

SUBSCRIBER SENDER LINK AND CONTROLLER TESTS

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1. GENERAL INFORMATION

1.1 Description of Test: This section describes a test of the operating features of the subscriber sender link and controller circuits SD-25004 and SD-25554. These tests should be made after the miscellaneous tests on the line link and subscriber sender link frames described in other sections of this handbook have been completed.

1.2 Testing Additions: The tests outlined in this section may be applied on additions. The operations outlined in Paragraphs 10 and 11 may be made at any time; Paragraph 12 after the sender multiple transition and Paragraphs 4 to 9 after the D.J.G.F. cross-connections are installed. The tests requiring the use of line link frames should be made from a new line frame.

2. RECORDS AND REQUIREMENTS

2.1 Records: Forms SD-4-1313 and SD-4-1315 are required for recording the results of these tests. For further information on records see Section 3 of Handbook 50.

2.2 Requirements: The tests covered by this section are listed in Section 0.2 of this handbook.

3. TESTING EQUIPMENT

3.1 Test Sets and Accessories

<u>Amt</u>	<u>Code</u>	<u>Description</u>	<u>With</u> <u>ITE</u>
1	ITE-4033	Link Frame Test Set	
17	298A	Make Busy Plug	%4023
10	322A	Make Busy Plug	%4023
10	508A	Relay Blocking Tool	%4023
20	ITE-8507	Alligator Clip	%4023
1	ITE-4042	Hand Set, Telephone	%4023
1	ITE-9627	Remote Control Cord	%4023

% ITE-4023 is the test accessory set.

3.2 Cords

<u>Amt</u>	<u>ITE</u>	<u>Lgth</u>	<u>Cdrs</u>	<u>One End</u>	<u>Other End</u>	<u>With</u> <u>ITE</u>
1	9547	12'	1	Banana Plug	Banana Plug	4033
1	9598	12'	2	110 Plug	110 Plug	4033
1	9947	12'	10	Yaxley Recept. Plug	10 Banana Plugs	4033

4. TROUBLE REGISTERS

4.1 At the lowest numbered line link frame insert 298A plugs into jacks SS2 to SS9.

4.2 Manually operate the L relay of any line and release it immediately when the minor alarm is brought in at the associated sender link.

4.3 Observe that the TR (trouble) register associated with the line link frame and also the TR register associated with the sender link frame each score once. The TR registers are located on the sender make busy frame. Operate the AR key at the sender link momentarily to retire the alarm.

4.4 Shift the plugs from jacks SS2 and SS3 to jacks SSO and SS1 and repeat 4.1 to 4.3.

4.5 Continue the test, shifting the plugs from SS jacks 4 and 5 to 2 and 3, etc. until a call has been originated in each of the 5 groups on the line links. This test shall be made on each line link frame.

4.6 The connection of the TRL lead from the emergency sender link control circuit through each sender link shall be checked by performing operations 4.1 to 4.3 once with each sender link connected to the emergency control circuit, restoring the relays and switches to normal upon completion of the test.

## 5. FALSE START TRAFFIC REGISTER AND RELEASE

### 5.1 False Start Traffic Register

5.11 At any line frame having access to the sender link frame under test, make all secondary switches busy at the SS- jacks except one connecting to the sender link frame under test.

5.12 Manually operate a line relay and then release the relay immediately after the primary hold magnet operates.

5.13 Observe that the associated SF register (sender link false start) at the sender make busy frame scores once and that no alarm is brought in at the sender link frame.

5.14 Repeat the test with the emergency controller.

### 5.2 False Start Release

5.21 Insert 298A plugs into the MB jacks at the subscriber sender link frame under test to make it busy.

5.22 Cross the 1 and 2B contacts of relay GP-0. Insulate the 1 and 2B and the 3 and 4T contacts of relay DR. In addition to the above cross the 2 and 3B contacts of relay ON and block normal relay CK when SD-25554 is provided.

