

AUXILIARY SENDER LINK FRAME

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1. GENERAL INFORMATION

1.1 This section describes the tests to be made on the Auxiliary Sender Link circuit per SD-96483-01 and miscellaneous circuit per SD-96492-01. Crosspoint tests and tests of the auxiliary sender multiple between switches are performed using the ITE-4433 crosspoint test set. All other lead tests from the auxiliary sender link to the auxiliary senders and also to the senders are performed using the ITE-4261 whistler.

1.2 The sender multiple should be left open, until after crosspoint tests have been completed.

2. RECORDS AND REQUIREMENTS

2.1 Records: SD-4-1313, SD-4-1315 and ID-1334 are required as outlined in Handbook 50, Section 3.

2.2 Requirements: For requirements see Section 0.1 of this handbook.

3. TEST EQUIPMENT

3.1 Test Sets and Accessories

<u>Amt</u>	<u>Code</u>	<u>Description</u>	<u>With</u>
1	ITE-4433	Crosspoints and Continuity Test Set	
1	ITE-4261	Whistler	
2	547A	Connectors	44 Kit or 46 Kit
2	R-9572	Test Receivers	ITE-2367 or ITE-4023
10	322B	Make-Busy Plugs	★ITE-4023
1	KS-3008	Watch, Stop	

★ Order separately in panel offices.

4. FUSING

4.1 Fuses Installed by Shop

4.11 Observe each fuse block and fuse panel equipped with alarm type fuses and check that the fuses are correctly positioned, that the fuses are of the correct type and current carrying capacity and that there are no loose screws.

4.2 Fuses Not Installed by Shop

4.21 Using a test receiver or volt-ohmmeter check each fuse post for absence of battery and ground.

4.22 Using fuses of the correct type as indicated by circuit drawings and fuse panel designations, install the following fuses, one at a time and check that each fuse is associated with the correct circuit and is free from crosses with other unfused posts on the fuse panel.

<u>Fuse</u>	<u>Equipment</u>
A (2 per. Frame)	#6 ST(0-9) Relay
B (2 per. Frame)	L H(0-9) L Hold Mag.
C (2 per. Frame)	#10 G Relay
D	1L TM Relay
E (1 per. 2 AB - Relays)	1L AB - Relay
F	L G9 Relay
G	#3, 5 GA Relay

5. CONTACT PROTECTION

5.1 Contact protection networks shall be checked in accordance with the method described in Handbook 50, Section 2. Networks are listed on SD-96483-01-C1, Apparatus Figures 1, 2 and 3.

6. CROSSPOINT AND MULTIPLE TEST

6.1 Crosspoint Test

6.101 Connect 48V battery to the ITE-4433 Crosspoint test set using an ITE-9598 cord.

6.102 Connect the 4077 plug of an ITE-9775 cord to the 0 vertical of the left half of the highest numbered crossbar switch of the auxiliary sender link frame. Connect the H1 and H2 plugs of this cord to the T1 and 4-6 jacks respectively of the ITE-4433.

6.103 Connect an ITE-9547 cord from H1 jack of ITE-4433 to the R winding of the 0 vertical hold magnet of the same switch. Make connections to front of frame using a 547A connector obtained from Tool Kit 44 or 46.

6.104 Connect another ITE-9775 cord to the No. 9 vertical, left hand of the highest numbered switch. Connect the H1 and H2 plugs of the cord to the T2 and 6W jacks of ITE-4433.

6.105 Connect an ITE-9547 cord from the H2 jack of the ITE-4433 to the R winding of the No. 9 hold magnet of the highest numbered switch. Make connections to front of frame using a 547A connector obtained from Tool Kit 44 or 46.

6.106 Connect leads 0-9 of the ITE-9962 cord to the windings of RT or LB select magnets 0-9 respectively of any switch. Connect the other end to the SM connector of ITE-4433 test set.

