

DISTRICT LINK FRAME TEST

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1. GENERAL INFORMATION

1.1 Description of Test:

1.11 This section describes a method of testing the district link and connector circuit SD-25031-011 and miscellaneous circuit for district link frame SD-25205-01. The marker multiple test checks the marker multiple leads for continuity at the contacts of the marker connector (MC) relays. A test is made to verify the crosspoints on the primary and secondary switches. The select and hold magnets are verified for proper operation and wiring. Other tests are made to verify miscellaneous circuits and features.

1.12 The leads from the district junctor frame to the district link frame and the continuation of these leads through the district link frame (leads TRL, TC, TP, OT, etc.) are not checked on this method. These leads are verified on the district junctor routine test.

1.2 Cabling: The cables between the originating markers and the marker connector (MC) relays of the district link frames should be left disconnected at the markers until after the marker multiple test has been made.

1.3 Test Procedure

1.31 During the tests of the originating markers the regular lockout circuit (MP relays) and the emergency lockout circuit (E relays) of the district link frames should be used approximately the same amount as a means of exercising these circuits.

1.32 Test calls which interfere with operation of the test set on the test of crosspoints, links, etc., may be blocked by blocking non-operated the marker preference relays (MP or E).

1.4 Test of Additions: The tests outlined in this section may be made on district link frames added to a working office. Any variations in the testing procedure that are necessary when testing additions are given in connection with the individual tests. All tests should be made before the OJGF transition.

1.5 Special Test Connections: When circuits under test are equipped with CA6A and similar type wire wrap terminal strips, ITE-4026 Multi-Contact Relay T.S. Fixture should not be used for making test connections. Instead, ITE-4085 Push-On Clips should be used at the terminal strip punchings as required and the test cord connected to these clips by means of alligator clips. Test cord must be supported in order to remove weight of cord from terminal strip connections.

2. RECORDS AND REQUIREMENTS

2.1 Records

Forms ID-1313 and ID-1315 are required for recording the results of these tests. For further information see Section 3 of Handbook 50.

2.2 Requirements

For requirements see Section 0.2 of this handbook.

3. TEST EQUIPMENT

3.1 Test Sets Required

Amt	ITE	Description
1	4009	Crosspoint, Link and Junctor Test Set
1	4033	Link Frame Test Set

3.2 Cords Required with ITE-4009

Amt	ITE	Lgth	Cdrs	One End	Other End	Furnished With ITE
1	9598	12'	2	110 Plug	110 Plug	4009
1	9639	12'	3	310 Plug	3 ITE-2455	4009
11	9690	12'	2	2-110 Plugs	325A Plug	4009
1	9947	12'	10	Recp.Plug	10 ITE-2455 Plugs	4009

3.3 Cords Required with ITE-4033

Amt	ITE	Lgth	Cdrs	One End	Other End	Furnished With ITE
1	9598	12'	2	110 Plug	110 Plug	4033
3	9947	12'	10	Recp.Plug	10 ITE-2455 Plugs	4033
10	9547	12'	1	2455 Plug	2455 Plug	4023

3.4 Accessories Required

<u>Qty</u>	<u>ITE or Code</u>	<u>Description</u>	<u>Furnished With ITE</u>
10	298A	Make Busy Plug	/4023
1	ITE-8253	Contact Protection Test Set	/4023
As Req.	8507	Alligator Clips	/4023
	4085	Clip, Push-On	/4023

^ Crossbar Test Accessory Set

4. FUSING

4.1 Fuses Installed By Shop

4.1.1 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 Fuse Not Installed By Shop

4.2.1 Using a test receiver or voltmeter check each fuse post for absence of battery and ground.

4.2.2 Using fuses of correct type as indicated by circuit drawings and fuse panel designations install the fuses in Table 1, 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.

5. CONTACT PROTECTION

Check the following contact protection circuits using the method described in Section 2, Handbook 50.

<u>C.P. Cond.</u>	<u>Ckt. Res.</u>	<u>Type of Ckt. as shown on Fig. 7, Sect. 2</u>	<u>Connect to</u>
(A) 0-7	(A) 0-7	1	T Wdg. relays (MCA) 0-7

6.2 At the first district link frame, connect the whistler test set to 115V AC and allow about one minute to warm up.

6.3 Touch the test lead of the whistler to the 0 contact of the first marker MCA relay. A tone should be heard.

6.4 Adjust the volume control for sufficient volume.

6.5 At the next district link frame have an installer place ground on the 0 contact of the first marker MCA (other end of multiple lead). The tone should be silenced.

