TRANSMISSION TEST TERMINATION CIRCUITS (SD-2H185) TESTS— NO. 2 AND NO. 2B ELECTRONIC SWITCHING SYSTEMS

CONTENTS PAGE

1. GENERAL

1.01 This section describes the method of testing the transmission test termination circuits (SD-2H185) used in the No. 2 and No. 2B Electronic Switching Systems (ESS). The transmission test terminaton circuits consist of two types: short-circuit termination and open-circuit termination. Each termination circuit provides line testing and trunk testing.

1.02 This section is reissued to cover the No. 2B ESS. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

A. Short-Circuit Termination

1.03 ***Line Testing:*** When testing a local line for short-circuit termination, relay A0 is operated by the peripheral decoder (PD) circuit placing the line in the short circuit test state (State 1). Figure 1 shows the current path when A0 is operated.

1.04 ***Trunk Testing:*** When testing a trunk from a distant office, relay B0 is first operated by the PD circuit for a continuity check (State 2) when the short-circuit termination test is requested (Fig. 2). After the continuity check state has been set, program control allows relay A0 to be operated placing the trunk in the short-circuit termination test state (State 3). See Fig. 3.

B. Open-Circuit Termination

1.05 ***Line Testing:*** When testing a local line for open-circuit termination, relay A1 is operated by the PD circuit placing the line in the open-circuit test state (state 1) as shown in Fig. 4.

1.06 ***Trunk Testing:*** When a distant office is connected to this termination, relay B1 is operated placing the circuit in state 2 (Fig. 5—continuity check). Relay A1 is then allowed to be operated by program control placing the circuit in state 3 (Fig. 6). State 3 is the open-circuit termination test for the incoming trunk.

1.07 The tests in this section are to be performed when a malfunction of one of the circuits is suspected.

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 The tests will be performed from the trunk test panel (TTP) in conjunction with the display buffer and teletypewriter (TTY). The keys on the TTP may be either a locking or 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. For more detailed information about the TTP and its operation, refer to Section 232-130-301, Trunk Test Panel—Method of Operation.

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

1.10 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 and 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 a 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.

2. APPARATUS

2.01 One 262B-type plug.

3. PREPARATION

3.01 Refer to office records to obtain the circuit identifying digit (CID), trunk group number (TGN), member number (MEMN), and scan point number (SPN) of the transmission test termination circuits to be tested.

3.02 Verify SPN for the short-circuit test termination circuits under test obtained from office records as follows:

At maintenance TTY type in:

A VY:SVC:aaa bbb!

aaa = TGN

bbb = MEMN

The system response is as follows:

AR VY SVC aaa bbb
TEN nn gcsl
PDB cxzy b
SPN ss rrbb

ss = scanner number

rr = row number

bb = bit in row.

The bb field represents the first ferrod (0) in the scanner row; all other ferrods follow in consecutive order, i.e., (0, 1, 2, etc).

3.03 Repeat 3.02 to verify the open-circuit termination circuit obtained from office records.

3.04 For all tests, use the following procedure for gaining access to the circuit under test.

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 to gain access to the short-circuit termination.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute.

