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INSTALLATION TEST GUIDE

FOR

ITEC ANI 500

AUTOMATIC NUMBER IDENTIFIER SYSTEM

2/17/82 lssue

INSTALLATION TEST GUIDE

ANI 500 AUTOMATIC NUMBER IDENTIFIER SYSTEM

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1.00 GENERAL

1.01 Purpose of Section. This test guide for the ITEC ANI 500 System is intended to be a general guide for testing to be performed during installation. It can also be used as a check list of the tests that have been performed for equipment acceptance records. Each applicable item in this guide should be initialed by the Installer in charge, attesting that the equipment item covered has been fully tested as specified.

The ANI 500 System can be tested using the same procedures commonly used to test any identifier system. The technician has a distinct advantage, however, of having many Light Emitting Diodes (LED's) and a 40 character digital display to show the progress of the call being processed.

This guide includes all basic items in a complete new ANI 500 installation, however, it can also be used for equipment additions as applicable. It is organized in the sequence in which testing should be performed. 1.02 Purpose of Equipment. The

ITEC ANI 500 Identifier System is a number identification system arranged to automatically identify a calling number and to forward the number, in an acceptable format, to a distant toll center. The design of the equipment is such that it can be installed in any switching system having a continuous sleeve, with little or no modification to the existing equipment. A more comprehensive description of the system is provided in Section I through III of the I-2500 Technical Information Manual.

1.03 Documents and Drawings. A listing of documents and drawings associated with the ANI 500 Identifier System is provided in TABLE 1. These documents and drawings and the job drawings for the particular job site (equipment layout, connecting chart, cable lists, etc.) should be available for installation test.

1.04 Test Equipment. Most of the tests in this section can be performed from the Identifier front panel. For reference, the front panel is shown in Figure 1 and the internal card layout is shown in Figure 2. The functions of the controls and indicators in the Identifier are listed in TABLE 2. In addition to the front panel, the external test equipment listed in TABLE 3 is useful for system installation and check-out.

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TABLE 1. DOCUMENTS & DRAWINGS

NUMBER	DESCRIPTION
I-2500	ANI 500 Technical Information
I-2500A	ANI 500 Maintenance & Drawings
I-2990	TSPS/CAMA Trunk Technical Information



Figure 1. Front Panel







TABLE 2. IDENTIFIER CONTROLS AND INDICATORS

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LABEL	DESCRIPTION	FUNCTION
	40 character display	Displays all error messages, diagnostics, number assignments, and internal peg counts.
	Keypad	Hex keypad (0 thru F) for entry of all operator information, manually exercising the identifier functions, and selecting the displayed information.
	SENDER	
TONE	TONE LED (red)	Lites as a code is being transmitted by that Sender.
TEST	TEST LED (red)	The CPU is doing a diagnostic test of the Sender circuit.
то	TO LED (red)	Time-out of the Sender (5 sec.)
FA	Fuse Alarm (green)	1/4 A. fuse on Sender circuit has activated.
OS	Out-of-Service	OS switch has rendered Sender inoperative.
	OS Switch	Renders Sender inoperative.
R89	MF Level Adjust	l0 turn gain pot (-16 db to 0 db range) factory set at -6 db.
R107	MF Timing Adjust	l0 turn clock pot (5 to 12 pps range) factory set at 7 pps.
	HANDSET JACK	Tip & Ring across output transformer to Trunk Guard.
	TEUNK GUARD CONTROL	
FA	Fuse Alarm LED (green)	<pre>1/2 A. fuse on Trunk Guard Control circuit has activated.</pre>
FA-Rear Panel	Fuse Alarm LED (green)	A rear panel fuse has activated.
R4 9	Tone Level Adjust	10 turn gain pot for Matrix Tone. (factory set to 45 VAC minimum)

TABLE 2. (continued)

