

**DIAL PULSE TERMINATING SENDERS**  
**TESTS USING TERMINATING SENDER TEST CIRCUIT SD-25159-01**  
**NO. 1 CROSSBAR OFFICES**

1. GENERAL	PAGE
1.01 This section covers methods of testing dial pulse terminating senders in No. 1 crossbar offices using the automatic terminating sender test circuit SD-25159-01.	
1.02 This section is reissued to add paragraphs 1.05 and 2.02 which describe the record with ATA (RATA) feature. Information is also added to Part 5 and the Test Chart describing this feature. Other revisions include the addition of paragraph 2.08 and the addition of information to Tests B, F, G, I, and M. Revision arrows have been used to denote significant changes. The Equipment Test List is not affected.	
1.03 The tests and features covered are:	PAGE
<b>A. Regular Call—20 PPS:</b> This test checks that the sender will complete a call over maximum or minimum loop resistance at 20 pulses per second, using the dial of the sender test circuit. A method of checking the premature advance of the SPF lead is also provided.	4
<b>B. Special Call:</b> This test checks the sender to simulate a demand by the incoming trunk for a special marker and will cause the sender under test to be connected to a special marker.	5
<b>C. Trouble Release by Link:</b> This test checks the ability of the sender to release on a trouble release signal from the terminating sender link controller circuit.	6
<b>D. Trouble Release by Marker:</b> This test checks the ability of the sender to release on a trouble release signal from the marker.	6
<b>E. Disconnect Before Registration is Completed:</b> This test checks the ability of the sender to restore to normal in case the call is abandoned after the sender has been seized but before registration is completed.	7
<b>F. Disconnect After Registration is Completed:</b> This test checks the ability of the sender to restore to normal in case the call is abandoned after registration is completed.	7
<b>G. Sender Time-Out:</b> This test checks the time-out feature of the sender.	8
<b>H. Fast Release of Sender:</b> This test checks that the sender (FTO) fast time-out relay releases the sender when the trunk has been abandoned at a time when no ground is available to lock the trunk D relay.	9
<b>I. Sender S Lamp:</b> This test checks that the sender will light its associated S lamp at the terminating trouble indicator frame.	9
<b>J. Reorder:</b> This test checks that the sender will time out, call in the marker, and route the call to reorder if no digits or only some of the digits are dialed.	10

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	PAGE	
<b>K. Dial Tone Feature:</b> This test checks that the proper dial tone is received from a sender using dial tone start pulse indications. . . . .	10	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.
<b>L. Double Office Indication:</b> This test checks that the sender will block upon receiving a double office indication. . . . .	11	<b>1.07</b> Tests A and M are alternate methods of testing the same features. Test A uses the 20 pps dial of the test frame whereas Test M uses a 10 pps dial of the handset.
<b>M. Regular Call—10 PPS:</b> This test checks that the sender will complete a call over maximum or minimum loop resistance at 10 pulses per second, using a handset equipped with a 6A dial in conjunction with the terminating sender test frame. A method of checking the premature advance of the SPF lead is also provided. . . . .	11	<b>1.08</b> Test M is based on the use of multiplied B jacks. If B jacks are not multiplied between the sender frame and sender test frame, local cross connections must be placed to interconnect the B jacks.
<b>N. DID Call:</b> This test checks that the sender functions properly on a DID call to a PBX station. On this test the sender records and translates the C digit into a DID number series indication. . . . .	12	<b>2. Apparatus</b>
<b>1.04</b> Keys are provided for setting up various operating conditions in order that any possible service call may be simulated and the resulting operations checked. The functions of these keys, as well as functions of locating, progress, and trouble lamps, are described in Part 5.		<b>All Tests</b>
<b>1.05</b> In offices equipped with automatic trouble analysis (ATA) having the record with ATA (RATA) feature, a jack, lamp, and switches were added. However, since all the tests require either supervision and/or action by the tester while testing each circuit, it is not practical to use this feature. It may have a practical use as tests are added to this section and for that reason a description is included in Part 5 and in the Test Chart.		<b>2.01</b> Terminating sender test frame, SD-25159-01.
<b>1.06 Lettered Steps:</b> The letters a, b, c, etc, added to a step number in Parts 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 series		<b>2.02</b> 349A plug, optional feature (RATA).
		<b>Tests B, F, and G</b>
		<b>2.03</b> 322A make-busy plugs, as required.
		<b>Tests G and J</b>
		<b>2.04</b> KS-3008 stopwatch or equivalent.
		<b>Test K</b>
		<b>2.05</b> 52A head telephone set or equivalent.
		<b>Test M</b>
		<b>2.06</b> 1011G handset equipped with W2CK cord, 4 feet long, equipped with a 471A jack at one end and a 310 plug at the other end (2W38A cord assembly).
		<b>2.07</b> P2B patching cord, 3 feet long, equipped with two 310 plugs (2P4A cord).
		<b>Tests B, F, and G</b>
		<b>2.08</b> Terminating trouble indicator (TTI), SD-25284-01.

