OUTGOING TRUNK CIRCUIT VERIFICATION REQUEST AND INTERCEPT REVERSE BATTERY, HIGH-LOW SUPERVISION (SD-2H107)—TESTS NO. 2 AND ▸NO. 2B◂ ELECTRONIC SWITCHING SYSTEMS

1. GENERAL

1.01 This section describes the method of testing the outgoing trunk circuit SD-2H107 used in the No. 2 and No. 2B Electronic Switching Systems (ESS). The outgoing trunk circuit is used to provide the necessary transmission, signaling, and supervisory functions for completing calls to intercept facilities such as the 6A announcement system and the intercept desk No. 23. The circuit may also be used to complete busy verification request traffic to the local switchboard operator.

1.02 This section is reissued to cover the No. 2B ESS.

1.03 The following tests will be performed:

A. 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 outgoing trunk circuit.

B. Transmission Loss Measurements: This test verifies the transmission loss of the outgoing trunk circuit.

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

1.05 The tests will be performed from the trunk test panel (TTP) in conjunction with the maintenance display buffer and teletypewriter (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 or 4 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 designated by that 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.

2. APPARATUS

Note: Equivalent apparatus may be substituted.

2.01 A 2500-type telephone set.

2.02 Two 2P4A cord assemblies consisting of a P2B cord 3 feet long and two 310 plugs.

2.03 One 2W6A cord assembly consisting of a W2C cord 10 feet long with a 310 plug on one end and two 59-type cord tips on the other.

2.04 One 262C-type (900 ohm) plug.

2.05 Transmission measuring set (TMS), 23D. Equivalent apparatus must be capable of measuring power in 900-ohm circuits at 1 kHz. The accuracy must be ±0.1 dB from −15 dBm to +10.0 dBm at 1 kHz.

Note: This item will not be required if the TTP is equipped with a TMS.

2.06 KS-14510 L1 volt-ohm-milliammeter (VOM).

2.07 KS-14510 L3 test leads (one red and one black).

3. PREPARATION

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) Supervisory scan point number (SPN),

(d) Protector block assignment of the outgoing trunk circuit at the protector frame.

Note: When the trunk enters the office through carrier equipment, it will not appear at the protector frame.

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

At maintenance TTY, type in:

A VY:TRK:aaa bbb!

aaa = TGN

bbb = MEMN

The system response is as follows:

AR VY TRK aaa bbb

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.

.

SPN ss rrbb

ss = scanner number

rr = scanner row

bb = bit in row

The bb bit represents the first ferrod sensor (0) in the scanner row that is associated with the specific circuit. All other ferrod sensors assigned to the same circuit follow in consecutive order (0, 1, 2, etc). Refer to the output message manual (OM-2H200) for explanation of other data fields, if required.

3.03 The following is a step-by-step procedure to make the outgoing 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.

STEP	ACTION	VERIFICATION
		At MISC TEST CONTROL— P & E lamp lighted steadily 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 Steps 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.

4. METHOD

4.01 If a verification procedure fails during any part of these tests, 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 that failed. If verification is successful, continue the test.

STEP	ACTION	VERIFICATION
	A. Circuit State and Scan Point Operation	
7	Use the TTY printout from 3.02 to determine the trunk scanner and number of the scanner row associated with the scan points assigned to the outgoing trunk circuit.	
8	At maintenance TTY— ▶For No. 2 ESS offices type in:◀ UBRL TS:RSN:ssrr! ss = Number of trunk scanner in decimal (0-11) from Step 7. rr = Number of scanner row in decimal (0-63) from Step 7. ▶For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner in decimal (0-11) from Step 7. rr = Number of scanner row is decimal (0-63) from Step 7.	At DISPLAY BUFFER— Scanner row containing specific scan points displayed on DISPLAY BUFFER lamps. Lamps associated with ferrod sensors connected to circuit under test lighted.

STEP	ACTION	VERIFICATION
	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. 100K lamp extinguished. At VOLTMETER— Meter indicates 0.
12	Release TR REV key.	At VOLTMETER CONTROL— TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
13	Depress 1K key. Operate GRD key.	At VOLTMETER CONTROL— 1K lamp lighted. GRD 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 and 1 key.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps lighted.
16	Depress AT 1 key.	At VOLTMETER— Meter indicates between 9.6 and 10.4 volts on 24-volt scale. At circuit under test— Relays A and B operated.
17	Release GRD key. Depress MET VM key.	At VOLTMETER CONTROL— GRD lamp extinguished. 1K lamp extinguished. MET VM lamp lighted. At VOLTMETER— Meter indicates 0.

