Error Type 1314:** far CSU Loopback deactivation error. This error occurs when the UDS1 circuit pack could not deactivate a far-end CSU loopback on power-up/reset or upon software request.

Try to clear the alarm using **`busyout board`** ***`location`***, **`test ds1-loop`** ***`location`*** **`end-loopback/span-test`**, and **`release board`** ***`location`***. If the attempt to deactivate the Far CSU loopback continues to fail, escalate the problem.

s. **Error Types 1400, 1401: e**cho cancellation errors are logged when:

- **Error 1400:** echo canceller function failed. The Echo Canceller Function test, which is executed by firmware, failed.
- **Error 1401:** echo canceller memory failed. The Echo Canceller Memory test, which is executed by firmware, failed.

Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **`busyout board`** ***`location`***, **`test board`** ***`location`*** **`long`**, and **`release board`** ***`location`***. If Test #1420 (Echo Canceller test) fails, replace the circuit pack.

t. **Error Type 1537:** LAN Bus Timeout Error. This error occurs when the circuit pack transmits too many bytes on the LAN bus for a single frame. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those Maintenance Objects.

If the error occurs three times within 10 minutes, the board is isolated from the Packet bus and the board is alarmed. To clear the alarm and restore the board to the Packet bus, use **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`*** **`long`**, and **`release board`** ***`location`***.

If the problem persists, and there are no PKT-BUS alarms or port alarms, then replace the circuit pack.

u. **Error Type 1538:** the hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

- The common circuit pack level tests such as Test #50 and/or Test #52 abort with Error Code 2000.
- The tests run on the ports of this circuit pack return a NO-BOARD result.
- A busyout/release of the circuit pack has no effect on test results.
- A **`list configuration`** command shows that the circuit pack and ports are properly installed.

The circuit pack is isolated from the system and every trunk or port on this circuit pack is placed into the out-of-service state. The system will try to restore the circuit pack within 20-30 minutes. When no faults are detected for 20-30 minutes, the UDS1 Interface circuit pack is restored to normal operation. Every trunk or port of the UDS1 Interface circuit pack is then returned to the in-service state.

If the board is not restored to normal operation or the error recurs after the board was restored to normal operation, escalate the problem.

v. **Error Types 3073 to 3160:** for releases of G3V4 and higher, Error Type 3073 shows that this board is receiving slips. The Aux Data contains the last slip count reported.

w. **Error Type 3330:** LAN critical error. A critical failure has been detected in the Packet bus interface of the circuit pack. This failure may be due to an on-board fault or a Packet bus fault. If the Packet bus is alarmed, see PKT-INT (Packet Interface) for recommended repair procedures.

This error isolates the board from the Packet bus and raises an alarm. If the Packet bus is not alarmed, enter **`busyout board`** ***`location`***, **`reset board`** ***`location`***, **`test board`** ***`location`***, and **`release board`** ***`location`***. This should clear the alarm and restore the board to the Packet bus.

If the problem persists, and there are no PKT-BUS alarms, then replace the circuit pack.

x. **Error Types 3585 to 3601:** for later releases of G3V4 and beyond, Error Type 3585 shows that this board is receiving misframes. The AUX Data contains the last misframe count reported.

y. **Error Type 3840:** not service-affecting. No action is required. These errors are reported by the circuit pack when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

Aux Data	Event
4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link

z. **Error Type 3841:** the UDS1 Interface circuit pack has detected a transient hardware logic error (for example, program logic inconsistency). This error will disappear when no faults are detected for 100 minutes. The value in Aux Data indicates the type of hardware problem.

aa. **Error Type 3842:** bad translation RAM location found error. This error is not service-affecting. No action is required. A Bad Translation RAM is detected, but the call continues by using another translation location.

ab. **Error Type 3843:** LAN Receive Parity Error. This error occurs when the circuit pack detects an error in a received frame from the Packet bus. These errors are most likely caused by a Packet bus problem, but may be due to a circuit pack fault.

See PKT-INT (Packet Interface) to determine whether the problem is isolated to this circuit pack or is caused by Packet bus faults.

ac. **Error Type 3900:** provides status information about a CPE Loopback Jack test. The value in the Aux Data field indicates the status of the loopback test.

Aux Data	Test Status
1	Test is currently running
2	Failed because loopback could not be activated
3	Failed because test pattern could not be detected
4	Test has been terminated

ad. **Error Type 3901:** provides status information about a Far CSU Loopback test. The value in the Aux Data field indicates the status of the loopback test.

Aux Data	Test Status
1	Test is currently running
2	Failed because loopback could not be activated
3	Failed because test pattern could not be detected
4	Test has been terminated

ae. **Error Type 3902:** provides status information about a One-Way Span test. The value in the Aux Data field indicates the status of the span test.

Aux Data	Test Status
1	Test is currently running
2	Failed because test could not be activated
3	Test pattern was not received from the far end
4	Test has been terminated

Note:

G700: If the One-Way Span test is run between a circuit pack and a DS1 Interface Media Module on a Media Gateway, the test will fail because the DS1 Media Module does not frame-align its test pattern.

af. **Error Type 3999:** indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type 1538 is absent, then the circuit pack was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This might be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack is being lightly used, it might indicate a problem with the circuit pack or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND[1]
Echo Canceller Test (#1420)		X			D
NPE Audit Test (#50)		X			ND
Control Channel Looparound Test (#52)		X			ND
Loss of Signal Alarm Inquiry Test (#138)	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND
Misframe Alarm Inquiry Test (#145)	X	X			ND
DS1 Translation Update Test (#146)	X	X			ND
ICSU Status LEDs Test (#1227)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Looparound Test (#135)			X		D
DS1 Board Loopback Test (#1209)				X	D
CSU Equipment Loopback Test (#1210)				X	D
CSU Repeater Loopback Test (#1211)				X	D
CPE Loopback Jack Test (#1212)				X	D
Far CSU Loopback Test (#1213)				X	D
One-Way Span Test (#1214)				X	D
Inject Single Bit Error Test (#1215)				X	D
End Loopback/Span Test (#1216)				X	D

1. D = Destructive; ND = Nondestructive

VAL-BD (Voice announcements over LAN Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
VAL-BD	MIN	**test board *location* long**	Voice announcements over the LAN Circuit Pack
	WRN	**test board *location***	

The Voice announcements over the LAN (VAL) TN2501AP provides per-pack announcement storage time of up to one hour, up to 31 playback ports, and allows for announcement file portability over a LAN. The VAL circuit pack also allows for LAN backup and restore of announcement files and the use of user-provided (.WAV) files. The circuit pack also provides the ability to download new versions of the firmware to itself.

Error log entries and recommended actions

Table 274: VAL-BD Error Log entries *1 of 2*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	0	Sanity	MIN	ON	
18 (b)	0		WRN	OFF	**release board *location***
217 (c)	0		WRN	ON	
257	65535	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* l r 20**
257 (d)					
513 (e)	4352–4357		MIN	ON	
769 (f)	4358				
1281 1290–1295 (g)	Any		MIN	ON	**reset board *location***
1537 1796 (h)	Any		MIN	ON	
1794 (i)			MIN	ON	
1798 (j)					
2049 (k)		Packet Interface test (#598)	MIN	ON	**test board *location* l r 3**
					1 of 2

Table 274: VAL-BD Error Log entries ***2 of 2***

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
2305, 2306 (l)					
2561–2668 (m)	Any				
2817 2819 (n)		Congestion Query (#600)	MIN	ON	`test board` *`location`* `r 3`
3073 (o)		Link Status test (#601)	MIN	ON	`test board` *`location`*
3330 (p)			MIN	ON	`reset board` *`location`*
3586 (q)					
3999 (q)	Any				
3840 (r)	4096–4102				
3841 3843 (s)					
3842 (t)		Receive FIFO Overflow Error Counter test (#596)			
3844 (u)	Any				
3845 (v)	Any				
3846 (w)	Any				
3848 (x)	Any				
3851 (y)	Any				
3852 (z)	Any				
3853 (aa	Any				
3854 (ab)	Any				
3855 (ac)	Any				
3856 (ad)	Any				
					2 of 2

Notes:

a. **Error Type 1:** circuit pack stopped functioning or is not physically present.

1. Verify that the circuit pack is present (**`list config board`** ***`location`***).
2. If circuit pack is present, reset the circuit pack (**`reset board`** ***`location`***).
3. If the error persists, replace the circuit pack.

b. **Error Type 18:** the VAL circuit pack is busied out. Release the circuit pack.

c. **Error Type 217:** applies to 10 circuit packs:

1. Remove the circuit pack(s) against which the error is logged.

d. **Error Type 257:** transient communication problem between switch and circuit pack.

1. Ignore this error, unless the Control Channel Loop test (#52) fails.
2. If Test #52 fails, replace the circuit pack. Repetitive failures of the Control Channel Loop test indicate circuit pack hardware failure.

e. **Error Type 513:** circuit pack detected and reported hardware failure.

1. Reset the circuit pack (**`reset board`** ***`location`***).

   Aux Data:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4356	Angel Message Corruption error
4357	Instruction set error

f. **Error Type 769:** logic error. By itself this error can be ignored, but it can result in other Error Types being reported.

g. **Error Type 1281, 1290–1295:** critical hardware or firmware error.

If the switch detects:	Then the switch:
1 error,	Resets circuit pack.
3 errors in 15 minutes,	Raises MINOR alarm.

Error Type descriptions are as follows:

1290	Global HDLC error
1291	Main RAM/ROM error
1292	CPU error
1293	Insane on-board processor
1294	On-board translation RAM error
1295	(Aux 3) RSCL link down
	(Aux 0) RSCL keepalive failure

1. Attempt to clear the alarm (**reset board *location***).
2. If the alarm persists, replace the circuit pack.

h. **Error Type 1537, 1796:** a hyperactive VAL circuit pack has exceeded the error threshold and has been removed from service.

1. Attempt to clear the alarm (**reset board *location***).
2. If the error recurs within 15 minutes, replace the circuit pack.

i. **Error Type 1794:** packet bus transmit buffers have overflowed.

1. Attempt to clear the alarm (**reset board *location***).
2. If the error recurs within 15 minutes, replace the circuit pack.

j. **Error Type 1798:** unable to write translation RAM.

1. Attempt to clear alarm (**reset board *location***).
2. If the alarm recurs within 15 minutes, replace the circuit pack.

k. **Error Type 2049:** packet Interface test (#598) failed.

1. Attempt to clear the alarm (**test board *location* l r 3**).
2. If alarm does not clear, reset the circuit pack (**reset board *location***).
3. If circuit pack resets, execute Packet Interface test (#598) several times.
4. If Packet Interface test (#598) continues to fail, replace the circuit pack.

l. **Error Type 2305-2306: e**rror in received frame from packet bus. Most likely a packet bus problem.

Error Type 2305 - Received invalid LAPD frame.
Error Type 2306 - Detected parity error on received frame

Invalid LAPD frame errors occur when the frame:

- contains a bad Cyclic Redundancy Check (CRC)
- is greater than the maximum length
- violates the link-level protocol

1. Run **`test board`** ***`location`*** and see if the condition clears.
2. If the condition persists, execute the Invalid LAPD Frame Error Counter Test (#597) and determine whether the condition clears.
3. If the condition persists, execute the Packet Interface Test (#598) to verify circuit pack integrity.
4. If the Packet Interface test (#598) fails, see PKT-BUS (Packet Bus) for repair procedures.

m. **Error Type 2561–2668: s**ystem software received an indication that the socket was closed due to an error. Errors are reported as log only. Errors logged here are for the sockets that had *no* processor channels associated with them, for example, sockets to read SNMP data. The counter base is offset by the application type of the application associated with this socket that is down. The Aux Data field of the log entry contains this application's number, for example, a SNMP application would have its application number in the Aux Data field.

Note:

2561–2668 is a range of reserved numbers for future applications. 2570 currently represents an SNMP socket failure.

n. **Error Type 2817–2819:** Congestion Query test (#600) failed.

Error Type 2817 - Every buffer exhausted
Error Type 2819 - Utilized buffers exceed threshold

See Congestion Query Test (#600) for repair procedures.

o. **Error Type 3073:** Remote Socket Control Link (RSCL) or Link Status Test (#601) failed. This failure can be due to:

- This circuit pack
- The packet bus
- The packet interface circuit pack.

If:	Then:

RSCL disconnects at link level	Link fails
Link cot be reconnected quickly	Switch raises MINOR alarm

p. **Error Type 3330:** critical failure in Packet bus interface.

Below, Error Types correspond to descriptions.

If the switch detects:	Then it:
1 error,	Resets circuit pack.
2 errors in 15 minutes,	Raises MINOR alarm.

1. Attempt to clear the alarm (**`reset board`** ***`location`***).
2. If alarm persists, replace circuit pack.

q. **Error Type 3586 and 3999:** switch removed hyperactive circuit pack that reported threshold number of errors. One or more of the following symptoms can be present:

- Circuit pack port tests return NO BOARD.
- List configuration command shows circuit pack and ports are installed properly.

If Error Type 3999:	And traffic volume is:	Then:
Does not accompany Error Type 3586	Heavy	Circuit pack is in service, but sent at least half hyperactive threshold. With heavy traffic, this is normal.
Does not accompany Error Type 3586	Light	Circuit pack is in service, but sent at least half hyperactive threshold. With light traffic, this error indicates a problem with the circuit pack, its links, or the equipment attached to the links.
Accompanies Error Type 3586	Either Light or Heavy	Switch removed hyperactive circuit pack.

1. Enter **`busyout board`** ***`location`*** and **`release board`** ***`location`*** to reset the circuit pack.
2. Allow 30 minutes for condition to clear itself.
3. To re-establish circuit pack into service manually, enter **`busyout board`** ***`location`***, **`reset board`** ***`location`***, and **`release board`** ***`location`***.
4. If error recurs within 15 minutes, replace the circuit pack.
5. If the same error occurs on a different circuit pack, follow normal escalation procedures.

r. **Error Type 3840:** circuit pack received bad control channel message from switch. The Aux Data value displays the cause of the error event:

Aux Data	Error Cause
4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link
4102	Bad application identifier

s. **Error Type 3841, 3843:** errors do not affect service.

Error Types correspond to the error descriptions.

3841	Internal firmware error
3843	Bad translation RAM

These errors do not affect service, however, they can cause reports of other errors that do affect service.

If Error Type 3843 begins to affect service, it escalates to Error Type 1294 (See Note g).

t. **Error Type 3842:** packet interface receive buffers overflowed.

If this error occurs frequently, the overflow can be congesting the circuit pack.

See Receive FIFO Overflow Error Counter Test (#596).

u. **Error Type 3844:** LAPD frame contains LAPD Protocol Error. By themselves, these errors do not affect service.

v. **Error Type 3845:** Angel interprocessor error. By themselves, these errors do not affect service.

w. **Error Type 3846:** main interprocessor error. By themselves, these errors do not affect service.

x. **Error Type 3848:** main internal channel error. By themselves, these errors do not affect service.

y. **Error Type 3851:** unable to write LAN translation RAM error. By themselves, these errors do not affect service.

z. **Error Type 3852:** LAN external RAM error. By themselves, these errors do not affect service.

aa. **Error Type 3853:** interprocessor LAPD frame error. By themselves, these errors do not affect service.

ab. **Error Type 3854:** interprocessor LAPD protocol error. By themselves, these errors do not affect service.

ac. **Error Type 3855:** memory allocation error. By themselves, these errors do not affect service.

ad. **Error Type 3856:** high CPU occupancy error. By themselves, these errors do not affect service.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
Circuit Pack Restart Test (#594)			D
Invalid LAPD Frame Error Counter Test (#597)		X	ND
LANBIC Receive Parity Error Counter Test (#595)		X	ND
Receive FIFO Overflow Error Counter Test (#596)		X	ND
Packet Interface Test (#598)	X	X	ND
Congestion Query Test (#600)	X	X	ND
Link Status Test (#601)	X	X	ND

1. D = Destructive; ND = Nondestructive

VAL-PT (Voice Announcements over LAN Packet/Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
VAL-PT	MAJ MIN	**test port *location* long**	VAL Port
	WRN	**test port *location***	

S8300 / G700 / G450 / G350 / G430 / G450

The MG- (Voice announcements) maintenance object provides per board announcement storage time of up to 20 minutes (15 playback ports and 1 recording port that can also be used as a playback port), and allows for announcement file portability via LAN connectivity. MG- also allows for LAN backup and restore of announcement files and the use of customer provided waveform (.WAV) files.

The MG- hardware is located on the Media Gateway motherboard. Communication Manager maintenance supports the MG- by using a virtual board concept to allow for board insertion and maintenance testing. The virtual slot location is V9.

S8700 | S8710 | S8720 | S8500

A remote socket control link (RSCL) connects the VAL and the server to pass call-control and other management information. Because one link serves every port on the circuit pack, maintenance of the RSCL is part of the VAL circuit pack maintenance.

VAL Congestion Controls

The switch activates congestion controls on VAL when it detects buffers exceeding the threshold. The switch releases the congestion controls when the VAL reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm
Exhausts buffers	Raises MINOR alarm
Ceases for 12 minutes	Retires MINOR alarm

Error log entries and recommended actions

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location* l**
1 (b)	0	SCOTCH Sync Looparound (#1275)	MIN	ON	**test port *location* l r 3**
257 (c)	0		WRN	OFF	
3585 (d)	0, 1	TDM Looparound Test (#1285)	MAJ	ON	**test port *location* l r 3**

Notes:

a. **Error Type 0**: there is no short test sequence for this MO. Every test is available in the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** SCOTCH Synchronous Looparound Test (#1275) failed.

1. Test the port (**test port *location* long**).
2. See SCOTCH Synchronous Looparound Test (#1275) for repair procedures.

c. **Error Type 257:** VAL port detected overrun or underrun condition that can indicate a hardware problem.

1. Test for hardware problem (**test port *location* long**).

2. See SCOTCH Synchronous Looparound Test (#1275) repair procedures to verify repair.
3. Clear the alarm (**`test port`** ***`location`*** **`long clear`**).

d. **Error Type 3585:** TDM Looparound Test (#1285) failed.

1. Test the port (**`test port`** ***`location`*** **`long`**).
2. See the TDM Looparound Test (#1285) repair procedure.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TDM Looparound Test (#1285)		X	D
SCOTCH Synchronous Looparound Test (#1275)		X	D

1. D = Destructive, ND = Nondestructive

VC-BD (Voice Conditioner Circuit Pack)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
VC-BD	MAJ MIN	**test board *location* l**	Voice Conditioner circuit pack
	WRN[1]	**test board *location***	

1. See XXX-BD (Common Port Circuit Pack/Media Module).

CAUTION:

If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

The TN788 Voice Conditioner circuit pack (VC-BD) is a service circuit pack that provides conditioning for the audio signals from multimedia equipment based on the CCITT H.221 standard. The TN788 transcodes, gain adjusts, and bridges the audio bit streams demultiplexed by the TN787 (MMI) circuit pack and transmits encoded, exclusive audio conference sums onto the TDM bus so that the MMI can multiplex the audio, video, and data streams for the H.221 endpoints.

Error log entries and recommended actions

Table 275: VC-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test board *location***
1 (b)	Any	None	MIN	ON	
18 (c)	0	**busyout board *location***	WRN	OFF	**release board *location***
257 (d)	Any	Control Channel Looparound Test (#52)	MIN	ON	**test board *location* r 20**
513 (e)	4352-4357				
769 (f)	4358				
1025 (g)	4363	NPE Audit Test (#50)			
1281 (h)	Any	SAKI Sanity test (#53)	MAJ	ON	
1293 - 1294 (i)	46088-46096	SAKI Sanity test (#53)	MIN	ON	
1538 (j)	46082		MIN	ON	

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 1:** the circuit pack stopped functioning or it was removed from the system. This alarm is logged approximately 11 minutes after the circuit pack is removed and/or the SAKI Sanity test (#53) fails.

   To resolve this error, insert a circuit pack in the same slot as the error indicates, if the circuit pack is not already in the system. Or, if the circuit pack is in the system and the red LED is on, then follow instructions for Red alarms.

   CAUTION:

   If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

c. **Error Type 18:** this circuit pack is busied out by **busyout board *location***.

d. **Error Type 257:** transient communication problems exist between the switch and this circuit pack. Execute **test board *location*** and see the repair procedures for the Control Channel Looparound Test (#52).

e. **Error Type 513:** the circuit pack detected an on-board hardware failure. The reported Aux Data values correspond to the following detected errors:

Error	Description
4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4357	Instruction set error

   Reset the circuit pack by executing **busyout board *location***, **reset board *location***, and **release board *location***. When it is reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedures in footnote (a) for Error Type 1.

f. **Error Type 769:** the circuit pack detects a program logic error. While no action is required, this error may lead to errors of other types being reported against this circuit pack.

g. **Error Type 1025:** the circuit pack cot update NPE memory and read it back. This Error Type can be ignored, but it may lead to other Error Types being reported against this circuit pack.

h. **Error Type 1281:** a critical hardware failure has been detected on the circuit pack. Use **busyout board *location***, **reset board *location***, followed by **release board *location***. If Test #53 passes, the on-board circuitry is healthy. Use **test board *location* long clear** to retire the alarm. If Test #53 fails, replace the circuit pack.

i. **Error Type 1293 and 1294:** the circuit pack detected a critical hardware failure. Reset the circuit pack with **busyout board *location***, **reset board *location***, and **release board *location***. Circuit Pack Restart Test (#594) passes, then the on-board circuitry is healthy. Retire the alarm by entering **test board *location* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

The reported Error Types correspond to the following detected errors:

Error Type	Description
1293	On-board auxiliary processor insane
1294	Internal memory access error

j. **Error Type 1538:** the circuit pack is hyperactive — it is flooding the switch with messages sent over the control channel. The circuit pack is taken out of service when a threshold number of these errors is reported to the switch. Clear the alarm by using **busyout board *location***, **reset board *location***, **test board *location* long clear**, and **release board *location***. If the error recurs within 10 minutes, then replace the circuit pack.

Demand test descriptions and error codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Control Channel Looparound Test (#52)	X	X	Nondestructive

CAUTION:

If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

VC-DSPPT (Voice Conditioner DSP Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
VC-DSPPT	MAJ MIN WRN	**test port *location***	Voice Conditioner DSP Port

Each Voice Conditioner circuit pack (VC-BD) provides two types of resources:

- Transcoder Resources used for encoding and decoding audio formats
- Summer Resources used for summing audio from different sources

The eight Voice Conditioner DSP ports are the transcoder resources on the VC-BD.

Error log entries and recommended actions

Table 276: VC-DSPPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port *location***
18 (b)	0	**busyout port *location***	WRN	OFF	**release port *location***
257 (c)	Any	VC DSP NPE Crosstalk Test (#1103)	MIN	ON	**test port *location* 1 r 3**
513 (d)	Any	VC DSP Port Local TDM Loopback test (#1104)	MIN	ON	**test port *location* r 3**
778-781 (e)	Any	VC Port Reset DSP test (#1106)	MAJ	ON	
1025 (f)			WRN	ON	
1281 (g)	Any	VC DSP Port DSP Loopback test (#1105)	MIN	ON	**test port *location* r 3**
3840 (h)					

Notes:

a. **Error Type 0:** run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 18:** this port has been busied out by **`busyout port`** ***`location`***.

c. **Error Type 257:** the NPE Crosstalk test (#6) failed.

d. **Error Type 513:** the VC DSP Port Local TDM Loopback Test (#1104) failed. Run the long test sequence.

e. **Error Type 778 - 781:** a critical hardware failure has been detected on the circuit pack. Reset the port by **`busyout port`** ***`location`*** and **`reset port`** ***`location`***. If the VC Reset DSP test (#1106) passes, then the on-board circuitry is healthy. Retire the alarm with **`test port`** ***`location`*** **`long clear`**.

f. **Error Type 1025:** the VC DSP port reported loss of framing on the Service channel between the VC and MMI circuit packs.

g. **Error Type 1281:** the VC DSP Port DSP Looparound Test (#1105) failed.

h. **Error Type 3840:** the DSP corresponding to this port on the VC circuit pack reported a firmware error. No action is required.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Restart Sequence	D/ND[1]
VC DSP Port NPE Crosstalk Test (#1103)		X		D
VC DSP Port Local TDM Loopback Test (#1104)	X	X		D
VC DSP Port DSP Looparound Test (#1105)	X	X		D
VC Port Reset DSP Test (#1106)			X	D

1. D = Destructive; ND = Nondestructive

VC-LEV (Voice Conditioner Resource Level)

MO Name in log	Alarm Level	Initial Command to Run	Full Name of MO
VC-LEV	MAJ	See Resolving VC-LEV Errors/Alarms	Voice Conditioner Resource Level

The MMCH feature must be enabled on the **System-Parameters Customer-Options** screen before you can change these fields.

The Voice Conditioner (VC) Resource Level MO monitors VC efficiency by tracking the number of VC ports that are in-service, and then comparing that number with the value entered in the VC field on the System-Parameters Maintenance screen. This **VCs** field is located under the Minimum Maintenance Thresholds section. The **VCs** field contains the minimum number of VC ports needed for the Multimedia Call Handling (MMCH) feature, and is an administrable field. The **VCs** field must contain a number between 0 and 126, and is entered by the system administrator. The MMCH feature must be enabled in the License File and corroborated by the System-Parameters Customer-Options screen before the **VCs** field can be changed to a number greater than **0**. For example, administering **8** in that field means 1 circuit pack. The algorithm for determining that a low level of VC resources exists uses the number entered in the **VCs** field, and the number of VCs that are in-service in the system.

Each VC circuit pack contains 16 physical ports: 8 ports are reserved for VC-DSPPT ports, and the remaining 8 ports are designated as VC-SUMPT ports. The 8 DSP ports are made up of 4 encoder and 4 decoder resources that encode and decode audio formats. Thus, *one VC circuit pack is required for every 8 ports of MMCH port capacity*. If the number of in-service VC ports falls below the MMCH port capacity (value entered on the System-Parameters Maintenance screen under the Minimum Maintenance Thresholds section and in the **VCs** field), a VEC-LEV error is logged. If this outage continues for 15 minutes a MAJOR alarm is raised.

Resolving VC-LEV Errors/Alarms

VC ports are a key part of the MMCH feature, any loss in the number of ports available for use degrades the MMCH customer defined service level.

If a VC circuit pack or port is busied out using `busyout board` or `busyout port`, these out-of-service ports are not included in the VC level calculation, thus allowing a technician to busyout a VC circuit pack for maintenance reasons without causing a MAJOR alarm to be raised.

Note:

When diagnosing a VC-LEV problem, resolve any alarms raised against VC-BD or VC-DSPPT MOs. Clearing VC-BD or VC-DSPPT alarms may clear the VC-LEV alarm.

The VC circuit pack is maintained by the software similarly to the Tone Detector circuit pack. Tone Detector circuit packs may be removed and reinserted in any port-board slot without administration. The same rule applies to VC circuit packs. If a VC circuit pack is removed from service logically (by failing the Archangel sanity scan test) or is removed from service physically (by physically removing the circuit pack from the carrier), no error/alarm is raised against VC-BD or VC-DSPPT MOs. Therefore, if a VC-LEV error/alarm exists, and none has been raised against VC-BD or VC-DSPPT MOs, a VC circuit pack may have been removed from service causing the VC-LEV error/alarm. To resolve a VC-LEV MAJOR alarm, restore the number of VC ports available for service to be equal to or more than the calculated port capacity (value entered in the `VCs` field).

To determine how many VC circuit packs are needed for the MMCH feature:

1. Display the System-Parameters Maintenance screen by executing **`display system-parameters maintenance`**.
2. Locate the number listed in the Minimum Maintenance Threshold (**VCs**) field. The MMCH feature requires one VC circuit pack for each four ports listed in the Minimum Maintenance Threshold (**VCs**) field.
3. Divide the Minimum Maintenance Threshold value by 8 to determine the number of VC circuit packs needed. For example, a port capacity of 12 listed in the Minimum Maintenance Threshold (**VCs**) field would require 2 VC circuit packs.
4. Use **`list configuration`** to verify that the number of VC circuit packs listed agrees with the required number of VC circuit packs (determined in step 3). If the number of VC circuit packs listed in the step 3 differs from the calculated number, restore the number of VC circuit packs to the correct value, in order to resolve the VC-LEV alarm.

Error log entries and recommended actions

Table 277: VC-LEV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
1 (a)	Any	None	MAJ	OFF	

Notes:

a. **Error Type 1:** the number of VC resources in the system that are in service has fallen below the calculated minimum value. If the number of in-service VC ports falls below the MMCH port capacity (value entered in the Minimum Maintenance Threshold `VCs` field on the system parameters maintenance screen), a VEC-LEV error is logged.

If this outage continues for 15 minutes a MAJOR alarm is raised. To resolve this alarm, correct the out-of-service problem:

1. See VC-DSPPT (Voice Conditioner DSP Port) and VC-BD (Voice Conditioner Circuit Pack) to resolve any associated alarms.
2. If a VC-LEV error/alarm exist and none has been raised against VC-BD or VC-DSPPT MOs, a VC circuit pack may have been removed from service causing the VC-LEV error/alarm. To resolve a VC-LEV MAJOR alarm, restore the number of VC ports available for service to be equal to or more than the calculated port capacity. See Resolving VC-LEV Errors/Alarms for details.

Demand test descriptions and error codes

There are no demand tests for VC-LEV.

VC-SUMPT (Voice Conditioner Summer Port)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
VC-SUMPT	MAJ MIN WRN	**test port** ***location***	Voice Conditioner Summer Port

Each Voice Conditioner circuit pack (VC-BD) provides two types of resources:

- Transcoder Resources that are used for encoding and decoding audio formats
- Summer Resources that are used for summing audio formats from different sources.

The Voice Conditioner Summer Ports (VC-SUMPT) are the summer resources on the VC-BD. There are 8 such ports on a VC-BD.

Error log entries and recommended actions

Table 278: VC-SUMPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0 (a)	0	Any	Any	Any	**test port** ***location***
18 (b)	0	**busyout port** ***location***	WRN	OFF	**release port** ***location***
130 (c)			WRN	ON	**test port** ***location***
257 (d)	Any	VC DSP NPE Crosstalk Test (#1103)	MIN	ON	**test board** ***location*** **1 r 3**
513 (e)	Any	VC Summer Port Local Loopback test (#1100)	MIN	ON	**test board** ***location*** **r 3**

Notes:

a. **Error Type 0**: run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

b. **Error Type 18:** this port has been busied out with **busyout port** ***location***.

c. **Error Type 130:** the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

d. **Error Type 257:** the VC DSP Port NPE Crosstalk Test (#1103) failed.

e. **Error Type 513:** the VC Summer Port Local TDM Looparound Test (#1100) failed.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
NPE Crosstalk Test (#6)		X	Destructive
VC Summer Port Local TDM Looparound Test (#1100)	X	X	Destructive

WAE-PORT (Wideband Access Endpoint Port)

MO Name in Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
WAE-PORT	MIN	**test access-endpoint *extension* l**	Wideband Access Endpoint Port
	WRN	**test access-endpoint *extension***	

1. For additional repair information, see also DIG-BD (Digital Line Circuit Pack) and MG-DS1 (DS1 Interface Media Module).

Wideband Switching supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. Communication Manager switching capabilities support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

Wideband Switching extends the Administered Connections feature to include non-signaling wideband access endpoints. Endpoint application equipment with direct T1 or E1 interfaces may connect directly to the switch's line-side facilities; application equipment without T1 or E1 interfaces requires a terminal adapter such as a DSU/CSU. The terminal adapter or endpoint application equipment is connected to the TN464C Universal DS1 circuit pack, and to the DS1 Interface Media Module.

Note:

Not all tests that run on circuit packs are applicable to media modules. These tests will abort with error code 1412. This error can be ignored.

These endpoints are administered as wideband access endpoints and have no signaling interface to switch; they simply transmit and receive data. (Some applications detect and respond to the presence or absence of data). Calls are initiated from these endpoints using the Administered Connections feature.

Multiple access endpoints on one line-side UDS1 circuit pack or DS1 Interface Media Module facility are separate and distinct within the facility. Endpoint application equipment must be administered to send and receive the correct data rate over the correct DS0s. Every Administered Connection originating from a wideband access endpoint uses the entire bandwidth administered for the endpoint. An incoming call with a different data rate than that administered for the endpoint cot be routed to the endpoint.

Although Wideband Access Endpoints are used primarily for line-side facilities, these endpoints can also be administered on network DS1 facilities to connect Communication Manager to non-switched network services, such as the Avaya fractional T-1 service. An example of this is the Avaya Static Integrated Network Access, where a trunk group to AT&T 4ESS Switched Services shares an access T-1 facility with a Wideband Access Endpoint. In this case, the Wideband Access Endpoint is connected to the AT&T fractional T-1 service, and it does not terminate on local endpoint equipment, but is connected to a far-end CPE via the dedicated fractional T-1. All Wideband Access Endpoint functionality and operation is identical on both line-side and network facilities. However, because maintenance capabilities are limited to the Wideband Access Endpoint interface, and because faults can occur end-to-end, troubleshooting procedures based on an end-to-end view of the network is required.

Wideband access endpoint port maintenance provides a strategy to maintain a wideband access endpoint port via a port on the Universal DS1 interface circuit pack or the DS1 Interface Media Module hardware. The maintenance strategy covers logging wideband access endpoint port hardware errors, running tests for port initialization, periodic and scheduled maintenance, demand tests, and alarm escalation and resolution. Two different port service states are specified in the wideband access endpoint port maintenance:

- *out-of-service:* the port is in a deactivated state and cot be used for calls
- *in-service:* the port is in an activated state and can be used for calls

  If the UDS1 Interface circuit pack or the DS1 Interface Media Module is out of service, every port on it is taken out of service, and a Warning alarm is raised.

Error log entries and recommended actions

Table 279: WAE-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	`test access-endpoint` ***extension***
18 (a)	0	`busyout access-endpoint` ***extension***	WRN	OFF	`release access-endpoint` ***extension***
130 (b)			WRN	ON	`test access-endpoint` ***extension***
1281 (c)		Conference Circuit Test (#7)	MIN	ON	`test access-endpoint` ***extension*** `l r 4`
1537 (d)		NPE Crosstalk Test (#6)	MIN	ON	`test access-endpoint` ***extension*** `l r 3`
1793 (e)					`test board` *location* `long`
3840 (f)	Any	Port Audit and Update (#36)			

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a. **Error Type 18:** the wideband access endpoint has been busied out by **`busyout access-endpoint`** ***extension***. No calls can be made to this extension.

b. **Error Type 130:** the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

c. **Error Type 1281:** the Conference Circuit test (#7) failed on this port. See Test #7 for repair procedures.

d. **Error Type 1537:** the NPE Crosstalk test (#6) failed on this port. See Test #6 for repair procedures.

e. **Error Type 1793:** the TN464C UDS1 Interface circuit pack or the DS1 Interface Media Module has failed. See UDS1-BD (UDS1 Interface Circuit Pack) or MG-DS1 (DS1 Interface Media Module).

f. **Error Type 3840:** the Port Audit and Update test (#36) failed due to an internal system error. Enter **`status access-endpoint`** ***`extension`*** and verify the status of the port. If the wideband access endpoint port is out of service, enter **`release access-endpoint`** ***`extension`*** to put it back into service. Retry the test command.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk Test (#6)		X	ND
Conference Circuit Test (#7)		X	ND
Port Audit And Update Test (#36)	X	X	ND

1. D = Destructive; ND = Nondestructive

XXX-BD (Common Port Circuit Pack/Media Module)

MO Name in Log	Alarm Level	Initial Command to Run	Full Name of MO
XXX-BD[1]	MAJ MIN WRN	**test board** ***location***	Common Port Circuit Pack/ Media Module maintenance

1. Refer to the appropriate circuit pack or media module documentation for the correct MO name displayed in this field.

Common Port Circuit Pack maintenance is a set of common tests used by many circuit packs and media modules. The common portion of these circuit packs/media modules is the generic hardware that interfaces with the TDM bus. The XXX-BD designation is also used on SAT displays when **reset board** is entered with an empty circuit pack or media module slot, or with a circuit pack or media module type that is in conflict with the actual board type administered for that slot.

When any of the Common Port circuit packs or media modules are physically removed from the backplane, no alarm will be logged for approximately 11 minutes. In the case of the following, approximately 21 minutes will elapse before an alarm is logged:

- TN754 Digital Line
- TN758 Pooled Modem
- TN566 EMBEDDED AUDIX
- TN2224 Digital Line Board
- MM712 Digital Line Media Module
- MM717 Digital Line Media Module
- MM720 BRI Media Module
- MM722 BRI Media Module
- MM312 Digital Line Media Module
- IMM-DCP Integrated Digital Line Board
- VMM-2BRI Integrated BRI Media Module
- TIM521 Juniper BRI Media Module

When a circuit pack or media module that has been removed is alarmed, the alarm type is minor and is classified as an on-board alarm. The time delay permits maintenance activity to be performed without triggering an additional alarm.

Alarms are logged against only those common port circuit packs or media modules on which ports have been administered. In a heavily loaded system, the interval between the removal of a Common Port circuit pack or media module and the logging of the alarm may be several minutes longer.

Table 280: Common MOs contains the list of common circuit pack and media module maintenance objects:

Table 280: Common MOs

ADX8D-BD
ADX16A-B
ADX16D-B
ANL-BD
AUX-BD
AXA12-BD
AXD12-BD
CLSFY-BD
CO-BD
DETR-BD
DID-BD
DIG-BD
DIOD-BD
DT-LN-BD
E-DIG-BD
HYB-BD
MET-BD
MODEM-BD
M/T-BD
S-SYN-BD
TIE-BD
TR-LN-BD

Error log entries and recommended actions

Table 281: Common Port Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Recommended Action
0[1]	0	Any	Any	Any	**test board *location***
1 (a)	0	Circuit pack or Media Module removed or SAKI Sanity (#53)	MIN	ON	
18 (b)	0	**busyout board *location***	WRN	OFF	**release board *location***
23 (c)	0	None	WRN	OFF	
36 (d)	4368	none			
125 (e)		None	MIN	ON	
217 (f)	0	None	WRN	ON	
257 (g)	65535	Control channel Looparound Test (#52)	MIN	ON	**test board *location* r 20**
267 (h)	0	None	WRN	ON	
513 (i)	Any	None	MIN	ON	**test board *location***
769 (j)	4358	None			
1025 (k)	4363	NPE Audit Test (#50)			**test board *location* l r 20**
1281 (l)		Ringing Application Test (#51)	MIN	ON	**test board *location* r 2**
1412 (m)					
1538 (n)	Any	None	WRN MIN	ON	
1793 (o)		Neon Test (#220)	MIN	ON	**test board *location* r 2**
3840 (p)	Any	None			
3999 (q)	Any	None			

1. Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a. **Error Type 1:** the circuit pack or media module stopped functioning or has been physically removed from the system. The alarm is logged approximately 11 minutes after removal of the circuit pack or failure of the SAKI Sanity Test (#53).

   Check for the physical presence of the circuit pack or media module in the slot indicated by the alarm. If the circuit pack or media module is absent, insert one of the proper type. If the circuit pack or media module is present and its red LED is lit, see the LED alarms without an Alarm Log entry or with Error Type 1 section in *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*.

b. **Error Type 18:** the circuit pack or media module has been busied out. Release the circuit pack or media module using **`release board`** ***`location`***.

c. **Error Type 23:** the circuit pack or media module has been logically administered but not physically installed. The alarm should clear when the circuit pact or media module is installed.

   If the circuit pack or media module is already installed:

   1. Run **`test board`** ***`location`*** **`long`** and look at any test failures or Error Codes generated.
   2. If the test does not clear error 23, then execute **`reset board`** ***`location`*** and run the long test again.
   3. If the reset/test does not clear error 23, replace the circuit pack or media module.

d. **Error Type 36:** this error applies only to the Maintenance/Test circuit pack (TN771B or TN771C). The error indicates that the hardware associated with the Analog Trunk Testing port of the circuit pack failed to initialize. Note that when this error occurs, the Maintenance/Test circuit pack may report an invalid vintage. Although this error is not service-affecting, the Maintenance/Test circuit pack should be replaced.

e. **Error Type 125:** the circuit pack or media module physically installed in the slot does not match the type that is administered for that slot. Do one of the following:

   - Remove the incorrect circuit pack or media module and replace it with one of the type that is administered for that slot.
   - Use **`change circuit-pack`** or **`change media-module`** to re-administer the slot so that it matches the board that is installed, and follow with **`reset board`** ***`location`***.

f. **Error Type 217:** this error applies to the Maintenance/Test circuit pack (TN771D), Tone Detector (TN748B, TN748C, or TN748D), and Call Classifier (TN748) circuit packs. For the Maintenance/Test circuit pack, the error indicates that there is more than one Maintenance/Test circuit pack in the port network. For the Tone Detector or Call Classifier packs, the error indicates that there are more than 10 circuit packs in the system. Remove the circuit pack against which the error is logged.

g. **Error Type 257:** transient communication problems between the switch and this circuit pack or media module. Execute **`test board`** ***`location`*** and refer to the repair procedures for the Control Channel Looparound Test (#52).

h. **Error Type 267:** transient communication problems with this circuit pack or media module. This error is not service-affecting and no action is required.

i. **Error Type 513:** This error indicates an on-board hardware failure. The system will continuously test the circuit pack or media module and report the results approximately every 10 minutes. If the hardware problem is resolved, the alarm should clear in approximately 30 minutes. If the alarm does NOT clear in 30 minutes, then the circuit pack or media module should be replaced.

j. **Error Type 769:** this error can be ignored, but look for other errors on this circuit pack or media module.

k. **Error Type 1025:** this error is not service-affecting and no action is required.

l. **Error Type 1281:** no ringing current is detected. Run Test #51, Ringing Application Test, and follow the procedures for Ringing Application Test (#51).

m. **Error Type 1412:** Test is not applicable to media modules or gateways. This error can be ignored. No action is necessary.

n. **Error Type 1538:** the hyperactive circuit pack or media module is out-of-service and may exhibit one or more of the following symptoms:

1. The common circuit pack/media module level tests such as Test #51 and/or Test #220 are aborting with Error Code 2000.
2. The tests run on the ports of this circuit pack or media module are returning with a NO-BOARD.
3. A busyout/release of the circuit pack or media module has no effect on test results.
4. A **`list configuration`** command shows that the circuit pack or media module and ports are properly installed.

If the XXX-BD is not a TN754 Digital Line Circuit Pack (DIG-BD) or Digital Line Media Module, and if this error happens again within 15 minutes, then replace the circuit pack or media module. If the XXX-BD is a TN754 Digital Line Circuit Pack (DIG-BD) or Digital Line Media Module, then check the alarm level. If the alarm level is a WARNING, this indicates that users are probably causing the hyperactivity by adjusting or changing their digital stations. If the circuit pack or media module is very hyperactive, then this alarm will be upgraded to a MINOR alarm within 1 hour. If the alarm level is a MINOR alarm, then replace the circuit pack or media module.

o. **Error Type 1793:** no neon current is detected. Run **`test board`** ***`location`*** and follow the procedures for Neon Test (#220).

p. **Error Type 3840:** this error is not service-affecting and no action is required.

q. **Error Type 3999:** the circuit pack or media module sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack or media module was taken out-of-service due to hyperactivity. If Error Type

1538 is absent, then the circuit pack or media module was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this Error Type is logged when the circuit pack or media module is being lightly used, it may indicate a problem with the circuit pack or media module, or the equipment attached to it.

Demand test descriptions and error codes

Investigate tests in the order presented. By clearing errors associated with the first test, errors generated from other tests may also be cleared. Click on the link to see the full description of the test, error codes, and recommended actions.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
NPE Audit Test (#50)		X		ND
Ringing Application Test (#51)	X	X		ND
Control Channel Looparound Test (#52)	X	X		ND
SAKI Sanity Test (#53)			X	D
Neon Test (#220)	X	X		ND

1. D = Destructive; ND = Nondestructive

Chapter 2: Maintenance Demand Tests

Dial Tone Test (#0)

The Dial Tone Test attempts to seize a port and check for the return of a dial tone. It is run for CO-TRK (Analog CO Trunk) and DIOD-TRK (DIOD Trunk).

Table 282: Dial Tone Test (#0) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1005	ABORT	Could not allocate system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test were not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 4

Table 282: Dial Tone Test (#0) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Trunk has been administered as incoming-only or DID trunk group type. Dial tone can only be obtained on outgoing trunks. This is a normal condition.
1018	ABORT	Test has been disabled by administration. Determine why this test was disabled before enabling it. 1. To enable the test, enter **`change trunk-group`** ***<grp#>***. Enter **y** in the **Maintenance Tests** field, and submit the screen. 2. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 4

Table 282: Dial Tone Test (#0) ***3 of 4***

Error Code	Test Result	Description / Recommendation
	FAIL	The trunk was seized, but dial tone could not be detected. **CO-TRK**: 1. Test every administered outgoing port on the board. • Failure of one port indicates a problem toward the CO. • If every port fails, see note below. 2. Check for TONE-BD and TONE-PT errors. Clear any errors found, and repeat the test. • If the error has still not cleared, refer the problem to the CO. 3. If no service problems exist on the port, continue to use the port until the circuit pack or media module can be replaced as a last resort. Perform a trunk test call to see if the trunk is operable. **Note:** If the dial tone test fails for every port on a circuit pack or media module, a -5 Volt power problem is indicated. To investigate problems with a power unit, see CARR-POW (Carrier Power Supply) or RMC-ENV (Power/Fan Sensors). **DIOD-TRK**: 1. Check for TONE-BD and TONE-PT errors. Clear any errors and repeat the test. 2. If the error has still not cleared, refer the problem to the CO.
		3 of 4

Table 282: Dial Tone Test (#0) ***4 of 4***

Error Code	Test Result	Description / Recommendation
2002	FAIL	Seizure portion of the test failed due to a hardware problem. The fault is usually caused by a disconnected trunk. **CO-TRK**: 1. If the CO Port Diagnostic Test (#3) also failed, enter **`display errors`** to display the error log. If Error Type 1281 appears in the error log (the CO Port Diagnostic Test failed because it could not detect ground) AND Error Type 3329 or 3585 appears in the error log with the same last occurred time as Error Type 1281 and 1537, replace the circuit pack or media module. 2. Check the trunk wiring to ensure good connection. Repeat the test if a wiring correction is made. 3. Locate another identical CO trunk and swap its wiring with the one under test. Repeat the test on both trunks, and determine whether the problem follows the trunk or remains at the original port. If the problem follows the trunk, refer the problem to the CO. If the problem remains at the port, replace the circuit pack or media module and repeat the test. **DIOD-TRK**: 1. Check trunk wiring to ensure good connection. Repeat the test if a wiring correction is made. 2. Locate another identical CO trunk and swap its wiring with the one under test. Repeat the test on both trunks and determine whether the problem follows the trunk or remains at the original port. If the problem follows the trunk, refer the problem to the CO. If the problem remains at the port, replace the circuit pack and repeat the test.
	PASS	Trunk was seized, and dial tone was detected. Investigate user-reported troubles on this port by using other port tests and by examining the trunk or external wiring.
Any	NO BOARD	See NO BOARD for the repair procedures.
		4 of 4

CO Port Diagnostic Test (#3)

For ground start trunks, circuit pack or media module port relays are operated and checked to see if the port can detect and apply ground on the Tip lead. This test also verifies that there is no external ground on the Ring lead. In the absence of other failures, the circuit pack or media module should be replaced only if this test fails with the CO line disconnected.

This test also checks the on-board programmable transmission circuits that allow the circuit pack or media module to support transmission characteristics of several different countries.

This test runs on CO-TRK (Analog CO Trunk) and DIOD-TRK (DIOD Trunk).

Table 283: CO Port Diagnostic Test (#3) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000 1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port** ***location*** to determine the trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Test is not valid for the present configuration. This error can be ignored.
1018	ABORT	Test has been disabled by administration. Determine why this test was disabled before enabling it. 1. To enable the test, enter **change trunk-group** ***<grp#>*** and enter **y** in the **Maintenance Tests** field on the Trunk Group form. 2. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 283: CO Port Diagnostic Test (#3) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	Failure to detect ground or faulty ground detected on Ring lead. Enter **`display errors`** to display the error log. Check for Error Type 1025 or 1281. If both errors appear in the error log, choose the most recent error. **Error Type 1025** - Faulty ground detected on Ring lead. This is an off-board fault. **Note:** On TN747B vintage 8 and greater circuit packs, an incoming seizure during this test may cause it to fail with an off-board fault. 1. Repeat the test. If the test passes, ignore the original failure. If the test aborts, continue with Step 2. 2. Repeat the test with the CO line removed. 3. If the test fails, replace the circuit pack or media module. 4. If the test passes, refer the problem to the CO. **Error Type 1281** - Failure to detect internally generated ground. This is an on-board fault. 1. Run the long test sequence. If all of the following conditions are true, replace the circuit pack or media module: • The CO Port Diagnostic Test (#3) fails • The Dial Tone Test (#0) fails with Error Code 2002 • Error Type 3329 or 3585 appears in the error log with the same last occurred time as Error Type 1281 and 1537 2. Repeat the test with the CO line removed. 3. If the test fails, replace the circuit pack or media module. 4. If the test passes, the CO may be drawing too much current. Refer the problem to the CO.
	PASS	This test verifies that the port is able to apply ground for outgoing calls and detect ground for incoming calls. However, it does not provide information about whether a CO line is actually connected. Investigate user-reported troubles on this port by using other port tests and by examining the trunk or external wiring.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Battery and Power Supply Query Test (#5)

The Battery and Power Supply Query Test queries the PN's Maintenance circuit pack for the status of the battery pack and battery charger, then reports the result. In a DC-powered system, this test should never fail. On AC-powered systems, the test turns the battery charger status LED on and off to determine if the battery charger is connected.

Depending on the cabinet type, this test runs on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- DC-POWER (Single-Carrier Cabinet Environment)
- EMG-XFER (Emergency Transfer)
- EXT-DEV (External Device Alarm)
- POWER
- RMC-ENV (Power/Fan Sensors)
- SER-BUS (Serial Communication Bus)

Table 284: Battery and Power Supply Query Test (#5) ***1 of 7***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 7

Table 284: Battery and Power Supply Query Test (#5) ***2 of 7***

Error Code	Test Result	Description / Recommendation
1005	ABORT	The battery charger is not connected. DC-powered cabinets do not have battery backup, so ignore this error if this is a DC-powered cabinet. If the system has a UPS and no battery charger and batteries, ignore this error since the batteries and charger are not required with certain UPSs. Otherwise: 1. Verify that the battery charger is switched on. 2. Unplug one battery. 3. Switch off the charger and remove its white power cord. 4. Verify that the power cord has at least 106 VAC. 5. Verify that the connector on the rear of the charger is properly inserted. 6. Re-insert the charger power cord and switch on the charger. 7. Plug the battery back in. 8. Run the test environment. The batteries may need charging if it was drained if there were power outages. Reconnect the battery charger to recharge. If Test #5 is run before the batteries are completely charged, the test fails with Error Code 2. If Abort 1005 occurs again, escalate the problem. 9. Wait 30 hours and rerun the test.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times. 2. For AC-powered systems, if the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier. Look for and resolve every AC-POWER and CARR-POW alarm in a multicarrier cabinet system. Repeat the test. 3. For AC-powered systems, if the test continues to ABORT with a 2000 Error Code, check for and resolve every MAINT (Maintenance circuit pack) error in a PN. Repeat the test.
2028	ABORT	An internal system error prevented the Battery Charger status LED from being turned off. 1. Since this test is not relevant for DC-powered systems, there may be internal system problems. Retry the command at 1-minute intervals up to 5 times.
		2 of 7

Table 284: Battery and Power Supply Query Test (#5) ***3 of 7***

Error Code	Test Result	Description / Recommendation
2029 2319 2320 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** The system is in nominal power holdover, and the battery is so low that the system will disconnect power very shortly. 1. If power returns, the port carriers in the PN should power-up again. Every circuit pack should be reinserted, and the system should continue to operate normally. There will probably be a minor alarm against battery and battery charger due to the fact that the batteries are recharging. 2. If power does not return, the system will shut down to prevent damage to the batteries. Restore power, and the system will reboot. *No manual intervention is required.* 3. Rerun the test. If the test still fails, the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. Resolve every alarm on this MO, and rerun the test. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but which will cause many, if not every, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun.
		3 of 7

Table 284: Battery and Power Supply Query Test (#5) ***4 of 7***

Error Code	Test Result	Description / Recommendation
4	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** The battery is currently being charged. 1. After 30 hours, the battery should be fully charged, and this error should clear. 2. If after 30 hours the battery is still in the high charge rate, an alarm will be raised. Enter **`display errors`** to display the Error Log, and select the category "environs" to show only environment-related errors. Look for POWER errors of type 257. The first occurrence of this error indicates the time when the battery started charging. Use this time as the starting point to determine whether the battery has been charging for 30 hours. If so, replace the battery and battery charger. **CAUTION:** Read the section, Replacing the Battery and Battery Charger (J58890CE) before proceeding. 3. Rerun the test. If the test still fails, the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. There are failures that can occur on the PN's Maintenance circuit pack that will not be detected by their respective maintenance, but which will cause many, if not every, environment test to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. Resolve every alarm on these MOs, and rerun the test.
6	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** This indicates that Error Codes 2 and 4 occurred. Refer to these descriptions. Also, refer to this test's description for Error Code 14.
		4 of 7

Table 284: Battery and Power Supply Query Test (#5) ***5 of 7***

Error Code	Test Result	Description / Recommendation
8	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** For a global AC MCC (J58890CH), use the procedures outlined in step 3. There is a reserve power fault. A problem exists with the battery charger or, less likely, the batteries. Also, this fault could be generated if the charger is switched off or a battery is unplugged. 1. Replace the battery charger and the battery. The fault should disappear. Always turn off the battery charger before replacing the batteries. 2. Rerun the test. If the test still fails, the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. Resolve every alarm on this MO, and rerun the test. Some failures on the PN's Maintenance circuit pack are not detected by maintenance, but they cause environment tests to fail. If many environment tests fail, replace the suspect circuit pack and rerun the test. 3. Procedures for a Global MCC (J58890CH): a. See if any red LEDs are "on" on any of the rectifier modules or the BIU (Battery Interface Unit) located in the Power Distribution Unit (J58890CH). b. If the BTW (Battery Temp Warning) LED on the BIU is "on," check the batteries for an over temp condition. If temp is normal, replace the BIU. If the test still fails, replace the battery in a small battery system. For a large battery system, escalate the problem. **Note:** The equipment must be installed in a well-ventilated area. Maximum equipment performance is obtained at an ambient room temperature between 40 and 120 degrees Fahrenheit (4 and 49 degrees Celsius) for short term operation (not more than 72 consecutive hours or 15 days in a year) and up to 110 degrees Fahrenheit (43 degrees Celsius) for continuous operation. c. If the BNA (Battery Not Available) LED is "on," check the battery connections including connector J20.
		5 of 7

Table 284: Battery and Power Supply Query Test (#5) ***6 of 7***

Error Code	Test Result	Description / Recommendation
8 (cont'd)	FAIL (cont'd)	d. If there is an alarm and every LED is OK (PWR OK and BOK) on the rectifier modules and the BIU (Battery Interface Unit), verify that the BIU and the RM0850 rectifiers are seated properly (plugged in). If the BOK LED on the BIU is OK, check the number of rectifiers serving this cabinet: No. of carriers/cabinet — No. of rectifiers/cabinet 1 — 2 2 — 3 3 — 3 4 — 4 5 — 4 If the number of rectifiers is correct replace the maintenance circuit pack in the PN.
10	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** Error codes 2 and 8 have occurred. Refer to these descriptions. Also, refer to this test's description for Error Code 14.
12	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** Error codes 4 and 8 have occurred. Refer to these descriptions. Also, refer to this test's description for Error Code 14.
		6 of 7

Table 284: Battery and Power Supply Query Test (#5) ***7 of 7***

Error Code	Test Result	Description / Recommendation
14	FAIL	**DC-powered cabinet:** The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again. **AC-powered cabinet:** Error codes 2, 4, and 8 have occurred. Refer to these descriptions. This could also indicate that the detection logic on the PN's MAINT (Maintenance) circuit pack is defective. Such an error will not be detected by the respective maintenance. If many environment tests are failing, replace the suspect circuit pack, depending on the system configuration.
Any	FAIL	The PN's Maintenance circuit pack is incorrectly reporting a problem with power. Replace the suspect circuit pack and run the test again.
	PASS	No power problems exist.
		7 of 7

NPE Crosstalk Test (#6)

For the majority of maintenance objects, this test is known as the NPE Crosstalk Test (#6). One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conference functions on a per-port basis. This test verifies that the port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test takes about 20 to 30 seconds to complete.

For **MMI-BD**, this test is known as the TSI Crosstalk Test (#6). The Time Slot Interchanger (TSI) chip controls connectivity to the TDM bus. The TSI Crosstalk test verifies that this TSI talks on the selected TDM bus time slot and never crosses over to time slots reserved for other connections. If the TSI is not working correctly, one-way and noisy connections may occur. If the test passes, the TSI can communicate over the TDM bus. This test takes approximately 20 to 30 seconds to complete.

For **VC-SUMPT**, this test is known as the VC-SUMPT Port NPE Crosstalk Test (#6). It is a slightly modified version of the NPE Crosstalk Test

This test runs on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)

- AN-LN-PT (Analog Line Port)
- ANL-16-L (16-Port Analog Line)
- ANL-LINE (8-Port Analog Line)
- AUX-TRK (Auxiliary Trunk)
- CO-DS1 (DS1 CO Trunk)
- CO-TRK (Analog CO Trunk)
- DAT-LINE (Data Line Port)
- DID-DS1 (Direct Inward Dial Trunk)
- DID-TRK (Direct Inward Dial Trunk)
- DIOD-DS1 (DS1 DIOD Trunk)
- DIOD-TRK (DIOD Trunk)
- HYB-LINE (Hybrid Line)
- ISDN-TRK (DS1 ISDN Trunk)
- MET-LINE (MET Line)
- MMI-BD (Multimedia Interface Circuit Pack)
- OPS-LINE (DS1 Off-Premises Station Line)
- _PE (Processor Ethernet) Alarms
- S-SYN-PT (Speech Synthesis Port)
- TIE-DS1 (DS1 Tie Trunk)
- TIE-TRK (Analog Tie Trunk)
- VC-SUMPT (Voice Conditioner Summer Port)
- WAE-PORT (Wideband Access Endpoint Port)

Table 285: NPE Crosstalk Test (#6) ***1 of 8***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 8

Table 285: NPE Crosstalk Test (#6) ***2 of 8***

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port may be busy with a valid call, or the system's Music-On-Hold port is off-hook, which it usually is. **AUX-TRK:** 1. Enter **display port *location*** to determine the trunk group/member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times. **CO-DS1:** 1. Enter **display port *location*** to determine the trunk group/member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. If the port status is active but the port is idle (no calls), enter **display errors** and check the error log for Error Type 1025. If this error exists, see the error log table for a description of this error and required actions for CO-DS1 (DS1 CO Trunk). The port may be locked up. 4. If the port is idle, retry the command at 1-minute intervals up to 5 times. **CO-TRK:** 1. Enter **display port *location*** to determine the trunk group/member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. If the port status is active but the port is idle (no calls), enter **display errors** and check the error log for Error Type 1025. If this error exists, see the error log table for a description of this error and required actions for CO-TRK (Analog CO Trunk). The port may be locked up. Check the CO wiring, check for excessive loop current, and check the trunk translations. If the trunk is translated incorrectly, this test will abort. 4. If the port status is idle, busyout and release the trunk, and retry the command at 1-minute intervals up to 5 times. 5. If the test still aborts, replace the circuit pack.
		2 of 8

Table 285: NPE Crosstalk Test (#6) ***3 of 8***

Error Code	Test Result	Description / Recommendation
1000 (cont'd)	ABORT	**DAT-LINE**: 1. Enter **status data-module** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 2. Retry the command at 1-minute intervals up to 5 times. **DID-DS1, TIE-DS1,** and **TIE-TRK:** 1. Enter **display port *location*** to determine the trunk group/member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. If the port status is active but the port is idle (no calls), enter **display errors** and check the error log for Error Type 1025. If this error exists, see the error log table for a description of this error and required actions for the appropriate maintenance object (DID-DS1 (Direct Inward Dial Trunk), TIE-DS1 (DS1 Tie Trunk), or TIE-TRK (Analog Tie Trunk). The port may be locked up. 4. If the port status is idle, busyout and release the trunk, and retry the command at 1-minute intervals up to 5 times. **DID-TRK**: 1. Enter **display port *location*** to determine the station extension, attendant number, or trunk group/member number of the port. 2. Enter **status station**, **status attendant**, or **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. If the port status is active but the port is idle (no calls), enter **display errors** and check the Error Log for Error Type 513. The port may be locked up. 4. If the port status is idle, retry the command at 1-minute intervals up to 5 times. **DIOD-TRK** and **ISDN-TRK:** 1. Enter **display port *location*** to determine the trunk group/member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.

Table 285: NPE Crosstalk Test (#6) ***4 of 8***

Error Code	Test Result	Description / Recommendation
1000 (cont'd)	ABORT	**PE-BCHL:** 1. Enter **status pri-endpoint *extension*** to determine the service state of the port. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 5 times. **WAE-PORT:** 1. Enter **status access-endpoint *extension*** to determine the service state of the port. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 5 times. **All other Maintenance Objects**: 1. Enter **display port *location*** to determine the station's extension. 2. Enter **status station *extension*** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are unavailable. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		4 of 8

Table 285: NPE Crosstalk Test (#6) *5 of 8*

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **DAT-LINE:** 1. Enter **`status data-module`** ***`extension`*** to determine whether the port is in use. 2. Retry the command at 1-minute intervals up to 5 times. **PE-BCHL:** 1. Enter **`status pri-endpoint`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 5 times. **WAE-PORT:** 1. Enter **`status access-endpoint`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 5 times. **All other Maintenance Objects:** 1. Enter **`display port`** ***`location`*** to determine the station extension, attendant number, or trunk group/member number of the port. 2. Enter **`status station`** ***`extension`***, **`status attendant`** ***`extension`***, or **`status trunk`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. Retry the command at 1-minute intervals up to 5 times.
		5 of 8

Table 285: NPE Crosstalk Test (#6) ***6 of 8***

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test was aborted due to a configuration problem, such as when an analog port is used in a combined modem pool. This error can be ignored.
1018	ABORT	The test has been disabled by administration. Determine why this test was disabled before enabling it. 1. To enable the test, enter **`change station`** ***`extension`*** for analog stations and **`change trunk-group`** ***`<grp#>`*** for trunks. 2. Enter **y** in the **Maintenance Tests** field and submit the screen. 3. Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or there is a more general circuit pack error. 1. Enter **`display errors`** and check the Error Log for existing errors against this port or circuit pack. Attempt to diagnose the previously existing error. 2. After resolving the previously existing errors, retry the command.
1117	ABORT	A service state audit message is outstanding. 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		6 of 8

Table 285: NPE Crosstalk Test (#6) *7 of 8*

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response from the test was not received within the time allowed. **DAT-LINE:** 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test aborts with Error Code 2000 again, run the short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD also abort with Error Code 2000, hyperactivity on the board or facility is indicated. The hyperactivity problem should be dealt with first. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module **All other Maintenance Objects:** 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors was found on the DS1 circuit pack: ● 1281 - Loss of signal ● 1793 - Blue alarm ● 2049 - Red alarm ● 2305 - Yellow alarm ● 1537 - Hyperactivity 1. Enter **`display errors`** and check for the listed Error Types in the Error Log. If any exist, follow the procedures for DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) for the existing Error Type.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		7 of 8

Table 285: NPE Crosstalk Test (#6) ***8 of 8***

Error Code	Test Result	Description / Recommendation
Any	FAIL	The NPE of the tested port is transmitting in error. This causes noisy and unreliable connections. Clear every off-board problem before replacing the circuit pack. A TDM-BUS problem is usually the result of a faulty board connected to the backplane, or bent pins on the backplane. 1. Resolve any of the following errors: ● EXP-PN (Expansion Port Network) ● EXP-INTF (Expansion Interface Circuit Pack), ● RMC-ENV (Power/Fan Sensors) 2. Resolve any TDM-BUS (TDM Bus) errors. 3. Resolve any TONE-BD (Tone-Clock Circuit Pack) or TONE-PT (Tone Generator) errors. 4. Test the board when the faults from steps 1, 2, and 3 are cleared. 5. If the test fails, replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. Investigate user-reported troubles on this port by using other port tests, examining station and trunk wiring, examining the station, and ensuring that the station is correctly translated.
0	NO BOARD	See NO BOARD for the repair procedures.
		8 of 8

Conference Circuit Test (#7)

The Conference Circuit Test verifies that the Network Processing Element (NPE) channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

This test runs on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)
- AN-LN-PT (Analog Line Port)
- ANL-16-L (16-Port Analog Line)

- CO-DS1 (DS1 CO Trunk)
- DAT-LINE (Data Line Port)
- DID-DS1 (Direct Inward Dial Trunk)
- DIOD-DS1 (DS1 DIOD Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- OPS-LINE (DS1 Off-Premises Station Line)
- PE (Processor Ethernet) Alarms
- S-SYN-PT (Speech Synthesis Port)
- TIE-DS1 (DS1 Tie Trunk)
- WAE-PORT (Wideband Access Endpoint Port)

Table 286: Conference Circuit Test (#7) ***1 of 7***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 7

Table 286: Conference Circuit Test (#7) ***2 of 7***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **DAT-LINE**: 1. :Enter **`status data-module`** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **PE-BCHL**: 1. :Enter **`status pri-endpoint`** ***`extension`*** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **WAE-PORT**: 1. :Enter **`status access-endpoint`** ***`extension`*** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **CO-DS1, DID-DS1, TIE-DS1**: 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** ***`<grp#/mem#>`*** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. 3. If the port status is active but the port is idle (no calls), check the error log for Error Type 1025. See the error log table for a description of this error and required actions for this maintenance object (CO-DS1 (DS1 CO Trunk), DID-DS1 (Direct Inward Dial Trunk), TIE-DS1 (DS1 Tie Trunk)). The port may be locked up. 4. Retry the command at 1-minute intervals up to 5 times. **All other Maintenance Objects**: 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number or station extension of the port. 2. Enter **`status trunk`** ***`<grp#/mem#>`*** or **`status station`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
		2 of 7

Table 286: Conference Circuit Test (#7) ***3 of 7***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		3 of 7

Table 286: Conference Circuit Test (#7) ***4 of 7***

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. **DAT-LINE**: 1. Enter **`status data-module`** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **PE-BCHL**: 1. Enter **`status pri-endpoint`** ***`extension`*** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **WAE-PORT**: 1. Enter **`status access-endpoint`** ***`extension`*** to determine if the port is idle. 2. If the port is idle, retry the test at 1-minute intervals up to 5 times. **For all other Maintenance Objects**: 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number or station extension of the port. 2. Enter **`status trunk`** ***`<grp#/mem#>`*** or **`status station`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test is not applicable for this port. This error can be ignored.
1018	ABORT	The test has been disabled by administration. This may be due to the ONS Ringer Application Test #48, which can be customer or terminal disturbing. 1. To enable the test for a particular station, enter **`change station`** ***`extension`*** and set the **Maintenance Tests** field on the Station screen to **y**. Submit the screen. 2. Retry the command at 1-minute intervals up to 5 times.
		4 of 7

Table 286: Conference Circuit Test (#7) ***5 of 7***

Error Code	Test Result	Description / Recommendation
1020	ABORT	The test did not run due to either a previously existing error on the specific port or a more general circuit pack error. 1. Examine the Error Log for existing errors against this port or the circuit pack and attempt to diagnose and resolve the previously existing error. 2. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: ● 1281 – Loss of signal ● 1793 – Blue alarm ● 2049 – Red alarm ● 2305 – Yellow alarm ● 1537 – Hyperactivity Look for these Error Types in the error log, and follow the procedures given in the DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) maintenance documentation for the listed Error Types.
2100	ABORT	System resources required to run this test are not available. 1. Resolve any TONE-PT (Tone Generator) errors. 2. If there are no TONE-PT errors in the error log, retry the test at 1-minute intervals for a maximum of 5 times.
		5 of 7

Table 286: Conference Circuit Test (#7) ***6 of 7***

Error Code	Test Result	Description / Recommendation
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. **ADX16A-P, DIOD-DS1, ISDN-TRK, PE-BCHL, S-SYN-PT, VC-SUMPT, WAE-PORT**: 1. Replace the circuit pack. **ANL-16-L, AN-LN-PT, DAT-LINE**: 1. Enter **`display port`** ***`location`*** and **`status station`** ***`extension`*** to determine whether the station is idle. 2. If the station is idle, enter **`test port`** ***`location`*** for this port. 3. If the test continues to fail, enter **`busy port`** ***`location`*** and **`release port`** ***`location`***, and then retest. 4. If the test still fails, replace the circuit pack. **CO-DS1, DID-DS1, OPS-LINE, TIE-DS1**: 1. Enter **`list configuration board`** ***`location`***. The circuit pack must be a TN767C V3 or later. Check the error log for Error Type 1281 entries. 2. Test every administered trunk on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. 3. If every port fails, a -5 Volt power problem is indicated. Check CARR-POW (Carrier Power Supply) or RMC-ENV (Power/Fan Sensors) for troubleshooting procedures. If a red LED is lit on a TN736 or TN752 power unit circuit pack, replace the circuit pack. 4. If several ports fail, check the error log for TONE-BD (Tone-Clock Circuit Pack) or TONE-PT (Tone Generator) errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. 5. If the retry passes and troubles are reported, coordinate isolation with the CO. Verify that the switch, the CO, and any NICE equipment (the CSI's) have the correct administration. 6. If the test still fails, replace the circuit pack.
		6 of 7

Table 286: Conference Circuit Test (#7) ***7 of 7***

Error Code	Test Result	Description / Recommendation
	PASS	The port can correctly conference multiple connections. Investigate user-reported troubles on this port by using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	See NO BOARD for the repair procedures.
		7 of 7

GPP NPE Crosstalk Test (#9)

The General-purpose Port (GPP) Network Processing Element (NPE) Crosstalk Test verifies that the port's NPE channel talks on the selected time slot and that it never crosses over to time slots reserved for other connections. One or more NPEs reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. An NPE that is not working correctly may cause one-way and noisy connections. This test takes about 20 to 30 seconds to run.

Crosstalk testing is performed on both the primary (for voice) and the secondary (for data) information channel associated with each port. If this test fails on either channel, the port is taken out of service.

This test is run on the following maintenance objects:

- ADX8D-PT (AUDIX Digital Port)
- ADX16D-P (16-Port AUDIX Digital Port)
- DIG-LINE (Digital Line)
- E-DIG-ST (Emulated Digital Line)
- M/T-ANL (Maintenance/Test Analog Port)
- M/T-DIG (Maintenance/Test Digital Port)
- PDMODULE (Processor Data Module)
- TDMODULE (Trunk Data Module)

Table 287: GPP NPE Crosstalk Test (#9) ***1 of 6***

Error Code	Test Result	Description / Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available or the port may have been busy during the test. 1. Enter **`display port`** ***`location`*** to determine the extension of the port. 2. Enter **`status station`** ***`extension`*** to determine the service state of the port. If the service state indicates that the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
2	ABORT	System resources may not have been available or the port may have been busy during the test. **DIG-LINE** and **E-DIG-ST:** 1. Check if port is being used. If possible, disconnect by toggling the disconnect button on DTDM. Retry the command after 1 minute. This action will drop any calls in progress. **All other Maintenance Objects:** 1. Verify that the port is idle. 2. Retry the command at 1-minute intervals up to 5 times.
		1 of 6

Table 287: GPP NPE Crosstalk Test (#9) ***2 of 6***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available or the port may be busy with a valid call. **ADX8D-PT** and **ADX16D-P**: 1. Enter **display port** ***location*** to determine the extension of the port. 2. Enter **status station** ***location*** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times. **DIG-LINE** and **E-DIG-ST:** 1. Enter **display port** ***location*** to determine the station extension or attendant number of the port. 2. Enter **status station** ***extension*** or **status attendant** ***location*** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. Retry the command at 1-minute intervals up to 5 times. **M/T-ANL:** 1. The port may be in use on a valid ATMS trunk call. Retry the command at 1-minute intervals up to 3 times. **M/T-DIG:** 1. Enter **list isdnpri-testcall** to determine if the port is in use (listed in the M/T Port column). If so, wait for the test call to finish as indicated in the **Start Time** and **Duration** fields, or abort the test call with **clear isdnpri-testcall** ***grp#/mem#***, where ***grp#/mem#*** is determined from the **B-Channel** field of **list isdnpri-testcall**. 2. Retry the command at 1-minute intervals up to 5 times. **PDMODULE** and **TDMODULE**: 1. Enter **display port** ***location*** to determine the extension of the port. 2. Enter **status data-module** ***extension*** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
		2 of 6

Table 287: GPP NPE Crosstalk Test (#9) ***3 of 6***

Error Code	Test Result	Description / Recommendation
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		3 of 6

Table 287: GPP NPE Crosstalk Test (#9) ***4 of 6***

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during testing. **ADX8D-PT** and **ADX16D-P**: 1. Enter **`display port`** ***`location`*** to determine the extension of the port. 2. Enter **`status station`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times. **DIG-LINE** and **E-DIG-ST**: 1. Enter **`display port`** ***`location`*** to determine the station extension or attendant number of the port. 2. Enter **`status station`** or **`status attendant`** to determine the service state of the port. 3. If the service state indicates that the port is in use, wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 4. Retry the command at 1-minute intervals up to 5 times. **M/T-ANL**: 1. To determine whether the port is in use by a valid ATMS test call, enter **`status station`** ***`ext`*** where ***`ext`*** is the assigned ATMS station's number. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 3 times. If the port is idle and the test continues to abort, escalate the problem. **M/T-DIG**: 1. The port has been seized by a valid ISDN-PRI test call. Enter **`list isdnpri-testcall`** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the **Start Time** and **Duration** fields of the above display, or abort the test call with **`clear isdnpri-testcall`** ***`grp#/mem#,`*** where ***`grp#/mem#`*** is determined screen the **B-Channel** field **`list isdnpri-testcall`**. 2. Retry the command at 1-minute intervals up to 5 times.
		4 of 6

Table 287: GPP NPE Crosstalk Test (#9) ***5 of 6***

Error Code	Test Result	Description / Recommendation
1004 (cont'd)		**PDMODULE** and **TDMODULE:** 1. Enter **`display port location`** to determine the extension of the data module port. 2. Enter **`status data-module extension`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or there is a more general circuit pack error. 1. Enter **`display errors`** and check the Error Log for existing errors against this port or circuit pack. Attempt to diagnose the previously existing error. 2. After resolving the previously existing errors, retry the command.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		5 of 6

Table 287: GPP NPE Crosstalk Test (#9) ***6 of 6***

Error Code	Test Result	Description / Recommendation
1 2 Any	FAIL	The NPE of the tested port is transmitting in error. This causes noisy and unreliable connections. **M/T-ANL** and **M/T-DIG**: 1. If the remaining ports are currently idle (amber LED is off), try to reset the circuit pack and rerun the test. 2. If the problem persists, replace the circuit pack. **All other Maintenance Objects**: Error code 1 = Crosstalk test failed on the primary channel. Error code 2 = Crosstalk test failed on the secondary channel. 1. Replace the circuit pack. **CAUTION:** **ADX8D-PT** and **ADX16D-P**: Shut down AUDIX before replacing the EMBEDDED AUDIX circuit pack.
	PASS	The port is using its allocated time slots correctly. 1. To ensure that this is not an intermittent problem, repeat this test up to 10 times and see if it continues to pass. 2. If the problem still exists, examine the stations, connections, and wiring.
		6 of 6

Digital Line Electronic Power Feed Test (#11)

For TN413, and TN754 vintage 13 or earlier, this is the Electronic Power Feed (EPF) Restoral Test. In this test, the processor requests that the EPF be turned on for a given port, and an attempt is made to turn on the power supply to the station. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed, there may be a short in the loop. A message is returned reporting that either the EPF was successfully turned on, or that an overcurrent condition was sensed. This test is repeated again 5 seconds later.

For TN754 vintage 14 or later, TN754B and TN2136, this is a Positive Temperature Coefficient (PTC) Restoral Test. In this test, the processor requests that the PTC be turned on for a given port, and an attempt is made to turn on the power supply to the station. If an overcurrent condition is sensed, there is probably a short on the power line that causing the PTC to open and disconnect the voice terminal. Since the PTC does not have self-restoral capability, the voice terminal must be manually unplugged for 30 seconds and then plugged back in to restore the PTC. A message is returned reporting that either the PTC was successfully turned on successfully with no problem or an overcurrent condition was sensed. This test is repeated again 5 seconds later.

For TN2181 and TN2224 boards, this is a Protected Power Feed restoral test, since the boards carry Protected Power Feed (PPF) relays, one for each port. The test procedure and its response is same as that of EPF. One of differences between EFP and PPF is that, if the port goes into a overcurrent state, PPF does not report this change of state because it is a transient state which will not last more than 50ms. If the overcurrent persists, the power will be shut off automatically.

For MM717 Media Modules, this is an EPF Restore Test. The Media Module provides power to the terminals. The test procedure and its response is same as that of EPF. If the overcurrent persists, the power will be shut off automatically.

This test runs on the following maintenance objects:

- DIG-LINE (Digital Line)
- RC-BD (Radio Controller Board)

Table 288: Digital Line Electronic Power Feed Test (#11) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 288: Digital Line Electronic Power Feed Test (#11) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension or attendant number of the port. 2. Enter **`status station`** or **`status attendant`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources for this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. 1. Although, except for the previous Internal system error, this test never actually returns a FAIL result, it will log an error indicating the real results of the test. Check the Error Log for any entries with Error Types 767 or 769 after the test completes. 2. If Error Type 767 appears in the Error Log, this indicates that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station and check that every feature button is operating. 3. If Error Type 769 appears in the Error Log, this indicates some problem with the power to the station. Check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Local Loop Test (#13)

This test is executed on the following maintenance objects:

- ADX8D-PT (AUDIX Digital Port)
- ADX16D-P (16-Port AUDIX Digital Port)
- DIG-LINE (Digital Line)
- E-DIG-ST (Emulated Digital Line)
- M/T-ANL (Maintenance/Test Analog Port).
- M/T-DIG (Maintenance/Test Digital Port)
- PDMODULE (Processor Data Module)
- TDMODULE (Trunk Data Module).

For **ADX8D-PT, ADX16D-P, DIG-LINE,** and **E-DIG-ST**, this test is known as the Voice and Control Channel Local Loop Test (#13). This test consists of four tests that check the information and control channels between the server and the port circuit. If any of the tests fail or abort, the test sequence stops and the result is reported.

For **M/T-ANL,** this test is known as the Analog Port Digital Looparound Test (#13). The test performs a loop test on the data channel and TDM bus, then runs a conference test.

For **M/T-DIG**, this test is known as the Digital Port Looparound Test (#13). The test performs a loop test on the data channel and TDM bus, then runs a conference test.

For **PDMODULE** and **TDMODULE**, this test is known as the Information and Control Channel Looparound Test (#13). This is a set of four tests that check the operation of the information and control channels used between Communication Manager and the Digital Line port circuit.

User impact from problems with this port many range from no noticeable effect to not being able to use this port. Users may not notice a disruption in service. In extreme cases, the conferencing feature may not work at all.

Table 289: Local Loop Test (#13) ***1 of 9***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
		1 of 9

Table 289: Local Loop Test (#13) ***2 of 9***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>1000</td><td>ABORT</td><td>Could not seize the port. The port may be busy with a valid call.
ADX8D-PT, ADX16D-P, DIG-LINE and E-DIG-ST:
1. Enter <code>display port</code> <code>location</code> to determine the station extension or attendant number of the port.
2. Enter <code>status station</code> <code>extension</code> or <code>status attendant</code> <code>extension</code> to determine the service state of the port. If the port is in use, wait until it is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out.
3. Retry the command at 1-minute intervals up to 5 times.
M/T-ANL:
1. To determine whether the port is in use by a valid ATMS test call, enter <code>status station</code> <code>ext</code> where <code>ext</code> is the assigned ATMS station's number.
2. If the port is in use, wait until it is idle.
3. Retry the command at 1-minute intervals up to 3 times.
M/T-DIG:
1. Enter <code>list isdnpri-testcall</code> to determine which call is using the port. Wait for the test call to complete as indicated in the Start Time and Duration fields, or abort the test call with <code>clear isdnpri-testcall</code> <code>grp#/mem#</code>, where <code>grp#/mem#</code> is determined from the B-Channel field of <code>list isdnpri-testcall</code>.
2. Retry the command at 1-minute intervals up to 5 times.
PDMODULE and TDMODULE:
1. Enter <code>display port</code> <code>location</code> to determine the data module extension.
2. Enter <code>status data module</code> <code>extension</code> to determine the service state of the data module. If the service state indicates that the data module is in use, wait until the port is idle before retesting.
3. Retry the command at 1-minute intervals up to 5 times.</td></tr>
<tr><td>1001</td><td>ABORT</td><td>System resources required to run this test are not available.
1. Retry the command at 1-minute intervals up to 5 times.</td></tr>
<tr><td colspan="3" align="right">2 of 9</td></tr>
</table>

Table 289: Local Loop Test (#13) ***3 of 9***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		3 of 9

Table 289: Local Loop Test (#13) ***4 of 9***

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. **ADX8D-PT, ADX16D-P, DIG-LINE** and **E-DIG-ST**: 1. Enter **`display port`** ***`location`*** to determine the station extension or attendant number of the port. 2. Enter **`status station`** ***`extension`*** or **`status attendant`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. Retry the command at 1-minute intervals up to 5 times. **M/T-ANL:** 1. To determine whether the port is in use by a valid ATMS test call, enter **`status station`** ***`ext`*** where ***`ext`*** is the assigned ATMS station's number. If the port is in use, wait until it is idle. 2. Retry the command at 1-minute intervals up to 3 times. **M/T-DIG:** 1. Enter **`list isdnpri-testcall`** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the **Start Time** and **Duration** fields of the above display, or abort the test call with **`clear isdnpri-testcall`** ***`grp#/mem#`*** where ***`grp#/mem#`*** is determined from the **B-Channel** field of **`list isdnpri-testcall`**. 2. Retry the command at 1-minute intervals up to 5 times. **PDMODULE** and **TDMODULE:** 1. Enter **`display port`** ***`location`*** to determine the data module extension. 2. Enter **`status data module`** ***`extension`*** to determine the service state of the data module. If the data module is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		4 of 9

Table 289: Local Loop Test (#13) ***5 of 9***

Error Code	Test Result	Description / Recommendation
2000 2100 2500	ABORT	Response from the test was not received within the time allowed. Could not allocate the necessary system resources for this test Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		5 of 9

Table 289: Local Loop Test (#13) ***6 of 9***

Error Code	Test Result	Description / Recommendation
7	FAIL	The Conference Test failed on the primary channel. **M/T-ANL:** 1. Check the Tone Clock and the Tone Detector circuit packs by entering **test board** ***location*** for these circuit packs. 2. Resolve any problems detected on the Tone-Clock or Tone Detector circuit pack and retest. 3. If the Tone Clock and Tone Detector circuit packs are functioning properly and the test still fails, replace the Maintenance/Test circuit pack. **For all other Maintenance Objects:** 1. Check the Tone Generator and the Tone Detector circuit packs by entering **test board** ***location*** for these circuit packs. 2. Resolve any problems detected on the Tone Generator and Tone Detector circuit packs and retest. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly and the test still fails: **ADX8D-PT** and **ADX16D-P**: Shut down AUDIX and replace the EMBEDDED AUDIX circuit pack. **DIG-LINE, E-DIG-ST, PDMODULE,** and **TDMODULE:** Replace the Digital Line circuit pack. **M/T-DIG**: Replace the Maintenance/Test circuit pack.
		6 of 9

Table 289: Local Loop Test (#13) ***7 of 9***

Error Code	Test Result	Description / Recommendation
14	FAIL	The primary information channel is not transmitting properly. 1. Check the Tone Generator and the Tone Detector circuit packs by entering **`test board`** ***`location`*** for these circuit packs. 2. Resolve any problems detected on the Tone Generator or Tone Detector circuit pack and retest. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly and the test still fails, **ADX8D-PT** and **ADX16D-P**: Shut down AUDIX and replace the EMBEDDED AUDIX circuit pack. **DIG-LINE, E-DIG-ST, PDMODULE,** and **TDMODULE:** Replace the Digital Line circuit pack. **M/T-ANL** and **M/T-DIG**: Replace the Maintenance/Test circuit pack.
		7 of 9

Table 289: Local Loop Test (#13) ***8 of 9***

Error Code	Test Result	Description / Recommendation
15	FAIL	The control channel between the processor and the circuit pack is not transmitting properly. 1. Check the Tone Generator and the Tone Detector circuit packs by entering **`test board`** ***`location`*** for these circuit packs. 2. Resolve any problems detected on the Tone Generator or Tone Detector circuit pack. 3. If both circuit packs are functioning properly and the test still fails, **ADX8D-PT** and **ADX16D-P**: Shut down AUDIX and replace the EMBEDDED AUDIX circuit pack. **DIG-LINE, E-DIG-ST, PDMODULE,** and **TDMODULE**: Replace the Digital Line circuit pack.
16	FAIL	The secondary information channel is not transmitting properly. 1. Check the Tone Generator and the Tone Detector circuit packs by entering **`test board`** ***`location`*** for these circuit packs. 2. Resolve any problems detected on the Tone Generator or Tone Detector circuit pack. 3. If the Tone Generator and the Tone Detector circuit packs are functioning properly and the test still fails, **ADX8D-PT** and **ADX16D-P**: Shut down AUDIX and replace the EMBEDDED AUDIX circuit pack. **DIG-LINE, E-DIG-ST**, **PDMODULE,** and **TDMODULE:** Replace the Digital Line circuit pack.
None	FAIL	**ADX8D-PT** and **ADX16D-P:** The test failed for reasons external to the EMBEDDED AUDIX circuit pack. 1. Check the Tone Generator and the Tone Detector circuit packs by entering **`test board`** ***`location`*** for these circuit packs. 2. Resolve any problems detected on the Tone Generator or Tone Detector circuit pack. 3. If both circuit packs are functioning properly and the test still fails, shut down AUDIX and replace the EMBEDDED AUDIX circuit pack.
		8 of 9

Table 289: Local Loop Test (#13) ***9 of 9***

Error Code	Test Result	Description / Recommendation
	PASS	The Local Loop test passed. Every channel is transmitting properly. 1. To ensure that this is not an intermittent problem, repeat this test up to 10 times and see if it continues to pass. 2. If the problem still exists, examine the connections, station, and wiring.
		9 of 9

Digital Station Lamp Update (#16)

This test lights all lamps on the terminal as specified. The lamp updates run only if the station is in-service. The lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

This test runs on the following maintenance objects:

- DIG-IP-S (Digital IP Station)
- DIG-LINE (Digital Line)
- E-DIG-ST (Emulated Digital Line)
- RC-BD (Radio Controller Board)

Table 290: Digital Station Lamp Update Test (#16) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1	ABORT	This port may have been busied out by a system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port using the command **`release station`** ***`extension`*** and run the test again. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.

Table 290: Digital Station Lamp Update Test (#16) ***2 of 2***

Error Code	Test Result	Description / Recommendation
3	ABORT	Station may be in ready-for-service or out-of-service state. 1. Enter **status station** to verify the state of the station. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the station extension or attendant number of the port. 2. Enter **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **display port** (the port is a TTI port) or **list config** (a “t” is displayed for the port). 2. If either **list config** or **display port** indicates that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to light every station lamp was successfully sent to the port. 1. Observe the station lamps being lit when running the test. If all lamps do not light, the other Digital Line test results may indicate related problems that do not allow the lamps to light. 2. Investigate troubles by using other Digital Line port tests, and by examining the station, wiring, and connections.

Digital Station Audits Test (#17)

This test is a series of audits. This test is run on PDMODULE, TDMODULE, digital stations, softphone applications, and IP phones. This test is run on a station only if the station is in-service. The following audits are performed:

- Switch hook Inquiry: This is an update of the server's software records based on the on-hook/off-hook status of the data module or voice terminal.
- Station ID Request: A request is made to the data module or station for its status. The data module or station returns its configuration and health information. This information is checked and a pass/fail result is provided.
- EPF inquiry: The test requests the status of the Electronic Power Feed. EPF is not used for data modules.
- Bad Scan Inquiry: An uplink message is sent containing a count generated by certain events relating to the link conditions. This can be an indication of communication problems between the server and the digital port board or media module.
- Ringer Update: This updates the ringer state according to the server's records.
- DTMP Administration Update: This sends a message to the digital station to refresh the default value that causes the station to send touch-tones only in the primary information channel. This value is initially set when the station is put in-service and each time the station's state changes from another state to in-service. This test is not used with data modules.

This test runs on the following maintenance objects:

- DIG-IP-S (Digital IP Station)
- DIG-LINE (Digital Line)
- PDMODULE (Processor Data Module)
- TDMODULE (Trunk Data Module)
- RC-BD (Radio Controller Board)

Table 291: Digital Station Audits Test (#17) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1 2	ABORT	Switchhook audit timed out. Station ID request failed or the health bit is defective. 1. Verify that the data module or voice terminal is connected and repeat the test. 2. If the test aborts, replace the data module or voice terminal and repeat the test. 3. For PDMODULE or TDMODULE, if this test continues to abort, replace the circuit pack and repeat the test.
		1 of 4

Table 291: Digital Station Audits Test (#17) ***2 of 4***

Error Code	Test Result	Description / Recommendation
3	ABORT	The EPF has detected an overcurrent condition **DIG-LINE**: 1. For a TN754 vintage 13 or earlier Digital Line circuit pack, enter **`test port`** ***`location`*** **`long`**. ● If Test #11 passes, the EPF condition was cleared. Rerun the short test sequence. ● If Test #11 does not pass, follow the repair procedures for Digital Line Electronic Power Feed Test (#11) 2. Look for Error Type 769 logged against DIG-LINE and follow the procedures for DIG-LINE (Digital Line). 3. Rerun the test. **RDIG-STA**: 1. Enter **`test port`** ***`location`*** **`long`**. ● If Test #11 passes, the EPF condition was cleared. Rerun the short test sequence. ● If Test #11 does not pass, follow the repair procedures for Digital Line Electronic Power Feed Test (#11). 2. Look for Error Type 769 logged against RDIG-STA and follow the procedures for RC-BD (Radio Controller Board). 3. Rerun the test.
4	ABORT	Internal system error 1. Resolve any outstanding circuit pack or media module maintenance problems. 2. Retry the command at 1-minute intervals up to 5 times.
		2 of 4

Table 291: Digital Station Audits Test (#17) ***3 of 4***

Error Code	Test Result	Description / Recommendation
5	ABORT	Ringer update aborted. Data module or station not in the in-service state. **PDMODULE, TDMODULE**: 1. Verify that the data module is powered (power LED on). 2. Make sure data module is connected to the building wiring, check for faulty wiring, check for faulty data module. 3. Retry the command at 1-minute intervals up to 5 times. 4. Replace the Data Module and repeat the test. 5. If the test continues to abort, replace the Digital Line circuit pack and repeat the test. **DIG-LINE, RDIG-STA**: The port could have been busied out by a system technician. 1. Look in the Error Log for Error Type 18 for this port. If this error is present, release the port using **`release station`** ***`extension`***. 2. Make sure that the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
6	ABORT	Touch-tone update failed. 1. Retry the command at 1-minute intervals up to 5 times.
7	ABORT	Downloadable parameter downlink failed. 1. Retry the command at 1-minute intervals up to 5 times.
8	ABORT	Terminal levels audit failed. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using **`display port`**, where the display shows that the port is a TTI port, or **`list config`**, where the display shows a `t` for the port. 2. If **`list config`** or **`display port`** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
		3 of 4

Table 291: Digital Station Audits Test (#17) ***4 of 4***

Error Code	Test Result	Description / Recommendation
1706	ABORT	IP endpoint is not registered. 1. Verify the IP phone is connected. 2. Retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test was not received within the time allowed. Internal error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The audits passed. 1. If complaints still exist, investigate by using other port tests and by examining the data module options, wiring, and connections.
		4 of 4

Looparound and Conference Test (#33)

The Looparound and Conference Test checks the reflective and non-reflective looparound and conference capabilities of a trunk port circuit. It transmits 404-Hz, 1004-Hz, and 2804-Hz tones. Each tone is transmitted separately to and from the port, then verified

Disabling this test also disables the Port Diagnostic Test (#35).