## 3. PREPARATION

STEP	ACTION	VERIFICATION
<b>All Tests</b>		
1	Restore all test frame keys to normal.	
2	Operate RN key.	All lamps extinguished.
3a	If test circuit does not restore to normal— Momentarily operate CA key.	
4a	Operate RN key.	All lamps extinguished.
5	Restore RN key to normal.	
6b	If end-of-group feature is provided— Operate EG_ key.	
	<i>Note:</i> The operation of an EG_ key will cause the test circuit to block with the EG lamp lighted when all senders associated with operated EG_ key have been tested. Upon receiving the EG lamp during any test, consult the office records and reset the test frame keys as required. Restore the EG_ key to allow the test frame to advance.	
7c	If pass-group feature is provided and it is desired to pass senders having different operating conditions than those for which the test frame is set up— Operate PG_ key or keys.	
8	Operate DPS key.	
9	Operate F_ key.	
10d	If senders serve more than 10 incoming frames— Operate FA_ key.	
11e	When senders under test serve multioffice terminating units— Operate office indicating keys per Table A.	
12f	If senders are equipped for reverse battery start pulse indication— Operate SP key.	
13g	If senders are equipped for dial tone start pulse— Operate DT key.	

→TABLE A (NOTE 1)←

TRUNK ARRANGEMENT	OFFICE	OPERATE KEY
Individual only	A	LOA
	B	LOB, OAB
Common only (Note 2)	A	None
	B	OAB
Common and individual, (simulating individual)	A	LOC
	B	LOB, OAB
Common and individual, (simulating common) [Note 2]	A	LOC
	B	LOC, OAB

*Note 1:* In some multioffice terminating units with 10 or less incoming trunk frames, the FA-0 or FA-1 key is used to indicate office A or B, respectively.

*Note 2:* For office A, dial an odd digit as the first digit. For office B, dial an even digit as the first digit. In both cases, the digit to be dialed should be indicated by the office records.

#### 4. METHOD

STEP	ACTION	VERIFICATION
A.	Regular Call—20 PPS	
14	Operate keys as shown on test chart.	

*Note:* Tests using LT key should only be made during light traffic.

STEP	ACTION	VERIFICATION
15	Operate ST key.	RC lamp lighted.
16h	If code digit is required— Dial code digit. (See Table A.)	
17	Dial number set up on numerical keys.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.
18	Repeat Steps 16h and 17.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Restore ST key.	
20	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

#### B. Special Call

14	Operate keys as shown on test chart.	
15	At TTI— Make all special markers busy.	
	<b>Note:</b> All special markers will be made busy during the major portion of this test. It should, therefore, be made during periods of the day when such a condition will be least objectionable.	
16	◆At terminating sender test frame—◆ Operate ST key.	RC lamp lighted.
17h	If code digit is required— Dial code digit. (See Table A.)	
18	Dial number set up on numerical keys.	Test circuit blocks. TC lamp lighted.
19	◆At TTI—◆ Momentarily restore one special marker to service.	◆At terminating sender test frame—◆ TC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.

**Caution:** Step 19 should be performed promptly. A delay exceeding 5 to 12 seconds will result in a connector time alarm. If the alarm sounds, momentarily operate the LORL key at the terminating trouble indicator frame.