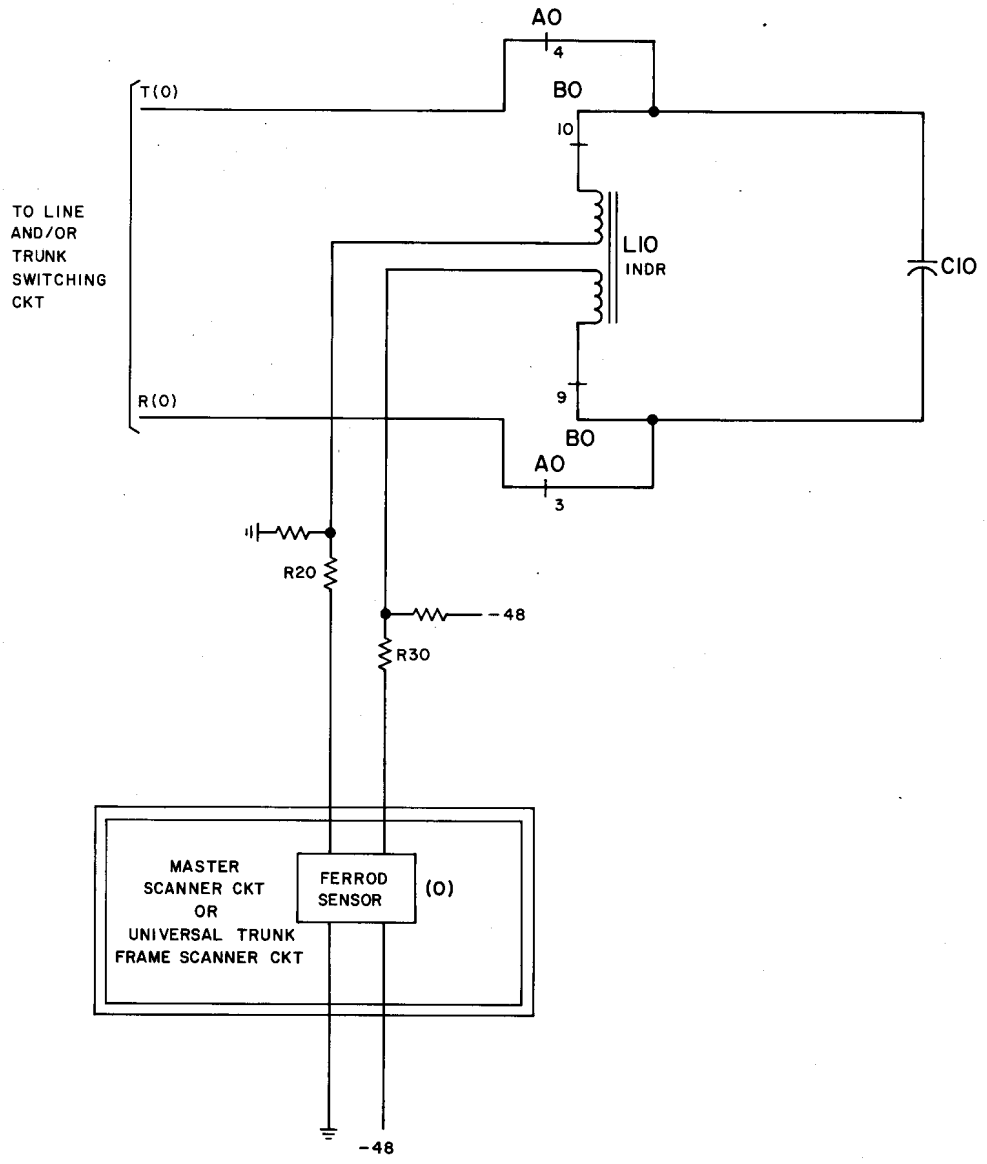


Fig. 1—Short Circuit Termination Circuit (State 1)

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.

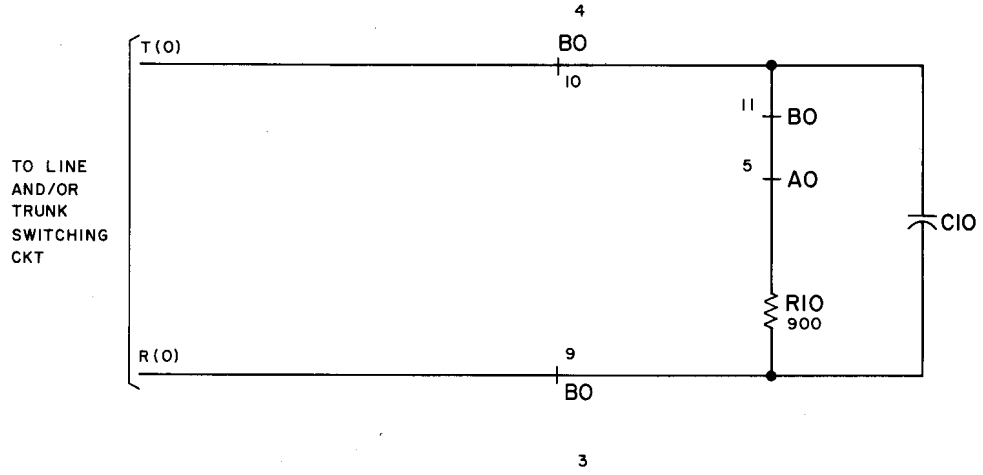


Fig. 2—Short Circuit Termination Circuit (State 2)

