JUNCTOR CIRCUIT (SD-2H102)

TESTS

NO. 2 AND NO. 2B ELECTRONIC SWITCHING SYSTEMS

1. GENERAL

1.01 This section describes the method of testing the junctor circuit (SD-2H102) used in the No. 2 and No. 2B Electronic Switching Systems (ESS).

1.02 This section is reissued to include changes due to the EF-2 and 2B-EF-2 generic programs.

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 junctor circuit.

B. Transmission Loss Measurement: This test verifies the transmission loss of the junctor circuit in the talk state.

1.04 The junctor circuit tests are performed 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. 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 insure 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 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.

2. APPARATUS

2.01 A 262C-type (900 ohm) plug.

2.02 Headset for receiving only, with a 310 plug on the end.

2.03 Transmission measuring set (TMS), 23D, or equivalent. Equivalent apparatus must be capable of measuring power in a 900-ohm circuit at 1 kHz. The accuracy must be ±0.1 dB at 1 kHz at normal room temperature and the range must be from -15 dBm to +10 dBm at 1 kHz.

2.04 A 2P4A cord assembly consisting of a P2B cord 3 feet long and two 310 plugs.

Note: 2.03 and 2.04 will not be required if the TTP is equipped with a TMS.

3. PREPARATION

3.01 Refer to the office records to obtain the NN_A, NN_B, S_A, L_A, G_A, and supervisory scan point number (SPN) of the circuit to be tested.

Where:

NN_A = Network number A

NN_B = Network number B

S_A = Switch A

L_A = Level A

G_A = Grid A

Note: NN_A, S_A, L_A, G_A, comprise the junctor network number (JNN) for the A network appearance of the junctor circuit.

3.02 Use the following procedure to make the junctor circuit traffic busy and to connect it to the TTP.

Note: Connection to a junctor circuit must be initiated on access trunk 1. In addition, access trunk 2 must be idle. Both ends of the junctor circuit to be tested will be connected to the TTP, one end on access trunk 1 and the other on access trunk 2. See Fig. 1.

STEP	ACTION	VERIFICATION
All Tests		
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 3 + NN_A, NN_B, S_A, L_A, G_A + ST.	At ACCESS TRUNK 2 CONTROL— SUPV lamp lighted. At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. ***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— 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.