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STEP	ACTION	VERIFICATION
20	Repeat Steps 17h, 18, and 19.	When all senders have been tested— ♦At terminating sender test frame—♦ EC lamp lighted. Minor alarm sounds.
21	♦At the TTI— Restore all special markers.	
22	At terminating sender test frame—♦ Restore ST key.	
23	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

**C. Trouble Release by Link**

14	Operate keys as shown on test chart.	
15	Operate ST key.	EC lamp lighted. Minor alarm sounds.
	<b>Caution: Since this test holds the sender subgroup busy almost continually, it should be made during periods when traffic conditions will permit and under close supervision.</b>	
16	Restore ST key.	
17	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

**D. Trouble Release by Marker**

14	Operate keys as shown on test chart.	
15	Operate ST key.	RC lamp lighted.
16h	If code digit is required— Dial code digit. (See Table A.)	
17	Dial number set up on numerical keys.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.
18	Repeat Steps 16h and 17.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Restore ST key.	
20	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

STEP	ACTION	VERIFICATION
<b>E. Disconnect Before Registration is Completed</b>		
14	Operate keys as shown on test chart.	
15	Operate ST key.	RC lamp lighted.
16h	If code digit is required— Dial code digit. (See Table A.)	
17	Dial first digit set up on numerical keys.	
18	Momentarily operate DSR key.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.
19	Repeat Steps 16h, 17, and 18.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
20	Restore ST key.	
21	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>F. Disconnect After Registration is Completed</b>		
14	Operate keys as shown on test chart.	
15	◆At TTI—◆ Insert make-busy plugs into HLD jacks of senders to be tested.  <i>Note:</i> On large installations, it may be desirable to place make-busy plugs in some of the HLD jacks and move them along as the test proceeds.	
16	◆At terminating sender test frame—◆ Operate ST key.  <i>Caution: Since this test holds the sender subgroup busy continually, this test should be made during periods when traffic conditions permit.</i>	RC lamp lighted.
17h	If code digit is required— Dial code digit. (See Table A.)	
18	Dial number set up on numerical keys.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.

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STEP	ACTION	VERIFICATION
19	◆At TTI—◆ Remove plug from HLD jack of sender tested.	
20	Repeat Steps 17h, 18, and 19.	When all senders have been tested— ◆At terminating sender test frame—◆ EC lamp lighted. Minor alarm sounds.
21	◆At terminating sender test frame—◆ Restore ST key.	
22	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>G. Sender Time-Out</b>		
14	Operate keys as shown on test chart.	
15	At TTI— Insert make-busy plugs into HLD jacks of senders to be tested.  <i>Note:</i> On large installations it may be desirable to place make-busy plugs in some of the HLD jacks and move them along as the test proceeds.	
16	◆At senders being tested—◆ Block operated FTO relays.  <i>Note:</i> On large installations it may be desirable to block operated FTO relays of part of the senders and move blocking tools along as the test proceeds.	
17	◆At terminating sender test frame—◆ Operate ST key.	RC lamp lighted. 58 to 88 seconds later— ◆At TTI—◆ Sender TL lamp lighted. ◆At terminating sender test frame—◆ RC lamp extinguished. 5 to 12 seconds later— Minor alarm sounds.
18	◆At sender being tested—◆ Remove blocking tool from FTO relay.	
19	◆At terminating sender test frame—◆ Momentarily operate MGB key.	
20	◆At TTI—◆ Remove make-busy plug from HLD jack of sender tested.	TL lamp extinguished. Minor alarm silenced.

STEP	ACTION	VERIFICATION
21	<p>◆At terminating sender test frame—◆ Momentarily operate AV key.</p> <p><i>Note:</i> Since the operation of the MGB key makes the sender subgroup busy, operate and then release the AV key without undue delay. (If REP key is operated, it will be necessary to hold AV key operated about one second.)</p>	<p>Test circuit advances to next sender. RC lamp lighted. 58 to 88 seconds later— ◆At TTI—◆ Sender TL lamp lighted. ◆At terminating sender test frame—◆ RC lamp extinguished. 5 to 12 seconds later— Minor alarm sounds.</p>
22	Repeat Steps 18 through 21 for each sender.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
23	Restore ST key.	
24	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>H. Fast Release of Sender</b>		
14	Operate keys as shown on test chart.	
15	Operate ST key.	RC lamp lighted.
16h	If code digit is required— Dial code digit. (See Table A.)	
17	Dial number set up on numerical keys.	RC lamp extinguished. D lamp momentarily lighted. Test circuit advances to next sender.
18	Repeat Steps 16h and 17.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Restore ST key.	
20	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>I. Sender S Lamp</b>		
14	Operate keys as shown on test chart.	
15	Operate ST key.	At terminating trouble indicator frame— S lamp associated with sender under test momentarily lighted when sender is seized.
16	◆At terminating sender test frame—◆ Momentarily operate CA key.	◆At terminating sender test frame—◆ Test circuit advances to next sender. At terminating trouble indicator frame—