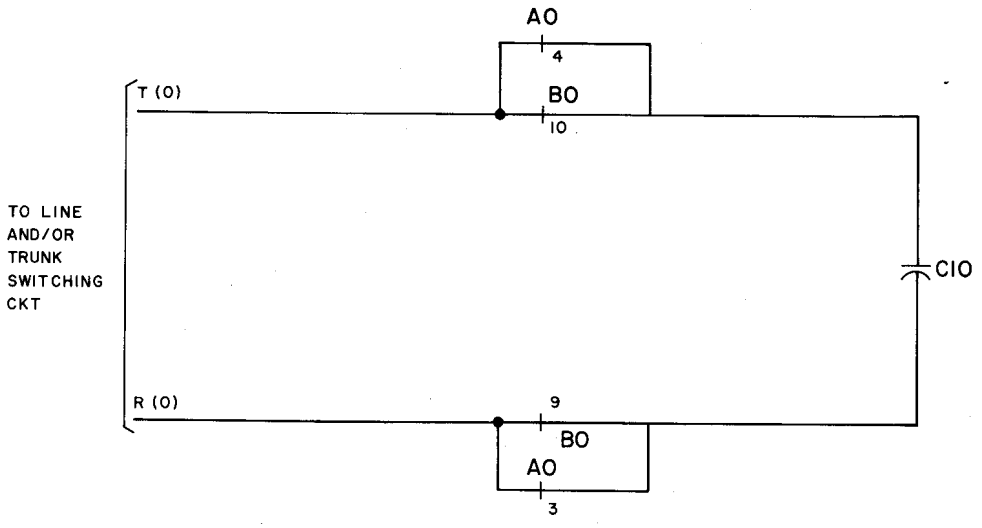


Fig. 3—Short Circuit Termination Circuit (State 3)

