DIAL PULSE RECEIVER
TEST CIRCUIT SD-2H133 TESTS
NO. 2/2B ELECTRONIC SWITCHING SYSTEM

1. GENERAL

1.01 This section describes the method of testing the dial pulse receiver (DPR) test circuit SD-2H133 used in the No. 2/2B Electronic Switching System (ESS).

1.02 This section is reissued to modify the pulsing verification test. Change arrows are used to denote significant changes.

1.03 The DPR test circuit SD-2H133 is used to test customer dial pulse receivers (CDPRs) and trunk dial pulse receivers (TDPRs). The DPR test circuit is physically located on a miscellaneous trunk frame (MTF).

1.04 Test B of this section is to be performed on a periodic basis as prescribed in the Equipment Test List. Tests A through C are to be performed whenever a malfunction of the circuit is suspected.

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

1.06 The tests will be performed from the trunk test panel (TTP) in conjunction with the maintenance display buffer and teletypewriter (TTY). 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. 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.

1.07 The tests covered are:

A. Testing Scan Point Operation: This test checks the operation of the test circuit ferrods from the trunk test panel (TTP) in conjunction with the maintenance display buffer.

B. Pulsing Verification Test: This test checks that the test circuit can generate test pulses of the proper frequency and percent break.

C. DC Voltage Test: This test checks that the required -48 Vdc is present across the tip and ring of the dial pulse receiver test circuit.

1.08 The DPR test circuit tests are to be performed on a periodic basis or when malfunction of the circuit is suspected. Malfunction of the DPR test circuit is suspected when the periodic tests indicate failure of a large number of CDPRs and/or TDPRs having the same trouble locating number (refer to Trouble Locating Manual, TLM-2H100-01).

2. APPARATUS

Note: Equivalent apparatus may be substituted.

2.01 A 50-ohm coaxial cable, 6 feet long, terminated on one end with a UG-88C/U BNC male connector and two alligator clips on the other end.

2.02 Hewlett-Packard 5233L, 5216A, or 5326A electronic counter (frequency counter).

2.03 A 2W17A cord assembly consisting of a W2C cord 6 feet long, a 310 plug, a 360B and a 360C tool.

2.04 Three 411C test picks for connections to pin jacks.

3. PREPARATION

3.01 Refer to the office data administration (ODA) forms and the office records to obtain the trunk group number (TGN=40), member number (MEMN), and scan point number (SPN) of the DPR test circuit. Use the following procedure to make the DPR test circuit maintenance busy and connect it to the TTP (Fig. 1 and 2).

All Tests

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	At telephone set— Access trunk lamp lighted.
2	Lift handset off-hook or operate TRFR key at TEL CKT on TTP if using headset.	At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. Dial tone received or TRFR lamp lighted.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST. (Digit information is available in office records.)	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 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 the 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 step which failed. If verification indicates that the faulty circuit has been repaired, continue the test.

A. Testing Scan Point Operation

STEP	ACTION	VERIFICATION
7	From office records, determine the number of the trunk scanner and the number of the scanner row associated with the trunk group and member number.	
8	At maintenance TTY— For No. 2 ESS offices, type in: UBRL TS:RSN:aabb! aa= Number of trunk scanner in decimal (00-11) from Step 1. bb= 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 2B-EF-1 generic program) or (00-30 for 2B-EF-2 or later generic programs) from Step 7. rr = Number of scanner row in decimal (00-63) from Step 7. RDT LAMPS = Direct the result to the DISPLAY BUFFER.	At DISPLAY BUFFER— Scanner row containing specified scan point displayed on DISPLAY BUFFER lamps. Lamp associated with ferrod of interest will light if ferrod is unsaturated.
9	At STATE CHANGE CONTROL — Set PD GROUP switch to 0-5 position.	
10	At PERIPHERAL DECODER POINTS— Operate 3 and 4 keys.	At PERIPHERAL DECODER POINTS— 3 and 4 lamps lighted.
11	Depress AT 1 key.	At trunk circuit— Relays D and E operated. At DISPLAY BUFFER— Lamp associated with ferrod of interest extinguished.
12	At PERIPHERAL DECODER POINTS— Release 3 and 4 keys.	At PERIPHERAL DECODER POINTS— 3 and 4 lamps extinguished.
13	Depress AT 1 key.	At trunk circuit— Relays D and E released. At DISPLAY BUFFER— Lamp associated with ferrod lighted.
14	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— Scanner row is no longer displayed on DISPLAY BUFFER lamps.