LABEL	DESCRIPTION	FUNCTION		
	PARTY TEST			
*SATT	SAIT Format LED (green)	Indicates SATT format being sent. *May not be on all boards and is not labeled on front panel. Positioned above labeled LEDs.		
BOOST	Boost LED (red)	Party test is in progress.		
NEG	Neg LED (red)	Negative potential is being applied to the Tip.		
POS	Pos LED (red)	Positive potential is being applied to the Ring.		
PTY	Pty LED (red)	Party Test is completed.		
TEST	Test LED (red)	The CPU is doing a diagnostic test of the Party Test circuit.		
FA	Fuse Alarm LED (green)	<pre>1/4 A. fuse on Party Test circuit has activated.</pre>		
	MATRIX CONTROL			
FA+	Fuse Alarm LED (green)	Fl (1/2 A.) fuse on Matrix Control circuit has activated.		
FA	Fuse Alarm LED (green)	F2 or F3 fuse on Matrix Control circuit has activated.		
TEST	Test LED (red)	The CPU is doing a diagnostic test of the Matrix Control circuit.		
R168	Tone Self-test Adjust	15 turn pot, internal diagnostics.		
R174	Tone Detection Adjust	15 turn Matrix Tone detection pot.		

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TABLE 2. (continued))
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LADEL DESCRIPTION		FUNCTION			
MISCELLA	TABLE 13 & 14 in I-2500 manual)				
SW1	MODE SWITCH	Mode select			
SW2	MODE SWITCH	Format select			
SW3	MODE SWITCH	Format select			
SW4	Reset Switch	Momentary pushbutton to reset CPU.			
SW5	MODE SWITCH	Future Options			
SYS	STEM INTERFACE (Refer to)	Figure 14 in I-2500 manual)			
SWl	MODE SWITCH	Selects whether card interfaces with Trunk Guard Control or Matrix Control.			

TABLE 3. TEST EQUIPMENT

- ITEM	MODEL
Multimeter	Simpson 260 VOM or equivalent.
Oscilloscope	Tektronix 504 or equivalent.
dB meter	Hewlett-Packard 403B or equivalent.
MF displa y	Northeast Electronics TTS-2762 MF & Loop Signalling Display or equivalent.
Test Probe	310 plug with 600 g across tip and ring, and other end to match test equipment inputs.
Eandtest Phone # (Butt-in)	Dracon TS21 or equivalent.

NOTE: Test equipment may be substituted depending on type of measurement and capability of each unit.

Required

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2.00 VISUAL INSPECTION

2.01 Identifier Hodule. Before powering up the ANI 500 System, a thorough visual inspection should be given, beginning with each Identifier Module. TABLE 4 lists the inspection items for the Identifier Module(s). The programming switch options on the Miscellaneous Interface Card should all be set OPEN (off) except SW1-6 Manual Mode CLOSED (on) for the initial installation tests. Upon completion of these tests, the switch options should be set as required for the office characteristics.

2.02 Matrix Module. After completion of the Identifier Module inspection, proceed with an inspection of each Matrix Module as outlined in TABLE 5.

Trunk Hodule. Inspection 2.03 items for the Trunk Modules are listed in TABLE 6. An inspection of each trunk circuit may be made to verify all strapping and plug-on options are correct. After the first trunk has been verified, other trunks may be compared with the known trunk. Several groups of trunks (0+, 1+, coin, etc.) may require repeating the initial verification with the Technical Bulletin to assure proper strapping of different groups.

TABLE 4. IDENTIFIER INSPECTION

STEP	INSPECT	VERIFY
	Wiring	
l	Power Connection	 A) Proper polarity b) Minimum 20 gauge c) BATT & GND wraps are not touching d) Backplane fuses correct e) Transformer & processor cage power cables in place
2	External Cabling	 (a) P3 ribbon cable to Matrix Backplane P3 (b) Pl ribbon cable to Trunk Backplane P5 (c) Optional P2 ribbon cable to Dual Identifier P2 (d) FA posts wired to Fuse Panel (e) Peg Count Outputs wired as required
3	Internal Cabling	 a) Front Panel Display & Keypad cabled to Miscellaneous Interface b) Matrix Control cabled to System Interface #2 (P1) c) Trunk Guard Control cabled to System Interface #1 (P1) d) Optional Party Detect cabled to System Interface #2 (P2) e) Optional Sender #3 cabled to System Interface #1 (P4) T) Optional Sender #2 cabled to System Interface #1 (P4) f) Optional Sender #2 cabled to System Interface #1 (P3) g) Sender #1 cabled to System Interface #1 (P2)
	Switch Options	
4	Interface	 All Switches set OPEN (off) except: SW1-6 Manual Mode CLOSED (on) (Refer to Figure 13, I-2500) NOTE: Switch options will be set as required for the office characteristics at the completion of the installation tests.
5	System Interface #1	SW1-1 OPEN SW1-2 CLOSED (Refer to Figure 14, I-2500)
6	System Interface ∉2	SWI-1 CLOSED SW1-2 OPEN (Refer to Figure 14, I-2500)