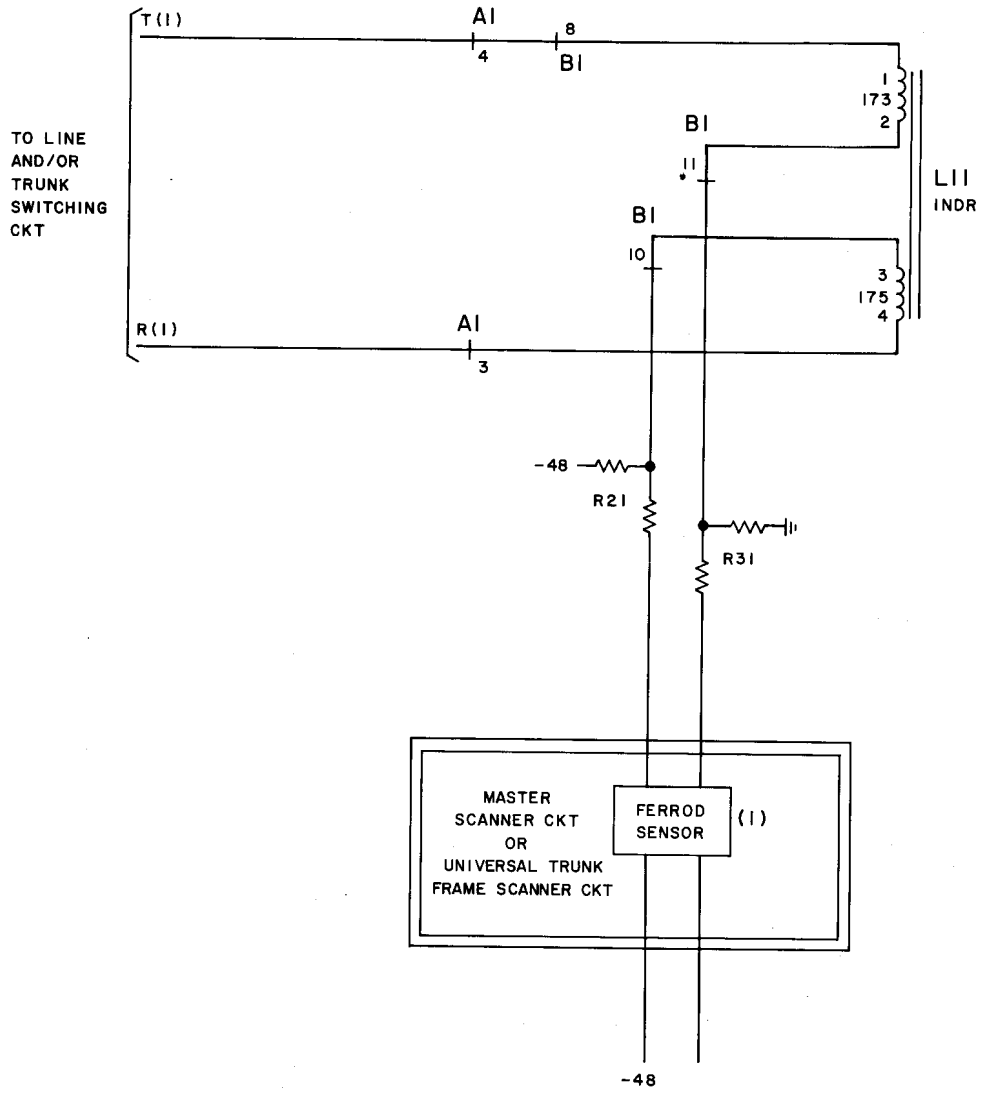


Fig. 4—Open Circuit Termination Circuit (State 1)

STEP	ACTION	VERIFICATION
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.

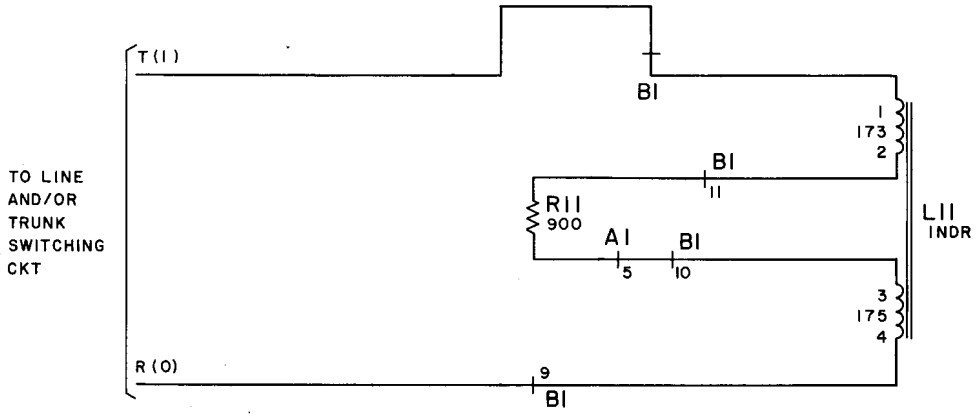
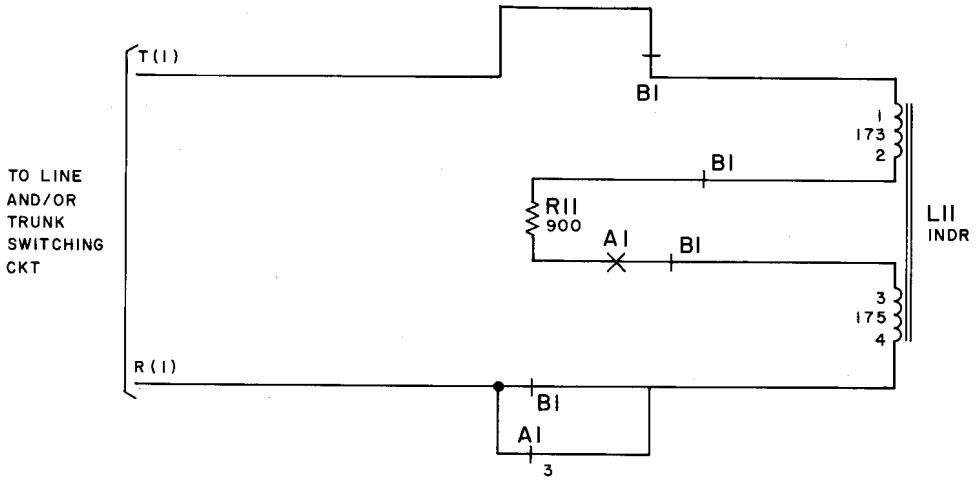


Fig. 5—Open Circuit Termination Circuit (State 2)



NOTE:
NO CURRENT PATH IS AVAILABLE WHILE RELAYS A AND B ARE OPERATED AT THE SAME TIME.