This test runs on the following maintenance objects:

- AUX-TRK (Auxiliary Trunk)
- CO-TRK (Analog CO Trunk)
- DID-TRK (Direct Inward Dial Trunk)
- DIOD-TRK (DIOD Trunk)
- TIE-TRK (Analog Tie Trunk)

Table 292: Looparound and Conference Test (#33) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port** ***location*** to determine the trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		1 of 4

Table 292: Looparound and Conference Test (#33) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	The test was disabled by administration 1. To enable the test, enter **`change trunk-group`** ***`x`***, where ***`x`*** is the trunk group number. Change the **Maintenance Tests** field to **y**. 2. Retry the command.
1412	ABORT	This test does not run on media modules or gateways. Ignore this error.
		2 of 4

Table 292: Looparound and Conference Test (#33) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2000 2100	ABORT	Response to the test was not received within the time allowed. Could not allocate the resources necessary to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
7 129 131 133	FAIL	No transmission was detected to or from the port. The problem may be off-board. Error Code 7 - The conference capabilities of the port failed. Error Code 129 - The reflective 404-Hz tone test failed. Error Code 131 - The reflective 1004-Hz tone test failed. Error Code 133 - The reflective 2804-Hz tone test failed. 1. If the Looparound and Conference test fails for every port on a circuit pack, a -5 Volt power problem is indicated. See CARR-POW (Carrier Power Supply) or RMC-ENV (Power/Fan Sensors). 2. If a red LED is lit on the power unit circuit pack, replace the circuit pack. 3. If the test fails on more than one port, check for TONE-BD and TONE-PT errors. If there are errors, see TONE-BD (Tone-Clock Circuit Pack) and/or TONE-PT (Tone Generator). When the tone errors have been resolved, rerun the test. 4. **S8700-series Fiber-PNC**: if the test fails again, see Fault Isolation Using Duplicated PNC 5. To check if the problem is on-board, disconnect the port from the auxiliary equipment or CO and retry the test. If disconnecting from the CO, coordinate the disconnect with the CO or do it after hours. Otherwise, the CO may put the connection out of service. If the retry fails, replace the circuit pack. 6. If the test passed after disconnecting the port from the auxiliary equipment or CO, the problem is off-board. **AUX-TRK**: Check the wiring and connections to the auxiliary equipment and retry the test after reconnecting the port to the auxiliary equipment. If the test fails, check the auxiliary equipment. See the preceding procedure for a failure with Error Code 7. **All other Maintenance Objects**: If the test passes and no troubles have been reported, disable the test by changing the **Maintenance Tests** field to **y** on the **`change trunk-group x`** screen, where ***x*** is the trunk group number. If the test passes and troubles have been reported, refer the problem to the CO.
		3 of 4

Table 292: Looparound and Conference Test (#33) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	PASS	This port is functioning properly. If users are reporting troubles, examine the loop connections to the port.
		4 of 4

Port Diagnostic Test (#35)

This test is also known as the Battery Feed Test.

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switch hook capabilities of the battery feed chip by terminating the port, applying battery, and trying to detect a current.

This test is run on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)
- ALARM-PT (Alarm Port)
- AN-LN-PT (Analog Line Port)
- ANL-16-L (16-Port Analog Line)
- ANL-LINE (8-Port Analog Line)
- DID-TRK (Direct Inward Dial Trunk)
- MET-LINE (MET Line)
- RANL-STA (Remote Analog Line (Station) Port)

Table 293: Port Diagnostic Test (#35) ***1 of 6***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 6

Table 293: Port Diagnostic Test (#35) ***2 of 6***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **ALARM-PT**: The port may be reporting an external device alarm. 1. Enter **`test external-device-alarm port`** ***`location`*** to determine whether the port is reporting an EXT-DEV failure. 2. If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times. **ANL-16-L, ANL-LINE, AN-LN-PT, MET-LINE, RANL-STA**: The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension or attendant number of the port. 2. Enter **`status station`** ***`extension`*** or **`status attendant`** ***`extension`*** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. If the port status is idle, retry the command at 1-minute intervals a maximum of 5 times. **DID-TRK:** The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. If the port status is active but the port is idle (no calls), check the error log for Error Type 513 for this maintenance object. The port may be locked up. 4. If the port status is idle, busyout and release the trunk, and retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, check for wiring errors toward the CO which may cause the trunk to lock up. 6. If the wiring is good and the test continues to abort, replace the circuit pack or media module.
		2 of 6

Table 293: Port Diagnostic Test (#35) ***3 of 6***

Error Code	Test Result	Description / Recommendation
1004	ABORT	**ALARM-PT**: The port received an EXT-DEV failure during the test. 1. Enter **`test external-device-alarm port`** ***`location`*** to determine whether the port is reporting an EXT-DEV failure. 2. If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times. **ANL-16-L, ANL-LINE, AN-LN-PT, DID-TRK, MET-LINE, RANL-STA**: The port was seized by a valid call during the test. 1. Enter **`display port`** ***`location`*** to determine the station extension, attendant number, or trunk group/member number of the port. 2. Enter **`status station`**, **`status attendant`**, or **`status trunk`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test is not applicable for this type of port. This error can be ignored.
1018	ABORT	**DID-TRK**: The test has been disabled by administration. 1. To enable the test, enter **`change trunk-group`** ***`x`***, where ***x*** is the trunk group number. Change the **Maintenance Tests** field to **y**. 2. Retry the command. **All other Maintenance Objects**: The test has been disabled by administration. Determine why the **Maintenance Tests** field on the station form was set to **n** on this station. It may be due to the ONS Ringer Application Test #48, which can be customer or terminal disturbing. 1. To enable the test for the particular analog station being tested, enter **`change station`** ***`extension`*** and set the **Maintenance Tests** field to **y**. 2. Retry the command.
		3 of 6

Table 293: Port Diagnostic Test (#35) ***4 of 6***

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is a TTI port. The test will not run on TTI ports. 1. Verify that the port is a TTI port using either **`display port`**, which shows that the port is a TTI port, or **`list config`**, which shows a **t** for the port. 2. If either command indicates that the port is a TTI port, the abort is correct for the test and no action is necessary. 3. If the port is *not* a TTI port, escalate the problem.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100		Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
61446	FAIL	**DID-TRK**: Battery feed test failed. A loop current fault was detected. This is most likely an incoming CO-line problem. 1. Check the incoming CO-line for loop current. If none is detected refer the problem to the CO. 2. If the CO-line checks out OK, the failure must be on the DID port. Replace the circuit pack.
61456	FAIL	**DID-TRK**: Battery feed test failed. An on-board problem was detected. This port is out-of-service. 1. Replace the circuit pack or media module.
61472	FAIL	**DID-TRK**: Battery feed test failed. A problem with the incoming CO-line was detected. 1. Check the incoming CO-line for proper operation. If warranted, refer the problem to the CO. 2. If the CO-line is not at fault, the failure must be on the DID port. Replace the circuit pack or media module.
		4 of 6

Table 293: Port Diagnostic Test (#35) ***5 of 6***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td></td><td>FAIL</td><td>ALARM-PT: The port’s battery feed chip is unable to supply sufficient power to sense the external device alarm. This may occur when the test is performed at the same time that the external device contact closure occurs.
1. Enter <code>test external-device-alarm port location</code> to determine whether the port is reporting an EXT-DEV failure. Wait until the port has no EXT-DEV failures before retesting.
2. Retry the command at 1-minute intervals up to 5 times.
ANL-16-L, ANL-LINE, AN-LN-PT, MET-LINE, RANL-STA: The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This may occur when the test is performed at the same time the terminal equipment goes off-hook.
1. Enter <code>display port location</code> to determine the station extension of the port.
2. Enter <code>status station</code> to determine the service state of the port. If the port is in use, wait until it is idle before testing.
3. Retry the command at 1-minute intervals up to 5 times.
4. If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack or media module only if the customer is experiencing problems.</td></tr>
<tr><td colspan="3" align="right">5 of 6</td></tr>
</table>

Table 293: Port Diagnostic Test (#35) ***6 of 6***

Error Code	Test Result	Description / Recommendation
	PASS	**ALARM-PT**: The port's battery feed chip is able to provide power to the external device alarm to detect contact closure. **ANL-16-L, ANL-LINE, AN-LN-PT, RANL-STA**: The port's battery feed chip is able to provide power to the station equipment to detect on-/off-hook but may not be able to supply power for touch-tones. 1. If touch-tones are not heard when buttons are pressed, replace the circuit pack or media module. 2. Investigate user-reported troubles on this port by using other port tests, by examining station wiring, or by examining the station. **DID-TRK**: Current flow was detected for this port. 1. Investigate user-reported troubles on this port by using other port tests and by examining connections to the port. 2. If problems continue, refer the problem to the CO. **MET-LINE**: Current flow was properly detected for this port. 1. Investigate user-reported troubles on this port by using other port tests and by examining connections to the port.
0	NO BOARD	See NO BOARD for the repair procedures.
		6 of 6

Port Audit And Update Test (#36)

The Port Audit and Update Test sends port level translation data from the switch processor to the circuit pack to verify that the port's translation and current state are correct.

When the ringer is in the off state, this test also turns off the station's ringer to prevent constant ringing caused by defective hardware.

For an analog line port which is administered as an external alarm, this test is limited to updating the software with the switchhook state.

This test runs on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)
- ALARM-PT (Alarm Port)

- AN-LN-PT (Analog Line Port)
- ANL-16-L (16-Port Analog Line)
- ANL-LINE (8-Port Analog Line)
- AUX-TRK (Auxiliary Trunk)
- CO-DS1 (DS1 CO Trunk)
- CO-TRK (Analog CO Trunk)
- DAT-LINE (Data Line Port)
- DID-DS1 (Direct Inward Dial Trunk)
- DID-TRK (Direct Inward Dial Trunk)
- DIOD-DS1 (DS1 DIOD Trunk)
- DIOD-TRK (DIOD Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- OPS-LINE (DS1 Off-Premises Station Line)
- _PE (Processor Ethernet) Alarms
- RANL-STA (Remote Analog Line (Station) Port)
- TIE-DS1 (DS1 Tie Trunk)
- TIE-TRK (Analog Tie Trunk)

This test is also known as the Station Status and Translation Audits and Updates Test (#36)

Table 294: Port Audit and Update Test (#36) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the station extension or trunk group/member number of the port. 2. Enter **status station** or **status trunk** to determine the service state of the port. If the port is in use, wait it is idle before retesting. 3. If the port is idle, retry the command at 1-minute intervals a maximum of 5 times.
		1 of 4

Table 294: Port Audit and Update Test (#36) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1004	ABORT	**ALARM-PT**: The port received an EXT-DEV failure during the test. The test has been aborted. 1. Enter **`test external-device-alarm port`** ***`location`*** to determine whether the port is reporting an EXT-DEV failure. 2. If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times **All other Maintenance Objects**: The port was seized by a valid call during the test. 1. Enter **`display port`** ***`location`*** to determine the station extension or trunk group/member number of the port. 2. Enter **`status station`** or **`status trunk`** to determine the service state of the port. If the port is active, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	This test is not applicable for this type of port. Ignore this error.
		2 of 4

Table 294: Port Audit and Update Test (#36) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1006	ABORT.	The port is out of service. The port has been busied out by command or taken out-of-service by a failure of the NPE Crosstalk Test. **ALARM-PT**: 1. Check the Error Log for Error Type 18 (port busied out). If this error is present, use **release port** ***location*** and run the test again. 2. Check the Error Log for Error Type 1025 for this port. If this error is present, investigate errors associated with NPE Crosstalk Test (#6) **ANL-LINE**, **AN-LN-PT, ANL-16-L, OPS-LINE, RANL-STA**: 1. Check the Error Log for Error Type 18 (port busied out). If this error is present, use **release station** ***extension*** and run the test again. 2. Check the Error Log for Error Type 1025 for this port. If this error is present, investigate errors associated with NPE Crosstalk Test (#6). 3. Ensure that the terminal is connected and in service, and retest. **DAT-LINE**: 1. An existing Error Type #769 on this port prevented the test from running. Follow the procedure in the DAT-LINE (Data Line Port) Error Log Table for Error Type 769. **PE-BCHL**: 1. Enter **status pri-endpoint** ***extension*** to verify that the port is out of service. 2. Enter **release pri-endpoint** ***extension*** or **release port** ***location*** to put the port back in service, then run the test again. **WAE-PORT**: 1. If Error 18 is present in the Error Log for this port, enter **release access-endpoint** ***extension*** and retry the test. 2. If Error 18 is not present, check the error and alarm logs for WAE-PORT, DS1-BD, UDS1-BD, or MG-DS1 errors and follow the recommended repair procedures. See WAE-PORT (Wideband Access Endpoint Port), DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module) **All other Maintenance Objects**: 1. Enter **display port** ***location*** to determine the trunk group/member number of the port. Enter **status trunk** to verify that the trunk is out of service. If the trunk is out of service, determine why. If it is OK to put the trunk back in service, enter **release trunk** and retry the test. 2. Check the error log for Error Type 1025. If this error exists, investigate errors associated with the NPE Crosstalk Test (#6). 3. Retry the command at 1-minute intervals up to 5 times.
		3 of 4

Table 294: Port Audit and Update Test (#36) ***4 of 4***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Possible internal software failure. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	**ALARM-PT**: This failure does not indicate a hardware problem. The switchhook audit failed. This condition may occur when the audit is performed at the same time that the terminal equipment goes off-hook. 1. Enter **`test external-device-alarm port`** ***`location`*** to determine whether the port is reporting an EXT-DEV failure. Wait until the port has no EXT-DEV failures. 2. If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times. **All other Maintenance Objects**: This failure does not indicate a hardware problem. This condition may occur when the audit is performed at the same time that the terminal equipment goes off-hook. 1. Enter **`status station`** or **`status trunk`** to determine when the port is available for testing. 2. When the port becomes available for testing, retry the command at 1-minute intervals up to 5 times.
5 7 8	FAIL	Message Waiting Lamp update failed. Possible internal software error. Translation update failed. Possible internal software error. Ringer update failed. Possible internal software error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
	PASS	The software and the port processor have the same status. Investigate user-reported troubles on this port by running other port tests, examining the wiring, or by inspecting the station.
0	NO BOARD	See NO BOARD for the repair procedures.
		4 of 4

Tone Generator Transmission Test (#40)

This test verifies that the tone generation hardware on the IPSI or Tone-Clock circuit pack is capable of generating a subset of system tones and a set of test tones. This test does not verify all system tones the tone generator produces during normal system operation.

The test is performed in two parts. For the first part, the Tone Generator is told to generate the touch-tone digits. The digits are received and checked by a Tone Detector's touch-tone detector. If any of the digits fail, the test is repeated using a touch-tone detector in another Tone Detector circuit pack.

For the second part, the Tone Generator is told to generate call-progress tones that are detected and identified by a tone detector. These tones are:

- 440 Hz
- 2225 Hz
- Digital Count

The tone generator is then told to generate a sequence of test tones. The output levels are measured by a tone detector. These tones are:

- 404 Hz at 0 dB
- 1004 Hz at -16 dB
- 1004 Hz at 0 dB
- 2804 Hz at 0 dB

A Tone Detector's general-purpose tone detector listens for tones and measures their quality. If any of the measured values are not within certain limits, the test is repeated using a general-purpose tone detector in a different Tone Detector circuit pack. If the values are still not in the acceptable range of the limits, the test will fail.

For every failure case of Test #40, do the following:

1. Check that all Tone Detector circuit packs have the same companding mode as that administered for the system. Correct the situation if there is a mismatch.
2. Run the long test sequence: **`test tone-clock`** ***`location`*** **`long`**
3. If the problem persists, replace the IPSI or Tone-Clock circuit pack by following the steps outlined in Replacing the IPSI or Tone-Clock Circuit Pack.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 295: Tone Generator Transmission Test (#40) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate all the resources needed for this test or there was an Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1	ABORT	The system could not allocate all the resources needed to test the DTMF tones. 1. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. 1. If the system is not heavily loaded, test the TDM bus with **`test tdm port-network P`**. 2. Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1022	ABORT	Tone detection for the system is administered as wide broadband (tone detection mode 5), and the Tone Detector used for this test was not a TN420C (the only circuit pack with this capability). GPTD ports on other types of Tone Detector circuit packs are taken out of service since they cot provide the administered function. Either: ● Change the tone-detection mode administered on the system-parameters country-options screen. ● Remove all non-TN420C circuit packs from the system.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
		1 of 2

Table 295: Tone Generator Transmission Test (#40) *2 of 2*

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1 (a)	FAIL	DTMF generation failed for the active tone generator.
105 (a)	FAIL	Generation of 440-Hz failed.
109 (a)	FAIL	Generation of 2225-Hz failed.
110 (b)	FAIL	Generation of 404-Hz level invalid.
111 (b)	FAIL	Generation of 1004-Hz low level invalid.
112 (b)	FAIL	Generation of 1004-Hz high level invalid.
113 (b)	FAIL	Generation of 2804-Hz level invalid.
115 (b, c)	FAIL	Generation of digital count sequence invalid.
120 (a)	FAIL	Generation of quiet tone failed.
1044 (a)	FAIL	DTMF generation failed to generate Digit 1 for the standby tone generator.
1045 (a)	FAIL	DTMF generation failed to generate Digit 5 for the standby tone generator.
1046 (a)	FAIL	DTMF generation failed to generate Digit 9 for the standby tone generator.
1047 (a)	FAIL	DTMF generation failed to generate Digit D for the standby tone generator.
	PASS	The tone generation facility is able to generate and transmit all the tones.
		2 of 2

Notes:

Except in EPNs containing more than one IPSI or Tone-Clock circuit pack, replacing an IPSI or Tone-Clock circuit pack is a service disrupting procedure. The test should be run several times with more than one failure before the replacement policy specified in the following notes is executed. Use the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack.

a. This error may affect users if the failure is on the active tone generator. When this type failure is detected, the system will attempt to move the tone generation function to the alternate IPSI or Tone-Clock circuit pack, if one is present in the affected port network. When the tone generation facility fails in this way, especially in a port network without duplicated IPSI or Tone-Clock circuit packs, the faulty IPSI or Tone-Clock circuit pack should be replaced promptly.

b. This error is almost transparent to the user. When this type failure is detected, the system will attempt to move the tone generation function to the alternate IPSI or Tone-Clock circuit pack, if one is present in the affected port network. Users may or may not hear any noisy tones. This type of failure affects maintenance on other objects. Maintenance may not be able to run on other objects which use the tone generation facility (that is, Tone Detector circuit maintenance). In this case, the IPSI or Tone-Clock circuit pack can be replaced as suitable to the customer.

c. Error code 115 may also be caused by TDM bus corruption. There may be a physical problem with bent backplane pins, TDM/LAN bus cabling, or TDM/LAN bus terminators. Such physical problems should especially be suspected if board replacement or other physical activity has occurred just before this error is observed.

   Enter **`display errors`** to look for errors on other circuit packs in the carriers of the same port network as the indicated Tone-Clock circuit. If any are found, they should be resolved if possible, and the IPSI or Tone-Clock circuit pack retested. If this does not clear the problem, the IPSI or Tone-Clock circuit pack should be replaced and the new one tested. If the problem persists, follow the instructions for TDM-BUS (TDM Bus).

Tone Generator Update/Audit Test (#41)

This test refreshes the active tone generation facility with all the time slot tone information. This test also triggers inline error messages the IPSI or Tone-Clock circuit pack generates when it detects problems by itself.

A check is made between the type of Tone-Clock being tested and the type of Tone-Clock needed based on system administration. The administration on the system-parameters country-options screen may imply that a TN780 is required.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 296: Tone Generator Update/Audit Test (#41)

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate all the resources needed for this test. 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The system requires a TN780, TN2182, or TN2312 Tone-Clock circuit pack to support the administered **`tone-generation`** parameters. 1. Check the administration on the **`tone-generation`** screen. Specifically, check the Base Tone Generation Set on page 1 and any custom tone administration beginning on page 2. 2. Replace any existing IPSI with a TN2312, or an existing Tone-Clock circuits packs with a TN780 or TN2182.
	PASS	The tone generation facility has been successfully refreshed with its time-slot translation, and system administration is consistent with this type of Tone-Clock. 1. Display the Error Log using **`display errors`** to make sure this circuit pack did not generate new errors.

Tone Detection Verification Test (#42)

The test checks the operation of the circuit pack in touch-tone receiver, call classifier, and MFC modes. It verifies the circuit pack's ability to detect DTMF, ring back, busy reorder, and modem answer tones, and to generate and detect forward and backward MFC tones.

This test runs on the following maintenance objects:

- CLSFY-PT (Call Classifier Port)
- DTMR-PT (Dual-Tone Multifrequency Receiver Port)
- ETR-PT (Enhanced Tone Receiver Port)
- GPTD-PT (General-Purpose Tone Detector Port)

- TONE-BD (Tone-Clock Circuit Pack)

Table 297: Tone Detection Verification Test (#42) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate resources needed for this test, OR there was an internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1	ABORT	The system could not allocate resources needed to test the tones. 1. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	The system was unable to seize the port to test it. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. 1. Check to see if there are any alarms against the TONE-BD or TONE-PT in the PN where the test aborted. If so, see TONE-BD (Tone-Clock Circuit Pack) and TONE-PT (Tone Generator) for recommended procedures. 2. If a new Tone-Clock has been inserted, allow about 1-minute for the system to initialize the newly inserted circuit pack. 3. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 297: Tone Detection Verification Test (#42) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2006	ABORT	The active Tone-Clock circuit pack or a Tone Detector circuit pack may not be functioning properly. If there is more than one Tone Detector circuit pack in the system, the problem can be either with the Tone-Clock circuit pack or the Tone Detector circuit pack. This could also be caused by the mode administered for the system not matching that of the Tone Detector circuit pack. 1. Test the *active* Tone-Clock circuit pack in the PN with **test tone-clock** ***location***. See TONE-BD (Tone-Clock Circuit Pack) for failures. 2. Verify that the companding mode administration for the system matches that of the tone detectors. 3. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1 2 3	FAIL	TTR Digit Reception Test failed DTMF Digit Detection and Blocking Test failed Speech Passage Test failed 1. Run the short test sequence with **test port** ***location*** 2. If the problem persists, the system is still operating properly but capacity will be reduced. To restore performance to normal, replace the circuit pack containing the defective port. See TONE-BD (Tone-Clock Circuit Pack) for the procedures to replace a Tone-Clock circuit pack.
101 102 103	FAIL	Test failed to detect 440 HZ tone Test failed to detect 2225 HZ tone Test failed to detect touch tone 2 1. Run the short test sequence with **test port** ***location*** 2. If the problem persists, the system is still operating properly but capacity will be reduced. To restore performance to normal, replace the circuit pack containing the defective port. See TONE-BD (Tone-Clock Circuit Pack) for the procedures to replace a Tone-Clock circuit pack.
		2 of 3

Table 297: Tone Detection Verification Test (#42) *3 of 3*

Error Code	Test Result	Description / Recommendation
110-122 130	FAIL	A Tone Level Test failed. Forward/backward MFC signals not correctly generated/detected. 1. Run the short test sequence with **`test port`** ***`location`*** 2. If the problem persists, the system is still operating properly but capacity will be reduced. To restore performance to normal, replace the circuit pack containing the defective port. See TONE-BD (Tone-Clock Circuit Pack) for the procedures to replace a Tone-Clock circuit pack.
1022	FAIL	Invalid tone detector circuit pack. Tone detection for the system is administered as wideband but the tone detector circuit pack is invalid. Ports on invalid types of tone detector circuit packs are taken out of service since they cot provide the administered function. 1. Change the tone-detection mode administered on the **system-parameters country-options** screen, or remove every tone detector circuit pack from the system except the following: TN2182, TN2312, TN8412, TN420C or later, TN744C or later. 2. Retry the command.
	PASS	Tone detection verification is successful. The port is able to detect and generate every necessary tone.
		3 of 3

Tone Detector Audit/Update Test (#43)

The Tone Detector Audit/Update Test performs a sanity audit on the following port types:

- CLSFY-PT (Call Classifier Port)
- DTMR-PT (Dual-Tone Multifrequency Receiver Port)
- ETR-PT (Enhanced Tone Receiver Port)
- GPTD-PT (General-Purpose Tone Detector Port)
- TONE-BD (Tone-Clock Circuit Pack)

Table 298: Tone Detector Audit/Update Test (#43)

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate the resources for this test. 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Hardware audit failed. 1. Enter **list configuration carrier** to get the board type and location. If the board type is TN2182, TN2312, or TN8412, do steps 2 – 6. Otherwise, do steps 7 - 9. 2. Check if the board is duplicated using the commands **list cabinet** and **status port-network** on the affected PN. 3. If the board is duplicated, switch to the standby side using **set tone** or **set ipserver-interface**. 4. Test the alarmed board using **test tone location long**. This command resets the board. This will probably will not affect calls in progress, but could cause a call origination to abort or cause a user to not get dial tone when going off-hook. 5. If every test passes and the alarm does not resolve, retest using **test tone location long clear**. 6. If the test passes, terminate the repair process. If it fails, replace the circuit pack at the customer's convenience. Follow the procedures in TONE-BD (Tone-Clock Circuit Pack). 7. Attempt to reset the circuit pack. The reset is required to reload RAM associated with the DSPs. This will take all tone detector ports out of service for a few seconds. Other than the unlikely potential of running out of tone detector resources in the switch, there is no other effect when the board is reset. 8. Test the board using **test board location long**. 9. If the test passes, terminate the repair process. If the test fails, replace the board. Follow the procedures in TONE-BD (Tone-Clock Circuit Pack).
	PASS	The port passed the sanity audit.

Clock Health Inquiry Test (#46)

The Clock Health Inquiry Test reads special data stored in memory to determine if the IPSI or Tone-Clock circuit pack had a loss of any of three clock types:

- SYSCLK
- SYSFM
- SYSDCLK

If this data indicates this IPSI or Tone-Clock circuit pack had a loss of any of these clocks, the test fails. TDM-CLK Error 1 indicates a suspect clock is at the edge of its specified frequency. If the circuit pack did not have a loss of clock, the test passes.

This is not really a test, in the sense that it simply reports status held by the system, and does not generate new information or raise alarms. If this test fails with no Error Code, there is at least one Major alarm against an IPSI or Tone-Clock circuit pack. If this test fails with an Error Code of 1, there is at least one Minor off-board alarm against a TDM-CLK.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 299: Clock Health Inquiry Test (#46) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. Retry the command at 11-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		1 of 2

Table 299: Clock Health Inquiry Test (#46) ***2 of 2***

Error Code	Test Result	Description / Recommendation
None	FAIL	This Tone-Clock or IPSI circuit pack had an apparent loss of clock. One or more of Error Types 2049, 2305, 3834, 3857, 3858 and 3872 will appear in the error log. Correct the problem according to the appropriate error log entries. **Tone-Clock circuit pack** – If this test fails for a Tone-Clock circuit pack, the only way to make it pass and to retire its associated alarm is to repair the problem, then enter **set tone-clock *location* override** against the indicated or Tone-Clock circuit pack. **IPSI Tone-Clock circuit pack** – If this test fails for an IPSI circuit pack's Tone-Clock circuit, the only way to make it pass and to retire the associated alarm is to repair the problem, then enter **busy ipserver-interface** and **release ipserver-interface** against the indicated IPSI circuit pack. Enter **set tone spe health-override** To restore the TONE-BD to service.
1	FAIL	This IPSI or Tone-Clock circuit pack is suspected of having a clock at the edge of its specified frequency. A Tone-Clock circuit pack with this problem can cause Expansion Interface circuit packs and SNI circuit packs to go out-of-frame or report no neighbor conditions, thus causing EPNs, Expansion Archangel Links (EALs), Remote Neighbor Links (RNLs), and/or Local Neighbor Links LNLs) to go down. 1. Replace the IPSI or Tone-Clock circuit pack identified in the error log. See Replacing the IPSI or Tone-Clock Circuit Pack.
	PASS	This IPSI or Tone-Clock circuit pack has not reported a loss of clock.
		2 of 2

Looparound and Conference Test (#47)

Each analog port consists of:

- An NPE (Network Processing Element) for port connectivity, gain, and conferencing functionality
- A codec that converts TDM Bus digital signals to analog
- A battery feed chip that provides power to the telephone set for signaling, dial pulsing, transmission, and balance.

This test checks the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. A Tone Detector and a Tone Generator talk and listen on the same pair of time slots as the analog port. The analog port is then instructed to go into looparound mode (see Figure 96: Looparound and Conference Test). The test passes if the signal measured by the Tone Detector is within acceptable limits.

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. Test #47 also tests the operation of the port conference circuits in the NPE for three and four parties. In addition, a test is run to measure noise. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

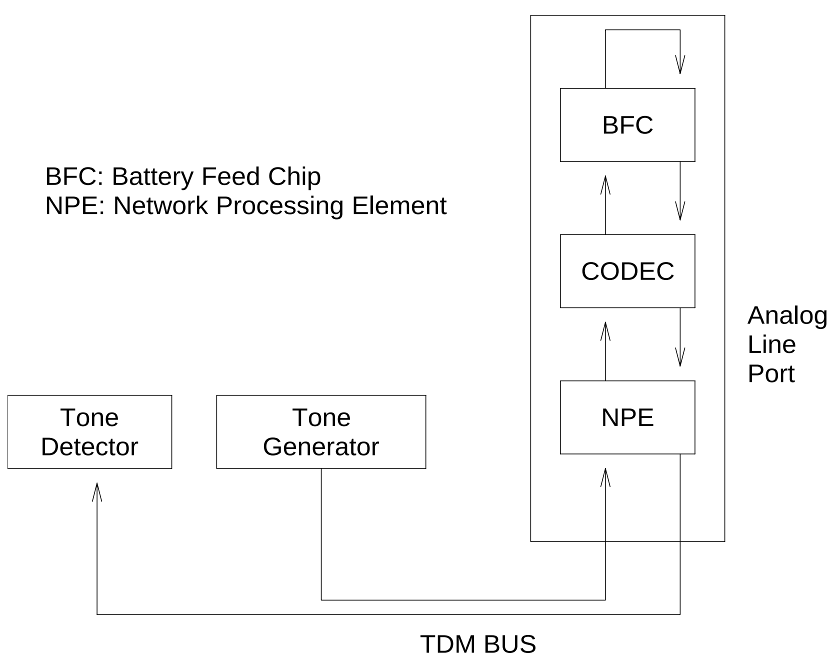
The noise test is performed by filtering out the tone and measuring inherent port noise.

Problems with the port can cause noisy or unreliable connections, or users may report hearing an echo.

Note:

This looparound test is sensitive to the length of the loop, the equipment in the loop, or the equipment terminating the loop, such as off-premises stations. If this test is causing a false alarm, use `change station` for this station and change the **Tests** field to **n** to disable the test.

Figure 96: Looparound and Conference Test



This test is run for ANL-LINE (8-Port Analog Line).

Table 300: Looparound and Conference Test (#47) ***1 of 5***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
7	ABORT	The port was seized by a user for a valid call. 1. Enter **display port** ***location*** to determine the station's extension. 2. Enter **status station** ***extension*** to determine the service state of the port. If the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. This could be a Music-on-Hold port. 1. Enter **display port** ***location*** to determine the station's extension. 2. Enter **status station** ***extension*** to determine the service state of the port. If the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 300: Looparound and Conference Test (#47) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized for a valid call during the conference or noise test. 1. If the circuit pack is a TN742 of Vintage 10 or less, this test is not valid. Otherwise, proceed with step 2. 2. When the port is available for testing, retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This error code occurs under either of the following conditions: ● This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or music on hold). ● The circuit pack is one of the following: – TN742 vintage 13, 14, or 15 – TN769 vintage 3, 4, or 5
1018	ABORT	Test disabled by administration. Determine why this test was disabled before enabling it. 1. To enable the test for a particular station, enter **`change station`** ***`extension`*** and set the **Maintenance Tests** field on the Station screen to **y**. Submit the screen. 2. Retry the command at 1-minute intervals up to 5 times.
		2 of 5

Table 300: Looparound and Conference Test (#47) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port. Enter **display port** to show that the port is a TTI port, or **list config**, which displays a **t** for the port. 2. If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. 3. If both commands indicate that the port is a TTI port, no action is necessary. This error can be ignored.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		3 of 5

Table 300: Looparound and Conference Test (#47) ***4 of 5***

Error Code	Test Result	Description / Recommendation
7 13 14 15	FAIL	A test failed. ● Error Code 7 - The conference test or the noise test failed. ● Error Code 13 - The reflective looparound test with gain set to low and 600-ohm balance failed. ● Error Code 14 - The reflective looparound test with gain set to high, using RC, balance failed. ● Error Code 15 - The nonreflective looparound test failed. 1. Disconnect the terminal equipment from the circuit pack at the cross-connect and run the test again. 2. If the test fails again, replace the circuit pack and reconnect the terminal equipment. If the test passes the second time, this means the test results were affected by the terminal equipment connected to the port. In this case, ignore the results of this test if every other test passes or aborts and the station is operating properly. Failure of test 47 does not cause an alarm. If there are failures of other tests, investigate those errors. Investigate user-reported troubles with this port by using other port tests, by examining station wiring, and by examining the station to ensure that it is correctly translated as off-premises or on-premises. If the Looparound and Conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with the power unit, see RMC-ENV (Power/Fan Sensors) or CARR-POW (Carrier Power Supply). If a red LED is lit on TN736 or TN752 power unit circuit pack, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors exist, take appropriate actions. When the tone errors are cleared, rerun the test.
		4 of 5

Table 300: Looparound and Conference Test (#47) ***5 of 5***

Error Code	Test Result	Description / Recommendation
	PASS	The port is able to provide an analog transmission path to the station equipment. Investigate user-reported troubles on this port by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **Note:** This test always passes for circuit packs TN712 prior to vintage 14 and TN742 prior to vintage 6.
0	NO BOARD	See NO BOARD for the repair procedures.
		5 of 5

ONS Ringer Application Test (#48)

The Ringing Application Test applies momentary ringing voltage to the terminal equipment to determine if the terminal equipment is connected to the port. The test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it using the **Tests** field on the **Station** screen. With some software releases, Tests #6, #7, #35, and #161 are also disabled.

This test is also known as the Station Present Test (#48).

This test runs on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)
- ANL-16-L (16-Port Analog Line)
- AN-LN-PT (Analog Line Port)
- ANL-LINE (8-Port Analog Line)

- RANL-STA (Remote Analog Line (Station) Port)

Table 301: ONS Ringer Application Test (#48) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000 1004	ABORT	System resources required to run this test are not available or the port was seized with a valid call during the test. 1. Enter **`display port`** ***`location`*** to determine the station extension. 2. Enter **`status station`** ***`extension`*** to determine the service state of the port. If the port is in use, wait until the port is idle. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not applicable for this type of port. This error can be ignored.
1008	ABORT	Could not allocate a ringing circuit. Either every ringing circuit is in use, or the ringing generator is defective or incorrectly wired. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or incorrectly wired See RING-GEN (Analog Ring Generator). 3. If ABORT 1008 does not occur on other ports, then all four ring phases are in use.
1018	ABORT	The test has been disabled by administration. Determine why the **Test** field on the **change station** screen has been set to **n** for this station. It may be due to the brief ringing disturbance that this test may cause. 1. To enable the test for the particular analog station, enter **`change station`** ***`extension`*** and set the **Test** field to **y**.
2000	ABORT	Response to the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 301: ONS Ringer Application Test (#48) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment, such as modems, may fail even when connected properly. 1. Remotely test the equipment. 2. If the test fails again, look for RING-GEN errors in the error log. If present, see RING-GEN (Analog Ring Generator). 3. Check all of the wiring between the station equipment and the switch. Then, run the test again. 4. If the test still fails, the set may be defective. Check the set and replace it, if necessary. 5. Some terminal equipment could fail even when it is connected properly. If so, enter **`change station`** ***`extension`*** and set the **Test** field to **n** to disable the test. This also disables Tests #6, #7, #35, and #161 on this port.
	PASS	The station is connected properly. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. Investigate user-reported troubles on this port by using other port tests, examining station wiring, or examining the station.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

NPE Audit Test (#50)

The NPE Audit Test sends a message to the circuit pack to update the network connectivity translation for all the Network Processing Elements (NPEs) on the circuit pack.

This test runs on the following maintenance objects:

- -BD (Announcement circuit pack)
- ATM-TRK (Circuit Emulation Service Circuit Pack)
- BRI-BD (ISDN-BRI Line Circuit Pack)
- CO-BD (Central Office Trunk Circuit Pack)
- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-ANA (Analog Media Module)
- MG-BRI (BRI Trunk Media Module)
- MG-DCP (Digital Line Media Module)
- MG-DS1 (DS1 Interface Media Module)
- MG-IAMM (Integrated Analog Media Module)
- M/T-BD (Maintenance/Test Circuit Pack)
- RC-BD (Radio Controller Board)
- TBRI-BD (ISDN Trunk-Side BRI Circuit Pack)
- UDS1-BD (UDS1 Interface Circuit Pack)
- XXX-BD (Common Port Circuit Pack/Media Module)

CAUTION:

Though normally nondestructive, this test could unintentionally tear down an active call if the internal software tables are corrupt.

Table 302: NPE Audit Test (#50) ***1 of 2***

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 302: NPE Audit Test (#50) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1019	ABORT	A test was already running on the port. 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2030	ABORT	EPN is down.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The circuit pack's SCOTCH-NPE chip has been updated.
	NO BOARD	See NO BOARD for the repair procedures.
	EXTRA BD	Certain circuit packs have limitations on how many circuit packs can be in the system or port network such as the Maintenance/Test circuit pack (TN771B or TN771C), the Tone Detector circuit pack (TN748B, TN748C or TN748D) and the Call Classifier (TN744). The Maintenance/Test circuit pack allows only one circuit pack per port network. The Tone Detector and Call Classifier allow only 10 circuit packs in each system. All additional circuit packs will return EXTRA-BD and should be removed.
		2 of 2

Ringing Application Test (#51)

The Ringing Application Test checks the ringing application circuitry common to every port on an Analog Line circuit pack. This test runs on the following maintenance objects:

- MG-ANA (Analog Media Module)
- MG-IAMM (Integrated Analog Media Module)

- XXX-BD (Common Port Circuit Pack/Media Module).

Table 303: Ringing Application Test (#51) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. Could not allocate the necessary system resources to run test. The circuit pack is not installed.
1000	ABORT	System resources required to run test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test.d. 1. Enter **`display port`** ***`location`*** to determine the station extension. Enter **`status station`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 2. Retry the command at 1-minute intervals up to 5 times.
1008	ABORT	Could not allocate a ringing circuit for one of the following reasons: all the ringing circuits are in use; the ringing generator is defective; ringing generator is not wired correctly. 1. If the test continues to abort, look for RING-GEN errors in the Error Log. a. If there are RING-GEN errors, see RING-GEN (Analog Ring Generator) and try to resolve any problem(s). Then retry the test at 1-minute intervals up to 5 times. b. If there are no RING-GEN errors, and the test continues to abort, enter **`test board`** ***`location`*** on other TN742, TN769, or TN746 Analog circuit packs. If an ABORT with Error Code 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or may not be wired properly. See RING-GEN (Analog Ring Generator) maintenance documentation for details. If an ABORT with Error Code 1008 does NOT occur on the other ports, then all four ring generators are in use. No further action is necessary. 2. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		1 of 2

Table 303: Ringing Application Test (#51) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	There was no response from the board. 1. If Error Type 1538 (hyperactivity) is present in the error log, follow the maintenance strategy that is recommended for this Error Type. 2. Reset the circuit pack or media module and rerun the test. 3. If the test still aborts, check the off-board wiring and the terminal. 4. Retry the test. If the test still aborts, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	No ringing current is detected. The ringing application circuitry on this circuit pack probably is not healthy. 1. Retry the command again. 2. If the test continues to fail, look for RING-GEN error in Error Log. a. If there are RING-GEN errors, see RING-GEN (Analog Ring Generator) and try to resolve any problem(s). b. If there are no RING-GEN errors, replace the circuit pack.
	PASS	Ringing current is detected or this test is not executed on this circuit pack.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Control Channel Looparound Test (#52)

The Control Channel Looparound test queries a circuit pack or media module for its board code and vintage to check the operation of the control channel and board communication. The test passes if the correct board code and vintage are returned. The test aborts if there is no response. The test fails otherwise. This test runs on the following maintenance objects:

- -BD (Announcement circuit pack)
- ATM-INTF (ATM Interface),
- ATM-TRK (Circuit Emulation Service Circuit Pack)
- BRI-BD (ISDN-BRI Line Circuit Pack)
- CLAN-BD (Control LAN Circuit Pack)
- CO-BD (Central Office Trunk Circuit Pack)
- DS1-BD (DS1 Interface Circuit Pack)
- IPMEDPRO (TN2302 IP Media Processor)
- IPMEDPRO (TN2602AP IP Media Resource 320)
- MAPD-BD (MAPD Interface Circuit Pack)
- MEDPRO (Media Processor MAPD Circuit Pack)
- MG-ANA (Analog Media Module)
- MG_ANN (Media Gateway Announcement Module)
- MG-BRI (BRI Trunk Media Module)
- MG-DCP (Digital Line Media Module)
- MG-DS1 (DS1 Interface Media Module)
- MG-IAMM (Integrated Analog Media Module)
- MG-VOIP (MM760 VoIP Media Module)
- MMI-BD (Multimedia Interface Circuit Pack)
- M/T-BD (Maintenance/Test Circuit Pack)
- RC-BD (Radio Controller Board)
- TBRI-BD (ISDN Trunk-Side BRI Circuit Pack)
- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- UDS1-BD (UDS1 Interface Circuit Pack)
- VAL-BD (Voice announcements over LAN Circuit Pack)

- VC-BD (Voice Conditioner Circuit Pack)
- XXX-BD (Common Port Circuit Pack/Media Module)

Table 304: Control Channel Looparound Test (#52)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response from the test was not received in the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2030	ABORT	EPN is down.
2100	ABORT	Could not allocate necessary system resources. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The circuit pack or media module failed to return its board code or vintage. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, reset the circuit pack or media module and rerun the test. 3. If test continues to fail, replace the circuit pack or media module.
	PASS	The circuit pack or media module is communicating correctly with the switch.
	EXTRA BD	This result should only appear when more than one TN771D Maintenance/Test circuit pack has been installed in this port network. Remove the extra circuit pack.
0	NO BOARD	See NO BOARD for the repair procedures.

SAKI Sanity Test (#53)

This test is destructive.

The SAKI Sanity Test resets the circuit pack or media module. It is executed as part of the **`reset board`** ***`location`*** command.

For **IPMEDPRO**: Use the **`change ip-interface`** screen to disable the Media Processor's IP interface before performing this procedure.

For the Tone-Clock circuit packs, DS1 Interface circuit packs, and DS1 Interface Media Modules, this test is executed as part of the long test sequence.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MEDPRO (Media Processor MAPD Circuit Pack)
- MG-ANA (Analog Media Module)
- MG-DS1 (DS1 Interface Media Module)
- MMI-BD (Multimedia Interface Circuit Pack)
- RC-BD (Radio Controller Board)
- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)
- UDS1-BD (UDS1 Interface Circuit Pack)
- XXX-BD (Common Port Circuit Pack/Media Module)

Table 305: SAKI Sanity Test (#53) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 305: SAKI Sanity Test (#53) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1005	ABORT	This error applies only to DS1 interface circuit packs and DS1 media modules. It means the DS1 interface circuit pack or media module is providing timing for the system and, therefore, it cot be reset without causing major system disruptions. If this is **not** a media gateway system, go to Step 1. If this **is** a media gateway system, go to Step 2. 1. If the circuit pack needs to be reset, set synchronization to another DS1 interface circuit pack or the Tone-Clock circuit pack and try the command again. See SYNC (Port Network Synchronization). 2. If the DS1 Media Module needs to be reset, set the synchronization timing source to another DS1 interface Media Module located in the same media gateway and retest. See Setting G700 synchronization in *Maintenance Procedures (03-300432)*.
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack or media module with **busyout board *location*** 2. Enter **reset board *location***
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2803	ABORT	This error applies to IP Media Processors only. The IP interface must be disabled before running this command. 1. Use the **change ip-interfaces** screen to disable the media processor's IP interface. 2. Enter the command again. 3. If the test passes, re-enable the media processor's IP interface using the **change ip-interfaces** screen.
2966	ABORT	This error applies to TN2501 VAL boards only. An announcement autosave is in progress on the board and the reset cot be performed at this time. 1. Wait a few minutes, then retry the command.
		2 of 3

Table 305: SAKI Sanity Test (#53) ***3 of 3***

Error Code	Test Result	Description / Recommendation
1	FAIL	The circuit pack or media module failed to reset. 1. Enter the command again. 2. If the problem persists, replace the circuit pack or media module.
2	FAIL	The circuit pack or media module failed to restart. 1. Enter **reset board *location*** again. 2. If the problem persists, escalate this problem.
	PASS	The circuit pack or media module initialized correctly.
ANY	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Analog Electronic Power Feed Test (#56)

The test requests that the EPF be turned on for a given port. The hardware then attempts to turn on that port's station power unit. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed (too much current is drawn), a short may exist in the loop or the voice terminal may be defective. The test results indicate either the EPF was turned on successfully with no problems or an overcurrent condition exists. This test is repeated after a 5 second delay. If either test is not successful, the test aborts.

Although this test will never actually return a fail result except for the internal system error, an Error Type 257 entry will be made in the error log after the test has completed if the overcurrent case is detected by the hardware.

This test is run on HYB-LINE (Hybrid Line) and MET-LINE (MET Line).

Table 306: Analog Electronic Power Feed Test (#56)

Error Code	Test Result	Description / Recommendation
	ABORT	The test was aborted due to an internal system error on a software request to the board. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension of the port. 2. Enter **`status station`** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The test failed while was attempting to turn on the EPF. Internal error. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The Analog Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. 1. Although this test will never actually return a FAIL result except for an *internal system error*, it will log an error if the overcurrent case is detected by the hardware. Check the Error Log for any entries with Error Type 257 when the test has completed. 2. If Error Type 257 does not appear in the Error Log within 10 seconds after completion of this test, it is safe to assume that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station, if available, and check that every feature button is operating. 3. The appearance of Error Type 257 in the Error Log indicates a station power problem. Check for a wiring short, a damaged jack, a defective voice terminal, or an incorrect type of terminal.
0	NO BOARD	See NO BOARD for the repair procedures.

Hybrid Circuit and Conference Circuit Test (#57)

This test checks two different port circuit functions. It performs an analog reflective looparound measurement on the port's hybrid circuitry. The Conference Circuit test performs a conference test on the port's Network Processing Element (NPE).

For the test results to be valid, a voice terminal must be connected to the port being tested. The test instructs the on-board microprocessor to put the port in analog reflective looparound mode. The Tone-Clock circuit pack supplies a 1004-Hz tone to the port's listen time slot and a GPTD (General-Purpose Tone Detector) measures the level of the reflected signal appearing on port's talk time slot.

The Conference test is performed only if the Hybrid Circuit test passes. The Conference Circuit test verifies that the NPE can correctly conference several test tones together. The test is executed in two parts. The first half of the test verifies operation of the NPE's first three conference channels, and the second half verifies the NPE's remaining four conference channels. The test puts the NPE in looparound mode and instructs it to talk on a specified time slot while listening to a 1004-Hz tone using the Conference Channels. A GPTD then measures the signal and noise levels of the conferenced output and reports whether or not these fall within a specified acceptable range.

This test is run on HYB-LINE (Hybrid Line) and MET-LINE (MET Line).

Table 307: Hybrid Circuit and Conference Circuit Test (#57) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension of the port. 2. Enter **`status station`** to determine the service state of the port. If the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test were not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 4

Table 307: Hybrid Circuit and Conference Circuit Test (#57) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **display port** ***location*** to determine the station extension of the port. 2. Enter **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **display port** (the port is a TTI port) or **list config** (the display shows a `t` for the port). 2. If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct and no action is necessary.
		2 of 4

Table 307: Hybrid Circuit and Conference Circuit Test (#57) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. 1. Retry the command at 1-minute intervals up to 5 times.
7	FAIL	The Conference Test failed. The user may be able to use conference circuit without difficulty in some cases. In other extreme cases, conference calling will be totally restricted. The failure may be due to off-board circumstances, the most common of which is an off-hook occurring during the test. Also, check the error logs against the GPTD-BD, the TONE-BD, and the TONE-PT. 1. This error can be caused by a disconnected terminal. Ensure that the terminal is connected and the wiring is OK. 2. Enter **display port** and **status station** to determine whether the station is idle. If so, enter **test port** for this port. 3. If test continues to fail, enter **busyout port**, **reset port, release port**, then retest the port. 4. It is possible that the port may still be functional from a user's point of view.
57	FAIL	The Hybrid Circuit test failed. This can result in noisy or bad connections. 1. Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack, using **test board *location*** 2. Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. 3. If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the MET Line or Hybrid Line circuit pack. If the Hybrid Circuit and Conference Circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. To investigate problems with a power unit, see RMC-ENV (Power/Fan Sensors), or CARR-POW (Carrier Power Supply).
		3 of 4

Table 307: Hybrid Circuit and Conference Circuit Test (#57) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	PASS	The hybrid circuitry is transmitting properly. 1. If complaints persist, investigate by using other port tests and by examining the station, wiring, and connections.
0	NO BOARD	See NO BOARD for the repair procedures.
		4 of 4

Hybrid Line Local Digital Looparound Test (#58)

This test checks the control channel between the server and the port's digital circuitry. The server sends data to the on-board microprocessor and compares the data echoed back. This test is run on HYB-LINE (Hybrid Line).

Table 308: Hybrid Line Local Digital Looparound Test (#58) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension number of the port. 2. Enter **`status station`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 308: Hybrid Line Local Digital Looparound Test (#58) *2 of 2*

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **display port *location*** to determine the station extension number of the port. 2. Enter **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
1 2 3	FAIL	The control channel between the processor and the port is not transmitting properly. This port is not operable. 1. Retry the test. 2. If the failure still occurs, enter **busyout *location*** and **release *location***, and then retest. 3. If the failure is occurring on more than one port on the board, suspect the board. 4. If the failure is occurring on several boards in the same carrier, escalate the problem. 5. If the failure appears to be isolated to one port, check all wiring to the set and all set connections. 6. Replace the circuit pack as a last resort.
	PASS	The control channel is transmitting properly. 1. If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

Hybrid Line Remote Digital Looparound Test (#59)

This test checks the digital control pair from the port circuit to the terminal. The on-board microprocessor sends a message to the terminal and checks for a proper return message. This test is repeated three times, with two out of the three attempts passing being sufficient for this test to pass. This test will run if the station is in service or out of service.

This test is run on HYB-LINE (Hybrid Line).

Table 309: Hybrid Line Remote Digital Looparound Test (#59) *1 of 2*

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1	ABORT	A request for a remote station audit aborted even though all internal resources were correctly allocated. 1. Look in the error log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port with **`release port`** ***`location`*** or **`release station`** ***`extension`***, and then run the test again. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension number of the port. 2. Enter **`status station`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 309: Hybrid Line Remote Digital Looparound Test (#59) *2 of 2*

Error Code	Test Result	Description / Recommendation
1 2 3	FAIL	No response was received within the allowed time on one of the transmissions to the terminal. This indicates a problem with the data link to the voice terminal. This could be a sleeping set problem or it may be due to wiring or an unplugged or defective set. 1. Check for errors in the error log, for example, error 1537. 2. Remotely enter **`busyout`** ***`location`*** and **`release`** ***`location`***, and run the short test sequence on the port to check for other errors associated with the port or terminal. 3. Check the wiring to the set if it appears that the terminal is not responding to any tests. Otherwise, replace the terminal and rerun the test. 4. If the test still fails, replace the circuit pack and reconnect the original terminal.
	PASS	Hybrid Line Remote Digital Looparound test passed. The hybrid circuit pack is sending and receiving proper messages to and from the voice terminal. 1. If problems still exist, investigate using other circuit pack tests and by examining the station, wiring, and connections.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

Analog Line Station Lamp Update Test (#60)

For this test, the lamps on the terminal are turned on based on the status record contained in the processor. The lamp updates run only if the station is in-service.

This test is run on HYB-LINE (Hybrid Line) and MET-LINE (MET Line).

Table 310: Analog Line Station Lamp Update Test (#60) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1	ABORT	This port may have been busied out. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, then release the port using **release station *extension*** and run the test again. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
2	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
3	ABORT	The station is in ready-for-service or out-of-service state. This may be due to wiring or an unplugged or defective set. 1. Make sure the terminal is connected and the wiring is correct. 2. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the station extension of the port. 2. Enter **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **display port** (the port is a TTI port) or **list config** (shows a t for the port). 2. If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	Analog Line Station Lamp Update Test completed successfully. 1. If complaints persist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
		1 of 2

Table 310: Analog Line Station Lamp Update Test (#60) ***2 of 2***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	See NO BOARD for the recommended repair procedures.
		2 of 2

Analog Line Audits Test (#61)

This test is a series of three audits. These audits will abort if attempted on an out-of-service station. The tests are as follows:

- Switchhook Audit: This updates the server's records according to the circuit packs' records.
- Bad Scan Inquiry: An uplink message is sent containing a count generated due to certain events relating to the data link's conditions. This indicates data-transmission problems between the circuit pack and the voice terminal.
- EPF Inquiry: An uplink status message of the Electronic Power Feed is sent.

This test is run on HYB-LINE (Hybrid Line) and MET-LINE (MET Line).

Table 311: Analog Line Audits Test (#61) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1	ABORT	Internal system error during the switchhook audit. 1. Make sure the station is not in an out-of-service state. 2. Retry the command at 1-minute intervals up to 5 times.
2	ABORT	Internal system error during the bad scan audit. 1. Make sure the station is not in an out-of-service state. 2. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 311: Analog Line Audits Test (#61) ***2 of 2***

Error Code	Test Result	Description / Recommendation
3	ABORT	Internal system error occurred during the EPF inquiry audit. 1. Make sure the station is not in an out-of-service state. 2. Retry the command at 1-minute intervals up to 5 times.
1000 1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension number of the port. 2. Enter **`status station`** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **`display port`** (the port is a TTI port) or **`list config`** (shows a `t` for the port). 2. If either **`list config`** or **`display port`** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The Analog Line Audits test passed. 1. Although this test never actually returns a FAIL result except for an Internal system error, it can enter Error Types 257 and 513 into the Error Log. To check for problems that don't show up in the test result, look for these Error Types in the Error Log. 2. If these errors appear in the Error Log, or if user complaints still exist, investigate by using other circuit pack tests and by examining the station, wiring, and connections.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Analog Line Ringer Update Test (#62)

A "ringer on" or a "ringer off" message is sent to the firmware to start and stop the ringer on the set. This test runs on HYB-LINE (Hybrid Line) and MET-LINE (MET Line).

Table 312: Analog Line Ringer Update Test (#62) ***1 of 2***

Error Code	Test Result	Description / Recommendation
3	ABORT	This port may have been busied out by system technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port with the **release station *extension*** command, and run the test again. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
1000 1004	ABORT	System resources required to run this test are not available. The port was seized by a valid call during the test. 1. Enter **display port *location*** to determine the station extension number of the port. 2. Enter **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **display port**, (the port is a TTI port) or **list config**, which shows a `t` for the port. 2. If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 312: Analog Line Ringer Update Test (#62) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	Analog Line Ringer Update passed 1. If complaints still exist, investigate using other circuit pack tests on this circuit pack, and by examining the terminal, wiring, and connections.
0	NO BOARD	See NO BOARD for the recommended repair procedures.
		2 of 2

Tie Trunk Seizure Test (#73)

This test performs a seizure test on an analog tie trunk. The tie trunk must be outgoing, and be wink-start, delay-dial, continuous-seize-ack, discontinuous-seize-ack trunks, or TGU/E/I. This test activates the M lead and checks for a response from the far end within 10 seconds.

The test seizes a trunk and outpulses a pause. The port reports the result of the seizure. This test can be disabled using the **Test** field on the Trunk Group Administration screen.

This test aborts on ports administered as access endpoints.

This test runs on TIE-TRK (Analog Tie Trunk).

Table 313: Tie Trunk Seizure Test (#73) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 313: Tie Trunk Seizure Test (#73) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. 1. Enter **`display trunk-group xx`** to determine the trunk group/member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. If the port status is active but the port is idle (no calls), then check the Error Log for Error Type 1025. See the Error Log table for a description of Error Type 1025 for this maintenance object. The port may be locked up. The far-end may not be releasing. 4. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **`display trunk-group xx`** to determine the trunk group/member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not valid for this trunk translation. The trunk must be a wink-start or delay dial trunk and must be outgoing or 2-way for this test to run. For the TN2140, the trunk must also be continuous-seize-ack or discontinuous-seize-ack. 1. Check trunk translation. If it is not a wink-start or delay dial trunk, this abort message should be ignored.
1018	ABORT	Test is disabled by administration. 1. Verify that the **Maintenance Tests** field on the **Trunk Group** screen is **n**. To enable the test, enter **`change trunk-group x`** where ***x*** is the number of the trunk group to be tested, and enter **y** in the **Maintenance Tests** field.
		2 of 3

Table 313: Tie Trunk Seizure Test (#73) ***3 of 3***

Error Code	Test Result	Description / Recommendation
1040	ABORT	This test is not performed for trunk ports administered as access endpoints. 1. Verify this port is an access endpoint by using **`display port`**. 2. If the port has been administered as an access endpoint, then this test should abort and no action is necessary.
2000	ABORT or FAIL	Seizure message is not received back within 10 seconds. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, check the far-end to ensure a translation match at both ends. 3. Check the facility.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The seizure test passes. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port, wiring, and stations.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Tie Trunk EPF Test (#74)

The first part of this test checks for proper activation and deactivation of the port's E lead. The second part checks the M lead electronic power feed current flow.

This test runs on TIE-TRK (Analog Tie Trunk).

Table 314: Tie Trunk EPF Test (#74) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run the test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. 1. Enter **display trunk-group *xx*** to determine trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. If the port status is active, but the port is idle (no calls), check the Error Log for Error Type 1025. See the Error Log table for the description of this error and required actions for this maintenance object. The port may be locked up. The far-end may not be releasing. 4. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **display trunk-group *xx*** to determine the trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not valid for this trunk translation. Must be a type-1 standard trunk for this test to run. 1. Check trunk configuration. If it is not a type-1 standard trunk, this error can be ignored.
		1 of 2

Table 314: Tie Trunk EPF Test (#74) *2 of 2*

Error Code	Test Result	Description / Recommendation
1014	ABORT	The circuit pack has not been inserted into the system. 1. Enter **`list configuration board`** to verify that the circuit pack is inserted in the carrier. 2. If the board is not inserted, make sure the circuit pack is inserted in the carrier and fully seated.
1040	ABORT	This test is not performed for trunk ports administered as access endpoints. 1. Verify this port is an access endpoint by using **`display port`**. 2. If the port has been administered as an access endpoint, this test should abort and no action is necessary.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The E lead test failed due to an on-board port problem. 1. Replace the circuit pack.
2	FAIL	The M lead test failed. The EPF has experienced an overcurrent condition, perhaps due to the external M lead. 1. To make sure the problem is on-board, disconnect the facility from the pack and retry the test. 2. If the test fails, replace the circuit pack. Otherwise, check the external wiring toward the far-end PBX.
	PASS	Tie Trunk EPF test is successful. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port.
0	NO BOARD	See NO BOARD for the recommended repair procedures.
		2 of 2

RMC Power/Fan Query Test (#77)

This test queries the TN2312AP IPSI circuit pack for the status of the cabinet sensors in the G600 media gateway (RMC). Only one alarm lead is supported by this cabinet type to indicate a power, temperature, or a fan problem. A failure of this test can also indicate a power problem, not necessarily just a temperature/fan problem.

This test runs on RMC-ENV (Power/Fan Sensors).

Table 315: RMC Power/Fan Query Test (#77) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2000 2100 2500	ABORT	Response to the test was not received within the time allowed. System resources required to run this test are not available. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 315: RMC Power/Fan Query Test (#77) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1	FAIL	There is a fan, temperature, power, or voltage problem in one or more of the cabinets. The power supply's LEDs may indicate the problem's source. 1. If none of the fans are running, verify 8- to 14-Volt DC power is available to the fan units by checking the wiring connector. ● If there is 8- to 14-Volt DC power at the connector, there should be power to the fans. If the fans still do not run, replace the fan assembly. ● If not, then the power unit's fan output is defective or thermally shut down. Let the power unit cool, and recycle AC input power. If there is no fan output, replace the power unit. If the fans still do not run, escalate the problem. 2. If only one of the fans is not running, replace the fan. 3. If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to Step 4 or 5 as applicable. 4. If the fans are not at high speed, measure the cabinet's temperature at the air intake and the air exhaust at the top of the cabinet. ● If the 5- to 60^0-C criteria is met, there is a problem with the fans that is preventing the fans from operating at high speed. Replace the fans. If the fans run at high speed, wait 5 minutes to give the cabinet time to cool down and rerun the test. If the problem persists, go to step 5. ● If not, the IPSI circuit pack is incorrectly reporting this condition. Look for and resolve every error on these MOs first, then rerun the test.
		2 of 3

Table 315: RMC Power/Fan Query Test (#77) ***3 of 3***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>1</td><td>FAIL
(cont'd)</td><td>5. If the fans are running at high speed, check the following items. Any one of these could be restricting or redirecting the cabinet's air flow.
● Check the filter. If the filter is dirty or clogged, it should be cleaned or replaced. The filter can either be washed with soap and water or vacuumed.
● Verify that nothing other than circuit packs are in the carrier slots that could be restricting air flow.
● Verify that no circuit-pack blanks or carrier faceplates are missing. Install and/or replace them as necessary.
● Verify the cabinet's doors are properly closed. The doors must be closed to enable the fans to properly cool the cabinet. Wait 5 minutes to allow the fans to cool the cabinet. Rerun the test. If the test still fails, proceed to Step 6.
6. At this point, there should be nothing impeding the air flow and the fans should be running at high speed. Check the temperatures for the 5- to 60^0-C criteria.
● If the 5 to 60^{0}C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait 5 minutes, and rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled.

If not, the fans are defective. Replace the fan assembly and rerun the test. Failures can occur on the Processor circuit pack which are not detected but can cause many, if not every, environment test to fail. If several environment tests are failing, the suspected circuit pack, depending on the system configuration, should be replaced and the test rerun.</td></tr>
<tr><td></td><td>FAIL</td><td>There is a problem with the environment of the power system. The power unit for the cabinet may be defective.
1. Verify and, if necessary, replace the power unit.
2. Rerun the test. If the test still fails, escalate the problem.</td></tr>
<tr><td></td><td>PASS</td><td>The cabinet does not have a power or fan problem. If a problem is reported, troubleshoot by using the previous procedures for the FAIL cases.</td></tr>
<tr><td colspan="3" align="right">3 of 3</td></tr>
</table>

AC Power Query Test (#78)

The AC Power Query Test queries either the server's watchdog via an Ethernet or USB interface or an MCC PN's Maintenance circuit pack for the status of the cabinet's AC power.

The AC Power Query Test (#78) is not valid for DC-powered cabinets and should either abort or pass.

This test runs on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- EMG-XFER (Emergency Transfer)
- POWER

Table 316: AC Power Query Test (#78) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the PN's A carrier. Resolve every AC-POWER, CARR-POW, and RMC-ENV alarm. Repeat the test. 3. If the test still ABORTs with Error Code 2000, check for and resolve every MAINT (Maintenance circuit pack) error in a PN. Repeat the test. 4. If the test still ABORTs with Error Code 2000, escalate the problem.
2028 2319 2320 2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 316: AC Power Query Test (#78) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1	FAIL	The cabinet is currently without AC power. **Note:** For a J58890CE, skip to Procedures for a J58890CE. **Procedures for a Global MCC (J58890CH)** 1. For a nominal holdover system, if there is no AC power at the wall outlet, have a qualified electrician restore power to the outlet. Power should range from 170 to 264 VAC. 2. If there is AC power at the wall outlet, there could be a problem with the RM0850 rectifiers, BU3200A BIU (battery interface unit), or battery. Resolve every alarm logged against POWER, and rerun the test. 3. If the test still fails, the BIU may be defective. Check the BIU. If the BOD alarm LED is on, replace the BIU. If the BOD LED is off and the BOK LED is on, a PN's Maintenance circuit pack may be incorrectly reporting the problem. Resolve every alarm against these MOs, and rerun the test.
		2 of 3

Table 316: AC Power Query Test (#78) ***3 of 3***

Error Code	Test Result	Description / Recommendation
1 (cont'd)	FAIL	**Procedures for a J58890CE** 1. Check for AC power at the wall outlet (99–127 or 200–250 VAC). 2. If AC power is absent, the problem is not with the system itself. Power must be restored to the wall outlet. If AC power is present, there could be a problem with the battery or battery chargers. Resolve every alarm logged against POWER (battery & battery charger), and rerun the test. 3. If the test still fails, fuse F5 may have opened. Replace this fuse, and rerun the test. Turn off the 397C Battery Charger before inserting or removing Fuse F5. 4. If the test still fails, the server's watchdog or a PN's Maintenance circuit pack may be incorrectly reporting the problem. Resolve every alarm against these MOs, and rerun the test. Some watchdog and Maintenance circuit-pack errors *may not* be detected by their respective maintenance routines, but can cause many environment tests to fail. 5. If more than two environment tests are failing, replace the suspected circuit pack, depending on the system configuration, and rerun the test.
100	FAIL	The cabinet is currently without AC power, and AC power maintenance is in the middle of timing the NPH interval. 1. Follow the repair steps for Error Code 1.
S8700-series Fiber-PNC Any	FAIL	A PN's Maintenance circuit pack is incorrectly reporting an AC power problem. If this test fails, there is a problem with a Maintenance circuit pack. Replace the suspected circuit pack, and run the test again.
S8700-series Fiber-PNC	PASS	Since this test is invalid for DC-powered cabinets, this result simply indicates that a PN's Maintenance circuit pack is handling this test properly.
	PASS	The server's watchdog or the PN's Maintenance circuit pack has reported the cabinet has AC power.
		3 of 3

Single-Carrier Cabinet Power Query Test (#79)

This test queries an PN's Maintenance circuit pack about the power status in a single-carrier cabinet PN. This test can only detect power problems in the carriers of the PN where the Carrier Port Power Supply physically resides.

This test runs on the DC-POWER (Single-Carrier Cabinet Environment) maintenance object.

Table 317: Single-Carrier Cabinet Power Query Test (#79) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to ABORT with a 2000 error code, check for and resolve every MAINT (Maintenance circuit pack) error. Repeat the test. 3. If the test still aborts with this error code, escalate the problem.
2029 2319 2320 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 317: Single-Carrier Cabinet Power Query Test (#79) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1	FAIL	There is a problem with the environment of the power system. 1. The power supply to any one of the carriers may have been lost. a. Verify, and if necessary restore, AC power at the wall outlet for each carrier. b. Rerun the test. If the test still fails, proceed to step 2. 2. One of the WP-91153 or 676-B power units for one of the carriers could be defective. a. If the yellow status LED on a WP-91153 or 676-B power unit is off, replace the power unit. See Chapter 11: Component replacement in *Maintenance Procedures (03-300432)*. b. Rerun the test. If the test still fails, proceed with Step 3. 3. The PN's MAINT (Maintenance circuit pack) could be incorrectly reporting this error. Resolve every alarm on these MOs, and rerun the test. There are failures that can occur on the PN's Maintenance circuit pack that will not be detected but that will cause many, if not all, environment tests to fail. If more than two environment tests are failing, replace the suspect circuit pack, depending on the system configuration, and rerun the test. 4. If the test still fails, follow normal escalation procedures.
	PASS	The PN's Maintenance circuit pack has reported no problem with power.
		2 of 2

Tone Generator Crosstalk Test (#90)

The Tone Generator Crosstalk Test verifies the ability of the Tone Generator to talk on a specific time slot. The other idle time slots are checked to make sure the Tone Generator put the tone on only the specified time slot.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)

- TONE-PT (Tone Generator)

Table 318: Tone Generator Crosstalk Test (#90) *1 of 2*

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. 1. If the system is not heavily loaded, test the TDM-BUS with **`test tdm port-network`** ***P***.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2000	ABORT	Response to the test request was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Tone Generator could be defective. In a port network with more than one IPSI or Tone-Clock circuit pack, the system will attempt to move the tone generation function to the alternate one. 1. Test the IPSI or Tone-Clock circuit pack again using **`test tone-clock`** ***location***. 2. If the test fails again, look in the Error Log for Tone Detector circuit pack errors. If there are Tone Detector circuit pack errors, see the following Tone Detector documentation to resolve the errors: • DTMR-PT (Dual-Tone Multifrequency Receiver Port) • GPTD-PT (General-Purpose Tone Detector Port) • CLSFY-PT (Call Classifier Port) • ETR-PT (Enhanced Tone Receiver Port) 3. If there are no Tone Detector circuit pack errors, replace the IPSI or Tone-Clock circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.
		1 of 2

Table 318: Tone Generator Crosstalk Test (#90) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	The tone generation facility is able to correctly put tones out.
		2 of 2

Modem Pool NPE Crosstalk Test (#96)

This test is destructive.

The Modem Pool Crosstalk Test verifies that the Network Processing Element (NPE) is connected only to the desired time slot and is not crosstalking on other time slots. This test operates exactly like the NPE Crosstalk Test #6 for other types of port circuits, but it is performed twice in order to test both NPEs in the Modem Pool Port.

This test runs on MODEM-PT (Modem Pool Port).

Table 319: Modem Pool NPE Crosstalk Test (#96) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available. The port may be in use on a valid call. Determine whether the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 319: Modem Pool NPE Crosstalk Test (#96) *2 of 3*

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. 1. Check the Error Log for existing errors against this port or the circuit pack, and attempt to diagnose the existing errors.
2000	ABORT	A response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 319: Modem Pool NPE Crosstalk Test (#96) ***3 of 3***

Error Code	Test Result	Description / Recommendation
6000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. This usually means the conversion resource or other hardware needed for the test was in use. 1. Wait 1 minute and attempt the test again. 2. If the same error occurs, enter **`status port`** to determine whether the Modem Pool conversion resource is in use. 3. If the conversion resource is in use, and it is absolutely necessary to test it, the call must be dropped by entering **`busyout port`** ***`location`*** against the conversion resource. Run the test again. 4. If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. 5. If the test continues to fail or abort, replace the Pooled Modem circuit pack and retest.
6001	ABORT	System resources needed to complete the test could not be allocated for the analog section of the Modem Pool conversion resource. Follow the test procedures for Error Code 6000.
	FAIL	This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource and rerun the test. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This condition will cause noisy and unreliable connections. 1. If the remaining ports are currently idle (amber LED is off), reset the circuit pack. 2. Repeat the test. If the test fails again, replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. Investigate user-reported troubles on this port using other port tests and by examining station, trunk, or external wiring.
		3 of 3

Modem Pool Conference Test (#97)

This test is destructive.

The Modem Pool Conference Test checks most of the switching and gain control functions provided by the NPE circuit in the analog section of the conversion resource. This test conferences a 1004-Hz tone through the NPE, looping it back so that it can be verified with a Tone Detector circuit

This test runs on MODEM-PT (Modem Pool Port).

Table 320: Modem Pool Conference Test (#97) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. 1. Determine whether the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Determine whether the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 4

Table 320: Modem Pool Conference Test (#97) *2 of 4*

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. 1. Check the Error Log for existing errors against this port or the circuit pack, and attempt to diagnose existing errors.
2000	ABORT	The response to the test was not received in the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 4

Table 320: Modem Pool Conference Test (#97) *3 of 4*

Error Code	Test Result	Description / Recommendation
4000	ABORT	System resources needed to complete the test could not be allocated. This usually means the conversion resource or other hardware needed for the test was in use. 1. Wait 1 minute and run the test again. 2. If the same error occurs, enter **status port** to determine whether the Modem Pool conversion resource is in use. 3. If the conversion resource is in use, and it is absolutely necessary to test it, the call must be dropped by entering **busyout port *location*** against the conversion resource. Run the test again. 4. If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. Run the test again. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest.
65515	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times. 2. Enter **test port *location* long** for the port on which the test aborted. If any test aborted or failed, follow the recommended repair procedures for the appropriate port type (for example, ANL-LINE (8-Port Analog Line), DIG-LINE (Digital Line)).
	FAIL	This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest.
		3 of 4

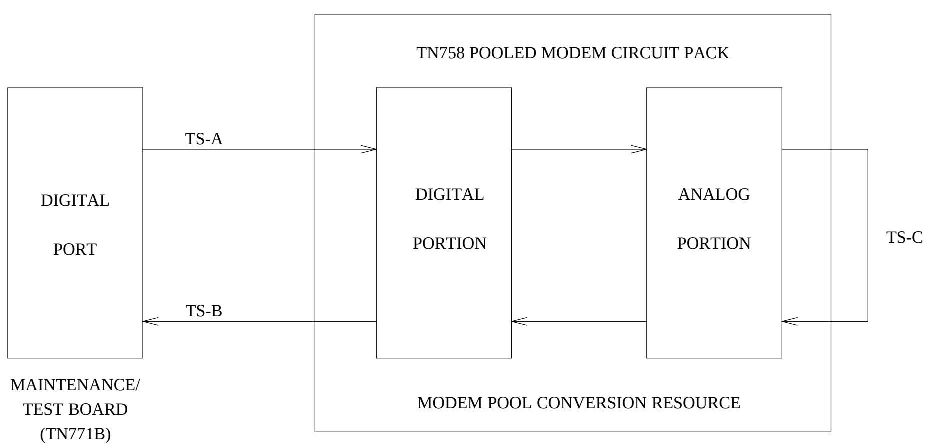
Table 320: Modem Pool Conference Test (#97) ***4 of 4***

Error Code	Test Result	Description / Recommendation
Any	FAIL	The Network Processing Element (NPE) of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. 1. If the remaining ports are currently idle (amber LED is off), reset the circuit pack. 2. Repeat the test. If the test fails again, replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
		4 of 4

Modem Pool Conversion Resource Looparound Test (#98)

The Modem Pool Conversion Resource Looparound test is set up as follows:

Figure 97: Modem Pool Conversion Resource Looparound



Test data patterns are transmitted from a Maintenance/Test board's digital port over network time slot A through the digital port on the conversion resource, looped around through the analog port via time slot C back to the Maintenance/Test board's digital port circuit via time slot B where the patterns are checked for accuracy. Finally, the test forces a disconnect by breaking the connection between the Maintenance/Test board's digital port and the Modem Pool port (time slot A) and verifying that the Maintenance/Test board's digital port and Modem Pool port go on-hook within the proper time. This test attempts to allocate a Maintenance/Test board's digital port, Modem Pool port, and other internal resources. If any of these allocation attempts fail, the test cot be completed, and a specific abort error is reported.

This test runs on MODEM-PT (Modem Pool Port).

Table 321: Modem Pool Conversion Resource Looparound Test (#98) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1000 1180	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. 1. Wait 1 minute and attempt the test again. 2. If the conversion resource is in use, and it is absolutely necessary to test it, the call will have to be dropped by entering **busyout port *location*** against the conversion resource. 3. Run the test again. If the test passes, release the port with **release port *location*** 4. If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. Rerun the test. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 6. If the test continues to abort with this error code after replacement, escalate the problem.
1181 1182	ABORT	No time-slots available to connect digital ports for the test. Internal system error. Failed to connect the digital ports with time-slots. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 321: Modem Pool Conversion Resource Looparound Test (#98) *2 of 5*

Error Code	Test Result	Description / Recommendation
1340	ABORT	No Maintenance/Test digital port is currently available for this test. 1. Enter **list config** and check if the Maintenance/Test digital ports (ports 02 and 03) are present in the system. If the ports are displayed, proceed to step 2. Otherwise, see M/T-PKT (Maintenance/Test Packet Bus Port) and M/T-DIG (Maintenance/Test Digital Port) to determine why no ports appear in the **list config** display. 2. Look for M/T-DIG errors in the error log. If present, refer to M/T-DIG (Maintenance/Test Digital Port). 3. If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, replace the Maintenance/Test circuit pack. 5. If the test continues to abort after replacement, escalate the problem.
2004	ABORT	Off-hook was not received from the Pooled Modem. 1. Busyout the digital port being tested on the Pooled Modem circuit pack. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test still aborts, replace the circuit pack. 4. If the test continues to abort after replacement, escalate the problem.
2005	ABORT	The Maintenance/Test and the Pooled Modem boards' digital ports failed to handshake. 1. Look for M/T-DIG errors in the error log. If any are present, refer to M/T-DIG (Maintenance/Test Digital Port) 2. If no errors are present retry the command at 1-minute intervals up to 5 times. 3. If the test still aborts, replace the Pooled Modem circuit pack. 4. If the test continues to abort after replacement, escalate the problem.
		2 of 5

Table 321: Modem Pool Conversion Resource Looparound Test (#98) *3 of 5*

Error Code	Test Result	Description / Recommendation
2312 2312 2314	ABORT	The Looparound test did not complete, failed to receive loopback data. No response from the digital port allocated for this test. The Modem Pool digital port did not respond to the downlink message. 1. Look for M/T-DIG errors in the error log. If any are present, refer to M/T-DIG (Maintenance/Test Digital Port) 2. If no errors are present retry the command at 1-minute intervals up to 5 times. 3. If the test still aborts, replace the Pooled Modem circuit pack. 4. If the test continues to abort after replacement, escalate the problem.
2323 2324	ABORT	The digital port allocated for this test did not disconnect properly. The digital port of the tested Modem Pool port did disconnect properly 1. Wait 1 minute and attempt the test again up to 5 times. 2. f the test continues to abort, replace the Pooled Modem circuit pack and retest.
2325	FAIL	The Modem Pool port did not respond with an on-hook message when the connection to the TN771 Maintenance/Test digital port was broken, indicating a likely problem with the TN758 Pooled Modem circuit pack. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest. 3. If the test fails after replacement, escalate the problem.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		3 of 5

Table 321: Modem Pool Conversion Resource Looparound Test (#98) ***4 of 5***

Error Code	Test Result	Description / Recommendation
5000	ABORT	Unable to allocate necessary resources for this test.System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. 1. Wait 1 minute and attempt the test again. 2. If the conversion resource is in use, and it is absolutely necessary to test it, the call will have to be dropped by entering **busyout port *location*** against the conversion resource. 3. Run the test again. If the test passes, release the port with **release port *location*** 4. If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. Rerun the test. 5. If the test continues to abort, replace the Pooled Modem circuit pack and retest. 6. If the test continues to abort with this error code after replacement, escalate the problem.
5001 5002 5003	ABORT	Internal system error. The data channel allocated for this test could not be seized Unable to establish a connection to the Modem Pool Port. 1. Wait 1 minute, then retry the test up to 5 times. 2. If the same error persists after 5 attempts, escalate the problem.
5004 5005	ABORT	Unable to allocate analog resources for this test. Internal error. 1. See the repair procedure for Error Code 5000
		4 of 5

Table 321: Modem Pool Conversion Resource Looparound Test (#98) *5 of 5*

Error Code	Test Result	Description / Recommendation
5006	FAIL	This error is internal to the Modem Pool circuit pack and does not involve external equipment or interfaces. 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. Retest. 2. If the test continues to fail, replace the Pooled Modem circuit pack and retest. 3. If the circuit pack fails after replacement, escalate the problem.
5007	ABORT	Data Channel off-hook failed. 1. Retry the test at 1-minute intervals up to 5 times. 2. If the test continues to abort with this error code, escalate the problem.
5010	FAIL	The Data Looparound Test failed, indicating a probable problem with the TN758 Pooled Modem circuit pack. 1. See the repair procedure for Error Code 5006
5013	FAIL	The Modem Pool Port did not respond with an on-hook message when the connection to the Data Channel was broken, indicating a likely problem with the TN758 Pooled Modem circuit pack. 1. See the repair procedure for Error Code 5006
5015	ABORT	Data Channels 1 and/or 3 have not been administered. 1. Administer the Data Channels and retest.
	FAIL	The loopback data did not match the original data. 1. Repeat Test #98. 2. If the test fails again, replace the Pooled Modem circuit pack.
	PASS	The port can correctly transmit/receive data.
		5 of 5

Modem Pool Audit Test (#99)

This audit updates the Modem Pool conversion resource status contained in the TN758 Pooled Modem circuit pack's microprocessor. It does not test the Pooled Modem circuit pack, so there are no FAIL codes. The audit can only be performed on idle conversion resources. If the conversion resource is in use, the audit aborts.

This test runs on MODEM-PT (Modem Pool Port).

Table 322: Modem Pool Audit Test (#99)

Error Code	Test Result	Description / Recommendation
Any	ABORT	The system was not able to allocate all necessary resources to run this test. The conversion resource was in use when the audit was performed. No repair action is necessary unless the conversion resource was known to be idle during the test (amber in-use LED was off) or was busied out before the test was run. In that case, a TN758 failure condition may exist and the following steps should be used: 1. Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. 2. If the test continues to abort, replace the Pooled Modem circuit pack and retest.
	PASS	The audit passed.

Sanity Handshake Test (#106)

This test checks the ability of a PN's Maintenance circuit pack's to respond to queries. A message is sent to the PN's Maintenance circuit pack. The test passes if a valid cabinet type is returned. This test runs on MAINT (PN Maintenance Circuit Pack).

Table 323: Sanity Handshake Test (#106) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to query was not received in the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2033	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2046	ABORT	The PN's Maintenance circuit pack reported an invalid cabinet type, which will prevent all PN environment maintenance from running. 1. Retry the command. 2. If the test continues to abort with 2046, either the PN's Maintenance circuit pack is defective or the PN cabinet's wiring is defective. First, replace the Maintenance circuit pack, then retest. 3. If the test continues to abort with 2046, the PN cabinet's wiring is defective in the A carrier. The PN's Maintenance circuit pack cot read the backplane pins to determine the cabinet type.
10601	ABORT	Test disabled via software patch.
		1 of 2

Table 323: Sanity Handshake Test (#106) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	No response to the Sanity Handshake. 1. Verify that the carrier A power units are good. If the -5 Volt unit is defective in the A carrier, communication with the PN's Maintenance circuit pack will not be possible. 2. If the -5 Volt unit is good and this test fails continuously, the system will automatically run the PN's Maintenance Circuit Pack Reset test (#306). Otherwise, manually reset a PN's Maintenance circuit pack by entering **`test maintenance long`** and evaluate any Error Codes from PN Maintenance Circuit Pack Reset Test (#306). If Test #306 passes, this test should also PASS. Use the following steps to determine whether the PN's Maintenance circuit pack or its serial link is defective: *Duplicated Port Network Connectivity (PNC)*: 1. Switch PNC by entering **`reset pnc interchange`**. 2. Run the short test sequence against the PN's Maintenance circuit pack. If Test #106 still fails, replace the Maintenance circuit pack and retest. Otherwise, follow the procedures for any errors that are logged by this test. *Unduplicated PNC*: 1. Replace the PN's Maintenance circuit pack and run the short test sequence against it. 2. If the error persists, replace the PN Expansion Interface circuit pack, at a time when the PN can go down with minimal inconvenience. 3. If the error still persists, the problem is with the actual serial link in the A carrier backplane and not with the PN's Maintenance circuit pack.
	PASS	The communication path to and from the PN's Maintenance circuit pack is sane, and the Maintenance circuit pack can read and report the correct PN cabinet type. The Maintenance circuit pack may still have problems related to Tests #228, #229, #303, or #306.
		2 of 2

Auxiliary Trunk Diagnostic Test (#114)

The system sends a message to the on-board microprocessor to operate a relay in the port circuit. If ground is detected, the test passes. This test runs on the AUX-TRK (Auxiliary Trunk) maintenance object.

Table 324: Auxiliary Trunk Diagnostic Test (#114)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** ***<grp#/mem#>*** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`*****<grp#/mem#>*** to determine the service state of the port. If the port is in use, wait until it is idle. 3. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The test failed to detect ground. 1. Rerun the test. 2. If the test fails again, replace the circuit pack.
	PASS	This test passed. Ground was detected.

Customer-Provided Alarming Device Test (#115)

The Customer-Provided Alarming Device (CPAD) Test closes the relay that activates the CPAD for one minute. If more than one minute is necessary to verify CPAD activation, use the **repeat** option for the **test customer-alarm** ***location*** command to close the relay for up to 99 minutes. For example, entering **test customer-alarm** ***location*** **r 5** closes the relay for five minutes.

When the repeat option is used, the results for Test #115 come back immediately and, for each test that passed, the CPAD is kept on for one minute. The CPAD does not turn off after the PASS result and then turn back on. Instead, the CPAD is kept on continuously for the entire time. If the CPAD is being activated and deactivated in a flickering fashion, there is a problem with either the CPAD or a PN's Maintenance circuit pack.

This test runs on CAB-CALM (Customer alarm) and MAINT (PN Maintenance Circuit Pack).

Table 325: Customer-Provided Alarming Device Test (#115)

Error Code	Test Result	Description / Recommendations
Any	ABORT	Internal system error or response from the test was not received in the time allowed. 1. Repeat the command at one-minute intervals up to 3 times.
	PASS	The request was successfully sent to the PN's maintenance or TN2312BP IPSI circuit pack to turn on the CPAD. Inspect the CPAD to verify that it is operating. 1. If the CPAD is operating but a customer says that the CPAD did not indicate an actual system alarm: a. Enter **`display system-parameters maintenance`** to check the administered alarm activation level. b. Compare the administered alarm level with the customer's specifications. If the administered alarm level does not match the customer's specifications, change the alarm level on the **`change system-parameters maintenance`** screen. 2. If Test #115 passes but the CPAD is not being activated, check the CPAD connection to the PN's Maintenance or TN2312BP IPSI circuit pack. 3. If the CPAD can be activated but not deactivated, enter **`status port-network`** or **`status cabinet`** to verify that Emergency Transfer is not activated in the affected PN or cabinet. Note that Emergency Transfer can be forced to manual OFF using **`set emergency-transfer`** for the TN2312BP circuit pack. 4. If Emergency Transfer is OFF and the CPAD still cot be deactivated: a. Enter **`display system-parameters maintenance`** to check the administered CPAD alarm levels. b. Enter **`display alarms`** to compare CPAD levels against those currently in the system.

Carrier Power Supply Recycle Override Test (#116)

The Carrier Power Supply Recycle Override Test test is **destructive**.

This test removes power from the specified carrier and causes all circuit packs in the recycled carrier to be removed and inserted. These actions cause all calls originating from or terminating to circuit packs in this carrier to be dropped. The pair of OLSs in the specified carrier is recycled. Both OLSs in the carrier are turned off for 2 seconds and then back on again. After the OLSs have been turned back on, the test queries a PN's Maintenance circuit pack for the status of the pair of OLSs in the specified carrier. If both OLSs are on and functioning, then the test passes. If both OLSs are not on and functioning, the test fails, and BOTH OLSs are turned off.

This test is run on CARR-POW (Carrier Power Supply) with the **`recyle carrier override`** command.

Table 326: OLS Recycle Test (#116) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1368	ABORT	Processor carrier - the carrier cot be recycled. 1. The "A" carrier is not allowed to be recycled.
1424	ABORT	Switch node carrier - the carrier cot be recycled. 1. Switch node carriers are not allowed to be recycled.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
2029	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2319	ABORT	PNN out of range - internal error. 1. Retry the command at 1-minute intervals up to 5 times.
2320	ABORT	Invalid carrier - internal error. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 326: OLS Recycle Test (#116) ***2 of 2***

Error Code	Test Result	Description / Recommendation
255	FAIL	Did not receive uplink alarm from the carrier. 1. Retry the command at 1-minute intervals up to 5 times.
1 (E) 2 (D) 4 (A) 8 (B) 16 (C)	FAIL	There is a problem with one or both OLSs on the cycled carrier. 1. Since the OLS Recycle test failed, both OLSs in the cycled carrier should have been powered off by the system software. Both OLSs should have a red status LED turned on instead of amber. Since the OLS Query test is a subset of the OLS Recycle test, the OLS Query test (#127) should also fail. Run the OLS Query test by using **`test environment`** ***`location`*** where ***`location`*** is the appropriate cabinet number. 2. If Test #127 fails, follow the repair procedures for the OLS/Power Unit Query Test (#127).
	PASS	Both OLSs in the recycled carrier were found to be healthy by a PN's Maintenance circuit pack after the OLSs were powered down and back up. If the status LEDs on both OLSs are not showing amber, then the MAINT (Maintenance) circuit pack may have incorrectly reported the state of the OLSs. Resolve any alarms on these MOs.
		2 of 2

Ring Generator Initialization Test (#117)

The Ring Generator Initialization Test sends a request to the active TN768, TN780, TN2182 Tone-Clock or TN2312AP/BP IPSI circuit pack's Tone-Clock circuit to monitor the voltage. The Tone-Clock responds with an error if the ringing voltage falls too low.

This test is run on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- DC-POWER (Single-Carrier Cabinet Environment)
- EMG-XFER (Emergency Transfer)
- EXT-DEV (External Device Alarm)

- POWER
- POW-SUP (Power Supply)
- RING-GEN (Analog Ring Generator)
- RMC-ENV (Power/Fan Sensors)
- SER-BUS (Serial Communication Bus)

Table 327: Ring Generator Initialization Test (#117)

Error Code	Test Result	Description / Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	The system is unable to determine the active Tone-Clock circuit pack, unable to allocated the resources necessary to run the test, or unable to send a downlink message. 1. Wait for the green LED on the active Tone-Clock to go out. 2. Enter **status port-network** to determine the active Tone-Clock circuit pack. 3. Rerun the test. If the test aborts again, see TDM-CLK (TDM Bus Clock).
2000	ABORT	Response from the test was not received within the time allowed. 1. Look for TDM-CLK errors and alarms. Resolve every TDM-CLK (TDM Bus Clock) problem first. 2. Rerun the test.
	PASS	The active Tone-Clock has successfully been enabled to monitor the ringing voltage level.

Ring Generator Query Test (#118)

The Ring Generator Query test requests the active Tone-Clock circuit pack to check the ringing voltage. The Tone-Clock circuit pack replies with PASS if the ringing voltage is adequate to ring the analog phones. If not, the active Tone-Clock circuit pack replies with a FAIL.

This test runs on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)

- CARR-POW (Carrier Power Supply)
- DC-POWER (Single-Carrier Cabinet Environment)
- EMG-XFER (Emergency Transfer)
- EXT-DEV (External Device Alarm)
- POWER
- POW-SUP (Power Supply)
- RING-GEN (Analog Ring Generator)
- RMC-ENV (Power/Fan Sensors)
- SER-BUS (Serial Communication Bus)

Table 328: Ring Generator Query Test (#118) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	Could not seize the resources to run the test. Other maintenance is running on the active Tone-Clock circuit pack. 1. Wait for the green LED on the active Tone-Clock circuit pack to go out. 2. Enter **`status port-network`** to determine the active Tone-Clock circuit pack. 3. Rerun the test. If the test aborts again, see TDM-CLK (TDM Bus Clock).
2000	ABORT	Response from the test was not received within the time allowed. 1. Look for TDM-CLK (TDM Bus Clock) errors and alarms. Resolve every Tone-Clock problem first. 2. Rerun the test.
		1 of 4

Table 328: Ring Generator Query Test (#118) ***2 of 4***

Error Code	Test Result	Description / Recommendation
	FAIL	The ringing voltage is below acceptable levels. There are two procedures: A procedure for a **multicarrier** cabinet system, and a procedure for a **single-carrier** cabinet system. Procedure for a **multicarrier** cabinet system: 1. If this is a duplicated system, enter **`status port-network`** to determine the active Tone-Clock circuit pack. 2. Enter **`set tone-clock`** ***`location`*** to make the standby Tone-Clock circuit pack active 3. Rerun the test. a. If the test passes, the trouble is with the now standby Tone-Clock circuit pack. See TONE-BD (Tone-Clock Circuit Pack) for details on replacing the standby Tone-Clock circuit pack. After the circuit pack is replaced, enter **`set tone-clock`** ***`location`*** to make this Tone-Clock active again, and rerun the test. b. If the test fails, resolve CARR-POW (Carrier Power Supply) alarms first, and rerun the test. If the test still fails: • Check the fuse on the power distribution unit. Replace the fuse if it is open, and rerun the test. • If the test still fails, an analog line circuit pack could be defective and causing the ring generator and/or fuse to fail. Unseat every analog circuit pack in the affected cabinet, and rerun the test. • If the test passes, the ring generator is healthy, and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. When the defective analog circuit pack is found, replace it and rerun the test. • If the test still fails, proceed with the next step.
		2 of 4

Table 328: Ring Generator Query Test (#118) ***3 of 4***

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	4. The ring generator is defective. a. If the reset button on the ring generator is out, push it in. b. Originate calls to several analog stations on different port circuit packs in different carriers in the affected port network. c. If no stations ring, replace the ring generator. Otherwise, If called stations ring, the fault is cleared. Rerun the test. d. If the test still fails, the active Tone-Clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the active Tone-Clock, and rerun the test. See TONE-BD (Tone-Clock Circuit Pack) for details on replacing the Tone-Clock. Rerun the test.
		3 of 4

Table 328: Ring Generator Query Test (#118) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	FAIL	Procedure for a **single-carrier** cabinet system: There is no ringing voltage in the carrier where the active Tone-Clock circuit pack resides. Other carriers may or may not have ringing voltage. 1. If this is a duplicated system, determine the active Tone-Clock circuit pack. Enter **`set tone-clock`** ***`location`*** to make the standby Tone-Clock circuit active, and rerun the test. a. If the test passes, then the trouble is with the “new” stand by Tone-Clock circuit pack. See TONE-BD (Tone-Clock Circuit Pack) for details on replacing the standby Tone-Clock circuit pack. After the circuit pack is replaced, use **`set tone-clock`** ***`location`*** to make this Tone-Clock circuit active, and rerun the test. b. If the test fails, proceed with Step 2. 2. Unseat every analog circuit pack in the cabinet that contains the active Tone-Clock circuit pack, and rerun the test. 3. If the test passes, then the ring generator is healthy and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. Replace the defective analog circuit pack. Rerun the test. If the test still fails, go to Step 4. 4. Replace the WP-91153 power unit for the affected carrier, and rerun the test. If the test still fails, go to Step 5. 5. The active Tone-Clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the active Tone-Clock, and rerun the test. See TONE-BD (Tone-Clock Circuit Pack) for details on replacing the active Tone-Clock circuit pack. Rerun the test.
	PASS	The analog ringing voltage level is acceptable. For a single-carrier cabinet stack, ringing voltage is acceptable in the cabinet containing the active Tone-Clock circuit pack.
		4 of 4

External Device Alarm Query Test (#120)

The External Device Alarm Query Test determines if the Major or Minor external alarm leads have been connected to ground, indicating an alarm condition in the adjunct equipment. The test has no affect on the external device itself. The **test environment** command will report an error against Test #120 if there is a short on one or both of the pairs of leads connecting the external device. This test runs on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- DC-POWER (Single-Carrier Cabinet Environment)
- EMG-XFER (Emergency Transfer)
- EXT-DEV (External Device Alarm)
- POWER

CAUTION:
Alarms can be generated on adjunct equipment, sent to the Avaya system, and recorded and reported as "external alarms". The adjunct equipment must provide an isolated contact closure across the alarm leads provided by the Avaya system. The contact must be rated at a minimum of 60 V DC, with a current carrying capacity of 5 mA minimum.

