TEST OF ORIGINATING SENDER TEST FRAME

1. GENERAL

1.1 Description of Test: This section describes a method of checking certain trouble detecting features of the originating sender test frame for:

SUB. SENDER (FULL SELECTOR CALL)

1.2 Manload: One man.

1.3 Test Procedure: These tests should be made before the checks of the PCI features of subscriber sender covered in Section 161.4 and the routine tests of senders.

1.4 Refer to Section 161 for information on setting up test calls, lamp indications, and other general information.

2. TEST OF TEST FRAME TROUBLE CHECKING FEATURES (SUB. SENDERS)

NOTE: In making test calls to check the various features, operate the DSS key where indicated to control the dialing of the digits individually or the SS key to control the revertive pulse selections individually. Operate the AV key for each digit and each selection. For some of these tests it will be convenient to control the selections by means of a 32A test set inserted in the remote control jack associated with the sender used for setting up the condition to be checked. The REP key should be operated when using the 32A test set. To restore the circuit to normal after a test is made, remove the trouble condition, restore the ST key and momentarily operate the CA key. Unless otherwise indicated, use a subscriber sender for making these tests.

2.1 Connector Circuit -0102, -0103

2.11 Timing Relays, TA and ACO Keys

Operate a key in rows (F) & (CS). Operate and release the ST key. Observe that after an interval of approximately (60-90) seconds, the TA lamp lights and that the minor alarm functions. Operate the ACO key to silence the alarm. Momentarily operate the TA key to retire the alarm. Operate and release the CA key to release the test circuit.

2.12 Check of the Connector Circuit

NOTE: Detailed method for setting up test call is covered in Section 161 of this handbook.

(a) Set up a test call and operate the ST key. Check that the test circuit is connected to the first sender to be tested, and that the G, T and U locating lamps light. When only one Fig. 2 of -0102 is furnished, the (G) 0 lamp does not light during test, therefore, with the test frame normal manually operate the RLN relay, observe that it locks and lamp (G) 0 lights.

(b) Make the tests of the Sender Group Test circuit -0131, as outlined in Paragraphs 2.81 to 2.88 at this time.

(c) Check that the test circuit progresses to succeeding senders upon satisfactory completion of a test and that the EC lamp lights when all senders have been tested. Also check that the EC keys and lamps, and the G and RN keys function properly. The test of the connector circuit may be made in conjuction with the test of key pulsing and subscriber senders covered in other sections of the handbook.

2.13 Removal of Ground from G Leads by Operation of BK Relay

Test that contact 3T of the BK relay is normally grounded and that ground is removed when the BK relay is operated.

2.14 Automatic Pass Busy

Make a sender of a group busy. Operate the APB key. Check that the busy sender is passed by after an interval of 29 to 59 seconds and that the PB register scores, when a call is originated from the test frame.

2.15 REP and REP2 Keys and RST and CT Registers

Set up a call and operate the REP key. Operate the ST key and observe that the RST register operates at the conclusion of each successful test. Release the REP key and observe that the CT register operates at the conclusion of the test. Operate the REP2 key, repeat the test and check that the test circuit makes two tests on a sender before advancing to the next sender.

2.16 Control Advance

Make a sender busy. Operate the REP key. Originate a call on this sender and when the BY lamp lights, momentarily operate the CA key and observe that the test circuit releases and then reseizes the same sender. Restore the ST and REP keys. Again originate a call and when the BY lamp lights, momentarily operate the CA key and observe that the test circuit advances to the next sender to be tested.

2.17 Remote Control

With a 32A test set connected to the remote control jack at the sender frame check that the red and white buttons of the 32A set perform the same functions as the CA and AV keys respectively. The REP, SS and DSS keys should be operated while calls are being sent through to test the jacks. All remote control jack appearances should be checked.

2.18 Dial Tone Test

Operate class key 15 and then operate the ST key. The first sender is seized and dial tone is heard in the receiver. Operate and release CA key. The test circuit advances to the next sender and dial tone is heard. Restore the circuit to normal.

2.2 Code Keys and Dial Pulsing Circuit -0105, -0106

2.21 Dialing the Preliminary Pulse. Subscriber Senders not Arranged to Register Prefix "One-One"

Set up a full selector call and operate keys REP and DSS. Operate the ST key and observe that one pulse is dialed. This may be checked by noting that the PP progress lamp lights and remains lighted until the AV key is operated.

2.22 Omitting the Preliminary Pulse. Subscriber Senders Not Arranged to Register Prefix "One-One"

Set up a full selector call and operate keys PP, REP and DSS. Operate the ST key and observe that the A progress lamp lights.

2.23 Preliminary Pulse and Prefix "One-One" - Subscriber Senders Arranged to Register the Prefix "One-One"

Operate the REP and the DSS keys and make four test calls using the PP and the 1 - 1 keys as indicated in the following table.

