B SWITCHBOARD SENDER

ROUTINE TESTS

CONTENTS

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1. GENERAL INFORMATION

1.1 Description

1.11 This section describes routine tests to be made using Terminating Sender Test Circuit, SD-25159-01. When test circuit is not arranged for checking centralized B senders, refer to Handbook 63, Section 521 for alternate method of performing routine tests.

1.12 In order to apply interoffice routine tests covered in Paragraph 6, the Telephone Company will be required to furnish at least two cable pairs between the crossbar office and switchboard office. Cable pairs are used for interconnecting the two parts of the B sender, Terminating Office Part and Switchboard Part.

1.13 When sufficient cable pairs are available, all associated senders should be connected in order to facilitate test operations. Refer to Figure 1.

1.14 Before applying interoffice routine tests, the Switchboard Part of B sender should have been previously tested in accordance with Section 551, Handbook 63.

1.15 For interoffice tests, the assistance of a B operator or another installer will be required at the switchboard office.

1.16 One cycle of routine test consists of applying all tests of Paragraphs 5 and 6 once to each sender.

1.2 Drawings

1.21 Routine tests of following circuits are described in this section.

SD-25382-01 - B Switchboard Sender-Circuit - Terminating Office Part

SD-96285-01 - B Switchboard Sender Circuit - Switchboard Part

2. RECORDS AND REQUIREMENTS

2.1 Records

2.11 Forms ID-1383, ID-1305 and ID-1334 are required for recording results of these tests. Refer to Section 3, book 50 for information regarding preparation and use of test trouble records.

2.2 Requirements

2.21 Test requirements for equipment units included in this section are listed in Section 10, Handbook 61.

3. TEST EQUIPMENT

3.1 Test Sets

Amt	Code	Description	With ITE
1	4029	Pulse Checking Set	-
2	9650	Telephone Set	4023

3.2 Accessories

Amt	Code	Description	With ITE
As Req.	322A	MB Plugs	4023
1	KS-3008	Stop Watch	-

4. PRELIMINARY TESTS - SD-25382-01

4.1 Fusing

4.11 Using a test receiver, check fuse posts for absence of foreign battery, grounds and crosses.

4.12 Install fuses of correct type and capacity specified by circuit drawing. Check for presence of battery at test point indicated in following table after installing associated fuse.

Fuse Desig.	Test Point Relay	Term.
A	H5(Hold Mag.)	B WDG.
B	RL	1B
C	GR	1B
D	MB	3B

NOTE: Fusing test may be omitted when senders are equipped with shop installed fuses.

4.2 MB Jacks

4.21 Provide a talking circuit by means of frame line jacks and two ITE-9650 telephone sets between terminating trouble indicator and sender frames under test.

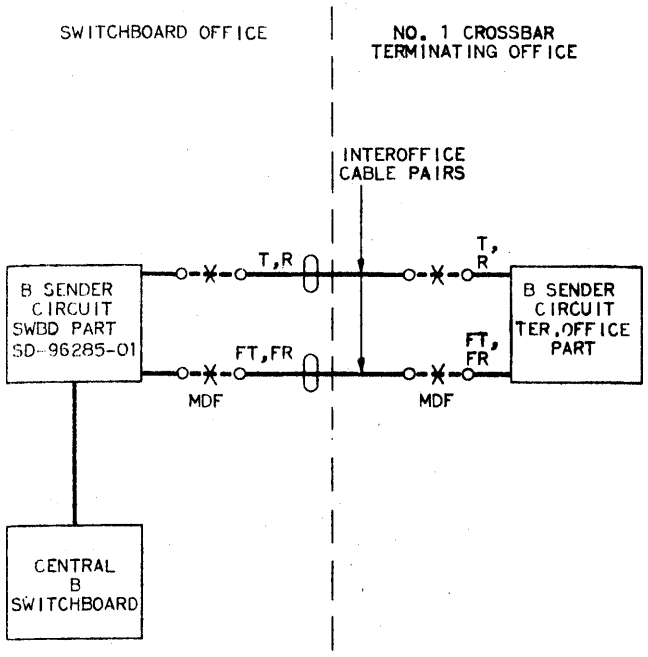

FIG. 1 CENTRALIZED B SWITCHBOARD SENDER APPLICATION

4.22 At trouble indicator, insert 322A plugs into MB jacks of senders under test.

4.23 Test for ground at punching 3 of each sender unit terminal strip.

4.24 Remove MB plugs one at a time and check that ground is removed from associated sender terminal strip, punching 3.

4.25 Operate test frame keys CL-O, BS and ST. Check that test circuit sender locating lamps lighted agree with first B sender in order of test sequence. Test circuit blocks with lamp BY lighted. Remove MB plug from jack of associated sender.