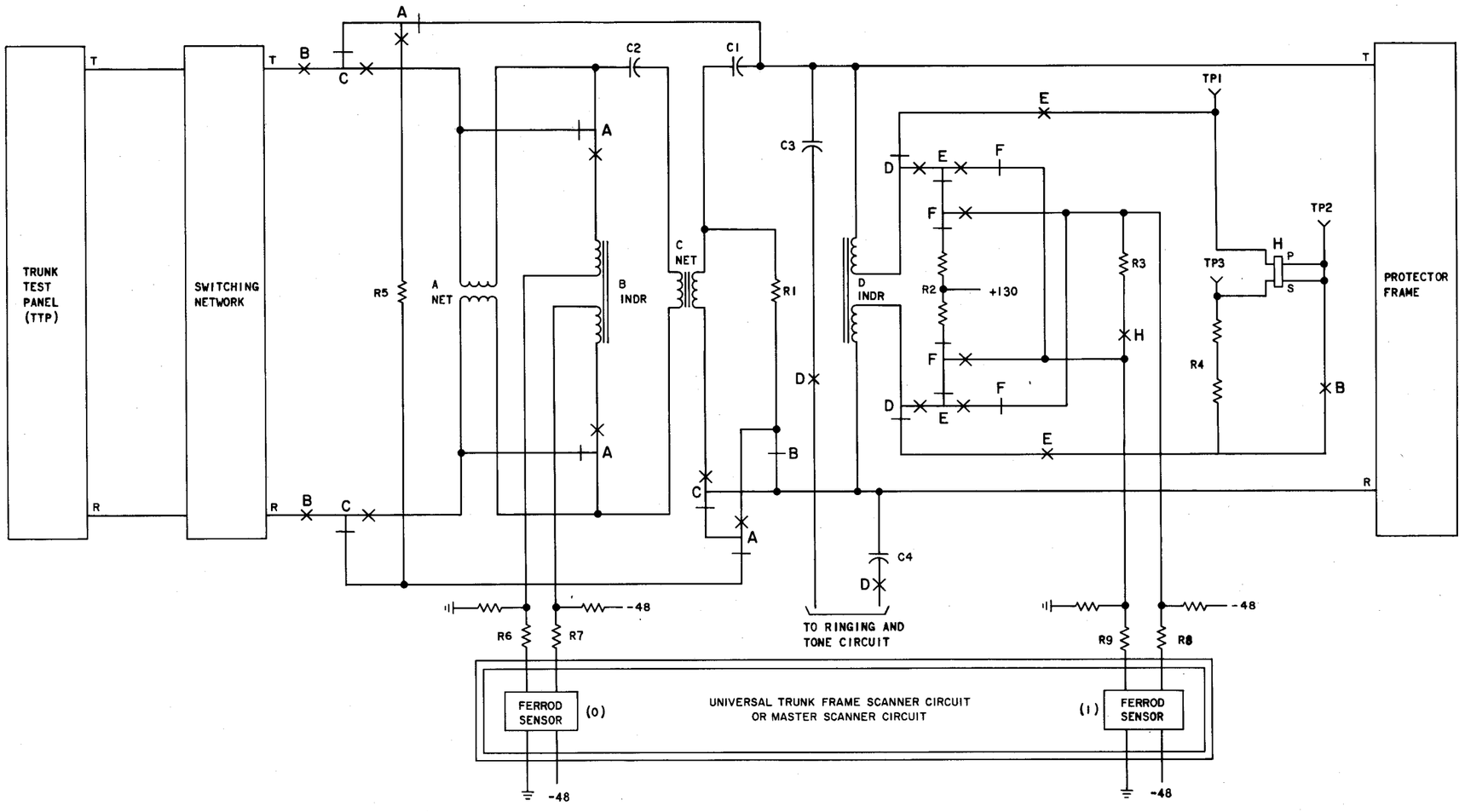

Fig. 1—Outgoing Trunk Circuit (SD-2H107)