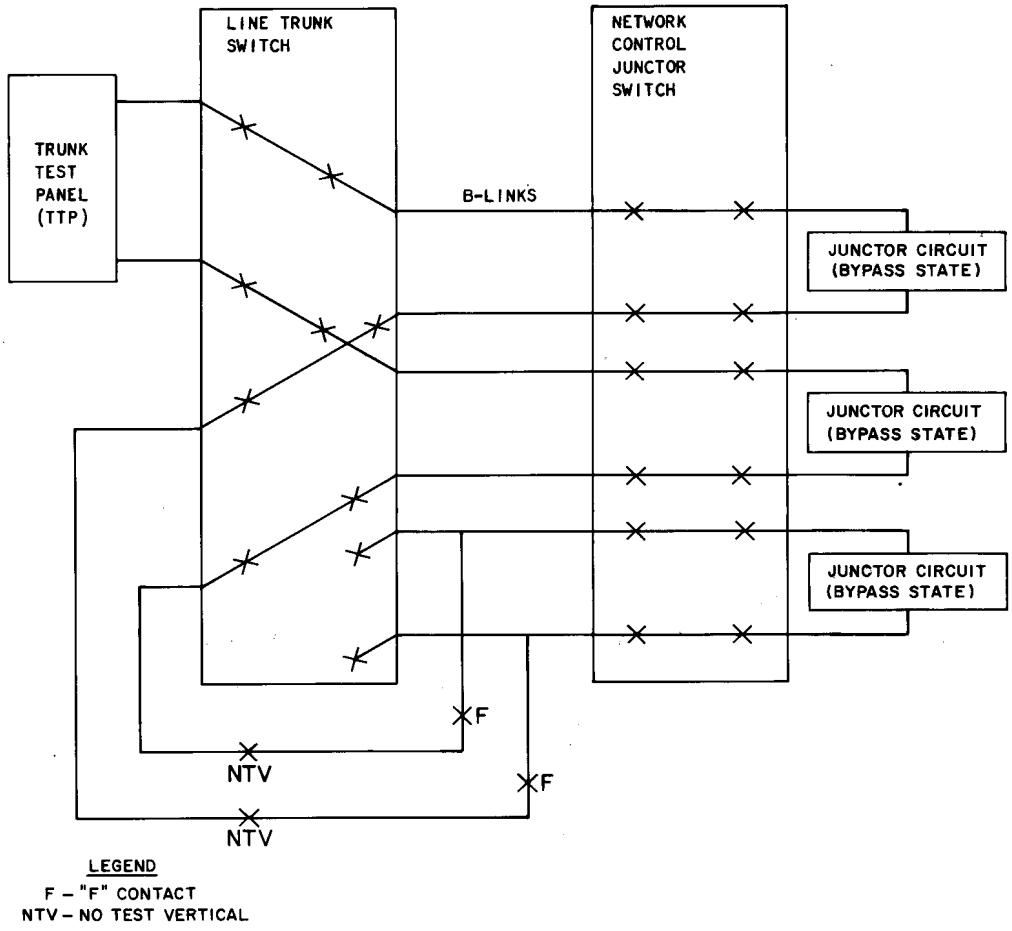

Fig. 1—Typical Test Configuration Using Trunk Test Panel When Testing a Junctor Circuit

4. METHOD

4.01 If the verification procedure fails or if a malfunctioning circuit is indicated during any part of these tests, proceed as follows.

(1) Discontinue the test.

(2) Troubleshoot the circuit which failed. See Fig. 2.

(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	From the SPN obtained in 3.01, determine the number of the trunk scanner, the number of the scanner row, and the bit numbers associated with ferrod sensor 0 and 1 of the junctor circuit to be tested.	
8	At maintenance TTY— For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner in decimal (00-11) from Step 7. rr = Number of scanner row to be displayed in decimal (00-63) from Step 7. For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner in decimal (00-11 for the 2B-EF-1 generic program) or (00-30 for the 2B-EF-2 generic program) from Step 7. rr = Number of scanner row to be displayed in decimal (00-63) from Step 7. RDT LAMPS = Direct the results to the DISPLAY BUFFER.	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.
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.	FEMF lamp lighted. At VOLTMETER— Meter indicates 0.