4.26 Check that lamp BY is extinguished. Advance test circuit to next busy sender by momentary operation of key CA. Check that test circuit again blocks with lamp BY lighted.

4.27 Continue the test, removing make busy plugs in turn and checking that BY lamp of test circuit is extinguished when busy condition is removed from sender connected to test circuit.

4.3 STP and GR Relay Pulsing

4.31 Connect ITE-9639 cord to T jack of terminating sender under test. Connect another ITE-9639 cord to the MN or MX frame jack associated with Revertive Pulse Interrupter circuit, SD-25289-01.

4.32 Using ITE-8507 alligator clips, connect other ends of two cords together, tip to ring and ring to tip. Equip sleeve of cord associated with T jack with a spade tip and connect to ITE-4029 P terminal.

4.33 Connect 48V battery and ground to test set A jack.

4.34 Proceed with test as outlined in Paragraph 4, Section 5 of Handbook 50 and check that per cent break and pulse speed readings are within limits specified by circuit requirements.

NOTE: Test of SD-25289-01, Revertive Pulse Interrupter circuit is included in Handbook 62, Section 222.

4.4 Crossed Office Indication Leads

NOTE: This test and operation of an office indication key in following tests are required only when senders are arranged to serve a multi-office terminating unit and test circuit is equipped with office indication keys LOA, LOB, LOC and 1G5.

4.41 Operate an F key associated with senders under test. Operate keys LOA, LOB, CL-O, BS and ST. Check that lamps MGB, BY, GB and SEL light momentarily and that test circuit blocks with lamp RL lighted.

4.42 Operate key CA to advance test circuit to next sender. Repeat test as required on all units.

4.43 Repeat test on all senders for pairs of keys LOA-LOC and LOB-LOC. Result of these tests should be as previously described.

4.44 Restore test circuit keys to normal after completing test.

4.5 Crossed and Open Frame Indication Leads

4.51 Operate an office indication key when required and F keys 0 and 1. Operate keys CL-O, BS and ST.

4.52 Check that lamps MGB, BY, GB and SEL light momentarily and that test circuit blocks with lamp RL lighted.

4.53 Momentarily operate key CA to advance test circuit to next sender. Repeat test for all sender units as required.

4.54 Repeat test on all sender units under test with F-keys normal. Check that test frame lamp indications and results are the same as previously described.

4.55 When equipped, operate keys FA-O and FA-1 and with other F keys normal, repeat test with same results.

4.56 Repeat test on all senders with all equipped office indication keys normal and any F key operated. Test results should be the same as described in Paragraph 4.52.

4.6 Timing Tests

4.61 TS Interrupter

4.611 Block relay ON2 operated. Observe that relay TM1 operates and that relay TM2 operates about 29 seconds later. Remove the block.

4.612 Repeat test on all senders.

4.62 Alarms

4.621 Insert 322A plugs into HLD jacks associated with B senders under test. With frame and office indication keys operated as required and key APB normal, operate MGB, TA, CL-6, BS and ST keys.

4.622 Lamp TC lights and remains lighted for 28 to 58 seconds after which the associated sender lamp TL on terminating trouble indicator lights.

4.623 Sender minor alarm lamp operates 5 to 12 seconds later.

4.624 Remove MB plug from HLD jack of sender under test. TL lamp goes out and minor alarm is retired.

4.625 Operate AV key to advance test circuit to next sender and repeat test. Check all senders in a similiar manner.

5. ROUTINE TESTS - TERMINATING OFFICE PART

5.1 General

5.11 Apply routine test calls listed in following call chart to all B senders under test.

5.12 Operate a different combination of frame identification keys (F and FA) for each call in order to check all frame indication features during routine tests. This information may be entered on call chart under respective columns.

5.13 When terminating part of central B senders serve a multi-office terminating unit, rotate use of office indication keys (LOA, LOB, LOC, and 1G-5) in order to check all features during routine tests. Enter this information for each call under LO- column on call chart.