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STEP	ACTION	VERIFICATION
		S lamp associated with sender under test momentarily lighted when sender is seized.
17	Repeat Step 16.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
18	Restore ST key.	
19	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>J. Reorder</b>		
14	Operate keys as shown on test chart.	
15	Operate ST key.	RC lamp lighted. 28 to 58 seconds later— TC lamp lighted.
16h	After RC lamp lights— If code digit is required— Dial code digit. (See Table A.)	
17	Momentarily release TA key.	Test circuit advances to next sender. RC lamp lighted. 28 to 58 seconds later— TC lamp lighted.
18	Repeat Steps 16h and 17.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Restore TA, RO, and ST keys.	
20	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
<b>K. Dial Tone Feature</b>		
14	Operate keys as shown on test chart.	
15	Insert operator telephone set into PT jack.	
16	Operate ST key.	RC lamp lighted. High or low tone heard in operator telephone set.
		<b>Note:</b> Tone may be high or low depending upon trunk arrangement and wiring options used in senders.

STEP	ACTION	VERIFICATION
17	Momentarily operate CA key.	Test circuit advances to next sender. RC lamp lighted. High or low tone heard in operator telephone set.
18	Repeat Step 17 for each sender.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Remove operator telephone set from PT jack.	
20	Restore ST key.	
21	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

#### L. Double Office Indication

14	Operate keys as shown on test chart.	
15	Operate ST key.	Test circuit blocks. RL lamp lighted.
16	Momentarily operate CA key.	RL lamp extinguished. Test circuit advances to next sender and blocks. RL lamp lighted.
17	Repeat Step 16 for each sender.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
18	Restore ST key.	
19	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

#### M. Regular Call—10 PPS

14	Operate keys as shown on test chart.	
15	Connect handset to B jack of sender test frame (see paragraph 1.07).	
16h	If it is desired to test with maximum trunk loop resistance— At sender frame— Connect B jack to MX-D jack.	At sender test frame— RC lamp lighted.
17i	If it is desired to test with minimum trunk loop resistance— At sender frame— Connect B jack to MN-D jack.	At sender test frame— RC lamp lighted.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
18j	If code digit is required— ◆At sender test frame—◆ Dial code digit. (See Table A.)	
19	Dial number set up on numerical keys using handset.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.
20	Repeat Steps 18j and 19.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
21	At sender frame— Remove cord connecting B and MX-D or MN-D jack.	
22	At test frame— Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.

**N. DID Call**

14	Operate keys as shown on test chart.	
15	Operate ST key.	RC lamp lighted.
16	Dial an assigned code digit corresponding to code digit key operated.	
17	Dial number set up on numerical keys.	RC lamp extinguished. Test circuit advances to next sender. RC lamp lighted.
18	Repeat Steps 16 and 17.	When all senders have been tested— EC lamp lighted. Minor alarm sounds.
19	Restore ST key.	
20	Momentarily operate RN key.	All lamps extinguished. Minor alarm silenced.
21	Repeat Steps 14 through 20 using unassigned code digit.	

**5. INTERPRETATION OF JACK, KEY, SWITCH AND LAMP DESIGNATIONS**

**5.01 JACKS:**

<b>JACK</b>	<b>PURPOSE</b>	<b>MN-D</b>
<b>B</b>	<b>Bridging:</b> These jacks are located on the sender frames and	<b>Minimum Dial:</b> These jacks are located on the sender frames and provide minimum trunk loop resistance when used in Test M.

**MX-D** *Maximum Dial:* These jacks are located on the sender frames and provide maximum trunk loop resistance when used in Test M.

**PT** *Pulsing Tone:* To facilitate a test that the sender applies dial tone to the tip and ring leads when the sender is arranged to apply dial tone as a start pulse signal.