Table 329: External Device Alarm Query Test (#120) ***1 of 2***

Error Code	Test Result	Description and Recommendation
1000	ABORT	Internal system error. 1. Repeat the command at one-minute intervals 1 to 3 times.
1035	ABORT	The port network is not available. 1. Enter **status port-network** to verify that the network is not up. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface), etc. and resolve any problems.
		1 of 2

Table 329: External Device Alarm Query Test (#120) ***2 of 2***

Error Code	Test Result	Description and Recommendation
2000	ABORT	Response to the test was not received within the time allowed. 1. Repeat the command at one-minute intervals up to 5 times. 2. (Maintenance Board) If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier. Resolve every AC-POWER and CARR-POW (Carrier Power Supply) alarm in a multi-carrier cabinet or DC-POWER (Single-Carrier Cabinet Environment) alarms. Repeat the test. 3. (Maintenance Board) If the test continues to ABORT with Error Code 2000, resolve every maintenance circuit pack error. Repeat the test.
2029 2100 2319 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 5 times.
1425	ABORT	The media gateway is not available.
ANY	FAIL	The External Device Alarm has been activated by the external device. 1. Clear the major alarm on the external device and repeat the test. 2. If the test fails, disconnect the external device alarm leads from the TN2312BP IPSI/TN8412AP SIPI circuit pack and repeat the test. 3. If the test fails, there is a problem with the analog external device alarm port, the TN775 Maintenance circuit pack, or the TN2312BP IPSI/TN8412AP SIPI circuit pack that reports the alarm. There are failures that can occur on the TN775 and TN2312BP IPSI/ TN8412AP SIPI circuit pack that *are not* detected but cause environment tests to fail. If more than two environment tests fail, replace the circuit pack and repeat the test.
	PASS	If there is a problem with the external device, but none of the following report an alarm, the external device might not be reporting the problem correctly or the external device might not be properly connected to the external device alarm leads: ● The administered analog line external device alarm ● TN775D or later circuit pack ● TN2312BP IPSI/TN8412AP SIPI circuit pack
		2 of 2

Cabinet Temperature Query Test (#122)

This test queries for the status of the temperature and fan sensors in the cabinet. This test is run on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- EMG-XFER (Emergency Transfer)
- POWER

Table 330: Cabinet Temperature Query Test (#122) ***1 of 6***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times. 2. **S8700-series**: If the test continues to abort with Error Code 2000, check for power problems with the PN's A carrier. **S8700-series Fiber-PNC**: Look for and resolve every AC-POWER and CARR-POW (Carrier Power Supply) alarm in a multicarrier cabinet or DC-POWER (Single-Carrier Cabinet Environment) alarm in a single-carrier cabinet. Repeat the test. If the test continues to abort with error code 2000, check for and resolve every MAINT (PN Maintenance Circuit Pack) error in a PN. Repeat the test. **S8700-series IP-PNC**:Look for and resolve every RMC-ENV (Power/ Fan Sensors) alarm. Repeat the test.
2029 2319 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 6

Table 330: Cabinet Temperature Query Test (#122) ***2 of 6***

Error Code	Test Result	Description / Recommendation
S8700-series S8500 1	FAIL	VARIABLE-SPEED FAN ASSEMBLIES: One or more fans have stopped. If none of the fans are running: 1. Resolve every alarm against CARR-POW (Carrier Power Supply). S8700-series IP-PNC Resolve every alarm against RMC-ENV (Power/ Fan Sensors). 2. Verify that 48 VDC is available to the fan power filter at the J2F local cable connector. The voltage range is -42.5 V to -52.5 V. There should be 48 VDC between the following pin pairs: 2/3, 8/9, 10/11. If -48 VDC is absent, replace the CFY1B current limiter card. 3. If there are 48 VDC at the power filter's input, follow this procedure to verify that there are also 48 VDC at the power filter's output to avoid damage to the fan alarm circuit. Note that the J2F/P2F connectors on the power filter must be disconnected whenever connecting or disconnecting the J2/P2 connectors on the fan assembly. a. Disconnect connector J2F from P2F on the top of the filter. b. Disconnect J2 from P2 on the fan assembly. c. Reconnect J2F to P2F on the filter. There should be 48 VDC between the following pin pairs on the J2 connector: 2/3, 8/9, 10/11. d. If 48 VDC is present, the fans should have power. Verify every power connector is sound and making good contact. *Be sure to disconnect the J2F/P2F connector again before reconnecting the J2/P2.* e. If not, replace the fan power filter using the previous procedure described. *Be sure to disconnect the J2F/P2F connector again before reconnecting the J2/P2.*
		2 of 6

Table 330: Cabinet Temperature Query Test (#122) ***3 of 6***

Error Code	Test Result	Description / Recommendation
1	FAIL *(cont'd)*	*If some of the fans are running and some are not:* 1. Replace the defective fans. If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to the next step. 2. Remove all six white 5-pin connectors on the front and back of the fan assembly. This will cause every fan to run at high speed and the alarm to be cleared. **S8700-series Fiber-PNC**: If the alarm does not clear, a PN's Maintenance circuit pack is incorrectly reporting the problem. Check for and resolve every error against MAINT (PN Maintenance Circuit Pack), and then rerun the test. 3. One at a time, replace the 5-pin connectors and check to see if the alarm recurs. Replace each fan whose reconnection causes a recurrence of the alarm.
		3 of 6

Table 330: Cabinet Temperature Query Test (#122) ***4 of 6***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>1</td><td>FAIL
(cont'd)</td><td>NONVARIABLE-SPEEDFAN ASSEMBLIES in older or upgraded cabinets: The AHD1 circuit pack has reported an air-flow problem. The temperature difference between the air intake and the air exhaust is at least 15^{0}C (59^{0}F)) and the absolute temperature at the top of the cabinet is at least 50^{0}C (122^{0}F). The fans should be running at high speed. If none of the fans are running:
1. Look for an resolve every alarm against CARR-POW (Carrier Power Supply).
S8700-series IP-PNC Look for an resolve every alarm against RMC-ENV (Power/Fan Sensors).
2. Verify that 48 VDC is available to the fan wiring harness connector between pin pairs 2/3, 8/9, and 10/11. The tolerable range for this measurement is -42.5 V to -52.5 V.
If 48 VDC is present and the fans are not running, replace the AHD1 circuit pack. If the fans still do not run, escalate the problem.
3. If 48 VDC is absent, replace the CFY1B current limiter card.
If the fans still do not run, escalate the problem.
If some fans are running and some not, replace the defective fans.
4. If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to the next step.
5. If every fan is running but not at high speed, measure the cabinet temperature at the air intake and the air exhaust at the top of the cabinet.
a. If the 15^{0-}/50^{0-}C criteria is met, there is a problem with the AHD1 circuit pack or the fans. Replace the AHD1 circuit pack and/or fans. If the fans run at high speed, wait 5 minutes for the cabinet to cool, then retest. If the test fails, escalate the problem.
b. If the 15^{0-}/50^{0-}C criteria is not met, environmental maintenance is incorrectly reporting this condition. Resolve every error (**S8700-series Fiber-PNC**: MAINT (PN Maintenance Circuit Pack)) and retest. If the test fails, escalate the problem.</td></tr>
<tr><td colspan="3" align="right">***4 of 6***</td></tr>
</table>

Table 330: Cabinet Temperature Query Test (#122) ***5 of 6***

Error Code	Test Result	Description / Recommendation
S8700-series S8500 1	FAIL *(cont'd)*	NONVARIABLE-SPEEDFAN ASSEMBLIES (cont'd): If the fans are running at high speed, check the following items, any of which can restrict or redirect airflow within the cabinet. 1. Check both filters. If a filter is dirty or clogged, clean with soapy water or a vacuum. 2. Ensure that there is nothing other than circuit packs in the carrier slots that could be restricting the airflow. 3. Ensure that there are no missing circuit-pack faceplates or blanks. 4. The cabinet door must be closed for proper cooling. 5. Wait 5 minutes for the cabinet to cool and rerun the test. 6. If the test fails, check temperatures for the $15^{0-}/50^{0-}$C criteria. If the $15^{0-}/50^{0-}$C criteria is present, the fans should be running at high speed. 7. Wait 5 minutes and rerun the test. 8. If the test still fails, then the ambient room temperature is probably too high. Cool the room. 9. If the $15^{0-}/50^{0-}$C criteria does not exist, one of the following components is defective: ● AHD1 circuit pack ● Fans ● S3 sensors ● S4 sensors Replace these items one at a time in the order listed, running the test after each replacement. S8700-series Fiber-PNC: If more than two environmental tests are failing, there may be a problem that is undetected on a PN's Maintenance circuit pack. Replace the circuit pack. 10. Escalate if the problem persists.
		5 of 6

Table 330: Cabinet Temperature Query Test (#122) ***6 of 6***

Error Code	Test Result	Description / Recommendation
S8700-series S8500 2	FAIL	A temperature problem due to the S1 sensor detecting a temperature of at least 65^0 C (149^0 F) has been reported. The entire cabinet is in danger of power-down if the temperature reaches 70^0 C (158^0 F). 1. If any of the fans are not running, there should be a FAIL with Error Code 1 present. Follow the procedures for that Error Code, noting the differences for variable- and constant-speed fan assemblies. 2. If the fans are running, check the temperature at the top of the cabinet. a. If the temperature is at least 65^0 C (149^0 F), the ambient room temperature is too high and the fans cot cool the system. Unless the room temperature is reduced, the system will shut down soon. 3. If the temperature at the top of the cabinet is less than 65^0 C (149^0 F), the S1 sensor, or a PN's Maintenance circuit pack is incorrectly reporting the problem. a. Resolve any errors against the S1 sensor or against MAINT (PN Maintenance Circuit Pack), then rerun the test. b. If there are still errors, replace the S1 sensor and retest. If the test fails, escalate the problem.
S8700-series S8500 3	FAIL	Fan failures and temperature alarms have been reported. 1. Resolve the fan failure (Error Code 1). This should also resolve the temperature alarm. With constant-speed fan assemblies, fan failures correspond to air-flow problems.
	PASS	Temperature measurements and fan performance are satisfactory.
		6 of 6

Emergency Transfer Query Test (#124)

This test reports the state of the Emergency Transfer switch. The test passes if the switch is in a position where the system can control Emergency Transfer. The test fails if the switch is in a position where the system cot control Emergency Transfer. The system does not have control of Emergency Transfer within a cabinet if the switch is in the manual ON or manual OFF state.

This test runs on the following maintenance objects:

- AC-POWER
- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- DC-POWER (Single-Carrier Cabinet Environment)
- EMG-XFER (Emergency Transfer)
- POWER

Table 331: Emergency Transfer Query Test (#124) ***1 of 2***

Error Code	Test Result	Description/Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the time allowed. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to ABORT with Error Code 2000, check for system powering problems with the PN's A carrier. Resolve every AC-POWER and CARR-POW (Carrier Power Supply) alarm in a multicarrier cabinet system or DC-POWER (Single-Carrier Cabinet Environment) alarm. Repeat the test. 3. If the test continues to ABORT with a 2000 Error Code, resolve every MAINT (PN Maintenance Circuit Pack) error in a PN. Repeat the test.
2029 2100 2319 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals a maximum of 5 times.
1 17 18 20 33 65 289	FAIL	The Emergency Transfer switch is in the OFF position. 1. Place the switch in the AUTO position.
2 24 90	FAIL	The Emergency Transfer switch is in the ON position. 1. Place the switch in the AUTO position.
		1 of 2

Table 331: Emergency Transfer Query Test (#124) ***2 of 2***

Error Code	Test Result	Description/Recommendation
	PASS	The system has control of Emergency Transfer. If the Emergency Transfer LED is on, a Major alarm in the system could be invoking Emergency Transfer. 1. Table 332: Test #124 Error Log Entries That Cause Emergency Transfer lists the Error Types and MOs that may cause Emergency Transfer. If any or all of these errors appear in the log, refer to the appropriate Maintenance documentation and resolve those problems first. 2. If none of these errors appear in the log, check the Emergency Transfer hardware. 3. On an EPN, if Emergency Transfer is invoked while call processing is permitted, verify that the current limiter card (982LS) is in the correct slot on the backplane. If the current limiter card is not in the correct slot, move it to the correct location, and rerun Test #124.
		2 of 2

Table 332: Test #124 Error Log Entries That Cause Emergency Transfer

MO Name	Error Type	Aux Data
SW-CTL	1	
SW-CTL	2	
TONE-BD	1	0
TONE-BD	2305	40800
TONE-BD	3585	121

OLS Recycle Test (#126)

The Off-Line Switcher (OLS) Recycle Test test is **destructive**.

This test removes power from the specified carrier and causes all circuit packs in the recycled carrier to be removed and inserted. These actions cause all calls originating from or terminating to circuit packs in this carrier to be dropped. The pair of OLSs in the specified carrier is recycled. Both OLSs in the carrier are turned off for 2 seconds and then back on again. After the OLSs have been turned back on, the test queries a PN's Maintenance circuit pack for the status of the pair of OLSs in the specified carrier. If both OLSs are on and functioning, then the test passes. If both OLSs are not on and functioning, the test fails, and BOTH OLSs are turned off.

This test is run on CARR-POW (Carrier Power Supply).

Table 333: OLS Recycle Test (#126) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1366	ABORT	The active Tone-Clock for the PN is in requested carrier. 1. If duplicated Tone-Clock boards or IPSIs exist, enter **`set tone-clock`** to switch Tone-Clocks, otherwise the power cot be cycled. 2. If the tone-clock switch succeeds, rerun the test.
1367	ABORT	The active Expansion Interface link for the PN is in requested carrier. 1. If duplicated EIs exist, enter **`reset pnc interchange`** to switch EIs. Otherwise, the power cot be cycled. 2. If the reset succeeds, rerun the test.
1368	ABORT	Processor carrier - the carrier cot be recycled. 1. The "A" carrier is not allowed to be recycled.
1424	ABORT	Switch node carrier - the carrier cot be recycled. 1. Switch node carriers are not allowed to be recycled.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 333: OLS Recycle Test (#126) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2029	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2319	ABORT	PNN out of range - internal error. 1. Retry the command at 1-minute intervals up to 5 times.
2320	ABORT	Invalid carrier - internal error. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
255	FAIL	Did not receive uplink alarm from the carrier. 1. Retry the command at 1-minute intervals up to 5 times.
1 (E) 2 (D) 4 (A) 8 (B) 16 (C)	FAIL	There is a problem with one or both OLSs on the cycled carrier. 1. Since the OLS Recycle test failed, both OLSs in the cycled carrier should have been powered off by the system software. Both OLSs should have a red status LED turned on instead of amber. Since the OLS Query test is a subset of the OLS Recycle test, the OLS Query test (#127) should also fail. Run the OLS Query test by using **`test environment`** ***`location`*** where ***`location`*** is the appropriate cabinet number. 2. If Test #127 fails, follow the repair procedures for the OLS/Power Unit Query Test (#127).
	PASS	Both OLSs in the recycled carrier were found to be healthy by a PN's Maintenance circuit pack after the OLSs were powered down and back up. If the status LEDs on both OLSs are not showing amber, then the MAINT (Maintenance) circuit pack may have incorrectly reported the state of the OLSs. Resolve any alarms on these MOs.
		2 of 2

OLS/Power Unit Query Test (#127)

This test is known as the Off-Line Switcher (OLS) Query Test for the following maintenance objects:

- CABINET (Cabinet Sensors)
- CARR-POW (Carrier Power Supply)
- RING-GEN (Analog Ring Generator)

This test is known as the Power Unit Query Test for:

- AC-POWER
- CABINET (Cabinet Sensors)
- EMG-XFER (Emergency Transfer)
- POWER

This test queries the PN's Maintenance for the status of the pair of OLSs in the specified carrier. If both OLSs are on and functioning, then the test passes. If both are not on and functioning, it fails.

Table 334: OLS/Power Unit Query Test (#127) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to ABORT with error code 2000, check for system powering problems with the PN's A carrier. Resolve every AC-POWER and CARR-POW alarm in a multicarrier-cabinet system or DC-POWER alarm in a single-carrier cabinet system. Then, repeat the test. 3. If the test continues to ABORT with a 2000 error code, resolve any errors against the PN's MAINT (Maintenance circuit pack). Then, repeat the test.
2029 2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 334: OLS/Power Unit Query Test (#127) ***2 of 5***

Error Code	Test Result	Description / Recommendation
	FAIL	**AC-POWERED SYSTEMS** There is a problem with one or both OLSs on the tested carrier. 1. For each OLS that has every status LED OFF, check the AC input to the OLS at the OLS outlet. If there is no AC, then check the appropriate fuses for the affected OLS. Replace open fuses. If the fuses open again or AC does not show up at the OLS outlet, then there is probably a power wiring problem in the cabinet. 2. At this point, AC should be present at the OLS outlet. Enter **`recycle carrier`** ***UUC***, where *UUC* is the appropriate cabinet and carrier, in an attempt to bring back the OLSs for this carrier. If the test passes, the trouble is cleared. If the test does not pass, one OLS or both in the tested carrier is defective. If only one OLS is defective, then the status LEDs on the healthy OLS will light green for a moment. When the recycle test determines that both OLSs are defective, the software will turn off power to both the good and defective OLSs. This will cause the status LED(s) on the good OLS to light red. 3. Unplug both OLSs, and wait approximately 1-minute to allow the OLSs to cool down. Plug in the OLSs. If either OLS is operating properly (the status LEDs show green), replace the defective OLS(s). See CARR-POW (Carrier Power Supply)
		2 of 5

Table 334: OLS/Power Unit Query Test (#127) ***3 of 5***

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	4. If the replaced OLS(s) still do not operate properly, then a circuit pack or a defective telephone connected to a circuit pack in the affected carrier could be causing an electrical load that is preventing the OLS from operating properly. Unseat every circuit pack in the carrier, and enter **`recycle carrier`**. a. If the recycle passes, the OLSs are healthy and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, replace the defective circuit pack. If the status LED still shows red, remove the amphenol connector on the back of the slot containing this circuit pack and enter **`recycle carrier`**. If the status LED shows green, the problem is with one of the telephones or the wiring to one of the telephones on this slot. b. If either OLS still shows a red status LED, check for bent pins and cable placement in the affected carrier. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many, if not every, environment test to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun.
		3 of 5

Table 334: OLS/Power Unit Query Test (#127) ***4 of 5***

Error Code	Test Result	Description / Recommendation
	FAIL	**DC-POWERED SYSTEMS** There is a problem with one or both port carrier power supplies on the tested carrier. 1. For each port carrier power supply that has every status LED OFF, check the DC input to the port carrier power supply at the port carrier power supply outlet. If there is no DC, check the appropriate circuit breakers for the affected port carrier power supply. If the circuit breaker has tripped, reset the circuit breaker. If the circuit breaker trips again or if DC is absent at the port carrier's power supply outlet, there is probably a power wiring problem in the cabinet. 2. At this point, DC should be present at the port carrier power supply outlet. Enter **`recycle carrier`** ***`UUC,`*** where *UUC* is the appropriate cabinet and carrier, to attempt to bring back the port carrier power supplies for this carrier. If the test passes, the trouble is cleared. If the test does not pass, either one port carrier power supply or both in the tested carrier is defective. If only one port carrier power supply is defective, the status LEDs on the healthy port carrier power supply will light green for a moment. When the recycle test determines that both port carrier power supplies are defective, the software will turn off power to both the good and defective port carrier power supplies. This will cause the status LED(s) on the good port carrier power supply to light red. 3. Unplug both port carrier power supplies, and wait approximately 1-minute to allow the power supplies to cool down. Plug in the power supplies. If either power supply is operating properly (the status LEDs show green), replace the defective power supplies). 4. If the replaced port carrier power supply(s) still do not operate properly, a circuit pack or a defective telephone connected to a circuit pack in the affected carrier could be causing an electrical load that is preventing the power supply from operating properly. Unseat every circuit pack in the carrier, and enter **`recycle carrier`**.
		4 of 5

Table 334: OLS/Power Unit Query Test (#127) ***5 of 5***

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	a. If the recycle passes, the port carrier power supplies are healthy and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, replace the defective circuit pack. If the status LED still shows red, remove the amphenol connector on the back of the slot containing this circuit pack and enter **`recycle carrier`**. If the status LED shows green, the problem is with one of the telephones or the wiring to one of the telephones on this slot. b. If either port carrier power supply still shows a red status LED, check for bent pins and cable placement in the affected carrier. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many, if not every, environment test to fail. If many environment tests are failing, replace the suspect circuit pack, depending on the system configuration, and the test rerun.
	PASS	Both OLSs or power supplies in the tested carrier were found to be healthy by the PN's Maintenance circuit pack. If the status LEDs on both OLSs or power supplies are not showing green, the PN's MAINT circuit pack may have incorrectly reported the state of the OLSs. Resolve any alarms on these MOs.
		5 of 5

Internal Looparound Test (#135)

This test is destructive.

The Internal Looparound Test loops the transmitted DS1 bit stream back into the board receiver. The loop occurs just before the DS1 facility interface. The test is highly destructive and can only be initiated by a **`reset board`** ***`location`*** command.

All of the trunks on the DS1 or UDS1 Interface circuit pack must first be busied out using the **`busyout board`** ***`location`*** command before the Internal Looparound Test can be executed. The test uses the Tone Generator and Tone Detector to exercise a bit pattern consistency test for all ports. If the transmitted and received bit patterns on a trunk are different, the test fails.

All trunks of the DS1 Interface circuit pack are restored to the in-service state after **`release board`** ***`location`*** is entered

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 335: Internal Looparound Test (#135) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	Received an incoming call on a port of the DS1 circuit pack during the test. 1. Enter **busyout board *location*** to put every trunk on the DS1 circuit pack into the out-of-service state. 2. Retry **reset board *location*** at 1-minute intervals up to 5 times.
		1 of 3

Table 335: Internal Looparound Test (#135) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1015	ABORT	Ports on DS1 Interface circuit pack have not been busied out. 1. Enter **busyout board *location*** to put every trunk on the DS1 circuit pack into the out-of-service state. 2. Retry **reset board *location***.
1039	ABORT	The DS1 or UDS1 Interface circuit pack is providing timing for the system. Therefore, it cot be reset without major system disruption. 1. If the DS1 or UDS1 Interface circuit pack needs to be reset, set the synchronization reference to another DS1 or UDS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack using the following command sequence: **a. disable synchronization-switch** **b. set synchronization location** **c. enable synchronization-switch**
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response to the test was not received within the allowed time. 1. Enter **display errors** on the SAT. 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error 1. Retry **reset board *location*** at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry **reset board *location*** at 1-minute intervals up to 5 times.
		2 of 3

Table 335: Internal Looparound Test (#135) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	FAIL	**DS1-BD**: DS1 Interface circuit pack failed the Internal Looparound test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the DS1 Interface circuit pack is a TN767, enter **`list measurement ds1-log location`** to read the error seconds measurement. Otherwise, skip this step. 3. Verify that both of the DS1 link's endpoints are administered with the same signaling mode, framing mode, and line coding. 4. Check the physical connectivity of DS1 Interface circuit packs and cable. 5. Contact T1 Network Service to diagnose remote DS1 endpoint. 6. If Steps 2 to 5 are OK and the problem recurs, escalate the problem. **UDS1-BD**: The UDS1 Interface circuit pack failed the Internal Looparound test. If the UDS1 connects to a T1 network facility or another switch: 1. Retry **`reset board`** ***`location`*** at 1-minute intervals up to 5 times. 2. Enter **`list measurement ds1-log`** ***`location`*** to read the error seconds measurement. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the physical connectivity of DS1 Interface circuit packs and cable. 5. Contact T1 Network Service to diagnose the remote DS1 endpoint. 6. Replace the local UDS1 Interface circuit pack and repeat the test. If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: 1. Retry **`reset board`** ***`location`*** at 1-minute intervals up to 5 times. 2. Enter **`list measurement ds1-log`** ***`location`*** to read the error seconds measurement. 3. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. 4. Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the line-side terminating device operating manual for information. 5. Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. If the error seconds measurement is severe, investigate premise distribution system wiring for noise and distance limitation. 6. Replace the local UDS1 Interface circuit pack, and repeat the test. 7. Contact the vendor of the line-side terminating device to diagnose the equipment.
	PASS	The Internal Looparound test passed on every administered trunk. 1. Enter **`release board`** ***`location`*** to put the trunks in the in-service state.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

DS1 Tie Trunk Seizure Test (#136)

The DS1 Tie Trunk Seizure Test verifies the trunk's signaling capability. The test is composed of two parts. The first part queries the circuit pack or media module for errors. The second part of the test sends a seizure message to the DS1 Interface circuit pack or media module and expects an active reply by the DS1 Interface circuit pack or media module. If the system does not receive any reply and the timer expires, the test fails.

This second part of this test ***cot*** be run on a trunk if one of the following cases is true:

1. The trunk direction is administered as an incoming only trunk.
2. The trunk is the 24^{th} port on a DS1 Interface circuit pack or media module which is administered using 24^{th} common-channel signaling.
3. The trunk has been seized by a normal trunk call.
4. The trunk is administered with maintenance test disabled.
5. The outgoing signal type of the trunk is either automatic or immediate-start.

This test runs on TIE-DS1 (DS1 Tie Trunk).

Table 336: DS1 Tie Trunk Seizure Test (#136) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 3. If the port status is active but the port is idle (no calls), check the error log for Error Type 1025. See the error log table for a description of this error and required actions for this maintenance object. The port may be locked up. 4. If the port status is idle, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 336: DS1 Tie Trunk Seizure Test (#136) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1004	ABORT	Far end is seizing the trunk while the test is ongoing. A glare situation is detected. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. Enter **`status trunk`** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. 2. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Incompatible configuration administered on Trunk Group form. 1. Verify the following fields on the Trunk Group administration form: a. Is trunk direction incoming only? b. Is trunk outgoing type either **automatic** or **immediate-start**? c. Is trunk the 24th port of the DS1 Interface circuit pack or media module while common control channel signaling is specified? 2. If the trunk has been administered using the above information, this test should abort.
1018	ABORT	The test was disabled by administration. Determine why the test has been disabled before enabling it. 1. Verify that the **Maintenance Test** field on the Trunk Group administration form is **n**. To enable the test, change the trunk administration and enter **y** in the **Maintenance Test** field. 2. Repeat the test.
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general circuit pack or media module error. 1. Examine the error log for existing errors against this port or the circuit pack or media module and attempt to diagnose the already existing error. 2. Retry the test.
1040	ABORT	The test is invalid for this trunk port because it is administered as an access endpoint. 1. Enter **`display port`** ***`location`*** to verify that this port is administered as an access endpoint. In this case the test should abort and no action is necessary.
		2 of 3

Table 336: DS1 Tie Trunk Seizure Test (#136) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2053	ABORT FAIL	At least one of the following errors is found in the Error Log for the DS1 circuit pack or media module: ● 1281 – Loss of Signal ● 1793 – Blue alarm ● 2049 – Red alarm ● 2305 – Yellow alarm ● 1537 – Hyperactivity. 1. Look for the above Error Types in the Error Log and follow the procedures for DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module) for the listed Error Types.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The far-end trunk did not respond to the seizure of the near-end trunk within the allowed time. 1. If the affected port is located on a Media Module, replace the Media Module. 2. Enter **`list configuration board`** ***`location`***. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. 3. Verify that the **Trunk Type** field on the Trunk Group administration form matches the trunk type administered on far-end switch. 4. Look for DS1-BD, UDS1-BD, or MG-DS1 errors in the error log. If any are present, see DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module) for repair procedures. 5. Retry the test at 1-minute intervals up to 5 times.
	PASS	The trunk can be seized for an outgoing call.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Loss of Signal Alarm Inquiry Test (#138)

Note:

The term "board" refers to the DS1 Interface circuit packs, UDS1 Interface circuit packs, and DS1 Interface Media Modules.

The Loss of Signal Alarm Inquiry Test verifies the synchronization status, echo cancellation, and continuity of the DS1 link.

A Loss of Signal Alarm indicates that the board is unable to derive the synchronization clock from the DS1 facility. If the board is administered as a timing source and it detects a Loss of Signal alarm, the board will stop providing the synchronization clock for the system and will transmit a Yellow alarm to the remote DS1 endpoint.

When the Loss of Signal alarm is confirmed, every trunk or port of the board is put into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

120A CSU Module/Sync Splitter

This test also maintains the 120A CSU module or the 401A T1 sync splitter, and the 402A or 403A E1 synchronization splitter. The CSU module, when combined with the functionality provided by the UDS1 circuit pack, provides functionality equivalent to an external stand-alone ESF T1 CSU. The combination of the UDS1 and 120A CSU module is known as an Enhanced Integrated CSU (I-CSU).

The 401A T1 synchronization splitter, when combined with the functionality provided by the UDS1 circuit pack, allows an ATM switch to derive its timing from a T1 connected to the UDS1 in the S8700 Fiber-PNC system.

The 402A or 403A E1 synchronization splitter, when combined with the functionality provided by the UDS1 circuit pack, allows an ATM switch to derive its timing from an E1 connected to the UDS1 in the S8700 Fiber-PNC system.

If a UDS1 circuit pack detects certain I-CSU/Sync Splitter hardware errors, it notifies the system. When the system receives notification of the I-CSU/Sync Splitter error, it executes the Loss of Signal Alarm Inquiry test (#138). The test queries for a Loss of Signal alarm condition, and queries the UDS1 board to confirm the I-CSU/Sync Splitter error. A Minor or Warning alarm is raised depending on the severity of the I-CSU/Sync Splitter error. The trunks on the board may be taken out of service if the I-CSU/Sync Splitter error is deemed serious.

If a Loss Of Signal alarm and an I-CSU/Sync Splitter error coexist, the Loss Of Signal alarm condition takes priority, and the board and all of its trunks are put in the out-of-service state. Errors are logged for both.

When the system receives notification that the I-CSU/Sync Splitter hardware error condition no longer exists, maintenance restores the board and its trunks to their previous service state if the alarm can be cleared (no other I-CSU/Sync Splitter errors or Loss Of Signal alarms exist).

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***1 of 7***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** on the SAT. 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The board detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. All trunks or ports of this board are out-of-service. **Note:** If a DS1/UDS1 circuit pack is designated as the supplier of the system synchronization source, the system synchronization maintenance adopts a source elsewhere. See SYNC (Port Network Synchronization) for details. 1. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 2. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
		1 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***2 of 7***

Error Code	Test Result	Description / Recommendation
1300	FAIL	The CSU module/T1 sync splitter or E1 Sync Splitter is missing. The CSU module/T1 sync splitter is missing: The **Near-End CSU Type** field on the **add ds1** screen has been administered as **integrated** but the 120A CSU module or the 401A T1 sync splitter is not physically connected to the UDS1 board on the back of the port carrier. 1. If using the 120A CSU module or the 401A T1 sync splitter, plug the CSU module/T1 sync splitter into the DS1/UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the **Near-End CSU Type** field to **other** using the **change ds1** screen. 2. Run the test again. The E1 Sync Splitter is missing: The **E1 Sync-Splitter?** field on the **add ds1** screen has been administered as **y** but the 402A or 403A E1 Sync Splitter is not physically connected to the UDS1 board on the back of the port carrier. 1. If using the 402A or 403A E1 synchronization splitter, plug the E1SS into the UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the **E1 Sync-Splitter** field to **n** using the **change ds1** screen. 2. Run the test again.
		2 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***3 of 7***

Error Code	Test Result	Description / Recommendation
1301	FAIL	The 120A CSU module or the 401A T1 sync splitter, or the 402A or 403A E1 synchronization splitter is not expected. The 120A CSU module or the 401A T1 sync splitter is not expected: The 120A CSU module/T1 sync splitter is physically connected to the DS1/ UDS1 board on the back of the port carrier, but the **Near-End CSU Type** field on the **`add ds1`** screen has not been administered as **integrated**. 1. If the 120A CSU module/T1 sync splitter is to be used, use **`change ds1`** to set the **Near-End CSU Type** field to **integrated**. Otherwise, physically remove the 120A CSU module/T1 sync splitter from the back of the port carrier. 2. Run the test again. The 402A or 403A E1 synchronization splitter is not expected: The 402A or 403A E1 synchronization splitter is physically connected to the DS1/ UDS1 board on the back of the port carrier, but the **E1 Sync-Splitter?** field on the **`add ds1`** screen has not been administered as **y**. 1. If the 402A or 403A E1 synchronization splitter is to be used, use **`change ds1`** to change the **E1 Sync-Splitter** field to **y**. Otherwise, physically remove the 402A or 403A E1 synchronization splitter from the back of the port carrier. 2. Run the test again.
1302	FAIL	Attempting to use the 120A CSU module with a DS1/UDS1 circuit pack that is configured for 32-channel (2.048-Mbps) operation. The CSU module only works with a DS1/UDS1 board configured for 24-channel (1.544-Mbps) operation in the United States. 1. If the 120A CSU module is to be used, physically remove the DS1/ UDS1 circuit pack and reconfigure it for 24-channel (1.544-Mbps) operation. 2. Reinsert the circuit pack and run the test again.
		3 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***4 of 7***

Error Code	Test Result	Description / Recommendation
1303	FAIL	The suffix of the DS1/UDS1 circuit pack is incorrect for CSU module/T1 sync splitter administration. The **Near-End CSU Type** field on the **add ds1** screen has been administered as **integrated** but the DS1/ UDS1 circuit pack does not support this. 1. If the CSU module/T1 sync splitter is to be used, and the **Near-End CSU Type** field is set to **integrated** to allow for CSU module/T1 sync splitter administration, remove the circuit pack and replace it with a board that has the correct suffix. Otherwise, use **change ds1** to set the **Near-End CSU Type** field to **other**. The suffix DS1/UDS1 circuit pack is incorrect for E1 Sync Splitter administration. The **E1 Sync-Splitter?** field on the **add ds1** screen has been administered as **y** but the DS1/UDS1 circuit pack does not support this. 1. If the E1 Sync Splitter is to be used, and the **E1 Sync-Splitter** field is set to **y** to allow for E1SS administration, remove the circuit pack and replace it with a board what has the correct suffix. Otherwise, use **change ds1** to set the **E1 Sync-Splitter** field to **n**.
1310	FAIL	The Board Loopback (BLB) Test (#1209) failed. 1. Enter **test ds1-loop *location* ds1/csu-loopback-tests** 2. If the BLB test continues to fail, replace the DS1/UDS1-BD circuit pack. 3. Run this test again.
		4 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***5 of 7***

Error Code	Test Result	Description / Recommendation
1311	FAIL	The Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test (#1210) failed. This test is executed by the I-CSU during I-CSU power-up/ reset (i.e., the DS1/UDS1 board is physically inserted and a CSU module or a Sync Splitter is already installed) or when the CSU module/Sync Splitter is plugged on to an already initialized DS1/UDS1 board. The ELB test is also executed as part of **test ds1-loop *location* ds1/ csu-loopback-tests** for the CSU module and T1 sync splitter. 1. Enter **test ds1-loop *location* ds1/csu-loopback-tests** 2. If the ELB test continues to fail, then either the DS1/UDS1 board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. 3. Replace the CSU module/T1 sync splitter and run **test ds1-loop *location* ds1/csu-loopback-tests** again. 4. If the ELB test continues to fail, replace the DS1/UDS1 board, and run **test ds1-loop *location* ds1/csu-loopback-tests** again. 5. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module/T1 sync splitter.
1312	FAIL	The Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test (#1211) failed. This test is executed during I-CSU/Sync Splitter power-up/ reset (i.e., the DS1/UDS1 board is physically inserted and the CSU module or the Sync Splitter is already installed) or when the CSU module/ Sync Splitter is plugged on to an already initialized DS1/UDS1 board. The RLB test is also executed as part of **test ds1-loop *location* ds1/ csu-loopback-tests** for the CSU module/T1 sync splitter. 1. Enter **test ds1-loop *location* ds1/csu-loopback-tests** 2. If the RLB test continues to fail, then replace the CSU module/T1 sync splitter. 3. Run this test again.
		5 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***6 of 7***

Error Code	Test Result	Description / Recommendation
1313	FAIL	The DS1/UDS1 circuit pack could not deactivate a CPE Loopback Jack loopback. 1. Enter **test ds1-loop *location* end-loopback/span-test** 2. If the attempt to deactivate the CPE Loopback Jack is not successful, check the cabling and investigate the problem at the CPE Loopback Jack. 3. Run the test again.
1314	FAIL	The DS1/UDS1 circuit pack could not deactivate a far-end CSU loopback. 1. Enter **test ds1-loop *location* end-loopback/span-test**
1320	FAIL	Either a CSU module/Sync Splitter hardware failure or an ICSU/Sync Splitter serial-interface audit failure was detected by the DS1/UDS1 circuit pack. 1. Replace the CSU module/Sync Splitter, and then run the test again. 2. If the test continues to fail with this Error Code, replace the DS1/ UDS1 circuit pack, and run the test again. 3. If the test continues to fail with this Error Code, then the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
1321	FAIL	DTE LOS (loss of signal) was detected between the DS1/UDS1 board and the CSU module or the Sync Splitter. Either the DS1/UDS1 board, the CSU module/Sync Splitter, or the I/O cable between the backplane and the CSU module/Sync Splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. 1. Replace the CSU module/Sync Splitter, and run the test again. 2. If the test continues to fail with this Error Code, then replace the DS1/UDS1 board, and run the test again. 3. If the test continues to fail with this Error Code, the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
		6 of 7

Table 337: Loss of Signal Alarm Inquiry Test (#138) ***7 of 7***

Error Code	Test Result	Description / Recommendation
1322	FAIL	No 5-Volt power detected from the DS1/UDS1 circuit pack to the CSU module or the Sync Splitter. The problem is probably due to an open fuse on the DS1/UDS1 board or to a faulty ICSU/Sync Splitter. **Note:** Do not immediately swap a DS1/UDS1 board as this may blow the fuse on the new board. 1. Remove the DS1/UDS1 circuit pack from the system and reinsert. 2. Run the test again once the circuit pack has finished its reset. 3. If the test continues to fail with this Error Code, then replace the DS1/UDS1 circuit pack and run the test again. 4. If the test continues to fail with this Error Code, the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
1323	FAIL	A service-affecting CSU module/Sync Splitter audit failure was detected by the DS1/UDS1 circuit pack. Every administered port on the DS1/UDS1 circuit pack is affected, and the system will place the ports into the out-of-service state. 1. Replace the CSU module or the Sync Splitter.
1324	FAIL	A non-service-affecting CSU module/Sync Splitter audit failure was detected by the DS1/UDS1 circuit pack. No ports should be affected. No immediate action is required. These errors indicate that the CSU module/ Sync Splitter hardware may have a problem, and that it should be replaced when practical to avoid further deterioration.
1400 1401	FAIL	Echo Canceller function failed. This could be a hardware problem on the board. 1. Reset the circuit pack. 2. Retest the circuit pack. 3. If Test 138 still fails, replace the board.
	PASS	DS1 signal is present and the physical link is healthy. For DS1-BD and UDS1-BD, no Integrated CSU/Sync Splitter errors or echo cancellation errors have been detected.
0	NO BOARD	See NO BOARD for the repair procedures.
		7 of 7

Blue Alarm Inquiry Test (#139)

Note:

The term "DS1 board" refers to the DS1 Interface circuit packs, the UDS1 Interface circuit packs, and the DS1 Interface Media Module.

A Blue Alarm is a signal sent by the remote DS1 endpoint when it is out-of-service. The Blue Alarm Inquiry Test checks the Blue Alarm status of the remote DS1 endpoint.

When a local DS1 board detects a Blue Alarm signal from the remote DS1 endpoint, it transmits a Yellow Alarm to the remote DS1 endpoint and sends a BLUE ALARM message to the system. When the Blue Alarm is confirmed, the system places all trunks or ports of the DS1 board into the out-of-service state. The inquiry test runs every 10 minutes until the Blue Alarm is cleared.

When the Blue Alarm is cleared, the DS1 board stops transmitting the Yellow alarm and places the trunks or ports back into the service state they were in before the Blue Alarm occurred

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Line Loopback Alarm

The Line Loopback (LLB) is used by the remote DS1 endpoint to put the DS1 board into a loopback mode. When the DS1 board is in the LLB mode, the arriving bit pattern is regenerated and sent back. The Line Loopback (LLB) Alarm activates when the in-band activate LLB bit pattern arrives continuously for 5 seconds on the DS1 line. The LLB deactivates when the in-band deactivate LLB bit pattern arrives continuously for 5 seconds on the DS1 line.

Since LLB is a condition rendering all DS0 channels unavailable for signaling or bearer traffic, the system treats this the same as a Blue Alarm.

Payload Loopback Alarm

The Payload Loopback (PLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. The PLB Alarm activates when a network protocol activate bit pattern arrives over the 4Kbps ESF data link on the DS1 line. The PLB deactivates when a network protocol deactivate bit pattern arrives over the 4Kbps ESF data link on the DS1 line.

Since PLB is a condition rendering all DS0 channels unavailable for signaling or bearer traffic, the system treats this the same as a Blue Alarm.

Table 338: Blue Alarm Inquiry Test (#139)

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals for a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **`display errors`** on the SAT. 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals for a maximum of 5 times.
	FAIL	The remote DS1 endpoint is out-of-service.
1	FAIL	A Line Loopback Alarm (LLB) was detected.
2	FAIL	A Payload Loopback Alarm (PLB) was detected. 1. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 2. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback Alarm was detected.
0	NO BOARD	See NO BOARD for the repair procedures.

Red Alarm Inquiry Test (#140)

A DS1/UDS1 Interface circuit pack or DS1 Interface Media Module raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry test checks the framing status of a DS1 board.

When the DS1 board detects a Red Alarm, it transmits a Yellow Alarm to the remote DS1 endpoint and sends a Red Alarm message to the system. After the Red Alarm is confirmed, the system places every trunk or port of the DS1 board into the out-of-service state. The inquiry test runs every 10 minutes until the Red Alarm is cleared.

When the Red Alarm is cleared, the DS1 board stops transmitting the Yellow alarm to the remote DS1 endpoint. The system restores all trunks or ports of the DS1 board to the service state they were in before the Red Alarm occurred.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Loss of Multiframe Alarm

If the DS1 circuit pack or media module is administered using DMI-BOS signaling, it raises a LMA (Loss of Multiframe Alarm) when it cot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24th channel. Once the DS1 board detects an LMA, the circuit pack transmits a RMA (Remote Multiframe Alarm) to the remote DS1 endpoint.

Table 339: Red Alarm Inquiry Test (#140) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 339: Red Alarm Inquiry Test (#140) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** on the SAT. 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate resources for this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The DS1 circuit pack or media module detected a Red Alarm. An out-of-frame condition occurred. The DS1 circuit pack/media module will transmit a Yellow Alarm to the remote DS1 endpoint until the Red Alarm is retired.
1	FAIL	The DS1 circuit pack or media module detected a loss of multiframe alarm (LMA). An out-of-frame condition occurred on the DS1 board. The DS1 board will transmit a remote multiframe alarm (RMA) to the remote DS1 endpoint until the LMA is retired. 1. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 2. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Red alarm is detected on the DS1/UDS1 circuit pack or media module.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Yellow Alarm Inquiry Test (#141)

The Yellow Alarm Inquiry Test determines whether the remote DS1 endpoint is transmitting a Yellow alarm. A Yellow Alarm indicates that the remote DS1 endpoint has an out-of-frame condition.

Once the Yellow alarm is confirmed, all trunks on the DS1 board are put into the out-of-service state. The Inquiry test will be run every 10 minutes until the Yellow Alarm is cleared. When the Yellow Alarm is cleared, all trunks on the DS1 board are restored back to their previous service state before the Yellow Alarm was raised.

The Yellow Alarm corresponds to the yellow F2 state documented in CCITT recommendation I.431.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Remote Multiframe Alarm

A Remote Multiframe Alarm (RMA) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition while the DS1 board is administered using the DMI-BOS common-channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 State Alarm

For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user to the network. Refer to CCITT recommendation I.431

Table 340: Yellow Alarm Inquiry Test (#141) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the test at 1-minute intervals up to 5 times.
		1 of 2

Table 340: Yellow Alarm Inquiry Test (#141) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** on the SAT. 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The DS1/UDS1 interface circuit pack or media module detected a yellow alarm sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint.
1	FAIL	The DS1/UDS1 Interface circuit pack or media module detected a Remote Multiframe Alarm sent by the remote DS1 endpoint. An out-of-frame condition occurs on the remote DS1 endpoint.
2	FAIL	The DS1/UDS1 Interface circuit pack or media module is reporting a yellow F5 State alarm. There is a fault in the user-network interface from the user to the network. 1. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 2. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Yellow alarm or Remote Multiframe Alarm or F5 State Alarm is received from the remote DS1 endpoint.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Major Alarm Inquiry Test (#142)

The Major Alarm Inquiry Test determines if the received average DS1 bit error rate on the DS1 facility is greater than 1/1000. All trunks on the DS1 board are put in the out-of-service state if a Major Alarm lasts for more than 20 minutes.

When the Major Alarm is cleared, all trunks on the DS1 board are restored to their previous service state before the Major Alarm occurred.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 341: Major Alarm Inquiry Test (#142) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **`display errors`** 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 341: Major Alarm Inquiry Test (#142) *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	The DS1/UDS1 Interface circuit pack or media module detects a Major alarm. The DS1 bit error rate is greater than 1/1000. The performance of the DS1 link between the DS1 board and the remote DS1 endpoint is very poor. 1. Enter **list measurement ds1-log *location*** to read the error seconds measurement. 2. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 3. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Major alarm is detected in DS1 board.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Minor Alarm Inquiry Test (#143)

The Minor Alarm Inquiry test determines if the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000.

Every trunk or port on the DS1 board is kept in the in-service state after the Minor Alarm is confirmed. The Minor Alarm Inquiry test runs every 10 minutes until the Minor Alarm is cleared.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 342: Minor Alarm Inquiry Test (#143)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** 2. Check for Error Type 1538 for this DS1 board. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	A Minor Alarm was detected. The performance of the DS1 link between the DS1 board and the remote DS1 endpoint is poor. 1. Enter **list measurement ds1-log** ***location*** to read the error seconds measurement. 2. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 3. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Minor Alarm is detected in the DS1 board.
0	NO BOARD	See NO BOARD for the repair procedures.

Slip Alarm Inquiry Test (#144)

Slips occur when the transmitter and receiver are not running at precisely the same clock rate. The DS1/UDS1 Interface circuit pack or media module can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry Test displays the total number of slips that have occurred on a DS1 link if there are any.

Every trunk or port of the DS1 board remains in the in-service state. If the DS1 board supplies the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See TDM-BUS (TDM Bus) and SYNC (Port Network Synchronization) for details.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 343: Slip Alarm Inquiry Test (#144) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check the Error Log for Error Type 1538. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/ UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 343: Slip Alarm Inquiry Test (#144) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1 to 88	FAIL	The DS1 board detected a slip alarm. The Error Code value is the number of slips detected since the last slip alarm inquiry test. 1. Enter **`list measurement ds1-log`** ***`location`*** to read the error seconds measurement. 2. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 3. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Slip Alarm is detected on the DS1 board.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Misframe Alarm Inquiry Test (#145)

A Misframe Alarm indicates that framing bits observed on a DS1 board are in error. The Misframe Alarm Inquiry test queries the total number of misframes that have occurred on a DS1 board since the last inquiry.

If the DS1 board is supplying the system synchronization source when the threshold of misframes is reached, a switching synchronization source message is sent to the TDM bus Clock. See TDM-BUS (TDM Bus) for details. A Minor Alarm against the DS1 board is raised, but every trunk or port of the DS1 board remains in the in-service state.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 344: Misframe Alarm Inquiry Test (#145)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** 2. Check the Error Log for Error Type 1538. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
ANY	FAIL	The DS1 board detected errors in the received framing bits pattern. The Error Code value is the number of misframes detected since the last misframe alarm inquiry test. Major bit and minor bit error rate (Error Types 2561 and 2817) errors often accompany misframe alarms. Clearing the cause of these errors may clear the misframes which are occurring. 1. Enter **list measurement ds1-log *location*** to read the error seconds measurement. 2. If the DS1/UDS1 circuit pack or media module connects to a T1 network facility or to another switch, see T1 Network Facility Procedures 3. If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, see Line-side Terminating Device Procedures
	PASS	No Misframe Alarm is detected on the DS1 board.
0	NO BOARD	See NO BOARD for the repair procedures

DS1 Translation Update Test (#146)

The DS1 Translation Update Test sends the board-level information specified by System Administration to the DS1/UDS1 Interface circuit pack or media module. Translation includes the following data (see the output of **`display ds1 location`**): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, Time Slot Number of 697-Hz Tone, Time Slot Number of 700-Hz Tone, etc.

If a DS1/UDS1 circuit pack is combined with a 120A CSU module or the 401A T1 sync splitter to screen an Integrated CSU module/T1 sync splitter, this test will also send the administration for the Integrated CSU to the circuit pack to assure the board's translations are correct. The administration of the CSU module/T1 sync splitter is done using the **DS1 Circuit Pack** administration screen. Translation for the CSU module/T1 sync splitter includes the following data: Transmit LBO, Receive ALBO, Supply CPE Loopback Jack Power.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MAPD-BD (MAPD Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 345: DS1 Translation Update Test (#146)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system software error. 1. Enter **`display ds1 location`** to verify the DS1 board translation. 2. Retry the command at 1-minute intervals up to 5 times.
	PASS	Translation data has been downloaded to the DS1 board successfully.
0	NO BOARD	See NO BOARD for the repair procedures.

TDM Bus Clock Circuit Status Inquiry Test (#148)

This test checks the sanity of the TDM Bus Clock circuitry.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 346: TDM Bus Clock Circuit Status Inquiry Test (#148) ***1 of 3***

Error Code	Test Result	Description / Recommendation
None 1001	ABORT	The system could not allocate the necessary resources for the test. 1. Wait 1-minute, and retry the test.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The Tone-Clock circuit framing verification firmware found an error in the clock synchronization signal coming into this port network. 1. If the Tone-Clock circuit reporting the problem is a master clock, then the system synchronization reference is providing a bad timing source. See SYNC (Port Network Synchronization) or Notes: to change the system synchronization reference. 2. If the Tone-Clock circuit is a slave clock, then the EI to which it is listening is providing a bad timing source. Follow the diagnostic procedures specified for TDM-CLK Error Code 2305. 3. **S8700 | S8710 | S8720 | S8500**: If no problem can be found with the incoming synchronization signal, replace the IPSI or Tone-Clock circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.
2	FAIL	The Tone-Clock circuit has inaccurately detected loss of signal on the incoming synchronization timing source.

1 of 3

Table 346: TDM Bus Clock Circuit Status Inquiry Test (#148) *2 of 3*

Error Code	Test Result	Description / Recommendation
4 8	FAIL	The local oscillator on the Tone-Clock circuit failed.
16 32	FAIL	The circuitry which detects synchronization timing errors on the Processor/Tone-Clock circuit has failed. 1. Errors 2, 4, 8, 16, and 32 indicate that there is poor synchronization between port networks and external facilities. It may be noticeable to the customer in the form of errors in data communications. The Tone-Clock circuit is defective. See Replacing the IPSI or Tone-Clock Circuit Pack.
64	FAIL	There has been a loss of valid synchronization timing information coming into this port network. It has been reported as TDM-CLK Error Log entries with one or more of Error Types 1025, 1281, 1537, 2049 and 2305. 1. Resolve the errors indicated for TDM-CLK (TDM Bus Clock). No separate corrective action is required.
65	FAIL	The Processor/Tone-clock is currently not able to lock on to the current synchronization reference. If this tone-clock is in the master port networK: 1. Examine the error log for any DS1-BD, SYNC or other TDM-CLK errors and resolve as applicable. 2. Run this test again using **`test tone-clock`** ***`location`***. 3. Examine the DS1 measurements to determine whether the facility is healthy. 4. Administer a new synchronization reference. 5. Replace the DS1 board currently supplying the reference. If this tone-clock is in the slave port network: 6. Examine the error log for any SYNC, EXP-INTF, or TDM-CLK errors. 7. Run this test again with **`test tone-clock`** ***`location`***.
		2 of 3

Table 346: TDM Bus Clock Circuit Status Inquiry Test (#148) ***3 of 3***

Error Code	Test Result	Description / Recommendation
66	FAIL	There is an on-board failure of TDM clock hardware. 1. Enter **`test tone`** ***`location`*** **`long`** to resolve the problem. The long test resets the board and is required to reload on-board RAM associated with the TN2182's DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds. This means that no dial tone or touch tones are available during this interval. It probably will not affect calls in progress, but could cause a call origination to abort or a user will not get dial tone when going off-hook. 2. If the test passes and the alarm does not resolve, retest with **`test tone-clock`** ***`location`*** **`long clear`**. 3. If the test passes, the repair process is completed. If the test fails, replace the circuit pack at the customer's convenience.
	PASS	TDM bus Clock Circuit Status is sane. There are no clock-detection circuit problems on the Tone-Clock circuit.
		3 of 3

TDM Bus Clock Slip Inquiry Test (#149)

This test queries the Tone-Clock circuit pack for timing slips.

This test is not applicable for TN2182, TN2312, or TN8412 circuit packs.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 347: TDM Bus Clock Slip Inquiry Test (#149) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	The system could not allocate the necessary resources for the test 1. Retry the test at 1-minute intervals up to 5 times.
1001	ABORT	Internal error. 1. Retry the test at 1-minute intervals up to 5 times.
1005	ABORT	This test does not run on a TN2182, TN2312, or TN8412 circuit packs. This error can be ignored.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the test at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available 1. Retry the test at 1-minute intervals up to 5 times.
		1 of 2

Table 347: TDM Bus Clock Slip Inquiry Test (#149) ***2 of 2***

Error Code	Test Result	Description / Recommendation
Any	FAIL	The Error Code represents the number of timing slips detected on the incoming synchronization source since the last slip inquiry was sent to the Tone-Clock circuit. The incoming synchronization signal can be from one of the following sources: 1. A DS1 Interface circuit pack, if DS1 Synchronization is administered, and associated with the circuit pack tested 2. **S8700-series Fiber-PNC**: A Stratum-3 clock, if that option is administered and the circuit pack tested was the active Tone-Clock in the PN 1. 3. **S8700-series Fiber-PNC**: The local oscillator on the master IPSI's Tone-Clock circuit or on the master Tone-Clock circuit pack, if it is providing the PN's clocking signals 4. **S8700-series IP-PNC**: The local oscillator on the IPSI's Tone-Clock circuit providing the media gateway's clocking signals 5. **S8700-series Fiber-PNC**: An EXP-INTF circuit pack, if the PN on which the test was executed does not contain the system's current synchronization reference The Error Code is a value between 1 and 255. 1. Small numbers of slips should not result in service degradation. If the Error Code is small (1 or 2), rerun the test. If the error only occurs infrequently, it may be ignored. 2. Otherwise, see Synchronization Troubleshooting in SYNC (Port Network Synchronization).
	PASS	The IPSI or Processor/Tone-Clock circuit pack does not detect any timing slips. This indicates that the incoming synchronization timing source is valid or that the system's synchronization reference is an IPSI or Processor/ Tone-Clock circuit pack. Enter **`status synchronization`** to verify that the desired synchronization reference is providing timing for the system.
		2 of 2

TDM Bus Clock PPM Inquiry Test (#150)

This test evaluates the quality of the synchronization source for the Tone-Clock circuit.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 348: TDM Bus Clock PPM Inquiry Test (#150) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	The system could not allocate the necessary resources for the test 1. Wait 1-minute, then retry the test.
1001	ABORT	The system could not allocate the necessary resources for the test. 1. Wait 1-minute, then retry the test.
255	ABORT	The test was not executed because the IPSI or Processor/Tone-Clock circuit pack was using its local oscillator rather than synchronizing to an external source. 1. Verify that this IPSI or Processor/Tone-Clock circuit pack is expected to be the synchronization source. If not, correct the synchronization information and re-run the test.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100		System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The Error Code represents the rate (in Parts Per Million, or PPM) at which clock slip errors have been detected on the incoming synchronization source since the last PPM inquiry was sent to the IPSI or Processor/Tone-Clock circuit pack. A failure of this test indicates that we are outside of (**S8700-series Fiber-PNC**: Stratum-3) or Stratum-4 timing specifications on the incoming timing source. The Error Code is a variable amount ranging from 1 to 254. 1. If error 1537 is entered in the error log against TDM-CLK, then the board has switched timing sources. Follow the procedures associated with hardware log Error Code 1537. 2. Otherwise, see Troubleshooting Approach in SYNC (Port Network Synchronization).
		1 of 2

Table 348: TDM Bus Clock PPM Inquiry Test (#150) *2 of 2*

Error Code	Test Result	Description / Recommendation
	PASS	The IPSI or Processor/Tone-Clock circuit pack does not detect timing any PPM errors. This indicates that the external synchronization timing source is valid or that the system synchronization reference is an IPSI or Processor/Tone-Clock circuit pack. Enter **`status synchronization`** to verify that the desired synchronization reference is providing timing for the system.
		2 of 2

TDM Bus Clock Parameter Update Test (#151)

This test updates the following internal parameters on the IPSI or Tone-Clock circuit pack:

- Disables inline duplication status messages.
- **S8700-series Fiber-PNC**: Disable inline subrate frame maintenance messages (TN768, TN780 only).
- **S8700-series Fiber-PNC**: Sets the PPM threshold at 60 PPM for TN768 and TN780.

  Sets the PPM threshold at 85 PPM for TN2182 and TN2312.
- Enables PPM threshold switching.
- Sets the number of slips to trigger *loss of signal* - currently 30 per 5-millisecond period.
- Enables the on-board synchronization switching algorithm (see above).
- Enables holdover operation (TN2182 and TN2312 only).

This test always passes without identifying or reporting any IPSI or Tone-Clock circuit pack errors.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 349: TDM Bus Clock Parameter Update Test (#151)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
	FAIL	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The IPSI or Processor/Tone-Clock circuit pack parameters have been successfully updated.

Analog Looparound Test (#161)

The Analog Looparound Test checks the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. The test passes if the signal measured by the Tone Detector is within acceptable limits.

This test runs on the following maintenance objects:

- ADX16A-P (AUDIX Analog Line/Control Link)
- AN-LN-PT (Analog Line Port)
- ANL-16-L (16-Port Analog Line)

Table 350: Analog Looparound Test (#161) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
		1 of 4

Table 350: Analog Looparound Test (#161) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. 1. Enter **`display port`** ***`location`*** to determine the station's extension. 2. Enter **`status station`** ***`extension`*** to determine the service state of the port. 3. If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		2 of 4

Table 350: Analog Looparound Test (#161) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1004	ABORT	A valid call seized the port during the test and aborted the test. 1. Enter **`display port`** ***`location`*** to determine the station extension. 2. Enter **`status station`** ***`extension`*** to determine the service state of the port. 3. If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
1005	ABORT	The test is not applicable for this type of port. This error can be ignored.
1018	ABORT	The test has been disabled by administration. Determine why the **Test** field on the **change station** screen has been set to **n** for this station. It may be due to the brief ringing disturbance that Ringing Application Test 48 may cause. 1. To enable the test for the particular analog station, enter **`change station`** ***`extension`*** and enter **y** in the **Test** field.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
		3 of 4

Table 350: Analog Looparound Test (#161) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	FAIL	The reflective looparound test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board. 1. Since a line seizure may affect the test, repeat the test at 1-minute intervals up to 5 times. 2. Enter **test board** ***location*** to run circuit pack tests to check the Tone Generator and the Tone Detector circuits on the IPSIs or the Tone Generator/Tone Detector circuit packs. 3. Resolve any problems on the Tone Generator or the Tone Detector circuit. 4. If the Tone Generator and Tone Detector circuits are functioning properly, determine whether a voice terminal is connected and wired properly. Resolve any problems found. 5. If the test still fails, replace the analog line circuit pack.
	PASS	The port provides an analog transmission path to the station equipment. Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station.
0	NO BOARD	See NO BOARD for the repair procedures.
		4 of 4

Speech Synthesis DTMF Receiver Test (#163)

A series of dual-tone multifrequency (DTMF) tones are conferenced from the TDM bus into the port's DTMF receiver and checked to see if the correct tones have been detected during the correct intervals. If every DTMF tone was detected correctly, the test passes. If any of the tones were not detected correctly, the test fails.

This test runs on S-SYN-PT (Speech Synthesis Port).

Table 351: Speech Synthesis DTMF Receiver Test (#163)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Wait until the port is idle (amber LED is off) before retesting. 1. If the port is idle, retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	DTMF tones were not detected. This type of failure may cause features using touch-tone input to the Speech Synthesis port to malfunction. 1. Verify that the Tone-Clock circuit is functioning correctly by checking the Error Log and entering the command **`test tone-clock long`** 2. If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The port has detected every DTMF tone correctly. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis DTMF Sanity Inquiry (#164)

This test determines the sanity of the port's dual-tone multifrequency (DTMF) receiver. The on-board microprocessor tests the port's DTMF receiver and determines if it is in a sane (test passes) or insane (test fails) condition. This test runs on S-SYN-PT (Speech Synthesis Port).

Table 352: Speech Synthesis DTMF Sanity Inquiry (#164)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Wait until the port is idle (amber LED is off) before retesting. 1. Retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test request was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The DTMF receiver for this port is insane. 1. If the test fails again, replace the circuit pack.
	PASS	The DTMF receiver for this port is sane. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis DSP Tone Test (#165)

The digital signal processor (DSP) associated with each port can generate a 440-Hz tone which can be detected by TN748 General-Purpose Tone Detector circuits. A 440-Hz tone is generated for 500 ms on a specified time slot which is being listened to by the detector circuit. If the detector determines the tone is present on the time slot, the test passes. Otherwise, it fails.

This test runs on S-SYN-PT (Speech Synthesis Port).

Table 353: Speech Synthesis DSP Tone Test (#165)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Wait until the port is idle (amber LED is off) before retesting. 1. Retry the command at 1-minute intervals up to 5 times.
1001 1002 1003	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1021	ABORT	The 440-Hz tone was not detected by the Tone Detector circuit and inter-digit time-out has occurred on the Tone Detector circuit. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, verify that every Tone Detector circuit in the system is functioning correctly by checking the Error Log and using **test board** ***location*** **long**. Replace any faulty circuit packs containing Tone Detector circuits, and repeat the test. 3. If the test continues to abort, replace the Speech Synthesis circuit pack.
2000 2100	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The 440-Hz tone was not detected by the Tone Detector circuits. 1. If the test fails again, verify that every Tone Detector circuit in the system is functioning correctly by checking the Error Log and using **test board** ***location*** **long**. Replace any circuit packs containing faulty Tone Detector circuits, and repeat the test. 2. If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The 440-Hz tone has been detected correctly. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis Memory Test (#166)

The encoded speech for the Speech Synthesis circuit pack is stored in on-board read-only memory (ROM). A checksum is computed for each 32K speech memory block and compared against a known checksum value. If every computed checksum value is successfully compared against the stored checksum values, the test passes. If, while testing the speech complex memory, the on-board microprocessor finds a memory error, the test is terminated and a failure is reported. This type of failure may affect other ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port.

This test runs on S-SYN-PT (Speech Synthesis Port).

Table 354: Speech Synthesis Memory Test (#166) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Wait until the port is idle (amber LED is off) before retesting. 1. Retry the command at 1-minute intervals up to 5 times.
1019	ABORT	The test is already running on a different port, possibly due to background maintenance activity. Only one of these tests may be active on a circuit pack at a time. 1. Retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The computed checksum from the speech vocabulary ROM did not compare correctly with the stored checksum. This type of failure may cause features using the Speech Synthesis port's speech services to malfunction and result in degradation of synthesized speech quality ranging from insignificant to major. 1. Replace the circuit pack.
		1 of 2

Table 354: Speech Synthesis Memory Test (#166) *2 of 2*

Error Code	Test Result	Description / Recommendation
	PASS	The computed checksum values were successfully compared against the stored checksum values. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.
		2 of 2

Speech Synthesis SSD Inquiry Test (#167)

This test determines the sanity of the specified port's speech synthesis device (SSD). The on-board microprocessor tests the port's SSD and determines if it is in a sane (test passes) or insane (test fails) condition. Other ports on the Speech Synthesis circuit pack will continue to function correctly during this type of failure.

This test runs on S-SYN-PT (Speech Synthesis Port).

Table 355: Speech Synthesis SSD Inquiry Test (#167)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Wait until the port is idle (amber LED is off), then retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The SSD is insane. 1. Replace the circuit pack.
	PASS	The SSD is sane. Investigate user-reported troubles by using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis PSS Handshake Test (#168)

This test verifies control functionality between the on-board microprocessor and programmable speech synthesizer (PSS) controller. A failure occurs if either of the following events occur:

- The on-board microprocessor times out while waiting for the PSS controller to respond.
- An invalid command is received by the on-board microprocessor from the PSS controller.

This type of failure will affect all four ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port. This test runs on S-SYN-PT (Speech Synthesis Port).

Table 356: Speech Synthesis PSS Handshake Test (#168)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Wait until the port is idle (amber LED is off), then retry the command at 1-minute intervals up to 5 times.
2000 2100	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The on-board microprocessor has timed out while waiting for the PSS controller to respond or an invalid command has been received by the on-board microprocessor from the PSS controller. This type of failure may cause features using the Speech Synthesis port's speech services to malfunction. 1. Replace the circuit pack.
	PASS	The on-board microprocessor/PSS handshake is working correctly. Investigate user-reported troubles by using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis Parameter Update Test (#169)

This test updates the dual-tone multifrequency (DTMF) inter-digit time-out parameter used by the Speech Synthesis circuit pack so that it is consistent with that specified by the server.

This test runs on S-SYN-PT (Speech Synthesis Port).

Table 357: Speech Synthesis Parameter Update Test (#169)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. 1. If the port is idle, retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	An internal system error has occurred. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The DTMF inter-digit time-out parameter has been updated. User-reported troubles should be investigated using other tests and by verifying that other ports on this circuit pack are working correctly.

Digital Looparound Test (#171)

The Digital Looparound Test checks the data line port's ability to transmit and receive data on the TDM Bus. Data is sent through an available Maintenance/Test digital port over the TDM Bus, internally looped through the data line port back onto the TDM Bus, and received again by the same Maintenance/Test digital port.

Only one of the two digital ports on a Maintenance/Test circuit pack is used for this test. If port 02 is in use, out-of-service, or not present, the test aborts. This test may fail if the Maintenance/Test digital port used by the test is not functioning properly.

If there are any M/T-DIG errors in the Error Log, see M/T-BD (Maintenance/Test Circuit Pack) and clear them first.

This test will pass regardless of any customer equipment that may be connected to the port, as long as the equipment is not using the port.

This test runs on DAT-LINE (Data Line Port).

Table 358: Digital Looparound Test (#171) ***1 of 4***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be in use on a valid call. Enter **status data-module** to determine when the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
1005 1007	ABORT	Data Channel 3 is not administered. This port is required to run this test. 1. Verify that data channel 3 is not administered with **list data-module**. 2. Administer data channel 3 with **add data-module**, and run this test again.
1016	ABORT	Data Channel 3 is busy. The port may be in use on a valid call. Enter **status data-module** to determine when the port is available for testing. 1. Retry the command at 1-minute intervals a maximum of 5 times.
1020	ABORT	An existing Error Type #769 on this port prevented the test from running. 1. Follow the procedure described in the Error Log Table for Error Type #769 for this maintenance object.
1042	ABORT	The port under test is a TTI port and has only default translations with no assigned extension. The test requires an assigned extension associated with the port being tested. 1. If there is a need to run the test on this particular port, verify that the port is fully translated and has an assigned extension.
		1 of 4

Table 358: Digital Looparound Test (#171) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1180	ABORT	There is no Maintenance/Test circuit pack digital port available for testing. 1. Check if the Maintenance/Test digital ports are present. Enter **`list config`**. Ports 02 and 03 should be displayed. 2. If the digital ports 02 and 03 on the Maintenance/ Test circuit pack are not present, see M/T-BD (Maintenance/Test Circuit Pack). 3. If the digital ports are present, retry the command at 1-minute intervals up to 5 times.
1181	ABORT	No time-slots available to connect digital ports for the test. 1. Retry the command at 1-minute intervals up to 5 times.
1182	ABORT	Internal system error. Failed to connect the digital ports with time-slots. 1. Retry the command at 1-minute intervals up to 5 times.
1340	ABORT	No Maintenance/Test digital port is currently available to perform this test. 1. Enter **`list config`** to determine whether the Maintenance/Test digital ports (ports 02 and 03 on the Maintenance/Test circuit pack) are present in the system. At least one Maintenance/Test circuit pack must be present in PN 1 of the system. There should be at least two such ports present. If the ports are present, proceed to step 2. Otherwise, determine why no ports appear in the **`list config`** display. Refer to M/T-DIG (Maintenance/Test Digital Port) and M/T-BD (Maintenance/Test Circuit Pack). 2. Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). 3. If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, replace the Maintenance/Test circuit pack.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using either **`display port`** (the display shows that the port is a TTI port) or **`list config`** (a “t” is displayed for the port). 2. If either **`list config`** or **`display port`** indicates that the port is not a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, no action is necessary.
		2 of 4

Table 358: Digital Looparound Test (#171) *3 of 4*

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. 2. Escalate the problem if the test continues to abort.
2003	ABORT	Failed to receive an off-hook from the Data Line. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2004	ABORT	Off-hook was not received from the data line device. 1. Busyout the digital port being tested on the data line circuit pack. Retry the command at 1-minute intervals up to 5 times. 2. If the test still aborts, replace the circuit pack.
2005	ABORT	The handshake between the Maintenance/Test circuit pack digital port and the data line port failed. 1. Resolve any M/T-DIG (Maintenance/Test Digital Port) errors. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test still aborts, replace the data line circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2312	ABORT	The test did not receive loopback data. 1. Resolve any M/T-DIG (Maintenance/Test Digital Port) errors. 2. Retry the test, if still aborts, replace the Data Line circuit pack.
2313	ABORT	Failed to receive a response from the Maintenance/Test digital port. 1. Resolve any M/T-DIG (Maintenance/Test Digital Port) errors. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test continues to abort, replace the Maintenance/Test circuit pack.
2314	ABORT	Data line port did not respond to the downlink message. 1. Busyout the digital port being tested on the data line circuit pack. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test still aborts, replace the circuit pack.
		3 of 4

Table 358: Digital Looparound Test (#171) ***4 of 4***

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2000	FAIL	No response received within the time allowed. 1. If the test fails again, replace the Data Line circuit pack.
	FAIL	The data received did not match the data sent. This indicates a fault somewhere in the transmit/receive path to the TDM Bus, which will probably result in data corruption over this port. This test may fail if the Maintenance/Test digital port used by the test is not functioning properly. 1. Resolve any M/T-DIG (Maintenance/Test Digital Port) errors. 2. Repeat Test #171. 3. If the test fails again, replace the data line circuit pack.
	PASS	The port can correctly transmit/receive data. Investigate user-reported troubles on this port using other port tests by examining the ADU, external wiring, and customer equipment.
		4 of 4

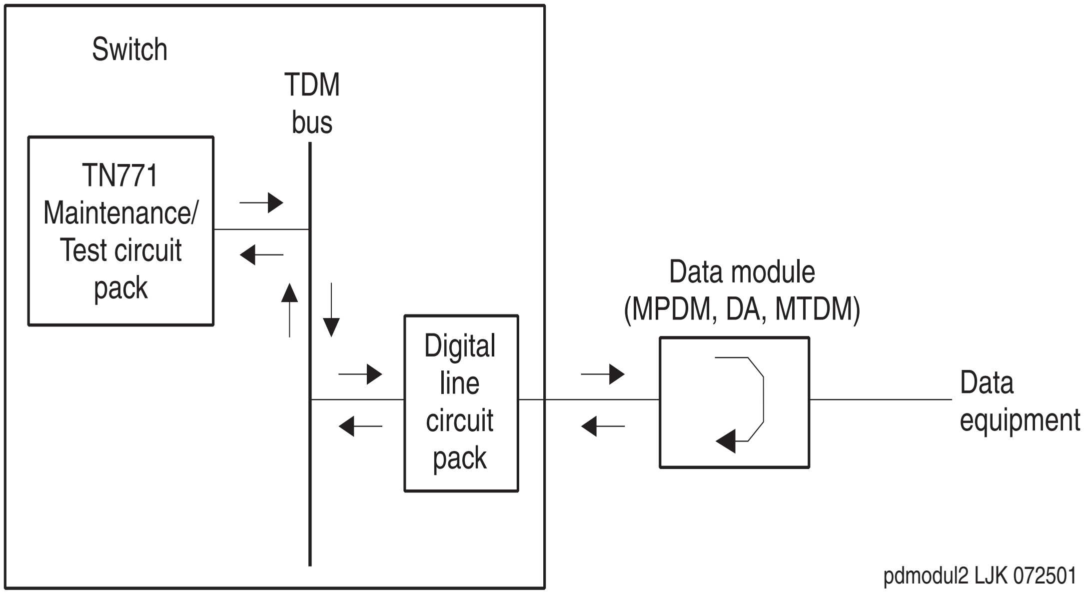
Data Module Internal Looparound Test (#175)

This test verifies that a data message can be sent from the switch, through the building wiring, through an internal looparound path in the data module, and back to the switch. This path is illustrated below.

For this test to run, the **Remote Looparound Test** field on the Data Module administration screen must be set to **y**, indicating that the data module endpoint supports the test.

This test runs on PDMODULE (Processor Data Module) and TDMODULE (Trunk Data Module).

Figure 98: Internal Looparound Test



A signaling message is sent through the digital port circuit pack to the data module, requesting it to enter looparound mode. A test pattern is then sent from the TN771D Maintenance/Test circuit pack, over the path illustrated above, and back to the TN771D where it is checked for consistency.

The test aborts if any of the following local resources are not available:

- A digital port on the TN771D. There are two such digital ports, but only one may be used at a time.
- Two TDM time slots
- An idle digital port connected to the data module

Table 359: Data Module Internal Looparound Test (#175) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Enter **`status data-module`** to determine when the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
		1 of 4

Table 359: Data Module Internal Looparound Test (#175) *2 of 4*

Error Code	Test Result	Description / Recommendation
1005	ABORT	Looparound testing is not enabled on the data module administration screen. 1. Set **Looparound Test** field to **y** on the data module administration screen. 2. Retry the test.
1340	ABORT	No Maintenance/Test digital port is currently available to perform this test. 1. Enter **`list config`** to determine whether the Maintenance/Test digital ports 02 and 03 are present in the system. Because at least one Maintenance/Test circuit pack must always be present in the PN of S8700 configurations, there should be at least two such ports present. If the ports are present, proceed to step 2. Otherwise, determine why no ports appear in the **`list config`** display. See M/T-DIG (Maintenance/Test Digital Port) and M/T-BD (Maintenance/Test Circuit Pack). 2. Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). 3. If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, replace the Maintenance/Test circuit pack.
1341	ABORT	No time-slots available to connect digital ports for the test. 1. Try the command again at 1-minute intervals up to 5 times.
1342	ABORT	Connection failed. 1. Try the command again at 1-minute intervals up to 5 times.
1392	ABORT	This port is a TTI port. The test does not run on TTI ports. 1. Verify that the port is a TTI port using **`display port`** where the display shows that the port is a TTI port, or **`list config`**, where the display shows a **t** for the port. 2. If **`list config`** or **`display port`** indicate that the port is not a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, no action is necessary.
		2 of 4

Table 359: Data Module Internal Looparound Test (#175) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Data module is disconnected. 1. Verify that the data module is powered (power LED on). 2. Make sure data module is connected to the building wiring. Check for faulty wiring and faulty data module. 3. Retry the command at one-minute intervals a maximum of 5 times. 4. Replace the Data Module and repeat the test. 5. If the test continues to abort, replace the Digital Line circuit pack and repeat the test.
2005	ABORT	The handshake between the Maintenance/Test digital port and the Data Module failed. 1. Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). 2. If test still aborts on retry, check physical connection of data module under test. Make sure the switches are on NORM, OFF (between REM_LP and LOC_LP), 9600, and ASYN. 3. If the test still aborts, replace the Data Module.
2012	ABORT	System call failed. Internal error. 1. Try the command again at 1-minute intervals up to 5 times.
2312	ABORT	The looparound test failed to receive loopback data. 1. Check for M/T-DIG error in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). 2. Retry the test. If it still aborts, replace the Data Module and retest. 3. If the test aborts again, replace the Digital Line circuit pack.
2313	ABORT	The Maintenance/Test digital port allocated for this test did not respond to downlinked message. 1. Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test continues to abort, replace the MTB.
		3 of 4

Table 359: Data Module Internal Looparound Test (#175) ***4 of 4***

Error Code	Test Result	Description / Recommendation
2314	ABORT	Data Module did not respond to downlinked message. 1. Check the wiring of the Data Module under test. 2. Verify that the Data Module is powered (power LED on). 3. Make sure the switches are on NORM, OFF (between REM_LP and LOC_LP), 9600, and ASYN. 4. If the test still aborts, replace the Date Module. 5. If the same abort code appears, replace the Digital Line circuit pack that is connected to the Data Module.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
3004	ABORT	This error has several causes. 1. This error could be caused by the switch setting of the PDM. Verify that the switch on the PDM is set to the "remote loop" position. When the remote looparound test is completed, return the switch to the "off" position. 2. This error could also result if no data equipment is connected to the data module. Verify that (a) the data equipment is properly connected to the data module, (b) that power is available to the data equipment, and that (c) the data equipment is powered on. 3. This error could also occur if the baud rate of the data module is set to 19.2 Kbps since the Network Control circuit pack used by this test does not support baud rates greater than 9600 bps. Verify that the baud rate of the data module is set to 9600 bps or less.
	FAIL	Data received from remote loopback does not match data sent. 1. Check for faulty wiring. 2. Replace the data module and repeat the test. 3. If the test fails, replace the Digital Line circuit pack associated with the data module and repeat the test.
	PASS	Data Module Looparound test passed.
		4 of 4

Channel Administration Memory Array Test (#205)

The Channel Administration Memory Array (CAMA) Test checks the dual port RAM, which is used for storing control information for the 140AY. Patterns are written, read back, and verified. The test passes if the patterns match. The test fails if the patterns do not match.

This test runs on -PT (Announcement Port).

Table 360: channel Administration Memory Array Test (#205)

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Wait until the port is idle (amber LED is off). 2. Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response from the test was not received within the time allowed. See Note (a) at the end of this table for more information.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed. Announcements played back on this port may sound corrupted. 1. Reset the circuit pack with **`reset board`** ***`location`*** and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. Refer to General notes.
	PASS	This test verifies that the Angel processor can properly set up this port for playbacks. Investigate user-reported troubles on this circuit pack using other port and circuit pack tests. Refer to -BD (Announcement circuit pack) for a description of the circuit pack tests.

Notes:

a. The announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the announcement Ports on the circuit pack (one of which is the record port) is unusable by software. Also, **`save/restore announcements`** do not work because the record port looks busy to the circuit pack. The system does not have any way of knowing this and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

- When attempting to record an announcement, users hear the proper record tone, but the announcement does not record. They do not know it until the announcement is played back.
- The command **`test board`** ***`location`*** **`long`** returns the following abort codes:
  - Ports 1 AND 9 abort Test #206 with error code 1024
  - Ports 1 AND 9 abort Test #205 with error code 2000
  - Board level Tests #209 and #210 abort with error code 1024
- **`Save/restore announcements`** times out with
  Error encountered, can't complete request

Clear the announcement circuit pack lock-up remotely by performing a soft reset on the circuit pack. Note that the busyout command drops all calls in progress on the announcement circuit pack.

Playback Speech Memory Array Test (#206)

The Playback Speech Memory Array (PSMA) test checks the integrity of a playback channel's interface to the speech memory and the TDM Bus. The SP has an internal buffer that contains a specific 256-byte sequence. During this test, the byte sequence is "played" through the 140AY device onto the TDM Bus. A General Purpose Tone Detector is used to confirm that the proper sequence was played. This test is very important. It is the only test that actually checks an announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence. The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

It is the only test that actually checks an announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence. The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

This test runs on -PT (Announcement Port).

Table 361: Playback Speech Memory Array Test (#206) ***1 of 2***

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Retry the command at 1-minute intervals a maximum of 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, **`status data-module`** ***<announcement data extension>*** should show that the announcement data port is connected to a NETCON data channel, and the memory card should be active. (To determine the extension of the announcement data module, use **`list data-module`**.) See Note (a) at the end of the table for Test #205 for more information. 1. Wait until download is finished. It could take a maximum of 45 minutes. Then run the test again. 2. If the test continues to abort and there is no download in progress, escalate the problem.
		1 of 2

Table 361: Playback Speech Memory Array Test (#206) ***2 of 2***

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
1 to 254	FAIL	Test failed. The error code indicates the number of byte count errors found by the Tone Detector. 1. Reset the circuit pack via **reset board *location*** and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. Refer to General notes.
255	FAIL	Test failed. The announcement Port and the Tone Detector never synchronized. Check for active GPTD-PT errors, and refer to GPTD-PT (General-Purpose Tone Detector Port) to diagnose them first. 1. If there are no active GPTD-PT errors, reset the circuit pack via **reset board *location*** and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. Refer to General notes.
	PASS	This port can cleanly play announcements. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to -BD (Announcement circuit pack) for a description of the circuit pack tests.
		2 of 2

Angel Speech Processor Handshake Test (#208)

This test checks the integrity of the communication link between the two processors on the announcement circuit pack. This test runs on -BD (Announcement circuit pack).

Failure of this test indicates that the Speech Processor is insane and results in the loss of all integrated announcements on the circuit pack.

Table 362: Angel Speech Processor Handshake Test (#208)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the time allowed. 1. Check the Error Log with **`display errors`**. If Error Type 1538 is present in the Error Log, reset the circuit pack. 2. Retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed. The circuit pack cot be used. announcement speech memory is cleared when this test fails. Therefore, when the problem has been resolved, announcements must be rerecorded or downloaded to the circuit pack. 1. Reset the circuit pack via **`reset board`** ***`location`*** and then run this test again. If the test continues to fail, replace the circuit pack and run this test again. 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works. Replacing the circuit pack results in loss of integrated announcements. See General notes.
	PASS	The communications link between the two processors on the announcement circuit pack is functioning properly. Investigate user-reported troubles on this circuit pack using other circuit pack and port tests. Refer to -PT (Announcement Port) for a description of the tests.

Announcement Checksum Test (#209)

A checksum is associated with every recorded announcement. In this test, the Speech Processor (SP) checks a stored global checksum covering all recorded announcements against a calculated one and returns the results to the maintenance system. If the global checksum failed, the switch requests the SP to check the checksum of each individual announcement.

If the test fails, then it returns the total number of defective announcements found. In addition, associated with each failure is an error in the Error Log (Error Type 14). The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by **`display announcement`**.

This test runs on -BD (Announcement circuit pack).

Table 363: Announcement Checksum Test (#209) ***1 of 3***

Error Code	Test Result	Description/ Recommendation
0	ABORT	The announcement file has been corrupted due to a hardware fault in the TN750 board. Follow step #7 under General notes.
1023	ABORT	There are no announcements currently recorded on the circuit pack.
		1 of 3

Table 363: Announcement Checksum Test (#209) ***2 of 3***

Error Code	Test Result	Description/ Recommendation
1024	ABORT	The test aborted for one of the following reasons: 1. An announcement upload or download is in progress. 2. An announcement upload or download was requested while this test is running. 3. A record is in progress. 4. A record request comes in when this test is running. If an announcement upload or download is in progress, the command **`status data-module`** ***`<announcement data extension>`*** should show that the announcement data port is connected to a NETCON data channel, and the "card-in-use" LED for the memory card is on. To determine the extension of the announcement data module, enter **`list data-module`**. See Note (a) at the end of the table for Test #205 for more information. 1. Wait until the blocking event is finished, then run this test again. An upload or download could take up to 45 minutes to complete. A recording session is finished as soon as the station that was making the recording is placed on-hook. 2. If the test continues to abort, and a record or upload/download is not in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the time allowed. 1. Enter **`display errors`**. If Error Type 1538 is present in the Error Log for this board, reset the circuit pack. 2. Retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
		2 of 3

Table 363: Announcement Checksum Test (#209) ***3 of 3***

Error Code	Test Result	Description/ Recommendation
0-256	FAIL	The test failed. The error code indicates the total number of defective announcements that were found. Error code 0 indicates the Global Checksum failed on the board, but no individual Checksum failed. **Note:** Since the announcements are recorded digitally, it is possible for the announcement Checksum Test to *fail* but still have all the announcements sound uncorrupted. When an individual announcement fails the Checksum Test, always listen to the announcement first before taking any action. An announcement can be played back by dialing the announcement extension associated with the announcement number. 1. Look in the Error Log to determine the number of the first defective announcement. Play back the announcement. If the announcement sounds defective, rerecord it or delete it. If the error code was greater than one, indicating that there is more than one defective announcement, run this test again and repeat this step. 2. If the checksum test still fails after deleting and rerecording all defective announcements, reset the circuit pack with **`reset board`** ***`location`*** and run this test again. 3. If the test still continues to fail, reseat the circuit pack and restore all announcements with an appropriate time estimate (for example, 40 minutes.) Then rerecord the lost announcements (that is, those recorded since the last save operation) and run this test again. 4. If the test still continues to fail, replace the circuit pack, and run this test again. Replacing the circuit pack results in loss of integrated announcements. See General notes.
	PASS	All recorded announcements checksum correctly, indicating that the speech main memory is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to -PT (Announcement Port) Maintenance documentation for a description of the port tests.
		3 of 3

140AY Looparound Test (#210)

This test checks the integrity of the record channel on the announcement circuit pack (Announcement Port 1).

Since this test involves sending a tone through two different ports, the Playback Speech Memory Array Test (#206) is run on the two ports first to make sure that they are working properly.

This test runs on -BD (Announcement circuit pack).

Table 364: 140AY Looparound Test (#210) ***1 of 3***

Error Code	Test Result	Description/ Recommendation
1-3	ABORT	Response to the test was not received within the time allowed. The error code indicates at which speech compression rate the test aborted (one being the first rate tested, three being the last). 1. Retry the command at 1-minute intervals a maximum of 5 times.
10 90	ABORT	The PSMA Test (#206) failed on announcement Port 1. The PSMA Test (#206) failed on announcement Port 9. 1. Refer to Playback Speech Memory Array Test (#206).
1000	ABORT	System resources required to run this test are not available. This test needs Announcement Ports 1 and 9 to run. One of the ports may be in use on a valid call. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort and Ports 1 and 9 are not in use, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 364: 140AY Looparound Test (#210) ***2 of 3***

Error Code	Test Result	Description/ Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1007	ABORT	The announcement circuit pack thinks that Port 1 or Port 9 is busy. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow the -PT (Announcement Port) maintenance procedures for Ports 1 and 9.
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, **`status data-module`** ***`<announcement data extension>`*** should show that the announcement data port is connected to a NETCON data channel, and the "card-in-use" LED for the memory card should be on (to determine the extension of the announcement data module, use **`list data-module`**). See Note (a) at end of the table for Test #205 for more information. 1. Wait until the download is finished, which can take up to 45 minutes. Run the test again. 2. If the test continues to abort and there is no download in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the time allowed. 1. Enter **`display errors`**. If Error Type 1538 is present in the Error Log for this board, reset the circuit pack. 2. Retry the test at 1-minute intervals up to 5 times.
2007	ABORT	The announcement circuit pack thinks that Port 1 or Port 9 is busy. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to abort, follow the announcement Port maintenance procedures for Ports 1 and 9.
		2 of 3

Table 364: 140AY Looparound Test (#210) ***3 of 3***

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
1-3	FAIL	The test failed. The error code indicates at which speech compression rate the test actually failed (one being the first rate tested, three being the last). 1. Reset the circuit pack via **`reset board location`** and then run this test again. If the test still fails, replace the circuit pack (see Warning) and run this test again. 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. See General notes.
	PASS	The record channel on the announcement circuit pack is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to -PT (Announcement Port) for a description of the tests.
		3 of 3

Super Frame Match Inquiry Test (#211)

The super frame is a means by which the Speech Processor (SP) synchronizes with the 140AY device on the announcement circuit pack. If the super frame is not synchronized, the SP is not able to properly process record/playback requests. Both the SP and the hardware generate a super frame pulse. When these two pulses are out of synch, the SP sets a flag to indicate the mismatch. When this test is run, the state of this flag is returned.

This test runs on -BD (Announcement circuit pack).

Table 365: Super Frame Match Inquiry Test (#211)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the time allowed. 1. Check the Error Log with **`display errors`**. If Error Type 1538 is present in the Error Log for this board, reset the circuit pack. 2. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	Test failed. Announcement playbacks should sound corrupted. 1. Reset the circuit pack via **`reset board`** ***`location`*** and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. See General notes.
	PASS	The SP can properly process record/playback requests. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to -PT (Announcement Port) for a description of the port tests.

Clock Match Inquiry Test (#212)

This test determines the state of the clock generation circuitry on the announcement circuit pack. This circuitry is used for controlling various pieces of the hardware such as the 140AY device. It also synchronizes the announcement circuit pack with the clock that is on the backplane.

This test runs on -BD (Announcement circuit pack).

Table 366: Clock Match Inquiry Test (#212)

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the time allowed. 1. Enter **display errors**. If Error Type 1538 is present in the Error Log for this board, reset the circuit pack. 2. Retry the test at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the test at 1-minute intervals up to 5 times.
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed. announcements recorded or played back while the clock circuitry is not functioning properly sound distorted. The -BD may be defective or the Active Tone-Clock circuit pack (TONE-BD) may be marginal and is causing this test to fail. 1. Reset the circuit pack with **reset board *location*,** then run this test again. 2. If the test continues to fail, proceed to Step 3 or 4 as applicable. Replacing the circuit pack results in loss of integrated announcements. See General notes. 3. Replace the -BD. Rerun the test. If the test continues to fail, replace the Tone-Clock circuit pack. Replacing the TONE-BD causes a COLD 2 reset. See Replacing the IPSI or Tone-Clock Circuit Pack. Replacing the -BD results in loss of integrated announcements. See General notes. 4. If there are recurring alarms on this circuit pack caused by this test failing, replace the -BD even if the previous steps were successful.
	PASS	Announcement record/playbacks should have clear sound quality. User-reported troubles on this circuit pack should be investigated using other circuit packs and port tests. Refer to -PT (Announcement Port) for a description of the tests.

Link Tear Down Test (#213)

This test is destructive.

This test disconnects the existing link between the system and the external output device. If the link has already been disconnected, this test just returns “PASS.” Each resource allocated for an output device link is released after this test.

This test runs on the following maintenance objects:

- CDR-LNK (Call Detail Recording Link)
- JNL-PRNT (Journal Printer Link)
- PMS-LINK (Property Management System Link)
- PMS-PRNT (PMS Printer Link)
- PRI-CDR (Call Detail Recording Link)
- SEC-CDR (Call Detail Recording Link)

- SYS-PRNT (System Printer)

Table 367: Link Tear Down Test (#213)

Error Code	Test Result	Description / Recommendation
40 50	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1010	ABORT	The Link has been busied out and is out-of-service. **PMS-LINK**: 1. Enter **`release pms-link`** to release the PMS Link from the busyout state. 2. Enter **`test pms-link long`** to rerun the test. **PMS-PRNT, JNL-PRNT**: 1. Enter **`release journal wakeup-log`** or **`release journal pms-log`** to release the link from the busyout state. 2. Enter **`test journal wakeup-log long`** or **`test journal pms-log long`** to rerun the test. **CDR-LNK, PRI-CDR, SEC-CDR:** 1. Enter **`release cdr-link primary`** or **`release cdr-link econdary`** to release the CDR link from the busyout state. 2. Enter **`test cdr-link primary long`** or **`test cdr-link secondary long`** to rerun the test. **SYS-PRNT**: 1. Enter **`release sp-link`** to release the System Printer Link from the busyout state. 2. Enter **`test sp-link long`** to rerun the test.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The output device link is torn down.

Link Retry Test (#215)

This test sends a message to the output device software process to make a data call to the extension where the output device connects. If the link is already up, this test passes without making any data call.