6.6 Continue the test on each contact of the MCA and MCB relays for each marker between the first two district link frames as described in the preceding paragraphs. The tone on each lead should be approximately the same pitch. However, if a particular lead should have a different pitch, try the corresponding contact of the MCB relay of a different marker for comparison before deciding if it is a trouble condition. Two crossed leads should lower the tone about half an octave.

6.7 The following leads are either grounded unequipped or not multiplied.

	<u>MCA</u>	<u>MCB</u>
Grounded	7 & 57	
Unequipped	54 & 56	3,8(optional)
Not Multiplied	55(optional)	1,4,6,9

6.8 Upon completion of the test between the first two district link frames for all markers, repeat the tests on the second and third frames, and continue in this manner until the complete multiple between all district link frames has been tested.

6.9 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.

6. MARKER MULTIPLE TEST

6.1 The Marker Multiple test using ITE-4261 whistler test set will check the multiple for continuity, reversals, crosses and false battery and ground.

TABLE 1

<u>Designation</u>	<u>Fuse</u>	<u>Battery Supplied To</u>
SH 0-4L	0-9 (See Note 3)	Wdgs. of (SH) Mags. 0-4L on Sec. Sws. 0-9
SH 5-9L	0-9	" " " " 5-9L " " " "
SH 0-4R	0-9	" " " " 0-4R " " " "
SH 5-9R	0-9	" " " " 5-9R " " " "
SS	0-9	" " (SS) " 0-9 " " " "
P	0-9	" " (PH) " 0-9 on Primary Sws. 0-9 and Relays (LC) 0-9
MC	0-7	" " (MCA and MCB Relays) and (Z relay of Zone Reg. & Cont. Ckt) 0-7 as provided.
(See Note 1) A-	{ Insulate 1T-3T and 5T-6T of any MP rel.	" " Relays (TR) 1-5 as provided, TI and CH and lamp CH
" "	PS	" " Relay PS and Lamp PS
" "	TBS	" " 48V Test Battery Supply Terminal

NOTE 1: Fuses A and PS should not be installed until after marker multiple tests described in Paragraph 6 have been made.

NOTE 2: Fuses PS and TBS are associated with miscellaneous circuit for district link frame SD-25205-01.

NOTE 3: If office link and connector circuit fuses are installed and OJGF cross-connections are connected through, battery will be present on the fuse posts of the secondary hold magnets of the district link frame. Verify that each district link secondary hold magnet fuse post is associated with its proper circuit at the office link frame.

