

IDENTIFIER

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| 1. <u>GENERAL INFORMATION</u> | 1.52 A maximum of 600 number networks may be connected to one primary bus on a network frame. This includes all multiplied PBX numbers connected to the bus. |
| 1.1 This section describes a method of testing the Identifier Circuit, SD-95810-01, and the Miscellaneous Circuit for the Identifier Frame, SD-95819-01. | 1.53 The primary cables for the sleeve leads from the LDF and IDF to the number network frames shall not exceed 400 feet, and shall not be located on the same cable rack with other switch train or ANI trunk sleeve leads for more than a total of 100 feet. |
| 1.2 Voltage tests of the Amplifier-Detectors are to be made using an ITE-4414 (Hewlett Packard vacuum tube voltmeter 400D). Do not use any other voltmeter that is less accurate, as tests of the Amplifier-Detectors are critical. | 1.54 When secondary cables are run above or below any cable racks, the top cable rack shall be equipped with sheet metal screens (shields) per ED-91689-30, or equivalent. Each section of these shields shall be connected by a continuous single No. 22 gauge type BH wire which shall be terminated on a ground bar on a nearby fuse panel or fuse board. |
| 1.3 Lead tests between the Identifier and connecting circuits are performed in Sections 108 and 109 of this handbook. | 1.55 Cable containing switching, ANI trunk or step-by-step or crossbar line verification sleeves shall not be run on the cable racks above the number network frames. Other cables not involving these sleeve leads may be run on these cable racks. |
| 1.4 <u>Precaution</u> | 1.56 Over the NN, XNN, and MNN frames the primary cables from the distributing frames shall be separated by a 2-inch horizontal space from the secondary network cables to the identifier frames and PBX tie line cables between frames. |
| 1.41 If tubes have not been installed in the amplifier-detectors, remove F and D fuses before installing tube and replace fuses after <u>all</u> tubes have been installed. | |
| 1.42 If any tubes must be removed from the circuit for any reason, remove the associated filament fuse before removing tubes. Do not replace fuse until after the tubes have been replaced. | |
| 1.5 The following limitations in the ANI system shall be observed per BSP Section 814-202-150, Issue 8. | |
| 1.51 Customer numbers served by one identifier group shall not have access to ANI trunks in another identifier group. | |

1.57 Except as noted in paragraphs 1.55 and 1.56, secondary cables shall be placed on separate racks. These racks may run side by side with other cable racks but shall not be subjected to continuous runs in parallel with the same cable for more than 60 feet. However, for panel district office and trunk sleeve cables the secondary cable racks must be separated by 5 feet for any parallel run.

1.58 The tip and ring field secondary leads shall be run in separate cables and shall not exceed 300 feet in length.

1.59 All primary and secondary cable runs shall be marked with designation plates, as follows, to insure that the other interfacing cables will not be placed on these runs.

ANI SEC CA ONLY (P-43D111)
ANI PRI CA ONLY (P-43D112)

These number plates shall be attached to the underside of the cable racks approximately every 5 feet. Where these plates are in such a position as to constitute an accident hazard, they shall be bent up to the cable rack with the stamping information retainable in a readable position.

1.591 Secondary cables of two identifier groups may be run on the same secondary cable rack.

1.592 Special care should be taken to insure proper wiring between the following circuits:

PRIMARY NUMBER NETWORK	SD-95813-01
SECONDARY NUMBER NETWORK	SD-95814-01
IDENTIFIER	SD-1C593-01
CALL DATA ACCUMULATOR	SD-32553-01
CALL DATA ACCUMULATOR	SD-32558-01

2. RECORDS AND REQUIREMENTS

2.1 Records

2.11 Forms SD-4-1313 and SD-4-1315 are required for recording the results of these tests.

2.2 Requirements

2.21 Tests of this section agree with performance requirements contained in BSP's 814-200-180, 815-015-180 and 816-200-180.

3. TEST EQUIPMENT

3.1 Test Sets and Accessories

<u>Amt</u>	<u>Code</u>	<u>Description</u>	<u>With ITE</u>
T-1	J94723	Pulse Checking Test Set	
	or		
R-1	ITE-4029	Pulse Checking Test Set	
X-1	ITE-4414	Vacuum Tube Voltmeter	
1	R-9572	Test Receiver	*
1	712A	Tool, Network Adjusting	*

T - Telephone company maintenance set.
R - Requisition only if J94723 is not available.

