

**INSTALLATION  
TEST PROCEDURE  
FOR  
EMS-1 CONNECTOR MODULE  
800030**

Approved: *Albrecht*

Issue 1: 9/14/82  
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Issue 2A: 1/21/86

**TEST PROCEDURE**  
**EMS CONNECTOR MODULE 800030**

**A. INSTALLATION INSPECTION**

1. All Installation shall be performed prior to start of testing.

Inspector

- a. All relay racks secure \_\_\_\_\_
- b. Equipment cages mounted per job specification \_\_\_\_\_
- c. Screws tight on all cages, fuse panels and  
terminal blocks \_\_\_\_\_
- d. Wire wrap terminals on MDF, OGT, backplanes  
and fuse panels tight, and have at least  
five (5) wraps \_\_\_\_\_
- e. All solder connections good \_\_\_\_\_
- f. All matrix cards installed \_\_\_\_\_
- g. All matrix cards strapped for position installed \_\_\_\_\_
- h. All flat (ribbon) cables installed \_\_\_\_\_
- j. Cable length for matrix cards long enough to  
permit cards to be pulled out from the front  
of cage \_\_\_\_\_
- k. Cables dressed \_\_\_\_\_
- l. Stenciling \_\_\_\_\_
- m. Grading cards completed \_\_\_\_\_

Number of Modules Inspected \_\_\_\_\_

Verified by \_\_\_\_\_ Date \_\_\_\_\_

## B. TEST PREPARATION

### 1. Preliminary Test Inspection

(Inspection)

- a. All Connector cards strapped per job specification \_\_\_\_\_
- b. All matrix card position strapping verified \_\_\_\_\_
- c. Selector DTA cross connection completed at IDF \_\_\_\_\_
- d. Straps to connect tones installed on backplane \_\_\_\_\_

### 2. Test Equipment Required

- 1 - Hand test set with a 310 type plug.
- 1 - Volt-ohmmeter
- 1 - Rotary dial telephone adjusted to 12 IPS
- 1 - 2000 ohm (1) watt resistor
- 2 - Additional telephones if PBX hunting is equipped
- 1 - 20,000 Ohm 1/4 watt min. resistor
- 1 - 3 MF cap. 60V min.
- 2 - 850 Ohm one (1) watt resistor
- 1 - 150 Ohm five (5) watt resistor

### 3. Bay Power & Alarm Tests

- a. The Bay Fuse Panel shall be tested per Technical Instruction I-2149 prior to Connector Modules.
- b. Fuse each Connector cage with a 5 amp fuse.
- c. Using a Volt-ohmmeter or polarity sensing test light verify that power connections to the cage backplane are the proper polarity before plugging in cards.

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## **C. CONNECTOR MODULE TEST**

### **1. Connector Cage Tests**

- a. The first steps to be performed when testing a module, are to ensure that all functions common to the circuits in that module are performing properly.**
- b. The testing sequence for the module should be as follows.**
  - 1. Test the cage itself for tones, sleeve ground in unequipped positions, etc., before plugging in circuit cards.**
  - 2. Install and check Connector Test Card.**
  - 3. Install one Connector only and test that Connector and the test card before plugging in the remaining Connectors.**
- c. Shorting Jacks - Using a Volt-ohmmeter, test for the presence of ground on pin A30 of the backplane at all ten (10) Connector card positions. Note: Pins A30 and B30 short together when cards are not plugged in to busy the position by grounding the sleeve.**
- d. Tones - Using a test receiver, test at Connector position 10 (cage pos. 11) for presence of 60 IPM busy tone on pin B7 and ringback tone on pin A8. If revertive call option is equipped, check for revertive call tone on pins A5 and B5.**
- e. Pick up - Ensure pickup has been connected to interrupter PU lead or has been connected to ground. Connector will not ring unless pick up is connected.**

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## D. CONNECTOR CIRCUIT TESTING

### 1. Connector Busy Test

a. Plug in a Connector card, with the OS switch in the **IN** service position.

1. Check for blown fuses.
2. Check for **NO** LEDs to light.
3. With a Volt-ohmmeter test for **NO** ground on the Selector S (sleeve) terminal at the OGT block or DTA.

b. Operate the OS switch to the Out of Service position.

1. Check for (LED) OS to light.
2. With a Volt-ohmmeter, test for ground on the Connector S (sleeve) terminal at the OGT block or DTA.