Test Condition	Key Operations PP	Key Operations 1-1	Results After Operating the ST Key
No Prel.Pulse and No Prefix Use Full Selector Code	Opr.	Nor.	A digit is registered on the A and AA verticals of the sender register switch when the AV key is operated and released.
Prel.Pulse and No Prefix Use Full Selector Code	Nor.	Nor.	Check that the 11A & 11B relays of sender are operated. Operate & release the AV key and check that the "A" digit is registered on the A and AA verticals of the sender register switch.
Prel.Pulse and Prefix 1-1 Use Extended Area Full Selector Code	Nor.	Opr.	Check that the 11A and 11B relays of sender are operated. Operate and release the AV key and check that relay 11C of sender operates. Again operate and release the AV key and note that relay 11C remains operated. Operate and release the AV key and note that the A digit is registered.
No Prel.Pulse and Prefix 1-1 use Extended Area Full Selector Code	Opr.	Opr.	Check that the 11A & 11B relays of the sender are operated. Operate and release the AV key and check that relay 11C operates. Again operate and release the AV key and check that the A digit is registered.

2.24 Tone to Sender Monitor X Wiring

Set up a full selector test and operate keys REP and DSS. Operate the ST key. Check for tone at contacts 1B and 6T of the sender MS relay or 4B and 3T of the MS1 relay. Operate the AV key and check that the tone is present each time that the dialing of a digit is completed.

2.3 Route Keys and Revertive Pulsing Circuit -0108, -0109

2.31 Test for Opening of Fundamental in Sender

Set up a full selector class of call (CLASS KEY No. 1) and insulate contacts 1 and 2T of the BO relay of the test circuit. Operate the REP and the ST keys and observe that the test frame blocks with the FC lamp lighted. Remove the insulation from the BO relay. CA the circuit and repeat the test. The call should be completed satisfactorily.

2.32 Check of the Selection Progress Lamps

Operate the REP and SS keys. Originate a full selector class call (use office selectors when assigned) and control the selections by means of the AV key. Check that the proper selection progress lamp lights as each selection is made.

2.33 Check of the Pulse Lamps

Operate the PL-LP key. Manually operate and release in turn counting relays 9 to 1 and observe that only the corresponding pulse lamp lights as each relay is operated. Insert a 298-A plug or equivalent into the CHK or the FND jack and observe that the 0 lamp lights when the 0 relay is operated. Remove the make busy plug from the jack and restore the circuit to normal.

2.4 Full Selector Dial Pulse Control Circuit -0111

2.41 Check of S and LR Lead Controls

Set up a panel class call and operate the REP key. Block relay S of the full selector dial pulse control circuit normal. Operate the ST key and observe that the DP selector blocks in position 20. Unblock S, block relay LK normal and repeat the test. Unblock relay LK.

2.5 Incoming and Final Selections Control Circuit -0113

2.51 Check of Synchronizing Features

Set up a panel class call and operate keys DSS and REP. Operate the ST key and dial the office code. Block relay TC1 of the Incoming and Final Selection circuit operated. Using the AV key dial the thousands digit. The S lamp lights and the SP selector blocks in position 1. Release the TC1 relay. CA the circuit and repeat the test blocking the TC1 relay before dialing the hundreds, the tens and the units digits and noting that the SP selector blocks in the position corresponding to the digit dialed. Operate the XB-SY key and check synchronizing on a crossbar call in the same manner as the panel class call except that the synchronization check starts with the hundreds digit. Note that the test circuit blocks with the S lamp lighted after the last digit is dialed.

2.52 TG Relay Test and Test for Undue Delay in Trunk Closure

Block relay TC1 of the incoming and final selector control circuit normal. Operate the REP key. Originate a full selector call and observe that the test circuit blocks with the U and S lamps lighted about 1-1/2 seconds after the tens digit has been dialed. Release the ST key and momentarily operate the CA key. Unblock relay TC1. Block relay TTG normal. Operate the ST key and observe that the SP selector blocks in position 1. Note that the test circuit blocks with T and TG lamps lighted after the hundreds digit is dialed. Unblock relay TTG. Repeat this test using a key pulsing sender.

2.53 MTG Relay Test

Temporarily strap the T1 resistance of the incoming and final selector control circuit. Operate the MTG, REP and DSS keys. Originate a full selector call using an office code which causes the sender to use its MTG relay. Observe that the test circuit blocks with the SP switch in pos. 1 and that lamp MTG-NO lights instead of MTG-O after the thousands digit has been dialed. Remove the strap from resistance T1.

2.54 Register Control Test

Set up a full selector test and operate the DS, REP, 26 P.P.S. -MAX BR and register control (CLASS No. 2) keys. Operate the ST key and dial the office code and the thousands digit. Block relay S of the incoming and final selector circuit operated. S lamp lights. Release key DSS and observe that the test circuit dials the hundreds, tens and units digit indicating that the synchronizing test is passed by.