**RATA** *Record with ATA:* Used in conjunction with the TSTH, TSTT, and TSTU switches to record failures, via the maintenance data transmitter (MDT), at the ATA location.†

**RC** *Remote Control:* These jacks are located on the sender frames. Momentary insertion of a make-busy plug causes the CA feature to operate. Used in conjunction with a 32A test set, depression of the red button operates the CA feature.

**5.02 KEYS:**

Key	PURPOSE
<b>ACO</b>	<i>Alarm Cutoff:</i> To prevent or silence the audible alarm.
<b>APB</b>	<i>Advance Past Busy:</i> To automatically pass by senders if they remain busy for 29 seconds minimum to 59 seconds maximum.
<b>AV</b>	<i>Advance:</i> To advance the test frame to the next sender during timeout tests.
<b>CA</b>	<i>Control Advance:</i> To manually advance the test circuit to the next sender or to restart a repeat test of the same sender, depending on the position of the repeat key.
<b>CL (0-9)</b>	<i>Class:</i> To provide for setting up various classes of test.
<b>DPS</b>	<i>Dial Pulse Senders:</i> To test only DP senders.

**DSD** *Disconnect Before Dialing:* To prepare the test circuit when making a test of the senders ability to restore to normal in case the call is abandoned before registration is completed.

**DSR** *Dial Pulse Sender Release:* To simulate the release of a trunk before all digits have been dialed.

**DT** *Dial Tone:* To apply dial tone to the trunk as a start pulse signal when the senders are arranged for this feature.

**EG (1-4)** *End of Group:* To stop the test circuit after it has tested the last sender in a group for which the test circuit was prepared.

**F (0-9)** *Frame:* To transmit the units digit of the incoming frame indication to the sender.

**FA-** *Frame Auxiliary:* To transmit the tens digit of the incoming frame indication to the sender.

**FTO** *Fast Time-Out:* Tests the ability of the sender or release before calling in a marker when a trunk has been abandoned after all digits have been dialed but no ground is available to lock the trunk D relay.

**G (0-1)** *Group:* To select the associated sender connector switch when the test frame has access to more than 10 sender subgroups.

**H (0-9)** *Hundreds:* To check the registration of the associated hundreds digit which is dial pulsed into the sender.

**LOA  
LOB  
LOC** *Local Office Indication:* To set up the desired office unit indication.

**LT** *Light Traffic:* To check, during periods of light traffic, the TT (regular test) leads. Also

to check for a premature advance of the preference leads. With this key normal, only the RT leads are checked.

**LTK**      **Loop Resistance Trunk:** With key operated, to test with maximum trunk loop resistance; with key normal, to test with minimum trunk loop resistance.

**MGB**      **Make Group Busy:** To make busy the sender subgroup to which the test frame is connected, thereby giving preference to the test frame for this subgroup of senders.

**NS (0-9)**      **Number Series:** To check the number series leads grounded to the marker on a DID call.

**OAB**      **Office A or B:** To check that the sender gives the proper office unit indication to the marker when an office unit B indication has been transmitted to the sender.

**PG (1-4)**      **Pass Group:** To pass by the associated subgroup of senders when it contains senders having different operating conditions than those for which the test frame is set up.

**REP**      **Repeat:** To test the same sender repeatedly. Also to extend the control advance feature to the remote control jacks at the sender frames.

**REP-2**      **Repeat 2:** To cause two successive tests to be made of the same sender, thus checking the ability of the sender to restore to normal.

**RN**      **Return to Normal:** To restore the test circuit to normal.

**RO**      **Reorder:** To check the signal on the RO lead from the sender to the marker.

**SP**      **Start Pulse:** To cause the sender to transmit a reverse battery start-pulse signal.

**SST**      **Secondary Start:** To permit dialing at 10 pps, with either minimum or maximum trunk loop resistance, using a handset connected to B jack of sender test frame.

**ST**      **Start:** To start the test circuit.

**T (0-9)**      **Tens:** To check the registration of the associated tens digit which is dial pulsed into the sender.

**TA**      **Time Alarm:** To prevent or silence the test circuit alarms.

**TH (0-9)**      **Thousands:** To check the registration of the associated thousands digit which is dial pulsed into the sender.

**U (0-9)**      **Units:** To check the registration of the associated units digit which is dial pulsed into the sender.

