

TOUCH-TONE® CALLING DETECTOR CIRCUIT (SD-1A173)
TEST
NO. 2 AND NO. 2B ELECTRONIC SWITCHING SYSTEMS

1. GENERAL

1.01 This section describes the method of testing the TOUCH-TONE calling detector circuit (SD-1A173) used in the No. 2 and 2B Electronic Switching Systems (ESS).

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

1.03 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 and No. 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.

1.04 This circuit is used to receive voice frequency TOUCH-TONE signals from a customer telephone set via the customer dial pulse receiver (SD-2H114 or SD-2H177) or the trunk dial pulse receiver (SD-2H123).

1.05 The TOUCH-TONE calling detector circuit recognizes the frequencies are present and converts them into dc signals suitable for operating associated scan points.

1.06 The test in this section is to be performed on a periodic basis as prescribed by local equipment test list procedures or when a malfunction of one of the circuits is suspected.

1.07 The test 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.

1.08 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 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 A 2500 TOUCH-TONE telephone set (or equivalent) equipped with appropriate cord terminating in a 310 plug.

3. PREPARATION

3.01 Refer to office records to obtain the trunk group number (TGN), member number (MEMN), and directed scan point number (DSP) of the customer dial pulse receiver circuit or the trunk dial pulse receiver circuit that is equipped with the TOUCH-TONE calling detector circuit (SD-1A173).

NOTICE

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SECTION 232-136-502

3.02 Verify the DSP obtained from office records as follows:

PDB cxzy b
 DSP ss rrbb

At maintenance TTY type in:

A VY:SVC:aaa bbb!

aaa = TGN
 bbb = MEMN

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

◆The system response for offices using No. 2 ESS unique (old) code is as follows:◆

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.).

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

Refer to input message manual (IM-2H200) and output message manual (OM-2H200) for interpretation of machine language.

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

3.03 Use the following procedure for gaining access to the circuit under test.

AR VY SVC aaa bbb
 OE nn gcsl

| 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 + TEN + MEMN + ST to gain access to the trunk dial pulse transmitter. | 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 Steps 3 and 4a until connection is successful. | |

| STEP | ACTION | VERIFICATION |
|------------------|---|--|
| 6 | Place handset on-hook or release TRFR key. | |
| 4. METHOD | | (2) Troubleshoot the circuit which failed. |
| 4.01 | If the verification procedure fails or if a malfunctioning circuit is indicated during any part of these tests, proceed as follows. | (3) Replace faulty circuit components using standard repair procedures. |
| | (1) Discontinue the test. | (4) Repeat the test that failed. If verification is successful, continue the test. |

TOUCH-TONE Calling Detector Circuit Test

| STEP | ACTION | VERIFICATION |
|------|--|--|
| 7 | At ACCESS TRUNK 1 CONTROL— Depress VM key. | At ACCESS TRUNK 1 CONTROL— VM lamp lighted. At VOLTMETER CONTROL— 100K lamp lighted. |
| 8 | At VOLTMETER CONTROL— Operate GRD key. | At VOLTMETER CONTROL— GRD lamp lighted. At VOLTMETER— Meter indicates 0. <i>Note:</i> A deflection on the voltmeter indicates a resistance between the tip and ring leads. |
| 9 | Operate TR REV key. | At VOLTMETER CONTROL— TR REV lamp lighted. At VOLTMETER— Meter indicates 0. |
| 10 | Depress FEMF key. | At VOLTMETER CONTROL— FEMF lamp lighted. 100K lamp extinguished. At VOLTMETER— Meter indicates 0. |
| 11 | Release TR REV key. | At VOLTMETER CONTROL— TR REV lamp extinguished. At VOLTMETER— Meter indicates 0. |
| 12 | Release GRD key. | At VOLTMETER CONTROL— GRD lamp extinguished. |
| 13 | At STATE CHANGE CONTROL— Set PD GROUP switch to 0-5 position. | |
| 14 | At PERIPHERAL DECODER POINTS— Operate 1 key. | At PERIPHERAL DECODER POINTS— 1 lamp lighted. |