6.107 Operate the HMT and A keys and the SM key to the B position.

6.108 Block normal the G relay of each group and operate relay LR in each Auxiliary Sender.

6.109 At each auxiliary sender, insert make busy plugs into the TGB, OF, SN and CL jacks. Also block operated relay AS of each auxiliary sender.

6.110 Block operated the G1 relay associated with the switch being tested.

6.111 Set SEL switch of ITE-4433 to position 1.

6.112 Disconnect lead P1 from punching A1 on each Aux. Sender unit.

6.113 Operate the ST key of ITE-4433. Test set will check the crosspoints automatically from horizontal 9 down thru horizontal 0.

6.114 At the completion of test of verticals 0 and 9, move ITE-9775 and 9547 cords from vertical 0 to vertical 1 and repeat test.

6.115 Repeat test on the remaining verticals of the left and right half of the highest numbered switch.

6.116 Repeat test as described on the remaining switches of the frame.

NOTE: It will not be necessary to move the select magnet connections, as these leads are multiplied between switches.

6.117 Upon completion of test, remove all blocks and connections.

6.118 Reconnect P1 lead at each aux. sender.

6.2 Multiple Between Switches

6.21 Using the setup described in Paragraph 4.1, connect the 4077 plug of an ITE-9775 cord to any vertical of the highest numbered switch. Also connect the associated ITE-9547 cord to the hold magnet winding of the same vertical.

6.22 Connect the other ITE-9775 and ITE-9547 cord to a vertical of the next lower numbered switch which is served by the same auxiliary sender multiple.

6.23 Perform a test once between each switch for continuity and false conditions as described in Paragraphs 6.107 to 6.111.

6.24 Repeat test in this manner between all switches served by the same multiple.

6.3 Crosspoint Test (Extension Frame)

NOTES:

(A) Leads to working equipment should not be connected until crosspoint tests are completed.

(B) In Crosspoint Test Set ITE-4433 install the following temporary straps, terminal 22 arc 4 of SM selector to ground, terminal 22 arc 3 of SM selector to sleeve of RCA jack, operating side of SW9 lamp to any terminal except 1 of arc 1 of SW selector.

6.31 At switch terminal strip "B", strap terminals 21-30 and connect to 48V battery. Connect 48V battery to ITE-4433 using ITE-9598 cord. Operate SW and SM switches to G.

6.32 Using ITE-9962 cord equipped with push on clips connect 0-9 to terminal strip "B" terminals 31-40. Insert cord in SW socket of ITE-4433.

6.33 Using ITE-9962 cord equipped with push on clips connect 0-9 to terminal strip "C" terminals 21-30. Insert cord in SM socket of ITE-4433.

6.34 Insert #1 and #2 plugs of ITE-9775 cord in T1 and 4-6 jacks respectively. Patch cord to vertical 9 of switch to be tested.

6.35 Similarly, connect second ITE-9775 in T2 and 6W jacks and patch cord to switch vertical 8.

6.36 Operate keys HMT, SWT, ST and STP SW once. Crosspoints close on verticals 8-9 level 9-0 are tested and buzzer sounds at end of cycle.

6.37 Move ITE-9775 cord from vertical 8 to 7 and repeat until all verticals have been tested. At the completion of testing remove all connections and temporary straps.

7. PREFERENCE CIRCUITS

7.1 Start and Hold Circuits

7.11 Block normal relay LR of the Aux. Sdr. Lk. Frame.

7.12 Block normal relay G of the circuit under test.

7.13 Using two pair of test receivers for this test, connect one side of each set to ground.

7.14 Hold the test probe of the first receiver on the upper winding terminal of relay ST9. Relay ST9 operates.

7.15 Hold the test probe of the second receiver on the upper winding terminal of relay ST8. Relay ST8 does not operate.

7.16 Remove and reapply ground to relay ST9 winding. Relay ST9 releases, relay ST8 operates, and relay ST9 reoperates.

7.17 Repeat this test successively to each overlapping pair of ST-relays in the group, that is ST9-ST8, ST8-ST7, ST7-ST6, etc. as equipped. Check in each case that the higher numbered relay has preference.