**5.03 SWITCHES**

SWITCH	PURPOSE
TSTH, TSTT, TSTU	♦ <b>Test Hundreds, Test Tens, Test Units:</b> Used in conjunction with the RATA jack to identify the test when failures are being recorded at the ATA location.♦

**5.04 LAMPS**

LAMP	PURPOSE
0-9	<b>Numerical:</b> To indicate what number was transmitted to the marker for the particular digit being checked by the register check circuit at that time.

**BY**      **Busy:** Indicates that the sender, to which the test circuit is connected, is busy.

CH	<b>Chain:</b> Indicates the operation of the S- relay failed to remove ground from the TCH lead.	LSP	<b>Long Start Pulse:</b> Indicates start pulse is too long.
CH1	<b>Chain-1:</b> Indicates that the operation of the S- relay failed to remove battery from the TCH1 lead.	MGB	<b>Make Group Busy:</b> Indicates the sender subgroup is being held busy by the test circuit. If the lamp remains lighted for an interval longer than 5 to 12 seconds, the major alarm will sound.
CO	<b>CO Lead:</b> Indicates that the test circuit is awaiting ground on the S and CO leads from the sender.	NS	<b>Number Series:</b> Number series check is being made on a DID call. This check is made of the grounded NS leads to the marker against the operated NS key.
D	<b>D Lead:</b> Indicates that the test circuit is waiting for the sender to (1) remove battery from the CO lead (2) connect battery to the T and R leads (3) connect ground to the D lead or, during Test J, remove ground from the S lead.	RATA	<b>Record With ATA:</b> When lighted, indicates that the maintenance data transmitter (MDT) is functioning and a record of test failures can be transmitted to the ATA location.
DG	<b>D Lead Ground:</b> Indicates that the D lead was grounded prematurely or, during Test J, that the sender failed to remove ground from the D lead.	RC	<b>Registration Completion:</b> Indicates that the test circuit is waiting for the sender to recognize that registration is completed.
EC	<b>End of Cycle:</b> Indicates that the last sender, to which the test frame has access, has been tested satisfactorily.	TH,H,T,U, F,F10,RO, OAB	<b>Register Check Progress:</b> Indicates which digit is being checked with the setting of the associated keys.
EF	<b>Even Frame:</b> Indicates the EF relay has failed to operate on a call using an even numbered frame indication.	RL	<b>RL Lead:</b> Indicates that the test circuit is waiting for the sender to connect ground to the RL lead.
EG (1-4)	<b>End of Group:</b> Indicates, when provided, that the last sender of a sender subgroup associated with the operated EG-key, has been tested satisfactorily.	S	<b>S Lead:</b> Indicates that the test circuit is waiting for the sender to connect ground to the S lead. Also lights, during Test H, when ground is removed from the S lead.
G (0-1)	<b>Group:</b> Indicates the particular sender test connector switch in use when more than one sender test connector switch is provided.	SEL	<b>Selection:</b> Indicates that the test circuit is waiting for the S-relay to operate and connect ground to the S- lead.
GB	<b>Group Busy:</b> Indicates the group busy test is being made.	SPF	<b>Sender Preference:</b> Indicates that the test circuit is waiting

for the operation of the SB- relay to advance the P lead to the next sender in the subgroup chain.

**SSP**            **Short Start Pulse:** Indicates start pulse it too short.

**TA**            **Time Alarm:** Indicates that the test was not completed within the allowable interval.

**TC**            **Trunk Closure:** Indicates that the test circuit is waiting for the sender to be connected to a marker.

**TENS (0-9)**    **Tens:** With units lamp, indicates location of sender being tested.

**TRL**            **Trouble Release:** Indicates whether or not a second marker is seized on trouble release tests.

**UNITS (0-9)**    **Units:** With tens lamp, indicates location of senders being tested.

**6. PREPARATION OF TEST CHART**

**6.01** Complete the Test Chart to show the test frame keys to be operated for each test as directed in Table A and the following paragraphs.

**6.02** Operate one key (0 through 2), when provided, in the FA group. Successive test calls require a combination of F- and FA- keys to simulate each equipped sender link frame.

**6.03** Test Calls 1 through 6 check the ability of a particular select bar, its unengaged select fingers, and its off-normal contacts to restore to normal and become stabilized before a following digit is registered.