Fig. 6—Open Circuit Termination Circuit (State 2)

STEP	ACTION	VERIFICATION
		At TEL CKT— TRFR lamp extinguished.
7	At telephone set— Operate access trunk 2 key.	At MISC TEST CONTROL— P & E lamp remains lighted.
8	Lift handset off-hook or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 2 lamp lighted. At ACCESS TRUNK 2 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
9	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST to gain access to the open-circuit termination.	At 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 connecctted to the circuit to be tested.
10b	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 2 CONTROL— Depress RLS key.	
11b	Repeat Steps 9 and 10b until connection is successful.	
12	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 2 lamp extinguished. At TEL CKT— TRFR lamp extinguished.

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.

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

(4) Repeat the test that failed. If verification is successful, continue the test.

TRANSMISSION TEST TERMINATIONS CIRCUIT (SD-2H185) TESTS

STEP	ACTION	VERIFICATION
A. Short-Circuit Termination Test		
13	At ACCESS TRUNK 1 CONTROL— Depress VM key.	At ACCESS TRUNK 1 CONTROL— VM lamp lighted.

STEP	ACTION	VERIFICATION
		At VOLTMETER CONTROL— 100K lamp lighted.
14	At VOLTMETER CONTROL— Operate GRD key.	At VOLTMETER CONTROL— GRD lamp lighted. At VOLTMETER— Meter indicates 0. A deflection on voltmeter indicates a resistance between the tip and ring leads.
15	At VOLTMETER CONTROL— Operate TR REV key.	At VOLTMETER CONTROL— TR REV lamp lighted. At VOLTMETER— Meter indicates 0.
16	At VOLTMETER CONTROL— Depress FEMF key.	At VOLTMETER CONTROL— FEMF lamp lighted. 100K lamp extinguished. At VOLTMETER— Meter indicates 0.
17	At VOLTMETER CONTROL— Release TR REV key.	At VOLTMETER CONTROL— TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
18	At VOLTMETER CONTROL— Release GRD key.	At VOLTMETER CONTROL— GRD lamp extinguished. FEMF lamp remains lighted. At VOLTMETER— Meter indicates 0.
19	At VOLTMETER CONTROL— Depress MET VM key.	At VOLTMETER CONTROL— MET VM lamp lighted. FEMF lamp extinguished. At VOLTMETER— Meter indicates 0.
20	At STATE CHANGE CONTROL— Set PD GROUP switch to 0-5 position.	
21	Use TTY printout information from 3.02 as input for the following message.	
22	At maintenance TTY— For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner in decimal (0-11). rr = Number of scanner row to be displayed in decimal (0-63).	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 for short circuit termination is displayed on display buffer and is lighted.

STEP	ACTION	VERIFICATION
	For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner in decimal (0-11) rr = Number of scanner row to be displayed in decimal (0-63) RDT LAMPS = Direct the result to the DISPLAY BUFFER.	
23	At PERIPHERAL DECODER POINTS— Operate 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp lighted.
24	At PERIPHERAL DECODER POINTS— Depress AT 1 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale.
25	At front of writing shelf on TTP— Insert 262B type plug into ACCESS TRK 1 jack. ***Note:*** Voltmeter is disconnected from the circuit when ACCESS TRK-1 jack is used.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished At circuit under test— Relay A0 operated.
26	At PERIPHERAL DECODER POINTS— Operate 1 key.	At PERIPHERAL DECODER POINTS— 1 lamp lighted. 0 lamp remains lighted.
27	At PERIPHERAL DECODER POINTS— Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 lighted. At circuit under test— Relay B0 operated. Relay A0 remains operated.
28	At PERIPHERAL DECODER POINTS— Release 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 lamp extinguished. 1 lamp extinguished.
29	At PERIPHERAL DECODER POINTS— Depress AT 1 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 remains lighted. At circuit under test— Relay A0 released. Relay B0 released.
30	At maintenance TTY— For No. 2 ESS offices type in: UB SY:CLB!	At DISPLAY BUFFER— Ferrod sensor lamp display cleared from DISPLAY BUFFER.
	For No. 2B ESS offices type in: STOP:UTIL!	