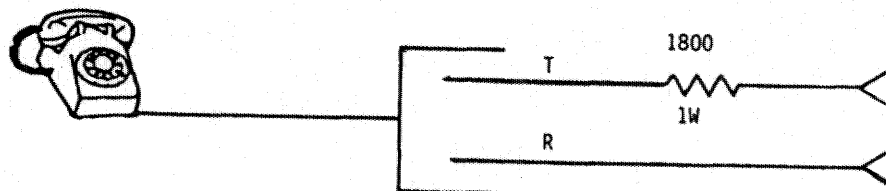
c. Operate the OS switch to the **IN** service position.

1. Check for (LED) OS to go out.

### 2. Connector Seizure and Digit Receiving Test

a. At the MDF connect a test telephone, with the correct ringing frequency on the T&R terminals of the 1st terminal number of the module (wire the test telephone per attached sketch).

#### TEST TELEPHONE



**b. Momentarily operate the STEP toggle switch on the Test Connector card until the CONN display lights the Connector number under test.**

**c. Plug the hand test set into the Connector T&R jack (310 type jack).**

**d. Seize the Connector by operating the seize switch on the hand test set.**

1. Check for (LEDs) SZ and BY to light.

**e. Dial the tens and units digits of the terminal number.**

1. Check for (LED) SZ to flash with dial pulses.

2. Check for (LEDs) SZ and BY to go out and CT and RING to light.

3. Check for the Test Connector TERM NO display to light the tens and units digits dialed.

4. Check for the Test telephone to ring and ringback tone in the hand test set.

Note: If Connector is equipped with 500186 or 500187 ringing option, test each frequency, code or polarity as appropriate for the exchange. See I-2130 for more detail.

**f. Answer the test telephone (Note: Answer calls in both ringing and silent periods).**

1. Check for (LEDs) ANS and CONN to light and RING to go out.

2. Check for Ringing and Ringback tone to be cut off promptly in both ringing and silent periods.

3. Check for transmission.

**g. Release the Connector by releasing the hand test set seize switch, and hang up the test telephone.**

1. Check for all lamps and LEDs to go out.





**d. Release the Connector, by releasing the seize switch on the hand test set.**

**1. Check for SZ LED to go out but other LEDs to remain lighted. Allow 45 seconds for Connector release if defective.**

**e. Release the Connector by releasing the seize switch on the hand test set and hanging up the test telephone.**

**f. Remove the called party hold strap from the Connector backplane, after all Connectors are tested in the module.**

**5. PBX Testing (If equipped)**

**a. Plug in the PBX Control card and set up a three (3) number PBX group with a meter over flow number per the PBX programming procedure in I-2130.**

**b. Connect a test telephone to each of the group numbers T&R terminals at the MDF.**

**c. Set Connector test card on Connector number to be tested.**

**d. Dial the PBX pilot number (tens & units digits).**

**1. Check for the test telephone to ring.**

**e. Release the Connector by releasing the seize switch on the hand test set.**

**f. Make the PBX pilot number busy, by removing the receiver of the test telephone.**



**g. Seize the Connector, and dial the PBX pilot number (tens & units digits).**

1. Check for (LED) PBX to light.
2. Check for the alternate test telephone to ring. Note: The alternate numbers will be rung in the order in which they are programmed.
3. Check for ALT LED on Test card to light.
4. Check for number displayed to change from number dialed to alternate number.

**h. Release the Connector, by releasing the hand test set seize switch.**

**j. Make the last tested alternate number busy by removing the receiver of the test telephone. Note: Leave the PBX pilot number and any other alternate number busy.**

**k. Repeat steps g through j for each alternate number programmed.**

#### **6. PBX Group Busy Meter Test**

**a. Program 97, 98 or 99 as an alternate, to the group to be observed as an alternate.**

**b. Busy out all numbers in the PBX group and dial the PBX pilot number in the Connector.**

1. Check for the operation of the overflow meter.

**Note: This function cannot be used when the PBX groups have 97, 98 or 99 as working numbers.**

#### **7. Trouble Timer Test (if equipped)**

**a. With the hand test set, seize the Connector and wait for the time out period (1, 2 or 4 minutes) as strapped.**

1. Check for (LED) BY to go out.

- b. Momentarily release the Connector, by releasing the hand test set seize switch.
- c. Dial the tens and units digits of a terminal number with the hand test set.
- d. Answer the test telephone then go back on hook.
- e. Wait approximately 23 seconds.
  - 1. Check for the Connector to release the matrix, by checking for no transmission between the hand test set and test telephone. Note: If Connector is seized via a Selector the Connector will completely release.

#### **8. Unused Number Test**

- a. Dial 97, 98, 99 or 00 with the hand test set.