NOTE: Sender test circuit key operation and central B sender apparatus options for multi-office service are associated as follows:

(A) OFF. KEYS	SDR OPT.	(B) OFF. KEYS
LOA	X	LOB & OAB
LOC	W	LOC,1G5 & OAB
FA-0	¢	FA-1 & OAB

¢ When senders receive office indicating signal over leads F00 and F10 from terminating sender link.

5.2 Test Operations

5.21 After setting numerical and special test circuit keys for particular call listed in call chart operate key ST to start test.

5.22 During one cycle of routine, operate key CL-1 and make busy terminating marker 1.

5.23 Repeat any of the test calls listed in call chart except test 1 or 2.

5.24 Check that relay SPL of terminating marker 0 operates for each of the test calls.

5.25 Move MB plug from jack DB-1 to DB-0 and repeat test. Check that relay SPL of marker 1 operates for each test call.

5.26 Remove make busy plug and restore test circuit to normal after completing test.

6. INTEROFFICE ROUTINE TESTS

6.1 Test Setup

6.11 Patch ITE-9650 telephone set to test circuit TEL jacks.

6.12 Operate frame indication keys and office indication key when required. Operate numerical keys 0000 special keys TO, TOS, CL-0 and BS.

6.2 Test Operations

6.21 Manual Tests

6.211 Operate test circuit ST key. When order tone is received from central B switchboard, request operator or assistant to key number that agrees with operated office and numerical keys.

6.212 Check that test circuit completes the call and advances to next central B sender.

6.213 Repeat the same test call to each of remaining senders.

6.22 Automatic Tests

6.221 Establish communication with central B operator or assistant by repeating procedure described in Paragraph 6.211.

6.222 Request B operator to accept an automatic signal (one long spurt of order tone) from test circuit as the indication to key office indications and line numbers (office key only when required and 1111 for first test).

6.223 With keys TO and TOS normal, operate frame, office and 1111 numerical keys. Operate keys CBT, CL-0, BS and ST. Lamp CB-REG lights.

6.224 Check that after number is keyed from B board position, the test call is completed and test circuit advances to next sender.

6.225 Test calls should be completed to each B sender automatically. Momentarily operate key RN to restore test circuit to normal after last sender has been checked.

CENTRAL B SENDER ROUTINE CHART

		TEST FRAME KEYS OPERATED								
NO.	TEST	F	FA	LO-	TH	H	T	U	OTHER	REMARKS
1	TBL.RLS-SDR LK	-	-	-	-	-	-	-	CL-3,BS	
2	TBL.RLS-TER.MKR				1	2	3	4	CL-4,BS	
3	TRK. DISCONNECT				2	3	4	5	CL-5,REP2,BS	322A PLUG IN HLD JACK AT TT1 FRAME
4	TELL TALE				0	0	0	0	CL-2,RO,BS	
5	REORDER				0	0	0	0	CL-8,RO,BS	
6	SENDER REGISTER				0	0	0	0	CLO,BS,	NOTE 1
7					9	9	9	9	CL-O,BS	NOTE 2
8					1	1	1	1	CL-O,Bs	
9					2	2	2	2	CL-O,BS	
10					3	3	3	3	CL-O,BS	
11	MIN.LOOP.MIN.SEL.INT.				4	4	4	4	CL-O,BS	
12					5	5	5	5	CL-O,BS	
13					6	6	6	6	CL-O,BS	
14					7	7	7	7	CL-O,BS	
15					8	8	8	8	CL-O,BS	
16	MIN.LOOP.MAX.SEL.INT.				0	0	0	0	CL-O,LST,BS	NOTE 3
17	MAX.LOOP.MIN.SEL.INT.				9	9	9	9	CL-O,L,BS	NOTE 4
18	OPR.TST-L&STP RLYS				0	4	9	0	CLO,STP,OPR,BS	
19					1	1	2	0	CL-O,BS	
20	SELECT BAR RELEASE				8	4	7	0	CL-O,BS	NOTE 5
21					6	4	9	0	CL-O,BS	

NOTES: 1. This test checks that (A) relay L2 is held operated until SM relay releases (B) relay SM is held operated through back contact of HM relay after L2 relay has reoperated for next selection (C) contacts 6B and 8B of relay L2 function properly (D) slow operate time requirement of L2 relay is correct (E) operate and release time requirement of RA1 relay is correct.

2. Test checks (A) closure of 3B contact on relay L2 (B) contact 6B on relay L2 does not break too soon due to fast release (C) operation of L3,L4 and L5 relays from GR relay contacts (D) ability of P relays to follow fast pulses.

