INCOMING TRUNK CIRCUIT FROM LOCAL TEST DESK NO. 14 OR 16 OR LOCAL TEST CABINET NO. 3 (SD-2H109) TEST NO. 2/2B ELECTRONIC SWITCHING SYSTEM

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1. GENERAL

1.01 This section describes the method of testing the incoming trunk circuit SD-2H109 used in the No. 2/2B Electronic Switching System (ESS). The incoming trunk circuit is used to provide a means for establishing a test path from local test desk No. 14 or 16, or local test cabinet No. 3 to a customer line through a No. 2/2B ESS central office.

1.02 This section is reissued to incorporate S and T options in Fig. 1 and to include new service codes which have been adopted for use with the EF-2 and 2B-EF-2 generic programs. Since this is a general revision, change arrows ordinarily used to indicate changes have been omitted.

1.03 The following test will be performed:

Circuit State and Scan Point Operation: This test verifies the operation of the circuit relays and the saturation of the ferrod sensors associated with the trunk circuit.

1.04 The trunk circuit test is performed on a periodic basis as prescribed by equipment test list procedure or when a malfunction of the circuit is suspected.

1.05 The test will be performed from the trunk test panel (TTP) in conjunction with the maintenance display buffer and TTY. For detailed information about the TTP and its operation, refer to Section 232-130-301, Trunk Test Panel—Method of Operation.

1.06 The keys on the TTP may be either a locking or a nonlocking type. In order to differentiate between the two types of keys, the use of a locking type key shall be identified by the words "operate" and "release" and the use of a nonlocking type key shall be identified by the word "depress" in the ACTION column.

Note: Nonlocking keys require a depression of at least one-half second to ensure system recognition.

1.07 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or series of lettered steps should be made is given in the ACTION column and all steps governed by the same condition are designated by the same letter

within a test. Where a condition does not apply, all steps designed by the letter should be omitted.

1.08 Whenever the term TOUCH-TONE® telephone service is used, it refers to the equipment required to provide this service to the customer.

1.09 New (conventional) service order codes were adopted for use with the EF-2 and 2B-EF-2 generic programs. However, the translations can be configured with the old (No. 2 ESS unique) service order codes as an option. These old codes are common to all previous No. 2/2B ESS generic programs. The EF-2 and 2B-EF-2 generic programs can be arranged to recognize either option. In this section the term "conventional (new)" or "No. 2 ESS unique (old)" is used to identify the service order code for the keywords in each TTY input message given.

2. APPARATUS

Note: The following equipment will be used at the local test desk or test cabinet.

2.01 A 1013A headset consisting of a LB7 receiver, a H2B cord, and two alligator clips or equivalent.

2.02 A test lead with alligator clips at both ends.

2.03 A 900-ohm termination.

3. METHOD

3.01 Refer to the office records to obtain the following information about the circuit to be tested:

(a) Trunk Group Number (TGN)

(b) Member Number (MEMN)

(c) Scan Point Number (SPN)

(d) Directed Scan Point Number (DSP).

3.02 Verify the scan point numbers obtained from the office records as follows:

At maintenance TTY, type in:

A VY:TRK:ggg mmm!

ggg = TGN

mmm = MEMN

The system response is as follows:

AR VY TRK ggg mmm
TEN nn gcsl
.
.
.
DSP ss rrbb
SPN ss rrbb

The system response for offices using conventional (new) code is as follows:

AR VY TRK ggg mmm
OE nn gcsl
.
.
.
DSP ss rrbb
SP ss rrbb

ss = scanner number
rr = scanner row
bb = bit in row.

The bb bit represents the first ferrod sensor (0 for SPN and 2 for DSP) in the scanner row. All other ferrod sensors follow in consecutive order (0, 1 for SPN and 2, 3, 4, 5 for DSP). Refer to the output message manual (OM-2H200) for explanation of other data fields, if required.