X - Requisition only if telephone company maintenance meter (Hewlett-Packard 400D AC Voltmeter) is not available.

3.2 Cords

<u>Amt</u>	<u>ITE</u>	<u>Lgth</u>	<u>Cdrs</u>	<u>One End</u>	<u>Other End</u>	<u>With ITE</u>
1	9598	6'	2	310 Plug	310 Plug	*
1	9639	12'	3	310 Plug	3-2455 Plugs	*
	or					
1	9606	6'	3	310 Plug	3 Spade Tips	*
1	9547	12'	1	Banana Plug	Banana Plug	

* Panel, Step or Crossbar Test Accessory Set.

4. PULSING TESTS

4.1 PG and PS Relays

4.11 Connect 48V battery and ground to the A or BAT-G jack of Pulse Checking Test Set using cord ITE-9598.

4.12 Using and ITE-9639 cord equipped with spade tips (#1 Crossbar) or and ITE-9606 cord, (Panel and SXS) make connections as follows.

4.121 With ITE-4029 - Connect the T spade tip to the P binding post of the test set and the R space tip to the G binding post.

4.122 With J94723 - Connect the R spade tip to the G binding post of the test set and the T spade tip to the P binding post.

4.13 Connect the other end of this cord to the P jack of the Identifier Frame.

- 4.14 Block operated relays P, ON, RP and LO (option) of the Identifier Circuit. To start pulsing, remove the block from relay P.
- 4.15 Calibration
- 4.151 Set meter of test set to read 0 percent break by adjusting CAL knob. When ITE-4029 is used, key C must be operated (during this adjustment only).
- 4.152 To check the percent break, operate P or PCB and read percent break. Release operated key.
- 4.153 To check the pulse speed, verify that meter reads 0 percent break as above. Readjust if necessary.
- 4.154 With ITE-4029 - Operate S key and read meter. Operate R key and note difference in the meter reading. Adjust ADJ knob while R key is alternately operated and released until difference becomes as small as possible. Release R and S keys and read pulse speed on meter.
- 4.155 With J94723 - Operate PPS key and read pulse speed on scale 20-0 or 40-0 depending on setting of SCALE key.
- 4.16 Check that the PG and PS relays meet the requirements specified on the Pulse Check Graph for both the low and high speeds as follows:
- (a) Plot the readings on the scales of the Pulse Check Graph (low speed) on SD-95810-01-F5. Extend a vertical line from the "Per Cent Break" value and a horizontal line from the "Pulses Per Second" value through the diamond shaped area on the graph.
- (b) If the intersection of these two lines falls within the area, bounded by the solid lines on the graph, the relay meets requirements. If the intersection of these two lines falls outside the solid lines on the graph, readjust the relay as outlined in the table below the graph to bring the intersection of the two lines within the area bounded by the dotted lines.
- 4.17 Block operated relay OFKC and in the manner described in Paragraphs 4.15 and 4.16 check the high speed pulsing of the PG and PS relays.
- 4.18 Remove all blocks upon completion of tests.
- 4.2 PD Relay
- 4.21 Remove the 310 plug of the ITE-9639 or 9606 cord from the P jack and insert in the PD jack of the identifier.
- 4.22 Block operated relays P and ONI.
- 4.23 Perform calibration tests as outlined in Paragraph 4.15. To start pulsing, remove block from relay P.
- 4.24 Check that the PD relay meets the pulsing requirements specified on the Pulse Check graph for both the low and high speeds as outlined in Paragraphs 4.16 (a) and (b).
- 4.25 Block operated relay OFKC to check the high speed pulsing.
- 4.26 Upon completion of tests, remove all blocks and connections.
5. AMPLIFIER-DETECTOR TESTS
- NOTE: Prior to the tests of this paragraph, tests should be completed on the Oscillator Circuit of the Outputser-Identifier Test Circuit. These tests are performed per Section 113 of this handbook. Also, resistance measurements of the Outputser-Identifier Test Circuit and the leads check between the Identifier and the Outputser-Identifier Test Circuit should be completed.
- 5.01 At the Outputser-Identifier Test Frame block operated relays IGA- and IGB-associated with the identifier under test. Operate key ADR on the Test Frame.
- 5.02 At the identifier, block operated relay TST-1.
- 5.03 Operate key TH00 at the Outputser-Identifier Test Circuit.
- 5.04 Connect a Hewlett Packard vacuum tube voltmeter 400D (ITE-4414) to the 0 Amplifier-Detector PA2 connectors. Adjust the GN potentiometer so that the voltage at the PA2 connector is 30 volts AC.