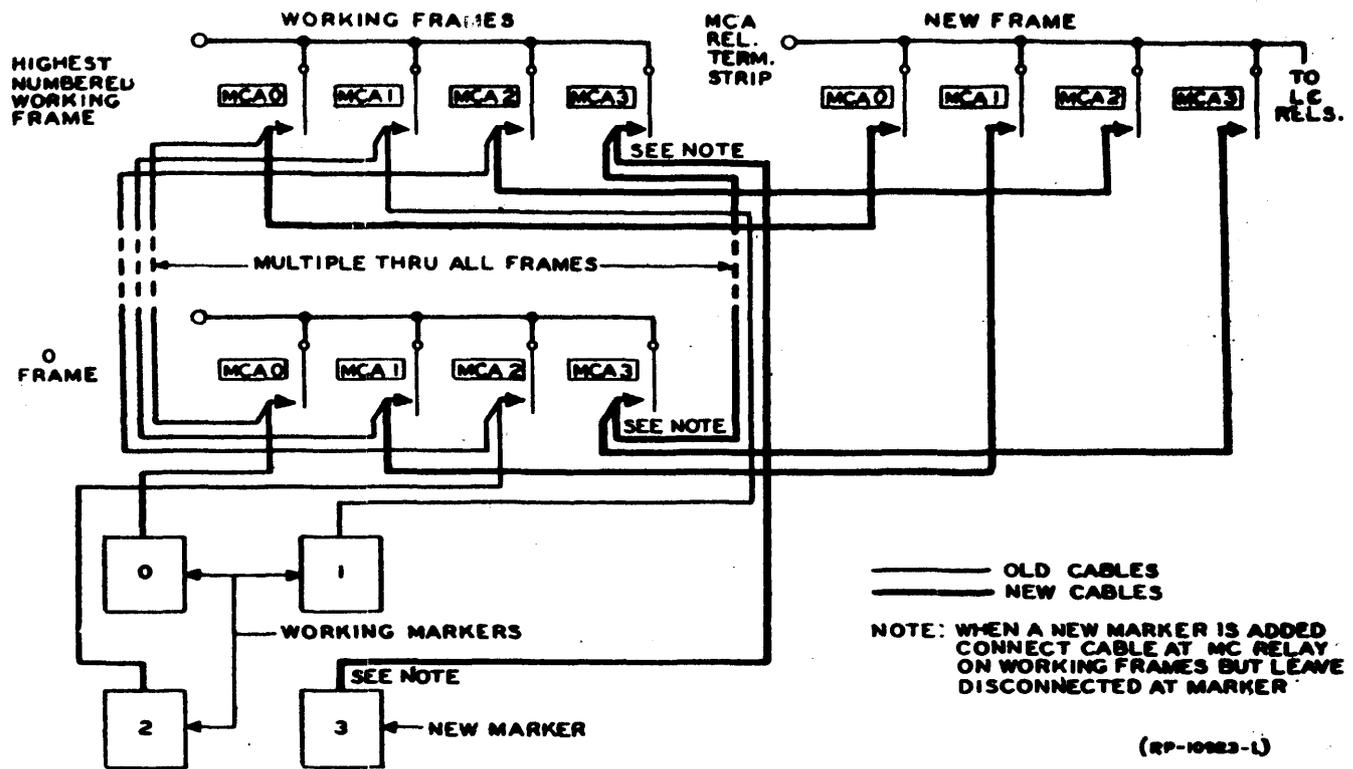


FIG. 1 SCHEMATIC OF MARKER MULTIPLE FOR ADDITIONS

7. MARKER LOCKOUT AND CONTROL

**NOTE:** On additions this test must be completed before closing down the cable to the markers.

7.1 Equip three ITE-9947 cords with alligator clips, to be used to connect ITE-4033, Link Frame Test Set to the ST, DK and DK1 leads.

7.11 Connect the ITE-9947 as follows:

From Test Set Connector	Connect To Misc. Terminals	To T.S. MCB Relay Contact	Lead Designation
A(0-7)	*180-187		ST(0-7)
S1(0-7)	*140-147		DK1(0-7)
S(0-7)		*0 (Even Mkrs)	DK(0-7)
		*5 (Odd Mkrs)	

Connect for markers 0-7 as equipped.

7.2 With the district line frame TR key and AL relay normal, operate test set keys AB, SB, S1B and A0. Observe that relays MP-0 and MCA-0 operate and that lamps (S1) 0 and (S) 0 light. Release key A0 and observe that relays MP-0 and MCA-0 release and lamps (S1) 0 and (S) 0 are extinguished. Repeat this test using keys 1 to 7 for lockout and control relays 1 to 7 as equipped.

7.21 Operate key (A) 0. Observe that relays MP-0 and MCA-0 operate and lamps (S1) 0 and (S) 0 light. Operate in numerical order keys (A) 1 to 7. Observe that relays MP-1 to 7 operate in the same order, relays MCA-1 to 7 do not operate and lamps (S) 1 to 7 and (S1) 1 to 7 do not light.

7.22 Release and reoperate key (A) 0. Observe that lamps (S) 0 and (S1) 0 are extinguished and (S1) 1 and (S) 1 light. Release and reoperate key A1. Lamps (S1) 1 and (S) 1 are extinguished, and (S1) 2 and (S) 2 light. Continue in the same manner until all A keys corresponding to equipped relays have been released and reoperated. When the last A key is released and reoperated, lamps (S1) 0 and (S) 0 should light. Release all A keys.

7.23 Operate the TR key and repeat tests in Paragraphs 7.2, 7.21 and 7.22. Return TR key to normal.

7.3 Insulate 1-3 top of any MP relay. Observe that the AL and TR 2-5 relays, as equipped, operate, the CH lamp lights and the audible and visual alarms operate. Remove the insulation from the MP relay. Operate the AR key, the AL and TR 2-5 relays, as equipped, return to normal, the CH lamp is extinguished and the alarms are retired.

7.4 Repeat the test in Paragraph 7.3 using 5-6 top of the MP relay. The results are the same.

7.5 Operate the TR key, the TR 2-5 relays as equipped operate. Insulate 1-3 top of any E relay. Observe that the AL relay operates, the CH lamp lights and the audible and visual alarms operate. Remove the insulation from the E relay. Operate the AR key, the AL relay returns to normal, the CH lamp is extinguished and the alarms are retired.

7.6 Repeat the test in Paragraph 7.5 using 5-6 top of the E relay. The results are the same.

7.7 Return the TR key to normal.

**8. M LEADS AND SELECT MAGNETS**

**NOTE:** The tests on the select magnets verify there are no reverses in the leads from the select magnets to the LC relays.