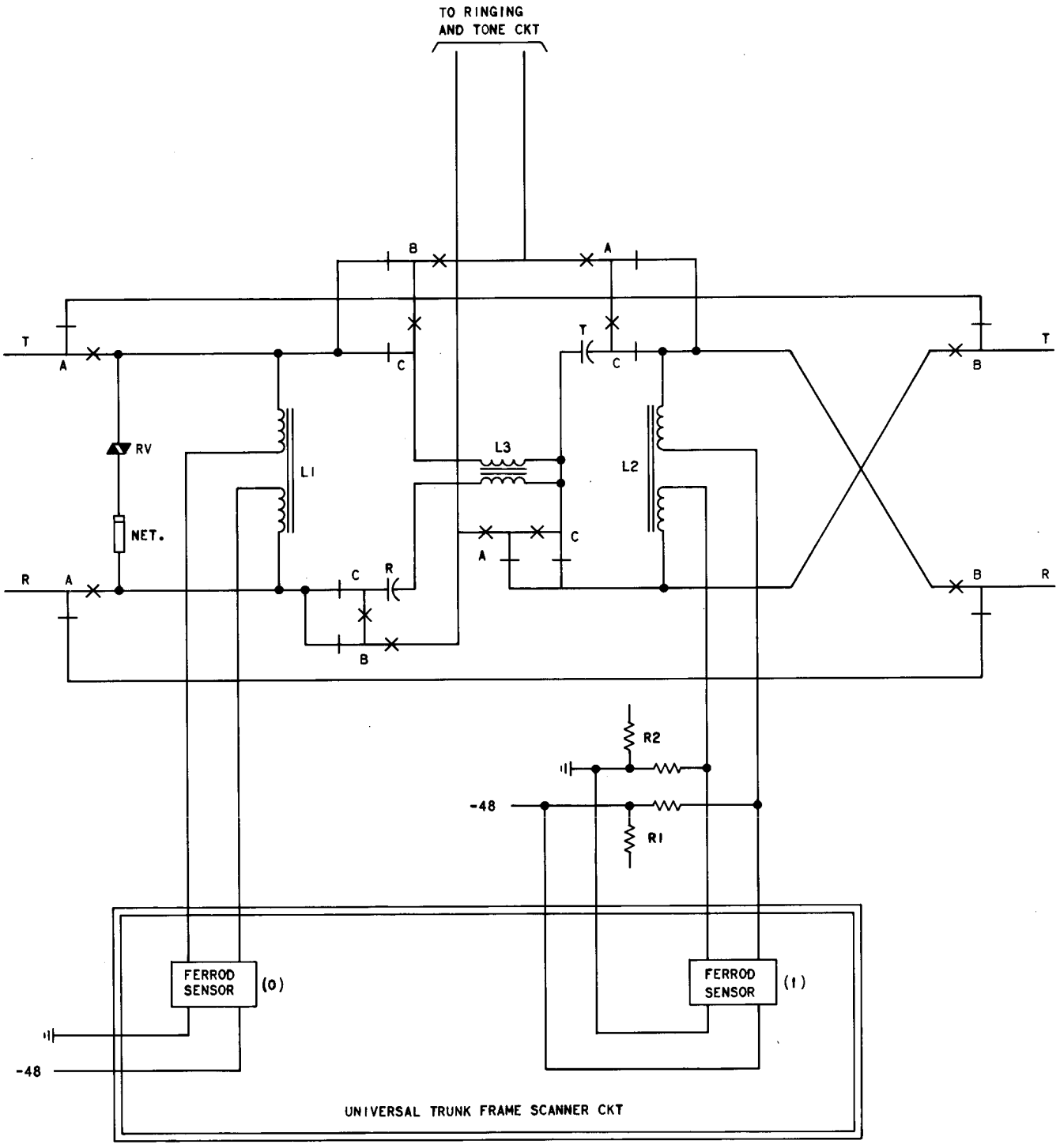

Fig. 2—Junctor Circuit (SD-2H102)

STEP	ACTION	VERIFICATION
12	Release TR REV key.	TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
13	Depress MET VM key.	FEMF lamp extinguished. MET VM lamp lighted.
14	♦At STATE CHANGE CONTROL— Set PD GROUP switch to 0-5 position.♦	
15	At PERIPHERAL DECODER POINTS— Operate 0, 1, and 2 keys.	PERIPHERAL DECODER POINTS— 0, 1, and 2 lamps lighted.
16	Depress AT 1 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale. At circuit under test— Relays A, B, and C operated.
17	At PERIPHERAL DECODER POINTS— Release 0 and 2 keys.	PERIPHERAL DECODER POINTS— 0 and 2 lamps extinguished.
18	Depress AT 1 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale At circuit under test— Relays A and C released. Relay B remains operated.
19	At front of writing shelf— Insert No. 262C-type (900 ohm) plug into ACCESS TRK-1 jack.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 extinguished.
20	Remove No. 262C-type (900 ohm) plug from ACCESS TRK-1 jack.	Lamp associated with ferrod sensor 1 lighted.
21	At PERIPHERAL DECODER POINTS— Release 1 key.	PERIPHERAL DECODER POINTS— 1 lamp extinguished.
22	Depress AT 1 key.	At circuit under test— Relay B released.
23	At ACCESS TRUNK 1 CONTROL— Depress HOLD key.	At ACCESS TRUNK 1 CONTROL— HOLD lamp lighted. VM lamp extinguished. At VOLTMETER CONTROL— MET VM lamp extinguished.
24	At ACCESS TRUNK 2 CONTROL— Depress VM key.	At ACCESS TRUNK 2 CONTROL— VM lamp lighted. At VOLTMETER CONTROL— 100K lamp lighted.