NOTE: If a low resistance device (such as a test receiver) is connected to the PA2 connectors there is danger of burning out the PL2 resistor and NI network. However, the signal can be heard (a very high pitched tone) by connecting a test receiver to the output terminals of the Hewlett packard voltmeter. DO NOT CONNECT TEST RECEIVER TO INPUT TERMINALS OF VOLTMETER.

- 5.05 Connect the vacuum tube voltmeter to the PC connector of the amplifier-detector. Check that the class C stage of amplification is operating by noting that there is an AC voltage at connector PC. This voltage is usually about 70 VAC.
- 5.06 Connect the vacuum tube voltmeter to the PA2 connector. Adjust the NI network for maximum AC voltage at the PA2 connector. Use the 712A tool for this adjustment.
- 5.07 Readjust the GN potentiometer so that the voltage at the PA2 connector is exactly 30 volts AC. Do not adjust above 30 volts.
- 5.08 Connect the vacuum tube voltmeter to the PC connector. Adjust the N2 network for maximum voltage at the PC connector. This should be 75 volts AC or higher.
- 5.09 If there is a voltage of 30 volts AC at the PA2 connector and a voltage of 75 volts AC or higher at the PC connector, this is an indication that the amplifier-detector is within requirements.
- 5.10 Release the TH00 key and operate the TH01 key at the Outpulser-Identifier Test Circuit.
- 5.11 Repeat the preceding tests on Amplifier-Detector 1.
- 5.12 Repeat tests on Amplifier-Detectors 2 through 9 in the same manner. Operate the TH0- key associated with the amplifier-detector under test. Operate keys SO and PTY for tests of these amplifier-detectors.
- 5.13 After Amplifier-Detector 0 through 9 have been tested for their operate values, use keys THN00 through THN09 for tests of the nonoperate value of the amplifier-detector.
- 5.14 For the nonoperate tests, the voltage at the PC connector should read nominally 0 and in no case greater than 15 volts AC. The voltage at the PA2 connector should read no greater than 22.5 volts AC and will read generally in the range of 15 to 22 volts AC.
- 5.2 Locating Trouble in Amplifier-Detectors (SD-95810-01-B7)
- 5.21 First verify whether the unit in question is defective, by substituting another one. This can be done by simply switching the two input leads (T.S. A punchings 7 and 8) and the one output lead (T.S. B punching 9).
- 5.22 Check a defective unit for visible defects such as broken wires, burned out resistors, improper lead dress, tube filaments not lit, broken shield ground, etc.
- 5.23 IF the requirements of Paragraph 5.04 cannot be met, the following may help:
- (a) check 407A tubes by substitution.
- (b) If there is an AC voltage present but it cannot be brought up to 30 volts, try adjusting the NI network.
- 5.24 If tests of 5.04 are met but not 5.05:
- (a) Try changing CA tube (type 408A).
- (b) Try carefully adjusting N2 network.
- (c) Recheck frequency of oscillator supply as outlined in Section 113.
- 5.25 If none of the above procedures result in obtaining the necessary readings, it may be assumed that the unit is defective and a replacement should be ordered.
6. OFFICE AND DIGIT STEERING
- 6.1 Office Steering
- 6.11 Remove pulsing relay PG from its socket.
- 6.12 Block operated relays ON, ON2 and RP. Observe that relays OFO, OFOA, PTK, THS and THSA operate.
- 6.13 Using a test receiver connected to ground, operate and release relay P by touching the probe of the test receiver

to the upper winding of relay P. Observe the operation and release of the relays as shown in Table 1.

