

ANI OUTPULSER-IDENTIFIER
 TEST CIRCUIT

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1. GENERAL INFORMATION

1.1 Description

1.11 This section provides a method for testing control features and miscellaneous functional features of the:

ANI OUTPULSER-IDENTIFIER TEST CIRCUIT
SD-95815-01

1.12 The tests of this section check various control indications and critical resistance measurements for the Outpulser-Identifier Test Circuit. Fusing Tests are covered in Section 107 of this handbook. Connections to other circuits are covered in Section 109 of this handbook.

1.13 The operational tests using the Outpulser-Identifier Test Circuit are covered in Sections 115, 116 and 119 of this handbook.

1.2 References

1.21 The tests of this section are based, in part, on BSP 216-913-501.

2. RECORDS AND REQUIREMENTS

2.1 Records

2.11 Results of the tests of this section shall be recorded on forms SD-4-1313 and SD-4-1315.

2.2 Requirements

2.21 The tests of this section conform with the performance requirements for ANI equipment as specified in BSP's 814-200-180, 815-015-180 and 816-200-180.

3. TESTING EQUIPMENT

3.1 Test Sets

<u>Amt</u>	<u>ITE</u>	<u>Description</u>
1	4442	Volt-Ohmmeter
*1	4414	Vacuum Tube Voltmeter
	or	Hewlett-Packard 400D Vacuum Tube Voltmeter
	Equiv.	

* Requisition ITE-4414 only if telephone company maintenance voltmeter (Hewlett-Packard 400D) is not available.

3.2 Accessories

<u>Amt</u>	<u>ITE or Code</u>	<u>Description</u>	<u>With ITE</u>
1	R-9572	Receiver and Cords	**
		Tester's	
As Req.	768A	Tool, Blocking Wedge	**

** Panel, Step or Crossbar Test Accessory Set.

NOTICE - NOT FOR USE OR DISCLOSURE OUTSIDE THE
 BELL SYSTEM EXCEPT UNDER WRITTEN AGREEMENT

4. IDENTIFIER SELECTION AND STEERING

4.1 Identifier Group Selection FS-1

NOTE: IG(-) keys and IG(-) relays are provided only where more than one identifier group is equipped. If only one group is equipped, IG(-) selection tests are not applicable.

4.11 At the OITF, operate key OIT. Determine the number of equipped identifier groups and operate the IG- key for the highest numbered identifier group. If key IG2 is operated, check that lamp IG2 is lighted and relays IG2, IGA2, IGB2 and IGC2 are operated. If key IG1 is operated, check that lamp IG1 is lighted and the IG1 and IG(A-C) 1 relays are operated.

4.12 Operate the next lower numbered IG-key (IG1 or IG0) and check that the higher numbered group IG- relays release and the lower numbered group IG- relays operate. Check that the associated IG(-) lamp lights for each operated IG(-) key.

4.13 Repeat the above test as required until key IG0 is operated. After all groups have been checked, release keys OIT and IG0. Check that all IG(-) relays are released.

4.14 Block operated relay TTGC at the OITF. At Identifier 0 for each identifier group, operate relay TST1 and verify that the associated identifier group IG(-) relays operate while relay TST1 is operated. After each group has been checked, release relay TST1 in identifier 0 and verify that all IG(-) relays are released.

4.2 Identifier Steering and Connector FS-8 & 9

4.21 At the OITF and at Identifier 0 of the first group, operate and release relays as indicated in the tests of Table 1 and observe results as shown. Block operated relays for each test unless the test sequence indicates that the relays are to be released in the following test operation. After completing tests of Table 1, check that all relays are released and all lamps extinguished.

4.22 Repeat the tests outlined in Table 1 for each equipped identifier frame. If identifier circuits are multiplied with shop wiring on the same frame, tests should be made at the last appearance on the frame.

5. TEST NUMBER NETWORK FS-7

5.1 At the OITF, block nonoperated relay BYA and operate keys ADR and SVN. Determine the number of offices equipped with number network frames at the particular installation, and locate the NNT(-) jack at the first number network frame for the highest numbered equipped office. If the maximum number of offices is equipped, test jack NNT5 will appear at the number network frame for office number 5.