3.03 If the verification procedure fails or if a malfunctioning circuit is indicated during any part of this test, proceed as follows:

(1) Discontinue the test.

(2) Troubleshoot the circuit which failed.

(3) Replace faulty circuit components using standard repair procedures.

(4) Repeat the test step which failed. If verification indicates that the faulty circuit has been repaired, continue the test.

3.04 Use the following procedure to make the incoming trunk circuit traffic busy and connect it to the TTP (Fig. 1).

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P&E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P&E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P&E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Step 3 and 4a until connection is successful.	
6	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
7	Use the TTY printout from paragraph 3.02 to determine the trunk scanner and scanner row of the SPN. The SPN is associated with ferrod sensors 0 and 1 of the incoming trunk circuit.	
8	At maintenance TTY— For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner for SPN in decimal (0-11) from Step 7. rr = Number of scanner row for SPN in decimal (0-63) from Step 7. For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner for SPN in decimal (00-11) for offices using the 2B-EF-1 generic program) or number of trunk scanner	Scanner row containing specific scan points displayed on DISPLAY BUFFER. Lamps associated with ferrod sensors 0 and 1 lighted.

STEP	ACTION	VERIFICATION
	for SPN in decimal (0-11) from Step 7. rr = Number of scanner row for SPN in decimal (0-63) from Step 7. RDT LAMPS = Direct the result to the DISPLAY BUFFER.	
9	At ACCESS TRUNK 1 CONTROL— Depress VM key.	At ACCESS TRUNK 1 CONTROL— VM lamp lighted. At VOLTMETER CONTROL— 100K lamp lighted. At VOLTMETER— Meter indicates 0.
10	At VOLTMETER CONTROL— Operate TR REV key.	At VOLTMETER CONTROL— TR REV lamp lighted. At VOLTMETER— Meter indicates 0.
11	Depress FEMF key.	At VOLTMETER CONTROL— FEMF lamp lighted. At VOLTMETER— Meter indicates 0.
12	Release TR REV key.	At VOLTMETER CONTROL— TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
13	Operate GRD key. Depress 1K key.	At VOLTMETER CONTROL— GRD lamp lighted. 1K lamp lighted. FEMF lamp extinguished. At VOLTMETER— Meter indicates 0.
14	Set PD GROUP switch to 0-5 position.	
15	At PERIPHERAL DECODER POINTS— Operate 0, 1, and 2 keys.	At PERIPHERAL DECODER POINTS— 0, 1, and 2 lamps lighted.
16	Depress AT 1 key.	At VOLTMETER— Meter indicates between 9 and 11 volts on 24-volt scale. At circuit under test— Relays A, B, and C operated.
17	At VOLTMETER CONTROL— Release GRD key.	At VOLTMETER CONTROL— GRD lamp extinguished. At VOLTMETER— Meter indicates 0.

STEP	ACTION	VERIFICATION
18	At PERIPHERAL DECODER POINTS— Release 0, 1, and 2 keys.	At PERIPHERAL DECODER POINTS— 0, 1, and 2 lamps extinguished.
19	Depress AT 1 key.	At circuit under test— Relays A, B, and C released.
20	At local test desk or test cabinet— Request maintenance personnel to place 1013A headset across tip and ring.	
21	Set PD GROUP switch to 6-11 position.	
22	At PERIPHERAL DECODER POINTS— Operate 6 key.	At PERIPHERAL DECODER POINTS— 6 lamp lighted.
23	Depress AT 1 key.	At headset— Overflow tone present (120 ipm).
24	At PERIPHERAL DECODER POINTS— Operate 7 key.	At PERIPHERAL DECODER POINTS— 7 lamp lighted.
25	Depress AT 1 key.	At headset— Busy tone present (60 ipm).
26	Set PD GROUP switch to 0-5 position.	
27	At PERIPHERAL DECODER POINTS— Operate 2 key. Release 1 key.	At PERIPHERAL DECODER POINTS— 0 and 2 lamps lighted. 1 lamp extinguished.
28	Depress AT 1 key.	At headset— Dial tone present. At circuit under test— Relays A and C operated.
29	At PERIPHERAL DECODER POINTS— Operate 1 key. Release 0 and 2 keys.	At PERIPHERAL DECODER POINTS— 1 lamp lighted. 0 and 2 lamps extinguished.
30	Depress AT 1 key.	At headset— Busy tone present (60 ipm). At circuit under test— Relay B operated. Relays A and C released.
31	Set PD GROUP switch to 6-11 position.	
32	Depress AT 1 key.	At headset— Busy tone present (60 ipm). At circuit under test— Relay F operated.