STEP	ACTION	VERIFICATION
15	At ACCESS TRUNK 1 CONTROL unit on TTP— Depress RLS key.	SUPV lamp extinguished. EQPT ST lamp extinguished.
16	At telephone set on TTP— Operate green release key.	Access trunk 1 released.

B. Pulsing Verification Test

7	Connect 411C test picks to the 360C (white lead) and the 360B (black lead) of the 2W17A cord assembly.	
8	At front of writing shelf on TTP— Insert 310 plug of 2W17A cord assembly into ACCESS TRUNK 1 jack.	
9	Below writing shelf at the right-hand side of the TTP frame— Insert the 411 tool that is attached to the 360C (white lead) of 2W17A cord assembly into the -48 jack.	
10	Insert the 411 tool that is attached to the 360B (black lead) of 2W17A cord assembly into the HRG jack.	
11	Insert a 411C tool into the GRD jack.	
12	Using the coaxial cable described in paragraph 2.01, connect the BNC connector to the electronic counter and the alligator clips to the 411C tools in the GRD and HRG jacks.	

State 12—12.69 pps at 50.8% Break

13	At STATE CHANGE CONTROL unit on TTP— Set PD GROUP switch to 0-5 position.	
14	At PERIPHERAL DECODER POINTS— Operate 1, 3, and 5 keys.	At PERIPHERAL DECODER POINTS— 1, 3, and 5 lamps lighted.
15	Depress AT 1 key.	Relays B and D operated.
16	At electronic counter— Observe ◗make◖ time of pulse train. ***Note:*** Counter is set to start timing on the negative going slope and stop on the positive going slope.	Digital display indicates 38.8 ms (±2.0 ms) make time.

STEP	ACTION	VERIFICATION
17	Observe ▶break◀ time of pulse train. ***Note:*** Counter is set to start timing on the positive going slope and stop on the negative going slope).	Digital display indicates 40.0 ms (±2.0 ms) break time.
State 3—12.69 pps at 71.4% Break		
18	At PERIPHERAL DECODER POINTS — Operate 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp lighted.
19	Depress AT 1 key.	
20	At electronic counter— Observe break time of pulse train ▶(Step 17).◀	Digital display indicates 56.3 ms (±2.0 ms) break time.
21	Observe make time of pulse train ▶(Step 16).◀	Digital display indicates 22.5 ms (±2.0 ms) make time.
State 10—20.5 pps at 69.2% Break		
22	At PERIPHERAL DECODER POINTS— Release 0 and 1 keys.	At PERIPHERAL DECODER POINTS— 0 and 1 lamps extinguished.
23	Depress AT 1 key.	
24	At electronic counter— Observe break time of pulse train ▶(Step 17).◀	Digital display indicates 33.8 ms (±2.0 ms) break time.
25	Observe make time to pulse train ▶(Step 16).◀	Digital display indicates 15.0 ms (±2.0 ms) make time.
State 11—20.5 pps at 53.85% Break		
26	At PERIPHERAL DECODER POINTS— Operate 0 key.	At PERIPHERAL DECODER POINTS— 0 lamp lighted.
27	Depress AT 1 key.	
28	At electronic counter— Observe break time of pulse train ▶(Step 17).◀	Digital display indicates 26.3 ms (±2.0 ms) break time.
29	Observe make time of pulse train ▶(Step 16).◀	Digital display indicates 22.5 ms (±2.0 ms) make time.
30	At PERIPHERAL DECODER POINTS— Release 0, 3, and 5 keys.	At PERIPHERAL DECODER POINTS— 0, 3, and 5 lamps extinguished.
31	Depress AT 1 key.	
32	Remove all connections made in Steps 7, 8, 9, 10, and 11.	

STEP	ACTION	VERIFICATION
33	At ACCESS TRUNK 1 CONTROL on TTP— Depress RLS key.	SUPV lamp extinguished. EQPT ST lamp extinguished.
34	At telephone set on TTP— Operate green release key.	AT 1 lamp extinguished.

C. DC Voltage Test

Perform Voltage Test

7	At ACCESS TRUNK 1 CONTROL on TTP— Depress VM key.	VM key lamp lighted. At VOLTMETER CONTROL panel— 100K key lamp lighted.
8	Depress FEMF key.	FEMF key lamp lighted. 100K key lamp extinguished.
9	At STATE CHANGE CONTROL— Set PD GROUP switch to 0-5 position.	
10	At PERIPHERAL DECODER POINTS— Operate 1 and 2 keys.	At PERIPHERAL DECODER POINTS— 1 and 2 key lamps lighted.
11	Depress AT 1 key.	Relays B and C operated. At VOLTMETER— Voltmeter indicates 48 volts.