STEP	ACTION	VERIFICATION
31	At front of writing shelf on TTP— Remove 262B type plug from ACCESS TRK-1 jack.	
32	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— VM lamp extinguished. EQPT ST lamp extinguished. At VOLTMETER CONTROL— MET VM lamp extinguished.

B. Open-Circuit Termination Test

13	At ACCESS TRUNK 2 CONTROL— Depress VM key.	At ACCESS TRUNK 2 CONTROL— VM lamp lighted. At VOLTMETER CONTROL— 100K lamp lighted.
14	At VOLTMETER CONTROL— Operate GRD key.	At VOLTMETER CONTROL— GRD lamp lighted. At VOLTMETER— Meter indicates 0. A deflection on the voltmeter indicates a resistance between the tip and ring leads.
15	At VOLTMETER CONTROL— Operate TR REV key.	At VOLTMETER CONTROL— TR REV lamp lighted. At VOLTMETER— Meter indicates 0.
16	At VOLTMETER CONTROL— Depress FEMF key.	At VOLTMETER CONTROL— FEMF lamp lighted. 100K lamp extinguished. At VOLTMETER— Meter indicates 0.
17	At VOLTMETER CONTROL— Release TR REV key.	At VOLTMETER CONTROL— TR REV lamp extinguished. At VOLTMETER— Meter indicates 0.
18	At VOLTMETER CONTROL— Release GRD key.	At VOLTMETER CONTROL— GRD lamp extinguished. FEMF lamp remains lighted. At VOLTMETER— Meter indicates 0.
19	At VOLTMETER CONTROL— Depress MET VM key.	At VOLTMETER CONTROL— MET VM lamp lighted. FEMF lamp extinguished At VOLTMETER— Meter indicates 0.

STEP	ACTION	VERIFICATION
20	At STATE CHANGE CONTROL— Set PD GROUP switch to the 0-5 position.	
21	Use TTY printout information from 3.02 as input for the following message.	
22	At maintenance TTY— For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner in decimal (0-11). rr = Number of scanner row to be displayed in decimal (0-63). For No. 2B ESS offices type in: MON:TSSN ssrr;RDT LAMPS! ss = Number of trunk scanner in decimal (0-11) rr = Number of scanner row to be displayed in decimal (0-63). RDT LAMPS = Direct the result to the DISPLAY BUFFER.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 for open-circuit termination is displayed on display buffer and is lighted.
23	At PERIPHERAL DECODER POINTS— Operate 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp lighted.
24	At PERIPHERAL DECODER POINTS— Depress AT 2 key.	At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on the 120-volt scale.
25	At front of writing shelf on TTP— Insert 262B type plug into ACCESS TRK-2 jack. ***Note:*** Voltmeter is disconnected from the circuit when ACCESS TRK-2 jack is used.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 extinguished indicating relay A1 at circuit under test is operated.
26	At PERIPHERAL DECODER POINTS— Operate 1 key.	At PERIPHERAL DECODER POINTS— 1 lamp lighted. 0 lamp remains lighted.
27	At PERIPHERAL DECODER POINTS— Depress AT 2 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 lighted. At circuit under test— Relay B1 operated. Relay A1 remains operated.
28	At PERIPHERAL DECODER POINTS— Release 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 lamp extinguished. 1 lamp extinguished.

STEP	ACTION	VERIFICATION
29	At PERIPHERAL DECODER POINTS— Depress AT 2 key.	At DISPLAY BUFFER— Lamp associated with ferrod sensor 1 remains lighted. At circuit under test— Relay A1 released. Relay B1 released.
30	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 lamp display cleared from DISPLAY BUFFER.
31	At front of writing shelf on TTP— Remove 262B type plug from ACCESS TRK-2 jack.	
32	At ACCESS TRUNK 2 CONTROL— Depress RLS key.	At ACCESS TRUNK 2 CONTROL— VM lamp extinguished. EQPT ST lamp extinguished. At VOLTMETER CONTROL— MET VM lamp extinguished.
33	At telephone set— Operate green release key.	At ACCESS TRUNK 1 and 2 CONTROL— SUPV lamps extinguished. At MISC TEST CONTROL— P & E lamp extinguished.