2.55 Late Release Full Selector Test

Operate key DSS and set up a full selector test and operate the REP and late release full selector class key No. 3. Block relay LR normal in the sender to which the test circuit is connected. Operate the ST key. The office and thousands digits should be dialed after which the test circuit opens the T and R leads to the sender. The sender should release and ground the LR lead but since the LR relay is normal no ground is received on lead LR and the test circuit blocks with the SP selector in position 1. Remove block from relay LR, restore the ST key and momentarily operate key CA. Block relay WO-1 of the test circuit normal and repeat the above test noting that the SP switch blocks in position 2. Unblock relay WO-1, restore the ST key and momentarily operate CA.

2.56 Official Reroute (OFF-9300)

(a) Operate key ORR and set up a full selector call using code OFF(633) and number 9300. Operate the REP and full selector class key No. 1. Insulate 1 and 2T of the SG5 relay of the sender to which the test circuit is connected. Operate the ST key. The test frame blocks and the ORR lamp lights. Operate the (PL-LP) key and check that the 9-5 pulse lamps light.

(b) Remove the block from the SG5 relay. Operate the CA key and observe that the sender calls for a marker three times before test call is completed.

2.6 Overflow Control Circuit Subscriber Senders -0119

NOTE: The code used need not be one which uses office selectors, but must be routed full selector or operator class on second trial. The sum of the beyond office compensating resistance in the sender and test circuit shall be 900 ohms.

2.61 Office Overflow Test (All Codes)

Set up a full selector code and operate class key 13. Office selections and compensating resistance should be set up

in accordance with the alternate route or second trial translation for the code used when required. Block relay TC3 normal, operate the REP and ST keys and observe that the test circuit blocks with the DP switch in position 20. Remove block from the TC3 relay, repeat test and observe that test call completes.

2.62 Incoming Overflow Test

Set up a full selector code similar to Paragraph 2.61 and operate class key No. 14. Block relay TC1 normal, operate the REP and ST keys. Observe that the test circuit blocks with the DP switch in position 18. Remove block from the TC1 relay. Operate the MTG, REP and ST keys. Observe that the call completes. Release MTG key and repeat test.

2.63 Test of Long Incoming Overflow

Set the test circuit on a sender. Operate class key #14 and operate the L-IOF key. Set up a full selector call and when relay IO1 operates, momentarily break the 6T contact of RV relay. This should release the L and IO1 relays. The DP switch of the overflow control circuit blocks in position 19.

2.7 Operator Class Control Subscriber Senders -0121

2.71 Checking Waiting of the Sender for the Dialing of all Digits Before Grounding the TR Lead

(a) Block relay C of this circuit operated. Momentarily connect ground to contact 3T of the SW relay of the connector circuit and note that relay TR of this circuit operates and locks. Release relay C, relay TR releases.

(b) Set up an unassigned code or restricted code and any numerical digits. Operate class key 18 and keys REP and DSS. Operate the ST key and advance the circuit to the point where the units digit is to be dialed. Manually operate the TR relay and note that it locks and operates the BK relay. The test circuit should block and after 30 to 60 seconds the TA lamp should light and the minor alarm functions. Repeat test but do not operate the TR relay. The call should be completed satisfactorily.

2.72 Permanent Signal Test - Extension of Time Alarm

With the test circuit connected to a subscriber sender, operate a frame and a class of service key and keys 12 (PS), RI, REP and ST. Observe that lamp TA lights and the minor alarm functions in from 90 to 120 seconds.

2.73 Testing of Calls to Trunks that Normally Return Reverse Battery To Sender - RVT Key Operated

Insulate the 1 and 2T contacts of the CL2 relay of the subscriber sender to be used for test. Set up an unassigned code and four numerical digits. Operate class key 18. Operate the RVT and REP keys. Start the call and observe that the test circuit blocks with the DP switch in position 14. A second marker is used in attempting to complete this call. Release the circuit and remove the insulation from the CL2 relay. Reoriginate the call and note that the test call is completed satisfactorily.

2.8 Sender Group Test Circuit -0131

2.81 Busy Test - Check of Second Test of S Lead for Busy Battery

Connect battery thru a test receiver to contact 1T of relay BT2 and observe that relays BT1 and BT4 operate. Manually operate relay BT3 and observe that relay BT1 releases, then slow release relay BT4 releases and BT1 reoperates. Release BT3 and remove battery from BT2 and observe that relay BT1 releases.

2.82 Busy Test - Check of BY and GB Lamps, Senders Made Busy

At the sender make busy frame, make a particular sender busy. Connect the test circuit to this sender by means of the PCR and PCS keys. Observe that the BY lamp lights. Remove the make busy plug from the sender and note that the BY lamp is extinguished. Make a sender sub-group busy (GB jack) and note that the GB lamp lights when the test circuit attempts to seize a sender in this sub-group. Remove the make busy plug and note that the lamp GB is extinguished.