5.2 Using a test receiver, R-9572, connected to ground, touch test pick to jack NTT5 (or the highest numbered equipped NTT(-) jack). Check that oscillator tone (5800 cycles) is not present. Block operated relay IGC0 and relay OF5 or the OF(-) relay corresponding to the highest numbered equipped office. Verify that oscillator tone is present in jack NNT5 (or the highest numbered equipped NTT-jack). If the test jack is multiplied to other number network frames by installer's cabling, check that tone is present at the NNT5 jack or highest numbered NNT- jack at each number network frame for the associated office.

5.3 Leaving relay OF5 (or the highest numbered equipped OF(-) relay) blocked operated, block operated relay OF4 or the next lower numbered OF(-) relay. Check that tone is removed from jack NNT5 and verify that tone is present at the NNT4 jack (or the next lower numbered NNT- jack). This jack will appear at the number network frames for the next lower numbered office. Check for tone at one NNT- jack appearance at each number network frame.

5.4 Repeat the above test, blocking operated relays OF3, OF2, OF1 and OF0 as equipped, one at a time, in turn. As each relay is blocked operated, check that the tone is transferred from the NNT4 jack to jacks, NNT3, NNT2, NNT1 and NNT0, in order, at the number network frames for the remaining equipped offices.

TABLE 1

TEST OF IDENTIFIER STEERING AND CONTROL

Test No.	Test Operation				Observe Results
	At OITF		At Identifier		
	Operate	Release	Operate	Release	At OITF
1	ON		ON,TST1		
2			OFO		OFOK Operates OFOS Lamp Lights
3	OFO				OFOK Releases
4		OFOS			OFOS Lamp is extinguished
5			THS		OFOS & THL Operate & Lock OFOS Lamp Lights
6	ES1	ES1		ES1,ES2	ES1 Lamp Lights THR Lamp Lights ES1 Lamp Out
7			OF1		OF1K Operates OF1S Lamp Lights
8	OF1				OF1K Releases
9			HS		HL Operates & Locks
10		OFOS, OF1S, THL,THR			OFOS, OF1S and THL Remain Released OFOS & OF1S Lamps are extinguished THR Lamp is extinguished
11	ES1	ES1		ES1,ES2	HR Lamp Lights ES1 Lamp Lights ES1 Lamp Out
12			OFEA	OFEA	OFE2 & OF1R Operate & Lock OF1R Lamp Lights
13		OFE2, OF1R			OFE2 & OF1R Remain Released OF1R Lamp is extinguished
14			OF2		OF2K Operates
15	OF2				OF2K Releases
16			TS		TL Operates & Locks
17		HL,HR			HL Remains Released HR Lamp is extinguished
18	ES1	ES1		ES1,ES2	ES1 Lamp Lights, TR Lamp lights. ES1 Lamp Out
19			OF3		OF3K Operates
20	OF3				OF3K Releases
21			US		UL Operates & Locks
22		TL,TR			TL Remains Released TR Lamp is extinguished

TABLE 1 (Cont'd)

Test No.	Test Operation				Observe Results
	At OITF		At Identifier		
	Operate	Release	Operate	Release	At OITF
23	ES1	ES1		ES1,ES2	UR Lamp Lights, ES1 lights ES1 Lamp Out
24			OF4	TST1	OF4K Operates
25	OF4				OF4K Releases
26			OF5		OF5K Operates
27	OF5				OF5K Releases
28		ON		ON	UL Releases UR Lamp is extinguished
29		OF(0-5)		OF(0-5) THS,HS, TS,US	All lamps extinguished

5.41 Busy Test - No. 1 Crossbar, Step-by-Step or Panel Battery - Cutoff Offices

5.411 Check that relay BYT operates when jack NNT0 is grounded. Remove block from relay BYA and check that operation of relay BYT causes relay BYA to operate and lamp LBY to light. Check that tone is cut off from NNT0 jack when relay BYA is operated.