5.23 By means of the district junctor test frame seize any district junctor associated with the sender link frame under test and originate a call. Observe that the FS and FSI relays operate after the ZA relay releases and that the AB relay operates to start the release of the SSL controller. Observe, also, that the subscriber sender link alarm does not sound. The call should complete satisfactorily.

5.24 Release the call at the district junctor test frame.

5.25 Block the SRI relay normal in the preferred originating sender.

5.26 Originate another call from the district junctor test frame. Observe that the FS, FSI and AB relays operate to release the sender link and originating sender and that the alarm does not sound. The call should not go thru.

5.27 Remove 298A plugs, insulation from the DR relay contacts and crosses from contacts of the GP-0 and ON relays. Remove blocks from CK and SRI relays.

## 6. EARLY RELEASE AND TRAFFIC RELEASE

### 6.1 Early Release

6.11 Insert make busy plugs into the line link SS- jacks as specified in Paragraph 5.11. Block nonoperated relays W and GH of the sender link control circuit.

6.12 Using the handset originate a call and disconnect after the sender link has been selected and observe that the line link and sender link release immediately.

### 6.2 Traffic Release (Figures 16 and 17 Not Provided)

6.21 Remove the blocking tools from the W and GH relays. Block relays SGO to SG9 nonoperated.

6.22 Originate a call and observe that the sender link is seized and released repeatedly.

6.23 Remove the blocking tool from one of the SG relays before the line link has had time to time out (within 6 seconds) and note that dial tone is received. Release the connections and remove the relay blocking tools.

6.24 Make the tests using the emergency controller.

### 6.3 Automatic Release Due to Traffic Delays (Figures 16, 17 Provided)

6.31 Block relays SG-0 to SG-9 and SS1 nonoperated.

6.32 Make busy an originating sender subgroup at the sender make busy frame. Observe that relays SGL, GS, GSI and GSA of the traffic release control circuit (Figures 16, 17 and 24) operate and the LI lamp lights at the CTI or SMB frame and line link controller releases.

6.33 Originate a call from any line link frame having access to the sender link frame under test. Observe that the TR and OS relays of the sender link operate to cause the sender link to be released and resealed repeatedly.

6.34 Remove blocks from relays SG-0 and SS1. Insulate the 4 and 5T contacts of relay LL-0 when SD-25004 is provided or contacts 4B and 5B when SD-25554 is provided.

6.35 Originate another call from the line link frame and observe that after the ZA relay operates the SS1 relay operates and that the OC relay does not. The sender link should be released and resealed as in the previous test.

6.36 Remove the make busy plug from the sender group make busy jack at the sender make busy frame. Observe that the SGL relay of the traffic release control circuit (Figures 16 and 17) releases. Observe that relays GS and GSI release and the LI lamp is extinguished in approximately 30 seconds after the release of the SGL relay.

6.37 Remove blocks from the SG- relays and the insulation from the contacts of the LL-0 relay.

6.38 Make busy a sender subgroup at the CTI or SMB frame. Observe that lamp LI lights. Remove make busy plug. Observe that lamp LI is extinguished in about 30 seconds. Repeat for each subgroup.

6.39 Two Controllers Timed to ZA or TA

6.391 Block the TA relays operated in the first two sender link controllers at the same time. Observe that relay SLT operates and lamp LI lights.

6.392 Release relays TA in the two controllers and observe that the LI lamp is extinguished in about 30 seconds.

6.393 Repeat Paragraph 6.391 in turn at the remaining pairs of controllers. In these tests observe that relay SLT (Figure 16) operates when two TA relays are operated and releases when they are released instead of waiting for LI lamp to extinguish each time.

6.394 Manually operate and release one at a time in turn the TA relays in all the controllers and observe that relay SLT does not operate each time.

6.395 Block all controller relays TA normal and repeat Paragraph 6.393 using the ZA relays instead of the TA.

6.396 Release the TA relays in all the controllers.

7. CONTINUITY FAILURE AND DOUBLE CONNECTION

7.1 Insert plugs into the line link SS jacks as specified in Paragraph 5.11.

7.2 Block the SL relay of the sender link frame nonoperated and insert a 298A plug into the HD jack.

7.3 Originate a call on any line of the line link frame using the handset. Observe that the major alarm is sounded and that the CF lamp lights. Remove the blocking tools, operate the SL relay and observe that the CF lamp is extinguished and that the D-C lamp is lighted. Release the connection.