**8.1 Setup for Test**

8.11 Connect 48 volt battery and ground to the A jack of ITE-4033, Link Frame Test Set using an ITE-9598 cord.

8.12 On terminal strip LC obtain the following association:

**NOTE:** Refer to Paragraph 1.5 for method of connecting to CA4A or similar type wire wrap terminal strips.

LC T.S.	
Pchg.	Leads
40-49	0-9

8.13 Connect the receptacle plug of an ITE-9947 cord to the A connector on the set. Connect plugs 0 to 9 of this cord to terminals 40-49 respectively, using insulated alligator clips.

8.14 Connect the receptacle plug of an ITE-9947 cord to the B connector on the set. Connect leads 0 to 9 of this cord to the top winding terminal, either magnet, of relays (LC) 0-9, respectively.

8.15 Using an ITE-9547 cord connect the test set jack (C) 0 to the #3 punching on the MCB relay terminal strip.

8.16 Insert make busy plugs into jacks MBO to MB9 of the secondary bay.

**8.2 Test Operations**

8.201 Operate and do not release keys AG, BG, CB and CO.

8.202 Momentarily apply ground to punching 50 on the terminal strip for MCA relays and check that the TI relay operates. Block operated the TI relay and the LPI relay of the originating trouble indicator.

8.203 Apply ground to leads M0 to M9 by operating and releasing keys A0 to A9, one at a time, and observe that lamps M0 to M9 respectively light at the trouble indicator. If more than one lamp lights at a time a cross is indicated.

8.204 Operate keys A0 to A9. Check for absence of battery or ground at the windings of any primary select magnet on each switch. The presence of ground would indicate false continuity of one of contacts 40-49 of an LC relay and the presence of battery would indicate false continuity of #6 contact of an LC relay. Release keys A0 to A9.

8.205 With the TI and LPI relays still blocked in the operated position momentarily operate relays LCO to LC9 by operating and releasing keys (B) 0-9, one at a time, and observe that lamps SW0 to SW9, respectively, light while the LC relay is operated. If more than one lamp lights, a cross is indicated. Remove the block from the TI and LPI relays

8.206 Operate key B0 to operate relay LCO. Operate and release keys A0 to A9, one at a time, and observe that

select magnets 0 to 9, respectively, on primary switch 0, operate and release. Release key B0.

8.207 Operate key B1 to operate relay LC1. Operate and release keys A0 to A9, one at a time, and observe that select magnets 0 to 9, respectively, on primary switch 1, operate and release. Release key B1.

8.208 Operate key B2 to operate relay LC2. Operate and release keys A0 to A9 to check select magnets 0 to 9 on switch 2. Release key B2.

8.209 Continue as described in Paragraphs 8.206 to 8.208 check the select magnets on primary switches 3 to 9.

8.210 Connect ground to leads SSA and SSB at punchings 6 and 8 on the terminal strip for MCA relays. Remove the plug from MBO jack. Operate and release keys (B) 0-9, one at a time, and observe that select magnets 0 to 9, respectively, on secondary switch 0 operate and release. Select magnets on secondary switches 1 to 9 should not operate and release.

8.211 Repeat the tests per Paragraph 9.210 on each secondary switch. When testing switch 1 make busy plugs are inserted in all MB jacks except jack MB1; when testing switch 2, in all MB jacks except jack MB2; etc.

8.212 With make busy plugs in jacks (MB) 0-9, operate and release keys (B) 0-9 and check that no secondary select magnet on the frame operates and releases. Remove the make busy plugs and remove ground from leads SSA and SSB.

**9. PRIMARY HOLD MAGNET TEST**

**9.1 Setup for Test**

9.11 Connect 48 volt battery and ground to the A jack of ITE-4033, Link Frame Test Set using an ITE-9598 cord.

9.12 On the terminal strip for MCA relays obtain the following association:

**NOTE:** Refer to Paragraph 1.5 for method of connecting to CA4A or similar type wire wrap terminal strips.

Connector Leads	MCA T.S.	
	Pchg.	Leads
S - 0-9	20 to 29	LS-0L to LS-9L
A - 0-9	10 to 19	LS-0R to LS-9R

9.13 Connect the receptacle plug of an ITE-9947 cord to the A connector on the set. Connect plugs 0-9 of this cord to terminals 10-19 using insulated alligator clips.

9.14 Connect the receptacle plug of an ITE-9947 cord to the S connector on the set. Connect plugs 0-9 of this cord to terminals 20-29 using insulated alligator clips.

9.15 Connect the receptacle plug of an ITE-9947 cord to the B connector on the set. Connect leads 0-9 on this cord to the top winding terminal, either magnet, of relays (LC) 0-9 respectively.