STEP	ACTION	VERIFICATION
18	At PERIPHERAL DECODER POINTS— Operate 2 key.	At PERIPHERAL DECODER POINTS— 2 lamp lighted.
19	Depress AT 1 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale. At circuit under test— Relay C operated. Relays A and B remain operated.
20	At front of writing shelf— Insert 262C-type (900 ohm) plug into ACCESS TRK-1 jack.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished.
21	Remove 262C-type (900 ohm) plug from ACCESS TRK-1 jack.	Lamp associated with ferrod sensor 0 lighted.
22	At PERIPHERAL DECODER POINTS— Operate 3 key.	At PERIPHERAL DECODER POINTS— 3 lamp lighted.
23	Depress AT 1 key.	At circuit under test— Relay D operated. Relays A, B, and C remain operated.
24	At front of writing shelf— Connect test telephone set to ACCESS TRK-1 jack. ***Note:*** Telephone must be off-hook.	At test telephone set— Audible ring present. At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished.
25	At PERIPHERAL DECODER POINTS— Operate 5 key.	At PERIPHERAL DECODER POINTS— 5 lamp lighted.
26	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 extinguished when operator answers. At test telephone set— When operator answers, ask her to hold until Step 30 is completed. Operator will be automatically disconnected at that time. Audible ring present. At circuit under test— Relay F operated. Relays A, B, C, and D remain operated.
27	At PERIPHERAL DECODER POINTS— Release 3 key. Operate 4 key.	At PERIPHERAL DECODER POINTS— 3 lamp extinguished. 4 lamp lighted.
28	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensors 0 and 1 remain extinguished.

STEP	ACTION	VERIFICATION
		At test telephone set— Audible ring not present. Conversion possible between test telephone and operator. At circuit under test— Relays E and H operated. Relay D released. Relays A, B, C, and F remain operated.
29	At PERIPHERAL DECODER POINTS— Release 1 key.	At PERIPHERAL DECODER POINTS— 1 lamp extinguished.
30	Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 lighted. At test telephone set— Operator is disconnected. At circuit under test— Relays B and H released. Relays A, C, E, and F remain operated.
31	At front of writing shelf— Remove test telephone set connection from ACCESS TRK-1 jack.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 lighted.
32	Use the protector block assignment from 3.01 to locate and remove the protector block assigned to the outgoing trunk circuit. ***Note:*** In order to perform these tests, the tip and ring leads coming into the circuit must be open. If the trunk circuit does not appear at the protector frame, open the tip and ring leads into the trunk circuit in accordance with local procedures.	
33	At the protector frame— Use 2W6A cord to connect the trunk side appearance of the tip and ring of the outgoing trunk circuit to the SP jack nearest the protector frame. ***Note:*** No other connections should be made to the SP jack in the office. If voltage measurements cannot be made via the SP jack, connect test equipment to the trunk side appearance of the tip and ring instead of using SP jack.	
34	At PERIPHERAL DECODER POINTS— Release 0, 2, and 5 keys. Operate 3 key.	At PERIPHERAL DECODER POINTS— 0, 2, and 5 lamps extinguished. 3 lamp lighted.

STEP	ACTION	VERIFICATION
35	Depress AT 1 key.	At circuit under test— Relays A, C, and F released. Relay D operated. Relay E remains operated.
36	At front of writing shelf— Connect VOM to the SP jack using a 2W6A cord assembly. Use appropriate test leads to connect positive side of VOM to tip and negative side to ring wires of 2W6A cord assembly. (White wire on 2W6A cord assembly is tip and blue wire is ring.)	At VOM— Meter indicates between 42.75 and 52.50 volts on 60-volt scale.
37	Connect VOM between the tip of SP jack (positive) and GROUND (negative) using 2W6A cord. Set VOM to read +130 volts dc.	
38	At PERIPHERAL DECODER POINTS— Release 4 key.	At PERIPHERAL DECODER POINTS— 4 lamp extinguished.
39	Depress AT 1 key.	At VOM— Meter indicates between 125 and 135 volts. At circuit under test— Relay E released. Relay D remains operated.
40	At front of writing shelf— Move VOM connection from the tip of SP jack (positive) to the ring of SP jack.	At VOM— Meter indicates between 125 and 135 volts.
41	At PERIPHERAL DECODER POINTS— Release 3 key.	At PERIPHERAL DECODER POINTS— 3 lamp extinguished.
42	Depress AT 1 key.	At circuit under test— Relay D released.
43	At front of writing shelf— Remove 2W6A cord assembly from SP jack and VOM.	
44	At maintenance TTY— ▶For No. 2 ESS offices type in:◀ UB SY:CLB! ▶For No. 2B ESS offices type in: STOP:UTIL!◀ ***Note:*** If transmission loss measurements are to be performed, proceed to Test B.	