6.14 Upon completion of test, remove blocks from relays ON, ON2 and RP.

6.2 Digit Steering

6.21 Block operated relays ON, ON2 and RP. Observe that relays OF0, OF0A, PTK, THS and THSA operate.

6.22 Operate relay P using test receiver connected to ground. Observe that relay PC1 operates.

6.23 Release relay P. Relay PC2 operates.

6.24 Manually operate relay HTR if this relay is not operated.

TABLE 1

SEQ.	RELAY P		RELAYS	
	OPERATE	RELEASE	OPERATE	RELEASE
1	X		PC1	
2		X	PC2	
3	X		OF1 OF1A	
4		X		OF0 OF0A
5	X		*OF2 OF2A	
6		X		OF1 OF1A
7	X		*OF3 OF3A	
8		X		OF2 OF2A*
9	X		*OF4 OF4A	
10		X		OF3 OF3A*
11	X		*OF5 OF5A	
12		X		OF4 OF4A*
13	X		*OF6 OF6A	
14		X		OF5 OF5A*
15	X		OFE OFEA	
			HS HSA	
16		X		OF6 OF6A*
				THS THSA
17	X		OF0 OF0A	
18		X		OFE OFEA
19	X		OF1 OF1A	
20		X		OF0 OF0A
21	X		*OF2 OF2A	
22		X		OF1 OF1A
23	X		*OF3 OF3A	
24		X		OF2 OF2A*
25	X		*OF4 OF4A	
26		X		OF3 OF3A*
27	X		*OF5 OF5A	
28		X		OF4 OF4A*
29	X		*OF6 OF6A	
30		X		OF5 OF5A*
31	X		OFE OFEA	
			EP	
32		X		OF6 OF6A**

* Optional relays.

** Highest number OF- and OFA- relays release.

6.25 Manually operate relay OFK. Observe that relays OFKC and OFKD operate.

6.26 Operate and release relay P and observe the operation and release of the relays shown in Table 2.

TABLE 2

SEQ.	RELAY P		RELAYS	
	OPERATE	RELEASE	OPERATE	RELEASE
1	X		HS HSA	
2		X		THS THSA
3	X		TS TSA	
4		X		HS HSA
5	X		US USA	
6		X		TS TSA
7	X		ES ESA	
8		X	ES1	US USA
9	X		ESR THIS THSA	
10		X	ES2	ES ESA
11	X		HS HSA	
12		X		THS THSA
13	X		TS TSA	
14		X		HS HSA
15	X		US USA	
16		X		TS TSA
17	X		ES ESA EP	
18		X		

6.27 Remove the blocks from relays ON, ON2, RP and HTR (if blocked operated).

6.28 Replace relay PG in its socket.

6.29 Repeat test on other identifier.

7. LOCKOUT BETWEEN IDENTIFIER

7.1 In the first identifier of the identifier group, block operated relays ON2 and PC1.

7.2 In the second identifier operate relay ON2.

7.3 Observe that relay L0 of the second identifier operates.

7.4 Release relay PC1 of the first identifier and operate relays ON2 and PC1 of the second identifier.

7.5 Observe that relay L0 of the first identifier operates.

7.6 Release the blocked relays.

8. MISCELLANEOUS CIRCUIT, SD-95819-018.1 Frame Test Battery Supply

8.11 Check 48V test battery terminals and tip of the A jack for presence of 48 Volts.

8.12 Check the G test terminal and sleeve of the A jack for direct ground.

8.13 Check the HRG test terminals for high resistance ground (12,000 ohms).

8.2 Miscellaneous Jacks8.21 Spare B Jack

8.211 Make a continuity test of the B jack to all associated outgoing trunk frames and also to th MDF, IDF or CDF.

8.22 C Jack

8.221 Check for presence of +130 volts on the tip of the C jack.

8.222 Check for presence of ground on the sleeve of the C jack.

8.23 Remote Control RC Jack

8.231 Check for ground on the sleeve of the RC jack. Make a continuity test of the tip and ring leads of the RC jack to all associated RC jacks and to the Outpulser-Identifier Trunk Test Circuit.

8.24 Frame Line Jacks

8.241 Panel and No. 1 Crossbar Offices - Make a continuity and cross test of the tip and sleeve leads of the TEL (A and B) jacks to all associated TEL jack appearances and to the Frame Line Circuit. Check transmission between appearances of the TEL jacks.

8.242 SXS Offices - Make a continuity and cross test of the tip and ring leads of the SWMN jack to other ANI frames and to the SWMN talking line circuit. Check transmission between appearances of the SWMN jacks.