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TABLE 5. MATRIX INSPECTION

STEP	INSPECT	VERIFY
1	Cabling	 A) Pl Ribbon Cable to Identifier A (P3), or next adjacent Matrix Module (P2). b) Optional P3 Ribbon Cable to Identifier B (P3) [Dual Identifier System], or next adjacent Matrix Module (P4) c) Sleeve Cables to correct Matrix Card
2	Strapping	<pre>Proper selection of:</pre>
3	Card Assignments	 Matrix Detector A in left end slot (facing frontplane) D) Optional Matrix Detector B in right end slot (facing frontplane) Matrix Card pairs (100 sleeves) in properly strapped slots

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TABLE 6. TRUNK INSPECTION

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		FIGURE A
	Hiring	
1	Cabling	 A) P5 Ribbon Cable to Identifier 'A' (Pl) or next adjacent Trunk Module (P4) b) P4 Ribbon Cable to next adjacent Trunk Module (P5)
	-	 c) Optional P7 Ribbon Cable to Identifier 'E' (P1) [Dual Identifier System] or next adjacent Trunk Module (P6) d) Optional P6 Ribbon Cable to next adjacent Trunk Module (P7) ye) P3 connectorized cable to DTA
2	Power Connection	 A) Minimum 20 gauge BATT, GND, or FA wraps are not touching C) Proper polarity
	<u>Strapping</u>	(Refer to Figure 21 of I-2500 Technical Bulletin)
3	Eackplane	 A) FA Posts wired to Fuse Panel B) Hundreds Address to Hundreds Common for correct cage number C) Tens Address to Tens Common for correct cage number Miscellaneous Trunk Leads wired as desired (verify tone inputs and voltage inputs are correct)
		Optional Dual Identifier System: -e) Identifier 'B' cage addressing the same as Identifier 'A'
4	Trunk Circuits	 A) Correct plug-on options properly installed -b) Trunk Interface Option strapped for correct party detection option (Refer to TABLE 18, I-2500)

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3.00 PRELIMINARY POWER-ON TEST

3.01 After a thorough visual inspection of all components of the ANI 500 System as outlined in Section 2.00, power may be applied to each cage. Insert one fuse at a time, starting with the Identifier(s), watching for any unusual indications or activated fuses. TABLE 7 outlines the preliminary test steps.

STEP	ACTION	VERIFY
√1	Insert Identifier Fuse in Bay Fuse Panel	Identifier Display "NO TRUNK FOUND" if not - ensure Manual Mode SWI-1 OPEN & SWI-6 CLOSED and press momentary RESET switch
12	Insert Trunk Cage Fuses in Bay Fuse Panel one at a time	No Trunk LEDs on - if any LEDs on - ensure OS switch off, pull the circuit and reseat in its connector
13	Measure at frame (or grading appearance) all Tip, Ring, Sleeve and 4th wire (if required)	Tip, Ring, Sleeve, and 4th wire idle indications

TABLE 7. PRELIMINARY POWER-ON TEST

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4.00 OPERATIONAL TEST

4.01 Upon contletion of the Visual Inspection (Section 2.00) and Preliminary Power-On Test (Section 3.00), a system operational test may be done. These functional test steps only verify that individual circuits are working and the installation is free of errors. For a complete diagnostic check of the ANI 500 System, refer to Section IV Maintenance Practices, of the I-2500 Technical Bulletin.

4.02 Identifier Operation. The Identifier and Matrix Modules are functionally tested first without utilizing the trunks. Ensure the Identifier Module is in the manual mode (SW1-1 OPEN and Sw1-6 CLOSED).

4.03 Matrix Verification. A wire must be run, either in temporarily or permanently, from or an unused MDF connector terminal in block pin to the Identifier ar backplane center pin of the NORM/BOOST strapping posts. This allows the matrix test tone to be jumpered to any sleeve terminal for testing. "TEST Turk ar with

4.04 Matrix strapping is verified by jumpering a sleeve at a time at the MDF and the Identifier will display the Matrix Cage, office code, terminal number, information digit, class of service, and number of times verified. Party numbers cannot be verified without the trunks and a party marking device, and will be tested during the trunk operational tests. Display indications during party number verifications must be ignored during this test segment. TABLE 8 lists the Identifier and Matrix functional tests.