STEP	ACTION	VERIFICATION
33	At PERIPHERAL DECODER POINTS— Release 7 key.	At PERIPHERAL DECODER POINTS— 7 lamp extinguished.
34	Depress AT 1 key.	At headset— No tone is present. At circuit under test— Relay F released. Relay B remains operated.
35	Set PD GROUP switch to 0-5 position.	
36	At PERIPHERAL DECODER POINTS— Operate 3 and 4 keys.	At PERIPHERAL DECODER POINTS— 3 and 4 lamps lighted.
37	Depress AT 1 key.	At circuit under test— Ensure relays D and E operated. Relay B released.
38	At PERIPHERAL DECODER POINTS— Release 3 and 4 keys.	At PERIPHERAL DECODER POINTS— 3 and 4 lamps extinguished.
39	Depress AT 1 key.	At circuit under test— Relays D and E released.
40	At local test desk or test cabinet— Request maintenance personnel to remove 1013A headset from tip and ring and connect tip to ring.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 extinguished.
41	At PERIPHERAL DECODER POINTS— Operate 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps lighted.
42	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 lighted. At circuit under test— Relays A and B operated.
43	At local test desk or test cabinet— Request maintenance personnel to remove connection between tip and ring and terminate circuit at 900 ohms.	
44	At VOLTMETER CONTROL— Operate GRD key.	At voltmeter— ***Note:*** If the test desk or test cabinet is at a remote location or option Z is not included in the circuit, use Table A to convert the VOLTMETER indication to total loop resistance. Meter indicates between 9.5 and 11.5 volts on 24-volt scale.

STEP	ACTION	VERIFICATION
		At VOLTMETER CONTROL—GRD lamp lighted.

TABLE A

REMOTE LOCATION LOOP RESISTANCE

LOOP RESISTANCE	VOLTMETER READING
Between 1000 and 1400 ohms	Between 8 and 10.4 volts
Between 1400 and 1800 ohms	Between 6.8 and 8.6 volts
Between 1800 and 2200 ohms	Between 6 and 7.4 volts
Between 2200 and 2600 ohms	Between 5.2 and 6.5 volts
Between 2600 and 3000 ohms	Between 4.8 and 5.7 volts

Note: The above table shows the loop resistance if the voltage reading in Step 44 is less than 10.4 volts. The loop resistance is the total tip and ring resistance plus 900 ohms. The tip and ring resistance is the resistance of the wire from the incoming trunk circuit to the test desk or test cabinet plus 200 ohms if option Z is not in the circuit. This resistance should be within limits specified in office records. Refer to Section 232-130-301 — Table G, for more detailed conversion tables, if necessary.