**NOTE:** Equip leads of cord ITE-9947 with alligator clips for connecting to relay winding terminals.

## 9.2 Test Operations

9.21 Operate keys IG, T3, BG and X and leave them operated. Key IG operated starts the interrupter circuit of the test set.

9.22 Operate key B0 to operate relay (LC) 0. Operate key A0 and observe that the primary hold magnet, PH-OR, switch 0, operates and releases from the interrupted ground. If this magnet should be crossed with another magnet the X lamp will flash. In order to detect that the X lamp will flash if two magnets are crossed, momentarily cross two magnets by operating keys A0 and A1 at the same time. Note that the X lamp flashes. Release keys A0 and A1.

9.23 The following chart shows the keys that are operated and released and the magnets on the right half of primary switch 0 that are tested when relay (LC) 0 is operated.

Keys	PH Magnet	Pri. Sw.
A0-A9	OR-9R	0

9.24 When the ten hold magnets on the right half of primary switch 0 have been checked, release key B0 and operate key B1 to operate (LC) 1. Check the ten hold magnets on the right half of switch 1 by operating and releasing keys A0 to A9, in turn.

9.25 Continuing as described in 9.21 to 9.24 check the hold magnets on the right half of all primary switches.

9.26 When the magnets on the right half of the frame have been checked, interchange the receptacle plugs connected to connectors A and S and check the PH magnets on the left half of the frame in the same manner as for the right half.

9.27 Move the plug from the A to the S1 connector. Leave the other plug in the S connector. Operate keys SB and S1B and insert a make busy plug into Jacks (MB) 0-9 in turn and observe that S-0 and S-10 lamps light when the plug is in (MB) 0 jack, S-1 and S-11 with the plug in (MB) 1, S-2 and S-12 with the plug in (MB) 2, etc.

## 10. CROSSPOINT TEST

### 10.1 Primary Switches

**NOTE:** Perform this test starting at primary switch 9. After testing the left and right halves of primary switch 9 (highest) work toward primary switch 0 (lowest).

#### 10.11 Setup for Test (See Figure 2)

10.111 Using the ITE-9598 cord, connect 48V battery and ground to the BAT jack of ITE-4009, crosspoint, link and junctor test set.

10.112 Insert the H plug of nine ITE-9690 cords into jacks (H) 0-8 on the test set ITE-4009. Connect

the other end of these cords to verticals 0 to 8 respectively of the half switch, left or right to be tested.

**NOTE:** The 325A plugs of the ITE-9690 cords may be tagged and numbered as a convenient means of keeping connections straight when moving from one switch to another.

10.113 Insert the H plug of an ITE-9690 cord into the JG jack on the test set, ITE-4009. Connect the other end of the cord to vertical 9 of the half switch, left or right, to be tested.

10.114 Connect the receptacle plug of an ITE-9947 cord to the A connector on ITE-4033, link frame test set, and connect leads 0 to 9 of this cord to the top winding terminals (either magnet) of relays (LC) 0-9, respectively. Connect 48V battery and ground to ITE-4033 using cord ITE-9598. This connection is used to operate relays (LC) 0-9.

10.115 Connect the receptacle plug of an ITE-9947 cord to the S connector on test set ITE-4009 and connect leads 0 to 9 of this cord equipped with ITE-4085 push on clips and insulated alligator clips to terminals 40-49 of the terminal strip for the LC relays. This connection is used to operate the select magnets on all ten primary switches.

10.116 Using an ITE-9547 cord equipped with an alligator clip, connect jack 0 of ITE-4033 to punching #6 on the terminal strip for LC relays. This connection is used to furnish battery over the B lead to the windings of the primary select magnets.

## 10.12 Test Operations

**NOTE:** Once or twice per day verify that crosses between the T, R and S conductors stop the test circuit.

10.121 Lamps H0 and S0 on ITE-4009 should be lighted to begin the test. Momentarily operate key RS on ITE-4009 to light these lamps if they are not lighted.

10.122 Operate and leave operated keys XPT, PB9 and SM on ITE-4009.

10.123 Operate keys AG, CB and (C) 0 on ITE-4033. Operate (A) 9 key on ITE-4033 to operate relay (LC) 9 for the tests on primary switch 9.

10.124 Operate the ST key on ITE-4009. The set automatically checks the 100 crosspoints of the half switch under test. When lamp EC lights the test is completed.

(a) Lamps S, S1, R, R1, T and T1 on ITE-4009 light momentarily as each crosspoint is tested. The lighted (S) 0-9 and (H) 0-9 lamps on ITE-4009 indicate respectively the operated select and hold magnets.