5.42 Busy Test - Panel Ground-Cutoff Offices

5.421 In ground-cutoff panel offices, the busy condition is a battery on the sleeve lead. Connect the test receiver to 48V battery and touch test pick to jack NNT0. Check that relay BYT operates while test pick is connected. Remove block from relay BYA and check that operation of relay BYT causes relay BYA to operate and lamp LBY to light. Verify that tone is cut off from NNT0 jack when relay BYA is operated.

5.5 After completing the above tests for the first identifier group, release relays IGCO and OF(0-5) (as operated), and restore keys ADR and SVN to normal. Disconnect test receiver from battery or ground, as connected.

5.6 If additional identifier groups are equipped, repeat the above test for each identifier group, blocking operated relays IGCl or IGC2, as required.

6. CANCEL TIME-OUT RELEASE TEST

6.1 Where more than one identifier group is furnished, perform this test on one outpulser per group. At the trouble ticketer jack panel, make busy the selected outpulser. At the outpulser, block nonoperated relays STM1 and TAL, then block operated relay ST.

6.2 At the OIT frame, operate the IGO key for the first identifier group. Operate keys OIT, ICA and SVN, then key ST. Observe that lamp CTOR lights.

6.3 Restore ST key to normal and check that lamp CTOR is extinguished. Release key ICA and operate key CTO. Reoperate key ST and check that lamp CTOR lights. Release ST key and check that CTOR lamp is extinguished. Restore keys SVN, OIT and CTO to normal.

7. OUTPULSER BUSY TEST

7.1 At the trouble ticketer frame, make busy the first outpulser. At the outpulser, block nonoperated relays STM1 and TAL. Then block operated relay ST.

- 7.2 At the OIT test circuit, operate keys OIT, OFF(0), TH(00), H(00), T(00) and U(00). Operate key OP(-) for the outpulsur made busy, and key IG(-), where necessary, for the associated identifier group.
 - 7.3 At the OIT frame, operate ST key and observe that lamps OIT, BTR and OTL light. Restore ST key and observe that lamp RL lights momentarily and lamps OIT, BTR and OTL are extinguished.
 - 7.4 At the outpulsur, remove block frame relay ST, then remove block from relays STM1 and TAL. At the trouble ticketer, remove make-busy plug from the outpulsur busy jack. At the OIT frame, restore all lever-type keys to normal.
 - 7.5 Repeat the preceding tests for each equipped outpulsur of each equipped identifier group.
8. RESISTANCE MEASUREMENTS
- 8.1 Using the Volt-Ohmmeter, ITE-4442, set to read resistance in ohms, measure resistances as indicated in Table 2. Change resistance multiplier scale as required to maintain readings in the less crowded half of the meter scale, wherever possible.
 - 8.2 Remove and replace fuses, and perform test operations as indicated in Table 2 before taking readings on the ohmmeter.

TABLE 2
OIT RESISTANCE MEASUREMENTS

Test No.	Test Operation		Meter Reads (Ohms)
	Preliminary Setups	Connect Ohmmeter	
1	Remove fuse C Operate key OIT		
2		Across 3900 ohm section of TGD Resistor	3500-4500
3		Across TP1 Resistor	1400-1600
4	(Panel party test req.)	Across TP2 Resistor	5000-6000
5	" " " "	Across TP3 Resistor	1900-2500
6		Across A Resistor	400-500
7		Across A Relay Wdg.	800-1100
8		1 BK, TPA Relay to ground	11,000-12,000
9	Restore OIT key and replace C Fuse		
10	Operate TT Key	4B of TT Key to ground	90-120
11	Restore TT Key	1F, NP Relay to ground	2850-2950
12	Operate TT, DX Keys	1F, NP Relay to ground	1250-1400
13		Across OT1 Resistor	19-25
14		Across OR Resistor	19-25
15		Across 6400 ohm section on PNT Resistor	6000-7000

TABLE 2 (Continued)

Test No.	Test Operation		Meter Reads (Ohms)
	Preliminary Setups	Connect Ohmmeter	
16		Across 6400 ohm section of DNT Resistor	6000-7000
17	Insulate 3B, NP Relay	Across 6400 ohm section of SNT Resistor	6000-7000
18	Remove Insulator from 3B of NP Relay	Across SO Resistor	50-90
19		Across OT Resistor	70-100
20	Restore TT Key		
21	Remove fuse B	Across BYT Relay Wdg.	6000-12,000
22		Across BT1 Resistor	600-1200
23		Across BT2 Resistor	8000-12,000
24	Replace fuse B and disconnect ohmmeter		
25		Across STPP Resistor	418-462