7.4 Using an ITE-9547 cord and alligator clips connect ground to terminal 32 (SL lead) of the terminal strip adjacent to relay C-9.

7.5 Again originate a call from the line link frame and observe that the major alarm is sounded and that the D-C lamp lights. Release the connection and remove the ground from terminal 32.

7.6 Test the emergency control circuit by connecting it to one sender link frame and performing operations 7.2 to 7.5.

7.7 Release the connections and remove the plugs from the HD and the SS jacks.

8. GB REGISTER

NOTE: Test of delay feature when there is one idle district junctor in the group.

8.1 Make busy nine of the ten district juncctors in subgroup O.

8.2 Block the RS relay operated and the W relay normal in the sender link controller. If the controller is arranged to work with dialing district juncctors block the CD relay normal when SD-25554 is provided and if Figure 15 is equipped when SD-25004 is provided.

8.3 Using a handset originate a test call on a line which has access to the district junctor subgroup O. Plug SS-jacks on the line link frame as required. The test blocks. Disconnect the call.

NOTE: Perform the test per Paragraph 8.4 when SD-25554 is provided and if Figure 15 is equipped when SD-25004 is provided, otherwise proceed to Paragraph 8.5.

8.4 Remove the block from the CD relay. Originate a call. Dial tone is received and the GB register scores. Again block CD relay normal.

8.5 Remove the block from the RS relay. Originate a call. Dial tone is received and the GB register scores.

8.6 Remove a make busy plug from a district junctor circuit making two circuits available in subgroup O.

8.7 Originate a call. Observe that dial tone is received and that the register does not score.

8.8 Repeat the tests per Paragraph 8 on each subgroup of districts.

9. REGULAR AND RESERVE SENDER SELECTION

9.01 At the sender link, block operated relays GB-1 to GB-9. Block non-operated relays R1, R2 and W.

9.02 At the sender make busy frame insert 322A plugs into all but two sender MB jacks of the sender group associated with the unblocked GB relay.

9.03 Using a handset originate a call on a line of a line link that prefers this sender link. It may be necessary to originate the call a second time since the preference of the line links for the sender links alternates between calls. Insulate the IOT contact of RL relay and then block the PR and RP relays of the line link controller so they are either operated or nonoperated to steer other calls to the sender link under test.

9.04 Observe that only the SG relay associated with the unblocked GB relay operates, and that dial tone is received.

9.05 Disconnect the call and insert a 322A plug into one of the two remaining MB jacks. Originate a call and observe that dial tone is not received.

9.06 Remove the block from the R1 and R2 relays. Observe that dial tone is received.

9.07 Insert 322A plug into the remaining sender MB jack. Originate a call and observe that the call is served by another sender link and control circuit. Remove all plugs from the sender MB jacks.

9.08 Remove the blocking tool from relay GB1 and block operated relay GBO.

9.09 Repeat 9.01 to 9.07 on the associated sender group.

9.10 Repeat 9.08 and 9.09 until all GB relays have been used for test.

9.11 Connect the sender link under test to the emergency control circuit and perform 9.01 to 9.07 with the last GB relay and sender subgroup used.

9.12 Release the RP and PR relays of the line link frame and any blocked relays on the sender link frame upon completion.

9.13 Repeat Paragraphs 9.01 to 9.12 from each sender link frame.

#### 10. SENDER LOAD REGISTER AND LOAD CONTROL

10.01 At the sender make busy frame insert 322A make busy plugs into the subscriber sender GB- jacks starting with the lowest numbered subgroup until the number of subgroups required to operate the LD subscriber sender register have been made busy. For example, assuming that there are 10 sender subgroups in the common group and that 6 subgroups are required to be busy in order to operate the LD register, then the 322A plugs would be inserted into GB jacks 0 to 5.