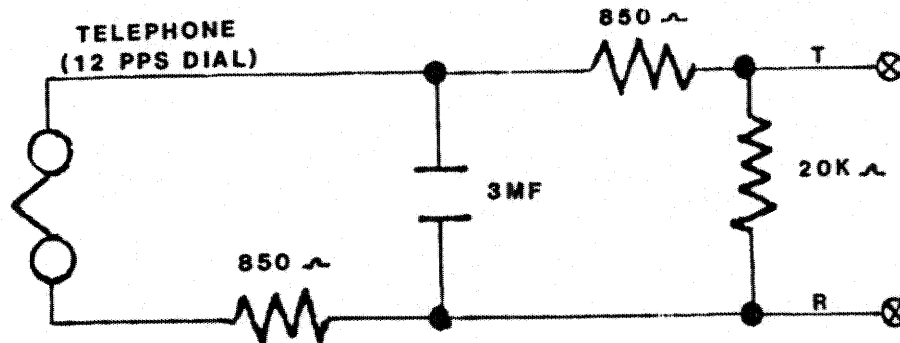
- 1. Check for intercept. (Backplane wired to Connector terminal intercept).

Note: This test is not required if 100 working numbers are equipped in the Module.

- b. Repeat steps D4 through D8 for each Connector equipped in the module.

## 9. Loop and Leak Seizure and Dialing Test

- a. Connect a rotary dial telephone adjusted at 12 IPS to the T&R terminals of the Connector at the DTA (wire telephone per attached sketch using the two [2] 850 ohm resistors, 20,000 ohm resistor, and 3 MF cap.)



- b. Seize the Connector by taking the test telephone receiver off hook.

1. Check for (LEDs) SZ and BY to light.

- c. Dial the tens and units digit of the terminal number.

1. Check for the dialed number to correctly display on the Connector test card.

- d. Release the Connector and repeat step 9 for each Connector equipped in the module.

## 10. Revertive Call Test (if equipped)

Jumper a line circuit to the Connector T, R, & S terminals at the MDF, and connect a test telephone to the T&R terminals. A call must be able to be completed through the exchange to conduct this test.

- a. Dial the test telephone number.

1. Check for the revertive call tone (or recording if equipped).

**b. Hang up the test telephone.**

1. Check for the test telephone to ring.
2. Check for LED RC to light.

**c. Answer the test telephone.**

1. Check for the revertive call tone.
2. Check for (LED) SZ to go out if Connector is to be held or for all LEDs to go out if Connector is to release call into lockout.

**d. Repeat step 10 for each Connector equipped in the module.**

**11. Test Connector Test**

**a. Access the Test Connector via the test distributor and/or operator verification access by dialing the last four digits of a test telephone terminal.**

1. Check for connection to the correct terminal.
2. Check that Connector #10 is made busy (if equipped).
3. Check for LEDs BY and CT to light.

**12. Alarm Test**

**a. Insert a blown fuse into a Connector Card, with the OS switch in the IN service position.**

1. Check for the bay Minor Alarm lamp to light.
2. If optional fuse failure busy equipped, test for a ground on the Connector S terminal.
3. If optional fuse failure busy equipped, repeat step c for each Connector in the module.

**b. Remove the blown fuse from the Connector Card.**

Number of Modules Tested \_\_\_\_\_

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## **E. LOOP DETECTOR ADJUSTMENT PROCEDURE**

1. This procedure provides instruction for field test and adjustment of line circuit off-hook loop detection. Loop limits can be adjusted to other than the 2000 ohms specified herein at local options.

### **2. Test Items Required.**

- a. Card Extender 500803
- b. Cord with test clips on each end.
- c. Decade box or two resistors one 2000 ohms, one 2400 ohms.
- d. Small potentiometer screw driver.
- e. Test receiver.

### **3. Test Procedure**

- a. Pull dial tone on each line with a test receiver with a resistor in series for total of 2000 ohms resistance. Note, it is good practice to have a diode in the test receiver circuit to detect any pairs that may be reversed.

Note any lines that do not seize.

- b. Change resistor so that test receiver circuit has 2400 ohms resistance. Try to pull dial tone on each line (none should seize).

Note any lines that return dial tone.

### **4. Adjustment Procedure**

- a. On line cards not passing the above operational test it will be necessary to adjust potentiometer R46 on 600110 cards or R45 on 600111 circuits.
- b. Put line card on extender board. Note: EMS line cards can be removed without cutting off lines that are busy.

c. Seize each line with a 2000 ohm resistor, adjusting potentiometer as required. In turn, try to seize each line with 2400 ohms adjusting as required to prevent seizure. It is important to re-test all 8 lines on the card after any adjustment is made.

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