This test runs on the following maintenance objects:

- CDR-LNK (Call Detail Recording Link)
- JNL-PRNT (Journal Printer Link)
- PMS-LINK (Property Management System Link)
- PMS-PRNT (PMS Printer Link)
- PRI-CDR (Call Detail Recording Link)
- SEC-CDR (Call Detail Recording Link)
- SYS-PRNT (System Printer)

Table 368: Link Retry Test (#215) ***1 of 2***

Error Code	Test Result	Description / Recommendation
10 20	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
30		Internal system error. 1. See Procedures for Restoring the System Printer Link for instructions.
		1 of 2

Table 368: Link Retry Test (#215) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1010	ABORT	The link has been busied out and is out-of-service. **PMS-LINK**: 1. Enter **`release pms-link`** to release the PMS Link. 2. Enter **`test pms-link long`** to rerun the test. **PMS-PRNT, JNL-PRNT**: 1. Enter **`release journal wakeup-log`** or **`release journal pms-log`** to release the link from the busyout state. 2. Enter **`test journal wakeup-log long`** or **`test journal pms-log long`** to rerun the test. **CDR-LNK, PRI-CDR, SEC-CDR**: 1. Enter **`release cdr-link primary`** or **`release cdr-link secondary`** to release the CDR link from the busyout state. 2. Enter **`test cdr-link primary long`** or **`test cdr-link secondary long`** to rerun the test. **SYS-PRNT**: 1. Enter **`release sp-link`** to release the System Printer Link from the busyout state. 2. Enter **`test sp-link long`** to rerun the test.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The link cot be established. 1. See Procedures for Restoring the System Printer Link for instructions.
	PASS	The output device link is up.
		2 of 2

Neon Test (#220)

This test checks the voltage required to light the neon lamp on an analog terminal. A relay connects a 150V DC source from the backplane of the circuit pack onto the voltage bus, and another relay connects a 2K shunt from the bus to ground. Current in the line is then monitored to determine if the voltage is present.

This test runs on XXX-BD (Common Port Circuit Pack/Media Module).

Table 369: Neon Test (#220) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Cot get the list of translated ports on the circuit pack. 1. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **display port** ***location*** to determine the station extension. 2. Enter **status station** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1008	ABORT	Could not allocate a ringing circuit. Either all the ringing circuits are in use, or the ringing generator is defective or is not wired correctly. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is not wired correctly (see errors for RING-GEN (Analog Ring Generator)). If ABORT 1008 does not occur on Test #48 for ANL-16-L, then all four ring phases are in use.
		1 of 3

Table 369: Neon Test (#220) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1018	ABORT	There are no translated ports on the circuit pack. If ports are translated, none are administered to have "neon." 1. Verify there are ports administered on the circuit pack. If no ports are administered, no further action is required. 2. Verify that neon sets are connected. If there are no neon sets connected to the circuit pack, at least one port needs to be translated with neon. To check if a port is translated with neon, use **`display port`** ***`location`*** to determine the station extension of any station on this circuit pack. Enter **`display station`** ***`extension`*** to determine if the port is administered with neon. The field "Message Waiting Indicator:" must be set to "neon" for at least one of the administered ports. If this field is not administered to "neon", the test continues to abort. This is acceptable because not all stations have neon lamps on their analog terminals. If none of the terminals have neon lamps, the test continues to abort, and no further action is required. 3. Retry the command at 1-minute intervals a maximum of 5 times. 4. If the test continues to abort, look for RING-GEN (Analog Ring Generator) errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective. If ABORT 1008 does not occur on Test #48 for ANL-16-L, all four ring phases are in use. 5. Retry the command again.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response to the test was not received within the allowed time.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 369: Neon Test (#220) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	FAIL	The test failed because no neon current was detected. 1. Determine if there is a TN755 or TN752 power unit circuit pack installed in the same carrier as the analog line circuit pack that failed the test. Look for the failure of test 220 on other analog circuit packs in the carrier. If test 220 fails on the other circuit packs, replace the TN755 or TN752 power unit circuit pack. 2. Retry the command again. 3. If the test continues to fail, replace the circuit pack.
	PASS	Neon current is detected.
Any	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

140AY Channel Sanity Inquiry Test (#222)

This test queries the Angel to determine the status for a particular channel. If a channel is insane, announcements cot be played back on that channel. This test runs on This test runs on -PT (Announcement Port).

Table 370: 140AY Channel Sanity Inquiry Test (#222) ***1 of 2***

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error. 1. Retry the command at 1-minute intervals a maximum of 5 times.
		1 of 2

Table 370: 140AY Channel Sanity Inquiry Test (#222) ***2 of 2***

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the time allowed. 1. Retry the command at 1-minute intervals a maximum of 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed. Announcements cot be played back over this port. 1. Reset the circuit pack with **`reset board`** ***`location`*** and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). 2. If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). Replacing the circuit pack results in loss of integrated announcements. Refer to General notes.
	PASS	Announcements can be played back over this port. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to -BD (Announcement circuit pack) for a description of the circuit pack tests.
		2 of 2

MTP SAT Channel Local Looparound Test (#228)

This test is destructive.

This test checks TN775D on-board circuitry associated with the serial link for the management terminal connection. This test will not cause the local terminal login to drop, but any data displayed on the terminal while the test is running will be lost.

The PN's Maintenance circuit pack has three separate serial interfaces, one for each of the following:

- Management terminal - tested by Test #228
- Active EI circuit pack - tested by Test #229
- Standby EI circuit pack - tested by Test #229

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 371: MTP SAT Channel Local Looparound Test (#228)

Error Code	Test Result	Description / Recommendation
1000 2000 2033	ABORT	System resources required for this test are not available. Response to the test was not received within the allowed time. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2034	ABORT	The SAT port is busy. Background maintenance may be running. 1. .Retry the command at 1-minute intervals up to 5 times.
	FAIL	The PN terminal is not usable. 1. Run the test three more times. 2. If the test continues to fail, replace the PN's Maintenance circuit pack.
	PASS	The serial interface circuitry on the PN's Maintenance circuit pack which controls the PN-connected terminal is functioning properly. If there are still troubles with the PN G3-MT terminal, the problem may be one of the following: 1. The PN-connected terminal is not configured properly. The connection between the terminal and the PN's Maintenance circuit pack must be set up at 9600 bps. 2. The serial link from the back of carrier A to the PN terminal may be defective. The serial link consists of the connector on the back of carrier A labeled TERM and the ribbon cable running to the terminal. 3. The terminal may be defective. Try another terminal. 4. Since this test is not 100 percent accurate, there may still be problems with the PN's Maintenance circuit pack.

Serial Channel Local Looparound Test (#229)

This test checks TN775D on-board circuitry associated with the serial links to the Expansion Interface circuit packs.

The PN’s Maintenance circuit pack has 3 separate serial interfaces, one to each of the following:

- Management terminal - tested by Test #228
- Active EI circuit pack - tested by Test #229
- Standby EI circuit pack - tested by Test #229

A request is sent to the PN’s Maintenance circuit pack over the active link. If a response is received, the serial interface circuitry associated with the active link is working properly.

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 372: Serial Channel Local Looparound Test (#229) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000 2000 2033	ABORT	System resources required to run this test are not available. Response to the test was not received within the allowed time. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times
2034	ABORT	The SAT port is busy. Background maintenance may be running. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times
		1 of 2

Table 372: Serial Channel Local Looparound Test (#229) *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	The on-board circuitry associated with the standby serial link is defective. Since the PN's Maintenance circuit pack reported this failure, the on-board circuitry associated with the active serial link is functional. 1. This test checks the circuitry on the PN's Maintenance circuit pack associated with the standby Expansion Interface link. a. In a switch without duplicated Port Network Connectivity (PNC), current service will not be affected because the circuitry failing is not being used. Nevertheless, a Minor alarm will remain in the Alarm Log against MAINT. Therefore, the PN's Maintenance circuit pack must be replaced. b. In a switch with duplicated PNC, service is not affected as long as you *do not* interchange the PNCs. Otherwise, the connection to the PN's Maintenance circuit pack will be lost. Losing this connection would mean losing connectivity to the terminal and PN Environment maintenance. The PN's Maintenance circuit pack must be replaced to correct this problem.
	PASS	The on-board circuitry associated with both Expansion Interface circuit pack serial links is good. If there is still a problem communicating with the PN's Maintenance circuit pack, check the following: 1. The cable comprising the serial link (B carrier Expansion Interface circuit pack to PN's Maintenance circuit pack only) may be defective. 2. The PN's Maintenance circuit pack may actually be defective. This test may not be 100 percent accurate. 3. The Expansion Interface circuit pack on the standby link may be defective.
		2 of 2

Expansion Interface Neighbor Query Test (#237)

The Expansion Interface Neighbor Query test is a request to an EI circuit pack to determine whether it has established communication with its neighbor EI or SNI circuit pack at the opposite end of the fiber.

For EI-to-EI fiber links, this test is run on both EI circuit pack endpoints of the fiber link. It runs on EXP-INTF (Expansion Interface Circuit Pack) and FIBER-LK (Fiber Link).

Table 373: Expansion Interface Neighbor Query Test (#237) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. 1. Enter **`list fiber-link`** to verify that there is no fiber link administered to this circuit pack. 2. If there is no fiber administered to this circuit pack, but there should be, add the correct fiber using **`add fiber-link`**. 3. Retry the command.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2031	ABORT	The attempt to send a message to the EI circuit pack failed. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 2

Table 373: Expansion Interface Neighbor Query Test (#237) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1033	FAIL	The EI circuit pack under test cot make contact with its neighbor EI or SNI circuit pack. 1. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
2027	FAIL	The EI circuit pack has contact with the neighboring EI or SNI circuit pack, but it is the incorrect EI or SNI circuit pack. 1. Enter **`list fiber-link`** and verify that every fiber link cable is installed as it is administered. 2. Repeat the command.
	PASS	The EI circuit pack has successfully established a link with the neighbor EI or SNI circuit pack. 1. If **`status port-network`** still indicates that this link is down, one or both of the EI and/or SNI circuit packs may have been busied out. 2. If the link still does not come up, reset one or both EI and/or SNI circuit packs on the link.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Expansion Interface Fiber Out-of-Frame Query Test (#238)

This test is a request to an EI circuit pack to determine if it is can detect the framing sequence on the incoming fiber's data stream. If it cot detect this framing signal, the EI circuit pack will not be able to establish a link with the opposite EI or SNI circuit pack.

For EI-to-EI fiber links, this test is run on both EI circuit pack endpoints of the fiber link. This test runs on EXP-INTF (Expansion Interface Circuit Pack) and FIBER-LK (Fiber Link).

Table 374: Expansion Interface Fiber Out-of-Frame Query Test (#238) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the test at 1-minute intervals up to 5 times.
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. Because **`test fiber-link`** was run, the expansion interface should be administered on a fiber link, therefore this must be a software problem.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the test at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the test at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error 1. Retry the test at 1-minute intervals up to 5 times.
	FAIL	The EI circuit pack could not detect the framing signal. Several fail codes may be returned depending on which endpoint cot frame up. Error codes 2326, 2327, and 2328 denote Endpoint 1, Endpoint 2, and both endpoints, respectively. 1. Clear any SYNC and TDM-CLK errors listed in the error log. 2. Run **`test board location`** for each EI board on this fiber link and follow the appropriate repair sequence for any failing tests. 3. If the EI circuit pack that is failing Test #238 is in the PN, and the red LEDs are ON for a large number of circuit packs, then reseat any Tone-Clock circuit packs in the PN. See Replacing the IPSI or Tone-Clock Circuit Pack instructions. 4. Enter **`display errors`** and follow the associated repair procedures for any SNC-BD (Switch Node Clock Circuit Pack) (if applicable to this fiber link configuration) or TDM-BUS (TDM Bus) errors. 5. Perform the Fiber link fault isolation procedures described in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*. 6. If the test continues to abort, follow normal escalation procedures.
		1 of 2

Table 374: Expansion Interface Fiber Out-of-Frame Query Test (#238) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	The EI circuit pack(s) have detected the valid framing signal on the fiber. 1. Refer to errors from other EI circuit packs, SNI (SNI) tests, or DS1 Converter tests (if present) if the link is still not functioning.
		2 of 2

Expansion Interface Local Looparound (#240)

The EI local looparound test is similar to the Lightwave Transceiver Looparound test (#242). A test tone is received by the EI being tested, but is not transmitted out to the fiber interface before being looped back. The loopback is internal to the circuit pack. This test does not interfere with the normal fiber data stream.

This test runs on EXP-INTF (Expansion Interface Circuit Pack).

Table 375: Expansion Interface Local Looparound Test (#240) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1	ABORT	Could not allocate time slot on TDM Bus A. Loopback passed on TDM Bus B. 1. If there is no reason to doubt that the EI circuit pack can transfer data to or from a TDM Bus, then since the test passed on one bus, assume that the test passes on the other bus. 2. If this test continues to abort with the same error, rerun test at 1-minute intervals up to 3 times. 3. If the test still does not pass on the other TDM Bus, follow the procedure for ABORT Error Code 3.
		1 of 4

Table 375: Expansion Interface Local Looparound Test (#240) ***2 of 4***

Error Code	Test Result	Description / Recommendation
2	ABORT	Could not allocate time slot on TDM Bus B. Loopback passed on TDM Bus A. 1. If there is no reason to doubt that the EI circuit pack can transfer data to or from a TDM Bus, then since the test passed on one bus, assume that the test passes on the other bus. 2. If this test continues to abort with the same error, rerun test at 1-minute intervals up to 3 times. 3. If the test still does not pass on the other TDM Bus, follow the procedure for ABORT Error Code 3.
3	ABORT	The system could not allocate time slots for the test on either TDM Bus. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. 1. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1031	ABORT	A query of the EI circuit pack aborted. The purpose of this query was to see if the EI circuit pack could detect the framing signal. 1. If Test #238 aborted, follow the procedure associated with this abort code. 2. If Test #238 did not abort, rerun Test #240 at 1-minute intervals up to 3 times.
1032	ABORT	The EI cot detect the framing signal and cot run the test. 1. Refer to the errors for Expansion Interface Fiber Out-of-Frame Query Test (#238) to determine why the EI circuit pack is out of frame.
		2 of 4

Table 375: Expansion Interface Local Looparound Test (#240) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. 1. Enter **`list fiber-link`** to verify that there is no fiber link administered to this circuit pack. 2. If there is no fiber administered to this circuit pack, but there should be, enter **`add fiber-link`** to add the correct fiber. 3. Retry the command.
1394	ABORT	The EI circuit pack is out of service and the test cot be run. This condition is due to a change in the EI circuit pack’s ability to communicate with the EI or SNI circuit pack on the other end of the fiber. 1. Run Test #237, and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 does not pass, see repair procedures for Expansion Interface Neighbor Query Test (#237)
1395	ABORT	This test cot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this EI circuit pack, enter **`change system-parameters duplication`** to enable PNC. 2. Enter **`set pnc lock`** to prevent the system from doing a PNC interchange. 3. Repeat this test.
2000 2100 2500	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		3 of 4

Table 375: Expansion Interface Local Looparound Test (#240) ***4 of 4***

Error Code	Test Result	Description / Recommendation
1	FAIL	Loopback on TDM Bus A failed. Loopback on TDM Bus B passed.
2		Loopback on TDM Bus B failed. Loopback on TDM Bus A passed.
3		Loopback on both TDM Buses failed.
12		Loopback on TDM Bus B failed. Loopback on TDM Bus A aborted because the system could not allocate time slots.
21		Loopback on TDM Bus A failed. Loopback on TDM Bus B aborted because the system could not allocate time slots.
None		The test tone was not detected correctly after being looped through the EI circuit pack. 1. Enter **`display errors`** and check if Error Type 2305 has been logged against the EI circuit pack in the last 5 minutes. If so, this test could have failed due to the associated slips. First resolve the 2305 error, then repeat the test. 2. Run the tests for the active Tone-Clock on the PN that contains the indicted EI circuit pack to verify that dial-tone is supplied. 3. If the tone-clock is healthy, repeat the short test on the EI board. 4. If this test continues to fail, replace the EI circuit pack.
	PASS	Test tone was correctly detected after internal EI loopback on both TDM buses. 1. Refer to other EI circuit pack tests if the links between this EI circuit pack and the EI or SNI circuit pack on the other end of the fiber is not functioning correctly.
0	NO BOARD	See NO BOARD for repair procedures.
		4 of 4

Expansion Interface 2-Way Transmission Test (#241)

Note:

The term EI applies to both the Expansion Interface (EI) and ATM Expansion Interface (ATM-EI) boards.

This test is nondestructive and applies to each EI, both active and standby.

The EI 2-way transmission test is a basic connectivity test between two PNs. The test first sends dial tone from the cabinet of the EI circuit pack under test through the switch, through the DS1 converter circuit packs, and through another EI circuit pack to a tone detector in the other cabinet. The connections are then reversed and the tone is passed in the opposite direction.

If the test either fails or aborts with the above connection, a second PN is chosen (if one is available and the EI circuit pack is In-Service) and the same test is run on this new connection. This helps in the isolation of the fault. Since two EI circuit packs are involved in the connection, either one of them could be at fault. This test can help determine which one is actually at fault.

The test results indicate if the test failed in one or both directions. The test aborts if the EIs do not exist on both ends (for example, the EIs are not administered correctly). If the test passes, the TDM and ATM framer interfaces of both EIs are functioning properly.

This test runs on ATM-EI (Expansion Interface Circuit Pack) and EXP-INTF (Expansion Interface Circuit Pack).

Table 376: Expansion Interface 2-Way Transmission Test (#241) ***1 of 6***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		1 of 6

Table 376: Expansion Interface 2-Way Transmission Test (#241) ***2 of 6***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>1033</td><td>ABORT</td><td>The test cot run because the EI board is not administered or there were no other PNs administered that had its EI board in-service.

ATM-EI:
1. Ensure that the board is administered as ATM PNC Expansion Interface circuit pack.
2. If the board is administered as ATM-EI circuit pack, then there has been some change in the ability of the ATM-EI circuit pack in the other PNs to communicate with the ATM-EI on the other end of its connection.
3. Enter <code>status port x</code> where x is the port-network number where the board is administered. Check if both ACL and EAL are up to this board. If not, see the service procedure for SYS-LINK (System Links).
4. Check the Error Log for Error Type 1281 with Aux Data 27 (board cot talk to the ATM switch). See Table 37: Error type 1281 Aux Data and repair procedures for repair procedures.
5. If present, check both the ATM switch and the Communication Manager translations for consistent ATM addresses. Reset the board, and see if the problem resolves.
6. Repeat Test #241. If it continues to abort with this error code, replace the board.

EXP-INTF:
1. Check fiber administration to insure that there is a fiber link administered to this EI circuit pack.
2. If there is a fiber administered to this EI circuit pack, then some change in the status of the ability of the EI circuit pack in the other PNs to communicate with the EI or SNI circuit pack on the other end of its fiber has occurred.
3. Test #237 and check for EXP-INTF circuit pack Error Type 1281 in the Error Log for the EI circuit packs in these other PNs. If Error Type 1281 is present and/or Test #237 does not pass, see repair procedures for Test #237, in Table 373: Expansion Interface Neighbor Query Test (#237).
4. If Test #237 passes, reseat the EI circuit pack. This is not destructive since the circuit pack cot be serving as the Expansion Archangel if it is not in service.</td></tr>
<tr><td colspan="3" align="right">2 of 6</td></tr>
</table>

Table 376: Expansion Interface 2-Way Transmission Test (#241) ***3 of 6***

Error Code	Test Result	Description / Recommendation
1394	ABORT	The EI circuit pack is out of service and the test cot be run. This condition is due to a change in the EI circuit pack's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. 1. Run Test #237, and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 foes not pass, see repair procedures for Test #237, in Table 373: Expansion Interface Neighbor Query Test (#237)
1395	ABORT	This test cot run on an EI circuit pack if it is part of the B-side PNC and Duplicated PNC is not enabled. 1. If this test needs to run on this EI circuit pack, enable PNC with the **change system-parameters duplication** command. 2. Prevent the system from doing a PNC interchange by entering **set pnc lock**. 3. Repeat this test.
1413	ABORT	This test requires the use of a Tone-Clock circuit in each of the PNs used in this test. A Tone-Clock circuit is absent from one of the PNs. 1. Verify that there is an IPSI or Tone-Clock circuit pack in the same PN as the Expansion Interface circuit pack under test. 2. In a Direct Connect configuration, verify that there is a Tone-Clock circuit pack in the PN where the neighbor EI circuit pack resides. 3. In a Center Stage Switch configuration, verify that there is at least one other PN, besides the PN where the EI circuit pack under test resides, with a Tone-Clock circuit pack.
1414	ABORT	The active Tone-Clock circuit in one of the PNs being used for the test has a MAJOR or MINOR alarm logged against it. 1. Enter **display alarms** and resolve any TONE-BD (Tone-Clock Circuit Pack) and TONE-PT (Tone Generator) alarms.
1956	ABORT	ACL to the board is not up. Check the ACL status with **list sys-link** and follow the repair procedures for SYS-LINK (System Links).
		3 of 6

Table 376: Expansion Interface 2-Way Transmission Test (#241) *4 of 6*

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	The test tone was not detected correctly in either direction. 1. Test the active Tone-Clocks in the PNs for which the EI circuit pack under test provides a link. This determines if the dial tone is supplied. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*
1 or 2	FAIL	These failure codes only apply to a system equipped with a Center Stage Switch.The test tone was detected correctly in one direction, but not the opposite direction. 1. Test for the active Tone-Clocks on the PNs for which the defective EI board provides a link. This determines if the dial tone is supplied. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
3 or 4	FAIL	These failure codes only apply to a system equipped with a Center Stage Switch. They indicate that the test aborted or failed for the first connection from the EI board under test to another PN, and that the test tone was detected correctly in one direction, but not the opposite direction when the connection was between the EI board under test and a different PN than was used in the first connection. 1. Run the test for the active Tone-Clocks on the PNs for which the defective EI board provides a link. This determines if the dial tone is being supplied. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
		4 of 6

Table 376: Expansion Interface 2-Way Transmission Test (#241) ***5 of 6***

Error Code	Test Result	Description / Recommendation
	FAIL	The following failure codes only apply to a system equipped with an ATM Switch. The letters “MM” refer to the distant or far-end PN, and “NN” to the near-end ATM-EI under test.
10MM	FAIL	The test tone was detected correctly in forward direction (data sent from the PN where the circuit pack under test resides and detected correctly in port network MM), but not the opposite direction.
20MM	FAIL	The test tone was detected correctly in reverse direction (data sent from port network ***MM*** was detected correctly in the PN where the circuit pack under test resides), but not the opposite direction.
30MM	FAIL	The test failed for the first connection from the ATM-EI board under test to another PN, and the test tone was detected correctly in the forward direction (data sent from the PN where the circuit pack under test resides was detected correctly in port network MM, but not the opposite direction).
40MM	FAIL	The test failed for the first connection from the ATM-EI board under test to another PN, and the test tone was detected correctly in the reverse direction (data sent from port network ***MM*** was detected correctly in the PN where the circuit pack under test resides), but not the opposite direction. 1. Test for the Active Tone-Clocks on port network ***MM*** and the PN where the ATM-EI under test resides. This determines if dial tone is supplied. 2. Ensure that the ATM address of the active ATM-EI circuit pack in port network ***MM*** matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *ATM Installation, Upgrades, and Administration using Avaya Communication Manager,* for the procedure to check the ATM port address on the ATM switch. 3. Run Test #241 on the active ATM-EI in port network ***MM***. If this test fails with Error Code 20NN or 40NN, go back to step 2. If the address was the same, replace the active ATM-EI circuit pack on port network ***MM***. If this test fails with Error Code 10NN or 30NN, replace the ATM-EI circuit pack with the initial problem.
	PASS	Tone successfully transmitted in both directions. Both EI boards and their lightwave transceivers are functioning properly.
		5 of 6

Table 376: Expansion Interface 2-Way Transmission Test (#241) ***6 of 6***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	See NO BOARD for the repair procedures.
		6 of 6

Expansion Interface Lightwave Transceiver Looparound Test (#242)

This test is destructive.

This test requires that the EI circuit pack first be busied out. If the system has a duplicated Port Network Connectivity, this test cot be run on an EI circuit pack that resides on the current active PNC due to restrictions that prohibit the busying-out of certain components that are part of the active PNC. If this test is run on an EI circuit pack that is part of the standby PNC, this test is not destructive and no service outages will take place.

In a system without duplicated Port Network Connectivity, where this EI circuit supports an IPSI to PN link, this test will disrupt service to one or more PN's. If the EI circuit pack is part of a PN-to-PN link in a Direct Connect system, service between the two PNs will be disrupted.

This is a 2-part connectivity test. In the first part of the test, a digital count is transmitted from the cabinet of the EI circuit pack under test, through the EI circuit pack under test, out to its lightwave transceiver. The connection then loops back into the lightwave transceiver, through the same EI circuit pack again, and into the originating cabinet. If the test tone is detected by a tone detector, the first part of the test passes. The path used for this part of the test is represented in Figure 99: TDM BUS Lightwave Transceiver Looparound.

In the second part of the test, a data packet is sent from the TN1655 Packet Interface circuit pack to the EI circuit pack under test, the packet is looped back through the lightwave transceiver and is sent back to the Packet Interface circuit pack. If the Packet Interface circuit pack receives the same packet it transmitted, the second part of the test passes. If the entire test has passed, the EI circuit pack, its backplane wiring, and the electrical portion of the lightwave transceiver are healthy. The path used for this test is represented in Figure 100: Packet Bus Lightwave Transceiver Looparound—PN only. The path used for this test if the EI resides in a PN is represented in Figure 101: Packet Bus Lightwave Transceiver Looparound—CSS and PN.

When the EI circuit pack under test is in a PN, the data packet must also pass through the active EI circuit packs and the active DS1 converter circuit packs (and the active SNI circuit pack(s) in a Center Stage Switch system) of the active PNC link connecting the PN.

This test requires the EI circuit pack to ignore incoming data from its neighbor EI circuit pack or SNI circuit pack. Thus this test will:

- Disturb any inter-PN connections that currently exist over the link provided by the EI under test and its neighbor
- Disrupt signaling between the two circuit packs

Figure 99: TDM BUS Lightwave Transceiver Looparound

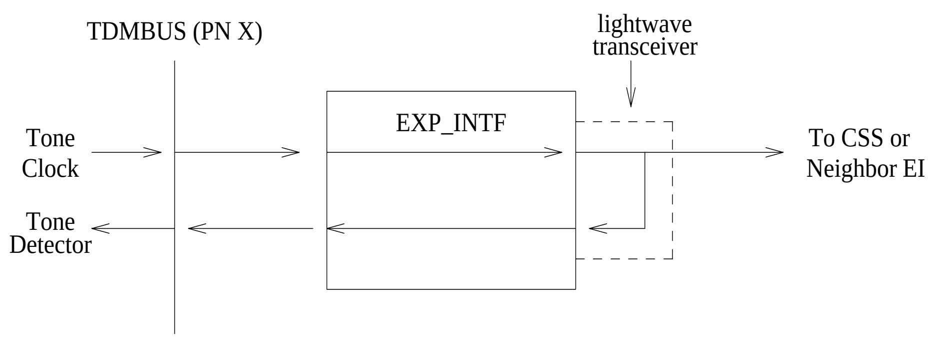


Figure 100: Packet Bus Lightwave Transceiver Looparound—PN only

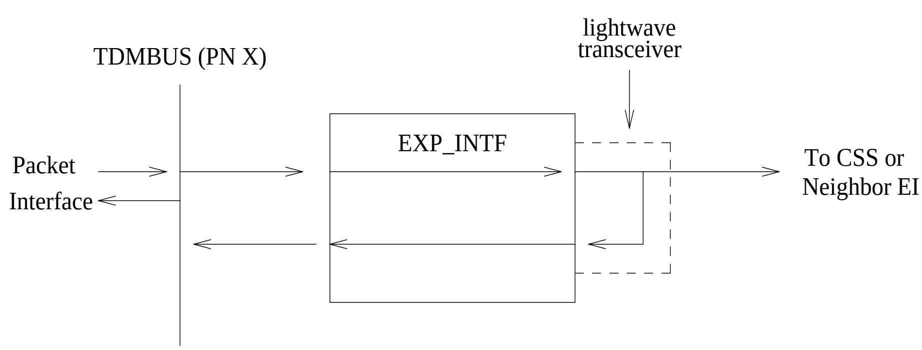
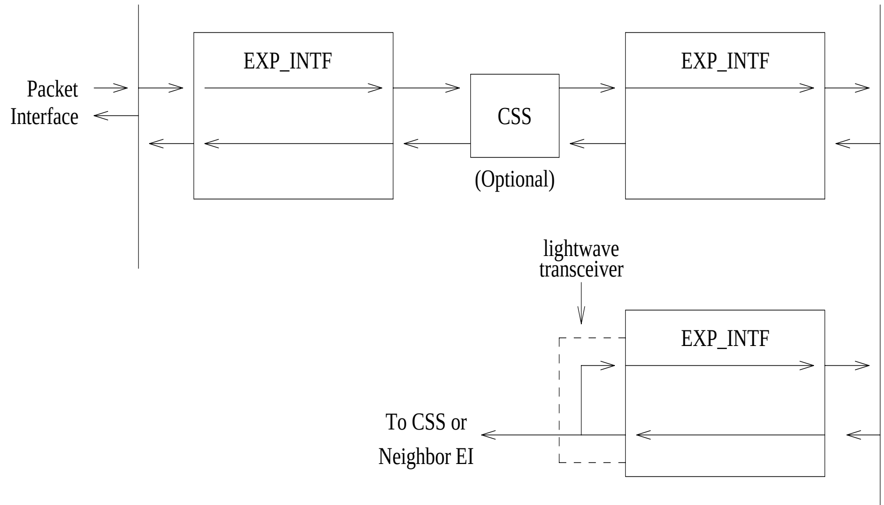


Figure 101: Packet Bus Lightwave Transceiver Looparound—CSS and PN



This test runs on EXP-INTF (Expansion Interface Circuit Pack).

Table 377: Expansion Interface Lightwave Transceiver Looparound Test (#242) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 377: Expansion Interface Lightwave Transceiver Looparound Test (#242) *2 of 5*

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	The EI circuit pack has not been busied out. 1. Busyout the EI circuit pack with **busyout board location** 2. Enter **test board location long**.
1031	ABORT	If the EI circuit pack is in a PN and is on the active PNC, and is not part of a PN-to-PN link, this test *cot* be executed. If the lightwave transceiver looparound is activated, it is impossible to deactivate it. 1. If PNC Duplication is enabled, attempt to make the standby PNC active with **reset pnc interchange**. 2. If the PNC Interchange is successful, the Lightwave Transceiver Looparound test may now be executed on the original EI circuit pack.
1033	ABORT	The test cot run because the EI circuit pack does not have a fiber link administered to it and there is not sufficient data to run the test. 1. Enter **list fiber-link** to verify that there is no fiber link administered to this circuit pack. 2. If there is no fiber administered to this circuit pack (but should be), add the correct fiber using **add fiber-link**. 3. Retry the command.
1139	ABORT	The packet bus in the PN where this EI board resides has a major alarm against it. This test needs to use the alarmed PN's packet bus. 1. Enter **display alarms** and **display errors** and resolve any PKT-BUS alarms. 2. Retry the command.
		2 of 5

Table 377: Expansion Interface Lightwave Transceiver Looparound Test (#242) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1141	ABORT	The Packet Interface circuit pack is out of service. 1. See PKT-INT (Packet Interface).
1144	ABORT	The PN's packet bus has a major alarm against it. This test needs to use the alarmed PN's packet bus. 1. Enter **display alarms** and **display errors** and resolve any PKT-BUS alarms. 2. Retry the command.
1394	ABORT	The EI board is out of service and the test cot be run. This condition is due to a change in the EI board's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. 1. Run Test #237 and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 does not pass, see repair procedures for Expansion Interface Neighbor Query Test (#237).
1395	ABORT	This test cot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this EI circuit pack, enable PNC with **change system-parameters duplication**. 2. Enter **set pnc lock** to prevent the system from doing a PNC interchange. 3. Repeat this test.
1407	ABORT	This test cot be run on an EI board that is on the active PNC because it cot be busied out. This error code indicates that PNC duplication is enabled. 1. Attempt to perform a PNC interchange with **reset pnc interchange**. 2. If the PNC interchange is successful, busyout the original EI circuit pack with **busyout board location** (location of the original EI board). 3. Retry the command.
2000	ABORT	Response to the test was not received in the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
		3 of 5

Table 377: Expansion Interface Lightwave Transceiver Looparound Test (#242) *4 of 5*

Error Code	Test Result	Description / Recommendation
2060	ABORT	The link on the packet bus being used to perform the test has failed. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the test continue to abort, enter **display errors** and resolve any PKT-INT errors.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
1	FAIL	The test did not detect the test tone through the looparound connection. The packet portion of this test was not run since the circuit portion failed. 1. Test the active Tone-Clock on the PN that contains the defective EI circuit pack to verify that dial tone is being supplied. 2. If the Tone-Clock is healthy, enter **test board location long** on the EI circuit pack. 3. If this test continues to fail, replace the EI circuit pack or transceiver. Then enter **test board location long** on the new EI circuit pack.
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the TN1655 Packet Interface circuit pack. 1. Test the TN1655 Packet Interface circuit pack to verify that it is functioning properly. If any tests fail, investigate those tests and repair the Packet Interface circuit pack. 2. If the Packet Interface circuit pack checks out OK, enter **display errors** and **display alarms** and resolve any SNI-BD and FIBER-LK alarms or errors (Center Stage Switch only) and DS1C-BD alarms or errors (if present). 3. Enter **test board location long** on the EI board. 4. If Test #242 continues to fail, replace the EI board. Then enter **test board location long** for the new EI board. 5. If Test #242 continues to fail, replace the lightwave transceiver, reset the circuit pack and enter **test board location long** on the EI circuit pack.
		4 of 5

Table 377: Expansion Interface Lightwave Transceiver Looparound Test (#242) ***5 of 5***

Error Code	Test Result	Description / Recommendation
	PASS	When this test (#242) and the EI Local Looparound test (#240) pass, this indicates that the EI board is functioning properly, but it does not verify that the optical portion of the lightwave transceiver is functioning. 1. Enter **`test board location`** on the EI board on both ends of fiber. If this test passes from both sides, but other tests fail, such as #241, this condition indicates either a faulty lightwave transceiver or the fiber itself has failed. To determine whether a lightwave transceiver or the fiber itself has failed, run the Expansion Interface Manual Loopback Procedure. Test #242 can only be run from both EIs if they are the standby pair and the active pair is working properly. 2. If this EI board is failing other tests, run the Expansion Interface Manual Loopback Procedure 3. If problems still exist after the EI Manual Loopback Procedure indicates both EI boards and both lightwave transceivers are healthy, manually check out the building fiber. Verify that each optical fiber connects to a transmitter at one end and a receiver at the other. 4. If the tests pass, enter **`release board`** ***`location`***.
0	NO BOARD	No board was detected by the test. 1. Check the error log for wrong board (Error 125) or no board (Error 131). Resolve either of these issues, if applicable. 2. Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, enter **`reset board location`**. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		5 of 5

Circuit Pack Restart Test (#252)

This test is destructive.

This test is not part of either the short or long demand test sequence.

Run this test to reset the circuit pack only if there are PPCPU errors. This test fails if the circuit pack does not return to a sane state after being reset. The circuit pack is reset by the SAKI Sanity test (#53).

This test runs on CLAN-BD (Control LAN Circuit Pack).

Table 378: Circuit Pack Restart Test (#252)

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack with **busyout board** ***location***. 2. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
1 2	FAIL	The circuit pack failed to reset. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, pull out and reseat the circuit pack. 3. If the problem persists, replace the circuit pack.
	PASS	The circuit pack initialized correctly 1. Enter **reset board** ***location*** to put the board back in-service.

Signaling Link State Audit Test (#255)

This test checks the state of critical signaling link hardware components such as DS1 and ATM CES circuit packs as required by the port.

This test runs on the following maintenance objects:

- ATM-BCH (ATM B-Channel Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- _PE (Processor Ethernet) Alarms

Table 379: Signaling Link State Audit Test (#255) *1 of 2*

Error Code	Test Result	Description / Recommendation
None or 0	ABORT	Internal system error. 1. Retry the command up to 5 times at 1-minute intervals.
1018	ABORT	Test is disabled by administration. 1. To enable the test, enter **y** in the **Maintenance Tests** field on the **change trunk-group** screen.
1114	ABORT	The signaling link is in a transitional state 1. Retry the command up to 5 times at 1-minute intervals.
1700	ABORT	Rollabout video abort for PE-BCHL. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. 1. Either reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **`change ds1`** ***`location`*** and set the **Alarm when PRI Endpoint Detached?** field to **y**.
4	FAIL	There is a problem with the signaling channel. **ATM-BCH**: 1. Look for errors or alarms against ATM-SGRP and ATM-DCH, and refer to ATM-SGRP (ATM Signaling Group) and ATM-DCH (ATM D-Channel Port) for the appropriate repair procedures. **ISDN-TRK**: 1. If the Packet Control circuit pack is used, consult the procedures for ISDN-SGR (ISDN-PRI Signaling Group). Further information may also be obtained by consulting the procedures for the ISDN-PLK (ISDN-PRI Signaling Link Port). 2. If the Packet Interface is used, consult the procedures for PKT-INT (Packet Interface) **PE-BCH**: There is a problem with the Signaling Channel and/or with the System Link. 1. Consult procedures for ISDN-SGR (ISDN-PRI Signaling Group) and SYS-LINK (System Links). See also ISDN-PLK (ISDN-PRI Signaling Link Port) for useful information.
		1 of 2

Table 379: Signaling Link State Audit Test (#255) ***2 of 2***

Error Code	Test Result	Description / Recommendation
8	FAIL	There is a problem with the circuit pack or media module. **ATM-BCH**: 1. See ATM-INTF (ATM Interface) for repair procedures. **ISDN-TRK**: 1. See the repair procedures for the appropriate DS1 interface circuit pack (DS1-BD (DS1 Interface Circuit Pack), UDS1-BD (UDS1 Interface Circuit Pack), MG-DS1 (DS1 Interface Media Module)). **PE_BCHL**: 1. See the repair procedures for UDS1-BD (UDS1 Interface Circuit Pack).
	PASS	The signaling link hardware is OK.
		2 of 2

Service State Audit Test (#256)

This test performs a service state audit with the far-end terminal adapter to ensure both sides agree on the service state.

If no reply is received within 2 minutes, the system will automatically try once again. If that attempt fails, an error will be logged (Error Type 3073) and the system will then attempt recovery by automatically retrying approximately every 15 minutes. If the port was initially in the INS (in-service) state, it will now be placed in the MTC/FE (maintenance state, far-end problem) state. Until a Service State audit attempt is successful, no outgoing calls will be placed over this port, but incoming calls will be accepted. The service state of this port does not affect the service state of other ports. If an incoming call that uses this port is presented while in such a state, a Service State audit attempt will immediately be attempted (that is, the system will not wait for the 15-minute cycle, but will instead try to recover immediately).

PASS for this test only means that a message to the far end was successfully sent.

To check the service state of an ATM-BCH port or TBRI-TRK ISDN BRI channel, enter **`status trunk`** ***`grp#/mem#`***.

To check the service state of a PRI endpoint port, enter **`status pri-endpoint`** ***`extension`***.

This test is run on the following maintenance objects:

- ATM-BCH (ATM B-Channel Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- _PE (Processor Ethernet) Alarms
- TBRI-TRK (ISDN Trunk-Side BRI Channel)

Table 380: Service State Audit Test (#256) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	Needed resources not available, or the port is on a call or initializing. **ATM-BCH, PE-BCHL, ISDN-TRK**: 1. Run **`status trunk`** ***grp#/mem#***. 2. Check the results of Signaling Link State Audit Test (#255). **TBRI-TRK**: 1. Run **`status trunk`** ***grp#/mem#***. 2. Check the results of Signaling Link State Test (#1251).
1005	ABORT	This test is not be run on this type of port. This error can be ignored.
1018	ABORT	Test is disabled by administration. 1. Enable the test by entering **y** in the **Maintenance Tests** field on the **change trunk-group** screen.
1113	ABORT	Signaling link failed **ATM-BCH**: 1. Run **`status trunk`** ***grp#/mem#***. 2. Check the results of the Signaling Link State Audit Test (#255). 3. See ATM-SGRP (ATM Signaling Group) and ISDN-PLK (ISDN-PRI Signaling Link Port). **ISDN-TRK**: 1. Check the results of Signaling Link State Audit Test (#255) and consult procedures for ISDN-SGR (ISDN-PRI Signaling Group) **PE-BCHL**: 1. Check the results of the Signaling Link State Audit Test (#255) **TBRI-TRK**: 1. Check the results of Signaling Link State Test (#1251).
		1 of 2

Table 380: Service State Audit Test (#256) *2 of 2*

Error Code	Test Result	Description / Recommendation
1114	ABORT	Signaling link in transitional state 1. Retry the command up to 5 times at 1-minute intervals.
1116	ABORT	The trunk is not in a service state which is appropriate for running the test. This test is only performed in the OOS/FE state.
1117	ABORT	A service state audit message is outstanding 1. Wait 2 minutes, then try again.
1700	ABORT	**PE-BCH**: Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. 1. Either reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **`change ds1`** ***`location`*** and set the **Alarm when PRI Endpoint Detached?** field to **y**.
2100	ABORT	Could not allocate needed resources 1. Retry the command up to 5 times at 1-minute intervals.
	FAIL	Internal system error 1. Retry the command up to 5 times at 1-minute intervals.
	PASS	Wait 4 minutes, then check the Error Log for any new errors of type 3073. 1. If there are no new errors of type 3073, then both sides of the ISDN connection agree on the service state. The negotiation succeeded. 2. If there is a new error of type 3073, the negotiation failed. The system will automatically retry approximately every 15 minutes. If the port was initially in the INS (in-service) state, it will now be placed in the MTC/FE (maintenance, far-end problem) state. Incoming calls will be accepted, but no outgoing calls will be originated this port. If an incoming call is presented, another Service State audit will be immediately performed in an attempt to bring the port into the proper state.
		2 of 2

Call State Audit Test (#257)

This test audits internal call state data by querying the far-end terminal adapter as to the ISDN state of the call. This can be helpful when trying to clear a hung call. If a call is active on the port, the switches on both sides of the connection should agree on the ISDN state of the call as defined in the ISDN Protocol Specification. If the internal call state data on the near-end switch is different than that of the far-end terminal adapter, the call will be torn down.

The ISDN specification allows up to 2 minutes for a reply. If a reply is not received within the 2 minute window, the test logs a protocol time-out violation against the associated signaling channel (Error Type 1 for ATM-DCH, ISDN-PLK).

his test is run on the following maintenance objects:

- ATM-BCH (ATM B-Channel Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- PE (Processor Ethernet) Alarms
- TBRI-TRK (ISDN Trunk-Side BRI Channel)

Table 381: Call State Audit Test (#257) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1018	ABORT	Test is disabled 1. Enable the test by entering **y** in the **Maintenance Tests** field on the **`change trunk-group`** screen.
1019	ABORT	Audit already in progress 1. Wait 2 minutes, and try again.
1113	ABORT	Signaling link failed **ATM-BCH, ISDN-TRK, PE-BCHL**: 1. Check the results of Signaling Link State Audit Test (#255). **TBRI-TRK**: 1. Check the results of Signaling Link State Test (#1251).
1114	ABORT	Signaling link in transitional state 1. Retry the command up to 5 times at 1-minute intervals.
		1 of 2

Table 381: Call State Audit Test (#257) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1116	ABORT	The trunk is in an out-of-service ISDN service state. A call cot be made if the trunk is in this state. No action is necessary. **ATM-BCH, ISDN-TRK, TBRI-TRK**: 1. Check the trunk service state with **`status trunk`** ***`grp#/mem#`***. **PE-BCHL**: 1. Enter **`status pri-endpoint`** ***`extension`*** to investigate the ISDN state of the port.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. 1. Reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **`change ds1`** ***`location`*** and set the **Alarm when PRI Endpoint Detached?** field to **y**.
2100	ABORT	Could not allocate needed resources 1. Retry the command up to 5 times at 1-minute intervals.
	FAIL	Internal system error 1. Retry the command up to 5 times at 1-minute intervals.
	PASS	A call-state auditing message was successfully sent to the far-end to verify the state of the call active on this port. Use **`display errors`** for the board to determine the true results of the test. When this test is run, a 2-minute timer is started and a Layer 3 Status Inquiry message is sent to the far-end. The test passes when a response is received from the far-end.
		2 of 2

ISDN Test Call Test (#258)

This test performs a far-end looparound test over an ISDN trunk if:

- The trunk is in-service, maint-NE, or out-of-service/NE.
- No calls are active on the trunk.

- The system uses country protocol 1 (including US), or the far end has looparound capability.

The test sets up a call to a far-end switch over the trunk to be tested. If a Maintenance/Test circuit pack does not reside in the system, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a data channel.

If a Maintenance/Test circuit pack does reside in the system, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a digital trunk testing port on the Maintenance/Test circuit pack. The digital port on a TN771D Maintenance/Test circuit pack sends a bit pattern to the far end which is echoed back. If the received pattern matches the pattern that was sent, the test passes. If there are differences, the test fails.

If a test call is running when scheduled maintenance starts, the green LED is turned off. To determine whether a test call is still running:

- Enter **list isdnpri-testcall** and **status isdnpri-testcall**.
- Check for a lit amber LED on the Maintenance/Test circuit pack.

Synchronous Test Calls

Enter one of the following commands to initiate a synchronous outgoing test call:

- **test trunk *grp#/mem#* long [*repeat #*]**
- **test board *location* long [*repeat #*]**
- **test port *location* long *[repeat #]***

The duration of the test call is 8.6 seconds for unrestricted (B8ZS) B-Channels and 9.4 seconds for restricted (ZCS) B-Channels. The test fails if the bit error rate retrieved from the Maintenance/Test digital port is greater than 0. When this occurs, perform further diagnostics such as **test isdnpri-testcall**.

Asynchronous Test Calls

You can start, query, and stop an outgoing test call by using the following commands:

- **test isdnpri-testcall *grp#/mem#* [*minutes #*]**

  This command initiates an outgoing ISDN-PRI test call up to 120 minutes. Default times are as above. Only one trunk per PN can be tested at one time.

- **status isdnpri-testcall *grp#/mem#***

  This command displays the progress of the outgoing test call by reporting bit and block error rates of the tested B-Channel.

- **clear isdnpri-testcall *grp#/mem#***

  This command terminates an outgoing test call already in progress. Measurements already collected are not cleared until the next test call begins.

A PASS of the asynchronous test indicates only that the test call was successfully established. Enter **status** and **list** to get the results of the test.

Note:

Before attempting to make an ISDN-PRI test call to the public network (that is, the network of the far end), make sure that test call service is provisioned by the network. The user must subscribe to Test Type 108 service and have the correct far-end test call number administered on the trunk group form for the call to be allowed.

Only one trunk can be tested in a given port network, until the test call is canceled or completes.

This test is run on the following maintenance objects:

- ATM-BCH (ATM B-Channel Trunk)
- ISDN-TRK (DS1 ISDN Trunk)
- TBRI-TRK (ISDN Trunk-Side BRI Channel)

Table 382: ISDN Test Call Test (#258) ***1 of 5***

Error Code	Test Result	Description / Recommendation
4	ABORT	A trunk has not been translated. 1. If the trunk should not be translated, no action is necessary.
1004	ABORT	B-Channel in use. 1. See if a call is active. Enter **status trunk** ***grp#/mem#***. 2. If the service state is In-Service/Idle, retry the test.
1005	ABORT	Bad configuration, such as no Maintenance/Test circuit pack. 1. Make sure that the Maintenance/Test circuit pack is inserted. 2. Repeat the test.
1018	ABORT	Test call disabled 1. Set the Maintenance field on the Trunk Group screen to **y**. 2. Repeat the test.
		1 of 5

Table 382: ISDN Test Call Test (#258) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1019	ABORT	Another Test call is in progress. 1. Enter **`list isdnpri-testcall`** to locate the test call. 2. Enter **`status isdnpri-testcall`** to find out the duration and start time of the test call. 3. Enter **`clear isdnpri-testcall`** to stop the test call from running. 4. If time and duration indicate that the test call should have stopped, and **`clear isdnpri-testcall`** does not work, see M/T-DIG (Maintenance/Test Digital Port) for the recommended maintenance strategy.
1020	ABORT	**ATM-BCH**: TN230x circuit-pack problem 1. See ATM-INTF (ATM Interface). **ISDN-TRK**: There is a problem with the DS1 interface circuit pack. 1. Consult the procedures for the appropriate DS1 interface circuit pack (DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack)). **TBRI-TRK**: The B-Channels are in an inconsistent state, the B-Channel does not exist at the far-end, or the B-Channel has been rejected by the far-end.
1024	ABORT	Maintenance/Test digital port in use. 1. Wait until the yellow and green LEDs on the Maintenance/Test circuit pack are OFF. 2. Rerun the test. 3. If the problem persists, see M/T-DIG (Maintenance/Test Digital Port).
1113	ABORT	Signaling link failed **ATM-BCH, ISDN-TRK**: Check the results of Signaling Link State Audit Test (#255). **TBRI-TRK**: Check the results of Signaling Link State Test (#1251).
		2 of 5

Table 382: ISDN Test Call Test (#258) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1116	ABORT	The switch could not change the service state 1. See if calls are active. Enter **status trunk** ***grp#/mem#***. 2. If a call is active, wait for the call to finish normally, or drop it by running **busyout trunk** ***grp#/mem#***. Then rerun the test. 3. If a call is not active: **ATM-BCH**: Check the Error and Alarm Logs for ATM-TRK problems and see ATM-TRK (Circuit Emulation Service Circuit Pack). **ISDN-TRK**: Check the Error and Alarm Logs for ISDN-TRK problems and see ISDN-TRK (DS1 ISDN Trunk). **TBRI-TRK**: Check the error and alarm logs for TBRI-TRK problems and see TBRI-TRK (ISDN Trunk-Side BRI Channel).
1117	ABORT	ISDN service message outstanding 1. Wait 2 minutes, then try again.
1118	ABORT	Far-end of trunk is not administered 1. Check the administration of the far end of the trunk. Run **status trunk** ***grp#/mem#***. 2. Try the test again.
1119	ABORT	The test call was aborted due to a normal call attempt on this trunk. The test call will only be performed if the trunk is idle. 1. Wait for the call to finish normally, or drop it by running **busyout trunk** ***grp#/mem#***. 2. When the trunk is idle, retry the test.
		3 of 5

Table 382: ISDN Test Call Test (#258) ***4 of 5***

Error Code	Test Result	Description / Recommendation
1120	ABORT	The trunk is in the out-of-service/far-end state. 1. Try to change the service state with Service State Audit Test (#256). 2. Try the test again. However, the trunk may be in the out-of-service/far-end state due to problems at the far-end switch. If that is the case, no remedial action can be taken at this end.
1122	ABORT	No test-line number for the far-end switch 1. Check the **Trunk Group** administration form.
1123	ABORT	No Feature Access Code administration for this Facility test 1. Check the Dial Plan and Feature Administration forms.
1412	ABORT	This test does not run on media modules or media gateways. Ignore
None 2000 2012 2035 2036 2037 2038 2039 2040 2041 2066 2067	ABORT	Internal system error. 1. Retry the command up to 5 times at 1-minute intervals. 2. If the test continues to abort, there is a serious internal problem.
2074	ABORT	Bit and Block Error query failed 1. Retry the command up to 5 times at 1-minute intervals. 2. If the test continues to abort, there may be a serious internal problem in the Maintenance/Test Digital port. See M/T-DIG (Maintenance/Test Digital Port).
2075	ABORT	Internal system error. 1. Retry the command up to 5 times at 1-minute intervals.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		4 of 5

Table 382: ISDN Test Call Test (#258) ***5 of 5***

Error Code	Test Result	Description / Recommendation
2104	ABORT	Call dropped or could not be originated. 1. Make sure service is provisioned by the network. 2. Check the administration of the far-end test line extension on the **Trunk Group Administration** form. 3. Check the administration of the test call BCC (Bearer Capability Class) on the **Trunk Group Administration** form. 4. Check the reason for termination with **`status isdnpri-testcall`**. 5. For further instructions see Troubleshooting ISDN-PRI test calls in *Maintenance Procedures (03-300432)*. 6. Try the test again. If the test continues to abort, escalate the problem.
2042	FAIL	The test data is corrupt. There is a loss of integrity on the communications path. 1. Take the trunk out of service and check the quality of the facility including the transmission facility and any external equipment such as DACs, CSUs, etc. Enter **`test isdnpri-testcall`** and **`status isdnpri-testcall`** to get the bit and block error rates.
	PASS	The test pattern was sent and received properly. If the synchronous test call was performed (long test sequence), the communications path is operating properly. If **`test isdnpri-testcall`** was used, PASS indicates only that the test call was established. Enter **`status isdnpri-testcall`** to get the bit and block error rates detected by the test. If the bit and block error rates are not acceptable, perform a complete analysis of the facility including the transmission facility and any external equipment such as DACs, CSUs, etc.
		5 of 5

Clear Error Counters Test (#270)

This test is not an actual test in the strict sense of the word. Many circuit packs have counters in the Angel firmware. These counters are used so that Control Channel Message Set (CCMS) messages are not continuously sent uplink to maintenance software. Using this method, the message will be sent until the counter reaches some preset threshold, then not sent again until the counter is cleared.

The ports on the circuit pack continually run self-tests whenever the port is idle. This test clears the counter so that if the port continues to fail during or after testing, the Angel will send a message to indicate that fact.

This test is only used to send a downlink message to the Angel on the circuit pack. Since the Angel normally provides no uplink response to this message, this test should never abort or fail.

This test is run on the following maintenance objects:

- ASAI-PT (ASAI Port)
- BRI-PORT (ISDN-BRI Port)
- M/T-ANL (Maintenance/Test Analog Port)
- M/T-DIG (Maintenance/Test Digital Port)
- M/T-PKT (Maintenance/Test Packet Bus Port)
- TBRI-PT (ISDN Trunk-Side BRI Port)

Table 383: Clear Error Counters Test (#270)

Error Code	Test Result	Description / Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
	PASS	The message to clear the circuit pack's counter for Background Maintenance Failures has been sent successfully.

Idle Time Slot Test (#294)

The Idle Time Slot test detects noisy time slots on the bus and takes them out-of-service. The Tone Detector circuit is told to listen to idle time slots. If it detects any noise on a time slot, it returns a failure. At the end of the test, any out-of-service time slots are retested to see if they are still noisy and are restored to service if they are idle. After every time slot has been tested, the number of bad time slots are reported in the Error Code field. No more than 220 time slots will be taken out-of-service on one bus, and no more than 300 will be taken out-of-service on both buses at one time.

This test runs on TDM-BUS (TDM Bus).

Table 384: Idle Time Slot Test (#294)

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run this test. For example, maintenance could be running on the Tone Detector circuit and it is using the CPTRs. 1. Retry the command at 1-minute intervals up to 3 times.
1115	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
Any	FAIL	The Error Code indicates the number of bad time slots that were detected. The cause of this failure is most likely due to a bad port circuit pack and not the TDM bus itself. 1. Run the command again. 2. If the error persists, check the Error and Alarm Logs for alarms on the port network where the faulted TDM bus resides. Also check for EXP-INTF (Expansion Interface Circuit Pack) alarms associated with Error Type 1537. 3. Refer to the appropriate circuit pack's documentation to clear the circuit pack's problem. 4. Test the TDM bus again. If the error continues, see TDM-Bus Fault Detection and Isolation.
	PASS	Every idle time slot that should be idle is indeed idle. There is no noise on any of the idle time slots.

Control Channel Test (#296)

The Control Channel Test tests the integrity of the Control Channel bus by ensuring that communication through the TDM bus is operational. The test attempts to query a Tone-Clock or Tone Detector circuit pack which is required in each port network for proper operation. If a reply from the queried circuit pack is received, the TDM bus is considered operational and the test passes. If no reply is received, the TDM Bus is not operational and the test fails.

This test runs on TDM-BUS (TDM Bus).

Table 385: Control Channel Test (#296)

Error Code	Test Result	Description / Recommendation
Any other than 1005	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
1005	ABORT	This test is valid only on the control channel bus. It aborts when run on the non-control channel bus. This is a valid response. Enter **status port-network** to verify which bus is the control channel bus.
None	FAIL	Communication through the Control Channel is not working. The problem is not necessarily the TDM bus itself. 1. Display the hardware error and alarm log for the Tone-Clock circuit and for the Tone Detector circuit in the port network where the faulted TDM bus resides. See the following to resolve errors: TONE-BD (Tone-Clock Circuit Pack) TONE-PT (Tone Generator) GPTD-PT (General-Purpose Tone Detector Port) DTMR-PT (Dual-Tone Multifrequency Receiver Port). 2. Resolve any errors and alarms for the Tone-Clock and Tone Detector circuits. 3. Display the hardware error and alarm log and look for errors and alarms for the active Expansion Interface circuit pack. See EXP-INTF (Expansion Interface Circuit Pack) and resolve its errors. 4. Enter **test tdm *P*** 5. If the test still fails, see TDM-Bus Fault Detection and Isolation.
	PASS	Communication through the control channel bus is operational.

Non-control Channel Test (#297)

The Non-control Channel Test is executed on the non-control channel bus. The Tone-Clock circuit puts a tone on the non-control channel bus and the Tone Detector circuit listens to it. The test passes if the tone is successfully transmitted on the non-control channel bus.

This test runs on TDM-BUS (TDM Bus).

Table 386: Non-control Channel Test (#297)

Error Code	Test Result	Description / Recommendation
None 1001 2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
1005	ABORT	This test is valid only on the non-control channel bus. It aborts when run on the control channel bus. This is a valid response. Enter **`status port-network`** to verify which bus is the control channel bus.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	Communication on the Non-control Channel is not reliable. 1. Run the command again. 2. If the problem persists, test the active Tone-Clock circuit and Tone Detector circuit/circuit pack in the port network where the faulted TDM bus resides, to verify they are healthy. See the following to resolve errors: TONE-PT (Tone Generator) GPTD-PT (General-Purpose Tone Detector Port) DTMR-PT (Dual-Tone Multifrequency Receiver Port). 3. Run the command again. 4. If the problems persists, see TDM-Bus Fault Detection and Isolation.
	PASS	The non-control channel bus is operational.

PN Maintenance Circuit Pack Sanity Maze Test (#303)

The processor on the PN's Maintenance circuit pack has direct access to special registers in the Maintenance circuit pack. These registers are tied to such things as the Expansion Interface circuit pack reset leads and Carrier Port Power Unit reset leads which enable the PN's Maintenance circuit pack to recycle carriers. To prevent an insane Maintenance circuit pack from inadvertently controlling these external devices, a special interface called the Sanity Maze is provided. There are two parts to the test. Part 1 involves navigating the Sanity Maze to toggle an unused lead. Part 2 attempts to toggle an unused lead without first navigating the Sanity Maze. The Sanity Maze test passes if Part 1 is successful and Part 2 fails.

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 387: PN Maintenance Circuit Pack Sanity Maze Test (#303)

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2033	ABORT	Internal error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Sanity Maze of the PN's Maintenance circuit pack is defective. 1. Replace the PN's Maintenance circuit pack.
	PASS	The Sanity Maze is working properly, and the PN's Maintenance circuit pack can access the unused register. If **recycle carrier** for PN carriers does not work, the following problems may still exist: 1. The Carrier Port Power Unit or wiring to the Carrier Port Power Unit may be defective. See CARR-POW (Carrier Power Supply). 2. Since this test only tests the PN, there is a very small probability that the PN's Maintenance circuit pack cot access those registers that deal with PN devices. The Maintenance circuit pack may need to be replaced.

Expansion Interface Lock Query Test (#304)

The Expansion Interface Lock Query Test queries the ATM EI circuit pack for its status concerning a lock to the backplane system clock. The test passes if the response is "in lock". The test fails if the response is "out of lock". This test runs on ATM-EI (Expansion Interface Circuit Pack).

Table 388: Expansion Interface Lock Query Test (#304) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	A PN's unduplicated ATM-EI circuit pack responded incorrectly, or a PN's active ATM-EI circuit pack could not communicate with the PN's circuit packs. 1. If the PN's active ATM-EI circuit pack is failing and duplicated PNC is enabled: a. Enter **`reset PNC interchange`** to switch to the standby PNC. b. Repeat the short test sequence. c. If test continues to fail, enter **`reset board`** ***`location`*** to reset the ATM-EI circuit pack. 2. If the PN's unduplicated ATM-EI circuit pack is failing: a. Enter **`display errors`** and **`display alarms`**, and follow the associated repair procedures for TDM-CLK, TONE-BD, or SYNC alarms/errors. b. Repeat the short test sequence. c. If test continues to fail, replace the circuit pack or transceiver.
	PASS	Communication to the ATM-EI circuit pack is functioning correctly.
		1 of 2

Table 388: Expansion Interface Lock Query Test (#304) ***2 of 2***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

PN Maintenance Circuit Pack Reset Test (#306)

This test is destructive.

The terminal connection will be dropped. If the Emergency Transfer switch is in the AUTO position, Emergency Transfer will be disabled for the duration of the test.

The PN's Maintenance circuit pack is reset by the active Expansion Interface circuit pack. After the Expansion Interface circuit pack reports that the PN's Maintenance circuit pack has reset, a handshake message is sent to the Maintenance circuit pack. If the Maintenance circuit pack responds to the handshake, the test passes. If not, it fails. If the test passes, the PN-connected terminal is brought back up, and Emergency Transfer is restored to its previous state.

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 389: PN Maintenance Circuit Pack Reset Test (#306) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2029	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 389: PN Maintenance Circuit Pack Reset Test (#306) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1204	FAIL	Response not received from the circuit pack.
1205		EI circuit pack could not reset the PN's Maintenance circuit pack. *For duplicated Port Network Connectivity*: 1. The standby EI circuit pack may be defective, preventing the active EI circuit pack from resetting the PN's Maintenance circuit pack. Unplug the standby EI circuit pack, and try to reset the Maintenance circuit pack with **`test maint long`**. If Test #306 passes, replace the standby EI circuit pack and attempt the reset test again. If Test #306 fails, replace the standby PN EI circuit pack. 2. The active EI circuit pack may be defective and unable to reset the PN's Maintenance circuit pack. Interchange the PNC with **`reset pnc interchange`**. Reset the Maintenance circuit pack again with **`test maintenance long`**. If the test passes, the problem is with the known standby EI circuit pack. Repeat Step 2 to determine whether the standby EI circuit pack should be replaced. 3. Replace the PN's Maintenance circuit pack and run the test again. If the test passes, the problem is with the Maintenance circuit pack. Interchange the PNC with **`reset pnc interchange`**, and run the test again. The test should pass with both EI circuit packs being active. 4. If the B carrier EI circuit pack is active, the ribbon cable connecting the Expansion Interface circuit pack and the PN's Maintenance circuit pack may be defective. Check the ribbon cable to make sure it is connected properly and is not damaged. *For unduplicated Port Network Connectivity*: 1. Replace the PN's Maintenance circuit pack and run the test again. If it passes, the problem is with the Maintenance circuit pack. 2. If the test fails, replace the EI circuit pack. If the tests passes, the problem is with the EI circuit pack. 3. If the test still fails, the problem is with the serial link wired into the backplane of carrier A.
		2 of 3

Table 389: PN Maintenance Circuit Pack Reset Test (#306) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2005	FAIL	PN Maintenance Circuit Pack reset passed but the PN's Maintenance circuit pack did not respond to the subsequent handshake message. Retry this command three more times. If it continues to fail, the Maintenance circuit pack, the active EI circuit pack, or the serial link is defective. To determine which is defective: *For Duplicated Port Network Connectivity*: 1. Interchange PNCs by entering **`reset pnc interchange`**. 2. Run the short test sequence against the PN's Maintenance circuit pack. If Test #306 still fails, replace the Maintenance circuit pack and retest. Otherwise, follow the error procedures for any errors that are logged by this short test sequence. *For Unduplicated Port Network Connectivity*: 1. Replace the PN's Maintenance circuit pack and invoke the short test sequence against it. 2. If the error persists, replace the EI circuit pack at a time when the PN can go down with minimal inconvenience. 3. If the error still persists, the problem is with the actual serial link in A carrier backplane and not with the PN's Maintenance circuit pack.
	PASS	The active EI circuit pack can reset the PN's Maintenance circuit pack. This implies the Maintenance circuit pack, the active EI circuit pack, and active serial link are sane. There could still be a problem with the standby EI circuit pack and standby serial link in a Duplication Option system.
		3 of 3

Battery Holdover Hardware Verification Test (#311)

The hardware/firmware vintage of the PN's TN775D Maintenance boards does not support battery holdover for *all carriers*. This test checks to see if PN cabinet battery holdover for *all carriers* has been administered in error. If battery holdover is administered for *all carriers*, the test will fail and an alarm will be raised against this MO.

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 390: Battery Holdover Hardware Verification Test (#311)

Error Code	Test Result	Description/ Recommendation
1000 2000 2029 2500	ABORT	System resources required to run this test are not available. Response to the test was not received within the allowed time. Internal system error. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The hardware vintage of the PN's Maintenance circuit pack does not support battery holdover for *all carriers*. This failure indicates that the cabinet administration is set for battery holdover for *all carriers*. 1. Verify cabinet administration. Make sure that the battery holdover feature is administered correctly, and that cabinet administration is not set for battery holdover for *all carriers*. 2. Retry the command at 1-minute intervals up to 5 times.
	PASS	The cabinet administration shows battery holdover for A carrier only. Also, the hardware vintage of the PN's TN775D Maintenance board is correct.

DS1 OPS Switchhook Inquiry Test (#312)

This test queries the switchhook state of the Off-Premises-Station in switch software. If the state in switch software disagrees with the state on the DS1 Interface circuit pack, then the state in the switch software is updated to match the state on the DS1 Interface circuit pack.

This test runs on OPS-LINE (DS1 Off-Premises Station Line).

Table 391: DS1 OPS Switchhook Inquiry Test (#312) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 391: DS1 OPS Switchhook Inquiry Test (#312) *2 of 3*

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port has been seized by a user for a valid call. 1. Enter **status station** to determine when the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Incompatible configuration administered in station administration. 1. Enter **display station** to verify that the station is not the 24th port of the DS1 Interface circuit pack while common channel signaling is specified. 2. Enter **display ds1** to check the signaling type of the DS1 circuit pack.
1006	ABORT	The station is out of service. This condition may be accompanied by an Error Type 18 entry in the error log. Determine why the station was taken out of service. When stations are taken out of service by maintenance software, the problems that led up to that must be cleared. 1. Enter **status station** to check the state of the port. If the port is indeed out of service, enter **release station** to bring the station back into service. 2. Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The DS1 Interface circuit pack is out-of-service. 1. Look for DS1-BD/UDS1-BD errors in the Error Log. If present, see DS1-BD (DS1 Interface Circuit Pack). 2. Retry the command.
2000	ABORT	The response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test aborts with Error Code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with Error Code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the recommended procedures.
		2 of 3

Table 391: DS1 OPS Switchhook Inquiry Test (#312) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	The test was aborted due to a system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Internal system error. 1. Look for DS1-BD and UDS1-BD errors in the Error Log. If there errors are present, see DS1-BD (DS1 Interface Circuit Pack) and/or UDS1-BD (UDS1 Interface Circuit Pack). 2. If a channel multiplexer is used as the remote DS1 endpoint to which the station connects, refer to the multiplexer vendor's maintenance document for diagnosis. 3. Retry the command at 1-minute intervals up to 5 times.
	PASS	The station hook states in both switch software and DS1 Interface circuit pack are consistent.
0	NO BOARD	See NO BOARD for the recommended procedures.
		3 of 3

DS1 CO Trunk Dial Tone Seizure Test (#314)

This test checks the trunk's signaling capability provided by the DS1 Interface circuit pack. The test sends a "seizure" message to the DS1 Interface circuit pack and expects an "active" reply in return. The test passes if the "active" message is received. It aborts if no message is received. It fails if the DS1 Interface circuit pack returns a "reorder" message.

This test cot be run on a trunk in any of the following conditions:

1. The trunk direction is administered as an incoming only trunk.
2. The trunk has been seized by a normal trunk call.
3. The trunk is administered with maintenance test disabled.
4. The trunk is on a port of a DS1 Media Module.

This test runs on the following maintenance objects:

- CO-DS1 (DS1 CO Trunk)

- DIOD-DS1 (DS1 DIOD Trunk)

Table 392: DS1 CO Trunk Dial Tone Seizure Test (#314) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. If the port status is active but the port is idle (no calls), check the error log for Error Type 1025. The port may be locked up. 4. If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call during the test. 1. Enter **display port *location*** to determine the trunk group/ member number of the port. 2. Enter **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Incompatible configuration administered on trunk group screen. 1. Look at the **Trunk Group** administration form and see whether the trunk is incoming only, port 24 on a DS1 Interface with common control channel signaling, or an automatic CO type such as FX. Under any of these conditions, this is a normal abort and can be ignored.
1018	ABORT	Test is disabled by administration. Determine why the test has been disabled before enabling it. 1. To enable the test, enter **change trunk-group *<x>*** (***<x>*** is the number of the trunk group to be tested). Change the **Maintenance Test** field on the screen to **y**. 2. Repeat the test.
		1 of 3

Table 392: DS1 CO Trunk Dial Tone Seizure Test (#314) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1020	ABORT	The DS1 Interface circuit pack is out-of-service. 1. Look for DS1-BD and UDS1-BD errors in the Error Log. If present, see DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) for the repair procedures. 2. Retry the command.
1040	ABORT	This port may be an access endpoint. 1. Verify that this port is an access endpoint with **`display port`** ***`location`*** 2. If the port has been administered as an access endpoint, this is a normal abort, and this error can be ignored.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	The test was aborted due to an internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources for this test. 1. Retry the command at 1-minute intervals up to 5 times.
2000	FAIL	Response to the seizure message was not received within the allowed time. 1. Enter **`list configuration board`** ***`location`***. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 314 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports will be taken out of service and extraneous on-board alarms will be generated. Replace the circuit pack with a TN767C V3 or later. 2. Verify that the **Trunk Type** field on the Trunk Administration form matches the trunk type administered on far-end switch. 3. Look for DS1-BD and UDS1-BD errors in the error log. If present, see DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack). 4. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 392: DS1 CO Trunk Dial Tone Seizure Test (#314) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2053	FAIL	At least one of the following errors was found on the DS1 circuit pack: ● 1281 - Loss of signal ● 1793 - Blue alarm ● 2049 - Red alarm ● 2305 - Yellow alarm ● 1537 - Hyperactivity Look for these Error Types in the Error Log, then follow the procedures described in DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) that is appropriate for the Error Type that was found.
	FAIL	The trunk cot be seized for an outgoing call. This could cause inline failures to be reported against the trunk (no answer would report Error Type 257 with auxiliary data 57487 in the error log). 1. Verify the `Trunk Type` field on the trunk administration screen screen matches the trunk type administered on far-end switch. 2. Look for DS1-BD or UDS1-BD errors in the Error Log. If errors exist, see DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack). 3. Retry the command at 1-minute intervals up to 5 times.
	PASS	The trunk can be seized for an outgoing call.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Expansion Interface Control Channel Test (#316)

If an ATM-EI or EI circuit pack is an *active* ATM-EI or EI in the PN (amber LED on long/off short), the Expansion Interface Control Channel test checks to see if the ATM-EI or EI circuit pack can communicate with other circuit packs in the PN using the PN's TDM bus.

If the circuit pack is a standby ATM-EI or EI (amber LED off), this test queries the circuit pack for its type and vintage information. This test runs on ATM-EI (Expansion Interface Circuit Pack) and EXP-INTF (Expansion Interface Circuit Pack).

Table 393: Expansion Interface Control Channel Test (#316) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1030	ABORT	The test is not being executed on the active PE in a duplex system.
1335	ABORT	The PKTINT is on the standby SPE
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	The ATM circuit pack responded incorrectly, or a PN's active ATM-EI or EI circuit pack could not communicate with the PN's circuit packs. 1. If the PN's active ATM-EI or EI circuit pack is failing and duplicated PNC is enabled: a. Enter **reset PNC interchange** to switch to the standby PNC. b. Repeat the short test sequence. c. If test continues to fail, enter **reset board *location*** to reset the circuit pack. 2. If the PN's unduplicated ATM-EI or EI circuit pack is failing: a. Enter **display errors** and **display alarms**, and follow the associated repair procedures for TDM-CLK (TDM Bus Clock), TONE-BD (Tone-Clock Circuit Pack), or SYNC (Port Network Synchronization) alarms/errors. b. Repeat the short test sequence. c. If test continues to fail, replace the circuit pack or transceiver.
		1 of 2

Table 393: Expansion Interface Control Channel Test (#316) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	The circuit pack responded correctly to the test. Communication from software to the ATM-EI or EI circuit pack is functioning. 1. Refer to other ATM-EI or EI circuit pack tests if the link is not functioning correctly.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Expansion Interface Reset Test (#336)

This test is destructive.

The Expansion Interface Reset test is executed using **`reset board`** ***`location,`*** where ***`location`*** is the location of the EI circuit pack to be reset. This test is potentially very destructive and requires the EI circuit pack to be busied out prior to execution of this test.

If the system does not have duplicated PNC, and is a Direct Connect system, and one of the EI circuit packs must be reset, the action of busying out the desired EI circuit pack will deny calls to the PN until the EI circuit pack is released from the busyout state. If the EI circuit pack is part of a PN-to-PN link, new connections to the PN will be denied. If the EI circuit pack is part of a PN-to-PN link, calls between the two PNs will be denied.

In a non-duplicated PNC system with a Center Stage Switch, if the EI circuit pack in the PN is busied out, new service to that PN only will be denied. However, if the EI circuit pack resides in the PN, new service to every PN will be denied until the EI circuit pack is released from the busyout state.

If the system does not have duplicated PNC, the reset of any EI is allowed, but it will result in the resetting of every PN board and loss of service to the PN(s) for a few minutes.

If the system does have duplicated PNC, and the EI circuit pack to be reset is part of the active PNC, the system will not allow the busyout and the system technician will be required to interchange the PNCs using **`reset pnc interchange`**. After executing the PNC interchange, it will be possible to busyout and then reset the original EI circuit pack.

If the PN's Maintenance (MAINT) circuit pack determines that the EI (EXP-INTF) circuit pack is cycling between sane and insane several times within several minutes, MAINT may inhibit operation of the EXP-INTF by holding the EI circuit pack in a reset state. This condition may result in an unsuccessful reset of the EI circuit pack.

If the reset command returns “PN is unavailable,” perform the following steps:

1. Enter **change circuit-pack *P***, where ***P*** is the Port Network number.
2. For the EI circuit pack you wish to reset, add an entry to the Circuit Pack screen for the TN570 EI circuit pack. Be sure to enter the appropriate carrier and slot.
3. Submit the screen.
4. Enter **busyout board *location***
5. Enter **reset board *location***

This test runs on EXP-INTF (Expansion Interface Circuit Pack).

Table 394: Expansion Interface Reset Test (#336) *1 of 3*

Error Code	Test Result	Description / Recommendation
4	ABORT	The neighbor EI circuit pack or SNI circuit pack is not recognized by the system. The circuit pack is not inserted. 1. Insert neighbor EI circuit pack or SNI circuit pack and perform the reset again.
1015	ABORT	The EI circuit pack has not been busied out. 1. Busyout the EI circuit pack with **busyout board *location***. 2. Enter **reset board *location***. 3. Retry the command.
2000 2100 2500	ABORT	Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 394: Expansion Interface Reset Test (#336) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1	FAIL	The EI did not successfully reset. 1. If the EI circuit pack is in the PN, the PN's Maintenance board may be holding the EI circuit pack reset. Attempt to rectify this condition by executing **test maint *P* long** on the Maintenance board in the same PN. 2. If step 1 was not successful in releasing the EI circuit pack, temporarily remove the PN's Maintenance circuit pack. 3. Repeat **reset board *location***. 4. If reset continues to fail, replace circuit pack. 5. Insert PN's Maintenance circuit pack if it was removed.
2	FAIL	The EI circuit pack was successfully reset, but it did not begin running after the reset. 1. If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. 2. Enter **reset board location**. 3. Reinsert the PN's Maintenance circuit pack if it was removed.
		2 of 3

Table 394: Expansion Interface Reset Test (#336) ***3 of 3***

Error Code	Test Result	Description / Recommendation
3	FAIL	The reset over the optical fiber failed. 1. Enter **test board location** on the PN neighbor EI circuit pack located on the opposite end of the fiber from this EI circuit pack. If Test #238 fails, follow the maintenance procedure associated with this test result. Then perform the reset again. 2. If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. 3. Enter **reset board *location***. 4. Reinsert the PN's Maintenance circuit pack if it was removed. 5. If the symptoms match those described in the EI and Tone-Clock Interactions section, follow those guidelines. 6. Check the Error Log for the PN Tone-Clock errors that were resolved when the PN went down. These errors may have been resolved BECAUSE the PN went down. When there is no Tone-Clock generating the system clock on a PN, then an EI circuit pack can only be reset once. Every subsequent reset attempt fails. It is also possible that the system itself may have already tried to reset the EI circuit pack. Refer to TONE-BD (Tone-Clock Circuit Pack) for Tone-Clock problems. 7. If the reset still fails, run the Expansion Interface Manual Loopback Procedure on the opposite PN EI circuit pack. This procedure is described in the section preceding the Error log entries and recommended actions table for this MO. If the EI circuit pack and the lightwave transceiver are healthy, the problem is the EI circuit pack and its lightwave transceiver on the PN end of the fiber or the fiber itself. Test the PN EI circuit pack with the manual loopback procedure and investigate the test results.
	PASS	The EI was successfully reset. Release the EI circuit pack from the busyout state by using **release board location**.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

PN Maintenance Circuit Pack Serial Link Test (#337)

This test is destructive.

This test checks the serial link from the standby EI or standby IPSI circuit pack to the PN's Maintenance circuit pack. If there is no standby link or the standby link is down at the time of the test, this test aborts.

Note:

The status of the link changes to "down" when the standby EI or standby IPSI circuit pack begins initialization tests (for example, after being reset). The link status updates at the conclusion of these tests.

This test runs on MAINT (PN Maintenance Circuit Pack).

Table 395: PN Maintenance Circuit Pack Serial Link Test (#337) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000 2029 2500	ABORT	System resources required for this test are not available. Internal system error. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 395: PN Maintenance Circuit Pack Serial Link Test (#337) *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	The serial link between the currently standby EI or standby IPSI circuit pack and the PN's Maintenance circuit pack is defective. If the standby EXP-INTF or IPSI is on Carrier A, then Error Type 3329 is logged. If the standby EXP-INTF or IPSI is on Carrier B, then Error Type 3585 is logged. 1. If Error Type 3585 was logged: ● See if the ICCA/ICCB cables between carriers A and B are present and properly connected (ICCA to ICCA, and ICCB to ICCB). ● See if the ICCC/ICCD cables between carriers A and B are present and properly connected (ICCC to ICCC, and ICCD to ICCD). ● If the IPSI has faceplate ICC cables See if the faceplate cables between the IPSIs and Maintenance circuit pack are properly connected. 2. Install or reconnect the cables if necessary, and rerun the test. 3. Replace the PN's Maintenance circuit pack. 4. Rerun the test. If the test continues to fail, replace the standby PN Expansion Interface circuit pack. 5. Rerun the test. If the test continues to fail and the standby link is on B side, replace the ICC cable or IPSI faceplate cable that carries the serial link from Expansion Interface or IPSI circuit pack B to the PN's Maintenance circuit pack.
	PASS	The serial link from the standby Expansion Interface or IPSI to the PN's Maintenance circuit pack is working.
		2 of 2

Synchronization Update Test (#417)

This test updates all synchronization parameters for BRI, EI, DS1, ATM Trunk, and Tone/Clock circuit packs in the system. This test is run for the following maintenance objects:

- ATM-SYNC (ATM Synchronization)

- SYNC (Port Network Synchronization)

Table 396: Synchronization Update Test (#417)

Error Code	Test Result	Description / Recommendation
None 1000 1115 2500	ABORT	Internal system error. System resources required to run this test are not available. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The Synchronization Maintenance parameters have been successfully updated. The system should be synchronized. If synchronization problems still exist, refer to the Error Log to obtain information about the source of the problem.

Digital Port Sanity Test (#565)

The Digital Port Sanity Test verifies that the port circuitry involved in the digital trunk testing on the Maintenance/Test digital port is functioning properly. This circuitry is common to both Maintenance/Test digital ports on the Maintenance/Test circuit pack and is only run for port 2. The test aborts if it is run on port 3.

The test connects the two Maintenance/Test digital ports on the TDM bus so that they talk and listen to each other. Four self-tests are attempted:

- sending data from port 2 to port 3 in asynchronous mode
- sending data from port 3 to port 2 in asynchronous mode
- sending data from port 2 to port 3 in synchronous mode
- sending data from port 3 to port 2 in synchronous mode

The test passes if all four self-tests are successful. The test stops if any one of the self-tests fails.

This test aborts if an ISDN test call is in progress on the Maintenance/Test digital port when the test is requested, or if an ISDN test call is initiated while the test is in progress.

This test runs on M/T-DIG (Maintenance/Test Digital Port).

Table 397: Digital Port Sanity Test (#565) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	One of the digital ports is busy with background maintenance. 1. Either wait for the port to become idle, or busyout both Maintenance/Test digital ports on the Maintenance/Test circuit pack with **busyout port** ***location*** (02) and **busyout port** ***location*** (03). 2. If the ports were busied out, release them with **release port** ***location*** (02) and **release port** ***location*** (03). 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid ISDN-PRI test call. 1. Enter **list isdnpri-testcall** to determine which call is using the port from the M/T Port column. Wait for the test call to complete as indicated in the **Start Time** and **Duration** fields, or abort the test call with **clear isdnpri-testcall** ***grp#/mem#***, where ***grp#/mem#*** is determined from the **B-Channel** field of **list isdnpri-testcall**. 2. Rerun the test.
		1 of 3

Table 397: Digital Port Sanity Test (#565) *2 of 3*

Error Code	Test Result	Description / Recommendation
1019	ABORT	An ISDN test call is in progress using this Maintenance/Test circuit pack. The Maintenance/Test circuit pack cot perform a self-test on one of its digital ports while an ISDN test call is using either of the digital ports. 1. Enter **`list isdnpri-testcall`** to determine which call is using the port from the M/T Port column. 2. Wait for the test call to complete as indicated in the **Start Time** and **Duration** fields, or abort the test call with **`clear isdnpri-testcall`** ***`grp#/mem#`***, where ***`grp#/mem#`*** is determined from the **B-Channel** field of **`list isdnpri-testcall`**. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort and the port is idle, escalate the problem.
1138	ABORT	This test does not run on port 3 of the Maintenance/Test circuit pack. This test will only run on port 2. Look at the results of the Digital Port Sanity test for port 2. 1. Run the command again for port 2 using **`test port`** ***`location`*** (02) or **`test port`** ***`location`*** (02) **`long`**.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100		System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2500		An internal operation failed; the test could not be completed. 1. Retry the command at 1-minute intervals up to 5 times.
50	FAIL	The system was unable to communicate with the port circuitry used for digital trunk testing. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 397: Digital Port Sanity Test (#565) ***3 of 3***

Error Code	Test Result	Description / Recommendation
100 101 102 103	FAIL	Data not sent successfully from port 2 to port 3 in asynchronous mode. Data not sent successfully from port 3 to port 2 in asynchronous mode. Data was not sent from port 2 to port 3 successfully in synchronous mode. Data was not sent from port 3 to port 2 successfully in synchronous mode. One of the self-tests failed. 1. Reset the circuit pack. 2. Test the port again with **`test port`** ***`location`*** (02) **`long`**. 3. If the test fails again, replace the circuit pack.
	PASS	The Maintenance/Test digital port digital trunk testing capability is operating correctly.
		3 of 3

Hook State Inquiry Test (#566)

This test verifies that the Maintenance/Test analog port and the system agree on the on-hook/off-hook status of the Maintenance/Test analog port. It runs on M/T-ANL (Maintenance/Test Analog Port) and M/T-DIG (Maintenance/Test Digital Port).

Table 398: Hook State Inquiry Test (#566) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1	ABORT	No response was received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the test continues to abort, replace the circuit pack and repeat the test.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 2

Table 398: Hook State Inquiry Test (#566) ***2 of 2***

Error Code	Test Result	Description / Recommendation
Any	FAIL	Internal system error. This test should never fail. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the test continues to fail, reset the circuit pack. 3. Retry the command at 1-minute intervals up to 3 times. 4. If the test continues to fail, escalate the problem.
	PASS	The system and the Maintenance/Test analog port agree on the Maintenance/Test analog port hook state.
		2 of 2

Packet Bus Port Health Inquiry Test (#567)

This test verifies that the packet bus fault-detection and maintenance function of the M/T-PKT is functioning properly. This is done by having the M/T-PKT perform a self-test. If the self-test passes, then the Packet Bus Port Health Inquiry test passes. If the self-test fails or Communication Manager cot communicate with the M/T-PKT, then the test fails.

This test runs on M/T-PKT (Maintenance/Test Packet Bus Port).

Table 399: Packet Bus Port Health Inquiry Test (#567) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources necessary to run this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	An internal operation failed, and the test could not be completed. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 399: Packet Bus Port Health Inquiry Test (#567) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2059	FAIL	The M/T-PKT has reported a failure of the on-board self-test.
2060		The M/T-PKT has reported an invalid state for the packet bus.
2061		Communication Manager cot communicate with the M/T-PKT, but can communicate with the Maintenance/Test circuit pack. 1. Retry the command. 2. If the test continues to fail, replace the Maintenance/Test circuit pack, and retry the command. 3. If the test continues to fail, see PKT-BUS (Packet Bus) or PKT-INT (Packet Interface) to determine whether the M/T-PKT failure is being caused by a packet bus fault.
	PASS	The M/T-PKT packet bus fault-detection capability is operating correctly.
		2 of 2

Maintenance/Test Circuit Pack Query Test (#572)

This test queries the Maintenance/Test packet bus port about the state of health of the packet bus. If the packet bus has faults, the test fails. The failure code describes the severity, type, and number of faults. The test passes if the packet bus is fault-free.

This test is run on PKT-BUS (Packet Bus).

Note:

A Maintenance/Test circuit pack is usually absent from the port networks of a standard-, duplex-, or high-reliability system. However, customers may optionally install a Maintenance/Test circuit pack to both utilize its enhanced analog-trunk and digital-line testing capabilities and to enhance the system's ability to quickly recognize a packet bus failure.

Table 400: Maintenance/Test Circuit Pack Query Test (#572) *1 of 3*

Error Code	Test Result	Description / Recommendation
1006	ABORT	The packet bus port of the Maintenance/Test circuit pack is out of service. 1. Determine whether the port is busied out. If so, release it with **release port *location* 04**. Then retry the test command. 2. If there are alarms active against the packet bus port (MT-PKT), see M/T-PKT (Maintenance/Test Packet Bus Port) to resolve them. Then retry the test command.
1142	ABORT	No Maintenance/Test circuit pack packet bus port is in service in this PN. 1. If this PN is required by configuration guidelines to have a Maintenance/Test circuit pack, investigate the following: • Check if the Maintenance/Test circuit pack has been busied out. If so, release it and rerun the test. • If i no Maintenance/Test circuit pack is installed in this PN, one must be installed. • Otherwise, the Maintenance/Test circuit pack for this PN has failed and should be replaced 2. In a PN of a system without PNC duplication, the Maintenance/Test packet bus Port is not required and may not be present. If it is present and is busied out, or has failed, release or replace the circuit pack. If there is no Maintenance/Test circuit pack, ignore the results of this test for this PN.
2000	ABORT	No response received within the allowed time. 1. Re-enter the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, look for M/T-PKT (Maintenance/Test Packet Bus Port) errors in the Error and Alarm Logs.
2059	ABORT	The Maintenance/Test packet bus port has reported a hardware failure. 1. See M/T-PKT (Maintenance/Test Packet Bus Port) to correct the problem. 2. Rerun the test command.
		1 of 3

Table 400: Maintenance/Test Circuit Pack Query Test (#572) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2077	ABORT	The Maintenance/Test Circuit Pack Query located more than one Maintenance/Test packet bus port in the PN. This is an internal system error and should not occur. Escalate the problem, but also attempt the following work-around steps. 1. Remove every Maintenance/Test circuit pack from the PN. 2. Insert one Maintenance/Test circuit pack. There should not be more than one in a PN. 3. Re-enter the test command.
2100	ABORT	Could not allocate all necessary resources to perform this test. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	An internal operation failed. The test could not be completed. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 400: Maintenance/Test Circuit Pack Query Test (#572) ***3 of 3***

Error Code	Test Result	Description / Recommendation
xyzz	FAIL	The Maintenance/Test packet bus port has detected faults on the Packet Bus. The Error Codes are interpreted as follows: **1***yzz* - The Maintenance/Test packet bus port has reconfigured the packet bus around the faulty leads. This action only occurs in a high- or critical-reliability system (duplicated PNC). **2***yzz* - The Maintenance/Test packet bus port is unable to correct every Packet Bus fault it has detected. x**0***zz* - None of the packet bus faults are open faults. x**1***zz* - At least some of the packet bus faults are open faults. Look for Error Type 2305 in the Error Log. The Aux Data value indicates the number of open leads. xy**zz** - The last two digits of the Error Code indicate the total number of faulty packet bus leads detected. Examples: Error Code 2003 FAIL: The Maintenance/Test packet bus port has detected 3 faulty leads. None of them are opens. At least one was unable to be corrected. Error Code 1103 FAIL: The Maintenance/Test Packet Port has detected 3 faulty leads. At least one is an open. The Maintenance/ Test circuit pack was able to correct all of them by reconfigured. See Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)*
	PASS	No faults have been detected on the packet bus by the Maintenance/Test circuit pack. The packet bus is operating correctly.
		3 of 3

Packet Circuit Pack Audit Test (#573)

This test determines whether Packet circuit packs have reported Packet Bus-related inline errors within the last minute. If so, the failure code indicates whether one or more than one circuit pack has reported such failures.

If the test has failed within the last 5 minutes, there is a 15 second delay before the result is returned. This prevents a repeated sequence of this test from always reporting the same result. If the test passes and a FAIL has not occurred within the last five minutes, a PASS is returned immediately.

This test is run on PKT-BUS (Packet Bus).

Table 401: Packet Circuit Pack Audit Test (#573)

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal error. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	One Packet circuit pack has reported packet bus-related inline errors within the last minute.
2	FAIL	More than one Packet circuit pack has reported packet bus-related inline errors within the last minute.
	PASS	No Packet circuit packs have reported packet bus-related inline errors within the last minute. This indicates that the packet bus is healthy, or that a packet bus fault is transient or is being caused by a faulty Packet circuit pack. If this test passes, but there are other signs of a packet bus failure such as logged errors or alarms or other test failures, see Isolating and repairing packet-bus faults in *Maintenance Procedures (03-300432)*.

Board Type Check Test (#574)

This test verifies that a Tone-Clock circuit pack administered with a Stratum-3 clock source has board code TN780.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

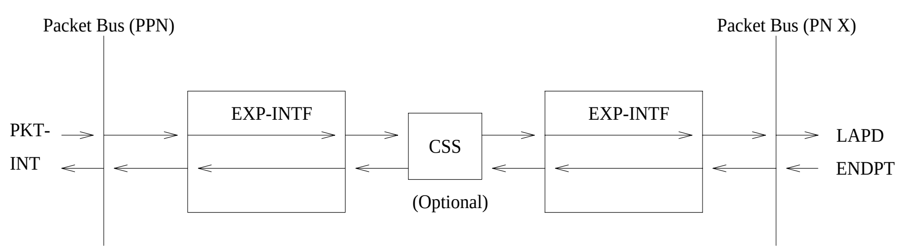
Table 402: Board Type Check Test (#574)

Error Code	Test Result	Description / Recommendation
1412	ABORT	This test does not run on media modules or media gateways. Ignore
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
ANY	FAIL	Stratum-3 clock synchronization is administered for the carrier where this Tone-Clock circuit pack resides, but the Tone-Clock does not have board code TN780. 1. If the Stratum-3 clock option is incorrectly administered, change it. 2. Otherwise, replace the circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack.
	PASS	The proper Tone-Clock circuit pack is present for Stratum-3 clock synchronization.

Expansion Interface Packet Interface Test (#589)

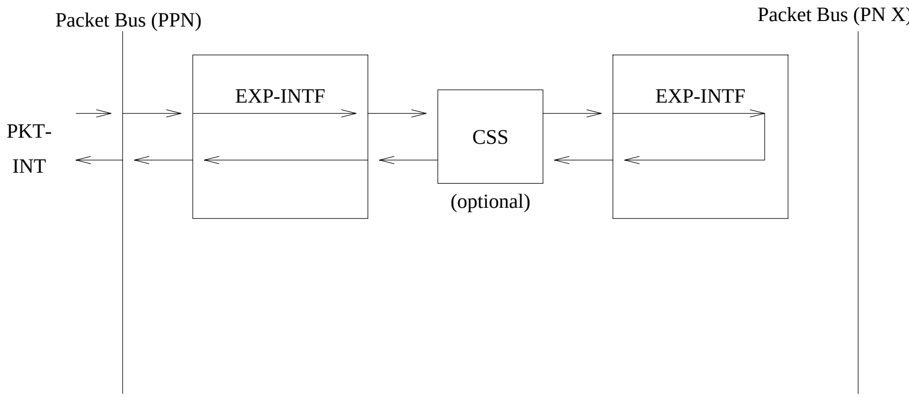
This test attempts to send a data packet from the TN1655 Packet Interface circuit pack through any intervening EI circuit packs and/or SNI circuit packs and through the EI circuit pack to be tested. The path the data packet takes is dependent on the location of the EI circuit pack to be tested and whether the system has duplicated PNC. The following diagrams and short discussion of each describe the different paths the test uses.