Terminate Voltage Test

12	At PERIPHERAL DECODER POINTS— Release 1 and 2 keys.	At PERIPHERAL DECODER POINTS— 1 and 2 lamps extinguished.
13	At telephone set on TTP— Depress AT 1 key.	AT 1 key lamp extinguished. At VOLTMETER— Voltmeter indicates 0 volts.
14	At telephone set on TTP— Operate green release key.	VM key lamp extinguished. SUPV key lamp extinguished. EQPT ST key lamp extinguished. At VOLTMETER CONTROL— FEMF key lamp extinguished.

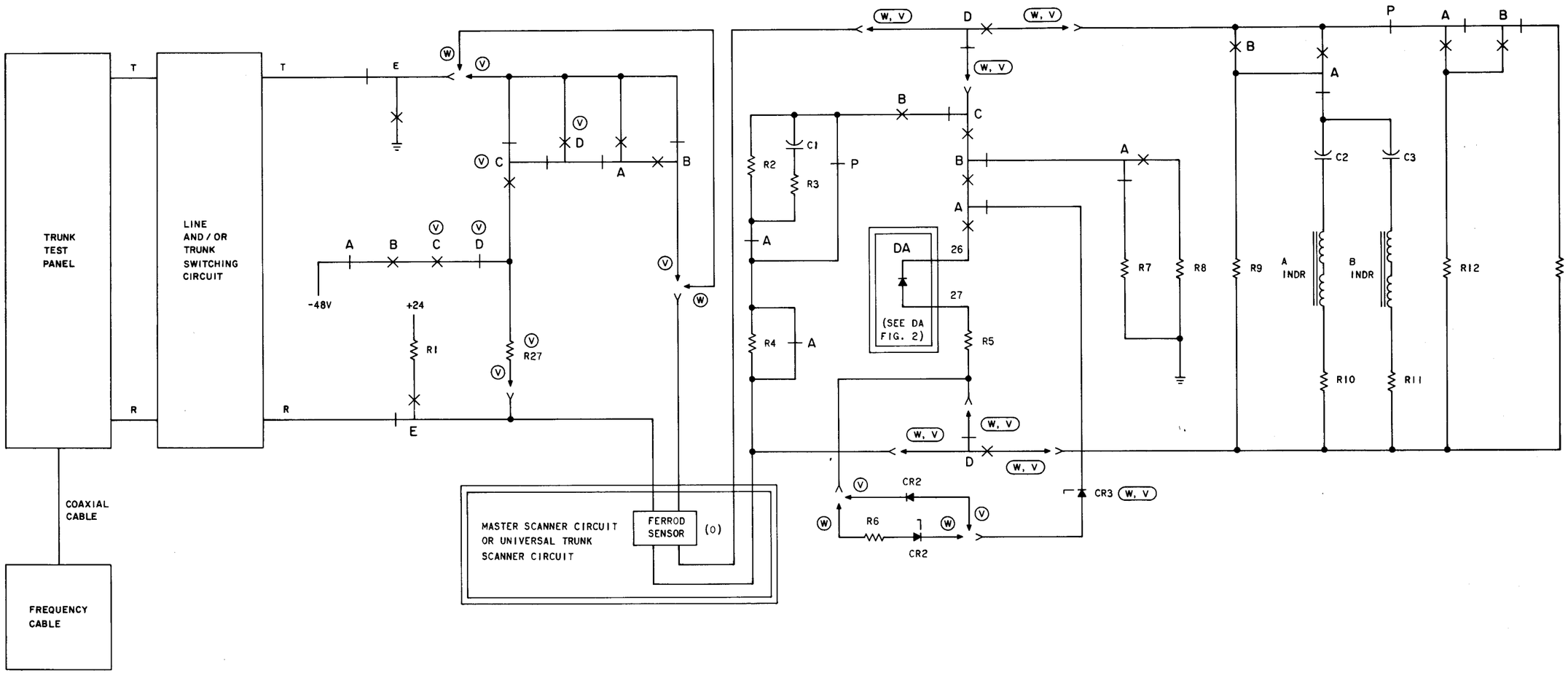