STEP	ACTION	VERIFICATION
45	At protector frame— Remove 2W6A cord from SP jack and the trunk side appearance of the tip and ring of the outgoing trunk circuit.	
46	Replace the protector blocks or connections opened in Step 32.	
47	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— SUPV lamp extinguished. EQPT ST lamp extinguished. VM lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
48	At telephone set on TTP— Operate green release key.	

B. Transmission Loss Measurements

Note: If Steps 45 thru 48 were omitted, omit Steps 7 and 8.

7 Use the protector block assignment from 3.01 to locate and remove the protector block assigned to outgoing trunk circuit.

Note: In order to perform these tests, the tip and ring leads coming into the circuit must be open. If the trunk circuit does not appear at the protector frame, open the tip and ring leads into the trunk circuit in accordance with local procedures.

8 At the protector frame—
Use 2W6A cord to connect the trunk side appearance of the tip and ring of the outgoing trunk circuit to the SP jack nearest the protector frame.

Note: No other connections should be made to the SP jacks in the office. If transmission measurements cannot be made via SP jack, connect test equipment to the trunk side appearance of the tip and ring instead of using SP jack.

9 At the front of writing shelf—
Use 2P4A cord to connect 0 DBM jack to SP jack.

STEP	ACTION	VERIFICATION
10	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
11	At TRANSMISSION MEASURING CONTROL— Set TEST SET switch to TMS position. Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position.	
12b	If TTP is not equipped with TMS— At front of writing shelf— Use 2P4A cord to connect external TMS to TM1 jack.	
13	At TMS— Set ADD DBM switch to 0 position.	
14	Set PD GROUP switch to 0-5 position.	
15	At PERIPHERAL DECODER POINTS— Operate 1 key.	At PERIPHERAL DECODER POINTS— 1 lamp lighted.
16	Depress AT 1 key.	At TMS— Meter indicates between 0 and −0.5 dB. Note level for reference use. At circuit under test— Relay B operated.
17	At PERIPHERAL DECODER POINTS— Operate 4 key.	At PERIPHERAL DECODER POINTS— 4 lamp lighted.
18	Depress AT 1 key.	At TMS— Meter indicates between 0 and 0.1 dB less than reference level in Step 16. At circuit under test— Relay E operated. Relay B remains operated.
19	At PERIPHERAL DECODER POINTS— Operate 2 key.	At PERIPHERAL DECODER POINTS— 2 lamp lighted.
20	Depress AT 1 key.	At TMS— Meter indicates between 0 and 0.5 dB less than reference level in Step 16. At circuit under test— Relay C operated. Relays B and E remain operated.
21	At PERIPHERAL DECODER POINTS— Opeate 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp lighted.
22	Depress AT 1 key.	At TMS— Meter indicates between 0 and 0.85 dB less

STEP	ACTION	VERIFICATION
		than reference level in Step 16. At circuit under test— Relay A operated. Relays B, C, and E remain operated.
23	At PERIPHERAL DECODER POINTS— Release 0, 1, 2, and 4 keys.	At PERIPHERAL DECODER POINTS— 0, 1, 2, and 4 lamps extinguished.
24	Depress AT 1 key.	At circuit under test— Relays A, B, C, and E released.
25	At front of writing shelf— Remove 2P4A cord from SP jack and 0 DBM jack.	
26b'	If TTP is not equipped with TMS— Remove 2P4A cord from TM1 jack and external TMS.	
27	At protector frame— Remove 2W6A cord from SP jack and the trunk side appearance of the tip and ring of the outgoing trunk circuit.	
28	Replace the protector blocks or connections opened in Step 7.	
29	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— SUPV lamp extinguished. EQPT ST lamp extinguished. XMSN lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
30	At telephone set— Operate green release key.	