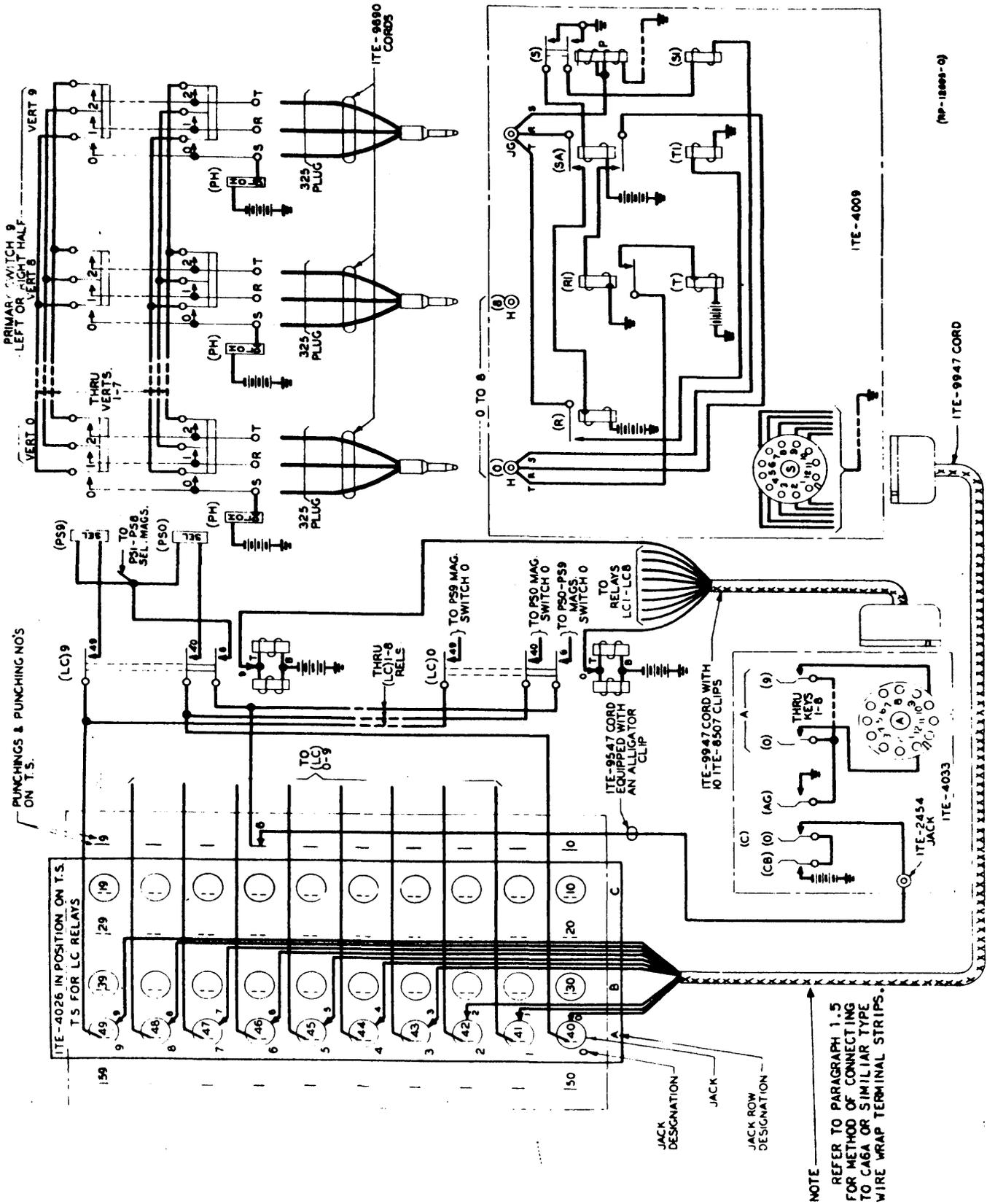


FIG. 2 SETUP FOR PRIMARY SWITCH CROSSPOINT TEST

(MP-18000-0)

(b) If the test set stops the following are typical trouble indications which may be encountered. Other indications such as crosses with battery may occur but are not listed below:

<u>Lamps</u>	<u>Trouble Indication</u>
X lighted, S and S1 not lighted.	Cross between S and T or R
None lighted	Sleeve cross to ground or circuit to hold magnet.
S not lighted.	Sleeve open
R and R1 not lighted.	Ring open
R1 not lighted.	Ring cross with ground.
R1 not lighted, X lighted.	Ring cross with tip
S and T1 not lighted.	Tip open
T1 not lighted	Tip cross with ground
SMG lighted	False ground on the leads connected to jack SM (key SM normal) or to connector S (key SM operated)

10.125 Shift the ITE-9690 cords to the verticals of the other half switch, left or right, to be tested on the same primary switch 9. Release and reoperate the ST key on ITE-4009 and test as in Paragraph 10.124.