Figure 102: Expansion Interface Packet Interface Test—Packet Endpoint Loop



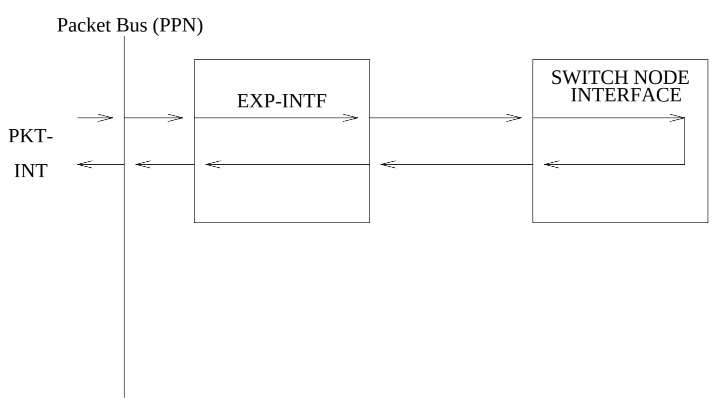
The path shown in Figure 102: Expansion Interface Packet Interface Test—Packet Endpoint Loop is used when testing a PN EI that is on the active PNC.

Figure 103: Expansion Interface Packet Interface Test, PN-to-PN loop



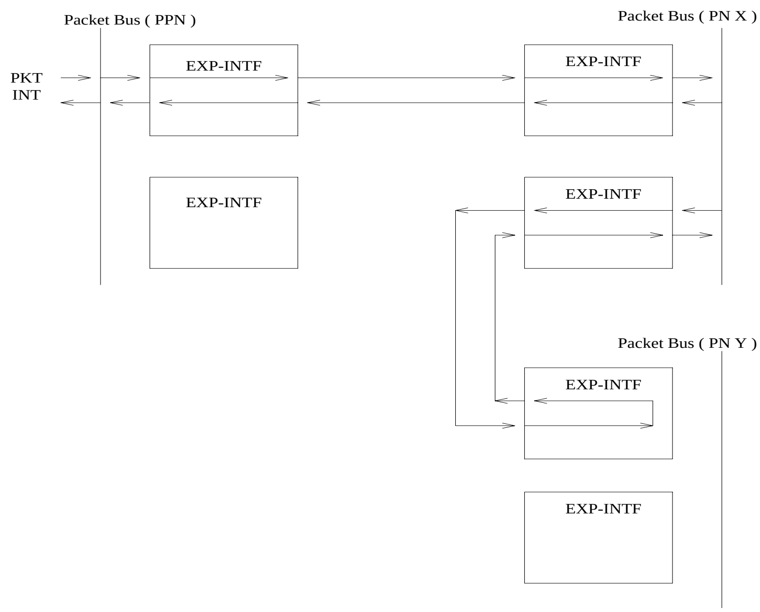
In a Center Stage configuration the path shown in Figure 103: Expansion Interface Packet Interface Test, PN-to-PN loop is used when testing a PN EI that is on the standby PNC. In a Direct Connect configuration, this path is used on any PN EI or on a PN EI that is on the standby PNC.

Figure 104: Expansion Interface Packet Interface Test—PN to CSS Loop



The path shown in Figure 104: Expansion Interface Packet Interface Test—PN to CSS Loop is used when running the test on a PN EI in a Center Stage configuration.

Figure 105: Expansion Interface Packet Interface Test, PN-to-PN link



The path shown in Figure 105: Expansion Interface Packet Interface Test, PN-to-PN link is used when the EI under test is one that provides connectivity between the two PNs in a Direct Connect configuration.

This test runs on EXP-INTF (Expansion Interface Circuit Pack).

Table 403: Expansion Interface Packet Interface Test (#589) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1033	ABORT	The test cot run because the EI circuit pack does not have a fiber link administered to it, there is not sufficient data to run the test, or because EI circuit packs on other port networks needed for this test are out of service. 1. Enter **list fiber-link** and determine whether the EI circuit pack under test is an endpoint of one of the administered fiber links. If so, then proceed to step 2. If not, then this is considered to be a spare board, and the test should not be attempted on this EI circuit pack. 2. Follow procedures for applicable configuration: **Direct Connect:** 1. Enter **list config** for the cabinet and carrier where the neighbor EI circuit pack resides. If the results reveal that the board is not recognized by software, the board is out of service because of this condition. Perform the following steps: a. If this test is being executed on an EI circuit pack located in the PN, enter **display errors** and resolve any EXP-PN errors for the port network where the neighbor EI circuit pack resides. Re-run this test. b. If this test continues to abort with Error Code 1033, reset the DS1 converter circuit pack, if so equipped, or the neighbor EI circuit pack. This will not be destructive since the circuit pack cot be serving as the Expansion Archangel if it is not in service. 2. Run Test #237 and check for EXP-INTF circuit pack Error Type 1281 in the Error Log. If Error Type 1281 is present and/or Test #237 does not pass, see repair procedures for Expansion Interface Neighbor Query Test (#237). 3. If Test #237 passes, reseat the EI circuit pack. This will not be destructive since the circuit pack cot be serving as the Expansion Archangel if it is not in service. 4. Rerun Test #237.
		1 of 5

Table 403: Expansion Interface Packet Interface Test (#589) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1033 *(cont'd)*	ABORT *(cont'd)*	**Center Stage:** If the EI circuit pack under test resides in the PN: None of the EI circuit packs located in the PNs (on the same PNC side) are in service (for PN EIs see the next case). 5. Enter **list fiber-linklist fiber-link** to determine whether any of the PN's EI circuit packs are administered as endpoints of a fiber link. If not, then ignore the results of this test. 6. Enter **list conf** for the cabinets and carriers where the EI circuit packs reside in every other PN. If the results returned indicated that the circuit packs are not recognized by software, they are out of service for this reason. 7. Enter **display errors**, and resolve any EXP-PN (Expansion Port Network)errors. Re-run this test. 8. If the test continues to abort with this error code, reseat the EI circuit packs (or DS1 converter circuit pack if so equipped) on the PNs. This will not be destructive since the circuit pack cot be serving as the Expansion Archangel if it is not in service. 9. Run Test #237 on each of the PN EI circuit packs, and check for EXP-INTF circuit pack Error Type 1281 in the error log. If Error Type is present and/or Test #237 does not pass, see repair procedures for Expansion Interface Neighbor Query Test (#237). 10. Repeat this test. *If the EI circuit pack under test resides in the PN:* The EI circuit located in the PN is out of service. 1. Run Test #237 on each of the PN EI circuit packs and check for EXP-INTF circuit pack Error Type 1281 in the error log. If Error Type is present and/or Test #237 does not pass, see repair procedures for Expansion Interface Neighbor Query Test (#237). 2. Repeat this test.
1139	ABORT	The packet bus in the PN where this EI circuit pack resides has a major alarm against it. This test needs to use the alarmed port network's packet bus. 1. Enter **display alarms** and resolve any PKT-BUS alarms. 2. Retry the command.
		2 of 5

Table 403: Expansion Interface Packet Interface Test (#589) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1141	ABORT	The Packet Interface circuit pack is out of service. 1. See PKT-INT (Packet Interface) for the recommended repair procedure.
1144	ABORT	The PN's packet bus has a major alarm against it. This test needs to use the alarmed PN's packet bus. 1. Enter **`display alarms`** and resolve any PKT-BUS alarms. 2. Retry the command.
1394	ABORT	The EI circuit pack is out of service and the test cot be run. This condition is due to a change in the EI circuit pack's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. 1. Run Test #237 and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 does not pass, see the repair procedures for Expansion Interface Neighbor Query Test (#237). 2. If Test #237 passes, rest the EI pack. Note that this will not be destructive to the port network where EI circuit pack resides because it will not be serving as the expansion Archangel if it is not in service. 3. Repeat this test.
1395	ABORT	This test cot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this EI circuit pack, enter **`change system-parameters duplication`** to enable PNC. 2. Enter **`set pnc lock`** to prevent the system from doing a PNC interchange. 3. Repeat this test.
		3 of 5

Table 403: Expansion Interface Packet Interface Test (#589) ***4 of 5***

Error Code	Test Result	Description / Recommendation
1421	ABORT	This abort code appears only when the EI circuit pack addressed in the test command is one that terminates a fiber link between two PNs in a direct connect system. It indicates that the test failed, but that this test was run on the PN EI board that is: a) in the same PN as the board under test b) on the active PNC (if duplicated) c) terminates the fiber from the PN. The EI tested is probably not at fault. 1. Enter **`display alarms`** and follow the EXP-INTF repair procedures for any alarms against the PN EI that is: a. In the same PN as the board just tested b. On the active PNC c. Terminates the fiber link from the PN 2. If there are no alarms logged against that EI, run Test #589 on it and follow procedures for this test. 3. Run this test again.
1422	ABORT	This abort code is valid and will only appear when the EI circuit pack under test resides in a PN of a system with a Center Stage Switch configuration. It means that the test failed, but that this test was then run on the PN EI on the same PNC as the EI under test and that test failed. This means that the EI originally tested is probably not at fault. 1. Resolve any alarms that are logged against the PN EI that is on the same PNC as the EI under test. 2. If there are no alarms logged against the PN EI, run Test #589 against the PN EI and follow procedures for this test. 3. Run this test again.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2060	ABORT	The link on the packet bus being used to perform the test has failed. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the test continues to abort, enter **`display errors`** and resolve any PKT-INT errors.
		4 of 5

Table 403: Expansion Interface Packet Interface Test (#589) ***5 of 5***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
ANY	FAIL	The transmitted data packet was not received correctly by the Packet Interface circuit pack. The failure may be in the EI under test, the DS1 converter circuit packs, or the intervening Center Stage components. 1. Test the Packet Interface circuit with **`test packet-interface`** ***`CS`*** where “C” is the IPSI’s carrier in a high- or critical-reliability system, and “S” is the slot number where the IPSI’s Packet Interface resides. If the Packet Interface circuit fails any tests, see PKT-INT (Packet Interface). 2. If the EI under test resides in a high-reliability system’s PN, (2 PN-to-CSS fibers in an unduplicated PNC), run the short test sequence on both of the PN’s EI boards, and follow procedures for Test #589. 3. Enter **`display errors`** and resolve any PKT-BUS errors. 4. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
	PASS	Although this test has passed, there may be related problems on other EIs used in connectivity to and from this EI. Software may have conducted tests on these other components and determined that this board was functioning properly and any problems were probably due to a problem with some other connectivity component. Check the error and alarm logs for problems with other EI circuit packs and resolve these errors. 1. Refer to other EI board tests if the link is not functioning correctly.
0	NO BOARD	See NO BOARD for repair procedures.
		5 of 5

Circuit Pack Restart Test (#594)

This test is destructive.

Run this test to reset the circuit pack only if there are PPCPU errors. This test fails if the circuit pack does not return to a sane state after being reset. The circuit pack resets through the SAKI Sanity test (#53).

This test runs on VAL-BD (Voice announcements over LAN Circuit Pack).

Table 404: Circuit Pack Restart Test (#594)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack with **busyout board *location***. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the problem persists, escalate the problem.
1966	ABORT	The board is in the process of running the autosave command to save announcements. 1. Retry the command again later.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
1 2	FAIL	The circuit pack failed to reset. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, pull out and reseat the circuit pack. 3. Rerun the test. If the problem persists, replace the circuit pack.
	PASS	The circuit pack initialized correctly. 1. Enter **release board *location*** to put the board in-service.

LANBIC Receive Parity Error Counter Test (#595)

This test reads and clears the LANBIC Receive Parity Error Counter on the circuit pack. This counter is incremented by the circuit pack when it detects a parity error in data received from the packet bus.

These errors may indicate a circuit pack problem, packet bus problem, or a problem with another circuit pack on the bus. This test is useful for verifying the repair of the problem.

This test runs on the following maintenance objects:

- BRI-BD (ISDN-BRI Line Circuit Pack)
- CLAN-BD (Control LAN Circuit Pack)
- MG-BRI (BRI Trunk Media Module)
- TBRI-BD (ISDN Trunk-Side BRI Circuit Pack)
- VAL-BD (Voice announcements over LAN Circuit Pack)

Table 405: LANBIC Receive Parity Error Counter Test (#595) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. If the test aborts repeatedly up to five times, reset the circuit pack and rerun the test. 2. If the test aborts again with Error Code 2000, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
2100		Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
2500		Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
		1 of 2

Table 405: LANBIC Receive Parity Error Counter Test (#595) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1–10	FAIL	The circuit pack detected parity errors. The error code indicates the value of the on-board error counter. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, run the Packet Interface Test (#598) with **`test board`** ***`location`*** **`long`** 3. If the Packet Interface Test (#598) fails, see Packet Interface Test (#598) for the repair procedures.
	PASS	No errors were detected by circuit pack.
		2 of 2

Receive FIFO Overflow Error Counter Test (#596)

When the TN799 C-LAN or TN2501 VAL circuit pack detects packet bus buffer overflow, it increments the error on its FIFO Overflow error counter. This test reads and clears the counter.

This test runs on CLAN-BD (Control LAN Circuit Pack) and VAL-BD (Voice announcements over LAN Circuit Pack).

If errors are:	They may be due to:
Occasional	Statistical buffer sizing
Persistent	Circuit pack congestion that requires redistribution of traffic load

Table 406: Receive FIFO Overflow Error Counter Test (#596)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive test response within the allowed time. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, reset the circuit pack with **`reset board location`**. 3. If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
1–10	FAIL	The circuit pack detects overflow errors. The error code indicates the value of the error counter. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, run the Packet Interface Test #598 with **`test board`** ***`location`***. 3. If the Packet Interface Test #598 fails, see Packet Interface Test (#598) for repair procedures.
	PASS	Circuit pack detects no errors.

Invalid LAPD Frame Error Counter Test (#597)

A TN799 C-LAN or TN2501 VAL circuit pack detects an invalid frame when it receives:

- a frame with a CRC error
- an unrecognizable frame
- a recognizable frame in an unexpected state

When the circuit pack detects an Invalid LAPD Frame, it increments its Invalid LAPD Frame error counter. This test reads and clears the counter, and verifies the repair of the problem.

Errors may indicate a:

- circuit pack problem
- packet bus problem
- problem with another circuit pack on the bus

This test runs on CLAN-BD (Control LAN Circuit Pack) and VAL-BD (Voice announcements over LAN Circuit Pack).

Table 407: Invalid LAPD Frame Error Counter Test (#597) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive test response within the allowed time. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, reset the circuit pack with **`reset board location`**. 3. Run the test again. If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
		1 of 2

Table 407: Invalid LAPD Frame Error Counter Test (#597) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1–10	FAIL	The circuit pack detects LAPD frame errors. The error code indicates the value of the error counter. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, run the Packet Interface test (#598) with **`test board`** ***`location`*** **`long`**. 3. If the Packet Interface test (#598) fails, see Packet Interface Test (#598) for repair procedures.
	PASS	Circuit pack detects no errors.
		2 of 2

Packet Interface Test (#598)

This test checks the circuit pack's packet bus interface. Data is sent through the bus and back to itself. If the data received is consistent with the data sent, the test passes. The test does not run if the specified PN's packet bus has a minor alarm or is out of service.

This test runs on the following maintenance objects:

- ATM-EI (Expansion Interface Circuit Pack),
- ATM-TRK (Circuit Emulation Service Circuit Pack)
- CLAN-BD (Control LAN Circuit Pack)
- VAL-BD (Voice announcements over LAN Circuit Pack)

Table 408: Packet Interface Test (#598) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1005	ABORT	Wrong circuit pack to run this test. Internal error.
		1 of 2

Table 408: Packet Interface Test (#598) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1139	ABORT	The packet bus in the PN where this board resides has a major alarm against it. This test needs to use the alarmed PN's packet bus. 1. Resolve any PKT-BUS problems. See PKT-BUS (Packet Bus) 2. Retry the command.
1144	ABORT	The Port Network (PN) Packet Bus is out-of-service. 1. Follow the repair procedures for the PKT-BUS (Packet Bus). 2. Retry the command.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 retries. 2. If the test fails repeatedly, attempt to reset the circuit pack with **reset board** ***location*** 3. If the test continues to fail, replace the circuit pack.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
ANY	FAIL	The transmitted data packet was not received correctly. 1. Retry the command at 1-minute intervals up to five times. 2. If the test continues to fail, replace the circuit pack.
	PASS	The Packet Interface test passed.
		2 of 2

Congestion Query Test (#600)

The test queries the number of used buffers to determine whether a TN799 CLAN-BD (Control LAN Circuit Pack) or VAL-BD (Voice announcements over LAN Circuit Pack) is congested.

If the test fails on a TN799 C-LAN circuit pack, the switch redirects outgoing calls to another available C-LAN and denies new incoming calls.

If the test fails on a TN2501 VAL circuit pack, the switch alarms and announcements can fail. Normal call handling resumes when the C-LAN or VAL circuit pack recovers from congestion.

Table 409: Congestion Query Test (#600) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive test response within the allowed time. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, reset the circuit pack with **`reset board location`**. 3. If the problem persists, replace the circuit pack.
2012	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
		1 of 2

Table 409: Congestion Query Test (#600) *2 of 2*

Error Code	Test Result	Description / Recommendation
1 2	FAIL	The buffer level is nearly exhausted. The circuit pack is congested and no buffers are available. 1. Retry command at 1-minute intervals up to 5 times. 2. If command continues to fail, examine the C-LAN or VAL port measurements to determine which ports are heavily utilized and the processor occupancy of the circuit pack. *Low processor occupancy* when the circuit pack is congested indicates circuit pack failure. 1. If the problem persists, reset the circuit pack with **`reset board location`**. 2. If congestion recurs, replace the circuit pack. *High processor occupancy* indicates the circuit pack is congested due to traffic load. 1. To relieve congestion in the short term, selectively busyout ports with **`busyout port`** ***`location`*** on the circuit pack. 2. To achieve a more permanent resolution for **CLAN-BD** circuit packs, it may be necessary to move ports on this circuit pack to other Control LAN circuit packs. For **VAL-BD** circuit packs, it may be necessary to reassign announcements to other integrated announcements circuit packs. 3. Consider replacing affected ports with new ports.
3	FAIL	The circuit pack is not operating normally and is congested. 1. Replace the circuit pack.
	PASS	Hardware setting and attached cable type match circuit pack administration, and no errors are detected.
		2 of 2

Link Status Test (#601)

This test determines the state of the call-control signaling link for the TN799 CLAN-BD (Control LAN Circuit Pack) and VAL-BD (Voice announcements over LAN Circuit Pack). If the signaling link is physically connected, the test sends a test frame over the link and checks for a response. The test passes only if both the signaling link is connected and the test frame is successfully transmitted.

A failure may indicate a problem with:

- this circuit pack
- the packet bus
- the Packet Interface circuit pack

Table 410: Link Status Test (#601) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1125	ABORT	RSCL link or circuit pack not in service. 1. Release the circuit pack with **`release board`** ***`location`***. 2. Repeat the test. 3. Escalate if the problem persists.
2012	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Internal system error. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, escalate the problem.
2	FAIL	The RSCL control link is disconnected. 1. Retry command at 1-minute intervals up to 5 times. 2. If the test continues to fail, run the Packet Interface test (#598) with **`test board`** ***`location`*** to determine if the problem is due to the circuit pack. 3. If the Packet Interface test (#598) fails, see Packet Interface Test (#598) for repair procedures. 4. If the Packet Interface test (#598) passes, refer to PKT-BUS (Packet Bus) repair procedures.
		1 of 2

Table 410: Link Status Test (#601) *2 of 2*

Error Code	Test Result	Description / Recommendation
3	FAIL	Received no response to RSCL control link test frame. 1. Retry command at 1-minute intervals up to 5 times. 2. If the problem persists, reset the circuit pack with **`reset board location`**. 3. If test continues to fail, replace the circuit pack.
	PASS	RSCL control link connected.
		2 of 2

TSC Heartbeat Inquiry Test (#604)

This test can be invoked for any ADM TSC administered in the switch. Most of the error conditions in the following table will not log an error, but switched services may take some type of recovery action in certain instances.

This test sends a USER INFORMATION TSC heartbeat message inquiry across an ADM TSC. It passes if the far end sends a response. It fails if there is no response.

This test runs on TSC-ADM (Administered Temporary Signaling Connections)

Table 411: TSC Heartbeat Inquiry Test (#604)

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Enter **`test tsc-administered`** at 1-minute intervals up to 5 times.
1005	ABORT	The Administered TSC does not exist. 1. Display the administration for the Administered TSC. 2. If an Administered TSC exists, enter **`test tsc-administered`**.
1113	ABORT	The D-channel is out-of-service. 1. See ISDN-PLK (ISDN-PRI Signaling Link Port).
		1 of 4

Table 411: TSC Heartbeat Inquiry Test (#604)

Error Code	Test Result	Description / Recommendation
1145	ABORT	There is congestion in the network. 1. Enter **`status tsc-administered`** at 1-minute intervals up to 5 times. 2. If the congestion does not clear, disable and enable the Administered TSC using **`change signaling-group`** ***`grp#`***. **NOTE:** To disable the Administered TSC, display the (administration) Signaling Group screen using **`change signaling-group`** ***`grp#`***, where ***`grp#`*** is the number of the signaling group under which the suspect TSC is administered. Set the **Enable** field to **n**. To enable the ADM TSC, set the **Enable** field to **y**. 3. If the congestion still does not clear, check other nodes in the network.
1146	ABORT	The congestion just occurred in the network. 1. Enter **`status tsc-administered`** at 1-minute intervals up to 3 times. 2. If congestion does not clear, disable and enable the Administered TSC using **`change signaling-group`** ***`grp#`***. **NOTE:** To disable the Administered TSC, display the **Signaling Group** administration screen with **`change signaling-group`** ***`grp#`***, where ***`grp#`*** is the number of the signaling group under which the suspect TSC is administered. Set the **Enable** field to **n**. To enable the ADM TSC, set the **Enable** field to **y**. 3. If congestion still does not clear, check the other nodes in the network.
		2 of 4

Table 411: TSC Heartbeat Inquiry Test (#604)

Error Code	Test Result	Description / Recommendation
1147	ABORT	The ADM TSC is being torn down. 1. Enter **`status tsc-administered`** at 1-minute intervals up to 3 times. 2. If ADM TSC is still down, disable and enable the ADM TSC using **`change signaling-group`** ***`grp#`***. **NOTE**: To disable the ADM TSC, display the **Signaling Group** administration screen using **`change signaling-group`** ***`grp#`***, where ***`grp#`*** refers to the number of the signaling group under which the suspect TSC is administered. Set the **Enable** field to **n**. To enable the ADM TSC, set the **Enable** field to **y**. 3. If the ADM TSC is still down, check the other nodes in the network.
1148	ABORT	The ADM TSC is enabled, but inactive at the near end. 1. Disable and enable the ADM TSC. 2. Enter **`test tsc-administered`**. 3. If the ADM TSC is still inactive, check the other nodes in the network.
1149	ABORT	The ADM TSC is disabled. 1. Enable the TSC, and see if the status indicates **active**. 2. Enter **`test tsc-administered`**. 3. If the TSC still disabled, remove the ADM TSC from the system.
1181	ABORT	Ran out of ADM TSC resources. 1. Enter **`test tsc-administered`** at 1-minute intervals up to 3 times.
		3 of 4

Table 411: TSC Heartbeat Inquiry Test (#604)

Error Code	Test Result	Description / Recommendation
2000	ABORT	The Administered TSC is not responding to a TSC heartbeat inquiry. 1. Enter **`test tsc-administered`** at 1-minute intervals up to 3 times. 2. If the problem continues to fail, obtain the status of the D-channel or D-channel pair associated with the ADM TSC using **`status signaling-group`** ***`grp#`***. If the D-channel is INS (i.e., in-service) and the status of the ADM TSC appears to be active, then disable and enable the ADM TSC through administration. **NOTE**: To disable the ADM TSC, display the **Signaling Group** administration screen using **`change signaling-group`** ***`grp#`*** where ***`grp#`*** refers to the number of the signaling group under which the suspect TSC is administered. Set the **Enable** field to **n**. To enable the ADM TSC, set the **Enable** field to **y**. 3. Enter **`test tsc-administered`**. 4. If the test fails, check the ADM TSC node on the other side of the network to verify that the ADM TSC is indeed active.
2012	ABORT	Internal system error. 1. Enter **`test tsc-administered`** at 1-minute intervals up to 5 times.
1	FAIL	The Administered TSC is not active (far end). 1. Enter **`test tsc-administered`**. 2. Verify that the Administered TSC node on the other side of the network is active. 3. Disable and enable the Administered TSC. 4. Retry **`test tsc-administered`**.
2	FAIL	Facility IE (Information Element) reject. 1. Check every other node in the network, and make sure Administered TSC is active.
	PASS	The Administered TSC responded to a heartbeat.
		4 of 4

BRI NPE Crosstalk Test (#617)

This test is destructive.

One or more Network Processor Elements (NPEs) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The BRI NPE Crosstalk test verifies that the port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's long test sequence and executes in approximately 20 to 30 seconds. Crosstalk testing is performed on both B-Channels (B1 and B2) associated with a BRI port. If this test fails on either channel, any endpoint connected to the port is taken out-of-service. This test aborts if the port and its associated channels are not in the idle state.

This test runs on BRI-PORT (ISDN-BRI Port) and TBRI-PT (ISDN Trunk-Side BRI Port).

Table 412: BRI NPE Crosstalk Test (#617) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the station extension or trunk group/member number of the port. 2. Enter **status bri-port *location*** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. 1. Enter **status bri-port *location*** to determine when the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times. 3. If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of port. This error can be ignored.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		1 of 2

Table 412: BRI NPE Crosstalk Test (#617) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	Internal system error. Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1 2	FAIL	The test failed on Channel B1. The test failed on Channel B2. The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. To verify that this is not an intermittent problem, repeat this test up to 10 times to make sure it continues passing. 2. If complaints still exist, examine the station, connections, and wiring.
		2 of 2

BRI Port Local LAN Looparound Test (#618)

This test is destructive.

This test checks the connectivity of a BRI port across the LAN Bus and executes only if the port is out-of-service. The test aborts if calls associated with the port are in-progress. Failures of this test indicate either on-board faults associated with the port hardware on the circuit pack or problems with the LAN Bus.

This test runs on the following maintenance objects:

- ASAI-PT (ASAI Port)
- BRI-PORT (ISDN-BRI Port)
- TBRI-PT (ISDN Trunk-Side BRI Port)

Table 413: BRI Port Local LAN Looparound Test (#618) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not out-of-service. 1. Enter **status bri-port *location*** to determine what stations or adjuncts are on this port. 2. Enter **status station *extension*** to determine whether the station or adjunct is in use. 3. If the port is in use, wait until it is idle, then busyout the port with **busyout port *location*** to place it in the out-of-service state. Repeat this test. Since the “busyout” command is destructive, execution of this command prior to the port being idle causes every call associated with BRI endpoints and every transaction associated with ASAI or Avaya adjuncts on the port to be torn down. Note that 3rd-party calls established by an ASAI or Avaya adjunct remain connected even though the port is taken out-of-service.
1139	ABORT	The packet bus in the port network is out-of-service. 1. Follow the repair procedures for the PKT-BUS (Packet Bus). 2. Enter **test port long *location*** and view the results of the BRI Port Local LAN Looparound Test #618 to verify the repair.
1144	ABORT	The Processor Port Network Packet Bus is out-of-service. 1. Follow the repair procedures for the PKT-BUS (Packet Bus). 2. After completing Step 1, enter **test port long *location***, and view the results of the BRI Port Local LAN Looparound Test #618 to verify the repair.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1144	ABRT	The PPN’s packet bus is out-of-service. 1. Follow the repair procedures for the packet bus. 2. Issue **test port long *location*** and review the results of the BRI Port Local LAN Looparound test to verify the repair.
		1 of 2

Table 413: BRI Port Local LAN Looparound Test (#618) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	Internal system error Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The looparound test has failed. 1. If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the board are idle. 2. Rerun the test. If the test fails again, enter **`test pkt`** ***`pn#`***. If this fails, follow the failure procedures in PKT-BUS (Packet Bus). 3. If the tests executed in step 2 pass, the problem is local to the BRI board. Replace the circuit pack.
	PASS	The BRI Port Local LAN Looparound test has passed. 1. Enter **`release board`** ***`location`*** to put the board and ports back into service.
		2 of 2

BRI Port Local TDM Looparound Test (#619)

This test is destructive.

This test verifies the connectivity of a BRI port across the TDM Bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

This looparound test runs the following individual tests on the two B-channels (B1 and B2) associated with the port:

- Looparound test across the TDM Bus for B1.
- Conference Circuit test for B1.
- Looparound test across the TDM Bus for B2.
- Conference Circuit test for B2.

The tests are run in the above order. If one test fails, the remaining tests in the sequence are not executed and an error code is returned at that point.

This test runs on BRI-PORT (ISDN-BRI Port) and TBRI-PT (ISDN Trunk-Side BRI Port).

Table 414: BRI Port Local TDM Looparound Test (#619) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	The system resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the station extension or trunk group/member number of the port. 2. Enter **`status bri-port`** ***`location`*** to determine the service state of the port. If the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 414: BRI Port Local TDM Looparound Test (#619) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Enter **`status station`** or **`status trunk`** for the station or trunk associated with this port, and determine when the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as “ASAI” or “ADJK” cot run this test, because the B-channels associated with the port are not used by ASAI or Avaya Adjunct Links. This error can be ignored.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, attempt to reset the circuit pack if the other ports are idle. 2. If this result occurs again, replace the circuit pack.
2012 2100 2103	ABORT	Internal system error. Could not allocate the necessary resources to run this test. The system could not make the conference connection for the test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1 2 7 8	FAIL	1 — TDM Looparound test failed on B1. 2 — TDM Looparound test failed on B2. 7 — Conference Circuit test failed on B1 8 —- Conference Circuit test failed on B2. 1. If the test fails repeatedly, try to reset the circuit pack if the other ports on the circuit pack are idle. 2. If the test fails again, replace the circuit pack.
	PASS	The BRI Port Local TDM Looparound test passed.
		2 of 2

Electronic Power Feed Restoral Test (#620)

This test attempts to restore the Electronic Power Feed (EPF) on an ISDN-BRI port twice. In this test, the processor requests that the EPF be turned on for a given port. An attempt is made to turn on the power unit to the station or adjunct. If no current is being drawn by a station, this probably indicates that the station is not connected. No current being drawn by an adjunct is the normal condition. If an overcurrent condition is sensed (that is, too much current is being drawn), this condition may indicate a short in the wiring to the endpoint or adjunct. Depending on what condition is sensed, a message is returned stating that either the EPF was turned on successfully with no problems or that an overcurrent condition is sensed. This response is reported by the Electronic Power Feed Inquiry (#622), which follows in the testing sequence. EPF Restoral is attempted again by this test five seconds later. This test always passes for the TN2198 because it has no EPF. This test will always abort when run on the TN2208.

This test runs on BRI-PORT (ISDN-BRI Port).

Table 415: Electronic Power Feed Restoral Test (#620)

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test is not valid for this port type. This error can be ignored.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	The EPF test passed. The message to turn on the power feed to the station or the adjunct was successfully sent to the port. 1. Although this test should not return a fail result, the Error Log should be checked for any entries with Error Type 257 to examine the real results of this test. 2. An Error Type of 257 in the Error Log indicates some problem with the power to the station or the adjunct. Check for a short in the wiring, a damaged jack, a defective voice terminal or adjunct, or an incorrect type of terminal.

Level 1 Status Inquiry Test (#621)

This test determines the state of the transmission facility of a BRI port at the physical layer (Level 1). Level 1 can be in one of three possible states: Activated, Pending Activation, or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state, the Level 1 interface can communicate with the BRI endpoint or ASAI or Avaya adjunct administered on this port. This test passes if the state of Level 1 (L1) is Activated. This test also passes if software has taken this port out of service. See the description of the Level 1 “Deactivated State” below for more details.

The Pending Activation state indicates a problem with the endpoints or adjunct, the wiring to the sets or adjunct, or the BRI-LINE or circuit pack. When in this state, the Level 1 interface is either not receiving any L1 framing from the endpoint or adjunct (Endpoint Idle), or it is communicating with the endpoint or adjunct but cot transition to the Activated state (Endpoint Active).

The Deactivated state indicates a problem with the BRI-LINE circuit pack. When in this state, the Level 1 interface is idle and is not trying to communicate with the BRI endpoints or adjunct. When an ISDN-BRI port is placed in the out-of-service state, Level 1 is also put into the Deactivated state. This could be due either to the system detecting a fault with the port or a **busyout port *location*** request.

This test runs on ASAI-PT (ASAI Port) and BRI-PORT (ISDN-BRI Port).

Table 416: Level 1 Status Inquiry Test (#621) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The board, port, or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (port busied out) for this port and ASAI-BD or BRI-BD (board busied out). 2. If this Error Type is present for ASAI-PT or BRI-PORT only, release the port using **`release port`** ***`location`*** and run the test again. 3. If the error is present for both ASAI-BD and ASAI-PT or BRI-BD and BRI-PORT, release the board using **`release board`** ***`location`*** and run the test again. **Note:** When you release a port, you release every port associated with it. If certain ports still need to be busied out, use **`busyout port`** ***`location`*** to busy them out. 4. Make sure the terminal is connected. 5. Retry the command at 1-minute intervals up to 5 times. 6. If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received within the allowed time. 1. If the test aborts repeatedly up to five times, reset the circuit pack and rerun the test. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
		1 of 4

Table 416: Level 1 Status Inquiry Test (#621) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1	FAIL	Received a status of Level 1 Pending Activation-Endpoint Idle which indicates a problem with the BRI endpoint or ASAI or Avaya adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. The TN2198 received a status of Level 1 Pending Activation - interface down, which indicates a problem with a connection between the switch and the NT1. **Note:** An NT1 is a 2- to 4-wire converter that is used to connect 4-wire Avaya terminals to a 2-wire TN2198 circuit pack. The NT1 also has status lamps to determine the health of the unit. 1. For the TN556, verify that an endpoint is connected to the port. If an endpoint is connected to the port then proceed to step 2. For the TN2198 verify that the connections are good between the switch and the NT1. Verify that the NT1 has power. 2. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. If a TN2198 is used the set must have been plugged in for at least 15 seconds before it will stabilize. Enter **test port** ***location***, and review the results of the Level 1 Status Inquiry test to verify the repair. If this test is still failing, proceed to step 3. 3. For BRI endpoints, replace the BRI endpoint(s) connected to the port or the NT1 if a TN2198 is used. For ASAI or Avaya adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the manufacturer's repair procedures. Then enter **test port** ***location*** and review the results of the Level 1 Status Inquiry test to verify repair. If this test is still failing, escalate the problem.
		2 of 4

Table 416: Level 1 Status Inquiry Test (#621) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2	FAIL	For the TN556 or TN2208, received a status of Level 1 Pending Activation-Endpoint Active which indicates a problem with the BRI endpoint or ASAI or Avaya adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. For the TN2198, received a status of Level 1 Pending Activation, U interface up S/T interface down, which indicates a problem with the NT1 or the wiring between the NT1 and the BRI endpoint (S/T interface). 1. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Enter **test port *location***, and review the results of the Level 1 Status Inquiry test to verify the repair. If this test is still failing, proceed to step 2. 2. For BRI endpoints, try replacing the BRI endpoint(s) connected to the port. For ASAI or Avaya adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the recommended repair procedures of the manufacturer. Then enter **test port *location***, and review the results of the Level 1 Status Inquiry test to verify repair. If this test is still failing, escalate the problem.
3	FAIL	Received a status of Level 1 Deactivated; the port is out-of-service. 1. Enter **status bri-port *location*** to verify that the service state of the port is out-of-service. If the service state of the port is not out-of-service, escalate the problem to the next tier. Otherwise, proceed to step 2. 2. If the port has been placed out-of-service via **busyout port *location***, try releasing the port by executing the **release port *location***. Then enter **test port long *location***, and review the results of Level 1 Status Inquiry test. If this test is still failing, proceed to step 3. 3. After executing **test port long *location***, review the results of every test. Follow the repair procedures for any tests that fail. Verify repair of the problem by executing **test port *location*** and by determining that the Level 1 Status test passes. If the test continues to fail for this reason, escalate the problem.
		3 of 4

Table 416: Level 1 Status Inquiry Test (#621) ***4 of 4***

Error Code	Test Result	Description / Recommendation
4	FAIL	For the TN2198 only: Received a status of Level 1 Pending Activation, the NT1 has a loss of power indicating a problem with the NT1. 1. For the NT1 follow the manufacturers recommended repair procedures. 2. Enter **test port** ***location***, and review the results of the Level 1 Status Inquiry test to verify the repair. If the test is still failing, escalate the problem.
	PASS	Level 1 is activated or the system has taken the port out of service.
		4 of 4

Electronic Power Feed Inquiry Test (#622)

This test queries the BRI-LINE circuit pack for the status of the Electronic Power Feed (EPF) supplied to a BRI endpoint or an ASAI or Avaya adjunct. If the EPF is on and no overcurrent condition exists, this test passes. All other states are not normal and indicate a problem with the endpoint or adjunct, the wiring to the endpoint or adjunct, or the BRI-LINE circuit pack. This test is not run on the TN2208 circuit pack or the TN2198 and will always return a pass for the TN2198. The TN2208 has no power feeds

This test runs on BRI-PORT (ISDN-BRI Port).

Table 417: Electronic Power Feed Inquiry Test (#622) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1005	ABORT	This test is not valid for this port type. Ports on the TN2208 cot run this test because this board does not have an electronic power feed. This error can be ignored.
		1 of 2

Table 417: Electronic Power Feed Inquiry Test (#622) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. If the test aborts repeatedly up to five times, reset the circuit pack and rerun the test. 2. If the test aborts again, replace the circuit pack.
2012 2100		Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The BRI-LINE circuit pack reports that it has detected an overcurrent condition and has turned off the EPF. 1. As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Check the endpoints and replace one or both sets if the sets are drawing too much current. Enter **test port** ***location*** and review the results of the EPF Inquiry test to verify the repair. If this test is still failing, proceed to step 2. 2. Enter **test port** ***location***, and review the results of the Level 1 Status Inquiry test. If this test is also failing, then follow the repair procedure for the Level 1 Status Inquiry test. Otherwise, escalate this problem to the next tier.
	PASS	The Electronic Power Feed Inquiry test reports that the EPF is on.
		2 of 2

CRC Error Counter Test (#623)

This test reads the port's CRC error counters that are maintained on the circuit pack. The Cyclic Redundancy Check (CRC) is a means of error detection to determine the integrity of data frame contents. The CRC error counter is incremented by the circuit pack when it detects a CRC error. The test passes if the value of the counter is 0, meaning the error is cleared. If the counter is non-zero, the test fails and the value of the counter is displayed in the `Error Code` field.

This test runs on ASAI-PT (ASAI Port), BRI-PORT (ISDN-BRI Port), and TBRI-PT (ISDN Trunk-Side BRI Port).

Table 418: CRC Error Counter Test (#623)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received from the circuit pack within the allowed time. 1. If the test aborts repeatedly up to 5 times, reset the circuit pack and rerun the test. 2. If the test aborts again, replace the circuit pack.
2012 2100	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The circuit pack is detecting CRC errors. The **Error Code** field contains the value of the counter. This error occurs when a frame with a bad CRC is received over the D-channel by the circuit pack. The problem is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring caused by a noise source such as an electrical motor or generator, or no termination (open circuit). It usually does not indicate a problem with the circuit pack.
	PASS	The error counter was cleared successfully.

Layer 1 Transmission Error Counter Test (#624)

This test reads and clears the port's Layer 1 Transmission error counter maintained on the ASAI or BRI-LINE circuit pack. This counter is incremented by the circuit pack when it detects a Layer 1 transmission problem. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error is most likely due to a problem with the wiring or the endpoint or adjunct. Verify that the wiring meets the configuration rules defined in *DEFINITY® Communications System Generic 1 and Generic 3i Wiring*. It does not indicate a problem with the circuit pack. This test is useful for verifying the repair of the problem.

This test runs on ASAI-PT (ASAI Port) and BRI-PORT (ISDN-BRI Port).

Table 419: Layer 1 Transmission Error Counter Test (#624)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. If the test aborts repeatedly up to five times, reset the circuit pack and rerun the test. 2. If the test aborts again, replace the circuit pack.
2012 2100	ABORT	Internal system error. Could not allocate necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, escalate the problem.
Any	FAIL	The circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, review the results of other tests in the long test sequence. Note the results of the Level 1 Status Inquiry test. Follow repair procedures for any of the executed tests if they fail. Otherwise, go to the next step. 3. If the tests for the endpoints or adjunct pass and the Layer 1 Transmission Error Counter test continues to fail, check the wiring to the endpoints or adjunct. If the wiring appears to be fine, escalate the problem.
	PASS	The Layer 1 Transmission error counter has a value of 0.

Receive FIFO Error Counter Test (#625)

This test reads and clears the port's Receive FIFO error counter maintained on the circuit pack. This counter is incremented by the circuit pack when it detects an overflow of its receive buffers. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error can occur if signaling frames are being received from a packet bus at a rate sufficient to overflow the receive buffers on the circuit pack for a port or if a hardware fault is causing the receive buffers not to be emptied properly. This test is useful for verifying the repair of the problem. This test runs on the following maintenance objects:

- ASAI-PT (ASAI Port)
- BRI-PORT (ISDN-BRI Port)
- TBRI-PT (ISDN Trunk-Side BRI Port)

Table 420: Receive FIFO Error Counter Test (#625)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. If the test aborts repeatedly up to 5 times, reset the circuit pack and rerun the test. 2. If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to fail, review the results of other tests in the long test sequence. Note the results of the Receive FIFO Error Counter test. Follow repair procedures for any of the tests that fail. Otherwise, go to the next step. 3. If the tests for the endpoints or adjunct pass and the Receive FIFO Error Counter test continues to fail, check the wiring to the endpoints or adjunct.
	PASS	The Receive FIFO error counter has a value of 0.

Signaling Link Status Test (#626)

This test determines the current status of the signaling link. This test passes if the link is “bound” to an endpoint and fails if the link is “not bound.”

The definition of the term “bound” for a link depends upon the type of endpoint and may depend on the successful completion of procedures at both Layers 2 and 3 of the protocol. The definition of “bound” for each type of endpoint is as follows:

- BRI endpoints administered for MIM (management information messages) initialization (multipoint):

Note:

An MIM is a level 3 message that conveys management and maintenance information between a communications system and a BRI terminal.

For endpoints of this type, the signaling link is “bound” when the link is connected at Layer 2 and the link has been associated with an endpoint, [that is, the endpoint has completed SPID initialization (L3 established)].

- ASAI adjuncts and BRI endpoints not administered for MIM initialization (point-to-point):

  For endpoints of this type, the signaling link is “bound” when the link is connected at Layer 2 (L2 established).

For every endpoint type, a signaling link becomes “unbound” when it is disconnected at Layer 2. For BRI endpoints supporting MIM initialization, a signaling link may also become “unbound” if a subsequent attempt to perform SPID initialization on a “bound” link fails (that is, wrong SPID is entered into the endpoint by the user).

This test runs on ASAI-EPT (ASAI Endpoint) and BRI-SET, Various Adjuncts.

Table 421: Signaling Link Status Test (#626) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN’s packet bus is out-of-service. 1. Follow the repair procedures for the PKT-BUS (Packet Bus). 2. After completing step 1, enter **test port long *location***, and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.
1144	ABRT	The PPN’s packet bus is out-of-service. 1. Follow the repair procedures for the PPN’s packet bus. 2. After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
		1 of 2

Table 421: Signaling Link Status Test (#626) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port, or station may have been busied out by command. 1. Look in the Error Log for Error Type 18 (busied out) for ASAI-BD, ASAI-PT, ASAI-EPT, BRI-BD, BRI-PORT, or BRI-SET. 2. If this Error Type is present for ASAI-EPT or BRI-SET only, enter **release station *extension*** and run the test again. 3. If this Error Type is present for ASAI-PT *and* ASAI-EPT or BRI-PORT *and* BRI-SET, use **release port *location*** and run the test again. 4. If this Error Type is present for ASAI-BD, ASAI-PT, *and* ASAI-EPT or BRI-BD, BRI-PORT, *and BRI-SET*, enter **release board *location*** and run the test again.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1113	FAIL	The signaling link is not “bound” to the adjunct or endpoint. For BRI endpoints supporting MIM initialization, this error indicates that the endpoint has not been bound to a signaling link (that is, SPID initialization has not been completed). Since the signaling link associated with the endpoint is not identified until SPID initialization completes, this error does not imply that the signaling link is connected or disconnected at Layer 2 nor does it provide the status of TEI assignment for the endpoint. For ASAI adjuncts and BRI endpoints not supporting MIM initialization, this error indicates that the link is disconnected at Layer 2. Since the signaling link associated with the endpoint has been identified via administration, the link is only “unbound” from the endpoint when it is disconnected. 1. Enter **status bri-port *location*** and see the associated procedures in BRI-PORT (ISDN-BRI Port).
	PASS	The signaling link is connected at Layer 2 and “bound” to the BRI endpoint or ASAI adjunct.
		2 of 2

BRI Remote Loopback Test (#627)

This test checks the integrity of a circuit-switched B-channel connection between the switch and the endpoint.

The endpoint is put in the “maintenance busy” state to prevent the switch from entering calls to the endpoint during the test. An application message containing a loopback activate request for the appropriate B-channel is sent to the endpoint. The endpoint responds with a loopback activated response. The switch then sends data to the endpoint over the B-channel under test. Since the B-channel is looped back at the endpoint, maintenance should receive the data that it sent. If no data is detected, the test fails. The switch then releases the endpoint so that it is available to terminate calls.

This test is not executed for ASAI adjuncts because adjuncts do not support MIMs upon which this test is based. This test is run on BRI-SET, Various Adjuncts.

Table 422: BRI Remote Loopback Test (#627) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1000	ABORT	Could not seize the endpoint or B-channels for test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1005	ABORT	The endpoint’s MIMs Supported field is administered to “no.” 1. Enter **change station *extension*** to change the field only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Enter **test port *location* long** to clear any errors that prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Signaling Link Status Test (#626). 3. If the XID test (#628) continues to abort, escalate the problem.
		1 of 4

Table 422: BRI Remote Loopback Test (#627) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN's packet bus is out-of-service. 1. Follow the repair procedures for the packet bus. 2. After completing step 1, enter **test port long** ***location***, and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.
1144	ABRT	The PPN's packet bus is out-of-service. 1. Follow the repair procedures for the PPN's packet bus. 2. After completing step 1, execute **test port long** ***PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1187	ABORT	The circuit pack, port, or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. a. If this Error Type is present for BRI-SET only, then release the station via the **release station** b. If this Error Type is present for BRI-PORT and BRI-SET, then release the port with **release port** ***location*** and run the test again. c. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack with **release port** ***location*** and run the test again. d. If the error is present for both BRI-BD and BRI-PORT, release the circuit pack with **release board** ***location*** and run the test again. e. If the error is present for BRI-SET only, release the circuit pack with **release port** ***location*** and run the test again. **Note:** When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, enter **busyout port** ***location*** to busy them out. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
		2 of 4

Table 422: BRI Remote Loopback Test (#627) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2068	ABORT	The endpoint has rejected the switch sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Loopback testing. 1. Enter **change station *extension*** and set the **MIMs Supported** field to **n**.
2069	ABORT	The endpoint has returned an error response to the application message sent by the switch.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2000	FAIL	No loopback activation or deactivation response received from the endpoint. 1. Consult the endpoint documentation to determine if ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use **change station *extension*** to set the MIMs Supported field to **n**. Enter **busyout station *extension*** and **release station *extension*** to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. 2. If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.
2071 2072	FAIL	No data is detected on Channel B1 during loopback. No data is detected on Channel B2 during loopback. 1. Replace the endpoint and repeat test. 2. If test continues to fail, check the wiring between the endpoint and the switch and repeat the test.
		3 of 4

Table 422: BRI Remote Loopback Test (#627) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	PASS	The endpoint has responded to the switch activate and deactivate loopback application messages. Data has been detected on the looped back channels.
		4 of 4

BRI XID Test (#628)

This test checks the D-channel connection between the server and an endpoint or adjunct.

A D-channel XID frame is sent to the endpoint or adjunct over the point-to-point signaling link. The test passes if the endpoint or adjunct responds with a layer-2 XID-RESPONSE frame.

This test must be administered to not run on the Station Administration screen for ports on a TN2208.

This test runs on BRI-SET, Various Adjuncts.

Table 423: BRI XID Test (#628) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1000	ABORT	The BRI-SET, ASAI-ADJ, ATT-ADJ, LGATE-AJ, ATTE-AJ is busy. The test cot be executed at this time: 1. Wait 1 minute and rerun the command. 2. If this problem persists, escalate this problem. **Note**: A BRI-PORT can also be busy. When running this test for BRI-PORT or ABRI-PORT, the above maintenance objects can be changed to “BRI-PORT, ABRI-PORT, ATT-ADJ.”
1005	ABORT	The endpoint is not administered to support XID testing. 1. If the endpoint documentation reflects support XID testing, enter **`change station`** ***`extension`*** and change the **XID Testing** field on the screen to **y**.
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Enter **`test port`** ***`location`*** **`long`** to clear any errors that prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. 3. If the XID test (#628) continues to abort, escalate the problem.
		1 of 4

Table 423: BRI XID Test (#628) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN's packet bus is out-of-service. 1. Follow the repair procedures for the packet bus. 2. After completing step 1, enter **test port *location* long** and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.
1144	ABRT	The PPN's packet bus is out-of-service. 1. Follow the repair procedures for the PPN's packet bus. 2. After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
		2 of 4

Table 423: BRI XID Test (#628) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. a. If this Error Type is present for BRI-SET only, use **release station** to release the station. b. If this Error Type is present for BRI-PORT and BRI-SET, use **release port *location*** and run the test again. c. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, use **release port *location*** to release the circuit pack, and run the test again. If the error is present for BRI-SET only, use **release port *location*** to release the circuit pack, and run the test again. If the error is present for both BRI-BD and BRI-PORT, use **release board *location*** to release the circuit pack, and run the test again. **Note:** When you release the circuit pack, you release every port associated with it. If ports still need to be busied out, use **busyout port *location***. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
2012 2100	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
		3 of 4

Table 423: BRI XID Test (#628) ***4 of 4***

Error Code	Test Result	Description / Recommendation
2000	FAIL	The XID-RESPONSE message was not received from the endpoint. 1. Consult the endpoint's documentation to determine whether layer-2 XID and XID-RESPONSE messages are supported. If the documentation reflects no support for these messages, use **`change station`** ***`extension`*** and change the XID Testing field to **n**. 2. If the endpoint supports these layer-2 messages and the test continues to fail, assume the endpoint is defective and replace it. 3. If the test continues to fail, escalate the problem.
	PASS	The switch can successfully pass messages over the D-channel to the BRI endpoint.
		4 of 4

BRI Layer 3 Query Test (#629)

The BRI Layer 3 Query Test checks the application layer communications between the switch and the endpoint or adjunct.

For BRI endpoints, an application message containing the appropriate endpoint service state is sent by the switch to the endpoint. The endpoint responds with an acknowledgment to the application message.

This test is not executed for ASAI and Avaya adjuncts from the administration terminal. Rather, a query message is automatically sent by the switch every two minutes. Failure of the switch to receive a response to a query from the adjunct is logged in the Error Log.

This test is run on BRI-SET, Various Adjuncts.

Table 424: BRI Layer 3 Query Test (#629) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1005	ABORT	The endpoint's **MIMs Supported?** field is administered to "no." 1. Enter **`change station`** ***`extension`*** to change the field only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.
1113	ABORT	The signaling link between the switch and the endpoint or adjunct is down. 1. Enter **`test port`** ***`location`*** **`long`** to clear any errors that prevent establishment of the signaling link. 2. Examine the results of Test #626. If this test aborts or fails, follow the repair procedure for the Signaling Link Status Test (#626). 3. Escalate problem if BRI Layer 3 Query test continues to abort.
1139	ABORT	The PN's packet bus is out-of-service. 1. Follow the repair procedures for the packet bus. 2. After completing step 1, enter **`test port`** ***`location`*** **`long`**, and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.
1144	ABRT	The PPN's packet bus is out-of-service. 1. Follow the repair procedures for the PPN's packet bus. 2. After completing step 1, execute **`test port`** ***`PCSSpp`*** **`long`** and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
		1 of 3

Table 424: BRI Layer 3 Query Test (#629) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. a. If this Error Type is present for BRI-SET only, release the station with **`release station`**. b. If this Error Type is present for BRI-PORT and BRI-SET, release the port with **`release port`** ***`location`*** and run the test again. c. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, release the circuit pack with **`release board`** ***`location`*** and run the test again. d. If the error is present for both BRI-BD and BRI-PORT, release the circuit pack with **`release board`** ***`location`*** and run the test again. **Note:** When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use **`busyout port`** ***`location`*** to busy them out. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2068	ABORT	The endpoint has rejected the sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Endpoint Service messages. 1. Enter **`change station`** ***`extension`*** and change the **MIMs Supported (?)** field to **n**.
		2 of 3

Table 424: BRI Layer 3 Query Test (#629) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2069	ABORT	The endpoint has returned an error response to the switch sent application message. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2000	FAIL	No response is received from the endpoint or the adjunct. For BRI endpoints: 1. Consult the endpoint's documentation to determine whether ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use **change station *extension*** to change the MIMs Supported field to **n**. Enter **busyout station *extension*** and **release station *extension*** to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. 2. If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.
	PASS	The endpoint has successfully responded to the switch's application message.
		3 of 3

BRI Set Audits Test (#630)

This is a series of tests that are classified as audits. The switch sends messages to the BRI endpoint to perform the following tests:

- Ringer Audit – This audit verifies that both the switch and the endpoint agree as to the current state of the endpoint's ringer.
- Lamps Audit – This audit verifies that both the switch and the endpoint agree as to the current state of the endpoint's lamps.
- Call Activity Audit – This audit verifies that the state of calls is consistent between the switch and the endpoint.

This test is not executed for ASAI or Avaya adjunct because adjuncts do not employ ringers or lamps and do not establish calls on the B-channels associated with the BRI interface.

This test is run on BRI-SET, Various Adjuncts.

Table 425: BRI Set Audits Test (#630) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1113	ABORT	The signaling link between the switch and the endpoint is down. 1. Enter **test port *location* long** to clear any errors that prevent establishment of the signaling link. 2. Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Signaling Link Status Test (#626). 3. If the BRI Set Audits test continues to abort, escalate the problem.
1139	ABORT	The PN's packet bus is out-of-service. 1. Follow the repair procedures for the packet bus. 2. After completing step 1, enter **test port *location* long** and review the results of the BRI Port Local LAN Looparound Test (#618) to verify the repair.
1144	ABRT	The PPN's packet bus is out-of-service. 1. Follow the repair procedures for the PPN's packet bus. 2. After completing step 1, execute **test port *PCSSpp* long**, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
		1 of 2

Table 425: BRI Set Audits Test (#630) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. a. If this Error Type is present for BRI-SET only, release the station with **release station**. b. If this Error Type is present for BRI-PORT and BRI-SET, release the port with **release port *location*** and run the test again. c. If the error is present for BRI-BD, BRI-PORT, and BRI-SET, enter **release port *location*** to release the circuit pack, and run the test again. d. If the error is present for both BRI-BD and BRI-PORT, enter **release board *location*** to release the circuit pack, and run the test again. **Note:** When you release the circuit pack, you release every port associated with it. Enter **busyout port *location*** if ports still need to be busied out. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
	PASS	The switch has successfully executed the BRI station audit test.
		2 of 2

Primary Signaling Link Hardware Check (#636)

This test runs on ATM-SGRP (ATM Signaling Group) and ISDN-SGR (ISDN-PRI Signaling Group).

For **ATM-SGRP**, the ATM-SGRP Signaling Group D-channel port depends on the health of the TN230X interface circuit pack on which it resides. This test fails if there are problems with either the ATM-DCH (D-channel port) MO or the TN230X circuit pack. Investigate the ATM TN230X circuit pack ATM-TRK (Circuit Emulation Service Circuit Pack) anytime there are problems with the ATM D-channel port ATM-DCH (ATM D-Channel Port).

For **ISDN-SGR**, the ISDN-PRI Signaling Group D-channel port depends on the health of the TN464 UDS1 Interface circuit pack or DS1 Interface Media Module on which it resides. This test will fail if there are problems with either the ISDN-PRI Primary D-channel port or the UDS1 circuit pack or DS1 Media Module. If there are problems with the ISDN-PLK (ISDN-PRI Signaling Link Port), also investigate UDS1-BD (UDS1 Interface Circuit Pack) or MG-DS1 (DS1 Interface Media Module).

Table 426: Primary Signaling Link Hardware Check (#636) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with the primary D-channel port is detached from the circuit pack or media module. This is a normal abort when the rollabout video feature is enabled. To complete test on this port, either: 1. Re-attach the disconnected PRI terminal adapter, **or** 2. Enter **`change ds1`** ***`location`*** to disable rollabout video on the board, and set the **Alarm when PRI Endpoint Detached** field to **y**.
		1 of 2

Table 426: Primary Signaling Link Hardware Check (#636) ***2 of 2***

Error Code	Test Result	Description / Recommendation
8	FAIL	**ATM-SGRP**: There is a problem with the ATM TN230X circuit pack or the ATM signaling channel (D-channel), preventing any ISDN trunk calls until the problem is resolved. 1. Consult the procedures for the TN230X ATM-TRK (Circuit Emulation Service Circuit Pack) and the ATM-DCH (ATM D-Channel Port). **ISDN-SGR**: There is a problem with the UDS1 TN464 UDS1 circuit pack or the DS1 Interface Media Module or the ISDN-PRI Signaling channel (D-channel). No ISDN trunk or PRI endpoint calls can be made until the problem is resolved. 1. Consult the procedures for the UDS1-BD (UDS1 Interface Circuit Pack) or the MG-DS1 (DS1 Interface Media Module), and the ISDN-PLK (ISDN-PRI Signaling Link Port).
	PASS	The basic physical connectivity of the primary D-channel is intact and functional. Try this test repeatedly to ensure the link is up and to uncover any transitory problems.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Remote Layer 3 Query (#637)

This test will query the far-end switch or terminal adapter to determine whether the signaling connection is functioning properly at Layer 3. It will select a B-channel in the in-service or maintenance service state and send an ISDN layer-3 SERVice message, which requires a response from the far end. The test will not be performed if there are no B-channels in an appropriate ISDN service state (as when none are administered or they are all out of service).

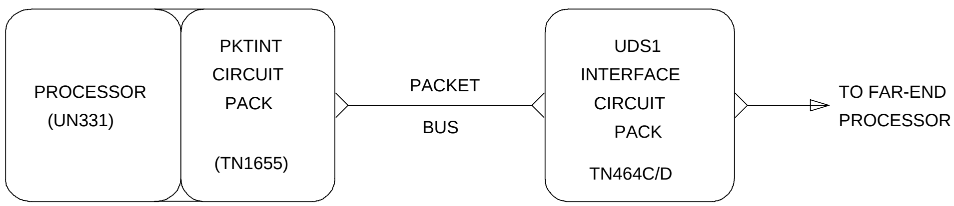
Note:

Enter **`status trunk`** ***`grp#/mem#`*** or **`status pri-endpoint`** to see the service state.

A PASS indicates only that a message was successfully sent to the far-end switch or terminal adapter. The ISDN PRI Specification allows up to 2 minutes for a response.

Tests #639 and #636 check the health of the D-channels and DS1/UDS1 Interface circuit packs or DS1 Interface Media Modules. As shown in Figure 106: Remote Layer 3 Query Test Diagram (#637), this test goes one step further by checking the communication path from the processor, through the TDM/packet bus and DS1/UDS1 Interface circuit pack, or through the Media Module, and on to the far-end switch or terminal adapter. A special ISDN message is sent to the far-end switch or terminal adapter, which must respond within a specified amount of time. This test is designed to ensure that the communication path between the switch and the far end is up and operational, and that the two endpoints can properly exchange ISDN control messages.

Figure 106: Remote Layer 3 Query Test Diagram (#637)



For systems supporting circuit packs, Figure 106: Remote Layer 3 Query Test Diagram (#637) illustrates a UDS1 Interface circuit pack located in the PN. When the UDS1 board resides in a PN, there is additional PNC hardware connecting the packet buses of the IPSI PN and PN. Examples of such hardware are the Center Stage Switch and fiber-optic cables.

This test runs on ISDN-SGR (ISDN-PRI Signaling Group).

Table 427: Remote Layer 3 Query (#637) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry the command a 1-minute intervals up to 5 times.
		1 of 3

Table 427: Remote Layer 3 Query (#637) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1006	ABORT	There are no associated B-channels in an ISDN in-service or maintenance service state. For country protocol 1 interfaces (including the USA), either there are no B-channels administered in this signaling group, or all B-channels in this signaling group are either out-of-service or are in a “pending” state (PINS or PMTC, indicating that a B-channel maintenance message for that B-channel has been sent and not yet acknowledged). This is a NORMAL ABORT. 1. Administer or release an ISDN trunk or PRI endpoint before retrying the test. For an ISDN trunk, use **status trunk** ***grp#/ mem#*** to verify the ISDN trunk state. For a PRI endpoint, use **status pri-endpoint** ***extension***. Then, retry this test when at least one B-channel is in the in-service or maintenance states. For systems not using country protocol 1 interfaces, there are no B-channels administered in this signaling group.
1019	ABORT	There is already a Remote Layer 3 Query in progress. This is a normal ABORT. 1. Wait two minutes, then follow the procedures for when this test passes.
1113	ABORT	The signaling channel is down. Therefore, no messages can be sent to the far-end switch or terminal adapter. 1. Examine the results of Tests #636 and the Secondary Signaling Link Hardware Check (#639) and follow recommendations provided there.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2500 or none	ABORT	Internal system error **or** administration problem 1. Determine whether any B-channels are administered. If not, then this is a normal ABORT since this test cot run unless at least one B-channel is administered. If at least one B-channel is administered, there is an internal system error. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error. See description of ABORT with Error Code 2500.
		2 of 3

Table 427: Remote Layer 3 Query (#637) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	PASS	A message was composed and sent to the far-end switch or terminal adapter. The ISDN PRI specification allows up to 2 minutes for a reply. 1. Check the Error Log for ISDN-PLK (ISDN-PRI Signaling Link Port) for errors of type 2305 for evidence of a Remote Layer 3 Query failure. If no new errors were logged since this test was run, then this switch and the far-end switch or terminal adapter can exchange call control messages. 2. If there is still a problem with a particular ISDN trunk or PRI endpoint, busyout the trunk and run the long test sequence, paying particular attention to the results of ISDN Test Call Test (#258).
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Secondary Signaling Link Hardware Check (#639)

The ISDN-PRI Signaling Group D-channel port depends on the health of the TN464 UDS1 Interface circuit pack or DS1 Interface Media Module on which it resides. This test will fail if there are problems with the ISDN-PRI Secondary D-channel port or the UDS1 circuit pack or the DS1 Media Module. This test will abort if a Secondary D-channel is not administered for the signaling group. If there are problems with the ISDN-PRI Secondary Signaling Channel port (ISDN-PLK), also investigate the UDS1-BD (UDS1 Interface Circuit Pack), DS1-BD (DS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module).

This test runs on ISDN-SGR (ISDN-PRI Signaling Group).

Table 428: Secondary Signaling Link Hardware Check (#639) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 428: Secondary Signaling Link Hardware Check (#639) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1132	ABORT	The Secondary D-channel is not administered for this Signaling Group. This is a NORMAL ABORT. Only a Primary D-channel must be administered for a Signaling Group. No action is necessary.
4	FAIL	There is a problem with the Processor Interface Link. No DS1 ISDN Trunk (B-channel) or Wideband PRI Endpoint calls can be made until the problem is resolved. 1. Display the Communication-Interface Links Form with **`display communication-interface`** to determine which link is down. Find the one that matches the DS1 Interface circuit pack on which this ISDN-PRI Signaling Link Port resides, and refer to PKT-INT (Packet Interface).
8	FAIL	There is a problem with the TN464 UDS1 Interface circuit pack, the DS1 Interface Media Module, or the ISDN-PRI Secondary Signaling Channel (D-channel). No ISDN trunk or PRI endpoint calls can be made until the problem is resolved. 1. Consult the procedures for the TN464 circuit pack for UDS1-BD (UDS1 Interface Circuit Pack), DS1-BD (DS1 Interface Circuit Pack), or MG-DS1 (DS1 Interface Media Module), and the ISDN-PLK (ISDN-PRI Signaling Link Port).
	PASS	The basic physical connectivity of the Signaling Group’s Secondary D-channel is intact and functional. Try this test repeatedly to ensure the link is up and to uncover any transitory problems.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Signaling Link Board Check (#643)

This test checks the health of the critical ATM TN230X circuit pack, DS1 Interface circuit pack, or DS1Interface media module hardware components required by the signaling link.

This test runs on ATM-DCH (ATM D-Channel Port) and ISDN-PLK (ISDN-PRI Signaling Link Port).

Table 429: Signaling Link Board Check (#643)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this D-channel port is detached from the circuit pack. This is normal when the rollabout video feature is enabled. To complete a test on this port: 1. Re-attach the disconnected PRI terminal adapter. 2. Enter **change ds1 location** to disable rollabout video on the board, and set the “Alarm when PRI Endpoint Detached” field to **y**.
8	FAIL	The circuit pack is not in service. 1. Check the Hardware Error Log for entries logged against UDS1-BD or ATM-TRK. Consult UDS1-BD (UDS1 Interface Circuit Pack) or ATM-TRK (Circuit Emulation Service Circuit Pack) for repair procedures.
	PASS	The circuit pack or media module transporting the ISDN-PRI Signaling Link Port is in service.
Any	NO BOARD	See NO BOARD for the repair procedures.

Layer 2 Status Query Test (#647)

The Layer 2 Status Query Test checks the Layer 2 status of the ATM-SGRP or ISDN-PRI Signaling Channel (D-channel). This test will fail if there is a hardware failure or a facility problem, or if the primary and secondary ISDN-PRI D-channelchannels are not administered correctly.

The Primary and Secondary Signaling Link Hardware Tests (Tests #636 and #639), the ATM Remote Layer 3 Query Test (test #1291), and the Remote Layer 3 Query Test (#637) will detect most problems caused by hardware failures or incorrect administration.

This test runs on ATM-SGRP (ATM Signaling Group) and ISDN-SGR (ISDN-PRI Signaling Group).

Table 430: Layer 2 Status Query Test (#647) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1132	ABORT	The port location for the primary D-channel is not known. This condition should not be possible since an administered circuit pack or media module must be specified when a Signaling Group is administered. 1. Retry the command at 1-minute intervals up to 5 times.
1134	ABORT	The associated circuit pack or media module is not administered. This condition should not be possible since an administered circuit pack or media module must be specified when a Signaling Group is administered. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error: 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Layer 2 of the primary signaling channel is down: 1. Examine the results of the Primary Signaling Link Hardware Check (#636), and follow recommendations provided there. 2. If Test #636 passes, the Layer 2 Query test may still fail if the signaling channel at the far end has not been administered correctly or if the signaling channel has been busied out. a. Verify that the Primary Signaling Channel (D-channel) at the far end has been administered correctly. b. Verify that the port used for the Primary D-channel has not been busied out at the far end.
2	FAIL	Layer 2 of the secondary signaling channel is down. 1. Examine the results of the Secondary Signaling Link Hardware Check (#639), and follow recommendations provided there. 2. If tests #639 passes, the Layer 2 Query test may still fail if the signaling channel at the far end has not been administered correctly or if the signaling channel has been busied out. a. Verify that the Secondary Signaling Channel (D-channel) at the far end has been administered correctly. b. Verify that the port used for the Secondary D-channel has not been busied out at the far end.
		1 of 2

Table 430: Layer 2 Status Query Test (#647) ***2 of 2***

Error Code	Test Result	Description / Recommendation
3	FAIL	Both the primary and secondary signaling channels are down. 1. Examine the results of the Primary Signaling Link Hardware Check (#636) and Secondary Signaling Link Hardware Check (#639) and follow the recommended procedures if either test fails. 2. If tests #636 and #639 pass, the Layer 2 Query test may still fail if the signaling channel at the far end has not been administered correctly or if the signaling channel has been busied out. a. Verify that the Primary and Secondary Signaling channels (D-channel) at the far end has been administered correctly. b. Verify that the port used for the Primary and Secondary D-channels has not been busied out at the far end.
	PASS	The Primary Signaling channel is up and, if administered, the Secondary channel is up.
Any	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Stratum-3 Clock Alarm Query (#649)

The Stratum-3 Clock Alarm Query Test queries the Stratum-3 clock for its alarm status and reports the results of the query. The Stratum-3 clock provides the system with the following six alarm indications via the TN780 Tone-Clock circuit pack:

- Reference A failed or CI card A failed.
- Reference B failed or CI card B failed.
- One power supply failed.
- Every power supply failed.
- One clock unit failed.
- Every clock unit failed.

CAUTION:

The removal of a card in the Stratum-3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum-3 clock to full service.

This test runs on STRAT-3 (Stratum-3 Clock) and SYNC (Port Network Synchronization).

Table 431: Stratum-3 Clock Alarm Query Test (#649) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1000	ABORT	The system could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to up to 3 times.
1005	ABORT	This test aborts when it is run on a Stratum-4 system. Do not change synchronization to Stratum 3 without consulting the synchronization plan administrator for this switch.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 5

Table 431: Stratum-3 Clock Alarm Query Test (#649) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1	FAIL	Either Reference A failed or CI card A failed. This condition usually indicates a failure of the DS1 reference. However, there may also be a failure of the CI card to which the reference is connected. The system technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure. If you are NOT ON-SITE, use the following procedure: 1. Enter **`display errors`** and look for DS1-BD errors. See DS1-BD (DS1 Interface Circuit Pack) for the recommended repair procedures. 2. If there are no DS1-BD errors **or** after resolving every DS1-BD error, enter **`test synchronization r 4`** to see if the alarm still exists. If every test repetition passes, the alarm no longer exists. Otherwise, the system technician should be dispatched with a spare CI card to use the following instructions on-site. If you are ON-SITE, use the following procedure: 1. Look for a red LED on CI card A (i.e., the left CI card). If there is a red LED, replace the CI card if a spare is available. If no spare CI is available on-site, proceed to Step 3. 2. If, after replacing the CI card, the red LED on the new CI card also lights, proceed to Step 3. Otherwise, enter **`test synch r 4`** to clear the alarm. If any test repetitions fail, follow the procedure for those failures. 3. Enter **`display errors`** and look for DS1-BD errors. If there are errors, see DS1-BD (DS1 Interface Circuit Pack) for the recommended repair procedures. If there are no DS1-BD errors, then proceed to Step 4. 4. After every DS1-BD error has been resolved or if there are no DS1-BD errors, enter **`test synch r 4`** to clear the alarm and see if the alarm still exists. If any test repetitions fail, follow the procedures for those test failures. 5. Check the DS1 reference A connections to the Stratum-3 clock.
		2 of 5

Table 431: Stratum-3 Clock Alarm Query Test (#649) ***3 of 5***

Error Code	Test Result	Description / Recommendation
2	FAIL	One power supply failed. This error occurs when the Stratum-3 clock has two power supplies and one of them has failed. However, the clock can function with one power supply. 1. Locate the failed power supply (the one with a red LED), and replace it. The power supplies reside under the Stratum-3 clock's carrier. 2. To determine whether the alarm still exists, enter **`test synch r 4`** to clear the alarm. If any test repetitions fail, follow the procedures for those failures.
4	FAIL	One clock unit failed. 1. Look at the Stratum-3 cabinet for a red LED on a circuit card marked "ST3." Replace the card. 2. To determine whether the alarm still exists, enter **`test synch r 4`** to clear the alarm. If any test repetitions fail, follow the procedures for those failures.
		3 of 5

Table 431: Stratum-3 Clock Alarm Query Test (#649) *4 of 5*

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>8</td><td>FAIL</td><td>Reference B failed or CI card B failed. This condition usually indicates a failure of the DS1 reference. However, there may also be a failure of the CI card to which the reference is connected. The system technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure.

If you are NOT ON-SITE, use the following procedure:
3. Enter display errors and look for DS1-BD errors. See DS1-BD (DS1 Interface Circuit Pack) for the recommended repair procedures.
4. If there are no DS1-BD errors or after resolving every DS1-BD error, enter test synchronization r 4 to see if the alarm still exists. If every test repetition passes, the alarm no longer exists. Otherwise, the system technician should be dispatched with a spare CI card to use the following instructions on-site.
If you are ON-SITE, use the following procedure:
1. Look for a red LED on CI card B (i.e., the right CI card). If there is a red LED, replace the CI card if a spare is available. If no spare CI is available on-site, proceed to Step 3.
2. If, after replacing the CI card, the red LED on the new CI card also lights, proceed to Step 3. Otherwise, enter test synch r 4 to clear the alarm. If any test repetitions fail, follow the procedure for those failures.
3. Enter display errors and look for DS1-BD errors. If there are errors, see DS1-BD (DS1 Interface Circuit Pack) for the recommended repair procedures. If there are no DS1-BD errors, then proceed to Step 4.
4. After every DS1-BD error has been resolved or if there are no DS1-BD errors, enter test synch r 4 to clear the alarm and see if the alarm still exists. If any test repetitions fail, follow the procedures for those test failures.
5. Check the DS1 reference B connections to the Stratum-3 clock.</td></tr>
<tr><td colspan="3" align="right">4 of 5</td></tr>
</table>

Table 431: Stratum-3 Clock Alarm Query Test (#649) ***5 of 5***

Error Code	Test Result	Description / Recommendation
16	FAIL	Every power supply failed. 1. Replace the failed power supplies. 2. If battery backup for the Stratum-3 clock is not supplied or if the battery backup holdover time has been exceeded, the system will be referencing the local oscillator on the active TN780 Tone-Clock circuit pack until software detects that one or both power supplies have been restored (approximately 40 minutes). To speed up this restoration, enter **`test synch r 4`**. 3. Every test should pass. If any repetitions fail, follow the procedures for those failures. Note: The battery backup resides under the Stratum-3 clock's carrier.
32	FAIL	Every clock unit failed. 1. Look at the Stratum-3 cabinet for red LEDs on circuit cards marked "ST3." Replace the card(s). 2. To determine whether the alarm still exists, enter **`test synch r 4`** to clear the alarm. 3. If any test repetitions fail, follow the procedures for those failures.
2101	FAIL	The TN780 Tone-Clock circuit pack detects loss of signal. See note (h) of the STRAT-3 Error Log Entries table in the STRAT-3 (Stratum-3 Clock) documentation for replacement procedures.
	PASS	The Stratum-3 clock has reported that it has no alarm conditions. If synchronization problems have been reported, look for SYNC errors and see SYNC (Port Network Synchronization) for recommended strategy for the recommended repair procedures for those errors.
		5 of 5

Standby Reference Health Check Test (#651)

This test evaluates the quality of the external synchronization timing source for a standby IPSI or Tone-Clock circuit pack. Every administered synchronization timing source must be valid for this test to pass. If the Tone-Clock circuit and the synchronization timing sources are in different port networks, the EI circuit packs transport the timing sources to the tone-clock.

Note:

This test only runs on the standby IPSI or Tone-Clock circuit pack in a port network with more than one IPSI or Tone-Clock circuit pack (high- or critical-reliability option). The Tone-Clock circuit pack must be a TN780 with firmware 2 or higher, or a TN2182.

This test runs on the following maintenance objects:

- TDM-CLK (TDM Bus Clock)
- TONE-BD (Tone-Clock Circuit Pack)
- TONE-PT (Tone Generator)

Table 432: Standby Reference Health Check Test (#651)

Error Code	Test Result	Description / Recommendation
	ABORT	This test may already be running due to a tone-clock installation, scheduled maintenance, alarm activity, or a demand test from another terminal. This abort can also occur due to an internal system error. 1. Try the command again at 1-minute intervals up to five times.
1184	ABORT	This test requires an external synchronization source to be administered (DS1 primary, DS1 primary and secondary, or Stratum-3 clock). 1. Administer the external synchronization source and retry the test.
2500	ABORT	Internal system error 1. Try the command again at 1-minute intervals up to 5 times.

Table 432: Standby Reference Health Check Test (#651)

Error Code	Test Result	Description / Recommendation
0	FAIL	The external synchronization timing source for side A of the Stratum-3 clock or for the primary DS1 reference is either absent or invalid. The external synchronization timing source for side B of the Stratum-3 clock or the secondary DS1 reference is not yet tested.
1	FAIL	The external synchronization timing source for side B of the Stratum-3 clock or for the secondary DS1 reference is either absent or invalid. 1. Correct the synchronization source problem. See SYNC (Port Network Synchronization). 2. If the error still exists, replace the IPSI or Tone-Clock circuit pack reported in the error log. See Replacing the IPSI or Tone-Clock Circuit Pack.
	PASS	The external synchronization timing source is valid.

Tie Trunk Dial Test (#747)

This test performs a dial tone/seizure test on a 2W LD tie trunk port. It seizes a trunk and outpulses a pause digit. It aborts on ports administered as access endpoints.

This test runs on TIE-TRK (Analog Tie Trunk).

Table 433: Tie Trunk Seizure Test (#747) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 433: Tie Trunk Seizure Test (#747) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. 1. Enter **`display trunk-group`** ***`xx`*** to determine the trunk group/member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. If the port status is active but the port is idle (no calls), check the Error Log for Error Type 1025. See the Error Log table for TIE-TRK (Analog Tie Trunk) for the description of this error and required actions. The port may be locked up. The far-end may not be releasing. 4. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **`display trunk-group`** ***`xx`*** to determine the trunk group/member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not valid for this trunk translation. Must be a wink-start or delay dial trunk and must be outgoing or 2-way for this test to run. For the TN2140, the trunk must also be continuous-seize-ack or discontinuous-seize-ack. 1. Check trunk translation. If it is not a wink-start or delay dial trunk, this abort message should be ignored.
1018	ABORT	Test disabled via administration. 1. Verify that the **Maintenance Tests** field on the **Trunk Group** screen is **n**. To enable the test, enter **`change trunk-group`** ***`x`*** where ***`x`*** is the number of the trunk group to be tested, and enter **y** in the **Maintenance Tests** field.
		2 of 3

Table 433: Tie Trunk Seizure Test (#747) *3 of 3*

Error Code	Test Result	Description / Recommendation
1040	ABORT	This test is not executed on trunk ports which are administered as access endpoints. 1. Verify that this port is an access endpoint by entering **`display port`**. 2. If the port has been administered as an access endpoint, this test should abort and this error can be ignored.
2000	ABORT or FAIL	Seizure message is not received back within 10 seconds. 1. Retry the command at 1-minute intervals a maximum of 5 times. 2. If the test continues to fail, check the far-end to ensure a translation match at both ends. 3. Check the facility.
2100	ABORT	Could not allocate the necessary system resources to run the test. 1. Retry the command at 1-minute intervals up to 5 times.
3	FAIL	No dial tone detected from the other end. (TN439 circuit packs only.) 1. Retry the command at one minute intervals up to five times. 2. If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. 3. Check the facility.
	PASS	The relevant Seizure test passes. This port is functioning properly. 1. If users are reporting troubles, examine loop connections to the port, wiring, and stations.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

SNI Circuit Path Test (#755)

The SNI Circuit Path Test performs an on-board test of the circuit path. It runs on SNI-BD (SNI Circuit Pack) and SNI-PEER (SNI Peer Link).

Table 434: SNI Circuit Path Test (#755) ***1 of 4***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received incorrect message data from the SNI circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNI circuit pack responded that software test requested is not valid. 1. Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 4

Table 434: SNI Circuit Path Test (#755) *2 of 4*

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where the SNI resides to verify whether the LEDs on the board turn on. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run Test #760 with **`test board`** ***`location`*** **`l`** for the active SNC in this carrier. Wait 5 minutes, then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **`list fiber-link`** to check the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: ● SYNC (Port Network Synchronization) ● SNI-BD (SNI Circuit Pack) ● SNC-BD (Switch Node Clock Circuit Pack) ● FIBER-LK (Fiber Link) ● SNI-PEER (SNI Peer Link) 4. Follow the Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
		2 of 4

Table 434: SNI Circuit Path Test (#755) ***3 of 4***

Error Code	Test Result	Description / Recommendation
102 - 109, 113 - 120	FAIL	The SNI circuit pack cot communicate with the SNI in a different slot over the circuit path. 1. Determine the slot number of the other SNI: Subtract 100 from the Error Code. For example, if the Error Code is 115, the SNI slot number is 15. This number is referred to as the "specified SNI slot". 2. Fix any on-board SNI-BD errors against this SNI and the SNI in the specified SNI slot. Enter **display errors** to find any SNI-BD errors, and enter **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD (SNI Circuit Pack). 3. Enter **display errors** and check the error log for other SNI circuit packs with SNI-PEER errors. See Table 435: SNI Slot / Error Type to determine the Error Type for SNI-PEER. For example, if the specified SNI slot number is 13, look for SNI-PEER errors with Error Type 2049. If other SNI circuit packs have SNI-PEER errors with the same Error Type, replace the SNI in the specified SNI slot. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 4. If other SNI circuit packs do not have SNI-PEER errors with the same Error Type, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. a. Replace this SNI. b. Replace the SNI in the specified SNI slot.
		3 of 4

Table 434: SNI Circuit Path Test (#755) *4 of 4*

Error Code	Test Result	Description / Recommendation
122	FAIL	The SNI circuit pack cot communicate with its neighbor via the circuit path. 1. Fix any on-board errors (SNI-BD (SNI Circuit Pack), EXP-INTF (Expansion Interface Circuit Pack), and/or DS1C-BD (DS1 Converter Circuit Pack)) against the components of this fiber link by using **display errors** and **display alarms** and following the repair procedures. Enter **list fiber-link** to find the fiber link associated with this SNI. The **display fiber-link** command can then be used to find the endpoints of the fiber link and the DS1C circuit pack locations if this fiber link has a DS1 Converter complex administered.) 2. Enter **display errors** and follow the repair procedures for any FIBER-LK entries for the fiber this SNI is administered on. Check **list fiber-link** to determine the administered fiber. 3. If this fiber link has a DS1 converter complex administered, enter **display errors** and **display alarms** and follow the repair procedures for any off-board DS1C-BD or DS1-FAC entries for either of the DS1C boards administered or for the DS1 facilities associated with either of the DS1C boards administered. 4. Replace this SNI.
	PASS	The SNI passed the SNI circuit path test.
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back. Therefore, **reset board** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		4 of 4

Table 435: SNI Slot / Error Type

Specified SNI Slot	Error Type
2	1
3	257
4	513
5	769
6	1025
7	1281
8	1537
9	1793
13	2049
14	2305
15	2561
16	2817
17	3073
18	3329
19	3585
20	3841

SNI Destructive Facility Off-Board Test (#756)

This test is destructive.

The SNI runs a destructive looparound of the on- and off-board looparounds. This test returns the result of the off-board looparound, while Test 757 returns the result of the on-board looparound. For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

The test runs on the following maintenance objects:

- FIBER-LK (Fiber Link)
- SNI-BD (SNI Circuit Pack)

- [SNI-PEER (SNI Peer Link)](#)

Table 436: SNI Destructive Facility Off-Board Test (#756) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1015	ABORT	**FIBER-LK**: This test cot run because the fiber link has not been busied out. Busyout the fiber link with **busyout fiber-link F P**, then enter **test fiber-link F P long**. **SNI-BD**: The test cot run because the SNI circuit pack has not been busied out. Enter **busyout board *location*** to busyout the SNI circuit pack, then enter **test board *location* long**.
1415 1416	ABORT	The lightwave transceiver is absent from Endpoint 1 of the fiber link. The lightwave transceiver is absent from Endpoint 2 of the fiber link. 1. If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1 converter circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. This test can only be run when a lightwave transceiver exists. 2. Enter **list fiber-link** to display fiber link endpoints. 3. Check the lightwave transceiver connections. 4. Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. 5. Replace the SNI circuit pack.
		1 of 4

Table 436: SNI Destructive Facility Off-Board Test (#756) ***2 of 4***

Error Code	Test Result	Description / Recommendation
2100 2300 2301 2304	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. The SNI circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 4

Table 436: SNI Destructive Facility Off-Board Test (#756) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run **test led switch-node** for the switch node where the SNI board(s) reside to verify whether their LEDs light. 2. If LEDs light on the other boards in the same carrier but not on this board, enter **test board location long** to run Test #760 for the active SNC in this carrier. Wait 5 minutes, and try step 1 again. If the board's LEDs still do not light, replace the board. Replacing an SNI may be service interrupting. Refer to SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Check **list fiber-link** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: • SYNC (Port Network Synchronization) • SNI-BD (SNI Circuit Pack) • SNC-BD (Switch Node Clock Circuit Pack) • FIBER-LK (Fiber Link) • SNI-PEER (SNI Peer Link) e. For SNI-BD, see Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
		3 of 4

Table 436: SNI Destructive Facility Off-Board Test (#756) ***4 of 4***

Error Code	Test Result	Description / Recommendation
127 227	FAIL	The data is not correctly looped around on Endpoint 1 of the fiber link. The data is not correctly looped around on Endpoint 2 of the fiber link. 1. Enter **`list fiber-link`** to display fiber link endpoints. 2. Check the lightwave transceiver. 3. Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers. 4. Replace the SNI circuit pack.
	PASS	No problems associated with this test are detected on the SNI(s).
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNI. It may be necessary to use **`reset board`** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back. Therefore, **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		4 of 4

SNI Destructive Facility On-board Test (#757)

This test is destructive.

The SNI runs a destructive looparound of the on- and off-board looparounds. This test returns the result of the on-board looparound, while Test 756 returns the result of the off-board looparound.

For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

This test runs on the following maintenance objects:

- FIBER-LK (Fiber Link)
- SNI-BD (SNI Circuit Pack)
- SNI-PEER (SNI Peer Link)

Table 437: SNI Destructive Facility On-board Test (#757) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1015	ABORT	**FIBER-LK**: The test cot run because the fiber link has not been busied out. Busyout the fiber link with **busyout fiber-link F P**, then enter **test fiber-link F P long**. **SNI-BD**: The test cot run because the SNI circuit pack has not been busied out. Enter **busyout board** to busyout the SNI circuit pack, then enter **test board *location* long**.
		1 of 4

Table 437: SNI Destructive Facility On-board Test (#757) ***2 of 4***

Error Code	Test Result	Description / Recommendation
2100 2300 2301 2304	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. SNI circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 4

Table 437: SNI Destructive Facility On-board Test (#757) ***3 of 4***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where the SNI board(s) reside to verify whether their LEDs light. 2. If LEDs light on the other boards in the same carrier but not on this board, enter **`test board location long`** to run Test #760 for the active SNC in this carrier. Wait 5 minutes, and try step 1 again. If the board's LEDs still do not light, replace the board. Replacing an SNI may be service interrupting. Refer to SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Check **`list fiber-link`** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: • SYNC (Port Network Synchronization) • SNI-BD (SNI Circuit Pack) • SNC-BD (Switch Node Clock Circuit Pack) • FIBER-LK (Fiber Link) • SNI-PEER (SNI Peer Link) e. For SNI-BD, see Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
127 227	FAIL	The data is not correctly looped around on Endpoint 1 of the fiber link. The data is not correctly looped around on Endpoint 2 of the fiber link. 1. Enter **`list fiber-link`** to display fiber link endpoints. 2. Replace the SNI circuit pack.
		3 of 4

Table 437: SNI Destructive Facility On-board Test (#757) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	PASS	No problems associated with this test are detected on the SNI(s). 1. Enter
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNI. It may be necessary to use **`reset board`** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back. Therefore, **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		4 of 4

Configuration Audit (#759)

This test performs a Configuration Audit for an SNI or an SNC circuit pack. It runs on the following maintenance objects:

- FIBER-LK (Fiber Link)
- SN-CONF (Switch Node Configuration)
- SNC-BD (Switch Node Clock Circuit Pack)
- SNC-LINK (Switch Node Clock Link)
- SNC-REF (Switch Node Clock Reference)
- SNI-BD (SNI Circuit Pack)
- SNI-PEER (SNI Peer Link)

For SNI circuit packs, this test determines if the circuit pack can communicate with:

- the active SNC
- its neighbor over the fiber link
- peer SNIs

For SNC circuit packs, this test determines if the circuit pack can communicate with the other SNC, and which SNIs the SNC can talk to over the serial communication channel.

This test is run by entering **test board** or **test board long** for SNI or SNC circuit packs, or **test fiber-link** for fiber links with SNI or EI endpoint(s).

Failures of this test cause entries in the error and alarm logs against Switch Node Configuration (SN-CONF) with the board location of the SNI or SNC.

For descriptions of result codes for this test, see:

- FIBER-LK Error codes and recommended actions for fiber links.
- SNC-BD Error codes and recommended actions when the circuit pack tested is a Switch Node Clock (circuit pack slots 10 or 12).
- SNI-BD Error codes and recommended actions when the circuit pack tested is a Switch Node Interface (circuit pack slots 2–9 or 13–20).

Incorrectly Connected Administered Fibers

Some physically connected fibers that do not match fiber administration can cause port network problems that are not detected and alarmed by this test. The symptoms will usually be phone calls not working correctly, and port network component alarms due to translation mismatches.

This test is unable to detect the case where an SNI is connected to the same type of board (EI or SNI) as administered but located in a different cabinet with the same carrier and same slot as the administered fiber endpoint. Enter **list fiber-link** to view the administered fiber endpoint. This test detects if the fiber endpoint connected to the SNI is in a different carrier and slot location than the administered fiber endpoint.

Incorrectly Connected SNI-to-EI Fibers

If the SNI is connected to the same type of fiber endpoint as the administered fiber endpoint, but the location is the same as administered except for the cabinet, every phone call will work incorrectly; some phone calls will not go through and others will ring the wrong phone.

To check connectivity:

1. Enter **test led port-network** for each administered port network and verify that the LEDs on the correct port network are lit.
2. If the LEDS are not lit, enter **list fiber-link.** Check that the fiber connections to the port network are consistent with the administered fibers connections of the port network that does not light the LEDs as expected.
3. Run **test led switch-node** on each administered switch node carrier and verify that the LEDs on the correct carrier are lit.
4. If they are not, check the connectivity to the switch node carrier that does not light the LEDs as expected.

Incorrectly Connected SNI-to-SNI Fibers between Three Switch Nodes

If the system has more than 2 switch nodes, SNI-to-SNI fibers administered between 2 switch nodes could be incorrectly connected to a third switch node. This is a problem that could occur during installation or when inter-switch node fibers are changed. For multiple fibers to a distant switch node, an incorrect connection would not appear as a problem unless this fiber is used for a system link to a port network connected to the distant switch node.

Enter **`status sys-link`** to determine the boards in the path from an IPSI connected PN to another specific PN. A specific SNI-to-SNI fiber connection must be in the system-link path to be checked with the port network LED test.

Forcing SNI-to-SNI Fiber Connection

To force an SNI-to-SNI fiber connection to be used as a system-link, remove every SNI-to-SNI connection except the fiber link being tested at the distant switch node by removing SNI boards in the distant switch node.

1. Enter **`status sys-link`** to verify that the fiber selected for test is in the path to the PN connected to the distant switch node that will be used for the LED test.
2. Run **`test led`** on a port network to verify this fiber connection.
3. Repeat the above procedure for each of the SNI-to-SNI fibers terminating on the distant switch node.

Testing Multiple Fiber Connections

To test multiple fiber connections to a distant switch node:

1. Enter **`list fiber-link`** to determine the number of SNI-to-SNI fibers that are administered to and terminate on the distant switch node.
2. Run **`test led port-network`** on a PN connected to the distant switch node, and verify the LEDs on the correct PN are lit.
3. Enter **`status sys-link`** and select the active EI in the IPSI connected PN connected to the distant PN under test. The display will show the path from the IPSI connected PN and the SNI-to-SNI fiber being used.
4. If the PN's LEDs are lit and there are multiple fibers to the distant switch node, remove the SNC that is listed by **`list fiber-link`** for this path.

   If the PN's LEDs are not lit, enter **`list fiber-link`** to verify that the fiber connections to the PN are consistent with the administration assignments.
5. Enter **`status sys-link`** to determine the new path from the IPSI connected PN to the distant switch.

6. Run **`test led port-network`** on the port network connected to the distant switch node, and verify that the LEDs on the correct PN are lit.
7. Repeat steps 4 – 6 until every SNI-to-SNI fiber connection to the distant switch has been tested.

FIBER-LK Error codes and recommended actions

The following table contains the error codes and recommended actions for FIBER-LK (Fiber Link).