3. Test checks SM relay holding path through contact 5B of L2 relay.

4. Test checks ability of L3 and L4 relays to respond to short closures and ability of L relay to release with a line leak current.

5. Test checks ability of select fingers and off normal contacts of select bars to restore in minimum time between selections.

6.226 Operate key LLR and numerical keys 2222. Inform B operator or assistant of change in number and repeat test on all senders.

6.227 Repeat test as required for remaining numerical digits 3333 - 9999. Operate key LLR on alternate test cycles. Rotate office indication signals so that each signal is used at least once.

7. SUPPLEMENTARY TESTS

7.1 Marker Connector Multi-Contact Relays

7.11 Select one B sender in each marker connector. Make busy all but one marker in connector associated with first of selected senders by inserting 322A MB plugs in CB jacks at terminating trouble indicator.

7.12 Apply routine tests 6-15 to selected sender, completing the calls through idle marker. Change MB plugs at TT1 as required to made remaining markers available one at a time and repeat series of test calls to each marker.

7.13 Repeat test for each terminating marker connector and remove MB plugs from CB jacks when tests have been completed.

7.2 Frame Miscellaneous Circuits

7.21 Using a test receiver, check frame 48V, GRD and HRG test battery supply terminals. Check frame A battery supply jack.

7.22 In any convenient manner check continuity of frame B jacks to MDF and D jack frame line circuit when provided.

7.23 Check frame fuse alarm circuit for both audible and visual alarm indication.

7.24 At each sender unit, check that terminal 70 (SB) of unit terminal strip is clear of ground except when sender ON1 relay is manually operated.

8. TEST CIRCUIT INFORMATION

8.1 Test Circuit Keys

8.11 Test circuit keys, provided for use in testing central B switchboard senders and their functions are associated as follows:

(BS) This key serves to connect the terminating sender test circuit to the first central B sender, in the order of test, and the corresponding sender subgroup circuit of the terminating sender link.

Class
(CL-0) Regular Call
(CL-1) Special Call
(CL-2) Telltale
(CL-3) Trouble Release by Terminating Sender Link
(CL-4) Trouble Release by Marker
(CL-5) Trunk Disconnect
(CL-6) Time Out
(CL-8) Reorder
(L) Normal-Minimum Fundamental Loop, Operated - Maximum Fundamental Loop
(IG-5) Causes five additional pulses to be transmitted for incoming group selection
(CBT) Connects the T, R, FT and FR leads between the terminating part and the switchboard part of the central B sender together under control of the test circuit.
(LLR) Cuts resistance into the FT and FR leads between the terminating and switchboard parts of the central B sender to test the selection relays on the working limits of the circuits.
(TOS) Permits the tester to talk through the terminating part of the sender to the position at the switchboard part, simulating service conditions.
(TO) Disconnects the T and R leads from the tone coil and connects them to the TEL SET at the test frame.

8.2 Test Circuit Lamps

8.21 When the test circuit blocks, refer to the lighted lamps to identify the sender circuit involved and the reason for the circuit failure. The significane of the lamps is indicated in the following list.

Lamps Lighted	Failure Indication
BY	Sender busy
GB	Sender subgroup busy
SEL	Failure of link S relay to operate
CH	Failure of link S relay to open ground chain
CH1	Failure of link S relay to open battery chain
RL	Failure of sender to ground lead RL
SPF	Failure to advance preference lead or sender grounds lead RL falsely.
X	Premature advance of preference lead or crossed SC relay contacts
MGB	Sender subgroup held busy by the test circuit
S	Sender fails to ground lead S or premature removal of ground from the S lead
CO	Sender fails to ground lead CO
EF	EF (even frame) lead open
TR	Awaiting cut thru of leads FT and FR to the test circuit pulsing circuits
IB	Sender fails to register incoming brush
IG	Sender fails to register incoming group
FB	Sender fails to register final brush
FT	Sender fails to register final tens
FU	Sender fails to register final units
TC	Sender fails to seize marker
D	Sender fails to ground lead D
F	Failure of premature disconnect feature of sender

Lamps Lighted	Failure Indication
TH, H, T or U	Failure to transmit the corresponding digit correctly to the marker
F or F-10	Failure to transmit frame indication correctly to the marker
TRL	Failure to release on trouble release from the marker
DC	False ground on D lead

R. E. RAHMES

Engineer of Installation

Reason for Reissue:
Complete revision of test information and addition of test call chart.

Replaces Section 229 dated 3-19-42.