10.02 Observe that the LD subscribers sender register located on the traffic register rack scores once every 1.3 seconds. If Touch-Tone is provided on a partial basis, observe that the LD register for Touch-Tone subscriber senders also scores every 1.3 seconds. Also observe that the minor continuous alarm sounds and the following lamps light: White aisle pilot, LR lamp at sender make-busy frame.

NOTE: Check the operations per Paragraph 10.03 or 10.04.

10.03 If the office is arranged to operate with a central DS A Board (Figure 5 of SD-25076-011 Misc. Ckt.

Sender Make Busy Frame) check that the associated T punching at the HMDF is grounded and the resistance battery is present at the R punching. Check that ground is removed from the T punching when 3 and 4 bottom springs of SSL relay are opened.

10.04 If a local DS A Board is provided the red pilot (beehive) LR lamp of the switchboard auxiliary signal circuit lights.

10.05 Remove the make busy plug from the GBO jack and note that the alarm continues. Operate and release the alarm release key at the sender busy frame to retire the alarm. If a local switchboard is installed the alarm release key of the auxiliary circuit must be operated to extinguish the red pilot (beehive) LR lamp at the board.

10.06 Insert the plug in the next higher GB- jack not plugged per Paragraph 10.01. On the assumption that 0-5 were plugged at that time the plugs should be inserted in jack GB6 making plugs in GB1 to 6. The LD register again scores. The alarm also functions.

10.07 Remove the plug from GB1. The register stops scoring. Reinsert in the next higher GB- jack not plugged. In this case BG7. The register again scores.

10.08 Repeat Paragraph 10.07 removing the plug from the lowest numbered jack and inserting it in the next highest GB- jack not plugged. Continue in this manner until all GB- jacks have been used. At the completion of the tests remove all plugs.

10.09 Insert one less 322A plug, than is required to operate the LD register, in the GB- jacks starting with highest numbered jack. In the example cited this would be 9 to 5. Observe that the LD register does not score.

10.10 Remove the plug from the 9 jack and insert it into 4 jack. Remove the plug from the 8 jack and insert it into 3 jack. Repeat this process until all subgroups have been tested. Observe that during these operations the LD register does not score.

NOTE: Perform the tests per Paragraphs 10.11 to 10.16 if Figure 19 of SD-25317-011 is installed.

10.11 With plugs in the required number of GB- jacks to cause the LD register to score, flash the plug in one of the jacks. Observe that the K relay of Figure 19 flashes but the register continues to score. This checks the slow release V and T relays. Leave the plugs in the jacks for the following tests.

10.12 Operate the LC key at the trouble indicator frame. The LC relay of Figure 19 SD-25317 operates. The O-RTA lamp lights, the green aisle pilot lamp associated with the trouble indicator frame lights and the major alarm sounds. When Figure 15 SD-25554 is provided observe that the LC relay of each sender link controller operates.

10.13 Remove the plug from one of the GB- jacks. The alarm should not be silenced. Operate the O-RTA key at the trouble indicator. The major alarm is silenced, the O-RTA lamp is extinguished, and the O-RTG lamp lights. Release O-RTA key. The O-RTG lamp is extinguished.

10.14 Reinsert the plug in the GB- jack. The O-RTA lamp is again lighted and the major alarm sounds. Operate the O-RTA key. The major alarm is silenced, the O-RTG lamp is lighted and the O-RTA lamp remains lighted. Remove the plug from one of the GB- jacks. The O-RTA lamp is extinguished. Release the O-RTA key and the O-RTG lamp is extinguished. Release the LC key. Remove the plugs from all GB- jacks.

10.15 With the LC relays of Figure 19 released, apply battery to the 2T contact of an LC relay by crossing contacts 1 and 2T. Observe that the X relay of Figure 19 operates, and the O-RTA lamp lights and the major alarm sounds. Remove the cross and operate and release the O-RTA key to silence the alarm and extinguish the lamp.