Table 438: FIBER-LK Configuration Audit (#759) ***1 of 9***

Error Code	Test Result	Description / Recommendation
2100 2300 2301	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***2 of 9***

Error Code	Test Result	Description / Recommendation
2306	ABORT	An SNI circuit pack on the fiber link is not responding to test requests. 1. Run **`test led switch-node`** for the switch node(s) where the SNI(s) reside to verify whether the LEDs on the board(s) light. Follow the steps below for the SNI(s) that had no LEDs light. 2. If the LEDs on the other boards in the carrier light but the LEDs on this board do not light, run Test #760 using **`test board location long`** for the active SNC in this carrier. Wait 5 minutes, then try step 1 one more time. If the LEDs on this board still do not light, replace the board. Replacing an SNI may be service interrupting. Refer to SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. 4. Enter **`list fiber-link`** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. 5. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the PN. Also, resolve errors for any of the following: • SYNC (Port Network Synchronization) • SNI-BD (SNI Circuit Pack) • SNC-BD (Switch Node Clock Circuit Pack) • FIBER-LK (Fiber Link) • SNI-PEER (SNI Peer Link)
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***3 of 9***

Error Code	Test Result	Description / Recommendation
102 - 109, 113 - 120	FAIL	The SNI circuit pack cot communicate with the SNI in a different slot. 1. Perform the Fiber link fault isolation procedures described in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*. This should resolve multiple SNI-PEER errors. 2. Determine the slot number of the other SNI: Subtract 100 from the Error Code. For example, if the Error Code is 107, the SNI slot number is 7. This number is referred to as the "specified SNI slot". See Table 435: SNI Slot / Error Type to determine the Error Type for SNI-PEER errors for this specified SNI slot. For example, for SNI slot 9, the Error Type is 1793. 3. If the SNI being tested has SNI-PEER errors of the Error Type specified in Step 2, replace the SNI being tested. Replacing an SNI may be service interrupting. Refer to SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. To view SNI-PEER errors, enter **`display errors`** with category PNC-PEER. Retry the command. 4. If the SNI being tested still has SNI-PEER errors of the specified Error Type, replace the SNI in the specified SNI slot.
112	FAIL	The SNI circuit pack cot communicate with the active SNC. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. 2. Check the error log for other SNI circuit packs in the same carrier with an SNI-BD error with Error Type 257. Enter **`display errors`** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have Error 257, replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. Refer to SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC. 3. Replace this SNI. Refer to SNI-BD (SNI Circuit Pack) for the procedure. 4. Replace the active SNC in the same switch node carrier.
		3 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***4 of 9***

Error Code	Test Result	Description / Recommendation
133	FAIL	No neighbor link is assigned, but the SNI has an EI neighbor. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. 2. Administer the SNI on a fiber link to the EI neighbor it is connected to via **`add fiber-link next`**. Or remove both fiber endpoints (i.e., this SNI and its EI neighbor) and remove the fiber endpoints from circuit pack administration via **`change circuit-pack`**.
134	FAIL	No neighbor link is assigned, but the SNI has an SNI neighbor. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. 2. Administer the SNI on a fiber link to the SNI neighbor it is connected to via **`add fiber-link next`**. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration via **`change circuit-pack`**.
135	FAIL	The SNI circuit pack cot communicate with its assigned neighbor. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. 2. Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. 3. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
136	FAIL	The Endpoint 1 SNI's administered neighbor does not match the physical neighbor connected. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. The SNI's assigned neighbor is another SNI, but the SNI is physically connected to an EI. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered.
137	FAIL	The Endpoint 1 SNI's administered neighbor does not match the physical neighbor connected. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. The SNI's assigned neighbor is an EI, but the SNI is physically connected to another SNI. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered.
		4 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***5 of 9***

Error Code	Test Result	Description / Recommendation
138	FAIL	The physical location of SNI Endpoint 1's neighbor does not match its administered location. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. One location (carrier and slot) is assigned for the endpoint's neighbor, but it physically resides in another location. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered. 3. If the problem does not seem to be caused by either a physical connection or an administration problem, replace the neighbor circuit pack. The neighbor circuit pack may have a hardware problem causing it to report a wrong Angel address (physical carrier/slot address) to software.
139	FAIL	The Endpoint 1 SNI is administered to be connected to a DS1 converter, but is not physically connected to one. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. If a DS1 converter should be connected to this SNI, enter **`list fiber-link`** and verify that the fiber-optic and/or metallic cables are installed as assigned. If not, change administration to remove the DS1 converter complex from the SNI's fiber link: 1. Enter **`list fiber-link`** to locate the fiber with this SNI as an endpoint 2. Enter **`remove fiber-link`** to remove the fiber 3. Enter **`add fiber-link`** to add the fiber back, without assigning the DS1 converter complex
		5 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***6 of 9***

Error Code	Test Result	Description / Recommendation
140	FAIL	The Endpoint 1 SNI is physically connected to a DS1 converter but is not administered to be connected to a DS1 converter. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. Either add the DS1 converter complex to the fiber that this SNI is associated with: 2. Check for the fiber that this SNI is an endpoint of by checking **`list fiber-link`**. 3. **`Remove fiber-link`** for the fiber that this SNI is an endpoint of. 4. Add the fiber back via **`add fiber-link`** and administer the DS1 converter complex also. Or, remove the DS1 converter connection and connect the SNI directly to its administered fiber endpoint by entering **`list fiber-link`** and verifying that the fiber-optic and metallic cable connections are installed as administered.
202 - 209, 213 - 220	FAIL	The SNI circuit pack cot communicate with the SNI in a different slot. 1. Determine the slot number of the other SNI: Subtract 200 from the Error Code. For example, if the Error Code is 207, the SNI slot number is 7. This number is referred to as the "specified SNI slot". 2. Perform the Fiber link fault isolation procedures described in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*. This should resolve multiple SNI-PEER errors. 3. See Table 435: SNI Slot / Error Type to determine the Error Type for SNI-PEER errors for this specified SNI slot. For example, if the specified SNI slot is 9, the Error Type is 1793. 4. If the SNI being tested has SNI-PEER errors of the Error Type specified in Step 2, replace the SNI being tested. Replacing an SNI may be service interrupting. Refer to SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. To view SNI-PEER errors, enter **`display errors`** with category PNC-PEER. Retry the command. 5. If the SNI being tested still has SNI-PEER errors of the specified Error Type, replace the SNI in the specified SNI slot.
		6 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***7 of 9***

Error Code	Test Result	Description / Recommendation
212	FAIL	The SNI circuit pack cot communicate with the active SNC. 1. Check the error log for other SNI circuit packs in the same carrier with an SNI-BD error for Error Type 257. Enter **display errors** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have error 257, then replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. Refer to SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC. 2. Replace this SNI. Refer to SNI-BD (SNI Circuit Pack) for the procedure. 3. Replace the active SNC in the same switch node carrier.
233	FAIL	No neighbor link is assigned, but the SNI (Endpoint 2) has an EI neighbor. 1. Enter **list fiber-link** to display a fiber link's endpoints. If the SNI should have an EI neighbor: 1. Enter **add fiber-link next** to assign the fiber link's SNI to its physically connected EI neighbor. If not: 2. Remove both fiber endpoints (i.e., this SNI and its EI neighbor). 3. Enter **change circuit-pack** to remove the fiber endpoints from circuit-pack administration.
234	FAIL	No neighbor link is administered, but the SNI (Endpoint 2) has an SNI neighbor. 1. Enter **list fiber-link** to display a fiber link's endpoints. 2. Administer the SNI on a fiber link to the SNI neighbor it is connected to via **add fiber-link next**. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.
		7 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***8 of 9***

Error Code	Test Result	Description / Recommendation
235	FAIL	The SNI circuit pack (Endpoint 2) cot communicate with its neighbor. 1. Enter **`list fiber-link`** to display fiber link endpoints. The SNI has an administered neighbor, but cot communicate with its neighbor. 2. Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. 3. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)*.
236	FAIL	The Endpoint 2 SNI's administered neighbor does not match the physical neighbor connected. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. The SNI's assigned neighbor is another SNI, but the SNI is physically connected to an EI. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered.
237	FAIL	The Endpoint 2 SNI's administered neighbor does not match the physical neighbor connected. 1. Enter **`list fiber-link`** to see fiber link endpoints. The SNI's assigned neighbor is an EI, but the SNI is physically connected to another SNI. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered.
238	FAIL	The physical location of SNI Endpoint 2's neighbor does not match its administered location. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. One location (carrier and slot) is assigned for the endpoint's neighbor, but it physically resides in another location. 2. Enter **`list fiber-link`** and verify that the fiber-optic and metallic cables are installed as administered. 3. If the problem does not seem to be caused by either a physical-connection or an administration problem, replace the neighbor circuit pack. The neighbor circuit pack may have a hardware problem causing it to report a wrong Angel address (physical carrier/slot address) to software.
		8 of 9

Table 438: FIBER-LK Configuration Audit (#759) ***9 of 9***

Error Code	Test Result	Description / Recommendation
239	FAIL	The SNI Endpoint 2 is assigned to be connected to a DS1 converter, but is not physically connected to one. 1. Enter **`list fiber-link`** to see a fiber link's endpoints. If this SNI endpoint should be connected to a DS1 converter: 1. Enter **`list fiber-link`** to verify that the fiber-optic cable and/or metallic cable connections are installed as assigned. If not, change administration to remove the DS1 converter complex from the SNI's fiber link: 1. Enter **`list fiber-link`** to locate this SNI endpoint's fiber 2. Enter **`remove fiber-link`** for this SNI endpoint's fiber 3. Enter **`add fiber-link`** to replace the fiber without assigning the DS1 converter complex.
240	FAIL	The SNI Endpoint 2 is physically connected to a DS1 converter, but is not assigned to be connected to one. 1. Enter **`list fiber-link`** to display a fiber link's endpoints. Either replace the DS1 converter with fiber: 1. Enter **`list fiber-link`** to verify that the fiber-optic and metallic cable connections are installed as assigned 2. Disconnect the SNI endpoint from the DS1 converter 3. Enter **`add fiber-link`** to reconnect the SNI to its assigned fiber or Add a DS1 converter complex to the SNI's fiber: 1. Enter **`list fiber-link`** to locate this SNI endpoint's fiber 2. Enter **`remove fiber-link`** for this SNI endpoint's fiber 3. Enter **`add fiber-link`** to replace the fiber and to assign the DS1 Converter complex
	PASS	The administered data and the circuit packs the SNI(s) can communicate with match.
		9 of 9

SNC-BD Error codes and recommended actions

The following table contains the error codes and recommended actions for SNC-BD (Switch Node Clock Circuit Pack).

Table 439: SNC-BD Configuration Audit (#759) ***1 of 5***

Error Code	Test Result	Description / Recommendation
2100 2300 2301	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where this board resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 using **`test board`** ***`location`*** **`l`** for the active SNC in this carrier. Wait 5 minutes, then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) for replacing an SNC. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **`list fiber-link`** to check the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`** and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures for any SYNC (Port Network Synchronization), SNI-BD (SNI Circuit Pack), SNC-BD (Switch Node Clock Circuit Pack), FIBER-LK (Fiber Link), or SNI-PEER (SNI Peer Link) error entries.
		1 of 5

Table 439: SNC-BD Configuration Audit (#759) ***2 of 5***

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 5

Table 439: SNC-BD Configuration Audit (#759) ***3 of 5***

Error Code	Test Result	Description / Recommendation
102 - 109, 113 - 120	FAIL	The SNC circuit pack cot communicate with the SNI in a different slot 1. Determine the slot number of the other SNI: Subtract 100 from the Error Code. For example, if the Error Code is 104, the SNI slot number is 4. This number is referred to as the "specified SNI slot". 2. If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. Enter **`status switch-node`** to show the active and standby SNCs. 3. Enter **`list configuration carrier`** to see if an SNI is physically present in the specified SNI slot. If the **Vintage** field indicates that a circuit pack is present, proceed to step 3. If the **Vintage** field shows **no board**: a. If an SNI should not be installed in the specified SNI slot: 1. This failure will not affect service. Enter **`change circuit-pack`** to remove the missing SNI from administration. 2. If the error persists, use **`reset board`** ***`location`*** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. b. If an SNI should be installed in the specified SNI slot, insert one. 4. Enter **`display errors`** for category **`pnc`**. If the SNC has SNC-BD error 513, or SNC-LINK errors with Aux Data 1 pointing to other SNIs besides the one in the specified SNI slot, replace the active SNC circuit pack. 5. If SNIs in the same carrier have SNI-BD error 257 logged, indicating they are having trouble communicating with the SNC, replace the active SNC circuit pack. 6. Refer to Table 435: SNI Slot / Error Type to determine the Error Type for the specified SNI slot. For example, if the specified SNI slot is 9, the specified Error Type is 1793. If the SNC being tested has SNC-LINK errors of the specified Error Type, replace the SNI in the specified SNI slot. Replacing an SNI may interrupt service. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 7. If the SNC being tested still has SNC-LINK errors of the specified Error Type, replace the SNC circuit pack.
		3 of 5

Table 439: SNC-BD Configuration Audit (#759) *4 of 5*

Error Code	Test Result	Description / Recommendation
112	FAIL	The SNC circuit pack cot communicate with the other SNC. If this test was run on the active SNC and if the switch node carrier is administered with duplicate SNCs: 1. If the system originally had duplicate SNCs and the standby SNC was removed and never replaced, this error will occur. *If you do not intend to replace the SNC:* a. Enter **`change circuit-pack`** and remove the standby SNC from administration. b. If the problem persists, reset the active SNC circuit pack using **`reset board`** ***`location`***. If the problem persists after the reset, replace the active SNC circuit pack. 2. Enter **`display errors`** to check the error log. If SNIs in the switch node carrier also have problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), replace the active SNC. 3. Replace the standby SNC circuit pack. 4. Retry **`test board`**. If this test continues to fail, replace the active SNC. If this test was run on the active SNC and if the switch node carrier is administered with only one SNC: 1. Replace the SNC. If this test was run on the standby SNC**:** 1. Enter **`display errors`** to check the error log. If more than one SNI in the switch node carrier has problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), then replace the active SNC. 2. Replace the standby SNC circuit pack. 3. Retry **`test board`**. Enter **`display errors`** to check the error log. If this error is still in the error log, replace the active SNC.
	PASS	The administered data and the circuit packs the SNC can communicate with match.
		4 of 5

Table 439: SNC-BD Configuration Audit (#759) ***5 of 5***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. 1. Check that SNC board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		5 of 5

SNI-BD Error codes and recommended actions

The following table contains the error codes and recommended actions for SNI-BD (SNI Circuit Pack).

Table 440: SNI-BD Configuration Audit (#759) ***1 of 6***

Error Code	Test Result	Description / Recommendation
2100 2300 2301	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 6

Table 440: SNI-BD Configuration Audit (#759) ***2 of 6***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where this board resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run Test #760 using **`test board`** ***`location`*** **`long`** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Check **`list fiber-link`** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. 4. Follow the Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 6

Table 440: SNI-BD Configuration Audit (#759) ***3 of 6***

Error Code	Test Result	Description / Recommendation
102 - 109, 113- 120	FAIL	The SNI circuit pack cot communicate with the SNI in a different slot. 1. Determine the slot number of the other SNI: Subtract 100 from the Error Code. For example, if the Error Code is 107, the SNI slot number is 7. This number is referred to as the "specified SNI slot". 2. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*. This will resolve multiple SNI-PEER errors. 3. See Table 435: SNI Slot / Error Type to determine the Error Type for SNI-PEER errors. For example, if the specified SNI slot is 9, the Error Type is 1793. If the SNI being tested has SNI-PEER errors of the specified Error Type, replace the SNI being tested. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. To view SNI-PEER errors, enter **display errors** with category PNC-PEER. Retry the command. 4. If the SNI being tested has SNI-PEER errors of the specified Error Type, replace the SNI in the specified SNI slot. Retry the command.
112	FAIL	The SNI circuit pack cot communicate with the active SNC. 1. Check the error log for other SNI circuit packs in the same carrier with a 257 SNI-BD error. Enter **display errors** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have error 257, then replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC. If other SNI circuit packs in the same carrier do not have SNI-BD Error Type 257 logged, proceed to step 2. 2. Replace this SNI. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 3. Replace the active SNC in the same switch node carrier. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC.
133	FAIL	No neighbor link is administered, but the SNI has an EI neighbor. 1. Administer the SNI on a fiber link to the EI neighbor it is connected to using **add fiber-link next**. Or remove both fiber endpoints (i.e., this SNI and its EI neighbor) and remove the fiber endpoints from circuit pack administration using **change circuit-pack**.
		3 of 6

Table 440: SNI-BD Configuration Audit (#759) ***4 of 6***

Error Code	Test Result	Description / Recommendation
134	FAIL	No neighbor link is administered, but the SNI has an SNI neighbor. 1. Administer the SNI on a fiber link to the SNI neighbor it is connected to using **add fiber-link next**. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration using **change circuit-pack**.
135	FAIL	The SNI circuit pack cot communicate with its neighbor. The SNI has an administered neighbor, but cot communicate with its neighbor. 1. Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. 2. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*.
136	FAIL	The SIN's administered neighbor does not match the physical neighbor connected. The type of neighbor administered is an SNI and the type of neighbor physically connected is an EI. 1. Enter **list fiber-link**, and verify that the fiber-optic and metallic cable connections are installed as administered.
137	FAIL	The SNI's administered neighbor does not match the physical neighbor connected. The type of neighbor administered is an EI and the type of neighbor physically connected is an SNI. 1. Enter **list fiber-link**, and verify that the fiber-optic cable and metallic cable connections are installed as administered.
138	FAIL	The physical neighbor location does not match administered neighbor location. The carrier and slot of the administered neighbor do not match the carrier and slot of the physical neighbor. 1. Enter **list fiber-link**, and verify that the fiber-optic cable and metallic cable connections are installed as administered. 2. If the problem does not seem to be caused by a physical connection problem or an administration problem, replace the neighbor circuit pack. It is possible for the neighbor circuit pack to have a hardware problem that causes it to report a wrong Angel address (physical carrier/slot address) to software.
		4 of 6

Table 440: SNI-BD Configuration Audit (#759) ***5 of 6***

Error Code	Test Result	Description / Recommendation
139	FAIL	The SNI is administered as connected to a DS1C but is not physically connected to a DS1C. *If a DS1C should not be connected to this SNI,* change administration to remove the DS1 converter complex from the fiber link associated with this SNI: 1. Enter **`list fiber-link`** to determine the fiber associated with the SNI. 2. Enter **`remove fiber-link`** to remove the fiber. 3. Enter **`add fiber-link`** to add the fiber back, and do not administer the DS1 converter complex at this time.
140	FAIL	The SNI is physically connected to a DS1C but is not administered to be connected to a DS1C. Either add the DS1 converter complex to the fiber that this SNI is associated with by: 1. Enter **`list fiber-link`** to determine the fiber associated with the SNI. 2. Enter **`remove fiber-link`** to remove the fiber. 3. Enter **`add fiber-link`** to add the fiber back, and administer the DS1 converter complex. **Or**: 4. Remove the DS1C connection, and connect the SNI directly to its administered fiber endpoint. 5. Verify that the fiber-optic and metallic cable connections are installed as administered by entering **`list fiber-link`**.
	PASS	The administered data and the SNI circuit packs match, and the SNI circuit packs can communicate.
		5 of 6

Table 440: SNI-BD Configuration Audit (#759) ***6 of 6***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		6 of 6

Processor Route Audit Test (#760)

This test sends a processor route to every SNI in the carrier for which **test board *location*** was run. A processor route enables an SNI board to send uplink messages to the server by providing the board with a specific sequence of boards for routing messages up to the server. Without a processor route, an SNI cot send any inline errors to the server.

As each SNI receives its processor route, the SNI returns a “board insertion” uplink message, and, if not already inserted, the server’s software inserts that board. Depending on the configuration, each SNI board is sent either one or two processor routes.

Enter **test led** or **list config carrier** to see if the boards are inserted.

The processor route test is run as part of the long test sequence for SNC boards. It runs on the following maintenance objects:

- SN-CONF (Switch Node Configuration)
- SNC-BD (Switch Node Clock Circuit Pack)
- SNC-LINK (Switch Node Clock Link)
- SNC-REF (Switch Node Clock Reference)

Table 441: Processor Route Audit Test (#760) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	None of the circuit packs in this switch node carrier are responding to the processor route messages. 1. Run **test led switch-node** for the switch node where this switch node carrier resides to verify whether the LEDs on any of the boards light. 2. If none of the LEDs light for the boards in this carrier, fix any problems associated with the connectivity of this carrier to the server. a. Enter **list fiber-link** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with an IPSI connected PN. d. Also, follow the repair procedures if there are errors for any of the following: • SYNC (Port Network Synchronization) • SNI-BD (SNI Circuit Pack) • SNC-BD (Switch Node Clock Circuit Pack) • FIBER-LK (Fiber Link) • SNI-PEER (SNI Peer Link)
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 2

Table 441: Processor Route Audit Test (#760) *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	One or more administered circuit packs in this switch node carrier did not respond with a "board insertion" uplink message. 1. Enter **`list config carrier`** ***`location`*** to verify that administered SNI and SNC boards match the physically installed SNI and SNC boards. The command output shows **NO BOARD** for every board that is administered but not inserted. 2. If every administered board is inserted, run this test again. 3. If administration does not match the physical configuration and is *correct*, insert the missing circuit packs in this switch node carrier. 4. If administration does not match the physical configuration, and is *incorrect*, change the administration, and run this test again. 5. If *none* of the administered boards in this switch node carrier were inserted, fix any other SN-CONF errors by following the repair procedures for SYS-LINK (System Links). Enter **`display errors`** with category **`pnc`** to view SN-CONF errors. Enter **`list sys-link`** to see if any INLs, LNLs, or RNLs are down. If any INLs, LNLs, or RNLs are down, see SYS-LINK (System Links) for fixing link problems.
	PASS	Every administered circuit pack in this switch node carrier was inserted.
0	NO BOARD	No board was detected by the test. 1. Check that SNC board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNC. It may be necessary to use **`reset board`** if the SNC circuit pack gets into a mode where it cot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		2 of 2

Switch Node Interface Reset Test (#761)

This test is destructive.

This test resets the SNI circuit pack using **reset board *location*** when an SNI circuit pack's location is entered. The SNI is reset via the active SNC circuit pack in the carrier. If the SNI is connected to an IPSI-connected PN's EI, the SNI is reset via its IPSI-connected PN's EI neighbor. If an SNI with a non IPSI-connected PN's EI or another SNI as its neighbor cot be reset via the active SNC (i.e., if no software communication exists between the active SNC and the server), an attempt will be made to reset the SNI via its neighbor.

An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cot communicate with software.

If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems.

This test runs on SNI-BD (SNI Circuit Pack) and SNI-PEER (SNI Peer Link).

Table 442: Switch Node Interface Reset Test (#761) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received incorrect message data from the SNI circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNI circuit pack responded that the test requested is invalid. 1. Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 442: Switch Node Interface Reset Test (#761) ***2 of 3***

<table>
<tr><th>Error Code</th><th>Test Result</th><th>Description / Recommendation</th></tr>
<tr><td>2306</td><td>ABORT</td><td>The SNI circuit pack is not responding to test requests sent by software.
1. Run <code>test led switch-node</code> for the switch node where the SNI resides to verify whether the LEDs on the board light.
2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 using <code>test board location l</code> for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI.
3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server.
a. Check <code>list fiber-link</code> to see the fiber connections to this carrier.
b. Check the LEDs on every SNI and EI, and fix any fiber problems.
c. Enter <code>display errors</code>, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI connected PN.
d. Also, follow the repair procedures if there are errors for any of the following:
• SYNC (Port Network Synchronization)
• SNI-BD (SNI Circuit Pack)
• SNC-BD (Switch Node Clock Circuit Pack)
• FIBER-LK (Fiber Link)
• SNI-PEER (SNI Peer Link)
4. Follow the Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.</td></tr>
<tr><td>2316</td><td>ABORT</td><td>The reset of the SNI circuit pack was attempted via the connected DS1C circuit pack. This ABORT code indicates that the fiber is not administered, but in this particular case it also indicates a software problem.
1. Retry the command at 1-minute intervals up to 1 time.</td></tr>
<tr><td colspan="3" align="right">2 of 3</td></tr>
</table>

Table 442: Switch Node Interface Reset Test (#761) *3 of 3*

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The “reset” message was sent out successfully to the active SNC or to the SNI’s neighbor. A PASS does not necessarily mean the SNI circuit pack was successfully reset. The reset can be verified by checking that the red and green LEDs turn on and then turn off. If an SNI circuit pack fails one of the firmware tests run during its reset sequence, the red LED will stay on and the circuit pack should be replaced.
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNI. It may be necessary to use **`reset board`** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		3 of 3

Packet Neighbor Link Test (#767)

This test checks the packet path of the neighbor circuit pack and the peer circuit packs. A packet is sent from the SNI being tested to the peer SNIs and to the neighbor EI or SNI. If the other EI or SNI sends the same data back in the packet, this test passes. Otherwise, this test fails.

This test runs on SNI-BD (SNI Circuit Pack) and SNI-PEER (SNI Peer Link).

Table 443: Packet Neighbor Link Test (#767) *1 of 5*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received incorrect message data from the SNI circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNI circuit pack responded that the software test requested is invalid. 1. Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI firmware is not able to run the test. For this particular test, the SNI circuit pack must be able to communicate with its neighbor. 1. Verify that the SNI can communicate with its neighbor by checking the yellow LED of the SNI to make sure the SNI is in frame, or by running **`test board`** for the SNI and checking test 989 for fiber out-of-frame. If the results of Test 989 indicate that the fiber is out-of-frame, follow the recommendation associated with the test failure. If a DS1 converter complex exists on the fiber link, enter **`display errors`** and follow the repair procedures for any DS1C-BD and DS1-FAC entries. 2. Retry the command at 1-minute intervals up to 3 times.
		1 of 5

Table 443: Packet Neighbor Link Test (#767) ***2 of 5***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run **test led switch-node** for the switch node carrier where the SNI resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 using **test board *location* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **list fiber-link** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors**, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: ● SYNC (Port Network Synchronization) ● SNI-BD (SNI Circuit Pack) ● SNC-BD (Switch Node Clock Circuit Pack) ● FIBER-LK (Fiber Link) ● SNI-PEER (SNI Peer Link) 4. Follow the Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
		2 of 5

Table 443: Packet Neighbor Link Test (#767) ***3 of 5***

Error Code	Test Result	Description / Recommendation
102 - 109, 113 - 120	FAIL	The SNI circuit pack cot communicate with the SNI in a different slot over the packet path. 1. Determine the slot number of the other SNI: Subtract 100 from the Error Code. For example, if the Error Code is 115, the SNI slot number is 15. This number is referred to as the "specified SNI slot". 2. Fix any on-board SNI-BD errors against this SNI and the SNI in the specified SNI slot. Enter **`display errors`** to find any SNI-BD errors, and enter **`display alarms`** to determine whether the errors have on-board alarms. Follow the repair procedures for SNI-BD (SNI Circuit Pack). 3. Enter **`display errors`** to check the error log for other SNI circuit packs with SNI-PEER errors. See Table 435: SNI Slot / Error Type to determine the Error Type for SNI-PEER. For example, if the specified SNI slot number is 13, look for SNI-PEER errors with Error Type 2049. If other SNI circuit packs have SNI-PEER errors of this Error Type, replace the SNI in the specified SNI slot. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 4. If other SNI circuit packs do not have SNI-PEER errors of this Error Type, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. a. Replace the SNI being tested. b. Replace the SNI in the specified SNI slot.
		3 of 5

Table 443: Packet Neighbor Link Test (#767) ***4 of 5***

Error Code	Test Result	Description / Recommendation
123	FAIL	The SNI circuit pack cot communicate with its neighbor using the packet path. 1. Fix any on-board errors (SNI-BD, EXP-INTF, and/or DS1C-BD) against the components of this fiber link by using **`display errors`** and **`display alarms`** and following the repair procedures. Enter **`list fiber-link`** to find the fiber link associated with this SNI. Enter **`display fiber-link`** to find the endpoints of the fiber link and the DS1C circuit pack locations if this fiber link has a DS1 Converter complex administered.) 2. Enter **`display errors`** and **`display alarms`** and follow the repair procedures for any SNC-BD error entries with corresponding on-board alarm entries. 3. Enter **`display errors`** and follow the repair procedures for any SYNC entries. 4. If this FIBER-LK has circuit, packet, and control path errors, check the lightwave transceiver connections or metallic connections. Enter the LED states to verify whether the connections are correct. Also, a test fiber-links command can be run to determine whether a fiber out of frame condition exists on the fiber link. The SNI Fiber Out of Frame Query Test (#989) reports whether a fiber out of frame condition exists for an SNI endpoint, and the Expansion Interface Fiber Out-of-Frame Query Test (#238) reports whether a fiber out of frame condition exists for an Expansion Interface endpoint. 5. Replace the lightwave transceivers if present. 6. Replace one of the endpoint boards. 7. Replace the other endpoint board. 8. Replace the DS1 converter circuit packs if a DS1 converter complex is administered on this fiber.
	PASS	The SNI can communicate with the peer SNIs and the neighbor over the packet path.
		4 of 5

Table 443: Packet Neighbor Link Test (#767) ***5 of 5***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		5 of 5

Fiber Link Reset Test (#768)

This test is destructive.

This test resets both endpoints of the fiber link and is executed via **reset fiber-link *F P*.** Any DS1 converter circuit packs on the fiber link are not reset. The **reset fiber-link** command should almost never be used. It may be necessary to use it when the endpoint circuit packs enter a mode in which they cot communicate with software. When necessary, always reset fiber endpoints with the command instead of reseating the endpoint circuit packs.

For EI-to-EI fibers that connect an IPSI PN, the EI on the PN is reset first followed by the EI on the IPSI PN. For EI-to-EI fiber links that connect two PNs, one EI is reset first followed by the other.

For an EI-SNI fiber link in which the EI is on the PN, the SNI is reset first followed by the EI.

For an SNI-to-SNI fiber link, the SNI farthest from the PN is reset first followed by the SNI nearest to the PN.

When an EI endpoint is reset, the Expansion Interface Reset Test (#336) is executed. When an SNI endpoint is reset, the Switch Node Interface Reset Test (#761) is executed.

This test starts the other reset test previously mentioned and returns PASS without waiting for the results of the other reset test. For a better indication of how the other reset tests are running, enter **reset board *location*** on each individual fiber link endpoint.

This test runs on FIBER-LK (Fiber Link).

Table 444: Fiber Link Reset Test (#768)

Error Code	Test Result	Description / Recommendation
1703	ABORT	Both fiber endpoints are in the hardware path for INLs to their respective switch node carriers and, therefore, cot get a response from this test. 1. Reset the individual fiber-link endpoints using **`reset board`**.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The reset of both fiber endpoints successfully completed.

Failure Audit (#777)

This test queries the SNI(s) on the fiber link for any existing failures and unacknowledged cleared failure messages. Each failure generates an error and alarm entry against SNI-BD, SNI-PEER, or FIBER-LK. An unacknowledged cleared failure message is a message sent by the SNI circuit pack to software indicating that a previous failure is now gone, and the SNI circuit pack did not receive a message from software indicating that the failure message was received by software.

If no failures are detected by the SNI circuit pack, this test will pass.

If this test reports failures, the results of **`test fiber-link`** will display FAIL with no FAIL code. The error log must then be displayed using **`display errors`** with category PNC to view SNI-BD and FIBER-LK errors. Enter **`display errors`** with category PNC-PEER to view SNI-PEER errors.

This test is not run for EI-to-EI fiber links. For EI-to-SNI fiber links, this test is run on the SNI circuit pack endpoint of the fiber link. For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

This test runs on the following maintenance objects:

- FIBER-LK (Fiber Link)
- SNC-BD (Switch Node Clock Circuit Pack)
- SNC-LINK (Switch Node Clock Link)
- SNC-REF (Switch Node Clock Reference)

- SNI-BD (SNI Circuit Pack)
- SNI-PEER (SNI Peer Link)

Table 445: Failure Audit Test (#777) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300		The downlink message necessary to run this test could not be sent.
2301		The timer could not be set before sending the downlink message.
2302		The SNI circuit pack received a bad message from software.
2303		Test requested by software is invalid.
2304		SNI firmware is not able to run the test. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 445: Failure Audit Test (#777) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2306	ABORT	An SNI circuit pack on the fiber link is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node(s) where the SNI(s) reside to verify whether the LEDs on the board(s) light. Follow the steps below for the SNI(s) from step 1 that had no LEDs light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 using **`test board location long`** for the active SNC in this carrier. Wait 5 minutes, then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. Refer to the documentation for SNI-BD (SNI Circuit Pack) for the procedure to replace an SNI. a. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. Enter **`list fiber-link`** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **`display errors`** and resolve any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the Port Network. Also, Follow the repair procedures if there are errors for any of the following: ● SYNC (Port Network Synchronization) ● SNI-BD (SNI Circuit Pack) ● SNC-BD (Switch Node Clock Circuit Pack) ● FIBER-LK (Fiber Link) ● SNI-PEER (SNI Peer Link)
		2 of 3

Table 445: Failure Audit Test (#777) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	FAIL	The SNI circuit pack reported failures or retransmitted a cleared failure message. 1. If this is the first time this test was run, run the test again. If there were any previous failure messages that software did not acknowledge, this test will FAIL even if the failure messages indicate a FAIL to PASS transition, i.e., a problem has gone away. If this test is run twice and FAILs both times, at least one problem still exists. 2. Enter **`display errors`** and **`display alarms`** and resolve any errors for SNI-BD (SNI Circuit Pack), SNI-PEER (SNI Peer Link) or FIBER-LK (Fiber Link). 3. If no SNI-BD, SNI-PEER, or FIBER-LK entries exist in the error and alarm logs, retry the command.
	PASS	No problems are detected on the board.
		3 of 3

SNC On-Board Test (#778)

This test queries the SNC circuit pack for status of the on-board background tests. These tests include an SNC on-board microcontroller test, clock test, an SNC on-board Stratum-3 oscillator test, and TPN microcontroller test.

This test runs on the SNC-BD (Switch Node Clock Circuit Pack) maintenance object.

Table 446: SNC On-Board Test (#778) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2100 2300 2301 2303 2304	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. Test request is not valid. SNC firmware is not able to run the test. 1. Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where this board resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run Test #760 using **`test board`** ***`location`*** **`l`** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNC. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **`list fiber-link`** to obtain a list of the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures for any SYNC (Port Network Synchronization), SNI-BD (SNI Circuit Pack), SNC-BD (Switch Node Clock Circuit Pack) SNI-PEER (SNI Peer Link) or FIBER-LK (Fiber Link) error entries.
		1 of 2

Table 446: SNC On-Board Test (#778) ***2 of 2***

Error Code	Test Result	Description / Recommendation
101	FAIL	The SNC circuit pack has on-board microcontroller failure. 1. Replace the SNC circuit pack.
128	FAIL	The SNC circuit pack has a problem with its clock. Firmware has detected a phase-locked loop failure, an inability to lock, or a failure of the clock drivers. 1. Replace the SNC circuit pack.
129	FAIL	The SNC circuit pack has a problem with the SNC on-board Stratum-3 oscillator. 1. Replace the SNC circuit pack.
130	FAIL	The SNC circuit pack has a problem with the TPN microcontroller. 1. Replace the SNC circuit pack.
	PASS	No problems exist with the on-board functions verified by this test.
0	NO BOARD	No board was detected by the test. 2. Check that SNC board is properly translated and inserted. 3. Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNC. It may be necessary to use **`reset board`** if the SNC circuit pack gets into a mode where it cot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **`reset board`** can mask real problems. 4. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		2 of 2

TPN Test (#779)

This test queries the SNC circuit pack for the status of the ROM and internal RAM background tests for the TPN microcontroller.

This test runs on the SNC-BD (Switch Node Clock Circuit Pack) maintenance object.

Table 447: TPN Test (#779) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300		The downlink message necessary to run this test could not be sent.
2301		The software timer could not be set for sending the downlink message.
2302		Software received unexpected message data from the SNC circuit pack.
2303		The SNC circuit pack responded that the test requested is not valid.
2304		SNC circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 447: TPN Test (#779) *2 of 3*

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNC circuit pack is not responding to test requests. 1. Run **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light but the LEDs on this board do not light, run Test #760 using **test board *location* l** for the active SNC in this carrier. Wait 5 minutes, then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **list fiber-link** to list the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors**, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: SYNC (Port Network Synchronization) SNI-BD (SNI Circuit Pack) SNC-BD (Switch Node Clock Circuit Pack) FIBER-LK (Fiber Link) SNI-PEER (SNI Peer Link)
	FAIL	The test failed. Replace the SNC circuit pack.
	PASS	No problems exist with the TPN microcontroller.
		2 of 3

Table 447: TPN Test (#779) *3 of 3*

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. 1. Check that SNC board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNC. It may be necessary to use **`reset board`** if the SNC circuit pack gets into a mode where it cot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		3 of 3

Switch Node Clock Reset Test (#780)

This test is destructive.

This test resets the SNC circuit pack using **`reset board`** ***`location`*** when an SNC circuit pack location is entered. If the system has PNC duplication, the active SNC on the active PNC cot be reset.

If the SNC is active and **`reset board`** is executed, an SNI in the same carrier as the SNC will be told by software to reset the SNC via the TPN link. If no inserted SNIs in the same carrier as the SNC can successfully reset the SNC, software will send a “reset” message directly to the SNC. Software first tries to reset the SNC via an SNI in case the SNC is insane because the latter method (sending the “reset” message directly to the SNC) will not work if the SNC is insane.

If an active SNC is reset and a standby SNC exists in the same switch node carrier, the standby SNC becomes active. Enter **`set switch-node-clock`** ***`location`*** to make a standby SNC active.

If the SNC is standby and **`reset board`** is executed, the active SNC is told by software to reset the standby SNC via the TPN link.

An SNC should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNC. It may be necessary to use **`reset board`** if the SNC circuit pack gets into a mode where it cot communicate with software.

This test runs on the SNC-BD (Switch Node Clock Circuit Pack) maintenance object.

Table 448: Switch Node Clock Reset Test (#780) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set for sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received unexpected message data from the SNC circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNC circuit pack responded that the test requested is not valid. 1. Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNC circuit pack responded that it is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 448: Switch Node Clock Reset Test (#780) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. 1. Run **`test led switch-node`** for the switch node where the SNC resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 using **`test board`** ***`location`*** **`l`** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) for the procedure for replacing an SNC. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter **`list fiber-link`** to list the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **`display errors`**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures if there are errors for any of the following: SYNC (Port Network Synchronization) SNI-BD (SNI Circuit Pack) SNC-BD (Switch Node Clock Circuit Pack) FIBER-LK (Fiber Link) SNI-PEER (SNI Peer Link)
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 3

Table 448: Switch Node Clock Reset Test (#780) *3 of 3*

Error Code	Test Result	Description / Recommendation
	PASS	The “reset” message was sent out successfully to the active SNC or to an SNI. A PASS does not necessarily mean the SNC circuit pack was successfully reset. The reset can be verified by checking that the red and green LEDs turn on and then turn off. If an SNC circuit pack fails one of the firmware tests run during its reset sequence, the red LED will stay on and the circuit pack should be replaced.
0	NO BOARD	No board was detected by the test. 1. Check that SNC board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		3 of 3

Reset Board Test (#787)

This test is destructive.

A DS1 converter circuit pack is reset using **reset board**. ***location***. When the circuit pack is reset, firmware executes a series of diagnostic tests on the circuit pack. The results of these tests are queried from the board when the board is inserted after completion of the reset sequence. If any of the diagnostic tests fail, the error log will have an entry of Error Type 1 for this circuit pack’s location, and the alarm log will have an entry of ON-BOARD MAJOR alarm.

The reset sequence will take about one minute to complete and runs on the DS1C-BD (DS1 Converter Circuit Pack).

Table 449: Reset Board Test (#787)

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **add fiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 converter circuit pack is not busied out. 1. Enter **busyout board** to busyout the DS1 converter circuit pack.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The reset sequence was executed successfully. However, this test result does not indicate whether the firmware diagnostic tests passed. 1. Enter **display errors** and check the error log for Error Type 1 for this circuit pack's location. This indicates a failed diagnostic firmware test. 2. Enter **display alarms** to check the alarm log for any ON-BOARD MAJOR alarms.
0	NO BOARD	See NO BOARD for the repair procedures.

Far-End DS1 Converter Circuit Pack Loopback Test (#788)

This test is destructive.

This test is executed by the TN574 DS1 Converter circuit pack only. See DS1 Facilities Connectivity Test (#790) for testing the TN1654 DS1 Converter.

This test starts at the specified DS1 converter circuit pack location and loops all fiber time slots at the far edge Fiber Optic Interface of the DS1 converter circuit pack at the other end of the DS1 converter complex. See Figure 107: Far-End DS1 Converter Loopback Configuration.

The test sends digital data through every administered DS1 facility channel. Two different test patterns are used: hexadecimal values 55 and AA.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the server relative to the neighbor DS1 converter circuit pack because of its impact on the system control links, The completion of the test is delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), this test can be executed on any DS1 converter circuit pack. This test runs on the DS1C-BD (DS1 Converter Circuit Pack) maintenance object.

Figure 107: Far-End DS1 Converter Loopback Configuration

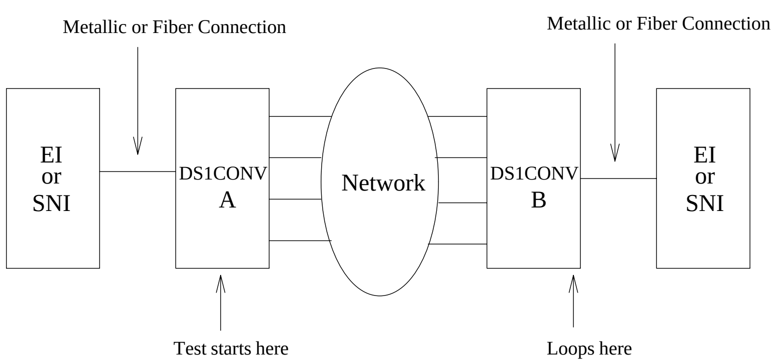


Table 450: Far-End DS1 Converter Circuit Pack Loopback Test (#788) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Test timed out while waiting for a response from the circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 450: Far-End DS1 Converter Circuit Pack Loopback Test (#788) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message could not be sent to the selected DS1C board. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Administer the DS1 converter fiber link with **add fiber-link** and rerun the test.
2321	ABORT	DS1 converter circuit pack is not busied out. 1. Busyout the DS1 converter circuit pack with **busyout board**.
2332	ABORT	With this system configuration (unduplicated PNC), the test cot run at the far end when there is only one DS1-FAC available. The link would be lost, and no test results would be seen at the server. Run the test at the other end of the DS1C complex.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 3

Table 450: Far-End DS1 Converter Circuit Pack Loopback Test (#788) *3 of 3*

Error Code	Test Result	Description / Recommendation
	FAIL	Far-end DS1 converter loopback failed. A problem exists between the DS1 converter A and the DS1 converter B. See Figure 107: Far-End DS1 Converter Loopback Configuration. 1. If there are facilities that are not digital-data compatible, busyout the facilities using **`busyout ds1-facility`**. 2. Enter **`display errors`** and follow the associated repair procedures for any on-board DS1C-BD (DS1 Converter Circuit Pack) errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. 3. Enter **`display errors`** and follow the associated repair procedures for any DS1-FAC (DS1 Facility) errors on the DS1 facilities. 4. Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Enter **`list measurements ds1-facility summary`**. If there are facilities with excessive errors, run the Far-End Internal Loopback test (#797) on those facilities, and follow repair procedures described for the Far-End Internal Loopback Test (#797). 5. If the test still fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex. 6. If the test still fails, replace this DS1 converter circuit pack.
	PASS	Transmission through the path of the loopback is successful.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Far-End Lightwave Transceiver Loopback Test (#789)

This test is destructive.

This test is executed on the TN574 DS1 Converter circuit pack only. DS1 Facilities Connectivity Test (#790) covers this testing on the TN1654 DS1 Converter.

This test starts at the specified DS1 converter circuit pack location and loops at the Fiber Optic Terminator (lightwave transceiver) that is connected to the DS1 converter circuit pack at the other end of the DS1 converter complex. See Figure 108: Far-End Lightwave Transceiver Loopback Test.

The test sends digital data through every DS1 facility channel. Two different test patterns are used, these are hexadecimal values 55 and AA.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the server relative to the neighbor DS1 converter circuit pack because of its impact on the system control links. The completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), the test can be executed on any DS1 converter circuit pack. This test runs on the DS1C-BD (DS1 Converter Circuit Pack) maintenance object.

Figure 108: Far-End Lightwave Transceiver Loopback Test

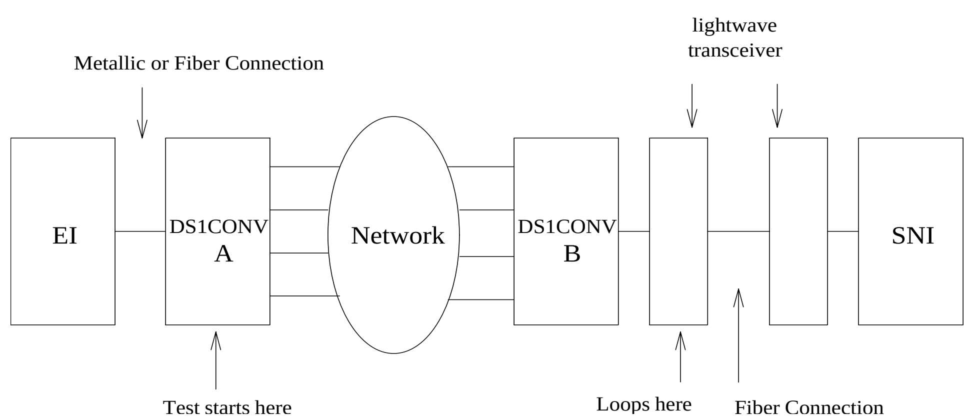


Table 451: Far-End Lightwave Transceiver Loopback Test #789 *1 of 3*

Error Code	Test Result	Description / Recommendation
1410	ABORT	No lightwave transceiver is present. The neighbor DS1 converter circuit pack and the fiber endpoint are connected via metallic cable. This error may be ignored.
2000	ABORT	Test timed out while waiting for a response from the circuit pack 1. .Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 451: Far-End Lightwave Transceiver Loopback Test #789 ***2 of 3***

Error Code	Test Result	Description / Recommendation
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Administer the DS1 converter fiber link using **add fiber-link**.
2321	ABORT	DS1 converter circuit pack is not busied out. 1. Busyout the DS1 converter circuit pack with **busyout board**.
2332	ABORT	With this system configuration (unduplicated PNC), the test cot run at the far end when there is only one DS1-FAC available. The link would be lost, and no test results would be seen at the server. Run the test at the other end of the DS1C complex.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 3

Table 451: Far-End Lightwave Transceiver Loopback Test #789 *3 of 3*

Error Code	Test Result	Description / Recommendation
	FAIL	Far-end lightwave transceiver loopback failed. A problem exists between the DS1 converter A and the lightwave transceiver connected to the DS1 converter B (see previous diagram). 1. If there are facilities that are not digital-data compatible, busyout the facilities with **`busyout ds1-facility`**. 2. Enter **`display errors`** and follow the associated repair procedures for any on-board DS1C-BD (DS1 Converter Circuit Pack) errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. 3. Enter **`display errors`** and follow the associated repair procedures for any DS1-FAC (DS1 Facility) errors. 4. Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Enter **`list measurements ds1-facility summary`**. If there are facilities with excessive errors, run the Far-End Internal Loopback test (#797) on those facilities, and follow the repair procedures described for the Far-End Internal Loopback Test (#797). 5. If the test still fails, replace the lightwave transceiver device that is connected to the DS1 converter circuit pack at the other end of the DS1 converter complex. 6. If the test still fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex. 7. If the test still fails, replace this DS1 converter circuit pack.
	PASS	Transmission through the path of the loopback is successful.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

DS1 Facilities Connectivity Test (#790)

This test is destructive.

The DS1 Facilities Connectivity Test checks the correct connectivity of the DS1 facilities at opposite ends of the DS1 converter complex.

For TN574 DS1 Converter circuit packs, this test sends digital data through each time slot of every DS1 facility channel. Two different test patterns are used: hexadecimal values 55 and AA.

For TN1654 DS1 Converter circuit packs, this test provides error codes that point to the exact fault. The TN1654 test specifically identifies the two DS1 facilities that are cross-connected at the near and far ends of the DS1 converter complex. In addition, a fault code will indicate the condition of not being able to loop-up the far end, as required to run the test, due to the packet DS1 facility being down.

The TN1654 connectivity test sends digital data through only one time slot. Instead of looping back the facility to itself, the TN1654 version of the test loops-up the other three facilities. If the test pattern comes back, the firmware fails the test due to an incorrect connection between DS1 facilities. It should be noted that this test will pass and give no indication of problems if the non-packet facilities are down.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the server relative to the neighbor DS1 converter circuit pack because of its impact on the system control links. In addition, for TN574 DS1 converter boards, the completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), the test can be executed on any DS1 converter circuit pack.

This test runs on DS1C-BD (DS1 Converter Circuit Pack).

Table 452: DS1 Facilities Connectivity Loopback Test (#790) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2000 2100 2300 2301	ABORT	Timed out while waiting for a response from the circuit pack. Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **addfiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 converter circuit pack is not busied out. 1. Enter **busyout board** to busyout the DS1 converter circuit pack.
2332	ABORT	With this system configuration (unduplicated PNC), the test cot be run at the far end when there is only one DS1-FAC available. The link would be lost, and no test results would be seen at the server. Run the test at the other end of the DS1C complex.
		1 of 3

Table 452: DS1 Facilities Connectivity Loopback Test (#790) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	TN574 DS1 facilities connectivity loopback test failed.
For the following failures, see the repair procedures for Error Code 55.		
1	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility B.
2	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility C.
3	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility D.
10	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility A.
12	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility C.
13	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility D.
20	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility A.
21	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility B.
23	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility D.
30	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility A.
31	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility B.
32	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility C.
		2 of 3

Table 452: DS1 Facilities Connectivity Loopback Test (#790) *3 of 3*

Error Code	Test Result	Description / Recommendation
55	FAIL	TN1654 DS1 converter packet facility is down and can't send loop-up message to the far end. 1. Enter **display errors** and follow the associated repair procedures for any DS1-FAC (DS1 Facility) errors on the DS1 facilities at both ends of the DS1 converter complex. If an alarm exists on a DS1 facility, then this test will fail. 2. Check the DS1 connections, both circuit packs should have their DS1 facilities connected identically. 3. Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Enter **list measurements ds1-facility summary**. If there are facilities with excessive errors, run the Far-End Internal Loopback test (#797) via **test ds1-facility *location* long** on those facilities, and follow repair procedures described for the Far-End Internal Loopback Test (#797). 4. Both circuit packs may not have the same translation information. Run the DS1C Board Options Audit (#795) using **test board *location*** for both circuit packs in the DS1 converter complex to send the options. Check the results of this audit test. This test does not pass until the audit test problems are resolved.
	PASS	DS1 facility connections are correct.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

DS1C Board Options Audit (#795)

This test sends the administered circuit pack options to the DS1 converter circuit pack. Options are sent to both DS1 converter circuit packs at the same time to prevent any transitional mismatch of options.

The following data is sent to the TN574 DS1 converter circuit pack:

- system-reliability configuration
- master and slave endpoints for framing, which is determined by the relative position of the circuit pack to the server
- facility mask (whether each facility is installed)
- clock reference mask (whether:
  - each facility can be used as a clock-reference source
  - the board is being used as a network-timing source)
- packet compatible mask (whether each facility is packet compatible)
- facility information for line coding, framing mode, and line compensation

The following data is sent to the TN1654 DS1 converter circuit pack:

- system-reliability configuration
- master and slave endpoints for framing, which is determined by the relative position of the circuit pack to the server)
- facility mask (whether each facility is installed)
- idle code
- CRC-enabled/-disabled flag (sent in E1 mode only)
- facility information for line coding and line compensation (sent in T1 mode only).

This test runs on the DS1C-BD (DS1 Converter Circuit Pack) maintenance object.

Table 453: DS1C Board Options Audit (#795) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 453: DS1C Board Options Audit (#795) ***2 of 2***

Error Code	Test Result	Description / Recommendation
105	ABORT	The neighbor DS1C circuit pack at the other end of the DS1C complex is not accessible. 1. Retry the command at 1-minute intervals up to 3 times. 2. The link at the other end of the DS1C complex may be down. Enter **`display errors`** and follow the associated repair procedures for any DS1C-BD (DS1 Converter Circuit Pack) and DS1-FAC (DS1 Facility) errors. 3. If the test still aborts, escalate the problem.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Required system resources to run this test are not available. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the test downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Administer the DS1C fiber link using **`add fiber-link`**.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The options were successfully sent to the DS1C circuit pack.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

Far-End Internal Loopback Test (#797)

This test is destructive.

This test starts at the specified DS1 converter circuit pack location, traverses over the specified facility, and loops at the internal facility interface on the other DS1 converter circuit pack in the DS1 converter complex. See Figure 109: Far-End Internal Loopback Test Configuration.

The test sends digital data through every DS1 channel on this facility. For TN574 DS1 Converter facilities, test patterns are sent through every DS1 channel. For TN1654 DS1 Converter facilities, test patterns are sent through one DS1 channel.

If there is only one DS1 facility available, the system will not allow that last facility to be busied out. In that case, the DS1 converter circuit pack must be busied out before executing this test.

For a standard-, duplex-, or high-reliability system (no PNC duplication), if there is only one DS1 facility available, then this test can only be executed at the endpoint that is closer to the server relative to the neighbor DS1 converter circuit pack because of its impact on the system control links. For TN574 DS1 converter boards, the completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication) or for a system with multiple DS1 facilities, the test can be executed on any DS1 converter circuit pack.

If the test passes on a TN1654 DS1 facility, the *round trip delay time* appears in milliseconds in the `Error Code` field. The round trip delay time is the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent.

This test runs on the DS1-FAC (DS1 Facility) maintenance object.

Figure 109: Far-End Internal Loopback Test Configuration

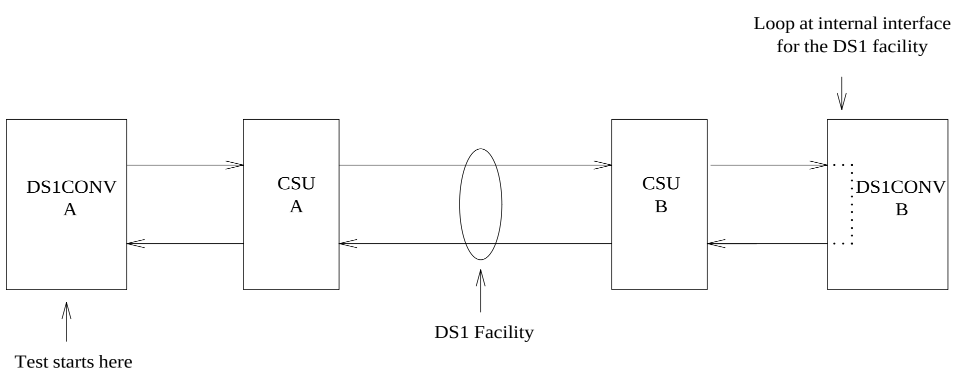


Table 454: Far-End Internal Loopback Test (#797) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Timed out while waiting for a response from the circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 454: Far-End Internal Loopback Test (#797) *2 of 3*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **add fiber-link** to administer the DS1 converter.
2321	ABORT	DS1 facility is not busied out. 1. Enter **busyout ds1-facility** to busyout the DS1 facility. 2. If there is only one DS1 facility, use **busyout board** to busyout the DS1 converter circuit pack.
2332	ABORT	For this system configuration, the test cot run at the far end when there is only one DS1 facility available. 1. Run the test at the other end of the DS1 converter complex.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 3

Table 454: Far-End Internal Loopback Test (#797) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	FAIL	Far-End Internal loopback failed. A problem exists between DS1 converter A and DS1 converter B's internal interface for the DS1 facility See Figure 109: Far-End Internal Loopback Test Configuration. 1. Enter **display errors** and follow the associated repair procedures for any on-board DS1C-BD (DS1 Converter Circuit Pack) errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. 2. If the network is used instead of private T1 lines, verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Enter **list fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See Line Coding and Framing Mode for details on how these options apply to the TN574 and TN1654 DS1 converter boards. 3. Isolate the problem by running the Near-End External Loopback test (#799) with **test ds1-facility location external-loopback**, first at this end and then at the other end of the DS1 converter complex. Set up loopbacks at different points as shown in the description diagram for Test #799, and follow repair procedures described for Near-End External Loopback Test (#799). 4. If the problem could not be found by near-end external loopback tests, the fault should be between the CSU A and the CSU B. Contact T1 Network Service to resolve the problem. Also see the repair procedures for Error Type 1025 (loss of frame alignment) for DS1C-BD (DS1 Converter Circuit Pack).
Any	PASS	Transmission through the path of the loopback is successful. TN1654 DS1 facilities will display the round trip delay time in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent.
		3 of 3

DS1 Interface Options Audit (#798)

This test sends the administered DS1 Interface options to the DS1 converter circuit pack. Options are sent to both DS1 converter circuit packs at the same time to prevent any transitional mismatch of options.

The following DS1 facility options are sent to the TN574 DS1 converter circuit pack: Framing Mode, Line Coding and DS1 converter-1 and DS1 converter-2 Line Compensation.

The following DS1 facility options are sent to the TN1654 DS1 converter circuit pack: Line Coding, and DS1 converter-1 and DS1 converter-2 Line Compensation (T1 only). These option fields appear on the Fiber-link Administration screen.

This test runs on the DS1-FAC (DS1 Facility) maintenance object.

Table 455: DS1 Interface Options Audit (#798) ***1 of 2***

Error Code	Test Result	Description / Recommendation
105	ABORT	The neighbor DS1 converter circuit pack at the other end of the DS1 converter complex is not accessible. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Timed out while waiting for a response from the circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **`add fiber-link`** to administer the DS1 converter fiber link, then rerun the test.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 2

Table 455: DS1 Interface Options Audit (#798) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	The DS1 Interface options were successfully sent to the circuit pack.
		2 of 2

Near-End External Loopback Test (#799)

This test is destructive.

This test starts at the specified DS1 converter circuit pack location, traverses over the specified facility, and loops back at the manually hard-wired external loopback device. Depending on the type of physical connectivity of the DS1 facility, special tools, cables or connectors may be required to make the hard-wired loopbacks.

To isolate a problem, set the loopback first at the loopback point LB 1, and then at the loopback point LB 2. See Figure 110: Loopback Points for Test #799 and Figure 19: DS1 Facility Connections. Place the loopbacks at as many points as your CSU capabilities will allow. Hard-wired loopbacks at the far end are not desirable, because the equalization-level adjustments may cause problems.

Every part of this test is executed under firmware control and the result is sent back to the system. The test is executed by sending digital data through every DS1 channel on this DS1 facility.

This test is executed using **`test ds1-facility location external-loopback`**. It is not part of the long test sequence because it requires modifications to the physical connectivity of the DS1 facility.

If there is only one DS1 facility available, the system will not allow the last facility to be busied out. In that case, the DS1 converter circuit pack must be busied out before executing this test.

For a standard-, duplex-, or high-reliability system (no PNC duplication), if there is only one DS1 facility available, then this test can only be executed at the endpoint that is closer to the server relative to the neighbor DS1 converter circuit pack because of its impact on the system control links. For a critical-reliability system (PNC duplication) or for a system with multiple DS1 facilities, the test can be executed at any DS1 converter circuit pack.

If the test passes on a TN1654 DS1 facility, the *round trip delay time* will be displayed in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent. This measurement is taken on the last DS1 channel tested.

This test runs on the DS1-FAC (DS1 Facility) maintenance object.

Figure 110: Loopback Points for Test #799

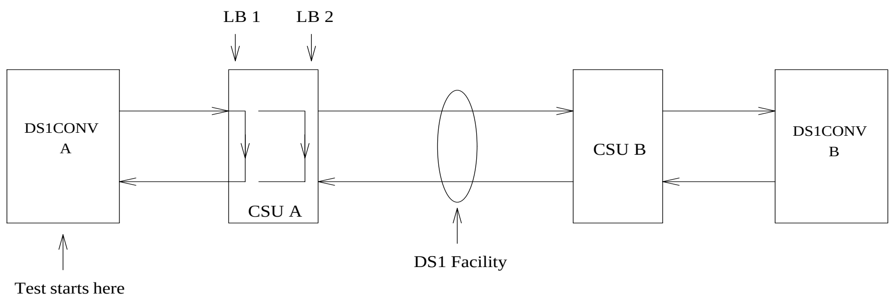


Table 456: Near-End External Loopback Test (#799) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2100 2000 2300 2301	ABORT	Could not allocate the necessary system resources to run this test. Test timed out while waiting for a response from the circuit pack. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **add fiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 facility is not busied out. 1. Busyout the DS1 facility via **busyout ds1-facility**. 2. If there is only one DS1 facility, busyout the DS1 converter circuit pack via **busyout board**.
2332	ABORT	With this system configuration, the test cot run at the far end when there is only one DS1 facility available. Check the green LED at the face plate of the DS1 converter circuit pack. The green LED should be on if the loop is complete.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 2

Table 456: Near-End External Loopback Test (#799) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	Near-end external loopback failed. A problem exists in the path of the loopback. 1. Enter **`display errors`** and follow the associated repair procedures for any on-board DS1C-BD (DS1 Converter Circuit Pack) errors. 2. If the loopback point is **LB 1**, replace connectors and cables between the DS1 converter A and the CSU A. If the loopback point is **LB 2**, replace CSU A. Also, see the repair procedure for Error Type 1025 (loss of frame alignment) for DS1C-BD (DS1 Converter Circuit Pack). 3. If the test still fails, replace DS1 converter A circuit pack.
Any	PASS	Transmission through the path of the loopback is successful. TN1654 DS1 facilities will display the round trip delay time in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent. This measurement is taken on the last DS1 channel tested.
		2 of 2

Automatic Transmission Test (#844-848)

Note:

Tests #844–848 are not supported on an International switch.

These tests are run by the Automatic Transmission Measurement System (ATMS). They are not part of the long or short trunk test sequences. Instead, they are run using the command **`test analog-testcall`** or as part of ATMS scheduled testing. For more information, see *Maintenance Procedures (03-300432)*.

The test call is run from an analog port on a TN771 Maintenance/Test circuit pack. It attempts to seize a port and make a call to a terminating test line (TTL) on the trunk's far end. Transmission performance measurements are made and compared to administered thresholds. Errors are generated when results fall outside of “marginal” or “unacceptable” thresholds. Detail and summary measurement reports are obtainable using **`list testcalls`**.

See the test analog-testcall section on the Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431) for the command syntax. The command options and the associated tests which are executed for **`test analog-testcall`** are:

Test Command	Option	Test executed
`test analog-testcall`	***`supervision`***	844
`test analog-testcall`	***`full`***	845
`test analog-testcall`	***`no-selftest`***	846
`test analog-testcall`	***`no-return-loss`***	847
`test analog-testcall`	***`no-st-or-rl`***	848

These tests run on CO-TRK (Analog CO Trunk) and TIE-TRK (Analog Tie Trunk).

Table 457: Automatic Transmission Test (#844-848) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **`display port`** ***`location`*** to determine the trunk group/ member number of the port. 2. Enter **`status trunk`** to determine the service state of the port. If the service state indicates that the port is in use, wait until the port is idle before retesting. 3. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 457: Automatic Transmission Test (#844-848) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. 1. Enter **`status trunk`** to determine when the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Wrong trunk group type for this test. This error can be ignored.
1115	ABORT	The near end test line on the TN771 circuit pack could not be allocated. 1. Enter **`status port`** and verify that the TN771 circuit pack is in service. Also verify that port 1 is administered and in service. 2. Retry the command at 1-minute intervals up to 5 times.
1900	ABORT	Test completion message was not received from the TN771 circuit pack. 1. Test the TN771 circuit packs.
1901	ABORT	TN771 sent wrong response for this test. 1. Verify that the trunk is administered properly.
		2 of 5

Table 457: Automatic Transmission Test (#844-848) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1905 1906 1907 1913 1914	ABORT	Intercept tone detected from far end. Reorder tone detected from far end. Other unexpected tone detected from far end. Audible Ring detected from far end. Unidentified interrupted tone detected from far end. 1. Get the test line data and verify it with the far end. Dial the test number manually to see if the TTL is reached. If it is not, then either the number is wrong, or the far end is administered incorrectly.
1915	ABORT	Busy tone detected from far end. 1. Since the test line at the far end was busy. Try the test again. 2. If the test continues to abort, the problem is with the far-end system.
1918 1919 1920 1921	ABORT	Test progress tone not removed from far end (type 105 test line only). Unexpected far-end release. No response from the far end. No data returned from the far end. 1. The problem is with the far-end system. A technician at the far end should test the test line (TN771 or ADFTC).
1922 1923 1924	ABORT	Steady, unidentifiable tone from far end. Broadband energy detected from far end (voice or announcement). No test tone from the far end. 1. Get the test line data and verify it with the far end. Dial the test number manually to see if the TTL is reached. If it is not, then either the number is wrong, or the far end is administered incorrectly.
1938 1939	ABORT	Near-end self test failed. Loss self check at 0dBm at 1004 Hz failed. 1. Test the TN771 circuit packs.
1940	ABORT	Far-end noise self check failed. 1. The problem is with the far-end system. A technician at the far end should test the test line (TN771 or ADFTC).
		3 of 5

Table 457: Automatic Transmission Test (#844-848) ***4 of 5***

Error Code	Test Result	Description / Recommendation
1941 1942 1943 1944 1945 1946 1947	ABORT	High frequency singing return loss self check failed. Echo return loss self check failed. Singing return loss self check failed. Loss self check at -16 dBm at 1004 Hz failed. Loss self check at -16 dBm at 404 Hz failed. Loss self check at -16 dBm at 2804 Hz failed. Noise with tone self check failed. 1. Test the TN771 circuit packs.
2000 2012 2053 2056	ABORT	No response to the test received within the allowed time. Internal software error. The test call could not be established, but an explanation is unavailable. Unable to obtain results from the TN771 circuit pack. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group screen. 1. Retrieve a measurement report using **`list testcalls`**. 2. Make sure that ATMS thresholds are set properly on page 4 of the trunk group screen. 3. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
		4 of 5

Table 457: Automatic Transmission Test (#844-848) ***5 of 5***

Error Code	Test Result	Description / Recommendation
8000	FAIL	Measured transmission performance was in the marginal range as administered on the trunk group screen. This generally means that the trunk is usable but has an undesirable amount of noise or loss. If the user does not report unacceptable effects, it may not be necessary to take any action. 1. Retrieve a measurement report using **`list testcalls`**. 2. Make sure that ATMS thresholds are set properly on page 4 of the Trunk Group screen. 3. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
	PASS	The measured transmission performance was in the acceptable range.
		5 of 5

Packet Interface Memory Checksum Test (#884)

This test sends a message to the Packet Interface module to run memory checksum tests on the Boot PROM and FLASH memory on the IPSI circuit pack. If the test fails, the Packet Interface module remains operational until a reset is executed. The Packet Interface is then placed in an out-of-service state.

This test runs on PKT-INT (Packet Interface).

Table 458: Packet Interface Memory Checksum Test (#884) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	Because the IPSI's Packet Interface module is out of service, normal maintenance tests do not run on the Packet Interface. 1. Enter **`reset packet-interface`** ***`location`*** to reset the Packet Interface. See Packet Interface Reset Test (#889).
		1 of 4

Table 458: Packet Interface Memory Checksum Test (#884) ***2 of 4***

Error Code	Test Result	Description / Recommendation
1334	ABORT	The Packet Interface command queue is full. This should be a temporary condition caused by a high rate of commands being sent to a Packet Interface. Continued operation with a full command queue causes a system WARM restart that may escalate to more severe restart levels. 1. Retry the command at 10-second intervals up to 5 times.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, so this test is not allowed to run. 1. Enter **`set ipserver-interface`** ***`location`*** to make the standby Packet Interface active. 2. Rerun the test.
2000	ABORT	Response to the test was not received within the allowed time.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 4

Table 458: Packet Interface Memory Checksum Test (#884) ***3 of 4***

Error Code	Test Result	Description / Recommendation
1 2 3	FAIL	The Boot PROM memory checksum test failed. The Flash memory checksum test failed. Both the Boot PROM and Flash memory checksum tests failed. The circuit pack may still be operational. 1. The failure may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the newer firmware if appropriate. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download the appropriate firmware image. 3. Retry the command. If the same Error Code occurs: a. If this is a standard- or duplex-reliability system, replace the circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced since it may not operate after a system reboot and it will enter a fatal fault state if it is reset for other reasons. b. If the Packet Interface module is on the standby IPSI, replace that circuit pack. **S8700-series Fiber-PNC**: If the Packet Interface module is on the standby IPSI and this is a high- or critical-reliability system, replace that circuit pack. c. If the Packet Interface module is on the active IPSI, enter **`set ipserver-interface`** to perform a pled IPSI interchange. **S8700-series Fiber-PNC**: If the Packet Interface module is on the active IPSI and this is a high- or critical-reliability system, enter **`set ipserver-interface`** to perform a pled IPSI interchange.
	PASS	The circuit pack's firmware is in a proper state. If problems are still reported on the circuit pack, check for errors on the Packet Interface Private Looparound Test (#885) and Packet Interface Maintenance Looparound Test (#886).
		3 of 4

Table 458: Packet Interface Memory Checksum Test (#884) ***4 of 4***

Error Code	Test Result	Description / Recommendation
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned, but is not detected as being physically present. 1. If the IPSI circuit pack is present, replace it. 2. If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and run the test again.
		4 of 4

Packet Interface Private Looparound Test (#885)

This test requests the Packet Interface to run its three private looparound tests: Level-2 Link Looparound, Level-3 Link Looparound, and Broadcast Path Looparound. These tests verify the health of the circuit pack's packet bus interface as well as the translation RAM, inward and outward bound data paths, parity indications and CRC calculations.

These tests are also run as part of the **`reset`** command. If any of the looparound tests fail, the Packet Interface is put in the out-of-service state. Repair procedures associated with Abort Code 1137 (out of service) should be followed.

This test runs on PKT-INT (Packet Interface).

Table 459: Packet Interface Private Looparound Test (#885) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	Packet Interface module is out of service. 1. Enter **`reset packet-interface`** ***`location`*** to reset the Packet Interface circuit. See the procedures in Packet Interface Reset Test (#889).
1334	ABORT	The Packet Interface modules's command queue is full. This condition should be temporary, caused by a high rate of commands being sent to a Packet Interface. Continued operation with a full command queue causes a system WARM restart that may escalate to more severe restart levels. 1. Retry the command at 10-second intervals up to 5 times.
		1 of 3

Table 459: Packet Interface Private Looparound Test (#885) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, so this test is not allowed to run. 1. Enter **`set ipserver-interface`** ***`location`*** to make the standby Packet Interface active. 2. Rerun the test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
1 2 3	FAIL	The Private Link Broadcast Looparound Test failed. The Private Level-2 Looparound Test failed. The Private Level-3 Looparound Test failed. 1. The Packet Interface module on the IPSI circuit pack enters a fatal-fault state when this error occurs, and the Packet Interface is put in a out-of-service state. By the time action is taken, the test should abort with ABORT code 1137, and a demand reset should be used to test the Packet Interface. 2. This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. 3. The firmware image on the IPSI circuit pack may have been corrupted. Download the appropriate firmware image. 4. Retry the command. 5. If the same Error Code occurs, enter **`reset packet-interface`** ***`location`*** to reset the Packet Interface. See the repair procedures for Packet Interface Reset Test (#889). 6. If the test continues to fail, replace the IPSI circuit pack.
		2 of 3

Table 459: Packet Interface Private Looparound Test (#885) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	PASS	All of the private looparound tests passed. The Packet Interface on the IPSI circuit pack is functioning properly. If the system is still unable to place calls, then: 1. Enter **display errors** to display the error log, and check for errors on the PKT-BUS (Packet Bus) and M/T-BD (Maintenance/ Test Circuit Pack) Clear those errors first. 2. Check all other circuit packs connected to the packet bus in the same cabinet. Packet bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. See PKT-BUS (Packet Bus) for repair procedures.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned, but is not detected as physically present. 1. If the IPSI circuit pack is present, replace it. 2. If an IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
		3 of 3

Packet Interface Maintenance Looparound Test (#886)

This test checks whether an IPSI circuit pack's Packet Interface module correctly sends and receives data. It establishes a LAPD link from the IPSI's Packet Interface module back to the same Packet Interface module, and transmits and receives test data over that testing link. While timing signals from the packet bus are used for the data transfer, the data itself is looped around on the circuit pack at the interface to the packet bus and does not get sent over the packet bus.

Note:

In a high- or critical-reliability system (duplicated IPSIs), this test does not run on a standby IPSI's Packet Interface module. However, a failure of the Maintenance Looparound test may cause an IPSI interchange that reports an alarm (associated with the looparound failure, Error Code 769) against the standby IPSI's Packet Interface module. If so, and if every other Packet Interface test in **test packet-interface *location* long** sequence passes, enter **set ipserver-interface** to force the standby IPSI to go active. Then, enter **test packet-interface *location*** to run the Maintenance Looparound test, and verify that the problem cleared.

This test runs on PKT-INT (Packet Interface).

Table 460: Packet Interface Maintenance Looparound Test (#886) *1 of 3*

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	The IPSI circuit pack's Packet Interface module is out of service. 1. Enter **reset packet-interface *location*** to reset the Packet Interface. See the repair procedures for Packet Interface Reset Test (#889).
1139	ABORT	The packet bus is alarmed. 1. Try to retire the alarm associated with the packet bus. Enter **display alarms** to see the Alarm Log. Refer to PKT-BUS (Packet Bus) for further action. 2. Retry the command when the alarm associated with the packet bus has been retired.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI. 1. Enter **set ipserver-interface *location*** to make the standby Packet Interface active. 2. Rerun the test.
1373	ABORT	Could not establish the link looparound link to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2060	ABORT	Packet link's bus went down during maintenance looparound test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If there are errors associated with the packet bus, see PKT-BUS (Packet Bus).
2100 2000 2500	ABORT	Could not allocate the necessary system resources to run this test. Response to the test was not received within the allowed time. Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 460: Packet Interface Maintenance Looparound Test (#886) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1–5	FAIL	Fail Codes 1 - 4: 1 = Did not receive looparound data 2 = Looparound data not correct length 3 = Looparound data did not match 4 = Transmit buffer exhaustion Either the system could not establish a looparound link from the IPSI's Packet Interface module back to itself, or it could not receive data that was sent on one side of the looparound link. 1. Enter **`test packet-interface`** ***`location`*** to retry the test. If the same Error Code is observed, the system automatically attempts to reset the Packet Interface and clear the problem. 2. Retry the command. If the test fails, replace the IPSI circuit pack that has the failing Packet Interface. 3. If the test continues to fail after replacing the IPSI circuit pack, enter **`test packet`** ***`P`*** **`long`**. If any of the tests fail, the fault may be on the packet bus. See PKT-BUS (Packet Bus) for the recommended repair procedures. 4. If the test continues to fail after the IPSI circuit pack is replaced, and with no other alarms associated with the packet bus or circuit packs connected to the packet bus, follow normal escalation procedures.
		2 of 3

Table 460: Packet Interface Maintenance Looparound Test (#886) ***3 of 3***

Error Code	Test Result	Description / Recommendation
1–5	FAIL (cont'd)	Fail Code 5: old firmware not compatible with new software. 1. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **Note:** At the Avaya support site(http://support.avaya.com), search on "Firmware Compatibility Matrix" to find the latest firmware vintage. Be sure to review the 'ReadMe' file that accompanies the firmware image for any interactions with a particular software release. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download and replace the firmware image. 3. Retry the command.
	PASS	The Packet Interface module on the IPSI circuit pack and its interface are functioning properly. If the system is unable to place calls on PNs served by this IPSI, then: 1. Check for PKT-BUS (Packet Bus) errors, and solve those errors first. 2. Check for errors in the PN where calls cot be completed, and solve those errors. 3. Check every other circuit pack connected to the packet bus in the same cabinet. Packet bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. 4. Check the IPSI circuit pack's Packet Interface module that serves this PN for errors, and resolve these errors. 5. If errors continue, escalate.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned but is not detected as being physically present. 1. If the IPSI circuit pack is present, replace it. 2. If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
		3 of 3

Packet Interface Read and Clear Counters (#887)

This test sends commands to read Packet Interface error counters located on the IPSI circuit pack. It also verifies the message interface between the server and the Packet Interface.

This test checks different Packet Interface counters S8700-series Fiber-PNC: depending on whether the Packet Interface module is on the active or standby IPSI.

Running this test on the active IPSI circuit pack's Packet Interface module reads and clears the Parity Error counter and FIFO Overflow counter. S8700-series Fiber-PNC: Those counters are not used when a Packet Interface module is in standby mode.

S8700-series Fiber-PNC: Running this test on the standby IPSI circuit pack's Packet Interface module, reads but does not clear a Translation RAM counter. The Translation RAM counter is not cleared since the number of bad translation RAM locations indicates bad locations that cot be used.

For an active Packet Interface module, information about the number of bad Translation locations is sent to maintenance software as an inline error from the IPSI circuit pack, so it is not necessary to read a counter location.

This test runs on PKT-INT (Packet Interface).

Table 461: Packet Interface Read and Clear Counters Test (#887) ***1 of 4***

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	The IPSI circuit pack's Packet Interface module is out of service. 1. Enter **reset packet-interface** ***location*** to reset the Packet Interface. See Packet Interface Reset Test (#889).
1335	ABORT	Internal IPSI error. The test is on standby IPSI's Packet Interface module, so this test is not allowed to run. 1. Enter **set ipserver-interface** ***location*** to make the standby Packet Interface active. 2. Rerun the test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command.
		1 of 4

Table 461: Packet Interface Read and Clear Counters Test (#887) ***2 of 4***

Error Code	Test Result	Description / Recommendation
256 512 768	FAIL	The active IPSI circuit pack's Packet Interface module has an error counter set. The following Error Codes are possible: 256 (parity error), 512 (FIFO overflow), 768 (parity error and FIFO overflow error). 1. This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. 3. Retry the command. 4. If the same Error Code occurs, and Error Code 256 or 768 is reported, the IPSI's Packet Interface module received a parity error off the packet bus. a. Check for alarms logged against the packet bus. See PKT-BUS (Packet Bus) to clear those errors first. b. Check for alarms and errors logged against other circuit packs connected to the PN's packet bus. See Maintenance Object Interactions for a list of packet circuit packs. Refer to the repair procedures for those circuit packs to clear those errors first. c. **S8700-series Fiber-PNC**: If this is a standard- or duplex-reliability system, replace the IPSI circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced. d. If this is a high-reliability (**S8700-series Fiber-PNC**: or critical-reliability) system and if the Packet Interface module is on the standby IPSI, replace the standby IPSI circuit pack. e. If this is a high-reliability (**S8700-series Fiber-PNC**: or critical-reliability) system and if the Packet Interface module is on the active IPSI, enter **`set ipserver-interface`** to perform a pled IPSI interchange. Replace the standby IPSI circuit pack.
		2 of 4

Table 461: Packet Interface Read and Clear Counters Test (#887) ***3 of 4***

Error Code	Test Result	Description / Recommendation
256 512 768 (cont'd)	FAIL (cont'd)	5. If Error Code 512 or 768 is reported for an active IPSI's Packet Interface module, the receive FIFO in the PKT-INT has overflowed. This may indicate the need for additional IPSI circuit packs. For the current hardware configuration, only one IPSI circuit pack is allowed per PN. Escalate the problem if not corrected by the following repair steps. Retry the command after one minute if the test continues to fail. a. If the Packet Interface module is on the active IPSI (**S8700-series Fiber-PNC**: and this is a high- or critical-reliability system), use **`set ipserver-interface`** to perform a pled IPSI interchange. Replace the standby IPSI circuit pack. b. Otherwise, replace the IPSI circuit pack at a time that would cause the least service disruption. 6. If Error Code 512 or 768 is reported for a standby IPSI's Packet Interface module, replace the standby IPSI circuit pack.
		3 of 4

Table 461: Packet Interface Read and Clear Counters Test (#887) *4 of 4*

Error Code	Test Result	Description / Recommendation
1024–1096	FAIL	Firmware problem. 1. This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. 3. Retry the command. 4. If the same Error Code occurs: The standby IPSI's Packet Interface module has bad translation RAM locations. A MINOR alarm is generated when the number of bad locations is between 1 and 4. A MAJOR alarm is generated if the number of bad locations is 5 or more. The MAJOR alarm prevents a pled IPSI interchange (scheduled or on-demand). If a MAJOR alarm is associated with this error, replace the alarmed standby IPSI circuit pack. If a MINOR alarm is associated with this error, replace the alarmed standby IPSI circuit pack at a time that would cause the least disruption to service.
	PASS	The server can communicate with the IPSI circuit pack's Packet Interface module. 1. If problems are still reported on the Packet Interface, check for failures using the Packet Interface Private Looparound Test (#885) and Packet Interface Maintenance Looparound Test (#886).
	NO BOARD	The IPSI circuit pack's Packet Interface module is administered, but is not detected as physically present. 1. If the IPSI circuit pack is present, replace it. 2. If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the administered slot, and rerun the test.
		4 of 4

Active-Standby Peer Link Test (#888)

The Active-Standby Peer Link test is run only in a system equipped with the high- or critical-reliability configuration. It verifies that a peer link can be set up between the active and standby PKT-INTs. A peer link is a logical connection established between the packet bus and an IPSI circuit pack's Packet Interface module for both active and standby IPSIs. This link forwards data and control messages between the active and standby PKT-INT to prepare for a pled IPSI interchange. This test checks the operation of setting up a Peer Link, and verifies that the active and standby IPSI's Packet Interface modules can communicate over the packet bus.

This test checks the functionality of both the active and standby Packet Interface modules, but it is run only on the standby Packet Interface module.

This test runs on PKT-INT (Packet Interface).

Table 462: Active-Standby Peer Link Test (#888) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	An IPSI circuit pack's Packet Interface module is out of service. 1. Enter **reset packet-interface *location*** to request a Packet Interface module reset. See Packet Interface Reset Test (#889).
1139	ABORT	The packet bus is alarmed. 1. Enter **display alarms** to refer to the Alarm log and try to retire the alarm associated with the packet bus. See PKT-BUS (Packet Bus). 2. Retry the command when the alarm associated with the packet bus is retired.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI. 1. Enter **set ipserver-interface *location*** to make the standby Packet Interface active. 2. Rerun the test.
1336	ABORT	Internal system error. 1. Enter **set ipserver-interface *location*** to make the standby Packet Interface active. 2. Rerun the test.
		1 of 3

Table 462: Active-Standby Peer Link Test (#888) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1337	ABORT	The test is not allowed to run because a PNC interchange is in progress. A PNC interchange may have been initiated with **`reset pnc interchange`**, or as part of a recovery action. 1. Wait 3 minutes and retry the command.
2000 2500	ABORT	Response to the test was not received within the allowed time. Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
1 2	FAIL	Setting up peer links between the active and standby IPSI circuit pack's Packet Interface modules failed. Error Code 1: The standby IPSI circuit pack's Packet Interface module did not respond to the peer link setup. Error Code 2: The active IPSI circuit pack's Packet Interface module did not respond to the peer link setup 1. This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. 3. Retry the command. 4. If the same Error Code occurs, use **`display alarms`** to display active alarms. 5. If there are errors related to the packet bus, see PKT-BUS (Packet Bus) and clear those problems first. 6. Retry the test command after a 1-minute delay. 7. If the test continues to fail, replace the affected IPSI circuit pack.
	PASS	The server can communicate with the IPSI circuit pack's Packet Interface module. 1. If problems are still reported on the Packet Interface, check for failures using the Private Looparound test (#885) and Maintenance Looparound test (#886).
		2 of 3

Table 462: Active-Standby Peer Link Test (#888) *3 of 3*

Error Code	Test Result	Description / Recommendation
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned but is not detected as physically present. 1. If the IPSI circuit pack is present, replace it. 2. If not, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
		3 of 3

Packet Interface Reset Test (#889)

The reset action initializes the Packet Interface firmware on the IPSI circuit pack and runs a comprehensive set of diagnostic tests.

The demand reset action aborts if the specified IPSI circuit pack's Packet Interface module is in the active in-service state.

An IPSI circuit pack's Packet Interface module is put in the out-of-service state automatically if it resets 3 times by background maintenance within the last 15 minutes, independent of the results of the reset action.

If the Packet Interface module is on the standby IPSI (**S8700-series Fiber-PNC**: and this is a high- or critical-reliability system), the demand reset action runs, independent of the service state.

This test runs on PKT-INT (Packet Interface).

Table 463: Packet Interface Reset Test (#889) *1 of 3*

Error Code	Test Result	Description / Recommendation
1334	ABORT	The Packet Interface modules's command queue is full. This should be a temporary condition caused by a high rate of commands being sent to a Packet Interface module. Continued operation with a full command queue causes a system WARM restart that could escalate to more severe restart levels. 1. Retry the command at 10 second intervals up to 5 times.
		1 of 3

Table 463: Packet Interface Reset Test (#889) *2 of 3*

Error Code	Test Result	Description / Recommendation
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, and this test is not allowed to run. 1. Enter **`set ipserver-interface`** ***`Uc`*** to make the standby Packet Interface active. 2. Run the test.
1362	ABORT	The Reset test is not allowed to run because the Packet Interface is in service. Resetting an active IPSI circuit pack's Packet Interface module while in service is not allowed because this is a destructive test. 1. Enter **`status packet-interface`** to determine the service state of the Packet Interface. If the Packet Interface is out of service, try the Reset command again.
2000 2500	ABORT ABORT	Response to the test was not received within the allowed time. Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
5001	ABORT	The TDM clock in the Processor port network has failed. 1. See TDM-CLK (TDM Bus Clock) to clear this failure.
5002	ABORT	The packet bus in the Processor port network has failed. 1. See PKT-BUS (Packet Bus) to clear this failure.
Any	FAIL	The diagnostic tests failed for the IPSI's Packet Interface module. If the system is equipped with the high-reliability or critical-reliability configuration, the reset runs only on demand if the Packet Interface is on the standby IPSI circuit pack or if Packet Interface is in an out-of-service state on the active IPSI. 1. This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. 2. The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. 3. Retry the command. 4. If the same Error Code occurs, retry **`reset packet-interface`**. 5. If the reset fails, replace the IPSI circuit pack.
		2 of 3

Table 463: Packet Interface Reset Test (#889) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	PASS	The IPSI's Packet Interface diagnostic software passed. The Packet Interface is put back into service automatically.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned but is not detected as physically present. 1. If the IPSI circuit pack is present, replace it. 2. If not, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
		3 of 3

Signaling Port LAN Loopback Test (#939)

This test is destructive.

This test verifies the connectivity of an ISDN-PRI signaling port (D-channel) across the packet bus, also known as the LAN bus. It will run only if the port is out of service. Failure of this test indicates a fault associated with the port hardware on the circuit pack.

This test runs on ISDN-PLK (ISDN-PRI Signaling Link Port).

Table 464: Signaling Port LAN Loopback Test (#939) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not in the out-of-service state. Enter **busyout port** ***location*** to place it in the out-of-service state and repeat this test. **CAUTION:** The **busyout** prevents new call originations on every B-channel in the signaling group until the port is released.
1139	ABORT	This port network's packet bus is out of service. 1. Follow repair procedures for the packet bus. 2. Enter **test port** ***location*** **long**, and check results of Test (#939).
		1 of 2

Table 464: Signaling Port LAN Loopback Test (#939) *2 of 2*

Error Code	Test Result	Description / Recommendation
1141	ABORT	The Packet Interface circuit pack is out of service. 1. Follow the repair procedures for PKT-INT (Packet Interface). 2. Enter **test port *location* long**, and check results of this test (#939).
1144	ABRT	The PPN's packet bus is out of service. 1. Follow repair procedures for the packet bus. 2. Enter **test port *location* long** command and check results of this test (#939).
1412	ABORT	This test does not run on a media module or media gateway. Ignore.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Loopback Test failed. 1. If the test fails repeatedly, attempt to reset the circuit pack when the other ports on the board are idle. 2. Repeat the test. If it continues to fail, replace the circuit pack.
	PASS	Connectivity of the D-channel over the packet bus is operational.
		2 of 2

Failure Audit Test (#949)

This test queries the DS1 converter circuit pack for any existing circuit pack or facility failures and any unacknowledged cleared failure messages.

This test runs on DS1C-BD (DS1 Converter Circuit Pack) and DS1-FAC (DS1 Facility).

Table 465: Failure Audit Test (#949)

Error Code	Test Result	Description / Recommendation
2000 2100 2300 2301	ABORT	Test timed out while waiting for a response from the circuit pack. Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set for the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. 1. Enter **add fiber-link** to administer the DS1 converter fiber link.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	The DS1 converter circuit pack reported failures or retransmitted a cleared failure message. 1. Enter **display errors** and follow the repair procedures for any DS1C-BD (DS1 Converter Circuit Pack) and DS1-FAC (DS1 Facility) errors.
	PASS	The DS1 converter circuit pack has no failures.
0	NO BOARD	See NO BOARD for repair procedures.

PN Cold Restart Test (#955)

PN Cold Restart, or PN Reset Level 2, is used as an error recovery mechanism for a PN that has been taken out of service. Once a PN has gone out of service, a PN Cold Restart is required to bring it back into service.

When a PN is taken out of service, all originating and terminating calls on the affected PN are dropped and new phone calls cot be made. During the restart, all hardware on the affected PN will be re-initialized. The restart takes no longer than 2 minutes.

When the link has been down for 60 seconds, the PN is taken out of service. When the link comes up, a PN cold restart will occur automatically. See PN Warm Restart Test (#956).

A PN Cold Restart can be invoked on demand with **`reset port-network P level 2`**

Table 466: PN Cold Restart Test (#955)

Error Code	Test Result	Description / Recommendation
1386	ABORT	The system link to this PN is unavailable and cot be used. This reset cot be executed without the link being operational. 1. Refer to SYS-LINK (System Links) and resolve the link problem.
2100 2000 2500	ABORT	Could not allocate the necessary system resources to run this reset. Response to the test was not received within the allowed time. Internal system error 1. Retry the **`reset`** command at 1-minute intervals up to 3 times.
	FAIL	Internal system error 1. Retry the **`reset`** command at 1-minute intervals up to 3 times.
	PASS	The PN Cold Restart procedure completed successfully.

PN Warm Restart Test (#956)

The PN Warm Restart, or PN Reset Level 1, restarts a PN that has not been taken out of service. It is the least severe of the PN restart levels and is used in an attempt to preserve the state of the system as much as possible to reduce user impact.

When the link goes down, the port network becomes unavailable. Current calls are preserved, but users on the affected PN are not able to place or receive new phone calls.

If the link comes up in less than 60 seconds, a warm restart is performed automatically.

If the link does not come back up within 60 seconds, the PN is placed in the out-of-service state. When the link does come back up, the PN will require a cold restart. See PN Cold Restart Test (#955)

A PN Warm Restart can be invoked on demand with **`reset port-network P level 1`**

Table 467: PN Warm Restart Test (#956) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this reset. 1. Retry the **`reset`** command at 1-minute intervals up to 3 times.
1386	ABORT	The system link to this PN is unavailable and cot be used. This reset cot be executed without the link being operational. 1. See SYS-LINK (System Links) and resolve the link problem.
1387	ABORT	This PN is not in a state where it is possible to perform a Warm Restart on the PN. It is necessary to perform a PN Cold Restart (PN Reset Level 2) because of one of the following reasons: ● The PN is in an out-of-service state. ● Insufficient time has elapsed since the last PN Cold Restart was performed on this PN.
1428	ABORT	As the port network is in the suspended state, you cannot perform the WARM reset. A port network enters a suspended state when a port network experiences a network outage on the control network.
2000	ABORT	Response to the test was not received within the allowed time.
2500		Internal system error 1. Retry the **`reset`** command at 1-minute intervals up to 3 times.
		1 of 2

Table 467: PN Warm Restart Test (#956) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error 1. Retry the **`reset`** command at 1-minute intervals up to 3 times.
	PASS	The PN Warm Restart procedure completed successfully.
		2 of 2

Analog Port Sanity Test (#963)

This test verifies that the port circuitry involved in the analog trunk testing on the Maintenance/Test analog port is functioning properly.

This test will abort if an ATMS test call is in progress on the Maintenance/Test analog port when the test is requested.

This test runs on M/T-ANL (Maintenance/Test Analog Port).

Table 468: Analog Port Sanity Test (#963)

Error Code	Test Result	Description / Recommendation
2000 2100 2500	ABORT	Response to the test was not received within the allowed time. System resources required to run this test are not available. An internal operation failed. The test could not be completed. 1. Retry the command at 1-minute intervals up to 5 times.
50	FAIL	The switch was unable to communicate with the port circuitry used for analog trunk testing. 1. Reset the circuit pack. 2. Test the port again using **`test port`** ***`location`*** **`l`**. 3. If the test fails again, replace the circuit pack.
	PASS	The Maintenance/Test analog port analog trunk testing capability is operating correctly.

SNI Sanity Timer Test (#964)

The SNI Sanity Timer Test checks the number of times the sanity timer has expired. If the sanity timer expires twice within one second, the SNI will lock up and port networks will go down. The test passes if there are no sanity timer expirations. The test fails if it detects that the SNI has missed sanity. This test runs on SNI-BD (SNI Circuit Pack).