4.05 Trunk Operation. The trunks should be tested one group at a time (0+, 1+, coin, etc.) since slightly different results may be obtained between groups because of differences in strapping. TABLE 11 lists the basic trunk functional tests.

4.06 The ATN leads from all Trunk cage backplanes (Trunk Miscellaneous Leads, Figure 21 of the I-2500 Technical Bulletin) should be multipled. The ATN multiple should then be run to a dedicated test number, or an unused connector terminal number on the MDF. This allows ANI while testing trunks from the faceplate jack by operating the out-of-service switch. (845-3015

4.07 The basic trunk operation is verified by the steps in TABLE 11. Specific trunk operations (depending on installed options and strapping) are listed in TABLE 12.

TABLE 8. IDENTIFIER OPERATIONAL TEST

STEP	ACTION	VERIFY
	SENDER OUTPUT	
l	Busy out all but one Sender	'OS' lites on
2	Press 141	Display: KY1-6=F1, KY7-C=F2, ALL=D, EX=F
3	Press 'D'	Operational Sender: TONE Lite blinks as Sender outputs MF tones NOTE: MF output is available at the sender test jack for a handset or MF test box to monitor the MF output.
4	Repeat steps 1 thru 3 with other Senders, if equipped	During MF sending the Tone LED lites as each digit is sent.
5	Exit Sender test: a) Press 'F' b) Press 'F'	Display: ENTERING TRUNK IDENTIFICATION NO TRUNK FOUND
	MATRIX VERIFICATION	
6	Jumper 'Test Tone' on connector block to a sleeve terminal	Refer to 4.03 for an explanation of 'Test Tone'
7	Press '2'	Display: 900 HZ OSC CONNECTED TO SLEEVE
8	Press 'F'	Display:
	NOTE: Refer to TABLE 10 for troubleshooting invalid number verifi- cations.	MX=aa DDD-cccc 1=d CS=eee V=1 PT=g NOTE: Refer to TABLE 9 for a break- down of the matrix display.
9	Move 'Test Tone' juzper to next sleeve terminal	
10	Repeat steps 6 thru.9	All matrix points should verify as strapped (with the exception of party numbers).

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TABLE 9. MATRIX DISPLAY

Display	MX=aa bbb-cccc I=d CS=eec V=f PT=g Example: MX=14 932-7608 I= CS=Coin V=5 PT= 14th Cage-Number-Info Digit-Class-Verified-No Party
Function	 -aa- indicates the matrix cage from 00 to 35 depending on the matrix backplane strapping. -bbb- indicates the office code. The office code may be strapped differently on each cage. -cccc- indicates the number identified. -d- is the Information Digit if the toll center requires an Information Digit other than standard. -eee- indicates the Class of Service, i.e. Coin, PBX, Blocked, ONI. -f- is the number of times an identified number verified. A number must verify at least 3 out of 5 times to be processed. Less than 3 causes an ANI FAILf- is from 1 to 5. -g- is the party identified (1, 2, 3, or 4), blank for private line (For party # verification refer to 4.04)

TABLE 10. INVALID NUMBER VERIFICATIONS

STEP	DISPLAY	FUNCTION
	ATTEMPT INVALID INCREMENTED	
Press 'F'	IDENTIFICATION FAILURE INCREMENTED	
Press 'F'	MX=aa bbb-cccc I=d CS=eee V=f PT=g (Refer to TABLE 9 for functions)	Each -F- in the identified number indicates a shorted sleeve or matrix point.
Press '5'	Al B2 C3 TH4 H5 TN6 UN7 ID8 CS9 EXF	Display Menu for individual numbers
Press 'l' thru '9'	Individual numbers will display	displays with multiple digits are the shorted matrix points.