8.3 Fuse Alarm8.31 48 Volt Alarm

8.311 Using an ITE-9547 cord, connect 48 volt battery to one side of the FA resistance.

8.312 Observe that FA operates, also relay FA2 in step-by-step offices, and that the red FA lamp lights and the audible alarm sounds.

8.313 Observe at the miscellaneous circuit for the trouble ticketer that relay I-B associated with the identifier under test operates.

8.314 Remove 48 volt battery from the FA resistance. Observe that lamp FA is extinguished, the alarm silenced and that lamp FG lights.

8.315 Momentarily operate key AR to extinguish lamp FG.

8.316 Repeat test in this manner, but connect battery to the PF resistance rather than the FA resistance. Observe the same results.

8.32 +130 Volt Alarm

8.321 Using a test receiver, connect +130 volt battery to either side of the FA1 resistance.

8.322 Observe that relay FA operates, (also relay FA2 in step-by-step offices) and that the red FA lamp lights and the audible alarm sounds.

8.323 Observe at the miscellaneous circuit for the trouble ticketer that relay I-B associated with the identifier under test operates.

8.324 Remove +130 volts from the FA1 resistance. Observe that lamp FG lights.

8.325 Momentarily operate key AR to extinguish lamp FG.

8.33 Secondary Net and Bus Conn.

8.331 Using a test receiver, connect 48 volt battery to one side of the PFS resistance.

8.332 Observe that relay FA3 operates, that the red FA lamp lights and that audible alarm sounds.

- 8.333 Remove 48 volt battery and observe that the FA lamp is extinguished and that the alarm is silenced.
- 8.334 Repeat test by applying 48 volt battery to the FAS resistance rather than the PFS resistance.
- 8.335 Observe the same results.
- 8.34 Identifier Make Busy
- 8.341 Connect ground to lead FA, terminal 04 of the miscellaneous terminal strip. Observe that relay I-B operates at the miscellaneous circuit for the trouble ticketer.
9. OPERATIONAL TESTS
- 9.1 Test Set Up
- 9.11 At the Outputser-Identifier Test (OIT) Frame, restore all keys to normal.
- 9.12 Operate keys IDK and OIT. Operate keys OP-, IG- and IDO/1 as required.
- 9.2 Particular Number Identification
- NOTE 1: For all tests of Table 3, verify that the numerical key operated in each column for the operate test is different than the key operated for the nonoperate test. If the same key is operated for both conditions, an inaccurate test results.
- NOTE 2: In certain instances erratic operation of an amplifier-detector circuit may be encountered. This is usually caused by unstable 407A amplifier tubes.
- 9.21 At the OIT, operate keys shown in Table 3 to perform the indicated tests.
- 9.22 Momentarily operate key ST. Verify the appropriate lamp indications as shown in Table 3.
- 9.23 After completing Test No. 10 of Table 3, momentarily operate key RN. Verify all lamps are extinguished.
- 9.3 Multiparty Identification
- 9.31 Verify that the keys required for Test No. 10 are operated. Operate an OFF-key not associated with an AIOD unit. Operate key PTY.
- 9.32 Momentarily operate key ST. Verify lamps IO, II, PTY, THS and OF-S are lighted.
- 9.33 Momentarily operate key RN. Verify all lamps are extinguished and all keys operated for Test No. 10 of Table 3 and key PTY are restored to normal.
- 9.4 Recycle Scanning (AIOD Not Provided)
- 9.41 Operate and OFF- key not associated with an AIOD unit. Operate keys TH0-, HO-, TO- and UO- to select a calling line directory number.
- 9.42 Operate key TH2AT and momentarily operate key ST. Verify appropriate lamps OF-S, OF-R, THR, THS, HS, TS and US lighted as the identifier scans the thousands digit and then make a second attempt to identify the directory number.
- 9.43 Restore to normal key TH2AT.
- 9.44 Repeat the tests of paragraphs 9.41 through 9.43 using keys H2AT, T2AT and U2AT one at a time instead of key TH2AT. Verify the same results except lamps HR, TR and UR light instead of lamp THR.
- 9.45 Restore to normal keys TH0-, HO-, TO-UO-, OFF- and U2AT. Momentarily operate key RN. Verify all lamps are extinguished.
- 9.5 Recycle Scanning (AIOD Provided)
- 9.51 Operate an OFF- key associated with an AIOD unit. Operate keys TH0-, HO-, TO- and UO- to select a PBX trunk number.
- 9.52 Operate key TH2AT and momentarily operate key ST. Verify appropriate lamps OF-S, OF-R, THR, THS, HS, TS, US and IOD lighted as the identifier scans the thousands digit and then makes a second attempt to identify the trunk number.
- 9.53 Restore to normal keys TH0-, HO-, TO-, UO-, OFF- and TH2AT. Momentarily operate key RN. Verify all lamps are extinguished.