Table 469: SNI Sanity Timer Test (#964) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
2073	ABORT	The firmware on the SNI circuit pack is invalid. 1. Escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. 1. Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	A bad uplink message was received. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	The test detected that the SNI missed sanity. 1. Escalate the problem.
	PASS	No problems are detected on the board.
		1 of 2

Table 469: SNI Sanity Timer Test (#964) ***2 of 2***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. 3. Run the test again. If it fails, escalate the problem.
		2 of 2

System Link Status Test (#985)

This test queries the switch for the status of the system link and verifies that every switch component has the same view of the link state. This test runs on SYS-LINK (System Links)

Table 470: System Link Status Test (#985)

Error Code	Test Result	Description / Recommendation
1007	ABORT	Could not locate the system link associated with this location 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
6	FAIL	The system link is down. 1. Follow the procedure for Error Type 13 for SYS-LINK (System Links).
	PASS	The system link is up.

SNI Fiber Out of Frame Query Test (#989)

This test performs a non-destructive facility test of the SNI. The SNI circuit pack reports whether a fiber out of frame condition exists, whether a loss of signal condition exists, and whether the lightwave transceiver is present.

This test runs on the following maintenance objects:

- FIBER-LK (Fiber Link)
- SNI-BD (SNI Circuit Pack)
- SNI-PEER (SNI Peer Link)

Table 471: SNI Fiber Out of Frame Query Test (#989) ***1 of 7***

Error Code	Test Result	Description / Recommendation
1415 1416	ABORT	The lightwave transceiver is absent from Endpoint 1. The lightwave transceiver is absent from Endpoint 2. 1. Enter **`list fiber-link`** to display fiber link endpoints. 2. If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. 3. Otherwise, check the lightwave transceiver connections. Check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. 4. If the test continues to abort, replace the SNI circuit pack.
2100 2300 2301 2304	ABORT	Could not allocate the necessary system resources to run this test. The downlink message necessary to run this test could not be sent. The timer could not be set before sending the downlink message. SNI circuit pack is not able to run the test requested by software. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***2 of 7***

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. 1. Run `test led switch-node` for the switch node where the SNI resides to verify whether the LEDs on the board light. 2. If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run Test #760 using `test board` *`location`* `long` for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See SNI-BD (SNI Circuit Pack) for the procedure for replacing an SNI. 3. If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Enter `list fiber-link` to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter `display errors`, and follow the repair procedures for any EXP-INTF (Expansion Interface Circuit Pack) error entries associated with the controlling IPSI connected PN. d. Follow the repair procedures for any of the following errors: SYNC (Port Network Synchronization) SNI-BD (SNI Circuit Pack) SNC-BD (Switch Node Clock Circuit Pack) FIBER-LK (Fiber Link) SNI-PEER (SNI Peer Link) 4. Follow the procedure described in Switch Node Interface Manual Loopback Procedure to determine whether the circuit pack or the fiber connection is faulty.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***3 of 7***

Error Code	Test Result	Description / Recommendation
141 142	FAIL	The SNI circuit pack has a fiber out of frame condition, but no loss of signal condition. Error Code 141: A lightwave transceiver is connected to the SNI circuit pack. Error Code 142: No lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. 2. If a lightwave transceiver should not be present, go to step 3. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4,900 feet. • 9823b is used for distances up to 25,000 feet. 3. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*. 4. Replace this SNI circuit pack. 5. Replace the connected circuit pack.
		3 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***4 of 7***

Error Code	Test Result	Description / Recommendation
143 144	FAIL	The SNI circuit pack has a loss of signal condition, but no fiber out of frame condition. Error Code 143: A lightwave transceiver is connected to the SNI circuit pack. Error Code 144: No lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. 2. If a lightwave transceiver should not be present, go to step 3. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: ● 9823a is used for distances up to 4900 feet. ● 9823b is used for distances up to 25,000 feet. 3. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*. 4. Replace this SNI circuit pack. 5. Replace the connected circuit pack.
		4 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***5 of 7***

Error Code	Test Result	Description / Recommendation
145 146	FAIL	The SNI circuit pack has a fiber out of frame condition and a loss of signal condition. Error Code 145: a lightwave transceiver is connected to the SNI circuit pack. Error Code 146: no lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. 2. If a lightwave transceiver should not be present, go to step 3. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: ● 9823a is used for distances up to 4900 feet. ● 9823b is used for distances up to 25,000 feet. 3. Perform the Fiber link fault isolation procedure in *Maintenance Procedures (03-300432)*. 4. Replace this SNI circuit pack. 5. Replace the connected circuit pack.
		5 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***6 of 7***

Error Code	Test Result	Description / Recommendation
241 242	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition, but no loss-of-signal condition. Error Code 241: a lightwave transceiver is connected to the SNI circuit pack. Error Code 242: no lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)* in Chapter 5. 3. Replace this SNI circuit pack. 4. Replace the connected circuit pack.
243 244	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a loss-of-signal condition, but no fiber out-of-frame condition. Error Code 243: a lightwave transceiver is connected to the SNI circuit pack. Error Code 244: no lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1 converter complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)* in Chapter 5. 3. Replace this SNI circuit pack. 4. Replace the connected circuit pack.
		6 of 7

Table 471: SNI Fiber Out of Frame Query Test (#989) ***7 of 7***

Error Code	Test Result	Description / Recommendation
245 246	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition and a loss-of-signal condition. Error Code 243: a lightwave transceiver is connected to the SNI circuit pack. Error Code 244: no lightwave transceiver is connected to the SNI circuit pack. 1. Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered. Check using **`list fiber-link`**. Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. 2. Perform the Fiber link fault isolation in Chapter 4: General troubleshooting in *Maintenance Procedures (03-300432)* in Chapter 5. 3. Replace this SNI circuit pack. 4. Replace the connected circuit pack.
	PASS	No problems associated with this test are detected on the SNI.
0	NO BOARD	No board was detected by the test. 1. Check that board is properly translated and inserted. 2. Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **`reset board`** command should almost never be used on an SNI. It may be necessary to use **`reset board`** if the SNI circuit pack gets into a mode where it cot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **`reset board`** can mask real problems. 3. Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.
		7 of 7

VC Summer Port Local TDM Looparound Test (#1100)

This test is destructive.

This test verifies the connectivity of a VC Summer Port across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack. The Loopback test runs the following tests:

- A Looparound test across the TDM bus.
- A conference circuit test.

The tests are run in the above order. If the first test fails, an Error Code is returned and the second test is not executed. The test is run on VC-SUMPT (Voice Conditioner Summer Port)

Figure 111: VC Circuit Pack Summer Port Looparound Test

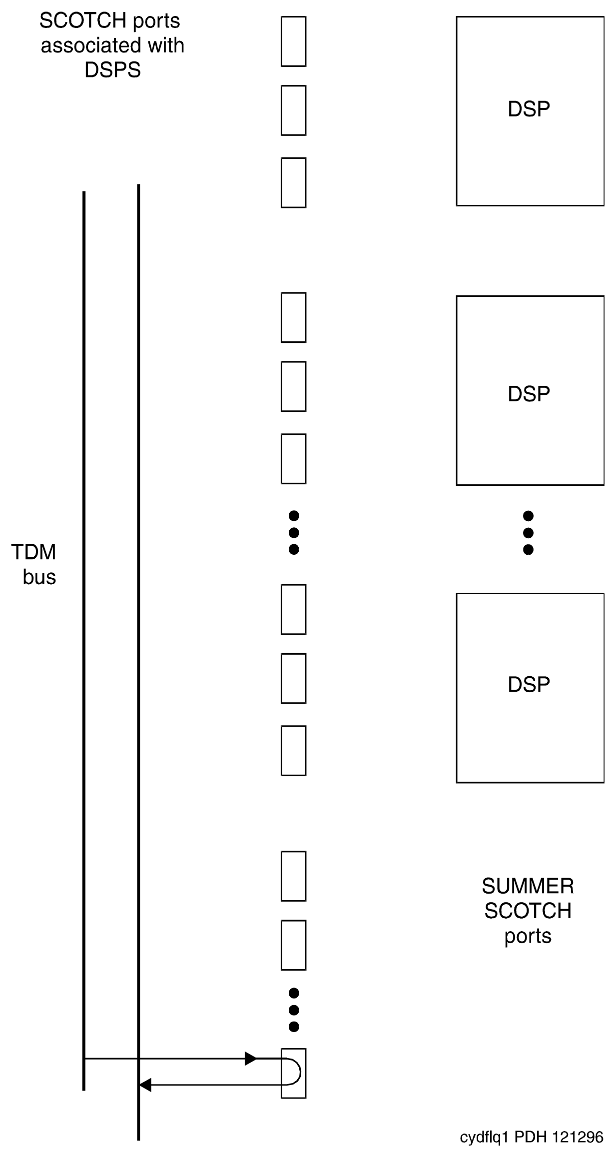


Table 472: VC Summer Port Local TDM Looparound Test (#1100) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available, or the port may be busy with a valid call. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. 1. Enter **`status station`** for the station associated with this port to determine whether the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 472: VC Summer Port Local TDM Looparound Test (#1100) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, reset the circuit pack if the other ports are idle. 2. Rerun the test. 3. If this result occurs again, replace the circuit pack.
2012 2100 2103	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. The system could not make the conference connection for the test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The TDM Loopoaround test or the Conference Circuit test failed. 1. Replace circuit pack.
	PASS	The VC Summer Port Local TDM Loopback test passed.
		2 of 2

VC DSP Port NPE Crosstalk Test (#1103)

This test is destructive.

The VC DSP Port NPE Crosstalk Test verifies that this port’s Network Processor Element (NPE) channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of the port’s long test sequence and takes approximately 20 to 30 seconds to complete.

This test runs on VC-DSPPT (Voice Conditioner DSP Port).

Table 473: VC DSP Port NPE Crosstalk Test (#1103)

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources for this test. 1. Retry the command at 1-minute intervals up to 5 times.
0-3	FAIL	The NPE of the tested port was transmitting in error, causing noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. 1. To be sure that this is not an intermittent problem, repeat this test up to 10 times. 2. If complaints still persist, examine the station, connections, and wiring.

VC DSP Port Local TDM Loopback Test (#1104)

This test is destructive.

This test verifies the connectivity of a VC DSP Port across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack. The Loopback Test runs a looparound test across the TDM bus, and a conference circuit test.

The tests are run in the listed order. If one test fails, an Error Code is returned and the remaining tests in the sequence are not executed. This test runs on VC-DSPPT (Voice Conditioner DSP Port).

Figure 112: VC Circuit Pack DSP Port Local TDM Loopback Test

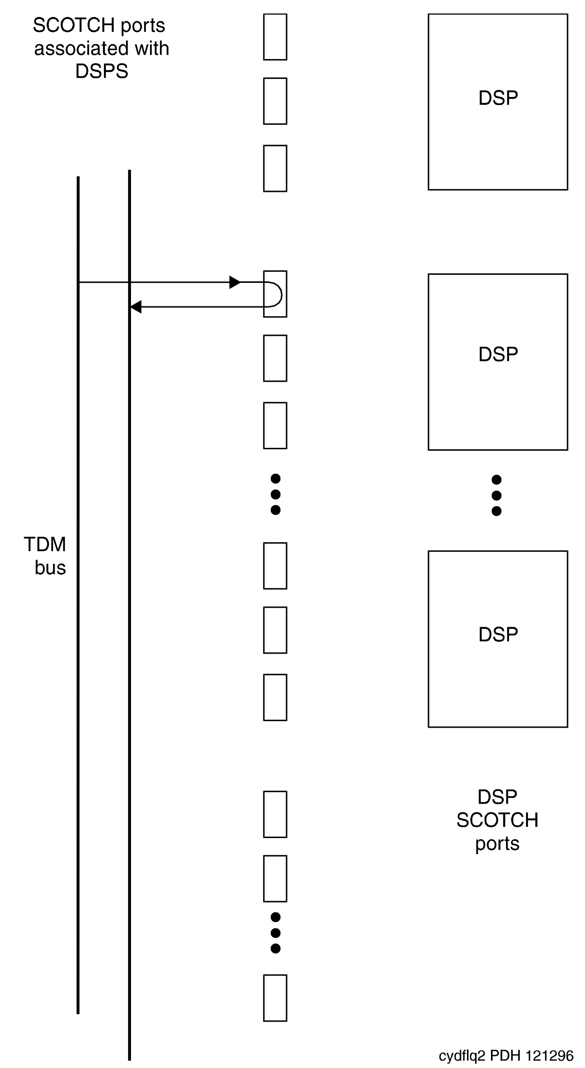


Table 474: VC DSP Port Local TDM Loopback Test (#1104) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available. The port is busy with a valid call. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 474: VC DSP Port Local TDM Loopback Test (#1104) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port is seized by a user for a valid call. Enter **status station** for the station associated with this port and determine whether the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, attempt to reset the port with **busyout port** ***location***, **reset port** ***location***, and **release port** ***location***. 2. Rerun the test. If this result occurs again, replace the circuit pack.
2012 2100 2103	ABORT	Internal system error. Could not allocate the necessary resources to run this test. The system could not make the conference connection for the test 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 474: VC DSP Port Local TDM Loopback Test (#1104) *3 of 3*

Error Code	Test Result	Description / Recommendation
0 - 3 4 - 7	FAIL	The TDM Looparound test failed. The Conference Circuit test failed. 1. Replace circuit pack.
	PASS	The VC DSP Port Local TDM Looparound test passed.
		3 of 3

VC DSP Port DSP Looparound Test (#1105)

This test is destructive.

This test verifies the connectivity of a VC-DSPPT across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

This test runs on VC-DSPPT (Voice Conditioner DSP Port).

Figure 113: VC DSP Port DSP Looparound Test

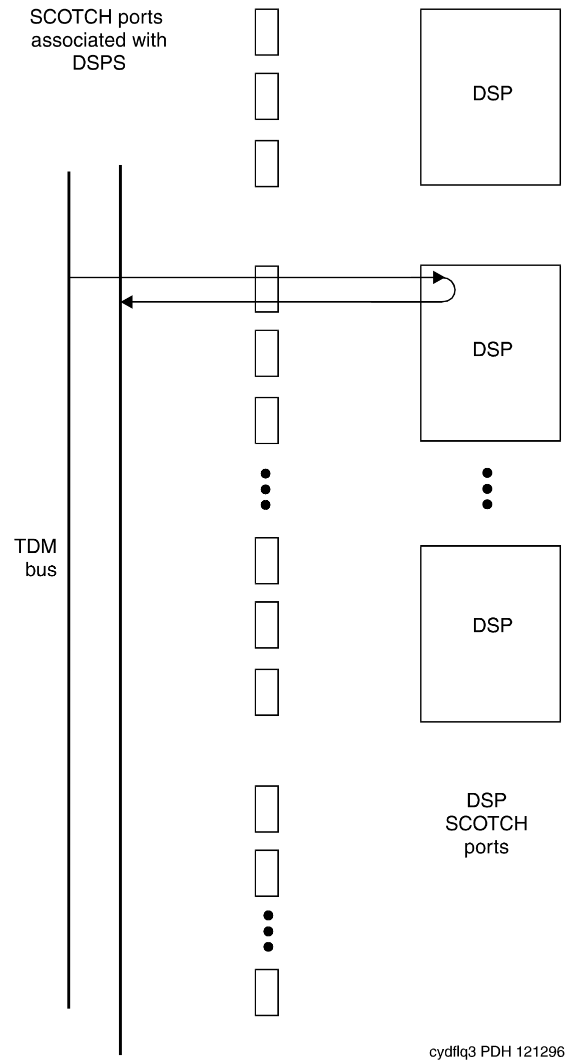


Table 475: VC DSP Port DSP Looparound Test (#1105) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available. The port is busy with a valid call. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 475: VC DSP Port DSP Looparound Test (#1105) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Enter **status station** for the station associated with this port and determine whether the port is available for testing. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, reset the circuit pack if the other ports are idle with **busyout port *location***, **reset port *location***, and **release port *location***. 2. If this result occurs again, replace the circuit pack.
2012 2100	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 475: VC DSP Port DSP Looparound Test (#1105) ***3 of 3***

Error Code	Test Result	Description / Recommendation
0 1	FAIL	The VC DSP Port DSP Loopback test failed. 1. Replace the circuit pack.
	PASS	The VC DSP Port DSP Loopback test passed
		3 of 3

VC Port Reset DSP Test (#1106)

This test is destructive.

This test resets the VC DSP port and the DSP associated with it. As part of the reset procedure, the VC DSP port runs a series of self-tests on the hardware. If these self-tests fail, the test fails. Otherwise, the test passes.

Before executing the test, the VC DSP port must be busied out by entering **busyout port** ***location***. After the completion of the test, the VC DSP port must be released by entering **release port** ***location***.

This test runs on VC-DSPPT (Voice Conditioner DSP Port).

Table 476: VC Port Reset DSP Test (#1106) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available. The port may be busy with a call. 1. Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	The VC DSP port is not busied out. 1. Busyout the VC DSP port by entering **busyout port** ***location***, then retry the test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. 2. If this result occurs again, replace the circuit pack.

Table 476: VC Port Reset DSP Test (#1106) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The reset of the VC DSP port was unsuccessful. 1. Replace circuit pack.
	PASS	The VC DSP port was successfully reset. 1. Release the VC DSP port by entering **release port *location***.

TSI Looparound Test (#1108)

During this test, the MMI's Time Slot Interchanger (TSI) listens to a TDM timeslot. A digital count tone loops back in the TSI and onto another TDM timeslot without passing through any resource hardware. A tone detector port verifies the looped data. If the digital count is correct, then the test passes. The test is done for both TDM buses. Failures indicate that the TSI is unreliable.

This test is run on MMI-BD (Multimedia Interface Circuit Pack).

Table 477: TSI Looparound Test (#1108) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 477: TSI Looparound Test (#1108) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, attempt to reset the circuit pack if the other ports are idle. 2. Rerun the test. If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. This is an abnormal abort. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The TSI was found to be transmitting in error, causing noisy and unreliable connections. 1. Replace the circuit pack.
	PASS	The TSI is correctly using its allocated time slots.
		2 of 2

Resource Looparound Test (#1111)

This test is destructive.

This test checks the connectivity of the resource within an MMI circuit pack and out to the TDM bus. It tests the circuitry that an H.221 bit stream comes in contact with when the stream is demultiplexed, pre-processed, written to the TDM bus and then reread (looped in the TSI), post-processed, multiplexed, and then written back to the TDM bus for verification. The video, audio, and data components of the bit stream are tested separately. If any one of these tests fails, the resource is taken out of service.

This test is run on MMI-PT (Multimedia Interface Port).

Table 478: Resource Looparound Test (#1111) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Retry the command at 1-minute intervals up to 5 times. 2. Enter **`status conference`** to determine if there is an active conference. If a call is active, the test cot run until the conference call finishes.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 478: Resource Looparound Test (#1111) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The resource has been seized by a user for a valid call. 1. Enter **`status conference`** to verify that there is an active conference call. 2. If there are no conference calls, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the test at 1-minute intervals up to 5 times. If this result occurs repeatedly, reset the circuit pack if the other ports are idle and rerun the test. 2. If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
0 1 2	FAIL	This resource cot guarantee data integrity and is out-of-service. The following Error Codes indicate failure of a particular media loop: 0 = video 1 = audio 2 = low-speed data 1. Replace the circuit pack.
	PASS	The resource is functioning normally.
		2 of 2

MMI Synchronization Status Test (#1122)

To support applications involving multiple MMI circuit packs, the appropriate MMI circuit packs must be synchronized with one another. One such circuit pack is designated as the master sync source, which provides the synchronization signal onto the TDM bus. The other MMI circuit packs in the system listen to this signal.

This test monitors this synchronization state. The test fails if the MMI circuit pack is not in sync. The test passes with auxiliary code 1100 if the MMI circuit pack is in sync and is providing the synchronization signal for the system. The test also passes with an auxiliary code of 1101 if the MMI circuit pack is in sync and listening to the sync signal. MMI circuit packs do not lose the synchronization signal unless an MMI circuit pack is either pulled out of the system or reset by using a technician command.

Test #1122 runs when **test board *location* long** is entered, initiating the recovery of synchronization. Use the **long** option only if synchronization is not established within 5 minutes of investigating the problem.

This test is run on MMI-BD (Multimedia Interface Circuit Pack).

Table 479: MMI Synchronization Status Test (#1122) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. 1. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	A response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. If this result occurs repeatedly and the MMI circuit pack is idle, reset the circuit pack. 2. Rerun the test. If the same result occurs again, replace the MMI circuit pack.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 479: MMI Synchronization Status Test (#1122) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	The MMI circuit pack is out of MMI synchronization. Run the **long** option of the **test board** command. 1. Wait 5 minutes, then reset the circuit pack with **busyout board *location***, **reset board *location***, and **release board *location***. 2. Rerun the test. If the same result occurs again, replace the circuit pack.
1100	PASS	The MMI circuit pack is providing the synchronization correctly. This MMI circuit pack is designated as the Master Sync source.
1101	PASS	The MMI circuit pack is listening to the synchronization signal correctly.
		2 of 2

MMI Update Synchronization Status Test (#1123)

To support applications involving multiple MMI circuit packs, the appropriate MMI circuit packs must be synchronized with one another. One such circuit pack is designated as the master sync source, which provides the synchronization signal onto the TDM bus. The other MMI circuit packs in the system listen to this signal.

This test monitors the synchronization state. The test fails if the MMI circuit pack is not in sync. The test passes with auxiliary code 1100 if the MMI circuit pack is in sync and is providing the synchronization signal for the system. The test also passes with an auxiliary code of 1101 if the MMI circuit pack is in sync and listening to the sync signal. MMI circuit packs do not lose the synchronization signal unless an MMI circuit pack is either pulled out of the system or reset by using a technician command.

This test is run on MMI-BD (Multimedia Interface Circuit Pack).

Table 480: MMI Update Synchronization Status Test (#1123) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 480: MMI Update Synchronization Status Test (#1123) *2 of 2*

Error Code	Test Result	Description / Recommendation
2000	ABORT	A response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. If this result occurs repeatedly and the MMI circuit pack is idle, reset the circuit pack. 2. Rerun the test. If the same result occurs again, replace the MMI circuit pack.
2012	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The MMI circuit pack is out of MMI synchronization. 1. Run the **`long`** option of the **`test board`** command. 2. Wait 5 minutes, then reset the circuit pack. 3. Rerun the test. If the same result occurs again, replace the circuit pack.
1100	PASS	The MMI circuit pack is providing the synchronization correctly. This MMI circuit pack is designated as the Master Sync source.
1101	PASS	The MMI circuit pack is listening to the synchronization signal correctly.
		2 of 2

Digital Terminal Remote Looparound Test (#1201)

This test checks the connection between the server and the digital terminal. It verifies the ability of the terminal and the associated port to send and receive data. This test is based on procedure 622 to isolate digital terminal problems.

This test runs on DIG-LINE (Digital Line).

Table 481: Digital Terminal Remote Looparound Test (#1201) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1000 1001	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. 1. Enter **display port *location*** to determine the station extension or attendant number of the port. 2. Enter **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. 1. If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 481: Digital Terminal Remote Looparound Test (#1201) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Enter **display errors** and resolve any TTR-LEV (TTR Level) errors. 3. Enter **display errors** and resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. 1. Enter **display port *location*** to determine the station extension or attendant number of the port. 2. Enter **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before resetting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. 3. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The installed circuit pack does not support this operation. Ignore this error.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1015	ABORT	The station is not busied out. 1. Enter **busyout station** and repeat the test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. 1. Make sure the terminal is connected and repeat the test. 2. If the test fails, replace the terminal and repeat the test. 3. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 481: Digital Terminal Remote Looparound Test (#1201) ***3 of 3***

Error Code	Test Result	Description / Recommendation
14 16	FAIL	The primary channel is not operating properly. The secondary channel is not operating properly. User impact may range from noticing nothing to not being able to use the port. 1. Check the results of the Local Loop Test (#13). 2. If that test fails, suspect the Digital Line circuit pack. Run **test board *location*** on the Digital Line circuit pack. If the tests pass, replace the terminal. 3. If component replacement does not change the results, then: a. Run circuit pack tests to check the tone generator circuit and the Tone Detector circuit using **test board *location***. b. Resolve any problems that are detected on the TONE-PT (Tone Generator) or TTR-LEV (TTR Level).
	PASS	The test passed. All channels are transmitting properly. 1. To verify that this is not an intermittent problem, repeat this test up to ten times. 2. If problems persist (noisy connections for voice, corrupted data transfer for data), examine the station, connections, and wiring.
		3 of 3

DS1 Board Loopback Test (#1209)

This test is destructive.

The DS1 BLB (Board Loopback) Test causes a loopback at the DS1 board edge and tests DS1 board internal circuitry.

This test is destructive and can only be initiated by entering the command **test ds1-loop *location* ds1/csu-loopback-test**.

All trunks or ports on the DS1 Interface circuit pack must be busied out using **busyout board** before running the BLB test.

When the BLB test is initiated, maintenance software sends a message to the DS1 Interface circuit pack. The board sets up the BLB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received patterns are different, the test fails.

When the test is complete, enter **release board** to restore all trunks or ports on the DS1 Interface circuit pack to the in-service state.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 482: DS1 Board Loopback Test (#1209) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry **test ds1-loop *location* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	The DS1 Board Loopback test cot be executed in the current configuration. To run this test, the DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to “1.544” for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **busyout board *location*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack using the following command sequence: **1. disable synchronization-switch** **2. set synchronization *location*** **3. enable synchronization-switch**
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
		1 of 2

Table 482: DS1 Board Loopback Test (#1209) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log will indicate whether a Customer loopback jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, that test must be deactivated using **`test ds1-loop location end-loopback/span-test`** in order to run this test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	DS1 Interface circuit pack failed the DS1 Board Loopback test. 1. Enter **`test ds1-loop location ds1/csu-loopback-tests`**. 2. If the BLB test continues to fail, replace the DS1 circuit pack.
	PASS	The BLB test executed successfully. The test pattern was transmitted and received successfully up to the DS1 board edge. 1. Enter **`release board`** ***`location`*** to restore all trunks and ports.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

CSU Equipment Loopback Test (#1210)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The CSU ELB (Equipment Loopback) test causes a loopback at the near-edge of the local 120A CSU module or T1 sync splitter, and tests the connection from the DS1 board to the CSU module/T1 sync splitter (DS1 board edge interconnecting cable, and CSU module/T1 sync splitter edge). This test will only be performed if the 120A CSU module/T1 sync splitter is present, administered, and connected to a 1.544-Mbps DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by entering the command **`test ds1-loop location ds1/csu-loopback-tests`**.

Enter **`busyout board`** to busy out all trunks or ports on the DS1 Interface circuit pack before running the ELB test.

When the ELB test is initiated, maintenance software sends a message to the DS1 Interface circuit pack to start the test. The board sets up the ELB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

The DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loopback pattern.

When the test is complete, enter **`release board`** to restore all trunks or ports on the DS1 Interface circuit pack to the in-service state.

This test is run on the DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack) maintenance objects.

Table 483: CSU Equipment Loopback Test (#1210) *1 of 3*

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Enter **`test ds1-loop location ds1/csu-loopback-tests`** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Equipment Loopback test cot be executed in the current configuration. To run this test, the `Near-End CSU Type` field on the DS1 circuit pack administration screen must be set to *integrated* and the `Bit Rate` field must be set to “1.544” (for 24-channel operation). 1. Enter **`change ds1`** ***`location`*** and set the `Near-End CSU Type` field on the DS1 circuit pack administration screen to **integrated**, and/or set the `Bit Rate` field to **1.544** if the board is to be used in a 24-channel configuration. 2. Retry **`test ds1-loop location ds1/csu-loopback-tests`**.
		1 of 3

Table 483: CSU Equipment Loopback Test (#1210) *2 of 3*

Error Code	Test Result	Description / Recommendation
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **busyout board location** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit with the following command sequence: 1. **disable synchronization-switch**. 2. **set synchronization location**. 3. **enable synchronization-switch**.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log will indicate whether a Customer loopback jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, that test must be deactivated via **test ds1-loop location end-loopback/span-test** in order to run this test.
1951	ABORT	The CSU Equipment Loopback test could not be executed because the 120A CSU module/T1 sync splitter was not physically installed. Physically connect the 120A CSU module/T1 sync splitter to the DS1 board on the back of the port carrier.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		2 of 3

Table 483: CSU Equipment Loopback Test (#1210) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	FAIL	DS1 Interface circuit pack failed the CSU Equipment Loopback test. 1. Enter **test ds1-loop location ds1/ csu-loopback-tests**. 2. If the ELB test continues to fail, either the DS1 board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the 120A CSU module or the 401A T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Replace the CSU module/T1 sync splitter, and run **test ds1-loop location ds1/csu-loopback-tests** again. 3. If the ELB test continues to fail, replace the board and run **test ds1-loop location ds1/csu-loopback-tests** again. 4. If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the 120A CSU module or the 401A T1 sync splitter.
	PASS	The ELB test executed successfully. The test pattern was transmitted and received successfully over the connection from the DS1 board to the near-edge of the 120A CSU module/T1 sync splitter. 1. Enter **release board *location*** to release all trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

CSU Repeater Loopback Test (#1211)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The CSU RLB (Repeater Loopback) test causes a loopback at the far-edge of the local 120A CSU module or T1 sync splitter, and tests the connection from the DS1 board to and including the CSU module/T1 sync splitter circuitry. The test runs only if the 120A CSU module/T1 sync splitter is present, administered, and connected to a 1.544-Mbps DS1 circuit pack on the back of the port carrier.

The test is destructive and can only be initiated by entering the command **`test ds1-loop location ds1/csu-loopback-test`**.

Enter **`busyout board`** to busy out all trunks or ports on the DS1 Interface circuit pack before running the RLB test.

When the RLB test is initiated, maintenance software sends a message to the DS1 Interface circuit pack to start the test. The board sets up the RLB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

The DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loopback pattern.

When the test is complete, use **`release board`** to restore all trunks or ports on the DS1 Interface circuit pack to the in-service state

This test is run on the DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack) maintenance objects.

Table 484: CSU Repeater Loopback Test (#1211) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Enter **`test ds1-loop location ds1/csu-loopback-tests`** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Repeater Loopback test cot be executed in the current configuration. 1. Enter **`change ds1 location`** and set the `Near-End CSU Type` field on the DS1 circuit pack administration screen to **integrated**, and/or set the `Bit Rate` field to **1.544** if the board is to be used in a 24-channel configuration. 2. Enter **`test ds1-loop location ds1/csu-loopback-tests`**.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **`busyout board location`** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
		1 of 3

Table 484: CSU Repeater Loopback Test (#1211) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit with the following command sequence: 1. **`disable synchronization-switch`** 2. **`set synchronization`** ***`location`*** 3. **`enable synchronization-switch`**
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log indicates whether a Customer Loopback Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, that test must be deactivated via **`test ds1-loop location end-loopback/span-test`** in order to run this test.
1951	ABORT	The CSU Repeater Loopback test could not be executed because the 120A CSU module/T1 sync splitter was not physically installed. Physically connect the 120A1 CSU module/T1 sync splitter to the TN767E board on the back of the port carrier.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	DS1 Interface circuit pack failed the CSU Repeater Loopback test. 1. Retry **`test ds1-loop location ds1/csu-loopback-tests`**. 2. If the RLB test continues to fail, and the CSU Equipment Loopback test (#1210) passed, replace the CSU module/T1 sync splitter.
		2 of 3

Table 484: CSU Repeater Loopback Test (#1211) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	PASS	The RLB test executed successfully. The test pattern was transmitted and received successfully over the connection from the DS1 board to the far-edge of the 120A CSU module/T1 sync splitter. 1. Enter **`release board`** ***`location`*** to release the trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures
		3 of 3

CPE Loopback Jack Test (#1212)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The CPE Loopback Jack (CLJ-LB) test causes a loopback at the CPE loopback jack and tests the building wiring connection between the DS1 board and the CPE loopback jack.

The test is highly destructive and can only be initiated by entering the command **`test ds1-loop`** ***`location`*** **`cpe-loopback-jack-test-begin [`*`number-of-bits bit-pattern`*`]`**. Enter a loopback activation code on the command line or use the default code (0x47F).

Enter **`busyout board`** to busy out all trunks or ports on the DS1 Interface circuit pack before running the CPE Loopback Jack test.

The CPE Loopback Jack test has the DS1 Interface circuit pack transmit a loopback activation code to the CPE loopback jack, waits up to 10 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result to indicate that the pattern was successfully sent. If the loopback is not established within the 10 seconds, the test returns FAIL.

The status of the CPE Loopback Jack test appears in the error log as Error Type 3900. Several distinct aux values give information on the status of the test.

Enter **list measurements ds1 summary** to show the length of time the test has been running (Test Duration field) and number of bit errors detected (Loopback/Span Test Bit-Error Count field). If the test pattern is passed through the loopback cleanly, the number of bit errors should be very low. The command also shows the type of loopback/span test executing (Test field), the type of pattern generated for the loopback/span test (Pattern field), and whether the pattern (*3-in-24 Pattern*) is synchronized (Synchronized field).

Enter **test ds1-loop *location* end-loopback/span-test** to end the test.

Enter **release board *location*** to restore each trunk or port on the DS1 Interface board to the in-service state.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 485: CPE Loopback Jack Test (#1212) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Enter **test ds1-loop location cpe-loopback-jack-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	CPE Loopback Jack test cot be executed in the current configuration. To run this test, the DS1 board must be administered for 24-channel operation. The Bit Rate field on the DS1 circuit pack administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter **busyout board location** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
		1 of 3

Table 485: CPE Loopback Jack Test (#1212) *2 of 3*

Error Code	Test Result	Description / Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit with the following command sequence: 1. **disable synchronization-switch**. 2. **set synchronization location**. 3. **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log will indicate whether a Customer loopback jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, that test must be deactivated via **test ds1-loop location end-loopback/span-test** in order to run this test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2	FAIL	The CLJ-LB test failed because it was not set up properly. The DS1 interface pack could not successfully put the CPE loopback jack into loopback mode. 1. Enter **test ds1-loop *location* cpe-loopback-jack-test-begin**. 2. If the test continues to fail, the problem could be with the DS1 board, the CPE loopback jack equipment, or somewhere between. Run **test ds1-loop location ds1/csu-loopback-tests** to determine if the loopback tests that are closer to the DS1 board are successful. If any of the tests fail, follow the maintenance strategy that is associated with the failing test.
		2 of 3

Table 485: CPE Loopback Jack Test (#1212) *3 of 3*

Error Code	Test Result	Description / Recommendation
3	FAIL	The CPE Loopback Jack test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the CPE loopback jack, could not be detected properly by the DS1 circuit pack. 1. Enter **`test ds1-loop location cpe-loopback-jack-test-begin`** 2. If the CPE Loopback test continues to fail, the problem could be with the DS1 board, the CPE loopback jack equipment, or somewhere in between. Run **`test ds1-loop location ds1/csu-loopback-tests`** to see if the loopback tests closer to the DS1 board are successful. If any of those loopback tests fail, follow the maintenance strategy associated with those.
	PASS	The CPE Loopback Jack test has successfully began executing. The test runs until **`test ds1-loop location end-loopback/span-test`** is entered. 1. Enter **`release board`** ***`location`*** to release the trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

Far CSU Loopback Test (#1213)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The Far CSU Loopback (R-LLB) test causes a loopback at the far-end CSU, and tests all circuitry and facilities from the local DS1 board to the far-end CSU.

The test is destructive and can only be initiated by entering the command **`test ds1-loop location far-csu-loopback-test-begin`**.

Enter **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the Far CSU Loopback test.

If the DS1 is administered for ami-zcs line coding and the far-end CSU is not a 120A CSU module or a 401A T1 sync splitter, density protection on the CSU must be disabled during the test due to the large number of zero's in the 3-in-24 test pattern.

The Far CSU Loopback test has the DS1 Interface circuit pack transmit a loopback activation code to the remote CSU, waits up to 15 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result. If the loopback is not established within the 15 seconds, the test fails.

The status of the Far CSU Loopback test appears in the error log as Error Type 3901. Several aux values give information on the status of the test.

Enter **list measurements ds1 summary** to show the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is passed through the loopback cleanly, the number of bit errors should be very low. The command also shows the type of loopback/span test executing (`Test` field), the type of pattern generated for the loopback/span test (`Pattern` field), and whether the pattern (*i.e., 3-in-24 Pattern*) is synchronized (`Synchronized` field).

Enter **test ds1-loop *location* end-loopback/span-test** to end the test.

Enter **release board *location*** to restore all trunks or ports on the DS1 Interface circuit pack to the in-service state.

This test is run on the DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack) maintenance objects.

Table 486: Far CSU Loopback Test (#1213) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Run **test ds1-loop location far-csu-loopback-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	Far CSU Loopback test cot be executed in the current configuration. To run this, the DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to **1.544** for 24-channel operation.
		1 of 3

Table 486: Far CSU Loopback Test (#1213) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. 1. Enter **`busyout board location`** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit with the following command sequence: 1. **`disable synchronization-switch`**. 2. **`set synchronization location`**. 3. **`enable synchronization-switch`**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log will indicate whether a Customer Loopback Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, that test must be deactivated with **`test ds1-loop location end-loopback/span-test`** in order to run this test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2	FAIL	The far CSU Loopback test was not set up properly. The DS1 Interface circuit pack could not put the far-end CSU into loopback mode.
		2 of 3

Table 486: Far CSU Loopback Test (#1213) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2	FAIL	The far CSU Loopback test was not set up properly. The DS1 Interface circuit pack could not put the far-end CSU into loopback mode.
3		The far CSU Loopback test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the far-end CSU, could not be detected by the DS1 circuit pack. 1. Enter **test ds1-loop location far-csu-loopback-test-begin** 2. If the Far CSU Loopback test continues to fail with this error code, the problem could be with the DS1 board, the far-end CSU equipment, or somewhere in between. Run **test ds1-loop** ***location*** **cpe-loopback-jack-test-begin** to see if the CPE Loopback Jack test that is closer to the DS1 board is successful. If a CPE loopback jack device is not being used, run **test ds1-loop** ***location*** **ds1/csu-loopback-tests** to see if the closer loopback tests succeed. If the closer loopback test fails, follow the maintenance strategy associated with that loopback
	PASS	The Far CSU Loopback test has successfully began executing. The test runs until **test ds1-loop location end-loopback/span-test** is entered. 1. Enter **release board** ***location*** to release the trunks and ports.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

One-Way Span Test (#1214)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The One-Way Span test allows 1-way span testing to and from remote test equipment or another Communication Manager solution. This tests all circuitry and facilities from the local DS1 board to the remote test equipment or other Communication Manager solution.

The test is destructive and can only be initiated by entering the command **`test ds1-loop location one-way-span-test-begin`**.

Enter **`busyout board`** to busy out all trunks or ports on the DS1 Interface circuit pack before running the One-Way Span test.

The One-Way Span test has the DS1 Interface circuit pack transmit a framed 3-in-24 test pattern and attempts to receive and verify the pattern. If the DS1 board receives a framed 3-in-24 test pattern sent from another Communication Manager system or test equipment at the far end of the DS1, it begins counting bit errors within the received pattern.

Note:

If a DS1 circuit pack and a DS1 Interface media module are connected, the test will fail because the media module does not frame-align its test pattern.

The status of the One-Way Span test appears in the error log as Error Type 3902. Several aux values give information on the status of the test.

Enter **`list measurements ds1 summary`** to see the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is sent cleanly over the span from the far end, the number of bit errors should be very low. The `Test Duration` field is **0** until the test pattern is received from the far end. Upon receiving the test pattern, the board begins calculating the test duration and number of bit errors. The command also shows the type of loopback/span test executing (`Test` field), the type of pattern generated for the loopback/span test (`Pattern` field), and whether the pattern (*i.e., 3-in-24 Pattern*) is synchronized (`Synchronized` field).

Enter **`test ds1-loop location end-loopback/span-test`** or **`release board`** to end the test. Enter **`release board`** to restore all trunks or ports on the DS1 Interface circuit pack to the in-service state

This test is run on the DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack) maintenance objects.

Table 487: One-Way Span Test (#1214) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry **`test ds1-loop location one-way-span-test-begin`** at 1-minute intervals up to 5 times.
		1 of 3

Table 487: One-Way Span Test (#1214) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1005	ABORT	One-Way Span test cot be executed in the current configuration. To run this, the DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **`busyout board location`** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit with the following command sequence: **`1. disable synchronization-switch`** **`2. set synchronization location`** **`3. enable synchronization-switch`**
1950	ABORT	Another loopback/span test is already running on the DS1 board, or the board is in a network requested loopback mode (Line loopback or Payload loopback). The error log will indicate whether a Customer Loopback Jack test, Far CSU Loopback test, or the One-Way Span test is running or if the board is in line loopback or payload loopback mode. Only one long-duration loopback/span test can be active at a given time If a loopback/span test is already active, that test must be deactivated with **`test ds1-loop location end-loopback/span-test`** in order to run this test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The test was run between a DS1 circuit pack and a DS1 media module, which generates incompatible patterns.
		2 of 3

Table 487: One-Way Span Test (#1214) ***3 of 3***

Error Code	Test Result	Description / Recommendation
	PASS	The One-Way Span test has successfully began transmitting a framed 3-in-24 test pattern. The test will continue to run until **test ds1-loop location end-loopback/span-test** is entered. 1. Enter **release board location** to release the trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

Inject Single Bit Error Test (#1215)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The Inject Single Bit Error test causes a single bit error to be sent within an active framed 3-in-24 test pattern.

The test is highly destructive and can only be initiated by entering the command **test ds1-loop location inject-single-bit-error**. An attempt to use this command is rejected if none of the three long-duration DS1 loopback/span tests (CPE Loopback Jack test, Far CSU Loopback test, One-Way Span test) are active on a ds1 circuit pack.

Enter **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the Inject Single Bit Error test.

Enter **list measurements ds1 summary** to show the number of bit errors detected (Loopback/Span Test Bit-Error Count field). Injecting this single bit error should increment the bit error count of the loopback/span test by one.

Enter **release board** to restore the trunks or ports on the DS1 Interface circuit pact to the in-service state.

This test is run on the DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack) maintenance objects.

Table 488: Inject Single Bit Error Test (#1215)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. 1. Retry **test ds1-loop location inject-single-bit-error** at 1-minute intervals up to 5 times.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **busyout board *location*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	A single bit error has been successfully injected into an active framed 3-in-24 test pattern. 1. Enter **release board *location*** to release the trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures.

End Loopback/Span Test (#1216)

This test is destructive.

For documentation purposes, the term *DS1* applies to the following:

DS1 Interface circuit packs

DS1 Interface media modules

UDS1 circuit packs.

The End Loopback/Span test deactivates an active loopback or span test on a DS1 circuit pack. Bit error counting against the received test pattern stream halts, and sending of the framed 3-in-24 test pattern ceases. If either the CPE loopback jack or the far-end CSU is looped, the loopback deactivate code is sent. If the loopback could not be deactivated, the test will FAIL and a MINOR alarm is noted in the alarm log until the loopback is cleared.

The test is highly destructive and can only be initiated by entering the command **test ds1-loop location end-loopback/span-test**. Since only one of these three different long-duration loopback/span tests can be active at a time, the DS1 circuit pack knows which loopback/span test to halt.

Enter **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running this End Loopback/Span test.

Enter **list measurements ds1 summary** to show the length of time the test ran (Test Duration field) and number of bit errors detected (Loopback/Span Test Bit-Error Count field).

Enter **release board** to restore the trunks or ports on the DS1 Interface circuit pack to the in-service state.

This test runs on DS1-BD (DS1 Interface Circuit Pack) and UDS1-BD (UDS1 Interface Circuit Pack).

Table 489: End Loopback/Span Test (#1216) *1 of 2*

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Run **test ds1-loop location end-loopback/span-test** at 1-minute intervals up to 5 times.
1005	ABORT	End Loopback/Span test cot be executed in the current configuration. To run this, the DS1 must be administered for 24-channel operation. The Bit Rate field on the DS1 circuit pack administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out. 1. Enter **busyout board location** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. 2. Retry the command.
2000	ABORT	Response to the test was not received within the allowed time. 1. Check for board hyperactivity. See Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module.
		1 of 2

Table 489: End Loopback/Span Test (#1216) *2 of 2*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1313	FAIL	The DS1 circuit pack could not deactivate the loopback through the Customer loopback jack. 1. Retry **test ds1-loop location end-loopback/ span-test** at 1-minute intervals up to 5 times.
1314	FAIL	The DS1 circuit pack could not deactivate the loopback through the far-end CSU. 1. Make sure that the far-end DS1 is installed if the far-end CSU is a 120A CSU module/T1 sync splitter. 2. Retry **test ds1-loop *location* end-loopback/ span-test** at 1-minute intervals up to 5 times.
	PASS	The active long-duration loopback or span test on the DS1 circuit pack was successfully deactivated. 1. Enter **release board *location*** to release the trunks or ports.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

ICSU Status LEDs Test (#1227)

This test runs only on TN767E or later DS1 circuit packs and TN464F or later UDS1 circuit packs administered for 24-channel operation (1.544 Mbps).

The DS1 circuit pack has four status LEDs on the faceplate in addition to the three standard faceplate LEDs. These four status LEDs are associated with the 120A channel Service Unit (CSU) Module that can be connected to the DS1 board via the I/O connector panel on the back of the port carrier.

This test is a visual test. It lights the four status LEDs red for 5 seconds, green for 5 seconds, and yellow for 5 seconds. It then turns the LEDs off and returns control of the status LEDs to the circuit pack. The interpretation of the LEDs are described in the DS1/UDS1 (TN767/TN464) section in the *LED Descriptions for Avaya Aura™ Communication Manager Hardware Components (03-602804)*

The DS1 circuit pack, combined with the 120A CSU module or the 401A T1 sync splitter, forms an Integrated CSU (ICSU).

If the 120A CSU module/T1 sync splitter is not installed, the status LEDs are always off and this test aborts.

This test is run on the following maintenance objects:

- DS1-BD (DS1 Interface Circuit Pack)
- MG-DS1 (DS1 Interface Media Module)
- UDS1-BD (UDS1 Interface Circuit Pack)

Table 490: ICSU Status LEDs Test (#1227) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The ICSU Status LEDs test cot be executed for the current configuration. The test applies only to TN767E or later DS1 circuit packs and TN464F or later UDS1 circuit packs administered for 24-channel (1.544-Mbps) operation. 1. If the circuit pack is of the correct type, retry the command.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1951	ABORT	The ICSU Status LEDs Test cot be executed because a 120A CSU module or a 401A T1 sync splitter is not physically installed. If using a 120A CSU module/T1 sync splitter, physically connect it to the TN767 or TN464 board on the back of the port carrier. Otherwise, ignore this abort.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 490: ICSU Status LEDs Test (#1227) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	PASS	The ICSU Status LEDs test executed successfully. A PASS result, however, does not necessarily mean that the status LEDs behaved properly. It only means that the software successfully attempted to light the status LEDs. This is a visual test. 1. Visually exam the behavior of the LEDs while the test is running. The LEDs are functioning properly if the four status LEDs are lit red for 5 seconds, then lit green for 5 seconds, then lit yellow for 5 seconds. If the LEDs behave differently, replace the circuit pack at the customer's convenience.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

Trunk-side Layer 1 Query Test (#1242)

This test determines the state of the transmission facility of a BRI port at the Layer 1 (L1) physical layer: Activated, Pending Activation, or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state, the L1 interface can send and receive synchronized signals. This test passes if the state of L1 is Activated. This test also passes if software has taken this port out of service. See the description of the L1 "Deactivated State" below for more details.

The Pending Activation state indicates a problem with the channels, the wiring, or the TBRI-BD circuit pack. When in this state, the Level 1 interface is either not receiving any L1 framing from the channel or it is communicating with the channel but cot transition to the Activated state.

The Deactivated state indicates a problem with the TBRI-BD circuit pack. When in this state, the Level 1 interface is not active, an idle signal is transmitted to the channels, or that Layer 1 was deactivated by the switch. When a TBRI-PT port is placed in the out-of-service state, Level 1 is also put into the Deactivated state. This could be due either to the system detecting a fault with the port or to a **busyout port *location*** request.

This test is run on TBRI-PT (ISDN Trunk-Side BRI Port).

Table 491: Trunk-side Layer 1 Query Test (#1242) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1187	ABORT	The board or port may be busied out. 1. Look in the Error Log for Error Type 18 (port busied out) for this port and TBRI-BD (board busied out). If this Error Type is present for TBRI-PT only, release the port with **`release port`** ***`location`*** and run the test again. If the error is present for both TBRI-BD and TBRI-PT, release the board with **`release board`** ***`location`*** and run the test again. **CAUTION:** When you release a board, you release every port associated with it. If certain ports still need to be busied out, use **`busyout port`** ***`location`*** to busy them out. 2. Make sure the endpoint is connected. 3. Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. If the test aborts repeatedly up to 5 times, reset the circuit pack. 2. Rerun the test. If the test aborts again with this error code, replace the circuit pack.
		1 of 3

Table 491: Trunk-side Layer 1 Query Test (#1242) *2 of 3*

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Received a status of Level 1 Pending Activation. U interface is down, indicating a problem with a connection between the switch and the NT1, a 2- to 4-wire converter that is used to connect 4-wire terminals to a 2-wire TN2198 or TN2185 circuit pack. 1. Verify that the connections between the switch and the NT1 are good. Verify that the NT1 has power. 2. Enter **test port *location*** and review the results of the Level 1 Status Query Test #1242 to verify the repair. If this test still fails, proceed to Step 3. 3. Follow the manufacturers repair procedures for the NT1. Then enter **test port *location*** and review the results of the Level 1 Status Query test to verify repair.
2	FAIL	Received a status of Level 1 Pending Activation. U interface up, S/T interface down, which indicates a problem with the NT1 or the wiring between the NT1 and the BRI endpoint (S/T interface). 1. Enter **test port *location*** and review the results of the Level 1 Status Query test to verify the repair. If this test still fails, proceed to Step 2. 2. Follow the manufacturer-recommended repair procedures for the NT1. Then enter **test port *location*** and review the results of the Level 1 Status Query test to verify repair.
		2 of 3

Table 491: Trunk-side Layer 1 Query Test (#1242) *3 of 3*

Error Code	Test Result	Description / Recommendation
3	FAIL	Received a status of Level 1 Deactivated. The port is out-of-service. 1. Run **status bri-port *location*** to verify that the service state of the port is out-of-service. If the service state of the port is not out-of-service, escalate the problem to the next tier. Otherwise, proceed to Step 2. 2. If the port has been placed out-of-service with **busyout port *location***, try releasing the port by entering **release port *location***. Then run **test port *location* long** and review the results of Trunk-side Layer 1 Query Test (#1242). If this test still fails, proceed to Step 3. 3. After entering **test port *location* long**, review the results of every test. Follow the repair procedures for any test that fails. Verify repair of the problem by entering **test port *location*** and by determining that the Trunk-side Layer 1 Query test passes. If the test continues to fail for this reason, escalate the problem to the next tier.
4	FAIL	Received a status of Level 1 Pending Activation. The NT1 has a loss of power indicating a problem with the NT1. 1. Follow the manufacturer-recommended repair procedures for the NT1. 2. Enter **test port *location*** and review the results of the Trunk-side Layer 1 Query Test (#1242) to verify the repair.
	PASS	Level 1 is activated or software has taken the port out of service.
		3 of 3

BRI Layer 3 Query Test (#1243)

This test checks the application layer communications across the in-service ISDN D-channel. The test passes if a status inquiry message is successfully sent, fails if the signaling link is down, and aborts if a query is already running or there is an internal error.

This test runs on TBRI-PT (ISDN Trunk-Side BRI Port).

Table 492: BRI Layer 3 Query Test (#1243)

Error Code	Test Result	Description / Recommendation
1005	ABORT	Wrong configuration. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or Music on Hold). This error can be ignored.
1019	ABORT	Test is already running.
1113	ABORT FAIL	The signaling link is down. 1. Enter **test port *location* long** to clear any errors which prevent establishment of the signaling link. 2. Examine the results of Test #626, which is executed with the **test port** command. If this test aborts or fails, follow the repair procedure for the Signaling Link Status Test (#626). 3. Escalate the problem if BRI Layer 3 Query test continues to abort.
1187	ABORT	The circuit pack or port may have been busied out by a technician. 1. Look in the Error Log for Error Type 18 (busied out) for TBRI-BD, MG-BRI or TBRI-PT. a. If this Error Type is present for TBRI-PT, enter **release port *location*** and run the test again. b. If the error is present for both TBRI-BD and TBRI-PT or MG-BRI and TBRI-PT, enter **release board *location*** and run the test again. When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *location*** to busy them out. 2. Make sure the terminal is connected. 3. Retry the command at 1-minute intervals up to 5 times.
2012 2100	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	A Status Inquiry message was successfully sent. Use **display errors** for the board to determine the true results of the test.

BRI Port Slip Query Test (#1244)

Slips occur when the transmitter and receiver are not running at precisely the same clock rate. The BRI Slip Query Test polls the total number of slips that have occurred on a link.

If the slip count is over the threshold, a MINOR alarm is raised against the circuit pack, leaving every port of the circuit pack in the in-service state.

TN2185 only: If the TN2185 circuit pack is supplying the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See TDM-BUS (TDM Bus) and SYNC (Port Network Synchronization) for additional information.

This test runs on TBRI-PT (ISDN Trunk-Side BRI Port).

Table 493: BRI Port Slip Query Test (#1244) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2000 2012 2100	ABORT	Response to the test was not received within the allowed time. Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1 to 88	FAIL	The circuit pack and the remote endpoint are not synchronized to the same clock rate. The Error Code equals the number of slips detected by the circuit pack since the last Slip Alarm Inquiry test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the circuit pack is a TN2185, enter **`list measurement ds1-log`** ***`location`*** to read the error seconds measurement. 3. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. 4. Check the physical connections of DS1 Interface circuit packs and cable. 5. Replace the local DS1 Interface circuit pack and repeat the test. 6. Contact T1 Network Service to diagnose the remote DS1 endpoint.
	PASS	No Slips are detected on the circuit pack.
		1 of 2

Table 493: BRI Port Slip Query Test (#1244) ***2 of 2***

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The circuit pack is not administered. 1. Administer the circuit pack. 2. Run test #53. 3. If the test continues to return NO BOARD, escalate the problem.
		2 of 2

Signaling Link State Test (#1251)

This test checks the current state of the signaling link. The test looks at the board-level translations, checks that the board is physically inserted, then gets the state of the D-channel and service state of the port.

The test passes if the signaling link (D-channel) is connected and operating normally. The test fails if the board is not installed, the signaling link is disconnected, or if the port is out of service. The test aborts otherwise.

This test runs on TBRI-TRK (ISDN Trunk-Side BRI Channel).

Table 494: Signaling Link State Test (#1251) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	The test is disabled. 1. Enable the test by entering **`enable test 1251`**.
1114	ABORT	The signaling link is in a transitional state. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 494: Signaling Link State Test (#1251) ***2 of 2***

Error Code	Test Result	Description / Recommendation
8	FAIL	The signaling link is down. 1. Consult the procedures for TBRI-TRK (ISDN Trunk-Side BRI Channel).
9	FAIL	The port is out of service. 1. Consult the procedures for TBRI-PT (ISDN Trunk-Side BRI Port).
	PASS	The signaling link is connected and operating normally.
		2 of 2

ATM Board Reset (#1256)

This test is destructive.

This test runs on ATM-EI and ATM-TRK circuit packs. It is only executed as part of the **`reset board`** ***`location`*** command. The board must first be busied out in order to run this test.

This test runs on the ATM-EI (Expansion Interface Circuit Pack) and ATM-TRK (Circuit Emulation Service Circuit Pack) maintenance objects.

ATM-EI: If the ATM-EI board is a standby in a PN, the reset is done through the SAKI reset interface. If the ATM-EI is an Expansion Archangel (active ATM-EI board in the PN) and if the EAL is present, a special message is sent to the board over the EAL.

ATM-TRK: This test checks the sanity of the Angel processor using the Sanity and Control Interface (SAKI) test (#53). It resets the circuit pack if the SAKI test fails and runs the test again.The ATM Board Reset test passes if SAKI can successfully reset the board.

Before running the SAKI test on an ATM-TRK circuit pack, you must:

- Move synchronization off the ATM-TRK circuit pack
- Busyout the ATM-TRK circuit pack

The test aborts if the ATM-TRK circuit pack is supplying synchronization.

Table 495: ATM Board Reset (#1256) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the required system resources 1. Retry the command up to 5 times at 1-minute intervals. 2. If the test continues to abort escalate the problem.
1005	ABORT	Wrong circuit pack configuration to run this test. The ATM CES Trunk Interface circuit pack provides timing for the system and cot be reset without major system disruptions. 1. Set synchronization to another ATM CES trunk circuit pack or to the Tone-Clock circuit pack and test again.
1015	ABORT	The ATM-TRK circuit pack has not been busied out. 1. Busyout out the circuit pack with **busyout board *location*** 2. Repeat the test with **test board *location* long**
1386	ABORT	No Active EAL to the board. This error applies only if the board under test is in a PN. Check the error logs for SYS-LINK (System Links) errors against the PN where the ATM-EI resides, and take appropriate diagnostic action for the SYS-LINK.
1407	ABORT	This test cot be run on an ATM-EI board that is on the active PNC because it cot be busied out. This error code indicates that PNC duplication is enabled. 1. Attempt to perform a PNC interchange with **reset pnc interchange** 2. If the PNC interchange is successful, busyout the original ATM-Expansion Interface circuit pack with **busyout board *location*** (address of the original ATM-EI board) 3. Retry the command.
2000	ABORT	Did not receive the response in the allowed time. 1. Verify that the board is seen by the system with **list config all**. 2. If the board is visible, run the test again. If the same abort code recurs, escalate the problem. 3. If the board is not visible to the system with **list config all**, reseat the board. 4. If the board is still not recognized by the system, replace the board.
		1 of 2

Table 495: ATM Board Reset (#1256) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2100 2500	ABORT	Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1 2	FAIL	The circuit pack failed to reset. The circuit pack failed to restart. 1. Run the command again. 2. If the problem persists, replace the circuit pack.
	PASS	The ATM circuit pack was successfully reset. **ATM-EI**: 1. If **status port-network** still indicates that this link is down, it is possible that one or both of the ATM-EI circuit packs are busied out. Review the error logs and take appropriate diagnostic action for ATM-EI (Expansion Interface Circuit Pack)
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

ATM Board Error Query Test (#1259)

This test queries the board for its on-board health information. The test passes if there are no failures on the board. The test fails if the circuit pack has hardware or signaling failures.

This test runs on ATM-EI (Expansion Interface Circuit Pack). and ATM-TRK (Circuit Emulation Service Circuit Pack).

Table 496: ATM Board Error Query Test (#1259)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2031	ABORT	Unable to send downlink message to the circuit pack. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	System resources required to run this test are not available. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
XXYY	FAIL	On-board hardware or off-board signaling errors on the board. XX indicates the on-board hardware error, and YY indicates the off-board errors as shown in Table 497: XX Error Codes, ATM Board Error Query Test (#1259) or Table 498: YY Error Codes, ATM Board Error Query Test (#1259). 1. Resolve any errors in the error log.
	PASS	No service-affecting errors or alarms were detected on the circuit pack.
0	NO BOARD	See NO BOARD for the repair procedures.

Table 497: XX Error Codes, ATM Board Error Query Test (#1259)

XX Aux Data	Description
1	ATM framer chip failed
2	NCE chip failed
3	LANHO critical error
4	TDM Programmable Logic device failed
5	Every on-board DSP failed
6	Receive Network Processor failed
7	Transmit Network Processor failed
8	Memory read failed
9	Dual UART chip failed
10	LANHO receive parity error
11	LANHO FIFO overflow error
12	LAN Bus timeout
13	LANHO Transmit FIFO overflow
14	One or more on-board DSPs failed

Table 498: YY Error Codes, ATM Board Error Query Test (#1259)

YY Aux Data	Description
15	Backplane clock failed
16	Loss of signal
17	Loss of frame
18	Multiplexer Section Alarm indication signal error
19	Multiplexer Section remote defect indicator error
20	Loss of pointer
21	Path signal level mismatch
22	High level path alarm indication signal
23	High level path remote defect indicator
24	Loss of cell delineation
25	Uncorrectable headers sent by the ATM switch
26	Too many cells with invalid Virtual Path Indicator Virtual Circuit Indicator (VPI/VCI) combination
27	The signaling link between the board and the ATM switch is down.
28	Board to the ATM switch connection is down
34	Excessive AAL-5 (ATM signaling protocol) retransmission requests
35	Excessive LAPD retransmission requests
37	ATM CLP (cell loss priority) bit. See ATM-NTWK (ATM Network Error).
38	ATM congestion indicator. See ATM-NTWK (ATM Network Error).
39	ATM cell underrun. See ATM-NTWK (ATM Network Error).
40	ATM cell overrun. See ATM-NTWK (ATM Network Error).
41	Lost ATM cell. See ATM-NTWK (ATM Network Error).

ATM Board Framer Looparound Test (#1260)

This test is destructive.

Note:

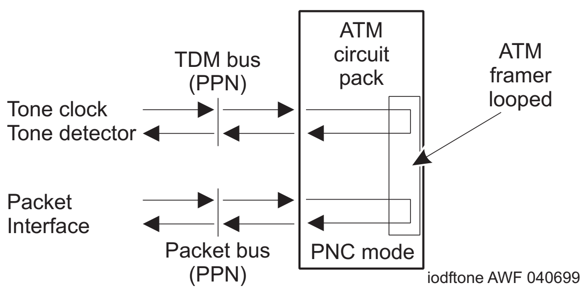
This test requires the board to be busied out. In a duplex system, this test can be run on the standby ATM-EIs. In a simplex system, this test can be run only on the ATM EI boards in the PPN.

This test places the ATM circuit pack in ATM framer looparound mode. It verifies the board's circuit and packet paths. This test verifies both the TDM path and the Packet Path. If the TDM test path passes, then the packet path is tested.

Definitions of each test path are:

- ***Circuit (TDM) path***: one of the Tone Generators sends a bit pattern through a TDM bus time slot to the ATM framer. The pattern is converted into ATM cells and is looped back to the ATM-EI board, which converts the cell back into the bit pattern and puts it on a pre-determined time slot. A Tone Detector tests for the bit pattern and reports the test result. This test verifies that a large portion of the ATM-EIs circuit paths are functioning correctly. Figure 114: ATM Board Framer Looparound Test (#1260) shows a diagram of the test.

Figure 114: ATM Board Framer Looparound Test (#1260)



- ***Packet path***: the Packet Interface circuit pack sends packet data to the ATM framer interface, where it is mapped into ATM cells and then looped around internally. The cells are converted back to packet data after it has been looped. This portion of the test verifies correct operation of the ATM-EI's packet bus interface and a large portion of the ATM-EI's packet paths. Figure 115: ATM Board Framer Looparound Test (#1260) (non-EAA, Packet Path) shows the packet switched signal path for the ATM circuit pack.

This test verifies the operation of a large portion of the ATM-EI circuit and packet paths, but does not verify the optical portion of the lightwave transceiver. If this test passes, the ATM-EI circuit pack is functioning correctly, but faults can exist in the lightwave transceiver. If the test fails, the fault can be on the board.

This test runs on ATM-EI (Expansion Interface Circuit Pack) and ATM-TRK (Circuit Emulation Service Circuit Pack).

Figure 115: ATM Board Framer Looparound Test (#1260) (non-EAA, Packet Path)

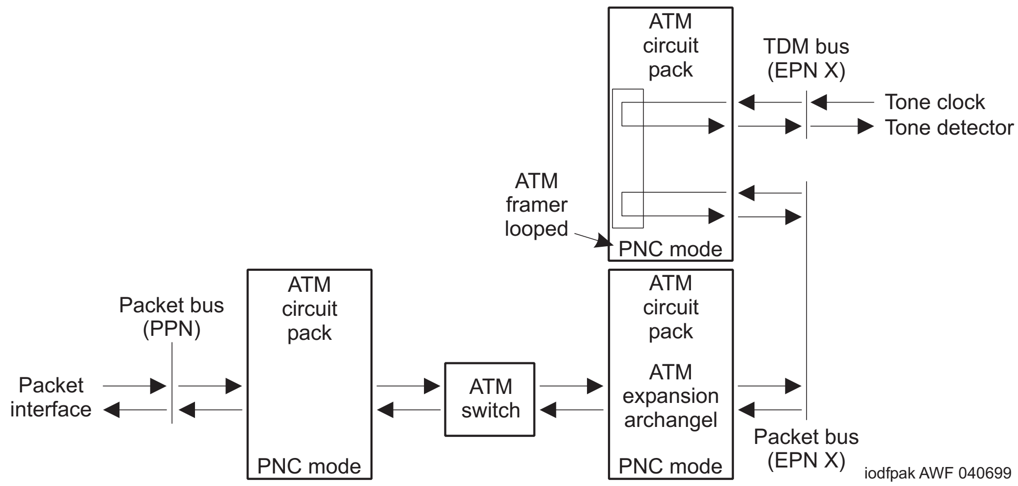


Table 499: ATM Board Framer Looparound Test (#1260) ***1 of 5***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 5

Table 499: ATM Board Framer Looparound Test (#1260) ***2 of 5***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	The ATM-EI or ATM-TRK circuit pack has not been busied out. 1. Busyout the ATM circuit pack, then rerun the test.
1031	ABORT	If the ATM Expansion Interface circuit pack is in a PN and is on the active PNC, this test cot be executed. 1. If PNC Duplication is enabled, attempt to make the standby PNC active using **`reset pnc interchange`**. 2. If the PNC Interchange is successful, rerun the test.
1033	ABORT	Circuit pack not found. **ATM-EI**: 1. Enter **`list atm pnc`** to verify the switch recognizes the circuit pack. 2. Retry the command. **ATM-TRK**: 1. Enter **`status trunk-group`** to verify the switch recognizes the circuit pack. 2. Retry the command.
1139	ABORT	Major Alarm on the PN's packet bus. 1. Resolve any PKT-BUS (Packet Bus) problems. 2. Retry the command.
		2 of 5

Table 499: ATM Board Framer Looparound Test (#1260) ***3 of 5***

Error Code	Test Result	Description / Recommendation
1141	ABORT	The Packet Interface circuit pack is out of service. 1. Resolve any PKT-INT (Packet Interface) problems. 2. Retry the command.
1144	ABRT	The PPN's packet bus has a major alarm against it. This test needs to use the alarmed PPN's packet bus. 1. Resolve any PKT-BUS problems. 2. Retry the command.
1394	ABORT	**ATM-EI**: The ATM-EI board is out of service and the test cot be run. 1. Run Test #241. If it does not pass, see the repair procedures for Expansion Interface 2-Way Transmission Test (#241). **ATM-TRK**: ATM-TRK circuit pack out of service. 1. Run ATM Board Reset Test #1256. If it does not pass, see the repair procedures for ATM Board Reset (#1256)
1395	ABORT	This test cot be run on an ATM-EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this ATM-EI circuit pack, enable PNC duplication with **`change system-parameters duplication`**. 2. Prevent the system from doing a PNC interchange with **`set PNC lock`**. 3. Repeat this test.
1407	ABORT	This test cot be run on an ATM-EI board that is on the active PNC because it cot be busied out. This error code indicates that PNC duplication is enabled. 1. Attempt to perform a PNC interchange with **`reset pnc interchange`**. 2. If the PNC interchange is successful, busyout the original ATM-Expansion Interface circuit pack with **`busyout board`** ***`location`*** (address of the original ATM-EI board). 3. Retry the command.
2000	ABORT	Response to the test was not received in the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
		3 of 5

Table 499: ATM Board Framer Looparound Test (#1260) ***4 of 5***

Error Code	Test Result	Description / Recommendation
2060	ABORT	The link on the packet bus being used to perform the test has failed. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the test continues to abort, enter **display errors** and resolve any PKT-INT (Packet Interface) errors.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
1	FAIL	The test did not detect the test tone through the looparound connection. **Note:** The packet portion of this test was not run since the circuit portion failed. 1. Test the active Tone-Clock (**test tone-clock *location***) in the PN that contains the defective ATM-EI circuit pack and verify that dial tone is reaching the circuit pack. If not, correct the situation. 2. If the Tone-Clock is healthy, enter **test board *location* long**. 3. If the test continues to fail, replace the ATM-EI or ATM-TRK circuit pack or transceiver. 4. Test the new ATM circuit pack using **test board *location* long**.
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the Packet Interface circuit pack. 1. Test the Packet Interface circuit pack to verify that it is functioning properly. If any tests fail, see PKT-INT (Packet Interface) for repair procedures. 2. If the Packet Interface circuit pack is OK, resolve any DS1C-BD (DS1 Converter Circuit Pack) alarms or errors, if applicable. 3. Enter **test board *location* long**. 4. If this test continues to fail, replace the ATM board. 5. Test the new ATM circuit pack with **test board *location* long**.
		4 of 5

Table 499: ATM Board Framer Looparound Test (#1260) ***5 of 5***

Error Code	Test Result	Description / Recommendation
3	FAIL	The test tone was transmitted correctly, but the returned tone was distorted. 1. Test the active Tone-Clock in the PN, and verify that a tone is reaching the ATM circuit pack. If not, see TONE-BD (Tone-Clock Circuit Pack) for repair procedures. 2. If the Tone-Clock is healthy, test the ATM circuit pack using **test board** ***location*** **long**. 3. If this test continues to fail, replace the ATM circuit pack. 4. Test the new ATM circuit pack with **test board** ***location*** **long**.
4	FAIL	Unable to create loop for TDM path. 1. Retry the command at 1-minute intervals up to 3 times. 2. If this test continues to fail, replace the ATM circuit pack. 3. Test the new ATM circuit pack with **test board** ***location*** **long**.
5	FAIL	Unable to create loop for packet path. 1. Retry the command at 1-minute intervals up to 3 times. 2. If this test continues to fail, replace the ATM circuit pack. 3. Test the new ATM circuit pack with **test board** ***location*** **long**.
6	FAIL	A previously-established looparound was not released. 1. Enter **reset board** ***location***. 2. Retry the command at 1-minute intervals up to 3 times. 3. If this test continues to fail, replace the ATM circuit pack. 4. Test the new ATM circuit pack with **test board** ***location*** **long.**
	PASS	The ATM board is functioning properly,. However, this test does not verify that the optical portion of the lightwave transceiver is functioning.
0	NO BOARD	See NO BOARD for the repair procedures.
		5 of 5

ATM Board Time Of Day Update (#1261)

The ATM circuit pack requires a reference time for SDH/SONET performance monitoring. This test sends the system time to the board to set the time of day. The update synchronizes the board with the system's clock. This test runs on ATM-EI (Expansion Interface Circuit Pack), ATM-TRK (Circuit Emulation Service Circuit Pack).

Table 500: ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description / Recommendation
2031	FAIL	The attempt to send the downlink message to the circuit pack failed. 1. Retry the command at 1-minute intervals up to 3 times.
2500	FAIL	Internal operation failed. 1. Retry the command at 1-minute intervals up to 3 times.
	PASS	The circuit pack was successfully updated with the system time. 1. If **status port-network** still indicates that this link is down, it is possible that one or both of the ATM circuit packs have been busied out. 2. If the link still does not come up, reset one or both ATM circuit packs on the link.
0	NO BOARD	See NO BOARD for the repair procedures.

SCOTCH Synchronous Looparound Test (#1275)

This test is destructive.

This test verifies the circuit in the data path of a C-LAN PPP call or VAL announcement port call. This test fails if the data transmitted on the port does not match the data received in the looparound mode. Failure of this test indicates a port hardware fault on the circuit pack.

This test aborts if calls are using the port, or if the PPP or VAL link associated with the port is connected. To avoid this, first enter **busyout data-module *extension***, or **busyout port *location***, or **busyout link *link#***, which will cause every call and link using the port to be torn down.

This test runs on PPP-PT (Control LAN Packet/Port) and VAL-PT (Voice Announcements over LAN Packet/Port).

Table 501: SCOTCH Synchronous Looparound Test (#1275)

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. 1. Retry the command when the port is idle, or use **busyout port *location*** to force the port to the idle state. **Note**: This command is **destructive**, causing every call and link using the port to be torn down.
1002	ABORT	No TDM bus time slots available for the test. 1. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
1963	ABORT	The port is in use. 1. Retry the command when the port is idle, or use **busyout port *location*** to force the port to the idle state. **Note**: This command is **destructive**, causing every call and link using the port to be torn down.
2000	ABORT	Did not receive test response within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. If this problem persists, reset the circuit pack and rerun the test. 2. If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The VAL or C-LAN circuit pack detected a test failure. 1. Retry the command at 1-minute intervals up to 5 times. If the problem persists, reset the circuit pack and rerun the test. 2. If the problem persists, replace the circuit pack.
	PASS	Port circuitry is functioning properly.

Ethernet Local Looparound Test (#1278)

This test checks the circuitry in the data path for an Ethernet call from the on-board processor to the Ethernet Transceiver. This test fails if the received data does not match the transmitted data.

This test runs on ETH-PT (Control LAN Ethernet).

Table 502: Ethernet Local Looparound Test (#1278)

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. 1. Determine status of port using **`status clan-port`** ***`location`***. 2. Retry the command when the port is idle. You can force the port to the idle state by executing **`busyout port`** ***`location`***. **Note**: The **`busyout port`** command is **destructive**, causing every call and link associated with the port to be torn down.
2000	ABORT	Response from the test was not received within the time allowed. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the problem persists, reset the circuit pack. 3. Retry the command at 1-minute intervals up to 5 times. 4. If the problem persists, replace the circuit pack.
2012 2100	ABORT	Internal system error. Could not allocate the necessary resources to run the test. 1. Retry the command at 1-minute intervals, up to 3 times. 2. If the problem persists, escalate the problem.
1	FAIL	Data received did not match the data transmitted. 1. Reset the circuit pack. 2. Retest the circuit pack with **`test board`** ***`location`*** **`long`** 3. If the problem persists, replace the circuit pack.
	PASS	The circuitry is functioning properly.

PPP Link Status Inquiry Test (#1279)

The PPP Link Status Inquiry Test determines the state of the PPP link. The test passes only if the link is up.

This test runs on PPP-PT (Control LAN Packet/Port).

Table 503: PPP Link Status Inquiry Test (#1279) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1124	ABORT	PPP link is not enabled. 1. Verify that the PPP link is enabled with **status port** ***location***, **status link** ***n***, or **display data-module**. 2. If the link is not enabled, enable the link with **change data-module** 3. Repeat the test.
1125	ABORT	PPP Link is not in service. 1. Verify whether PPP link is in-service with **status port** ***location*** or **status link** ***n***. 2. If the PPP link is not in service, release the link with **release link** ***n*** or **release port** ***location*** 3. Repeat the test.
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 503: PPP Link Status Inquiry Test (#1279) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	PPP link is down. 1. Test the port with **test port *location* long** to run the SCOTCH Synchronous Local Looparound test (#1275). 2. If the test passes, wait for sessions to come up. 3. If the test fails, check the destination and other components in the path (e.g., DS1 trunks). Rerun the test. 4. If the destination and other components in the path are in-service and the test still fails, enter **busyout port *location*** and **release port *location***, and repeat the test. 5. If the test still fails, reset the circuit pack and rerun the test. 6. If the problem persists, replace the circuit pack.
	PASS	PPP link is up.
		2 of 2

TCP/IP Ping Test (#1281)

The TCP/IP Ping Test checks the circuitry involved in the data path of a peer-peer IP layer connection. The test passes if at least one endpoint responds to the ping request. The test fails if all endpoints fail to respond.

This test is executed for C-LAN ports administered as PPP or Ethernet ports. It runs on ETH-PT (Control LAN Ethernet) and PPP-PT (Control LAN Packet/Port).

Table 504: TCP/IP Ping Test (#1281) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1 2 7	ABORT	Internal error 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 504: TCP/IP Ping Test (#1281) ***2 of 3***

Error Code	Test Result	Description / Recommendation
10	ABORT	No response to the ping, and the C-LAN is locked up in the ping task. 1. Reset the C-LAN circuit pack and retest. 2. If the test fails again, replace the C-LAN circuit pack.
11	ABORT	Internal error 1. Retry the command at 1-minute intervals up to 3 times.
1005	ABORT	Test configuration is incorrect. 1. Verify that the link is in service with **status port *location*** or **status link *n***. 2. Repeat the test.
1124	ABORT	PPP/Ethernet link is not enabled. 1. Verify that the PPP/Ethernet link is enabled with **status port *location***, **status link *n***, or **display data-module**. 2. If the link is not enabled, enable the link using **change data-module** 3. Repeat the test.
1125	ABORT	PPP/Ethernet link not in service. 1. Verify whether the PPP/Ethernet link is in service with **status port *location*** or **status link *n***. 2. If the link is not in service, release the link with **release link *n*** or **release port *location***. 3. Repeat the test.
2000	ABORT	Response to the test was not received within the allowed time. 1. Attempt to reset the circuit pack if the other ports on the board are idle (amber LED is off). 2. If the test fails again, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
		2 of 3

Table 504: TCP/IP Ping Test (#1281) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
1002	FAIL	Ping pipe write failure. The C-LAN has too many ping requests buffered, and there is no room to buffer more. 1. Reset the C-LAN circuit pack and retest. 2. If the test fails again, replace the C-LAN circuit pack.
1003	FAIL	Ping to the destination failed due to an on-board problem. 1. Retry the command at 1-minute intervals, up to 3 times. 2. If the problem persists, reset the circuit pack and rerun the test. 3. If the problem persists, re-administer the PPP/Ethernet connection through a different PPP/Ethernet port, if available. 4. If the problem still persists, or if there are no other available PPP/Ethernet ports, replace the circuit pack.
1007	FAIL	Ping to the destination failed due to the destination being down. 1. Verify that at least one destination reachable through this port is up. Ping this destination (**`ping ip-address`** ***`xxx.xxx.xxx.xxx`***). 2. If the ping to any destination is successful through this port, the link is up, although some destinations are unreachable. Ignore the failure. 3. If the ping to every destination fails, test the port with **`test port`** ***`location`***, and follow the repair procedures for Session Status Test (#1286) failures.
	PASS	TCP/IP Ping test (#1281) is successful.
		3 of 3

Link Integrity Inquiry Test (#1282)

This test checks the link integrity of the TN799 C-LAN Ethernet port's physical connections. It runs on ETH-PT (Control LAN Ethernet).

Table 505: Link Integrity Inquiry Test (#1282) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1124	ABORT	Ethernet link is not enabled. 1. Verify that the Ethernet link is enabled with **status port** ***location***, **status link n,** or **display data-module**. 2. If the link is not enabled, enable the link with **change data-module**. 3. Repeat the test. 4. Escalate if the problem persists.
1125	ABORT	Ethernet link not in service. 1. Verify whether Ethernet link is in service with **status port** ***location*** or **status link n**). 2. If the Ethernet link is not in service, release the link with **release link n** or **release port** ***location***. 3. Repeat the test. 4. Escalate if the problem persists.
1959	ABORT	Downlink message error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
2012 2100 2500	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
		1 of 2

Table 505: Link Integrity Inquiry Test (#1282) ***2 of 2***

Error Code	Test Result	Description / Recommendation
	FAIL	Link integrity lost due to problem with attachment of Ethernet cable to the port. 1. Repeat the test. 2. If the test fails, verify that the cable properly is secured to the Ethernet port and to the bus. 3. Verify the C-LAN circuit pack's link integrity LED is lit. 4. Retry the test. 5. If problem persists, see the Ethernet Local Looparound Test (#1278) repair procedures.
	PASS	The Link Integrity Test passed.
		2 of 2

TDM Looparound Test (#1285)

This test is destructive.

This test verifies whether the VAL or C-LAN port can send and receive data on the TDM bus. This test requests a tone generator to send tones on a timeslot and a tone receiver to receive tones on another timeslot. The tones are looped through the PPP port. The test passes if the received tones match the tones that were sent. The test fails if the tones do not match.

A test failure indicates failure of one or more of the following components:

- C-LAN (TN799DP) circuit pack
- VAL (TN2501) circuit pack
- TDM bus
- Tone generator / tone receiver circuit pack

This test runs on PPP-PT (Control LAN Packet/Port) and VAL-PT (Voice Announcements over LAN Packet/Port).

Table 506: TDM Looparound Test (#1285)

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. 1. Retry the command when the port is idle. The port may be forced to the idle state by entering **busyout port *location***. **Note**: The **busyout port** command is destructive, causing every call and link associated with the port to be torn down.
1002	ABORT	No TDM bus timeslots available for the test. 1. Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1412	ABORT	This test does not run on media modules or media gateways. Ignore.
2000	ABORT	Did not receive test response within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times. If this problem persists, reset the circuit pack and rerun the test. 2. If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 506: TDM Looparound Test (#1285)

Error Code	Test Result	Description / Recommendation
	FAIL	Received tones do not match transmitted tones. 1. Check for errors against TDM-BUS and TONE-PT. If any of these errors exist, see TDM-BUS (TDM Bus) and TONE-PT (Tone Generator) for the repair procedures. 2. If these errors do not exist, retry the test at 1-minute intervals up to 3 times. 3. If the problem persists, reset the circuit pack and repeat the test. 4. If the problem persists, replace the circuit pack.
	PASS	Port connections across the TDM bus function properly.
		2 of 2

Session Status Test (#1286)

This test queries the status of every Ethernet or PPP port session. It runs on ETH-PT (Control LAN Ethernet) and PPP-PT (Control LAN Packet/Port).

If the system indicates that...	Then the test...
Every port session is up (ALL UP)	Raises no alarm, or retires alarm
Some port sessions are up (SOME UP)	Raises a WARNING alarm
Every port session is down (ALL DOWN)	Raises a MINOR alarm

Table 507: Session Status Test (#1286) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1124	ABORT	Ethernet or PPP link is not enabled. 1. Verify that the Ethernet or PPP link is enabled using **`status port location`**, **`status link n`**, or **`display data-module`**. 2. If the link is not enabled, enable the link using **`change data-module`**. 3. Repeat the test. 4. Escalate if the problem persists.
1125	ABORT	Ethernet or PPP link not in service. 1. Verify whether the Ethernet or PPP link is in service with **`status port location`** or **`status link n`**. 2. If the Ethernet or PPP link is not in service, release the link with **`release link n`** or **`release port location`**. 3. Repeat the test. 4. Escalate if the problem persists.
2000	ABORT	Response to the test was not received within the allowed time. 1. If the problem persists, reset the circuit pack and rerun the test. 2. If the problem persists, replace the circuit pack.
		1 of 2

Table 507: Session Status Test (#1286) *2 of 2*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
1	FAIL	System software indicates at least one Ethernet or PPP link session is down (SOME UP). 1. Isolate downed sessions with **`status port location`** or **`status link n`**. 2. Follow actions based on session information.
2	FAIL	System software indicates every Ethernet or PPP session is down (ALL DOWN). 1. Test the port with **`test port location`** and note the Ethernet Local Looparound Test (#1278) result. • If the test passes, wait for system software to indicate ALL UP. • If the test fails, check the destination and other components in the path. 2. If the destination and other components in the path are in service, take action based on session information.
	PASS	Every session is up.
		2 of 2

ATM Remote Layer 3 Query (#1291)

The ATM Remote Layer 3 Query Test queries the far-end switch or terminal adapter to determine whether the signaling connection is functioning properly at Layer 3. It selects a B-channel in the in-service or maintenance service state and sends an ISDN Layer-3 SERVice message, which requires a response from the far end. The test is not performed if there are no B-channels in an appropriate ISDN service state (for example, when none are administered or they are all out of service).

Note:

The service state can be displayed by using the **`status trunk`** ***`grp#/mem#`*** or **`status pri-endpoint`** command.

A PASS only indicates that a message was successfully sent to the far-end switch or terminal adapter. The ISDN PRI Specification allows up to 2 minutes for a response. Check the Error Log for ATM-SGRP errors of type 2305 for evidence of an ATM Remote Layer 3 Query failure.

This test checks the communication path from the processor, through the TDM/packet bus and ATM Interface circuit pack, and on to the far-end switch or terminal adapter. It is designed to ensure that the communication path between the switch and the far end is up and operational, and that the two endpoints can properly exchange ISDN control messages.

This test runs on ATM-SGRP (ATM Signaling Group).

Table 508: ATM Remote Layer 3 Query Test (#1291) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1006	ABORT	There are no associated B-channels in an ISDN “in-service” or “maintenance” service state. This is a NORMAL ABORT. 1. Administer or release an ISDN trunk or PRI endpoint before retrying the test. For an ATM trunk, use **`status trunk`** ***`grp#/mem#`*** to verify the ISDN trunk state. 2. Retry this test when at least one B-channel is in the “in-service” or “maintenance” states.
1113	ABORT	The signaling channel is down. Therefore, no messages can be sent to the far-end switch or terminal adapter. 1. Examine the results of Test #636, and follow the recommendations for Primary Signaling Link Hardware Check (#636).
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 508: ATM Remote Layer 3 Query Test (#1291) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2500 none	ABORT	Internal system error or administration problem 1. Determine whether any B-channels are administered. 2. If there are none, this is a normal ABORT since this test cot run unless at least one B-channel is administered. 3. If at least one B-channel is administered, there is an internal system error. Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error 1. See description of ABORT with Error Code 2500.
	PASS	A message was sent to the far-end switch or terminal adapter. The ISDN PRI specification allows up to 2 minutes for a reply. 1. Check the Error Log for ATM-SGRP errors of type 2305 for evidence of a Remote Layer 3 Query failure. 2. If no new errors were logged since this test was run, this switch and the far-end switch can exchange call control messages. 3. If there is still a problem with a particular ATM trunk, busyout the trunk and run the long test sequence. Note the results of ISDN Test Call Test (#258).
		2 of 2

ATM Board DSP Test (#1293)

This test checks the board's interface to the TDM bus and the functions of all 24 on-board DSPs (Digital Signal Processors). There are three functional types of DSPs:

- talkers – put data on the TDM bus
- listeners – take data off the TDM bus
- echo cancellers – filter out echoes of the main transmission

If the test fails for every DSP, a MAJOR alarm is raised against the board.

If the test fails for one or more DSPs, a MINOR alarm is raised.

If a DSP is busy, the test for that particular DSP is considered passed.

The test aborts if the system resources such as TDM time slots and Tone Generator are not available.

This test applies to TN2305 and TN2306 ATM-EIs, both active and standby. It runs on ATM-EI (Expansion Interface Circuit Pack) and ATM-TRK (Circuit Emulation Service Circuit Pack).

Table 509: ATM Board DSP Test (#1293) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1962	ABORT	Every DSP is busy. This is a very unlikely event. 1. Retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Response to the test was not received within the allowed time. 1. If the board is in standby, reset the board and run the test again. 2. Check the Error Log for Error Type 1281 (bad DSP). If Error Type 1281 is not logged against this board, run the DSP test again. 3. If the error persists, escalate.
		1 of 2

Table 509: ATM Board DSP Test (#1293) *2 of 2*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Inconsistent uplink message from the ATM-EI board (an unlikely event). 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2752	ABORT	The circuit pack in this location is not a TN2305 or TN2306.
XYZ	FAIL	There is at least one bad DSP on the board. Values are as follows: ● X indicates the number of bad talker DSPs ● Y indicates the number of bad listener DSPs ● Z indicates the number of bad Echo Canceller DSPs 1. Run the tests for the active Tone-Clock in the PN that contains the indicted circuit pack to verify that dial-tone is supplied. Repair as needed. 2. If the Tone-Clock is healthy, repeat the test on the circuit pack. 3. If this test continues to fail, check for service-affecting MINOR alarms. If a MINOR alarm is raised for Error Type 2817 or 2818, replace the circuit pack. 4. If a WARNING alarm is raised, this is a non-service-affecting error. The circuit pack can still process calls.
XYZ	PASS	The test passed for some or all DSPs depending on XYZ values. XYZ indicates the number of talker, listener and echo-canceller DSPs for which the test passed, respectively.
0	NO BOARD	See NO BOARD for the repair procedures.
		2 of 2

ATM Crosstalk Test (#1298)

The ATM Crosstalk Test verifies that TDM time slots are correctly allocated to connections. It is useful for diagnosing one-way or noisy connections. The test fails if the TDM programmable logic and/or the interface to the DSP is not operating properly.

This test runs on ATM-EI (Expansion Interface Circuit Pack) and ATM-TRK (Circuit Emulation Service Circuit Pack).

Note:

This test takes approximately 12 minutes and applies only to TN2305 and TN2306 circuit packs.

Table 510: ATM Crosstalk Test (#1298) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 510: ATM Crosstalk Test (#1298) *2 of 3*

Error Code	Test Result	Description / Recommendation
1394	ABORT	The ATM-EI board is out of service and the test cot be run. 1. Run Test #241. If it does not pass, see repair procedures for Expansion Interface 2-Way Transmission Test (#241).
1395	ABORT	This test cot be run on an ATM-EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. 1. If this test needs to run on this ATM-EI circuit pack, enable PNC duplication with **`change system-parameters duplication`**. 2. Prevent the system from doing a PNC interchange with **`set PNC lock`**. 3. Repeat this test.
1407	ABORT	This test cot be run on an ATM-EI board that is on the active PNC because it cot be busied out. This error code indicates that PNC duplication is enabled. 1. Attempt to perform a PNC interchange with **`reset pnc interchange`**. 2. If the PNC interchange is successful, busyout the original ATM-Expansion Interface circuit pack with **`busyout board`** ***`location`*** (address of the original ATM-EI board). 3. Retry the command.
1962 2000 2100 2302 2500	ABORT	Every TALKER DSP is busy (an unlikely event). Response to the test was not received within the allowed time. Could not allocate the necessary system resources to run this test. Inconsistent uplink message from the ATM board. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2752	ABORT	The circuit pack in this location is not a TN2305 or TN2306.
1–8	FAIL	The board is writing to unauthorized TDM time slots. The error code indicates the number of faulted TALKER DSPs. 1. Retry the command up to 3 times. 2. If the failure persists, replace the circuit pack.
		2 of 3

Table 510: ATM Crosstalk Test (#1298) ***3 of 3***

Error Code	Test Result	Description / Recommendation
1–8	PASS	The board is talking to authorized time slots on the TDM Bus. The error code indicates the number of TALKER DSPs that were tested.
		3 of 3

RC NPE Port Audit Test (#1315)

This tests executes the NPE crosstalk test on a Radio controller (RC) NPE port. If the test is unsuccessful, the port number (1-24) of the RC NPE port which failed is returned.

Not all ports are tested, as this would take an excessive amount of time. It is most likely that if one port fails, then all of the ports are bad. To test all 24 RC NPE ports, use the ***repeat 24*** option for the **test board** command. This test is run on RC-BD (Radio Controller Board).

Table 511: RC NPE Port Audit Test (#1315) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1-24	ABORT	The Error Code identifies the NPE for which the test aborted. The NPE is probably being allocated for a call. 1. Enter **status radio-controller** ***loc*** to verify there are no calls on the RC circuit pack. 2. If not, retry the command at one-minute intervals up to 5 times. 3. If the test continues to abort, escalate the problem.
		1 of 2

Table 511: RC NPE Port Audit Test (#1315) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1-24	FAIL	The Error Code identifies the NPE for which the RC NPE Port Crosstalk test failed. 1. Enter **`test board`** ***`loc`*** **`long repeat 24`** 2. If any of the tests fail, replace the RC circuit pack.
ANY	NO BOARD	UTAM disablement of radio transmission usually causes this problem. 1. Check the Radio Transmission option. This option can be changed only at the INADS or higher level. 2. Verify the system is not booting. 3. Enter **`display radio-controller`** ***`loc`*** and verify that the RC is administered. 4. Retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, escalate the problem.
	PASS	All of the NPEs are functioning normally.
		2 of 2

RC NPE Port Loop Test (#1316)

The circuit pack must be busied out before running this test.

This tests executes the NPE Digital Port Loop Test on a Radio controller (RC) NPE port. If the test is unsuccessful, the port number (1-24) of the RC NPE port which failed is returned.

Not all ports are tested, as this would take an excessive amount of time. It is most likely that if one port fails, then all of the ports are bad. To test all 24 RC NPE ports, use the ***repeat 24*** option for the **test board** command. This test is run on RC-BD (Radio Controller Board).

Table 512: RC NPE Port Loop Test (#1316)

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1-24	ABORT	The Error Code identifies the NPE for which the test aborted. The NPE is probably being allocated for a call. 1. Enter **status radio-controller** ***loc*** to verify there are no calls on the RC circuit pack. 2. If not, retry the command at one-minute intervals up to 5 times. 3. If the test continues to abort, escalate the problem.
1-24	FAIL	The Error Code identifies the NPE for which the RC NPE Port Crosstalk test failed. 1. Enter **test board** ***loc*** **long repeat 24** 2. If any of the tests fail, replace the RC circuit pack.
ANY	NO BOARD	UTAM disablement of radio transmission usually causes this problem. 1. Check the Radio Transmission option. This option can be changed only at the INADS or higher level. 2. Verify the system is not booting. 3. Enter **display radio-controller** ***loc*** and verify that the RC is administered. 4. Retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, escalate the problem.
	PASS	All of the NPEs are functioning normally.

RC Hardware Translation Audit (#1317)

This tests validates that the operating parameters which are translated for an RC circuit pack match those that have been previously downloaded to the circuit pack.

If this audit fails, an error will be logged and a WARNING alarm generated. However, no attempt will be made to correct the mismatched data by re-downloading to the RC. Instead, the RC circuit pack needs to be reset to have the operating parameters re-downloaded to the circuit pack. The RC circuit pack cot accept operating parameter updates and still remain in-service.

This test is run on RC-BD (Radio Controller Board).