STEP	ACTION	VERIFICATION
45	At VOLTMETER CONTROL— Release GRD key. Depress 100K key.	At VOLTMETER— Meter indicates 0. At VOLTMETER CONTROL— GRD lamp extinguished. 1K lamp extinguished. 100K lamp lighted.
46	At maintenance TTY— For No. 2 ESS offices type in: UB SY:CLB! For No. 2B ESS offices type in: STOP:UTIL!	Scanner row display removed from DISPLAY BUFFER.
47	Use the TTY printout from paragraph 3.02 to determine the trunk scanner and scanner row of the DSP. The DSP is associated with ferrod sensors 2 through 5 of the incoming trunk circuit.	
48	For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner for DSP in decimal (00-11 for offices using the 2B-EF-1 generic program) or (00-30 for offices using 2B-EF-2 generic program) from paragraph 3.02. rr = Number of scanner row for DSP in decimal (0-63) from paragraph 3.02.	Scanner row containing specific scan points displayed on DISPLAY BUFFER. Lamps associated with ferrod sensors 2 through 5 lighted.
	For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner for DSP in decimal (0-11) from paragraph 3.02. rr = Number of scanner row for DSP in decimal (0-63) from paragraph 3.02. RDT LAMPS = Direct the result to the DISPLAY BUFFER.	Scanner row containing specific scan points displayed on DISPLAY BUFFER. Lamps associated with ferrod sensors 2 through 5 lighted.
49	At PERIPHERAL DECODER POINTS— Operate 2 key. Release 1 key.	At PERIPHERAL DECODER POINTS— 2 lamp lighted. 1 lamp extinguished.
50	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 3 extinguished. At circuit under test— Relay C operated. Relay B released. Relay A remains operated.
51	At PERIPHERAL DECODER POINTS— Release 2 key.	At PERIPHERAL DECODER POINTS— 2 lamp extinguished.

STEP	ACTION	VERIFICATION
52	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 3 lighted. At circuit under test— Relay C released. Relay A remains operated.
53	At local test desk or test cabinet— Request maintenance personnel to remove termination and connect test cord to REG or NT jack.	
54	Request maintenance personnel to operate TT key (places low resistance positive battery on sleeve lead).	At DISPLAY BUFFER— Lamps associated with ferrod sensors 2, 4, and 5 extinguished. At circuit under test— Relays T, S, and H operated.
55	At PERIPHERAL DECODER POINTS— Operate 1 key. Release 0 key.	At PERIPHERAL DECODER POINTS— 1 lamp lighted. 0 lamp extinguished.
56	Depress AT 1 key.	At DISPLAY BUFFER— Lamps associated with ferrod sensors 2, 4, and 5 remain extinguished. At circuit under test— Relay B operated. Relay A released.
57	At PERIPHERAL DECODER POINTS— Release 1 key.	At PERIPHERAL DECODER POINTS— 1 lamp extinguished.
58	Depress AT 1 key.	At DISPLAY BUFFER— Lamps associated with ferrod sensors 2, 4, and 5 lighted. At circuit under test— Relay B released.
59	Set PD GROUP switch to 6-11 position.	
60	At PERIPHERAL DECODER POINTS— Operate 7 key.	At PERIPHERAL DECODER POINTS— 7 lamp lighted.
61	Depress AT 1 key.	At DISPLAY BUFFER— Lamps associated with ferrod sensors 2, 4, and 5 lamp extinguished. At circuit under test— Relay F operated.
62	Request maintenance personnel to release TOUCH-TONE key (remove low-resistance, position battery from sleeve lead) and remove test cord.	At DISPLAY BUFFER— Lamps associated with ferrod sensors 2, 4, and 5 lighted.

STEP	ACTION	VERIFICATION
63	At PERIPHERAL DECODER POINTS— Release 7 key.	At PERIPHERAL DECODER POINTS— 7 lamp extinguished.
64	Depress AT 1 key.	At circuit under test— Relay F released.
65	At maintenance TTY— For No. 2 ESS offices type in: UB SY:CLB! For No. 2B ESS offices type in: STOP:UTIL!	Scanner row display removed from DISPLAY BUFFER.
66	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— VM lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P&E lamp extinguished.
67	At telephone set on TTP— Operate green release key.	