7.18 Repeat test on all link circuits.

7.19 At completion of test, remove all blocks and connections.

7.2 Auxiliary Sender Preference

7.201 Block normal relay LR of the link frame.

7.202 Manually operate the G relay associated with group 0 on the first auxiliary sender link frame.

7.203 Observe that the preferred AP-relay for that group operates.

NOTE: Refer to FS5 and FS101 on SD-96483-01 for sequence of preference chain between auxiliary sender links.

7.204 Release relay G.

7.205 Block operated relay AB- associated with the AP- relay just operated. Relay AP- releases.

7.206 Reoperate relay G.

7.207 Observe that the next preferred AP- relay operates.

7.208 Release relay G, and block operated the AB- relay associated with the AP- relay just operated.

7.209 Continue in this manner until the complete chain has been verified. Release all AB- relays.

7.210 Repeat the preceding test for each auxiliary sender group, and observe the proper sequence of the preference chain for each group.

7.211 At completion of test, remove block from relay LR.

8. LEADS TEST

8.1 Aux. Sender to Aux. Sender Link Frame

8.11 At the Aux. Sender link frame, connect the ITE-4261 whistler set to 115V AC and allow about one minute to warm up.

8.12 Touch the whistler test lead to the 0 contact on the horizontal, left side of the switch, associated with the first appearance of the auxiliary sender under test. A tone should be heard.

8.13 Adjust the volume control for sufficient volume.

8.14 At the associated aux. sender circuit, place ground on punching 6 of the A terminal strip. The tone should be silenced.

8.15 Continue this test on each contact of the horizontals on the left and right half of the switch under test. The associated horizontal contacts and the auxiliary sender punchings are as follows:

<u>Horizontal Contacts</u>	<u>Lead</u>	<u>Aux. Sender</u>	
Left 0	FT1	T.S. A Terminal	6
" 1	FR1	"	7
" 2	FT0	"	4
" 3	FRO	"	5
" 4	DC	"	3
Right 0	P1	"	1
1	LR	"	2
2	CL	"	9
3	AV1	"	8

8.16 The tone on each lead should be approximately the same pitch. However, if a particular lead should have a different pitch, try another lead for comparison before deciding if it is a trouble condition. Two crossed leads should lower the tone about half an octave.

8.17 Repeat this test between all auxiliary senders and their appearance on the auxiliary sender link verticals.

8.18 For further information on the use of the whistler test set, refer to Handbook 50, Section 2, Paragraph 5.10 and Handbook 100 TMO 4261A.

8.2 Sender To Aux. Sender Link Frame

8.21 Using the method as described in Paragraph 8.1, verify continuity of the leads between the aux. sender link and the senders. The lead designation and their associated terminals are listed as follows:

<u>Aux. Sdr. Switch</u>	<u>Vertical Contact</u>	<u>Lead</u>	<u>Sender (Unit T.S.)</u>	
			<u>(X-Bar)</u>	<u>(Panel)</u>
Left	0	FT1	51(Misc. T.S.)	6(DDD) T.S.)
	1	FR1	61	5
	2	FT0	71	4
	3	FRO	81	3
	4	DC	29	9
Right	0	P1	60	7
	1	LR	50	11
	2	CL	39	10
	3	AV1	70	8
H(0-9)L	#5	SA	19	2
T.S. A	20-29	ST	9	1

8.3 Multiple Between Frames

8.31 Using the whistler test set ITE-4261, and the method described in Paragraph 8.1, verify the auxiliary sender multiple, which appears on the switch horizontals, between auxiliary sender link frames.