Table 513: RC Hardware Translation Audit (#1317) ***1 of 3***

Error Code	Test Result	Description / Recommendation
2000	ABORT	No response to the test from the RC circuit pack. 1. Retry the command at 1-minute intervals up to 5 times. 2. If no response, **busy**, **reset**, and **release** the RC board to re-initialize it. Retry the command. 3. If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The RC has incorrect radio frequencies. 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
		1 of 3

Table 513: RC Hardware Translation Audit (#1317) ***2 of 3***

Error Code	Test Result	Description / Recommendation
2	FAIL	RC has incorrect cluster ID 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
3	FAIL	RC has incorrect DWBS System ID. 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
4	FAIL	RC has incorrect radio data (EIC) 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
5	FAIL	RC has incorrect radio data (E and ARC) 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
		2 of 3

Table 513: RC Hardware Translation Audit (#1317) ***3 of 3***

Error Code	Test Result	Description / Recommendation
6	FAIL	RC has incorrect modem operating parameters. 1. Enter **display radio-controller** ***loc*** to check the administration. If administered translations are wrong, use **change carrier-frequencies** and/or **change system parameters wireless** to modify as needed. 2. Re-initialize the RC board using the **busy**, **reset**, and **release** commands.
ANY	NO BOARD	UTAM disablement of radio transmission usually causes this problem. 1. Check the Radio Transmission option. This option can be changed only at the INADS or higher level. 2. Verify the system is not booting. 3. Enter **display radio-controller** ***loc*** and verify that the RC is administered. 4. Retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, escalate the problem.
	PASS	The RC is functioning normally.
		3 of 3

RC NPE Allocation Test (#1336)

This tests runs an RC NPE Allocation Test on a given RC. This test is run on RC-BD (Radio Controller Board).

Table 514: RC NPE Allocation Test (#1336)

Error Code	Test Result	Description / Recommendation
2000	ABORT	No response to the test from the RC circuit pack. The circuit pack may be busied out. 1. Enter **release board *loc*.** Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
ANY	NO BOARD	UTAM disablement of radio transmission usually causes this problem. 1. Check the Radio Transmission option. This option can be changed only at the INADS or higher level. 2. Verify the system is not booting. 3. Enter **display radio-controller *loc*** and verify that the RC is administered. 4. Retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, escalate the problem.
	PASS	The RC board is functioning normally.

RC Tone Loopback Test (#1343)

This test is very disruptive.

The RC board must first be busied out in order for this test to run.

This tests validates the RC board circuitry by looping a 1004 Hz reflective tone to the far-end of the RC circuit pack, then back to the processor. The Loopback Test is performed 24 times, once for each NPE port.

This test aborts if any of the 24 tone loopback tests abort. This test fails if any of the 24 tone loopback tests fail. If all 24 tone loopback tests pass, this test passes.

This test is run on RC-BD (Radio Controller Board).

Table 515: RC Tone Loopback Test (#1343) ***1 of 2***

Error Code	Test Result	Description / Recommendation
0	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1010	ABORT	An attempt was made to busy out a circuit pack that was already busied out. This error can be ignored.
1011	ABORT	An attempt was made to release a circuit pack that was not busied out. This error can be ignored.
1026	ABORT	The TDM Bus cot be busied out because the control channel or the system tones are present.
1362	ABORT	The RC circuit pack has not been busied out. 1. Enter **busyout board** ***loc*** 2. Retry the test. If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1-63	FAIL	One or more of the 24 tone loopback tests failed. 1. Replace the RC circuit pack.
		1 of 2

Table 515: RC Tone Loopback Test (#1343) *2 of 2*

Error Code	Test Result	Description / Recommendation
3001 3002 3003 3004 3005 3006	FAIL	One or more of the 24 tone loopback tests failed. 1. Replace the RC circuit pack.
4001	FAIL	The tone loopback tests that use DSPs 1 - 3 failed. 1. Replace the RC circuit pack.
4002	FAIL	The tone loopback tests that use DSPs 4 - 6 failed. 1. Replace the RC circuit pack.
62524 62525 62526	ABORT	Resources required to do maintenance activity on this circuit pack are not available. 1. Resolve alarms and retry the test.
ANY	NO BOARD	UTAM disablement of radio transmission usually causes this problem. 1. Check the Radio Transmission option. This option can be changed only at the INADS or higher level. 2. Verify the system is not booting. 3. Enter **`display radio-controller`** ***`loc`*** and verify that the RC is administered. 4. Retry the command at 1-minute intervals up to 5 times. 5. If the test continues to abort, escalate the problem.
ANY	EXTRA BD	Only a specific number of certain circuit packs can be in the system or port network. Only one Maintenance Test circuit pack is allowed per port network. 10 Tone Detector or Call Classifier circuit packs are allowed.
	PASS	The RC board is functioning normally.
		2 of 2

ASAI Link Status Test (#1365)

This tests queries the system for the state of the TCP Tunnel Connection and the ASAI TCP/IP link. If both the TCP Tunnel Connection and the ASAI TCP/IP Link are in the "established" state, the test passes. The test fails otherwise. This test is run on ADJ-IP (ASAI Adjunct TCP/IP Link).

Table 516: ASAI Link Status Test (#1365)

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times. 2. If the test continues to abort, escalate the problem.
1	FAIL	The ASAI Adjunct TCP/IP Link is down. The TCP Tunnel Connection is established but the ASAI TCP/IP Link is not established. 1. Use the **`ping`** command with the IP address for the Remote Node as specified on the **ip-services** form. 2. If no response is received, check the entry for the local node on the **ip-services** form. If the entry is **clanX**, where **X** is the board number, refer to the maintenance procedures for CLAN-BD (Control LAN Circuit Pack) to clear the problem. 3. If the test continues to fail, escalate the problem.
4	FAIL	The ASAI Adjunct Link is down. The ASAI Adjunct Link is established but the TCP Tunnel Connection is not established. 1. Check the entry for the local node on the **ip-services** form. If the entry is **clanX**, where **X** is the board number, refer to the maintenance procedures for CLAN-BD (Control LAN Circuit Pack) to clear the problem. 2. If the test continues to fail, escalate the problem.
	PASS	The ASAI Adjunct TCP/IP Link is up. The ASAI TCP/IP Link and the TCP Tunnel Connection are both "established".

IP Address Update Test (#1371)

This test is **conditionally destructive**.

This test queries the media processor for its IP address, subnet mask, and gateway translation (IP parameters). If the parameters do not match software translation, the system reboots the board. The board goes through a logical board removal and insertion.

When Test #1371 fails, it is an indication that an illegal change was made and the customer should be notified.

This test sends the following information to the board:

- IP address, subnet mask, gateway address, VLAN information, and ethernet options information from the **change ip-interface** form. If the board is one of a duplicated pair, the test also updates the board's virtual IP address and virtual MAC address.
- QoS, Diffserv, and Audio DSP gains from the **change system-parameters ip-options** and **change ip-network-region** forms

This test also updates the board's packet link translation and checks if the packet link is in service for the board.

This test is run on IPMEDPRO (IP Media Processor) and MEDPRO (Media Processor MAPD Circuit Pack).

Table 517: IP Address Update Test (#1371) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Insufficient system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered with the correct IP address. 2. Rerun the test.
	FAIL	The IP address, subnet mask, and gateway translation parameters do not match Communication Manager translations. The board has been reset. 1. If the problem persists, replace the circuit pack.
		1 of 2

Table 517: IP Address Update Test (#1371) ***2 of 2***

Error Code	Test Result	Description / Recommendation
6	FAIL	The packet link for the board is not up. 1. Check the state of the packet bus for the port network. 2. If the packet bus is OK, attempt to re-initialize the board by entering the following commands: — **disable ip-interface** — **reset board** ***location*** — **release board** ***location*** — **enable ip-interface**. 3. If the problem persists, replace the circuit pack.
2807	FAIL	The board is administered, but not enabled on the **change ip-interfaces** form. The board and its DSPs are taken out of service. 1. Enable the board on the **change ip-interfaces** form. 2. Rerun the test. 3. If the problem continues, replace the circuit pack.
	PASS	Translation data matches.
4	PASS	Duplicate IP address detected. Circuit pack administration contains an IP address that is a duplicate of an existing network IP address. This could cause problems in the network and problems with calls on the circuit pack.
		2 of 2

Registration Status Inquiry Test (#1372)

The Registration status inquiry reports the H.323 registration status of the endpoint. An endpoint must be registered and authenticated in order to receive service from the system.

Registration is initiated when the endpoint user attempts to login using the Avaya registration software application running on the endpoint PC. The user must provide a valid extension and security code. The registration messages are sent to the IP address of a C-LAN Ethernet port.

A registered extension has a port type of SNNNNN, where N is a digit from 0–9. A non-registered extension has a port type of X.

This test runs on DIG-IP-S (Digital IP Station) and H323-STN (H.323 IP Station).

Table 518: Registration Status Inquiry Test (#1372)

Error Code	Test Result	Description / Recommendation
1427	ABORT	This test does not apply to OPTIM stations. This error can be ignored.
1 2 3	FAIL	The endpoint is not successfully registered. 1. Verify that the user is entering the: ● correct extension and security code ● correct IP address of the C-LAN 2. Verify that the extension has been enabled for IP Softphone operation. 3. If several endpoints cot register, investigate any errors of the C-LAN Ethernet port. 4. Examine the Ethernet cabling from the endpoint PC to the Ethernet hub.
	PASS	The endpoint is successfully registered and continues to respond to registration handshaking.

Signaling Path PING Test (#1373)

This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection. The Signaling Path PING test determines the local C-LAN through which the signaling originates and the endpoint's IP address. It then requests the local C-LAN to execute a PING on the endpoint's address. If the PING is successful, the test passes. If the PING is not successful, the test fails.

Note:

Multiple failures of this test can take the IP Station out of service.

This test runs on DIG-IP-S (Digital IP Station) and H323-STN (H.323 IP Station).

Table 519: Signaling Path PING Test (#1373)

Error Code	Test Result	Description / Recommendation
	ABORT	This test does not run on media modules or media gateways. Ignore.
1427	ABORT	This test does not apply to OPTIM stations. This error can be ignored.
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times.
1003	FAIL	**Ping** to the destination failed. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Investigate any C-LAN Ethernet port errors.
1007	FAIL	The system could not PING the registered endpoint via the C-LAN. 1. Verify that at least one destination reachable through this port. PING this destination (**ping ip-address** ***xxx.xxx.xxx.xxx***). 2. If the PING to any destination is successful through this port, the link is up. 3. If the PING to every destination fails, test the C-LAN port using **test port** ***location***, and follow the repair procedures for Session Status Test (#1286) failures. 4. If only this station cot be pinged: ● Make sure the PC is up. ● Make sure the PC has a network connection (Ethernet or dial-up). ● Check the Ethernet cabling.
	PASS	The system can successfully send IP packets to the registered endpoint from the C-LAN.

Media Path PING Test (#1374)

The Media Path PING Test selects a Media Processor board. It then requests the local Media Processor to execute a PING on the endpoint address. If the PING is successful, the test passes. If the PING is not successful, the test fails.

The standard **`ping`** command can be executed using the Media Processor board address and endpoint IP address to see the actual round-trip delay.

This test checks the IP network connectivity needed for audio packets to be sent to the endpoint. It runs on H323-SGR (H.323 Signaling Group).

Table 520: Media Path PING Test (#1374)

Error Code	Test Result	Description / Recommendation
1427	ABORT	This test does not apply to OPTIM stations. This error can be ignored.
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals, up to 5 times. 2. Escalate if the problem persists.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Escalate if the problem persists.
2806	ABORT	No Media Processor board found to use for this test.
ANY	FAIL	The system could not PING the registered endpoint from a Media Processor board. This may result in calls with no talk path. 1. If the Registration Status Inquiry Test (#1372) fails, follow the repair procedures. 2. Refer to Ping Test (#1379) for a detailed description of the error codes.
	PASS	PING through this Media Processor is successful.

Ping Test (#1379)

This test verifies that the IP Media Processor can communicate with other nodes on the LAN.

This test pings the gateway IP address as defined on the IP Interface screen. If the PING is successful, this test looks at the PING round-trip delay. If a round-trip delay of greater than 4 seconds is reported, a separate error is logged. Excessive round-trip delays do not take the IP Media Processor out of service.

This test runs on IPMEDPRO (IP Media Processor) and MEDPRO (Media Processor MAPD Circuit Pack).

The test can be executed with the standard **ping** command using the C-LAN board address and IP Media Processor IP address to see the actual round-trip delay. (See **ping** commands.)

Table 521: Ping Test (#1379) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1 2	ABORT	Internal Error. 1. Retry the command at 1-minute intervals up to 3 times.
7	ABORT	Destination unreachable. 1. Verify that at least one destination reachable through this port is up. 2. Repeat the test. 3. If the test still aborts, escalate the problem.
1005	ABORT	Configuration for this test is incorrect. 1. Verify that the Ethernet link is in-service with **status port** or **status *link***. Verify that the routing table has destinations that are reachable through this port. 2. Repeat this test. 3. If the test aborts with error code 7 after step 1 is verified, escalate the problem.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times. If this result occurs repeatedly, attempt to reset the circuit pack and rerun the test. 2. If this result occurs again, replace the circuit pack.
		1 of 2

Table 521: Ping Test (#1379) *2 of 2*

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	The necessary system resources to run the test could not be allocated. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	No IP address defined. 1. Verify IP interface translations and retest.
2802	ABORT	Different IP address pinged than software had allocated for the test. 1. Retry the command at 1-minute intervals up to 3 times.
2805	FAIL	The number of pings received did not match the number sent (normally one ping sent). This means that no ping responses were received from the gateway defined on the **ip-interface** form for the IP Media Processor. 1. Retry the command at 1-minute intervals up to 3 times.
2807	ABORT	The board is administered but not enabled on the **change ip-interfaces** form.
7 89 1007	FAIL	A ping to the destination failed through this port. The destination is down. 1. Verify that at least one destination is reachable through this port. 2. Once verified, enter **test port *location*** to verify that the Signaling Group Ping test (#1387) passes.
	PASS	Ping through this port is successful.
		2 of 2

DSP Port TDM Looparound Test (#1380)

This test sets up a loopback path from the TDM bus out to the NIC edge of the Media Processor and back to the TDM bus. The loopback is established by setting up the outbound IP connection to send IP packets to the MedPro's own IP address. The tone generator places a test tone (440Hz) onto a timeslot. The timeslot is listened to by the Media Processor board. The tone is routed through the board's DSP farm, where it may undergo transcoding to G.723, etc. The tone is looped back at the Network interface and back through the board where it is converted back into standard PCM. The tone is placed onto a TDM timeslot and detected by a tone detector port. The test passes if 440Hz is reported by the tone detector

This test runs on MEDPROPT (MEDPRO DSP PORT).

Table 522: DSP Port TDM Looparound Test (#1380) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1014	ABORT	Board not inserted.
		1 of 2

Table 522: DSP Port TDM Looparound Test (#1380) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2000 2100 2500	ABORT	Response to the test was not received in the allowed time. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The TN802B/TN2302 Media Processor board has not been administered on the **ip-interfaces** screen.
ANY	FAIL	The test did not detect the test tone through the looparound connection. 1. Test the tone-clock in the port network that contains the media processor under test. 2. If the tone-clock is healthy, test the media processor board again. 3. If the test continues to fail, replace the media processor board.
	PASS	The board is functioning properly.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

Windows 2000 Reset Test (#1381)

This test resets the TN802 MAPD circuit pack. The test is highly **destructive** and can be initiated only by a **`reset board`** ***`location`*** command on the TN802 circuit pack.

This test runs on MEDPRO (Media Processor MAPD Circuit Pack).

Table 523: Windows 2000 Reset Test (#1381) ***1 of 2***

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. 1. Retry **`reset board`** ***`location`*** at 1-minute intervals up to 5 times.
		1 of 2

Table 523: Windows 2000 Reset Test (#1381) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1015	ABORT	Port is not out-of-service. 1. Busyout the circuit pack with **busyout board *location*** 2. Enter **reset board *location***.
2100	ABORT	System resources required for this test are not available. 1. Run **reset board *location*** at 1-minute intervals up to 5 times.
1 2	FAIL	The circuit pack failed to reset. The circuit pack failed to restart. 1. Enter **reset board *location***. 2. If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. 1. Enter **release board *location***.
0	NO BOARD	See NO BOARD for repair procedures.
		2 of 2

DSP Query Test (#1382)

When running on a TN802 Media Processor circuit pack, this test polls the circuit pack for the number of failed DSPs. If every DSP is functional, the test passes and the board is operating at maximum capacity. If any DSPs fail, the test fails and reports the number of failed DSPs. A failure of 3 or fewer DSPs does not result in an alarm. A failure of more than 3 and up to 8 DSPs results in a warning alarm. A failure of more than 8 DSPs results in a minor alarm. In all cases, except when every DSP fails, the MEDPROPT continues to provide reduced capacity

When running on a TN2302 or TN2602 IP Media Processor circuit pack, this test polls the circuit pack for the state of health of a specific DSP. If the DSP is bad, an error will be logged and the board will be polled again. If the circuit pack is still failing, the DSP will be taken out of service and a MINOR alarm will be raised.

This test runs on MEDPROPT (MEDPRO DSP PORT).

Table 524: DSP Query Test (#1382)

Error Code	Test Result	Description / Recommendation
1014	ABORT	Board not inserted.
1022	ABORT	Board not valid for test. This error can be ignored.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 3 times.
1–11	FAIL	TN802B: Some DSPs on the circuit pack have failed. The FAIL Error Code is the number of bad DSPs reported.
	FAIL	TN2302 and TN2602: The DSP failed. If it continues to fail, it will be taken out of service.
	PASS	All DSPs are functioning and in-service.
0	NO BOARD	See NO BOARD for repair procedures.

Network Connectivity Query Test (#1383)

This test passes if the Ethernet port is connected. It fails if no electrical signal is detected.

This test runs on IPMEDPRO (IP Media Processor) and MEDPRO (Media Processor MAPD Circuit Pack).

Table 525: Network Connectivity Query Test (#1383)

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Ethernet cable is not connected.
	PASS	The Ethernet cable is connected.
0	NO BOARD	See NO BOARD for the repair procedures.

C-LAN Ethernet Port Status Test (#1386)

This test checks the status of the C-LAN Ethernet port that is the near-end gatekeeper of this signaling group. If the C-LAN Ethernet port is in service, the test passes. If the port is out of service, the test fails.

This test runs on H323-SGR (H.323 Signaling Group) and SIP-SGRP (SIP Signaling Group).

Note:

Failure of this test will put the SIG-GRP in the OOS state.

Table 526: C-LAN Ethernet Status Test (#1386) ***1 of 2***

Error Code	Test Result	Description/Recommendation
1005	ABORT	Ethernet Link is not in service. The object is not in the right configuration to run this test. Either the Compact Flash has not been turned on in the change media gateway form, or the announcements have not been enabled, or the media gateway link is down.
2000	ABORT	Response to the test was not received from the MG announcement media module within the allowable time period. If this result occurs repeatedly, there is not much that can be physically done as this module is a part of the mother board.
2012	ABORT	The System Call failed. The command can be tried again. However, any continuous failure with this error code should be escalated.
2100	ABORT	The system resources to run the test could not be allocated. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. Retry the command at 1-minute intervals up to 3 times.
1	FAIL	The media gateway announcement module is experiencing problems with the Compact Flash. The Compact Flash is either not inserted, or is unrecognizable.
2	FAIL	The media gateway announcement module is experiencing problems with the Compact Flash. The Compact Flash does not have enough memory to support the announcements on the MG announcement module.
4	FAIL	The media gateway announcement module is experiencing problems with the Compact Flash. The available RAM is not sufficient to support the Compact Flash.
3, 5, 6, 7		The media gateway announcement module is experiencing problems with the Compact Flash. Any of the errors—3, 5, 6 and, 7—indicates multiple errors related to the Compact Flash. For example, 3 is a combination of failures 1 and 2.
		1 of 2

Table 526: C-LAN Ethernet Status Test (#1386) *2 of 2*

Error Code	Test Result	Description/Recommendation
	PASS	The media gateway announcement module has passed all tests. Alarms and errors are cleared if they were previously set.
		2 of 2

Signaling Group Ping Test (#1387)

This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection. It is only run for those signaling groups that have an administered far-end IP address. If the H.323 or SIP signaling group does not have an administered far-end IP address, the test will abort.

The test determines the local C-LAN through which the signaling originates, and the far-end terminating IP address. It then requests the local C-LAN to execute a PING on the far-end address. If the PING is successful, the test passes. If the ping is not successful, the test fails.

Note:

Multiple failures of this test will cause this signaling group's associated H.323 or SIP B-channels to be taken out of service (OOSFE). This will allow incoming calls to be made when the far-end comes up before the near end has detected it. The signaling group will be left in service, but in the far end bypass state.

If the PING is successful, the test looks at the PING round-trip delay. If a round-trip delay of greater than 4 seconds is reported, a separate error is logged. Excessive round-trip delays within the signaling group will not take the signaling group out of service.

The standard PING command can be executed using the C-LAN board's address and far-end IP address from the signaling group screen to see the actual round-trip delay.

This test runs on H323-SGR (H.323 Signaling Group) and SIP-SGRP (SIP Signaling Group).

Table 527: Signaling Group Ping Test (#1387) *1 of 3*

Error Code	Test Result	Description / Recommendation
None 1 2	ABORT	Internal Error. 1. Retry the command at 1-minute intervals up to 3 times.
		1 of 3

Table 527: Signaling Group Ping Test (#1387) ***2 of 3***

Error Code	Test Result	Description / Recommendation
7	ABORT	Destination unreachable. 1. Verify that the C-LAN has been administered with an IP-Route that enables the C-LAN to reach the far-end IP address. 2. Once verified, enter **`test sig-group`** ***`grp#`*** and verify that the Signaling Group Ping test (#1387) passes.
1005	ABORT	Configuration for this test is incorrect. 1. If Layer 3 or LRQ is enabled for this H.323/SIP signaling group, this error can be ignored. There is no need to run the ping test. 2. Verify that the link is in service with **`status port`** or **`status link`**. Verify that the routing table has destinations that are reachable through this port. 3. Repeat the test. 4. If the test aborts with Error Code 7 after step 2 is verified, escalate the problem.
1124 1125	ABORT	Link is not in service. 1. Check if the link is in service or not. If the link is not in service, release the link using **`release link`** or **`release port`**, and repeat the test. 2. If the test continues to abort after the link has been released, escalate the problem.
2000	ABORT	Response to the test was not received within the allowed time. 1. If this result occurs repeatedly, attempt to reset the circuit pack if the other ports on the board are idle (amber LED is off). 2. Rerun the test. If this result occurs again, replace the circuit pack.
2012 2100 2500	ABORT	Internal system error. The necessary system resources to run the test could not be allocated. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2800 2801	ABORT	No C-LAN in the same region. Could not find C-LAN with this IP address. No IP address defined. 1. Verify translations and retest.
		2 of 3

Table 527: Signaling Group Ping Test (#1387) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2802	ABORT	Different IP address pinged than software had allocated for the test. 1. Retry the command at 1-minute intervals up to 3 times.
7 89 1007	FAIL	**PING** to the destination failed through this port because the destination was down. 1. Verify that at least one destination reachable through this port is "up". Once verified, enter **test signaling-group *grp#*** to verify that the Signaling Group Ping test (#1387) passes.
Any	PASS	PING through this port was successful.
		3 of 3

MedPro Status Test (#1392)

This test determines if at least one media processor port is in service and serves the same region as the C-LAN that the signaling group uses. If at least port one exists and is in service, the test passes. Otherwise, the test fails.

This test runs on H323-SGR (H.323 Signaling Group) and SIP-SGRP (SIP Signaling Group).

Table 528: MedPro Status Test (#1392) ***1 of 2***

Error Code	Test Result	Description / Recommendation
None 2012 2100	ABORT	Internal system error. Internal system error. Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times
2808	ABORT	This test is not applicable when the SBS field on the H.323 signaling group form is set to **y**.
		1 of 2

Table 528: MedPro Status Test (#1392) *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	No MEDPRO ports in this region are in service. Every session is down. 1. Check the Error Log for errors against MEDPRO and MEDPROPT. 2. Enter **test signaling-group *grp#*** and verify the result of the H.323 Signaling Group Ping test (#1387). If the test continues to fail, escalate the problem. If the test passes, wait for the sessions to come up.
	PASS	Every session on the Ethernet link is up.
		2 of 2

PPC Sanity Query Test (#1402)

This test queries the circuit pack for the status of the processor on the board. It runs on IPMEDPRO (TN2602AP IP Media Resource 320).

Table 529: PPC Sanity Query Test (#1402)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received within the allowed time. 1. Retry the command. 2. If the test aborts again, attempt to reset the circuit pack and rerun the test. 3. If the problem continues, replace the circuit pack.
2012 2100	ABORT	System call failed. Could not allocate the necessary system resources to run this test. 1. Retry the command.
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered.
		1 of 2

Table 529: PPC Sanity Query Test (#1402)

Error Code	Test Result	Description / Recommendation
2807	ABORT	The board is administered, but not enabled on the **`change ip-interfaces`** form. 1. Enable the board on the **`change ip-interfaces`** form. 2. Rerun the test. 3. If the problem continues, replace the circuit pack.
20481 20735	FAIL	Something is wrong with the circuit pack. The on-board software detected an unknown error condition. 1. Attempt to reset the circuit pack. 2. Rerun the test. If the problem continues, replace the circuit pack.
	PASS	The processor is working correctly.
		2 of 2

Ethernet Hardware Query Test (#1405)

This test queries the circuit pack for the status of the Ethernet hardware on the board.

If the Ethernet hardware is bad, the board will indicate this. An error and alarm will be posted, and the DSPs will be taken out of service. The system then attempts to reset the Ethernet hardware. If the reset passes or the original test passes, the DSPs are placed into service, if necessary.

This test runs on IPMEDPRO (TN2602AP IP Media Resource 320).

Table 530: Ethernet Hardware Query Test (#1405) ***1 of 2***

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received within the allowed time. 1. Retry the command. 2. Attempt to reset the circuit pack. 3. Rerun the test. If the problem continues, replace the circuit pack.
		1 of 2

Table 530: Ethernet Hardware Query Test (#1405) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	System call failed. Could not allocate the necessary system resources to run this test. 1. Retry the command.
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered and rerun the test.
2807	ABORT	The board is administered, but not enabled on the **`change ip-interfaces`** form. 1. Enable the board on the **`change ip-interfaces`** form. 2. If the problem continues, replace the circuit pack.
24577 24579 24831	FAIL	Ethernet hardware is bad. Ethernet hardware has been disabled by the on-board software. On-board software detected an unknown error condition. 1. Attempt to reset the circuit pack. 2. Rerun the test. If the problem continues, replace the circuit pack.
	PASS	Communication with this circuit pack is successful.
		2 of 2

MP Diagnostic Test (#1406)

This test is destructive.

The MP Diagnostic Test runs the following diagnostic tests in the following order, but only if each successive test passes:

DSP FPGA Query: This test verifies the status of the FPGA device on the TN2302 circuit pack. If the device is bad, the system posts an error and alarm and takes out of service every DSP that is controlled by the one FPGA. The system then attempts to reset the FPGA. If the reset passes or the original test passes, the DSPs are placed back into service.

Ethernet Query: This test passes if the TN2302 hardware is functioning properly and the Ethernet port is connected. Otherwise, it fails.

SCOTCH Sanity: The SCOTCH device on a board communicates with switch software via the TDM bus for conferencing and gain adjustment by setting up connections on TDM bus time slots. If errors are reported from the board, the system takes the DSPs out of service and executes a circuit pack reset (SAKI Test #53)

This test runs on IPMEDPRO (TN2302 IP Media Processor).

Table 531: MP Diagnostic Test (#1406)

Error Code	Test Result	Description / Recommendation
2012 2100	ABORT	System error. System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The MP Diagnostic test failed and the circuit pack is in the out-of-service state. Error Codes 8192 - 8328: The FPGA DSP Test failed. Error Codes 16384 - 16900: A SCOTCH device failed. Error Codes 24576 - 24580: An ETHERNET device failed. 1. Reset the circuit pack with **busyout board *location***, **reset board *location***, and **release board *location***. 2. Enter **test board *location* long**. Replace the circuit pack if the test continues to fail.
	PASS	The FPGA device on this circuit pack is operating correctly.
0	NO BOARD	See NO BOARD for repair procedures.

DSP Port Status Query Test (#1407)

This test queries the state of the DSP port. It runs on MEDPROPT (MEDPRO DSP PORT).

Table 532: DSP Port Status Query Test (#1407)

Error Code	Test Result	Description / Recommendation
1	ABORT	This port is Out of service (OOS) due to: ● A board-level problem. For example, no IP address has been translated for this location. ● A DSP hardware problem. See DSP Port Status Query Test (#1407) and DSP Query Test (#1382).
2	ABORT	This port has been made maintenance busy.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received in the allowed time. 1. Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
	FAIL	Unable to get status for this port. Verify that this board has been administered correctly, and that there are no alarms against this board.
	PASS	The board is functioning properly and the port is in-service and available.
0	NO BOARD	See NO BOARD for repair procedures.

Firmware Download Test (#1413)

This test is destructive.

This test has two functions and can only be executed if there is a download schedule to verify or if there are FW-DWNLD errors to resolve and alarms to clear.

1. This test verifies that the information on the FIRMWARE DOWNLOAD screen is correct. It also verifies that the source board is of the correct type, the file to be downloaded is present on that source board, and the file is free of errors. In addition, it verifies that the target board code and suffix are correct. It also retrieves the new firmware vintage for the target board and populates the appropriate field in the firmware download table.
2. If this test is executed after a FIRMWARE DOWNLOAD schedule has run and there are FW-DWNLD alarms/errors, it resolves the errors, clears the alarms, copies the current download status table to the last table, and clears out the current table.

Table 533: Firmware Download Test (#1413) ***1 of 3***

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The firmware image file entered on the **`change firmware download`** screen is not present on the source board specified in the screen. 1. Enter **`list directory board`** ***`location`*** and verify that: ● A file system is enabled on the board ● The file is present 2. If the file system is not enabled: a. Enter **`enable filesystem`**. b. FTP the correct firmware image to the source board. 3. If the correct image file is present, the name entered on the screen is incorrect. Use **`change firmware download`** and enter the correct file name.
		1 of 3

Table 533: Firmware Download Test (#1413) *2 of 3*

Error Code	Test Result	Description / Recommendation
2 3	FAIL	The image file header on the source board is invalid. The firmware image file on the source board has a bad CRC. 1. FTP a good firmware image file to the source board.
4	FAIL	Firmware image file name is too long. 1. Rename the image file to a file name of the correct size. 2. FTP the new image file to the source board. 3. Use **`change firmware download`** and enter the new file name on the screen.
5	FAIL	The TN code of the firmware image file on the source board does not match the TN code entered on the screen. The firmware file is incorrect for the board type entered on the screen. 1. Enter **`list directory board`** ***`location`***, and verify that a file system is enabled on the board and the file is present. 2. If the file system is not enabled, enter **`enable filesystem`** and FTP the correct firmware image to the source board. 3. Enter **`change firmware download`** and enter the new file name on the screen.
6	FAIL	The suffix of the firmware image file on the source board does not match the suffix entered on the screen. The firmware image file is incorrect for the board types entered on the screen. 1. Enter **`list directory board`** ***`location`*** and verify that a file system is enabled on the board and the file is present. 2. If the correct firmware image is not present, FTP the correct firmware image to the source board. 3. Enter **`change firmware download`** and enter the new file name on the screen.
7	FAIL	The source board entered on the screen is not present. 1. Enter **`display firmware download`** and verify the source board's location. 2. Verify the source board's translations. 3. If the location is incorrect, enter **`change firmware download`** and enter the correct location on the screen.
		2 of 3

Table 533: Firmware Download Test (#1413) ***3 of 3***

Error Code	Test Result	Description / Recommendation
8	FAIL	The source boards entered on the screen are incorrect. The board could have been changed after the schedule was entered. 1. Enter **`list configuration`**. Verify the source board's location. 2. Enter **`change firmware download`** and enter the correct location on the screen.
	PASS	Firmware download to this circuit pack is successful.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

Network Region Interconnectivity Test (#1417)

This test does not specify and list Error Codes in the usual mer. If this test detects a failure, the test is retried using different IP endpoints, if available, from the same two network regions. If the test still fails between these network regions:

1. Maintenance software marks the connectivity between them as "failed."
2. Communication Manager denies every attempted call between them.

For this test, devices that can serve as IP endpoints include:

- IPMEDPRO
- MEDPRO
- CLAN-BD
- IP phones or Softphones, with the ability to initiate a ping

For a network region without an IPMEDPRO, MEDPRO, or a CLAN-BD, Test #1417 looks for another ping-capable endpoint. If found, the region's testing continues. If not, the test assumes that the region's connectivity is operating normally.

This test runs on NR-CONN (Network-Region Connect).

Table 534: Network Region Interconnectivity Test (#1417) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1 2 11	ABORT	Internal error 1. Retry the command at 1-minute intervals up to 3 times. 2. If the problem persists, escalate the problem.
1005	ABORT	Incorrect test configuration. 1. Verify the Ethernet link is in-service on all C-LAN boards in the source and destination regions with **status port** ***location*** or **status link** ***n***).
1125	ABORT	Ethernet link not in service. 1. Verify the Ethernet link is in-service for all C-LAN boards in the source and destination regions under test using **status port** ***location*** or **status link** ***n***. If interface is enabled, the ethernet link is expected to be in-service for this test to run.
2000	ABORT	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 3 times. 2. If the problem persists, reset the circuit pack. 3. Rerun the test. If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times.
2100	ABORT	Could not locate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals, up to 5 times.
2500	ABORT	Internal system error. 1. Retry the command at 1-minute intervals, up to 3 times.
2801	ABORT	No IP address defined. 1. Verify IP interfaces translations and retest.
2802	ABORT	Different IP address pinged than was allocated for the test. 1. Retry the command at 1-minute intervals up to 3 times.
2807	ABORT	The board is administered but not enabled on the **change ipserver-interfaces** screen.
		1 of 2

Table 534: Network Region Interconnectivity Test (#1417) ***2 of 2***

Error Code	Test Result	Description / Recommendation
1003	FAIL	Ping to the destination failed due to on-board problems of the source of the ping. The source of the ping can be a C-LAN board or a IPMEDPRO board for this error to occur. 1. Retry the command at 1-minute intervals, up to 3 times. 2. Look for problems associated with IPMEDPRO or C-LAN boards in this region.
7 89 1007	FAIL	Ping to the destination failed due to the destination being down. 1. Verify that at least one destination reachable through the network regions being tested is up. Ping this destination (**`ping ip-address`** ***`xxx.xxx.xxx.xxx`***).
2805	FAIL	The number of pings received did not match the number sent (normally one ping is sent). This means that no ping responses were received from the destination region endpoint being tested back to the source endpoint sending the ping.
	PASS	TCP/IP Ping test between network regions is successful.
		2 of 2

Echo Canceller Test (#1420)

This test is destructive.

Note:

This test is executed only for USD1 circuit packs and DS1 Interface Media Modules that have been administered on the DS1 screen to provide echo cancellation. The circuit pack or media module must be busied out before this test is run.

The Echo Canceller Test is part of the **`test board long`** demand test sequence of a UDS1 circuit pack or DS1 Media Module. The test checks echo cancellation on a subset of channels. If any channel fails twice or if any two channels fail once, the test fails and echo cancellation is bypassed on every channel of the board. Otherwise, the test passes and echo cancellation is configured to the administered parameters.

This test runs on MG-DS1 (DS1 Interface Media Module) and UDS1-BD (UDS1 Interface Circuit Pack).

Table 535: Echo Canceller Test (#1420)

Error Code	Test Result	Description / Recommendation
1015	ABORT	The board is not busied out. 1. If the board is not in use, enter **busyout board *location*** 2. Retry the test.
2000	ABORT	Response to the test was not received within the allowed time. This may be due to hyperactivity. 1. Enter **display errors** on the SAT. 2. If Error Type 1538 appears in the error log for this board, see Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module for the repair procedures. Otherwise, retry the test at 1-minute intervals up to 5 times.
2012 2100 2500	ABORT	Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1400 1401	FAIL	The Echo Canceller test failed. Echo Cancellation is no longer being supplied by the board. • Error 1400 - Echo canceller function test failed. • Error 1401 - Echo canceller memory test failed. Clear the alarm using **test board *location* long.** If the test still fails, replace the board. The board can still be used for a T1/E1 line interface without echo cancellation. This capability provides limited service for the customer until the board can be changed out.
	PASS	The Echo Cancellation feature is functioning properly. 1. Enter **release board *location*** to put the board back in service.
0	NO BOARD	See NO BOARD for the repair procedures.

Short IP 2-Way Transmission Test (#1505)

This test attempts to verify IP network connectivity between one pair of IP Media Processors which are connected to a customer's LAN/WAN IP network.

This test creates a G.711 audio path between the source IP Media Processor specified in the command line and a destination IP Media Processor. The destination IP Media Processor is chosen by the system. The destination IP Media Processor is chosen from a port network other than the port network containing the source IP Media Processor. In addition, the destination IP Media Processor is chosen from the same IP network region as the source IP Media Processor or is chosen from an IP network region that is administered to be connected to the IP network region of the source IP Media Processor.

An audio channel using G.711 is setup between both boards. A 1004-Hz test tone is transmitted from the source PN to the destination PN over the G.711 audio channel. The test tone is then transmitted from the destination PN to the source PN.

This test runs on IPMEDPRO (IP Media Processor).

Table 536: Short IP 2-Way Transmission Test (#1505) *1 of 3*

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **status health** to view the occupancy measurements. 2. Enter **display errors** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 536: Short IP 2-Way Transmission Test (#1505) *2 of 3*

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **`list measurements tone-receiver`** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1014	ABORT	Board not inserted. 1. Insert and administer a Media Processor circuit pack.
2000 2012 2100 2500	ABORT	Response to the test was not received in the allowed time. System call failed. Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The IP Media Processor has not been administered on the **`change ip-interface`** form. 1. Administer the IP Media Processor on the **`change ip-interface`** form and rerun the test.
2806	ABORT	The system could not find any in-service IP Media Processors to use as a destination for this test.
2807	ABORT	The specified IP Media Processor has been disabled on the **`change ip-interfaces`** form. 1. Enable the IP Media Processor on the **`change ip-interfaces`** form.
		2 of 3

Table 536: Short IP 2-Way Transmission Test (#1505) ***3 of 3***

Error Code	Test Result	Description / Recommendation
10XX XX = PN #	FAIL	The test tone was not successfully sent from the IP Media Processor specified in the test command and not successfully received by an IP Media Processor in the PN specified in the error code XX. The source to destination direction failed. The destination to source direction was not tested. 1. Resolve all other board alarms for the specified source IP Media Processor. 2. Resolve all other board alarms for the IP Media Processors in the destination PN. 3. Use **`ping`** and **`traceroute`** to localize the problem to the customer's LAN/WAN IP network.
20XX XX = PN #	FAIL	The test tone was successfully sent from the IP Media Processor specified in the test command and received by an IP Media Processor in the PN specified in the error code XX. The test tone was not successfully sent in the reverse direction. The destination to source direction failed. The source to destination direction passed. 1. Resolve all other board alarms for the specified source IP Media Processor. 2. Resolve all other board alarms for the IP Media Processors in the destination PN. 3. Use **`ping`** and **`traceroute`** to localize the problem to the customer's LAN/WAN IP network.
XX XX = PN #	PASS	The board is functioning properly. The test tone was transmitted and received successfully between: ● The IP Media Processor specified in the test command ● An IP Media Processor in the PN specified in the error code XX. The test tone was sent and received in both directions.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

Long IP 2-Way Transmission Test (#1506)

This test verifies IP network connectivity between a specified IP Media Processor and every other IP Media Processor in the system. It is an extended version of the Short IP 2-Way Transmission Test (#1505).

Test #1505 verifies IP voice connectivity in both directions between the specified IP Media Processor (A) and a system chosen destination IP Media Processor (B).

Test #1506 verifies IP voice connectivity in both directions between the specified IP Media Processor (A) and all other IP Media Processor/s (B, C, D, E, ...) that has administered IP network region connectivity to the IP network region of the source IP Media Processor.

The test passes if the source IP Media Processor (A) has 2-way voice connectivity to all other IP Media Processors. The test fails and stops immediately if the source IP Media Processor (A) cot verify 2-way talk path to any destination IP Media Processor. The failure code indicates the port network that contains the destination Media Processor that could not be reached.

This test creates a G.711 audio path between the source IP Media Processor specified in the command line and a destination IP Media Processor. All destination Media Processors are chosen from the same IP network region as the source IP Media Processor and connected IP network regions. An audio channel using G.711 is setup between a pair of boards. A 1004-Hz test tone is transmitted from the source PN to the destination PN over the G.711 audio channel. The test tone is then transmitted from the destination PN to the source PN.

This test runs on IPMEDPRO (IP Media Processor).

Table 537: Long IP 2-Way Transmission Test (#1506) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 537: Long IP 2-Way Transmission Test (#1506) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1014	ABORT	Board is not inserted. Insert and administer a TN2602 circuit pack.
2000 2012 2100 2500	ABORT	Response to the test was not received in the allowed time. Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The IP Media Processor has not been administered on the **ip-interfaces** form. 1. Administer the IP Media Processor on the **ip-interfaces** form.
2806	ABORT	The system could not find any in-service IP Media Processors to use as a destination for this test.
2807	ABORT	The specified IP Media Processor has been disabled on the ip-interfaces screen.
10XX XX = PN #	FAIL	The test tone was not successfully sent from the IP Media Processor specified in the test command, and not successfully received by an IP Media Processor in the PN specified in the error code XX. Source to destination direction failed. Destination to source direction not tested. 1. Resolve all other board alarms for the specified source IP Media Processor. 2. Resolve all other board alarms for the IP Media Processors in the destination PN. 3. Use **ping** and **traceroute** to localize the problem to the customer's LAN/WAN IP network.
		2 of 3

Table 537: Long IP 2-Way Transmission Test (#1506) ***3 of 3***

Error Code	Test Result	Description / Recommendation
20XX XX = PN #	FAIL	The test tone was successfully sent from the IP Media Processor specified in the test command and received by an IP Media Processor in the PN specified in the error code XX. The test tone was not successfully sent in the reverse direction. Destination to source direction failed. Source to destination direction passed. 1. Resolve all other board alarms for the specified source IP Media Processor. 2. Resolve all other board alarms for the IP Media Processors in the destination PN. 3. Use **`ping`** and **`traceroute`** to localize the problem to the customer's LAN/WAN IP network.
	PASS	The customer network is functioning properly. The test tone was transmitted and received successfully between the IP Media Processor specified in the test command and every other IP Media Processor in the set of connected IP network regions.
0	NO BOARD	See NO BOARD for repair procedures.
		3 of 3

Verify NIC Options Test (#1511)

The Verify NIC Options Test checks if the circuit pack's network interface parameters (auto-negotiate, speed, and duplex) match with its administration.

The test passes if the NIC parameters match circuit pack administration. The test fails if the NIC parameters do not match.

This test runs on IPMEDPRO (IP Media Processor) and ETH-PT (Control LAN Ethernet).

Table 538: Verify NIC Options Test (#1511) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1014	ABORT	Board is not inserted. 1. Enter **`list configuration board`** to ensure that the circuit pack is inserted in the carrier. 2. If the board is not inserted, make sure the circuit pack is inserted in the carrier and fully seated.
1022	ABORT	Invalid board. The board is not capable of changing its Ethernet options.
1115	ABORT	Unable to allocate system resources to run this test. 1. Retry the test at one minute intervals up to a maximum of 3 times.
2000	ABORT	Response to the test was not received within the time allowed. Retry the command at 1 minute intervals a maximum of 3 times. 1. If this result occurs repeatedly, attempt to reset the circuit pack. 2. Rerun the test. If this result occurs again after resetting the board, replace the circuit pack.
2012 2100 2500	ABORT	Internal system error. System resources required for this test are not available. Internal system error. 1. Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	Could not find the IP address for this board. 1. Enter **`change ip-interfaces`** ***`location`*** to administer an IP address for this board. 2. Rerun the test.
2807	ABORT	The board is administered but not enabled on the ip-interfaces form. 1. Enter **`change ip-interfaces`** ***`location`*** to enable the board. 2. Rerun the test.
		1 of 3

Table 538: Verify NIC Options Test (#1511) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1	FAIL	The board's NIC is set to auto-negotiate. However, the transmission is set to half-duplex. It should be set to full-duplex. There is a mismatch between what is programmed on the board and what is administered in Communication Manager. 1. Change the Ethernet options. Set the speed to **100Mbps** with **full** duplex. Set Auto (negotiate) to **n**. This should match the settings of the connected router. If the router does not have the same capabilities, you may have to adjust accordingly. The important thing is to make the media processor and the connected router match. The commands to change administration are: a. Enter **`get ethernet-options`** ***`location`*** to determine the current settings, both administered and actual. b. Enter **`change ip-interface`** ***`location`*** and change the **Enable Ethernet Port** field to **n** to turn off the interface. Submit the form to disable the interface. c. Enter **`change ip-interface`** ***`location`*** and change the Ethernet Options fields as required. Submit the form. d. Enter **`change ip-interface`** ***`location`*** and change the **Enable Ethernet Port** field to **y** to turn on the interface. Submit the form to enable the interface. e. Enter **`get ethernet-options`** ***`location`*** to verify that Ethernet options are the same in administration and on the board. 2. If service is normal and the alarm is causing concern, disable the test and escalate the problem.
		2 of 3

Table 538: Verify NIC Options Test (#1511) *3 of 3*

Error Code	Test Result	Description / Recommendation
2	FAIL	The board is reporting different options than what is administered. Software tried to correct the options but the board did not accept the option update. 1. Set the administration values to the actual values that the board is reporting. The commands to change administration are: f. Enter **get ethernet-options *location*** to determine the current settings, both administered and actual. g. Enter **change ip-interface *location*** and change the **Enable Ethernet Port** field to **n** to turn off the interface. Submit the form to disable the interface. h. Enter **change ip-interface *location*** and change the Ethernet Options fields as required. Submit the form. i. Enter **change ip-interface *location*** and change the **Enable Ethernet Port** field to **y** to turn on the interface. Submit the form to enable the interface. j. Enter **get ethernet-options *location*** to verify that Ethernet options are the same in administration and on the board. 2. Test the board using the **test board *location*** command. If the test still fails, replace the board. 3. If service is normal and the alarm is causing concern, disable the test and escalate the problem.
	PASS	The circuit pack's network interface parameters match administration.
		3 of 3

Link State Audit Test (#1527)

This test verifies the Media Gateway H.248 link state and alarm state. If the user knows the MG is up but there is still an alarm indicating the link is down, this test should be run by using **test media-gateway *location***.

This test runs on MED-GTWY (MEDIA GATEWAY).

Table 539: Link State Audit Test (#1527)

Error Code	Test Result	Description / Recommendation
1007	ABORT	The media gateway is not administered.
2012	ABORT	System call failed. 1. Retry the test at one-minute intervals up to 5 times.
1	FAIL	Gateway has been unregistered longer than the Link Loss Delay Timer. 1. A Major alarm is raised.
257	FAIL	Link is up on a Survivable Remote Server.
769	FAIL	Gateway is in link bounce. It has been unregistered less than the Link Loss Delay Timer. 1. A Minor alarm is raised.
	PASS	The link is up and there is no alarm.

Serial Bus Status Test (#1531)

The TN2312BP IPSI requests status information from the power supplies every 5 seconds. If it does not receive a response, or if it does not detect at least one power supply at initialization, it generates a serial bus failure error message. This test runs on SER-BUS (Serial Communication Bus).

Table 540: Serial Bus Status Test (#1531) ***1 of 4***

Error Code	Test Result	Description and recommendation
1000 2000	ABORT	Internal software error. The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
	FAIL	The test failed. 1. Enter **`list configuration power-supply`** ***`cab`*** and check if any power supplies are detected. 2. Enter **`list configuration all`** and verify that the carrier locations for the power supplies appear correct. If not, verify that the paddle boards are inserted in the correct position for the carrier location. 3. Use the following Serial Bus repair procedures: **Procedure 1:** This procedure removes and reinserts port circuit packs (those in the purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until all circuit packs in the port network have been tried. 1. If the Serial Bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. 2. If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the Serial Bus problem. However, other simultaneous failures might also be responsible for Serial Bus faults. Consider removing all circuit packs in the carrier and replacing them one at a time. However, if large service disruptions are to be avoided, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack. 3. Remove one or several circuit packs as appropriate. Any circuit packs that have been recently inserted should be checked first. If you decide to remove multiple circuit packs, consider working with an entire carrier at a time to more quickly and reliably determine which circuit packs are not the source of trouble. Do not remove the A carrier TN2312BP IPSI as it is the link back to the server.
		1 of 4

Table 540: Serial Bus Status Test (#1531) ***2 of 4***

Error Code	Test Result	Description and recommendation

	FAIL *(cont'd)*	4. Run **`list configuration power-supply`** ***`C`*** to determine if some power supplies are still not showing and the Serial Bus fault is still present.
		5. If the fault is still present:
		  1. Check if the backplane pins in the removed circuit pack's slot appear to be bent.
		  2. If the backplane pins are not bent, reinsert the circuit pack(s), and perform this Procedure 1 for the next set of circuit packs.
		  3. If the backplane pins are bent, remove power to the carrier by unplugging the two AC cords on the back, and the one DC input cord on the back, if there is one.
		  4. Straighten or replace the pins and reinsert the circuit pack.
		  5. Restore power and repeat Procedure 1, beginning with Step 2, for the same circuit pack(s).
		6. If the fault is not present:
		  1. Reinsert the circuit pack(s) one at a time, and repeat the following substeps until all of the circuit packs have been reinserted.
		  2. Run **`list configuration power-supply`** ***`C`*** to determine if the Serial Bus fault has returned.
		  3. If any of the power supplies don't show, the reinserted circuit pack is defective. Replace this circuit pack and repeat this procedure for the next circuit pack.
		  4. If none of the power supplies fail to show when all of the circuit packs have been reinserted, the problem has been fixed and the procedure is completed.

		2 of 4

Table 540: Serial Bus Status Test (#1531) ***3 of 4***

Error Code	Test Result	Description and recommendation
	FAIL (cont'd)	**Procedure 2:** This procedure attempts to isolate the Serial Bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 2 is organized into two parts. Part 1 attempts to clear the Serial Bus fault by replacing all the bus cabling and terminators within a port-network. Part 2 attempts to isolate the fault to a particular carrier by extending the Serial Bus from the A carrier to additional carriers one at a time. Power must be removed from the entire port network before any cables or terminators are removed. Failure to follow this procedure can cause damage to circuit packs and power supplies, and can be hazardous to the technician. **Part 1:** 1. If spare TDM/LAN Cable assemblies and TDM/LAN Bus Terminators are not available, go to Part 2 of this procedure. 2. Power down the port network. 3. Replace all of the TDM/LAN Cable Assemblies and both TDM/ LAN Bus Terminators. 4. Restore power to the port network. 5. Run **`list configuration power-supply`** ***`C`*** to determine if the Serial Bus fault is still present. 6. If the Serial Bus fault is resolved, the procedure is completed. Otherwise, go to Part 2. **Part 2:** 1. Terminate the TDM/LAN Bus so that it extends only across the carrier that contains the A carrier TN2312BP IPSI. 2. Determine if the Serial Bus fault is still present by running **`list configuration power-supply`** ***`C`***.
		3 of 4

Table 540: Serial Bus Status Test (#1531) ***4 of 4***

Error Code	Test Result	Description and recommendation
	FAIL (cont'd)	3. If **list configuration power-supply *C*** does show a power supply, extend the TDM/LAN/Serial Bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, perform Procedure 1 for only the circuit packs in that carrier. 4. If **list configuration power-supply *C*** fails to show any power supplies, and Procedures 1 and 2 have not resolved the problem, the added carrier(s) are defective and must be replaced. 5. If the Serial Bus repair procedures were unsuccessful, replace the TN2312BP IPSI circuit pack. 6. If all else fails, and there is only one power supply in the system, replace the power supply.
	PASS	At least one power supply responded to a status query from the TN2312BP IPSI.
		4 of 4

Emergency Transfer Query Test (#1532)

The Emergency Transfer Query Test queries the maintenance module on the TN2312BP IPSI to determine if Emergency Transfer is set in MANUAL-ON or MANUAL-OFF mode. If Emergency Transfer is set to MANUAL-ON, a major alarm is generated. If Emergency Transfer is set to MANUAL-OFF, a warning alarm is generated.

This test is run on CAB-EXFR (Emergency Transfer).

Table 541: Emergency Transfer Query Test (#1532) ***1 of 2***

Error Code	Test Result	Description and recommendation
1000 2000	ABORT	Internal system error. The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
1 2	FAIL	The emergency transfer is set to Manual-Off. The emergency transfer is set to Manual-On. 1. Enter the **status cabinet *cab*** or **status health *cab*** command to display the status of the emergency transfer select switch: ● “on” means that emergency transfer was manually activated by the **set emergency-transfer on** command. ● “off” means that emergency transfer was manually deactivated by the **set emergency-transfer off** command. ● “auto+” means that the system has a serious alarm that causes Communication Manager to activate emergency transfer. ● “auto-” means that emergency transfer is not active and is not being controlled by the **set emergency transfer** command. 2. If the status is "on" or "off", enter **set emergency auto *cab*** command to return control of emergency transfer to Communication Manager.
16	FAIL	Embedded software (firmware) has activated emergency transfer. This is an internal error, since Communication Manager should have set the state to "Manual-on", "Manual-off", or "auto" at the time the TN2312BP was initiated. 1. Run **test maintenance *cab*** to see if communications with the TN2312BP are up. 2. Reset the TN2312BP circuit pack with **reset ipserver**.
		1 of 2

Table 541: Emergency Transfer Query Test (#1532) ***2 of 2***

Error Code	Test Result	Description and recommendation
	PASS	System software has control of Emergency Transfer within this cabinet. If Emergency Transfer is currently invoked (the emergency transfer LED is on), the cause could be a major alarm. 1. The following shows the Error Types that can cause Emergency Transfer. If any of these errors appear in the log, see TONE-BD (Tone-Clock Circuit Pack), and resolve these Error Types first: ● Error Type 3848, Aux Data 0 ● Error Type 2305, Aux Data 0 These errors indicate the loss of one or more clock signals from the reported TN2312BP circuit pack. a. Examine the Error Log for errors reported against circuit packs in the same port network, especially TDM-CLK (TDM Bus Clock), TONE-BD (Tone-Clock Circuit Pack), and EXP-INTF (Expansion Interface Circuit Pack). Follow the repair or replacement procedures indicated for any such errors found. b. If the error is not corrected by resolving errors found in step 1, the TN2312BP circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack. 2. If none of the above stated errors appear in the log, check the Emergency Transfer hardware.
		2 of 2

Power/Fan Lead Query Test (#1533)

The Power/Fan Query Test sends a request for the state of the power/fan lead (AuxSig) to the TN2312BP IPSI board in the G650 with an A carrier address. If the lead is on, the test fails. If the lead is off, the test passes. This test runs on CAB-PFL (Power Fan Lead).

Table 542: Power/Fan Lead Query Test (#1533) ***1 of 3***

Error Code	Test Result	Description and recommendation
1000 2000 2029 2035 2319 2500	ABORT	Internal system error. The response to a query was not received in the time allowed. Internal error. The EPN is unavailable or going down. EPN is out of range. Internal system error. 1. Retry the command at one-minute intervals up to 3 times.
1	FAIL	**G650**: In a G650 carrier, this indicates a failure in any of the following MOs: • SER-BUS (Serial Communication Bus) • POW-SUP (Power Supply) • CAB-TEMP (Cabinet Temperature) • PS-RGEN (Power Supply Ring Generator) Use the diagnostic procedures for those MOs to clear the problem.
		1 of 3

Table 542: Power/Fan Lead Query Test (#1533) ***2 of 3***

Error Code	Test Result	Description and recommendation
1	FAIL (cont'd)	**G600** / **CMC1** There is a fan, temperature, power, or voltage problem in one or more of the cabinets. The power supply's LEDs may indicate the problem's source. 1. If none of the fans are running, then: a. Verify 8- to 14-Volt DC power is available to the fan units by checking the wiring connector. If there is 8- to 14-Volt DC power at the connector, there should be power to the fans. If the fans still do not run, replace the fan assembly. b. If not, then the power unit's fan output is defective or thermally shut down. Let the power unit cool, and recycle AC input power. If no fan output, replace the power unit. If the fans still do not run, escalate the problem. 2. If only 1 of the fans is not running, replace the fan. 3. If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to Step 4 or Step 5 as applicable. 4. If the fans are not at high speed, measure the cabinet's temperature at the air intake and the air exhaust at the top of the cabinet. a. If the 5- to 60^{0}-C criteria is met, there is a problem with the fans that is preventing the fans from operating at high speed. Replace the fans. If the fans run at high speed, wait 5 minutes to give the cabinet time to cool down and, rerun the test. If the problem persists, go to step 5. b. If not, the Processor circuit pack is incorrectly reporting this condition. Look for and resolve every error on these MOs first, then rerun the test.
		2 of 3

Table 542: Power/Fan Lead Query Test (#1533) ***3 of 3***

Error Code	Test Result	Description and recommendation
	FAIL (cont'd)	5. If the fans are running at high speed, check the following items. Any one of these could be restricting or redirecting the cabinet's air flow: a. Check the filter. If the filter is dirty or clogged, it should be cleaned or replaced. The filter can either be washed with soap and water or vacuumed. b. Verify that nothing other than circuit packs are in the carrier slots that could be restricting air flow. c. Verify that no circuit-pack blanks or carrier faceplates are missing. Install and/or replace them as necessary. d. Be sure the cabinet's doors are properly closed. The doors must be closed to enable the fans to properly cool the cabinet. Wait 5 minutes to allow the fans to cool the cabinet. Rerun the test. If the test still fails, proceed to Step 6. 6. At this point, there should be nothing impeding the air flow, and the fans should be running at high speed. Check the temperatures for the 5- to 60^0-C criteria. a. If the 5- to 60^0-C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait 5 minutes, then rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled. b. If the 5- to 60^0-C criteria does not exist, the fans are defective. Replace the fan assembly and rerun the test. Failures can occur on the Processor circuit pack that are not detected but that cause many, if not every, environment test to fail. If many environment tests are failing, the suspected circuit pack, depending on the system configuration, should be replaced and the test rerun. 7. There is a problem with the environment of the power system. The power unit for the cabinet may be defective. a. Verify and, if necessary, replace the power unit. b. Rerun the test. If the test still fails, escalate.
	PASS	This indicates that the power/fan lead is off and there are no failures in the G650 or G650 stack.
		3 of 3

Power Supply Recycle Test (#1534)

The Power Supply Recycle Test verifies that the redundant power supply (slot 15) can fully support the power load for the G650, or shuts down the power to an entire carrier to force all the circuit boards in the carrier to recycle. This test turns off the DC output voltages for a few seconds and then turns the voltages back on. This test is run as a scheduled test only if redundant power supplies are present and then only on one power supply at a time. When redundant power supplies are present, this test can generate error log entries for either power supply.

This test runs on POW-SUP (Power Supply).

Table 543: Power Supply Recycle Test (#1534) ***1 of 3***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Retry the command. 2. Escalate the problem if the test continues to abort.
1035	ABORT	The port network is not available. 1. Enter **`status port-network`** to verify that the network is not up. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface), etc. 3. Use the diagnostic procedures for those MOs to clear the problem.
1971 1973 1975	ABORT	The power supply is not detected. The carrier does not contain a redundant power supply. The other power supply has failed. 1. Refer to hardware errors for the other power supply. 2. Replace the other power supply.
		1 of 3

Table 543: Power Supply Recycle Test (#1534) ***2 of 3***

Error Code	Test Result	Description and recommendation
1977	ABORT	There is an active Expansion ArchAngel (EAA) in the carrier that a recycle was attempted on. Recycling the carrier with the active EAA will result in loss of network control to the entire port network. 1. If the TN2312 IPSI circuit packs are duplicated, move network control to the other carrier (IPSI) using the following commands: ● **list ipserver-interface** to verify that the IPSI in the carrier of interest is active. ● **set ipserver *cabinet a*** or ***b*** to move the control to the other IPSI. ● **recycle carrier *cabinet a*** or ***b*** to recycle the carrier. 2. If the TN2312 IPSI circuit packs are not duplicated. ● Enter **recycle carrier *override*** to recycle the carrier.
1980	ABORT	The power supply is in a carrier with an active expansion interface (EI). 1. Enter **status port-network *nn*** to verify that the EI (A or B) in the carrier of interest is active. 2. Enter **reset pnc interchange** to move port network connectivity to the other expansion interface. 3. Enter **recycle carrier**
1987	ABORT	The power supply data was not valid. 1. Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Run **test maintenance *nn***
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals 1 to 3 times. 2. Escalate the problem if the test continues to abort.
2319	ABORT	The EPN is out of range.
		2 of 3

Table 543: Power Supply Recycle Test (#1534) ***3 of 3***

Error Code	Test Result	Description and recommendation
2500	ABORT	An internal operation failed 1. Retry the command.
	PASS	The power supply recycle test passes.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.
		3 of 3

Power Supply Detection Test (#1535)

The power supply detection test verifies that:

- The power supply is detected.
- No internal failures are reported.
- Input power is present.

When redundant power supplies are present, the microcontroller for a power supply may still be powered, even though input power to the power supply is not present.

This test runs on POW-SUP (Power Supply).

Table 544: Power Supply Detection Test #(1535) ***1 of 3***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Retry the command. 2. Escalate the problem if the test continues to abort.
1035	ABORT	The port network is not available. 1. Enter **status port-network** to verify that the network is not up. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface), etc. 3. Use the diagnostic procedures for those MOs to clear the problem.
1987	ABORT	The power supply data was not valid. 1. Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Run **test maintenance** ***nn***
2319	ABORT	The EPN is out of range.
2500	ABORT	Internal system error. 1. Retry the command.
		1 of 3

Table 544: Power Supply Detection Test #(1535) ***2 of 3***

Error Code	Test Result	Description and recommendation
1[1]	FAIL	The system does not detect a power supply. 1. Verify that the power supply is plugged in. 2. Verify that the yellow LED on the power supply is lit and that at least one of the two green input power LEDs is lit. ● If the yellow LED is OFF and/or the red LED is ON, replace the power supply. ● If the green input power LEDs are OFF, check the AC and/or DC input power. 3. Run **`test board`**. ● If the serial bus test fails (Test #1531) and there is more than one power supply in the G650 stack, Test #1531 fails when none of the power supplies can be accessed over the serial bus. Follow the instructions for Serial Bus Status Test (#1531). 4. Replace the power supply.
2[1]	FAIL	Internal failure in the power supply. 1. Refer to POW-SUP (Power Supply) Error Code 1537 for more information. 2. Replace the power supply.
4	FAIL	The power supply has an operational failure. 1. Refer to POW-SUP (Power Supply) Error Code 1793 for more information. 2. Replace the power supply.
		2 of 3

Table 544: Power Supply Detection Test #(1535) *3 of 3*

Error Code	Test Result	Description and recommendation
8	FAIL	There is no input power. 1. Run **test board**. a. Verify that the **Input Power** field contains dashes. b. The green power supply LED for AC power and the green LED for DC power should be OFF when Test #1535 fails with an Error Code 8. 2. Verify that input power is present. If input power is present, replace the power supply. 3. The internal AC fuse or DC fuse may be open. This cot be repaired by the field technician.
	PASS	The power supply detection test passes.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.
		3 of 3

1. It is unlikely that these failure codes will occur when redundant power supplies are present because each power supply is measuring the backplane voltage rather than the power supply voltage.

Power Supply Voltage Test (#1536)

The TN2312BP IPSI scans the status of each 655A power supply on the serial bus every 5 seconds. This test returns the status of the most recent scan of the 655A DC output voltages.

This test runs on POW-SUP (Power Supply).

Table 545: Power Supply Voltage Test (#1536) ***1 of 3***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Retry the command. 2. Escalate the problem if the test continues to abort.
1035	ABORT	The port network is not available. 1. Enter **status port-network** to verify that the network is not up. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface), etc. 3. Use the diagnostic procedures for those MOs to clear the problem.
1987	ABORT	The power supply data was not valid. 1. Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Run **test maintenance *nn***
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals 1 to 3 times. 2. Escalate the problem if the test continues to abort.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed. 1. Retry the command. 2. Escalate the problem if the test continues to abort.
		1 of 3

Table 545: Power Supply Voltage Test (#1536) ***2 of 3***

Error Code	Test Result	Description and recommendation
1[1]	FAIL	The +5V is out of tolerance. 1. Enter **`status environment`** to check the voltages. a. +5V (+/- 5%) (4.75 to 5.25 V) 2. If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **`recycle carrier`** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431) before executing the **`recycle carrier`** command. 3. Replace the power supply. 4. If the problem persists, check the backplane for shorts.
2[1]	FAIL	The -5V is out of tolerance. 1. Enter **`status environment`** to check the voltages: -5V (+/- 10%) (-4.5 to -5.5 V) 2. If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **`recycle carrier`** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)* before executing the **`recycle carrier`** command. 3. Replace the power supply. 4. If the problem persists, check the backplane for shorts.
		2 of 3

Table 545: Power Supply Voltage Test (#1536) *3 of 3*

Error Code	Test Result	Description and recommendation
4[1]	FAIL	The -48V is out of tolerance. 1. Enter **status environment** to check the voltages: - 48V (+/- 8%) (- 44.2 to 51.8 V) 2. If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)* before executing the **recycle carrier** command. 3. Replace the power supply. 4. If the problem persists, check the backplane for shorts.
8[1]	FAIL	The fan voltage is out of tolerance. 1. Enter **status environment** to check the fan speed. It should be mid or high. 2. If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431) before executing the **recycle carrier** command. 3. Replace the power supply. 4. If the problem persists, check the backplane for shorts.
	PASS	The power supply voltage test passes.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.
		3 of 3

1. The values of these failure codes might be added together. For example, a value of 3 indicates that both the +5V and the -5V are out of tolerance or a value of 15 indicates that all four voltages are out of tolerance.

Power Supply Temperature Test (#1537)

The power supply temperature test runs on CAB-TEMP (Cabinet Temperature). It provides the status of the following temperatures:

- Inlet to the power supply (120F/49C)
- Carrier exhaust (120F/49C)
- Power supply hot spot status

Table 546: Power Supply Temperature Test (#1537) *1 of 2*

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Repeat the command at one-minute intervals 1 to 3 times.
1035	ABORT	The port network is not available. 1. Enter **`status port-network`** to verify that the network is not up. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface) etc. 3. Use the diagnostic procedures for those MOs to clear the problem.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed. 1. Repeat the command at one-minute intervals 1 to 3 times.
		1 of 2

Table 546: Power Supply Temperature Test (#1537) ***2 of 2***

Error Code	Test Result	Description and recommendation
1 2 3	FAIL	The inlet temperature is over threshold. The exhaust temperature is over threshold. Both the inlet and the exhaust temperatures are over threshold. 1. Enter **`test board`** ***`location`*** to check the temperature. 2. If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using **`recycle carrier`**, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in *Maintenance Commands for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300431)* before executing **`recycle carrier`**. 3. Replace the power supply. 4. If the problem persists, check the backplane for shorts.
4	FAIL	There is a hot spot temperature warning.
8	FAIL	There is a hot spot temperature shutdown.
	PASS	The inlet, exhaust, and hot spot temperatures are within limits.
0	NO BOARD	The power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.
		2 of 2

Power Supply Fan Test (#1538)

This test verifies that the fan alarm lead from the fan assembly is not active. It runs on CAB-TEMP (Cabinet Temperature).

Table 547: Power Supply Fan Test (#1538)

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Repeat the command at one-minute intervals up to 3 times.
1035	ABORT	The port network is not available.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Enter **test maintenance** ***nn*** to verify communication with the port network.
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals up to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed. Retry the command.
	FAIL	The fan alarm lead from the fan assembly is active. 1. Verify the proper operation of the fan assembly. 2. Replace the fan assembly. See G650 fan removal/replacement in *Maintenance Procedures for Avaya Aura™ Communication Manager, Media Gateways and Servers (03-300432)*.
	PASS	The fan alarm lead from the fan assembly is not active.
	NO BOARD	The power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.

Ring Generator Interchange Test (#1539)

The ring generator interchange test causes a temporary interchange and is only used if the G650 has redundant power supplies. This test sends a command to the primary power supply in slot 0 to turn off ringing voltage, the ring arbitration lead changes state, and the secondary power supply in slot 15 provides ringing voltage to the backplane. The ring detection circuit for the secondary power supply is checked to verify that the secondary power supply is providing ringing voltage.

A command is sent to the primary power supply to apply ringing. The ring arbitration lead changes back to allow the primary power supply to provide ringing voltage. The ring voltage detection circuit on the primary power supply is checked to verify that the primary supply is applying ring voltage.

The long test sequence causes a ring interchange. The short test, which is the default, does not cause a ring interchange.

This test runs on PS-RGEN (Power Supply Ring Generator).

Table 548: Ring Generator Interchange Test (#1539) ***1 of 2***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
1035	ABORT	The port network is not available. 1. Verify that the port network is not available by using **`status port-network`**
1972	ABORT	The secondary power supply is not inserted.
1990	ABORT	Both power supplies in the carrier are turned off.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Enter **`test maintenance`** ***`nn`*** to verify communication with the port network.
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals 1 to 3 times. 2. If the test continues to abort escalate the problem.
2319	ABORT	The EPN is out of range.
		1 of 2

Table 548: Ring Generator Interchange Test (#1539) ***2 of 2***

Error Code	Test Result	Description and recommendation
2500	ABORT	An internal operation failed. 1. Repeat the command at one-minute intervals 1 to 3 times. 2. If the test continues to abort escalate the problem.
1	FAIL	There is no ringing voltage on the backplane when interchanging the ring generator to this power supply. 1. Run **`test board`**.
64	FAIL	Unable to interchange the ringers. The power supply being tested has its ringer turned off.
65	FAIL	Unable to interchange the ringers. The power supply not being tested has its ringer turned off.
	PASS	The ring generation on redundant power supplies successfully interchanged.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. If the power supply was already plugged in, replace the power supply.
		2 of 2

Ring Generator Status Test (#1540)

The ring generator status test verifies that the power supply ring voltage detector detects the presence of ringing voltage. The operational status information from the ring generator does **not** indicate that the generator is:

- shut down because it has an internal fault or shorted lead
- active but its output is operating under overload

This test does not fail if the ring selector switch on the 655A power supply is disabled.

This test runs on This test runs on PS-RGEN (Power Supply Ring Generator).

Table 549: Ring Generator Status Test (#1540)

Error Code	Test Result	Description / Recommendation
1035	ABORT	The port network is not available. 1. Verify that the port network is not available by using **`status port-network`**
1990	ABORT	All inserted power supplies in the carrier are turned off.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Enter **`test maintenance`** ***`nn`*** to verify communication with the port network.
2100	ABORT	The system could not allocate resources. 1. Repeat the command at one-minute intervals 1 to 3 times. 2. If the test continues to abort escalate the problem.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed. 1. Repeat the command at one-minute intervals 1 to 3 times.
1[1] 2 4 8 16 32	FAIL	The ring generator is active, but overloaded. The ring generator is inactive because of a short. There is an internal fault in the ring generator. The ring generator is off by command. The ringer on the primary power supply is not active. There is no ringing voltage on the backplane. 1. Run **`test board`** ***`location`*** 2. If the test continues to fail, replace the power supply.
64	FAIL	Duplicated power supplies only. Unable to run the ring test because the power supply being tested has its ringer turned off.
	PASS	The ring voltage was successfully detected.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. If the power supply was already plugged in, replace the power supply.

1. The values of these failure codes might be added together. For example, a value of 36 indicates that the ringer generator is inactive because of a short and that the ring generator has an internal fault.

Reset Environmental Maintenance Test (#1545)

This test resets the environmental maintenance on the TN2312BP IPSI board for CAB-MTCE (Media Gateway Maintenance).

Table 550: Reset Environmental Maintenance Test (#1545) ***1 of 2***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software problem. 1. Repeat the command at one-minute intervals 1 to 3 times.
1982	ABORT	The board being tested is NOT a TN2312BP IPSI or later. 1. Insert a TN2312BP IPSI circuit pack.
1986	ABORT	The TN2312BP IPSI failed to set emergency transfer to AUTO at initialization. 1. Enter **`reset maintenance`** 2. If the reset maintenance command aborts again, enter **`set emergency`** to see if emergency transfer can be activated or deactivated. 3. If the reset maintenance command continues to abort, escalate the problem.
2000	ABORT	The response to a query was not received in the time allowed. 1. Run **`reset maintenance`** 2. Escalate the problem if the test continues to abort.
2500	ABORT	An internal operation failed. Possible unknown cabinet type. 1. Repeat the command at one-minute intervals up to 3 times. 2. Escalate the problem if the test continues to abort.
1	FAIL	The TN2312BP IPSI environmental maintenance initialization failed. 1. Repeat the command at one-minute intervals 1up to 3 times.
		1 of 2

Table 550: Reset Environmental Maintenance Test (#1545) *2 of 2*

Error Code	Test Result	Description and recommendation
2	FAIL	The TN2312BP IPSI failed a sanity test. 1. Run **reset maint**. 2. If the problem persists, replace the circuit pack.
	PASS	Environmental maintenance has been enabled and passes a sanity test.
		2 of 2

Correct Board Test (#1546)

A TN2312BP IPSI or TN8412 SIPI circuit pack is required for the environmental functions to work in the G650 or CMC1 media gateway. This test verifies that the proper circuit pack is inserted in the G650 or CMC1.

The G600 can have either a TN2312A or TN2312B IPSI circuit pack.

This test runs on CAB-MTCE (Media Gateway Maintenance).

Table 551: Correct Board Test (#1546)

Error Code	Test Result	Description and recommendation
2500	ABORT	An internal operation failed. 1. Repeat the command at one-minute intervals up to 3 times.
	FAIL	**G650** or **CMC1**: A TN2312AP IPSI is inserted.
	PASS	**G600**: Either a TN2312AP or TN2312BP IPSI is present.
	PASS	**G650** or **CMC1**: The correct circuit pack is present.

Sanity Test (#1547)

This test performs an IPSI maintenance board sanity handshake for CAB-MTCE (Media Gateway Maintenance).

Table 552: Sanity Test (#1547)

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal system error. 1. Repeat the command at one-minute intervals up to 3 times.
1981	ABORT	The TN2312BP IPSI is busied out. 1. Enter **`release ipserver-interface`**.
1982	ABORT	The board being tested is NOT a TN2312BP IPSI or later. 1. Insert a TN2312BP IPSI circuit pack.
2033 2500	ABORT	Internal system error. Internal operation failed. Possible unknown cabinet type. 1. Repeat the command at one-minute intervals up to 3 times.
	FAIL	The TN2312BP in carrier A is missing. This test will also fail if an incorrect response or no response from firmware is received when the board is queried.
	PASS	The correct board is present and a valid response was received.

Environmental Maintenance Initialization Test (#1548)

The Environmental Maintenance Initialization Test is executed when an IPSI circuit pack is inserted and the board and media gateway type is determined. When a TN2312AP is inserted in a CMC1, G600, or G650, the Power Fan Lead (AuxSig) environmental maintenance is enabled.

When a TN2312BP IPSI is inserted in either a CMC1 or G600, Communication Manager sends the following messages to the embedded software (firmware) on the board:

- Enable environmental maintenance (Power Fan lead)
- A query to verify that environmental maintenance is enabled

When a TN2312BP IPSI is inserted in a G650, Communication Manager sends the following messages to embedded software (firmware) on the board:

- Enable environmental maintenance
- Enable power supply insertion
- Enable power supply audits
- A query to verify that environmental maintenance is enabled
- A query to verify that power supply insertion is enabled
- A query to verify that power supply audits are enabled

This test runs on CAB-MTCE (Media Gateway Maintenance).

Table 553: Environmental Maintenance Initialization Test (#1548)

Error Code	Test Result	Description and recommendation
1000	FAIL	Internal system error. 1. Repeat the command at one-minute intervals up to 3 times.
1986	ABORT	Set Emergency Transfer failed. 1. Repeat the command at one-minute intervals up to 3 times.
2000 2033 2500	FAIL	No response received within the allowed time. Internal system error. Internal operation failed. Possible unknown cabinet type. 1. Repeat the command at one-minute intervals up to 3 times.
	FAIL	The TN2312BP in carrier A is missing. This test will also fail if an incorrect response or no response from firmware is received when the board is queried. 1. Ensure that there is a TN2312BP in the A carrier. 2. Repeat the command at one-minute intervals up to 3 times.
	PASS	Environmental maintenance initialization was successful.

Survivable Core Server IP Server Interface Request (#1605)

Request this server to gain control of an IPSI EPN. This test is run when **`get forced-takeover ipserver-interface`** is entered.

Table 554: Survivable Core Server IP Server Request (#1605)

Error Code	Test Result	Description / Recommendation
1995	ABORT	Survivable Core Server cluster is disabled
1996	ABORT	Port network does not exist.
1997	ABORT	Port network is not an IPSI port network.
2500	ABORT	Internal error.
	PASS	IPSI EPN is controlled by this server.

Enable Survivable Core Server Cluster (#1606)

Enable an Survivable Core Server cluster. This test is run when **`enable ess`** is entered.

Table 555: Enable Survivable Core Server Cluster (#1606) ***1 of 2***

Error Code	Test Result	Description / Recommendation
1991	ABORT	Requested Survivable Core Server cluster is not administered.
1992	ABORT	Requested Survivable Core Server cluster is not registered.
1993	ABORT	Requested Survivable Core Server is controlling an IPSI PN.
1994	ABORT	A Survivable Core Server cluster may not enable other clusters (Survivable Core Server or main). It can only change its own enable state.
2500	ABORT	Internal error.
		1 of 2

Table 555: Enable Survivable Core Server Cluster (#1606) *2 of 2*

Error Code	Test Result	Description / Recommendation
	PASS	The enable operation was successful.
		2 of 2

Disable Survivable Core Server Cluster (#1607)

Disable a Survivable Core Server cluster. This test is run when **`disable ess`** is entered.

Table 556: Disable Survivable Core Server Cluster (#1607)

Error Code	Test Result	Description / Recommendation
1991	ABORT	Requested Survivable Core Server cluster is not administered.
1992	ABORT	Requested Survivable Core Server cluster is not registered.
1993	ABORT	Requested Survivable Core Server is controlling an IPSI PN.
1994	ABORT	A Survivable Core Server cluster may not disable other clusters (Survivable Core Server or main). It can only change its own disable state.
2500	ABORT	Internal error.
	PASS	The disable operation was successful.

AESVCS Session Level Link Status Test (#1623)

The Application Enablement Services (AESVCS) Session Level Link Status Test determines if any AESVCS Links are associated with a given AESVCS Session. This test is run on AESV-LNK (AE Services Link).

Table 557: AESVCS Session Level Link Status Test (#1623)

Error Code	Test Result	Description / Recommendation
1124	ABORT	AE Services Server is disabled on the AE Services Administration page of the IP Services form
	FAIL	No AESVCS links are associated with this session.
	PASS	At least one AESVCS link is assigned.

AESVCS Link Heartbeat Test (#1624)

The Application Enablement Services (AESVCS) Link Heartbeat Test sends a TCP tunnel connection heartbeat message to the far end AESVCS Server. If the AESVCS Server fails to return a response to the heartbeat message, the test fails. An AESVCS Link that fails a Heartbeat test is subsequently deleted from the AESVCS Session.

This test is run for AESV-LNK (AE Services Link) and AESV-SES (AE Services Session).

Table 558: AESVCS Link Heartbeat Test (#1624)

Error Code	Test Result	Description / Recommendation
	FAIL	The heartbeat test failed. 1. Check the network connectivity and check the AE Server.
	PASS	The heartbeat test passed.

Aggregator Hardware Query (#1629)

This test queries the status of the aggregator hardware on the IP Media Processor. The host processor and aggregator hardware work in tandem to implement an IP network interface supporting VoIP connectivity.

If the status is bad, the DSPs are taken out-of-service and a reset of the aggregator hardware is attempted. If the reset is successful, the DSPs are placed back into service.

This test runs on IPMEDPRO (TN2602AP IP Media Resource 320).

Table 559: Aggregator Hardware Query (#1629)

Error Code	Test Result	Description / Recommendation
2000 2012 2100 2500	ABORT	Response to the test was not received within the allowed time. Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered.
2807	ABORT	The board is administered but not enabled on the **change ip-interfaces** form. 1. Enable the board on the **change ip-interfaces** form and rerun the test. 2. If the problem continues, replace the circuit pack.
28673 28674 28927	FAIL	Reset - not initialized Heartbeat failure Internal error. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The aggregator hardware is functioning properly.

Packet Count Query Test (#1630)

This test sends a request for a count of packets received by the firmware from the LAN bus on the TN2602AP IP Media Processor. This test is based on the Medpro DSP looparound test. The Packet Count Query requests the packet count value from the IP Media Processor, runs the looparound test on an available port, then requests a second packet count value from the IP Media Processor. If the second value is greater than the first, then the packet bus is working. If the second value is not greater than the first, then there is a problem with the packet bus.

This test runs on IPMEDPRO (TN2602AP IP Media Resource 320).

Table 560: Packet Count Query Test (#1630) ***1 of 3***

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. 1. Enter **`status station`** or **`status trunk`** to determine when the port is available for testing. 2. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. 1. Enter **`status health`** to view the occupancy measurements. 2. Enter **`display errors`** and resolve any TDM-BUS (TDM Bus) errors. 3. If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
		1 of 3

Table 560: Packet Count Query Test (#1630) ***2 of 3***

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. 1. Enter **list measurements tone-receiver** to see information regarding the system's tone receivers. 2. Resolve any TTR-LEV (TTR Level) errors. 3. Resolve any TONE-PT (Tone Generator) errors. 4. Retry the command at 1-minute intervals up to 5 times.
1007	ABORT	Port is not translated.
1014	ABORT	Board is not translated.
1115	ABORT	Unable to allocate system resources to run this test. 1. Retry the test at 1-minute intervals a maximum of 3 times.
1139 1144	ABORT	The PN's packet bus is out-of-service. The Processor Port Network Packet Bus is out-of-service 1. Follow the repair procedures for the PKT-BUS (Packet Bus). 2. After completing Step 1, run **test port *location* long** and verify the repair by viewing the results of the BRI Port Local LAN Looparound Test (#618)
2000 2012 2100 2500	ABORT	Response to the test was not received within the allowed time. Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered.
2807	ABORT	The board is administered but not enabled on the **change ip-interfaces** form. 1. Enable the board on the **change ip-interfaces** form. 2. If the problem continues, replace the circuit pack.
6	FAIL	System link down and not available for use
		2 of 3

Table 560: Packet Count Query Test (#1630) ***3 of 3***

Error Code	Test Result	Description / Recommendation
2060	FAIL	Packet Bus link went down during the test. 1. Retry the command at 1-minute intervals up to 5 times. 2. If there are errors associated with the packet bus, see PKT-BUS (Packet Bus).
Any	FAIL	The test did not detect the test tone.
	PASS	The Packet Bus is functioning normally.
0	NO BOARD	See NO BOARD for the repair procedures.
		3 of 3

System Link Status (#1647)

This test queries the circuit pack for the status of the serial link.

This test runs on S8400-BD (S8400 Server).

Table 561: System Link Status Test (#1647)

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate system resources. 1. Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
	FAIL	The serial link is down. This is a notification only. No action required.
	PASS	The serial link is up.

Power Supply Aux Signal Test (#1649)

The power supply aux signal test identifies which 655A power supply is asserting the AUXSIG lead. The test fails if the lead is being asserted by the power supply under test.

A POW-SUP Major alarm will be generated when the AUXSIG lead is asserted in a G650 carrier without duplicated power supplies.

A POW-SUP Minor alarm will be generated when the AUXSIG lead is asserted by a power supply in a G650 carrier with duplicated power supplies.

The test may abort for a power supply in a carrier that does not have duplicated power supplies since the microcontroller for the power supply may not have power when the power supply fails.

This test runs on POW-SUP (Power Supply).

Table 562: Power Supply Aux Sig Test (#1649) ***1 of 2***

Error Code	Test Result	Description and recommendation
1000	ABORT	Internal software error. 1. Retry the command. 2. Escalate the problem if the test continues to abort.
1035	ABORT	The port network is not available. 1. Enter **status port-network** to verify that the network is down. 2. Look for alarms against EXP-PN (Expansion Port Network), EXP-INTF (Expansion Interface Circuit Pack), PKT-INT (Packet Interface), etc. 3. Use diagnostic procedures for those MOs to clear the problem.
1987	ABORT	The power supply data was not valid. 1. Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to the test was not received in the time allowed. 1. Repeat the command at one-minute intervals 1 to 3 times.
2029	ABORT	There is a problem communicating with the environmental maintenance firmware. 1. Run **test maintenance nn**
2319	ABORT	The EPN is out of range.
		1 of 2

Table 562: Power Supply Aux Sig Test (#1649) *2 of 2*

Error Code	Test Result	Description and recommendation
2500	ABORT	An internal operation failed 1. Retry the command. 2. Escalate the problem if the test continues to abort.
1	FAIL	Failure detected at the power supply and the IPSI 1. Replace the power supply.
2	FAIL	Failure detected at the power supply but not the IPSI 1. Replace the power supply.
	PASS	The power supply detection test passes.
	NO BOARD	Power supply is administered but not detected. 1. Verify that the power supply is plugged in. 2. Replace the power supply.
		2 of 2

Board Health Query Test (#1652)

This test checks the state of health of the TN2602 circuit pack. It runs on IPMEDPRO (TN2602AP IP Media Resource 320).

Table 563: Board Health Query Test (#1652) *1 of 2*

Error Code	Test Result	Description / Recommendation
1005	ABORT	Test not applicable to this board. The firmware is too old to run this test.
2000 2012 2100 2500		Response to the test was not received within the allowed time. Internal system error. Could not allocate the necessary system resources to run this test. Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
		1 of 2

Table 563: Board Health Query Test (#1652) ***2 of 2***

Error Code	Test Result	Description / Recommendation
2801	ABORT	Unable to find IP address data for this location. 1. Verify that the board is administered.
2807	ABORT	The board is administered but not enabled on the **`change ip-interfaces`** form. 1. Enable the board on the **`change ip-interfaces`** form. Rerun the test. 2. If the problem continues, replace the circuit pack.
16385 to 16639	FAIL	The board has a non-critical error. This error is not severe enough to take the board out-of-service. Check that the other tests for the board pass. If the tests fail: 1. Attempt to reset the circuit pack. 2. Rerun the test. If the problem continues, replace the circuit pack.
16641 to 16895	FAIL	The board has a critical error and will be taken out-of-service. Check that the other tests for the board pass. If they do not: 1. Attempt to reset the circuit pack. 2. Rerun the test. If the problem continues, replace the circuit pack.
	PASS	The board is healthy and working properly
		2 of 2

Media Gateway Hyperactivity Audit Test (#1659)

The Media Gateway Hyperactivity Audit Test resolves hyperactive registration alarms associated with Error Code 1281 if the hyperactive condition no longer exists. This test is executed by entering **`test media-gateway`** ***`location`***

This test runs on MED-GTWY (MEDIA GATEWAY).

Table 564: Media Gateway Hyperactivity Audit Test (#1659)

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal error. 1. Repeat the command at 1-minute intervals up to 3 times.
	PASS	The hyperactivity audit test passed.

H.323 Signaling Layer 3 Test (#1673)

This test performs a Layer 3 test for an H323-SGR (H.323 Signaling Group).

Table 565: H.323 Signaling Layer 3 Test (#1673)

Error Code	Test Result	Description / Recommendation
1005	ABORT	The H.323 Signaling Layer 3 Test is not enabled for this H.323 signaling group or the far end IP address is not specified on the signaling group form.
1019	ABORT	A Layer 3 Test is already in progress for this signaling group.
1132 2012 2100	ABORT	No channel is available to run this test. Internal system error. Could not allocate the system resources necessary to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
2800	FAIL	C-LAN Ethernet connection could not be found. 1. Verify that the C-LAN board is administered and the Ethernet connection is available.
	FAIL	Layer 3 Test failed. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	Layer 3 Test passed.

IP Signaling Group Far-End Status Test (#1675)

For a specific IP signaling group, this test will send a status query to the far-end to check the integrity of the trunk. This test validates that the trunks on this signaling group can be used.

This test runs on SIP-SGRP (SIP Signaling Group).

Table 566: IP Signaling Group Far-End Status Test (#1675)

Error Code	Test Result	Description / Recommendation
	ABORT	Either the maintenance object is not a SIP signaling group, the signaling group does not exist, or the signaling group type is not SIP signaling.
1005	ABORT	The IP Signaling Group Far-End Status Test (Layer 3) is not enabled for this SIP signaling group.
1008	ABORT	Signaling group is not in the correct state to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
1019	ABORT	An IP Signaling Group Far-End Status Test is already in progress for this signaling group.
1133	ABORT	System is in restart. 1. Retry the command after the system finishes the restart.
1183	ABORT	The SIP signaling group is out of service. 1. Retry the command at 1-minute intervals up to 5 times.
2000	FAIL	Response to the test was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Internal system error. 1. Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Could not allocate the necessary system resources to run this test. 1. Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The IP signaling far-end status test failed. The response was not received within the allowed time. 1. Retry the command at 1-minute intervals up to 5 times.
	PASS	The IP signaling far-end status test passed.

Media Gateway Announcement Module Test (#1683)

The Media Gateway Announcement Module test (#1683) is nondestructive and performs the following:

- Checks the status of the Media Gateway Announcement module–verifies whether the Compact Flash is turned on in the change media gateway administration form.
- Makes status inquiries to the Media Gateway Announcement Module–requests for data from the module to inquire whether the module is currently experiencing any problems related to the Compact Flash.

This test runs as part of periodic and scheduled maintenance as well as initialization and analysis.

When running the demand test, the Media Gateway Announcement module can respond with any of the following:

- **Failure code 1**: if the Compact Flash is enabled, but not present, or not recognized, or there are no announcements found after a reset.
- **Failure code 2**: if the Compact Flash is enabled and is present, but there is not enough RAM to support it.
- **Failure code 4**: if the Compact Flash is enabled and is present, but there is not enough memory left on it.

The Media Gateway Announcement module can respond with multiple failures to a single query and make the error condition a combination of errors. If the board has multiple failures, the error codes are effectively in a logical order together.

This test also queries the module for the size of the Compact Flash and the amount of memory used on the Compact Flash.

Note:

Even if the Media Gateway Announcement Module test fails, the announcement module does not go out of service. However, the announcements may not be in good working condition and recording new announcements may fail.

NO BOARD

No board was detected by the test. The test could not relate the internal ID to the port. This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted.

1. Enter **`display errors`** and check the Error Log for Error Type 125 (wrong board) or Error Type 131 (no board). Resolve either of these issues, if applicable.
2. Verify that the board is properly translated and inserted by using **`list configuration`**. Resolve any problems.
3. For DS1/UDS1 boards, use **`add ds1 location`** to administer the DS1 interface if it is not already administered.
4. .If the board was already administered correctly, check the Error Log to determine whether the board is hyperactive (Error Type 1538). If so, the board was shut down. Reseating the board will re-initialize it.
5. If the circuit pack is correctly inserted, enter the following commands:
   - **`busyout board`** ***`location`***
   - **`reset board`** ***`location`***
   - **`release board`** ***`location`***
   - **`test board`** ***`location`*** **`long`**

This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

Note:

Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after entering **`list config`** but the **Vintage** field reports that there is no board when there really is a board, then the **`busyout board`** and **`release board`** commands will not work even though **`reset board`** ***`location`*** will work. The switch will put the hyperactive board back in service after the hyperactivity clears.

Hyperactive DS1/UDS1 Interface Circuit Pack/Media Module

Error type 1538 in the error log indicates hyperactivity. The hyperactive DS1 board is out of service and one or more of the following symptoms may be exhibited.

- The DS1 board tests such as test 138 and test 139 abort with error code 2000.

- The tests run on the ports are returning NO BOARD.
- A **`busyout`** or a **`release`** command has no affect on the test results.
- A **`list config`** command shows that the circuit pack or media module and the ports are properly installed.

When hyperactivity occurs, the DS1 board is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the DS1 board within 15 minutes. When no faults are detected for 15 minutes, the DS1 board is restored to normal operation and every DS1 interface trunk is returned to the in-service state.

Hyperactivity is often caused by the associated facility. In this case, faults such as slips, misframes, or blue alarms would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits.

If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

Repair Procedures for DS1/UDS1 Circuit Pack/Media Module

T1 Network Facility Procedures

If the DS1/UDS1 circuit pack or Media Module connects to a T1 network facility or to another switch, do the following:

1. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding.
2. Contact the T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint.
3. Check the physical connectivity of the DS1 boards and of the cable.
4. Replace the local DS1/UDS1 circuit pack or media module, and repeat the test.

Line-side Terminating Device Procedures

If the DS1/UDS1 circuit pack or media module connects to a line-side terminating device such as a PRI terminal adapter, do the following.

1. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding.

2. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information.
3. Contact the vendor of the line-side terminating device to diagnose the equipment.
4. Check the physical connection of the DS1 board to the terminating device, and check the premise distribution system or the intra-premise wiring for physical connection failures.
5. Replace the local DS1/UDS1 Interface circuit pack or media module and repeat the test.

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