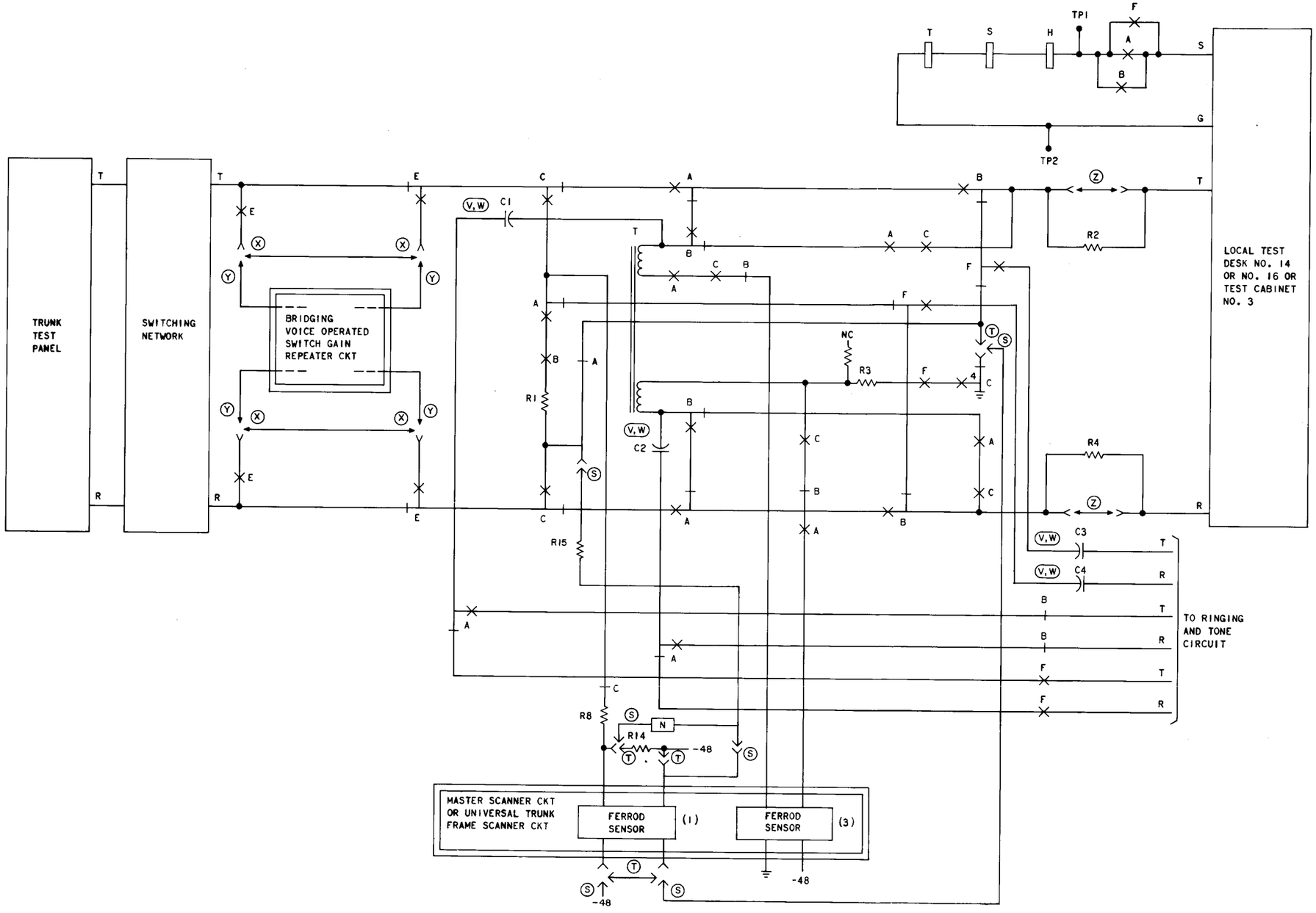

Fig. 1—Test Configuration Using Trunk Test Panel When Testing an Incoming Trunk Circuit