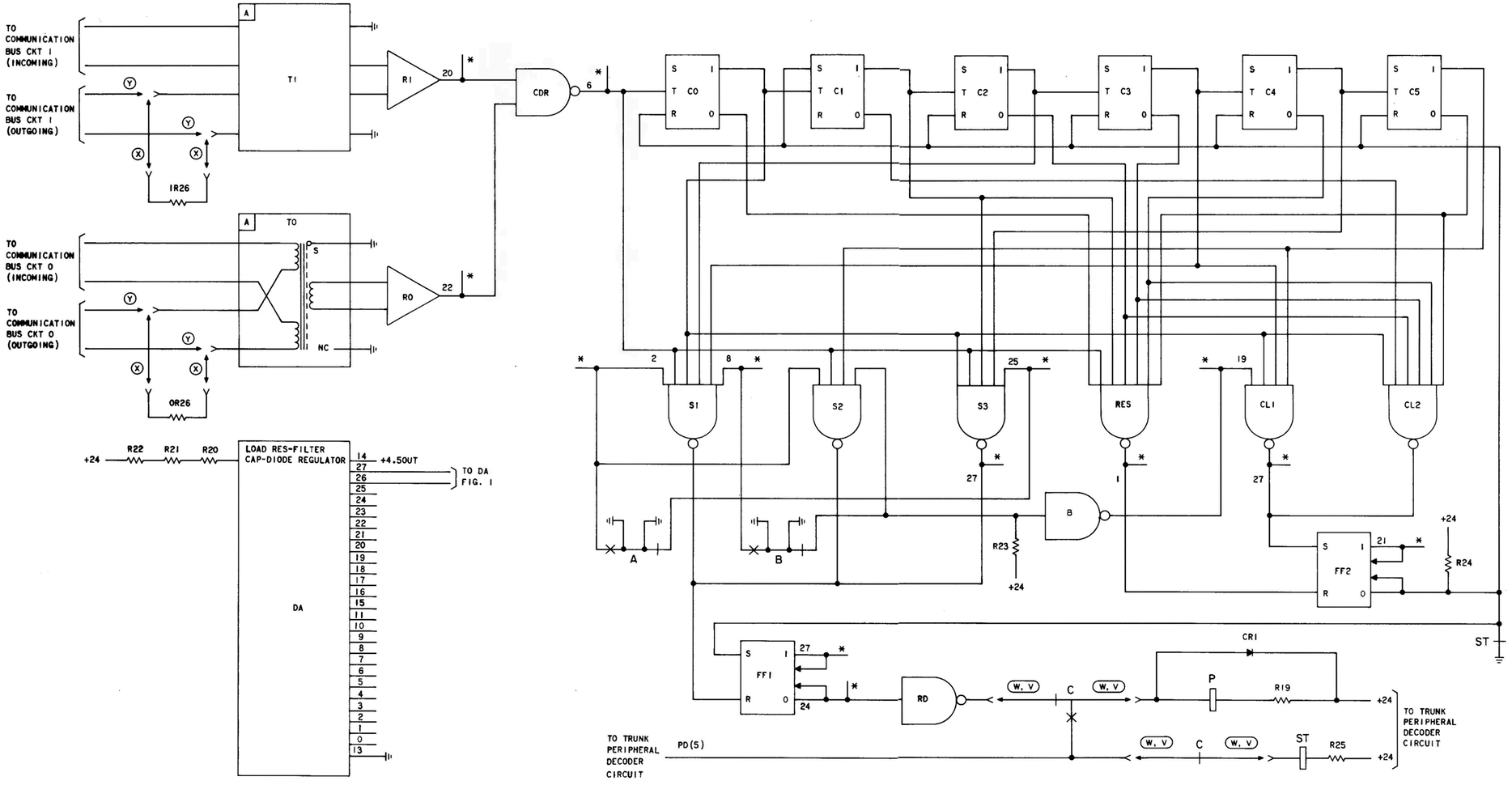


Fig. 1—Test Configuration Using Trunk Test Panel When Testing a Dial Pulse Receiver Test Circuit



NOTE:
* EXTERNAL COMPONENT CONNECTED PER COMPONENT CONNECTIONS TABLE.

COMPONENT CONNECTIONS TABLE

CKT ELEMENT		CONN TO RESISTORS	
EQPT LOC	TERM.	EQPT LOC	TERM
RO	22	DA	21
R1	20	DA	20
CDR	6	DA	6
FF2	21	DA	17
FF1	24	DA	22
FF1	27	DA	23
RES	1	DA	3
CL1	19	DA	19
CL1	27	DA	18
S1	2	DA	2
S1	8	DA	8
S3	25	DA	24
S3	27	DA	25

Fig. 2—Pulse Control Portion of Dial Pulse Receiver Test Circuit