TABLE 11. TRUNK OPERATIONAL TEST

STEP	ACTION	VERIFY
Y	Set all Trunk OS switches (on)	 Each trunk: a) OS lite on b) BY lite on c) a 'busy' appears on sleeve lead(s) of each trunk's frame (or OGT) appearance NOTE: Ensure proper operation of ATB lead (Figure 21 of I-2500) for each trunk group. The trunks provide idle ground.
12	Set all Trunk OS switches off	Each trunk: a) OS lite off b) BY lite off
V 3	Jumper ATN multiples to the sleeve of a dedicated test number or an unused terminal number on the connector block	Refer to 4.06 for an explanation of ATN
4	 a) Plug handtest telephone (butt-in) into Trunk E&M jack b) Go Off Hook 	Trunk BY and E lites on indicating "Busy Back"
5	 a) Move handtest telephone to trunk T&R jack b) Seize the trunk c) Plug 310 cord into Trunk E&M Jack d) Ground Tip of GRD (E lead) to simulate identification request sent by Toll Center 	Trunk BY & M lites on Trunk Guard: (Dual Identifier system will have 2 in each cage) REQ lite on After 4 to 5 seconds, REQ lite goes off ATO Peg Count: (Figure 21 of I-2500, Miscellaneous Trunk Leads) Ground pulse will appear when REQ lite goes off (ANI time-out)
6	Rotate handset dial	Trunk M lead lite pulses with dial return.
7	 a) Release Trunk b) Re-seize c) Ground E lead d) Within 4 seconds, press Identifier 'F' key 	Display: TRUNK SEIZED WITH IAG LEAD Trunk: IDENT Lite on Trunk Guard: REQ lite off IDENT lite on
×8	Press 'F' again	Display: Trunk ID xxy (xx=cage #, y=trunk #) (1 to A [A=10])

STEP	ACTION	VERIFY
1/9	Set Trunk OS switch up (on)	Trunk OS lite on
10	Press 'F' again	Display: TRUNK ATTEMPT INCREMENT
/11	Press 'F' again	Display: 900 HZ OSC CONNECTED TO SLEEVE
12	Press 'F' again	Display: MX=aa bbb-cccc I=d CS=eee V=f PT=g (Refer to TABLE 9 for functions) (ATN # is tied to sleeve -cccc-)
13	Press 'F' again	Display: 900 HZ OSC DISCONNECTED FROM SLEEVE
1/14	Press 'F' again	Display: ENTERING SENDER SUBROUTINE
15	Press 'F' again	Display: KP-0-bbb cccc-ST TSPS SENDER x Sender TONE lite pulses as MF tones are being output NOTE: MF output is available at sender handset jack for handset or MF test box to monitor the output tones
16	a) Press 'F' twice more b) Repeat steps 4 thru 16 with each Trunk 10 TRUISS tested.	Display: NO TRUNK FOUND Identifier is now ready to be manually stepped through another Trunk functional test
×17	Upon completion of all Trunks operational test, refer to TAELE 13 of I-2500 and set the switch options for the specific office format, automatic mode, watchdog timer enabled, etc.	Display: after 5 seconds CPU RESTART (Identifier is in Automatic Mode) if not: a) set SW1-1 CLOSED (on) b) press momentary reset switch c) set SW1-1 OPEN (off)

TABLE 11. TRUNK OPERATIONAL TEST (Cont.)

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TABLE 12. ADDITIONAL TRUNK TESTS

STEP	TEST	VERIFY
1	Transmission Tests (to include carrier alignment)	Perform in accordance with local require- ments and procedures.
2	Grading	 a) Insure that each trunk group generates proper start signal (Class of Call) to Toll Center. Monitor senders or display (depress 3). Test each trunk in group. b) If combined trunk group, access each trunk from both levels (i.e: 1+ or 0+) and
		insure that proper start signal is generated.
3	Coin	Access each trunk from a coin number (or a test number strapped as coin on the matrix cage). Insure proper operation.
		a) l+ trunk denial (120 IPM Busy) (if required)
		 b) 0+ thousand digit translated to 9 (if required)
		c) Post pay coin station (600990-5) Check: Operator ringback Operator hold
		d) Semi Post Pay (600990 w/-8) Check: Initial coin return Operator hold Ringback
		e) Prepay Coin (600990 w/-6 or -7) Check: Initial coin return Operator hold Ringback Coin collect Coin return
4	Other Options	Check operation of other options as required.

The Installer in charge should sign and submit this form to the Installation Manager attesting to having performed all tests listed.

I certify that all applicable tests herein have been performed and all deficiencies corrected.

Installer in Charge DATE

I verify that all tests herein have been performed by the Installer in charge.

Acceptance Test Engineer DATE