10.126 At the completion of the test of primary switch 9, release the (LC) 9 relay by releasing the (A) 9 key on ITE-4033.

10.127 Shift the ITE-9690 cords to the verticals of the next lower primary switch, left or right half, and operate the LC relay associated with the switch by operating the proper A key on ITE-4033 as indicated below. Release and reoperate the ST key on ITE-4009 and test as in Paragraph 10.124. (Continue in like manner until all switches have been tested.

<u>(A) Key Operated</u>	<u>(LC) Relay Operated</u>	<u>Primary Switch Under Test</u>
8	8	8
7	7	7
6	6	6
5	5	5
4	4	4
3	3	3
2	2	2
1	1	1
0	0	0

10.128 Restore the keys on the test sets and remove the test connections when all of the primary switches on the frame have been tested.

10.2 Secondary Switches

NOTE: Perform this test starting at secondary switch 9. After testing the left and right halves of secondary switch 9 (highest) work toward secondary switch 0 (lowest).

10.21 Setup for Test (See Figure 3)

10.211 Using the ITE-9598 cord, connect 48V battery and ground to the BAT jack of ITE-4009, crosspoint, link and junctor test set.

10.212 Insert the H plug of nine ITE-9690 cords into jacks (H) 0-8 on the test set. Connect the other end of these cords to verticals 0 to 8 respectively of the half switch, left or right, under test.

NOTE: The 325A plugs of the ITE-9690 cords may be tagged and numbered as a convenient means of keeping connections straight when moving from one switch to another.

10.213 Insert the H plug of an ITE-9690 cord into the JG jack on the test set. Connect the other end of the cord to vertical 9 of the half switch, left or right, under test.

10.214 Connect the receptacle plug of an ITE-9947 cord to the S connector on the set and connect leads 0 to 9 of this cord to the top winding terminals (either magnet) of relays (LC) 0-9 respectively.

10.215 On terminal strip MCA make connections using cord ITE-9639 and insulated alligator clips to obtain the following association:

<u>MCA T.S. Pchg.</u>	<u>Leads</u>	<u>Test Set Jack</u>
6	SSA	T of SM
8	SSB	R of SM

These connections are used for operating the select magnets on all ten secondary switches. However, make busy plugs should be inserted in jacks (MB) 0-9 except the MB jack associated with the switch under test in order to reduce the wear on the contacts of the LC relays.