8.32 The multiple of the auxiliary senders between switches within each frame was verified in Paragraph 6.2.

8.4 Continuity Test (Extension Frame)

8.41 Using the whistler test set ITE-4261 and the method described in Paragraph 8.1 verify continuity of the leads CC 0, 1, 2, 4, 7 and LC between switch verticals terminals 0-5 Aux. Sender Link Extension and Subscriber Recycle Circuits. Terminal strip "B" terminals 42, 14, 24, 34, 44 and 18.

8.42 In a similar manner as in Paragraph 8.41 verify continuity of the CC 0, 1, 2, 4, 7 and LC leads to the Code Reconstruction Unit Terminal Strip "C" terminals 6-11 of each Aux. Sender Circuit assigned to horizontal on extension switches.

8.43 Verify continuity of multiple between switches and repeat on succeeding frames.

8.44 At the extension frame verify continuity of the following leads HMG, SE0-9 on terminal strip "C" terminals 40, 21-30 and CAO-9, CBO-9, SEGO-9, HEO-9 on terminal strip "B" terminals 0-40 to the Auxiliary Sender Link BEFORE connections are made at the working frame.

9. MISCELLANEOUS TESTS

9.1 Auxiliary Sender MB Jacks

9.11 At the sender make busy frame, insert a 322A plug into the MB jack on an auxiliary sender.

9.12 Observe at the associated link circuits that the corresponding AB- relays operate.

9.13 Remove the 322B plug, and observe that the AB- relays release.

9.14 Repeat this test for all auxiliary senders.

9.2 AB- Relay Operation From AP- Relays

9.21 Block relay LR nonoperated on the link frame.

9.22 Block operated the AP- in the first link circuit.

9.23 The corresponding AB- relay of the first link remains normal. Corresponding AB- relay in other associated link circuits operate.

9.24 Release AP- relay. All AB- relays release.

9.25 Repeat Paragraphs 9.21 to 9.24 for all equipped AP- relays.

9.3 Time Release

9.31 Connect ground to the STO lead to the first link unit. (Terminal 21 on A T.S.).

9.32 Minor alarm sounds, lamp LR lights and HOL and HOR holdmagnets operate and lock.

9.33 Remove ground from lead STO. Hold magnets release.

9.34 Momentarily operate AR key.

9.35 Minor alarm is retired. Lamp LR is extinguished.

9.36 Repeat test for all equipped ST-leads on each unit. (Terminals 21-20 T.S. A).

9.4 All Senders Busy Alarm

9.41 At the sender make-busy frame, insert 322B plugs into the MG jacks for all auxiliary senders in a group.

9.42 After 15 to 30 seconds the minor alarm sounds and the ASB lamp lights.

9.43 Momentarily operate the ALM RLS key.

9.44 The minor alarm is retired.

9.45 Remove all 322B plugs.

9.46 The ASB lamp is extinguished when the first 322B plug is removed.

9.5 Link Start PEG Count

9.51 Using a cord connected to ground apply at the number 2 terminal of the PC diode.

9.52 Adjust the PT potentiometer so that the assigned register scores not more than 86 or less than 80 times in ten seconds after the ground is applied to the diode. Use a KS-3008 stop watch or equivalent to measure the time interval.

9.53 Start adjustment with the 3500 ohm PT resistor in the circuit. Do not strap the PT resistor for less than 1000 ohms.

9.6 Miscellaneous Circuit

9.61 Check miscellaneous circuits not checked on other tests as follows: (1) test battery supply, (2) fuse alarm. Check that fuse alarm is not stopped when the FA lamp is burned out or removed. (3) Spare jack to the MDF (4) frame line circuit and (5) remote control jack.

10. ROUTINE TESTS

10.1 Perform routine tests on auxiliary sender link frames in conjunction with routine tests on the auxiliary senders as specified in the performance requirements of Section 0.1 of this handbook.

→ Arrowed lines indicate new or changed information.

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To change information in Paragraph 9.5.

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