2.83 Busy Test - Check of BY Lamp for Sender Busy in Service

Block relay C operated; GB lamp lights. Connect ground to 5B of relay CH and observe that lamp BY lights and GB is extinguished. Release relay C and remove ground.

2.84 Check of Ground and Battery Chains, CH and CH1 Relays

Block relay CH normal and observe that the test circuit blocks when the ST key is operated to start a test call. Lamp BY lights. Release relay CH and repeat the check using the CH1 relay. Lamp SEL lights. Release the CH1 relay. Block relay CH operated and observe that the test circuit blocks with lamp CH lighted when a call is started. Block relay CH1 operated and again observe that the test circuit blocks with the CH lamp lighted when a call is started. Release relay CH and observe that the test circuit blocks with lamp CH1 lighted when a call is started. Release relay CH1.

2.85 Check of Sender Preference Leads - GH, RL and SPF Lamps

Note that the test circuit blocks with the following lamps lighted when a call is started with the following relays blocked normal.

SPF relay	GH lamp lighted
RL "	RL " "
SPF-2 "	SPF " "

2.86 Check of Advance of Preference Lead to Next Sender

Operate the LT key. Block relay SPF normal. Start a call, remove the blocking tool from relay SPF, and just after the tool is removed, manually operate relay SPF-3. Note that the test circuit blocks and that lamp X lights. Release the LT key.

2.87 Check for Crosses on SC - Relay Contacts

Block relays XB and CI operated and note that relays CI1 and X1 to X5 operate. Note that lamp X lights each time as ground is connected in turn to the following contacts; 6T (CI1); 5B, 7T, 9T and 11T (CI); 2, 5, 8T and B of (X1), (X3) and (X4); 2T, 5T, 2B, 5B, 8B (X2). Connect battery instead of ground to 8B (X2) and note that the X lamp lights. Release relays XB and CI.

2.88 Short Time Alarm and Group Make Busy

(a) Make busy a sender by inserting a 322A MB plug into a sender MB jack on the Sender Make Busy frame. Start a test call to the same sender and observe that lamp BY lights. Momentarily operate key MGB. Observe that lamp MGB lights. After 5 to 12 seconds the major alarm operates and lamp GB and TA light. Operate key TA to silence the alarm. Observe at any convenient subscriber sender link frame that the associated group busy (GB-) relay operates. Restore the test circuit to normal and remove the sender MB plug.

(b) Make senders busy and start test calls as required to perform the test once for each subgroup of senders.

(c) From one sender group set up the test as above but remove the busy condition from the sender before 5 seconds and observe that the sender is seized for test.

(d) Operate key REP and start a test call. Observe that the test call is repeated automatically to the same sender and that lamp MGB lights momentarily for each of the test calls. Operate and restore key CA during the progress of one of the test calls after lamp MGB has been observed to light momentarily. Check that relay MGB does not release when the CA key is restored. Restore key REP.

(e) Operate key REP-2, start a test call and observe that lamp MGB lights, momentarily, at the conclusion of the first of two test calls resulting from the operation of the REP-2 key. Restore keys REP-2 and ST.

3. TEST OF COIN FEATURES -0111

3.1 Synchronizing of Units Selections

Set up a full selector coin class of call. Block normal the CTR relay in the sender. Operate the ST key. With CTR relay normal the sender is set to cancel coin test, therefore, the sender will close the fundamental prematurely and block the test circuit with the FS-DPLS (DP) switch in position 18.

3.2 Failure of Sender GT Relay to Operate: Block normal the sender GT relay. Set up a full selector coin class of call. Operate the ST key. The test will block with the FS-DPLS (DP) switch in position 20. Remove block from GT relay.

3.3 Sender GT Relay Operate on Non-Operate Test: Short Circuit the C resistance in the test frame FS-DPLS circuit. Make a full selector coin class call. The test blocks with the FS-DPLS (DP) switch in position 18.

3.4 Sender SGT Relay Operate on Non-Operate Test: Remove the short circuit from the C resistance and short circuit the E resistance. Operate the SGT-NO key. Make a full selector coin class test. The test blocks with relay SGA in the sender operated.

3.5 Failure of Sender SGT Relay to Operate on Operate Test: Remove the short circuit from the E resistance. Block normal the sender SGA relay. Operate the SGT-OPR key. Make a full selector coin class test. The test blocks with the FS-DPLS (DP) switch in position 18.

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→ Arrowed lines indicate new or changed information.

Reason for Reissue: To indicate Short Time Alarm.

Replaces Section 161.3 of Handbook 61 dated 6-19-41 and Addendum 161.3 of 11-21-41.