SECTION 232-136-502

| STEP | ACTION | VERIFICATION |
|------|--|--|
| 15 | Depress AT 1 key. | At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale. At circuit under test— Relay B operated. |
| 16 | Use TTY printout information from 3.02 for input to the message in Step 17. | |
| 17 | At maintenance TTY— For No. 2 ESS offices type in: UBRL TS:RSN:ssrr! ss = Number of trunk scanner in decimal (00-11). rr = Number of scanner row to be displayed in decimal (00-63). 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 or later generic programs). rr = Number of scanner row in decimal (00-63) RDT LAMPS = Direct the result to the DISPLAY BUFFER. | At DISPLAY BUFFER— Lamps associated with ferrod sensors for TOUCH-TONE calling detector circuit are displayed on DISPLAY BUFFER and are lighted. |
| 18 | At front of writing shelf on TTP— Plug TOUCH-TONE telephone set into ACCESS TRK-1 jack. <i>Note:</i> Voltmeter is disconnected from the circuit when the ACCESS TRK-1 jack is used. | |
| 19 | At TOUCH-TONE telephone set— Lift receiver off-hook. | At DISPLAY BUFFER— Lamp associated with ferrod sensor 0 extinguished. |
| 20 | At TOUCH-TONE telephone set— Depress and hold 1 key. <i>Note:</i> Refer to Table A for TOUCH-TONE testing sequence. Continue to depress one key at a time and observing DISPLAY BUFFER lamps associated with saturated and unsaturated ferrod sensors as outlined in Table A. | At DISPLAY BUFFER— Lamps associated with ferrod sensors as outlined in Table A extinguished. Lamp associated with ferrod sensor 0 lighted only while a key is being depressed. |

STEP

ACTION

VERIFICATION

TABLE A

TOUCH-TONE TESTING SEQUENCE

| TOUCH-TONE DIAL OPERATION | LAMPS ASSOCIATED WITH SATURATED FERROD SENSORS extinguished | LAMPS ASSOCIATED WITH UNSATURATED FERROD SENSORS lighted |
|---------------------------|---|--|
| 1 | 1 & 5 | 0 |
| 2 | 1 & 6 | 0 |
| 3 | 1 & 7 | 0 |
| 4 | 2 & 5 | 0 |
| 5 | 2 & 6 | 0 |
| 6 | 2 & 7 | 0 |
| 7 | 3 & 5 | 0 |
| 8 | 3 & 6 | 0 |
| 9 | 3 & 7 | 0 |
| SPARE | 4 & 5 | 0 |
| 0 | 4 & 6 | 0 |
| SPARE | 4 & 7 | 0 |

- | | | |
|----|--|---|
| 21 | Place receiver on-hook. | At DISPLAY BUFFER— Lamps associated with ferrod sensors are displayed and lighted. |
| 22 | At front of writing shelf on TTP— Remove TOUCH-TONE telephone set from ACCESS TRK-1 jack. | At VOLTMETER— Meter indicates between 42.75 and 52.50 volts on 120-volt scale. |
| 23 | At PERIPHERAL DECODER POINTS— Release 1 key. | At PERIPHERAL DECODER POINTS— 1 lamp extinguished. |
| 24 | Depress AT 1 key. | At VOLTMETER— Meter indicates 0. At circuit under test— Relay B released. |
| 25 | At ACCESS TRUNK 1 CONTROL— Depress RLS key. | At ACCESS TRUNK 1 CONTROL— VM lamp extinguished. |

SECTION 232-136-502

| STEP | ACTION | VERIFICATION |
|-------------|---|--|
| | | EQPT ST lamp extinguished. At VOLTMETER CONTROL— FEMF lamp extinguished. |
| 26 | At telephone set on TTP— Operate green release key. | At ACCESS TRUNK 1 CONTROL— SUPV lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished. |
| 27 | 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— Lamps associated with ferrod sensors for TOUCH-TONE calling detector circuit extinguished. |
| 28 | Repeat all test procedures outlined in this section to test the remaining TOUCH-TONE calling detector circuits associated with the customer dial pulse receiver or the trunk dial pulse receiver. | |