TABLE 3

TEST NO.	TEST CIRCUIT KEYS OPERATED											TEST CIRCUIT LAMP INDICATIONS									
	OFF	O				NO				NOTE 3			OF-1	TH	H	T	U	I	IPT	RP	SO
		TH	H	T	U	TH	H	T	U	TP	NP	SO									
1	0	0	1	2	3	1	2	3	4	-	-	-	0	4,7	0,1	0,2	1,2	4,7	-	+	-
2	1	1	2	3	4	2	3	4	5	-	+	-	1	1,0	0,2	1,2	0,4	4,7	-	+	-
3	2	2	3	4	5	3	4	5	6	-	+	-	2	0,2	1,2	0,4	1,4	4,7	-	+	-
4	3	3	4	5	6	4	5	6	7	-	-	-	3	1,2	0,4	1,4	2,4	4,7	-	+	-
5	4	4	5	6	7	5	6	7	8	-	+	-	4	0,4	1,4	2,4	0,7	4,7	-	+	-
6	5	5	6	7	8	6	7	8	9	+	-	+	5	1,4	2,4	0,7	1,7	1,2	+	-	+
7	6	6	7	8	9	7	8	9	0	-	+	+	6	2,4	0,7	1,7	2,7	1,2	-	+	+
8	0	7	8	9	0	8	9	0	1	+	-	+	0	1,7	1,7	2,7	4,7	1,2	+	-	+
9	1	8	9	0	1	9	0	1	2	+	+	+	1	1,7	2,7	4,7	0,1	1,2	+	-	+
10	2	9	0	1	2	0	1	2	3	+	+	+	2	2,7	4,7	0,1	0,2	1,2	+	-	+

NOTE 1: A (+) in column means operated key or lamp lighted; a (-) means nonoperated key or lamp not lighted.

NOTE 2: The chart shows testing sequence where seven offices are equipped. Where this is not the case, use office keys of offices which are equipped.

NOTE 3: If the OFF- key is associated with an AIOD unit, the TP key operation is not required.

NOTE 4: If an AIOD unit is served by the ANI equipment, it may be associated with any one of the OFF (0-6) office keys, depending on the installation. When the AIOD associated office key is operated, the IOD test circuit lamp should light.

9.6 Steering

9.61 Operate an OFF- key not associated with and AIOD unit. Operate key HTR and keys THO-, HO-, TO- and UO- to select a calling line directory number.

9.62 Momentarily operate key ST. Verify lamps OF-S, HTR, THS, HS, TS and US lighted.

9.63 Restore to normal key HTR. Operate keys OFX and CTT. Momentarily operate key ST. Verify lamp OFX lighted.

9.64 Restore all keys to normal. Momentarily operate key RN. Verify all lamps are extinguished.

9.7 Identification of Subscriber

9.71 Select a particular number network for this test. If no cross-connections are installed, install temporarily cross-connections for either tip or ring party.

9.72 If tip party cross-connections are installed, operate key TP on the test frame.

9.73 Operate the OFF- key of the office associated with the number network selected.

9.54 Operate SVN and IDK keys. Select one output pulser by operating a CP(-) key.

9.75 At the primary number network frame connect a WIAT cord (obtain from telephone co.) from jack NNT to selected number network sleeve at rear of frame.

9.76 Operate ST key. Observe that two-out-of-five lamps are lighted for the TH, H, T and U digits of the number network selected.

9.77 Restore test frame to normal and remove WIAT cord.

Manager, Product Engineering
Control Center

Reason for Reissue

To make minor corrections and to update to current engineering standards