**6.04** Test Calls 7 through 16 check the ability of a particular select bar to operate in one direction when the maximum number of select fingers possible are trapped in the opposite direction.

**6.05** Test Calls 17 through 26 check the ability of a particular select bar and its unengaged select fingers to release and become stabilized in the minimum time between digits when the maximum number of select fingers are trapped in one direction.

→ TEST CHART ←

## DIAL PULSE TERMINATING SENDERS

BSP TEST	TEST NO.	(NOTE 4) RATA SWITCHES			TITLE	CODE DIGIT DIALED	TH	H	T	U	F	FA	TEST CLASS	LOA	LOB	LOC	OAB	MISC.
		TSTH	TSTT	TSTU														
A	1	1	0	1	Regular Call		2	0	2	0	0	0						
	2	1	0	2			1	2	1	2	2	0						
	3	1	0	3			4	3	4	3	3	0						
	4	1	0	4			6	5	6	5	5	0						LTK
	5	1	0	5			8	7	8	7	7	0						
	6	1	0	6			9	1	9	1	1	0						
	7	1	0	7			0	0	0	1	0	0						
	8	1	0	8			1	1	1	0	1	0						
	9	1	0	9			2	2	2	3	2	0						LTK
	10	1	1	0			3	3	3	2	3	0						LT
	11	1	1	1			4	4	4	5	4	0						
	12	1	1	2			5	5	5	4	5	0						
	13	1	1	3			6	6	6	7	6	0						
	14	1	1	4			7	7	7	6	7	0						LTK
	15	1	1	5			8	8	8	9	8	0						
	16	1	1	6			9	9	9	8	9	0						
	17	1	1	7			0	0	0	2	0	0						
	18	1	1	8			1	1	1	2	1	0						
	19	1	1	9			2	2	2	0	2	0						LTK
	20	1	2	0			3	3	3	0	3	0						LT
	21	1	2	1			4	4	4	0	4	0						
	22	1	2	2			5	5	5	0	5	0						
	23	1	2	3			6	6	6	0	6	0						
	24	1	2	4			7	7	7	0	7	0						LTK
	25	1	2	5			8	8	8	0	8	0						
B	26	1	2	6	Special Call		9	9	9	0	9	1						

→ TEST CHART (Contd) ←

## DIAL PULSE TERMINATING SENDERS

BSP TEST	TEST NO.	(NOTE 4) RATA SWITCHES			TITLE	CODE DIGIT DIALED	TH	H	T	U	F	FA	TEST CLASS	LOA	LOB	LOC	OAB	MISC.
		TSTH	TSTT	TSTU														
C	27	1	2	7	Trouble Release by Link							3						
D	28	1	2	8	Trouble Release by Marker		4	4	4	4	4	4						
E	29	1	2	9	Disc. Before Registration		6	6	6	6	6	0						DSD
F	30	1	3	0	Disc. After Registration		1	1	1	1	8	5						REP-2
G	31	1	3	1	Sender Timeout						9	6						TA
H	32	1	3	2	Fast Release of Sender		2	2	2	2	0	0						FTO
I	33	1	3	3	Sender S Lamp						1	0						BAT Key at TTI
J	34	1	3	4	Reorder		0	0	0	0	0	0						RO, TA
K	35	1	3	5	Dial Tone						2	0						
L	36	1	3	6	Double Office Indication						0	0						Note 1
M	37	1	3	7	Regular Call — 10 PPS		2	0	2	0	0	0						SST
N	38	1	3	8	DID Call — Assigned C-Digit						1	0						NS-, Note 2
	39	1	3	9	DID Call — Unassigned C-Digit						2	0						RO, Note 3

*Note 1:* If senders serve two terminating units and each unit has its own individual trunks, operate LOA and LOB keys. If senders serve two terminating units and the trunks are arranged in both common and individual groups, operate LOA and LOC keys.

*Note 2:* Set up NS- key in combination with an assigned code digit according to local cross-connection records.

*Note 3:* Dial an unassigned code digit according to local cross-connection records.

*Note 4:* When this feature is used, a 349A plug must be inserted into the RATA jack, the RATA lamp should be lighted, the APB key must be operated, and the REP key must be normal.