9. CAPACITANCE VERIFICATION TEST

- 9.1 This test checks the coupling capacitors which transmit the oscillator tone to the test network circuit. At the OIT frame, operate key ADR to activate the oscillator circuit. Using ITE-4414, or the operating company equivalent of the Hewlett-Packard 400D Vacuum Tube Voltmeter, connect the lower test terminal to ground with the cord provided. With the scale set at the 3V AC range connect the upper terminal of the VTVM to the ungrounded side of resistor OT.
- 9.2 Verify that the VTVM reads 1.5-1.9 volts on the 3V AC scale. If reading does not fall in this range, the oscillator circuit should be retested and adjusted as outlined in Section 113 of Handbook 59.
- 9.3 After verifying output signal, disconnect VTVM and restore ADR key to normal.

10. OUTPULSER TROUBLE REGISTRATION AND RELEASE

- 10.1 At the trouble ticketer frame, make busy the first available outpulser. Block operated relays STS in the trouble ticketer. At the outpulser made busy, block operated relay STS.
- 10.2 At the OIT test circuit, operate keys OIT, CTT and CTO. Operate key OP(-) for the outpulser made busy, and key IG(-), if provided, for the corresponding identifier group.
- 10.3 Operate key ST in the test circuit. Check that the following lamps are lighted:
- LAMPS LIGHTED
- | | | |
|--------|----------|----------|
| I7,I10 | TH7,TH10 | ST7,ST10 |
| A7,A10 | H7,H10 | RL |
| B7,B10 | T7,T10 | |
| C7,C10 | U7,U10 | |
- 10.4 Restore ST key and check that all lamps are extinguished.

- 10.5 Restore all lever-type keys. At the outpulser, remove block from relay STS. At the trouble ticketer, remove make busy plug from outpulser busy jack and block from relay STS.
- 10.6 Outpulser Release
- 10.61 At the OIT test frame, operate keys OIT, OFF(0), TH(00), H(00), U(00), ICA, IDO and key IGO, if provided.
- 10.62 Operate key OP(-) for any idle outpulser available in identifier group O. Operate key ST and observe that lamps OTCI and the corresponding OP(-) light.
- 10.63 Manually operate momentarily relay CTOR. Check that lamp CTOR lights and all other lamps are extinguished. Restore ST key and check that lamp CTOR is extinguished.
- 10.64 Operate ST key and check that lamps OTCI and OP(-) are lighted. Block operated relay BYA and observe that lamp OTCI is extinguished and lamps RL and LBY are lighted.
- 10.65 Remove block from relay BYA and restore ST key. Check that all lamps are extinguished.
- 10.66 Operate ST key. Observe that lamps OTCI and OP(-) are lighted. Operate CA key and check that all lamps are extinguished.
- 10.67 Restore ST key and all other lever-type keys. Repeat the above tests for all other equipped outpulsers.
11. SIMULATED EARTH POTENTIAL TEST (PANEL PARTY SERVICE ONLY)
- 11.1 When panel party test is required, the test circuit provides a simulated earth potential. Using an ITE-4442, Volt-Ohmmeter, set at the 60V DC scale, connect the positive terminal to ground. Connect the negative terminal of the meter to the midpoint of the TP1 resistor.
- 11.2 Check that the voltmeter reads 10 to 16 volts, DC. After completing test, disconnect volt-ohmmeter.
12. START PULSE TEST AND START PRIME PULSE TEST (SXS)
- 12.1 With STPP key normal check that resistance ground is present on 11 FIXED of the MF relay. Operate TPA relay. Ground is present on 12 FIXED MF relay.
- 12.2 Operate STPP key and repeat Paragraph 12.1 checking for presence of resistance battery.

Manager, Product Engineering
Control Center

Reason for Reissue
To remove Paragraph 13, Calling
Line Identification Feature.