STEP	ACTION	VERIFICATION
25	At VOLTMETER CONTROL— Depress MET VM key.	MET VM lamp lighted.
26	At PERIPHERAL DECODER POINTS— Operate 0 key.	PERIPHERAL DECODER POINTS— 0 lamp lighted.
27	Depress AT 2 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale. At circuit under test— Relay A operated.
28	At front of writing shelf— Insert No. 262C-type (900 ohm) plug into ACCESS TRK-2 jack.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished.
29	Remove No. 262C-type (900 ohm) plug from ACCESS TRK-2 jack.	Lamp associated with ferrod sensor 0 lighted.
30	At PERIPHERAL DECODER POINTS— Release 0 key.	PERIPHERAL DECODER POINTS— 0 lamp extinguished.
31	Depress AT 2 key.	At circuit under test— Relay A released.
32	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— Depress XMSN keys.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. HOLD lamp extinguished. At ACCESS TRUNK 2 CONTROL— XMSN lamp lighted. VM lamp extinguished. At VOLTMETER CONTROL— MET VM lamp extinguished.
33	At front of writing shelf— Insert headset into ACCESS TRK-1 jack.	
34	At PERIPHERAL DECODER POINTS— Operate 1 and 2 keys.	PERIPHERAL DECODER POINTS— 1 and 2 lamps lighted.
35	Depress AT 1 key.	At headset— Audible ring tone present. At circuit under test— Relays B and C operated.
36	At front of writing shelf— Move headset from ACCESS TRK-1 jack to ACCESS TRK-2 jack.	
37	At PERIPHERAL DECODER POINTS— Release 1 key. Operate 0 key.	PERIPHERAL DECODER POINTS— 1 lamp extinguished. 0 lamp lighted.

STEP	ACTION	VERIFICATION
38	Depress AT 1 key.	At headset— Audible ring tone present. At circuit under test— Relay B released. Relay A operated. Relay C remains operated.
39	At PERIPHERAL DECODER POINTS— Release 0 and 2 keys.	PERIPHERAL DECODER POINTS— 0 and 2 lamps extinguished.
40	Depress AT 1 key.	At circuit under test— Relays A and C released.
41	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— Depress RLS keys.	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— XMSM lamps extinguished. SUPV lamps extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
42	At front of writing shelf— Remove headset from ACCESS TRK-2 jack.	
43	At maintenance TTY— For No. 2 ESS offices type in: UB SY:CLB! ▶For No. 2B ESS offices type in: STOP:UTIL!◀	At DISPLAY BUFFER— Ferrod sensor display removed.

B. Transmission Loss Measurements

	Note: Repeat Steps 1 through 6.	
7	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— Depress XMSN keys.	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— XMSN lamps lighted.
8	At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 2.	
9b	If TTP is equipped with a TMS— At TRANSMISSION MEASURING CONTROL— Set TEST SET switch to TMS.	
10c	If TTP is not equipped with a TMS— Use the 2P4A cord assembly to connect 23D TMS to the TM2 jack at the front of the writing shelf on TTP. Set DIAL MEAS EXT switch to MEAS.	

STEP	ACTION	VERIFICATION
11	At TMS— Set ADD DBM switch to 0 position.	
12	At TRANSMISSION MEASURING CONTROL— Set SEND switch to 0 DBM-1KHZ position.	At TMS— Meter indicates 0 to -1.0 dB. Record this level for use as a reference level in Step 14.
13	At PERIPHERAL DECODER POINTS— Operate 0 and 1 keys.	PERIPHERAL DECODER POINTS— 0 and 1 lamps lighted.
14	Depress AT 1 key.	At TMS— Meter indicates 0 to 0.4 dB less than in Step 12. At circuit under test— Relays A and B operated.
15	At PERIPHERAL DECODER POINTS— Release 0 and 1 keys.	PERIPHERAL DECODER POINTS— 0 and 1 lamps extinguished.
16	Depress AT 1 key.	At circuit under test— Relays A and B released.
17	Remove any test connections.	
18	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— Depress RLS keys.	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— XMSM lamps extinguished. SUPV lamps extinguished. EQPT ST lamps extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
19	At TRANSMISSION MEASURING CONTROL— Set SEND switch to OFF position. Set MEASURE switch to OFF position.	
20	At telephone set on TTP— Operate green release key.	