10.16 Repeat this test at 2B, 5B, 8B, 2T and 7T by crossing these contacts with 1B, 4B, 7B, 1T and 6T respectively of each of the LC relays.

#### 11. SENDER SUBGROUP BUSY

11.1 At the sender make-busy frame, insert 322A plugs into the MB- jacks of all senders in the subgroup under test. Observe that the GB lamp on the sender make-busy frame lights. If Touch-Tone is provided on a partial arrangement basis, observe that the TTGB lamp is also lighted.

11.2 Momentarily remove one plug from the MB jack of a dial sender. Observe that the GB lamp is momentarily extinguished.

11.3 Momentarily remove one plug from the MB jack of a Touch-Tone sender. Observe that the TTGB lamp is momentarily extinguished.

11.4 Repeat Paragraphs 11.2 and 11.3 removing and replacing each of the 322A plugs until all senders in the subgroup have been checked. Remove all 322A plugs.

11.5 Insert a 322A plug into the GB jack at the sender make-busy frame for the sender subgroup under test. Observe that the GB and TTGB lamps on the sender make-busy frame are lighted. Remove the 322A plug.

#### 12. SIMULTANEOUS CALLS FROM DIALING DISTRICT JUNCTORS

12.1 Plug an ITE-9947 cord into the B receptacle of ITE-4033. Equipment leads 0 to 9 with alligator clips and connect to the sleeve (Punching #2, Individual Punchings on the Vertical T.S. on the Unit) of circuits 0 to 9 in the first subgroup of district junctors.

12.2 Using alligator clips short circuit the tip and ring (Pchgs. #0 and #1) of circuits 0 to 9 of the subgroup.

12.3 Patch 48 volt battery and ground to the BAT jack of ITE-4033 with cord ITE-9598.

12.4 Operate keys B0 to B9 and BB. Observe that a sender is connected to each district junctor and that no sender link alarms appear. Dial tone may be checked by connecting a test receiver to ground and touching the test pick to the clip which short circuits the tip and ring of each junctor.

12.5 Remove the clips from the circuits promptly or the senders will time out and connect the circuits to permanent signal trunks.

#### 13. TEST OF LINKS AND CONNECTIONS TO SENDERS

NOTE: Test of links and the connections between the secondary switch horizontals and senders.

13.1 Block operated relays GB-1 to GB-9 of the control circuit of the sender link frame under test in order to steer the calls in the first group of senders.

13.2 Using the district junctor test circuit as described in the district junctor test method, set up an operator class of call with the OPR and REP keys operated on one district junctor of the (0-1) subgroup of district junctors. Set up an ITE-9627 remote control cord at the sender link frame to control the test frame from that point. Operate and release the remote control red button to start the test. Release the test frame by momentary operation of the red button when the sender link crosspoints release. Have an assistant observe which SB relay of the sender selector unit associated with the first group of senders operates. Block this SB relay operated when the test circuit completes the test call.

13.3 Repeat Paragraph 13.2 and block operated the next SB relay that operates after the test call is released.

13.4 Continue as in Paragraph 13.3 until all senders of the first group have been tested, then release the blocked SB relays.

13.5 Remove the blocking tool from relay GB-1 and block relay GB-0 operated. Test that all senders of the second group are available in the same manner as the first group was tested.

13.6 Test the availability of the senders in the remaining groups to which the secondary switches of the sender link frame have access.

13.7 Make one operator class test call to each sender subgroup from a district junctor in each group (2-3), (4-5),

(6-7) and (8-9) that operates with line links. Block the GB- relays as required to steer calls to each sender subgroup.

13.8 If dialing district junctors are installed make one busy line call to each sender group using any junctor in the group. Make these test calls from the switchboard as described in Section 125.

13.9 Make the tests per Paragraph 13.1 to 13.8 with each sender link frame. Remove blocking tools from all relays when the tests are completed.

➔ Arrowed lines indicate new or changed information.

Manager, Crossbar Product Engineering  
Control Center

Reason for Reissue:  
To change Paragraphs 10 and 11 to include partial Touch-Tone features.

Replaces Section 137 dated 4-16-64.