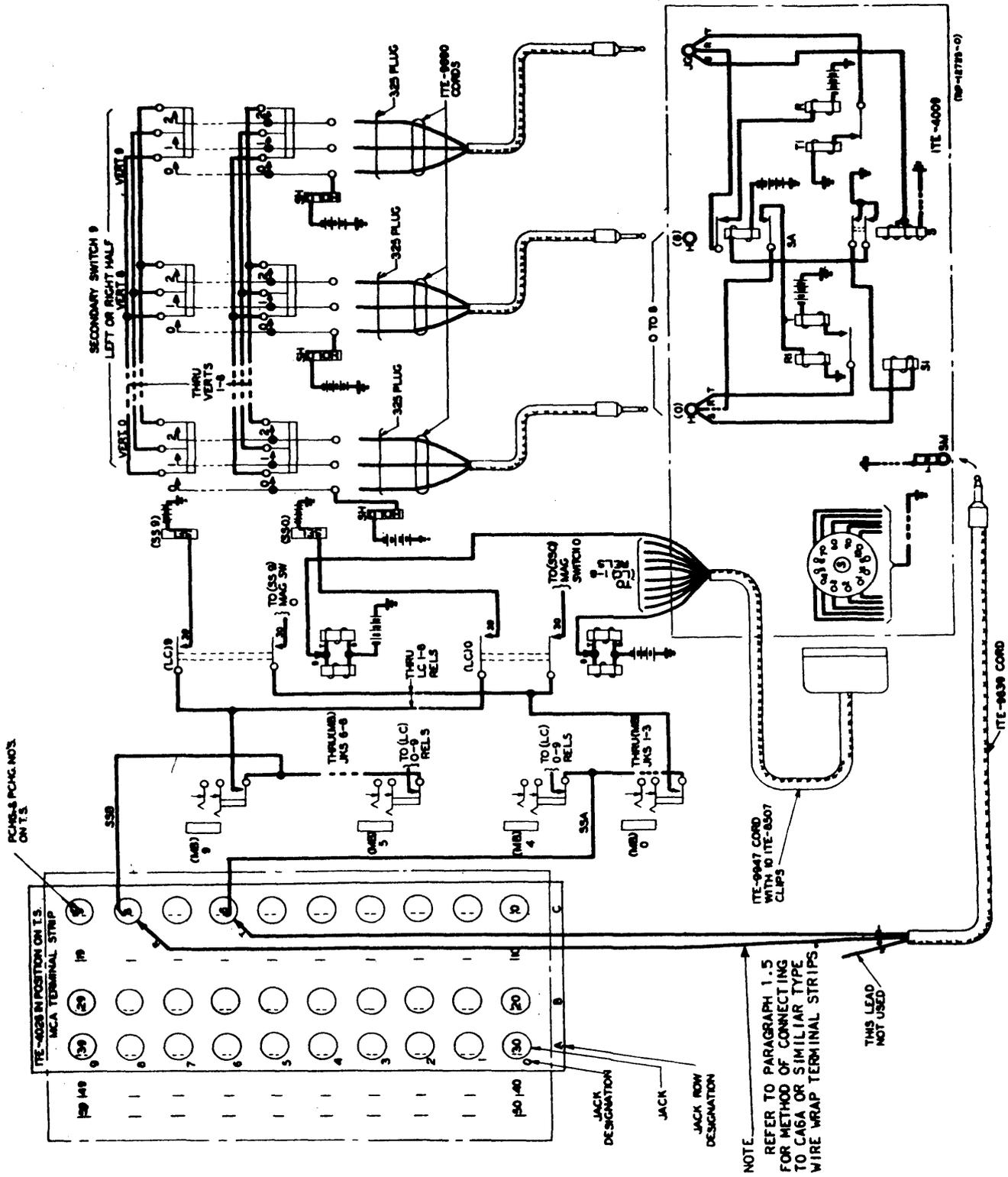


FIG. 3 SETUP FOR SECONDARY SWITCH CROSSPOINT TEST

**10.22 Test Operations**

**NOTE:** Once or twice per day verify that crosses between the T, R and S conductors stop the test circuit.

10.221 Test set lamps HO and SO should be lighted to begin the test. Momentarily operate test set key RS to light these lamps if they are not lighted.

10.222 Operate and leave operated keys XPT and PB9 on the test set.

10.223 Operate the test set ST key. The set automatically checks the 100 crosspoints of the half switch under test. When lamp EC lights the test is completed.

(a) Test set lamps S, Sl, R, Rl T and Tl light momentarily as each crosspoint is tested. The lighted (S) 0-9 and (H) 0-9 lamps on the test set indicate respectively the operated select and hold magnets.

(b) If the test set stops the following are typical trouble indications which may be encountered. Other indications such as crosses with battery may occur but are not listed below:

<u>Lamps</u>	<u>Trouble Indication</u>
X lighted, S and Sl not lighted.	Cross between S and R or T
None lighted	Sleeve cross to ground or circuit to hold magnet open.
S not lighted	Sleeve open
R and Rl not lighted	Ring open
Rl not lighted	Ring cross with ground
Rl not lighted, X lighted.	Ring cross with tip
T and Tl not lighted	Tip open
Tl not lighted	Tip cross with ground
SMG lighted	False ground on the leads connected to jack SM (key SM normal) or to connector S (key SM operated)

10.224 Shift the ITE-9690 cords to the verticals of the other half switch, left or right, to be tested on the same secondary switch 9. Release and reoperate the test set ST key and test as in Paragraph 10.223.

10.225 At the completion of the test of secondary switch 9, shift the ITE-9690 cords to the verticals of the next lower secondary switch, left or right half, to be tested. Release and reoperate the test set ST key and test as in Paragraph 10.223. Continue in like manner until all switches have been tested.

10.226 Restore the keys on the test set and remove test connections when all of the secondary switches on the frame have been tested.

**11. LINK TEST**

**NOTE:** This test should be made on additions only.

**11.1 Setup for Test (See Figure 4)**

11.11 Using the ITE-9598 cord connect 48V battery and ground to the BAT jack of ITE-4009, crosspoint, link and junctor test set.

11.12 Insert the H plug of ten ITE-9690 cords into jacks (H) 0-9 on the test set and connect the other end of the cords to vertical 9 (left) of secondary switches 0 to 9 respectively.

11.13 Connect the receptacle plug of cord ITE-9947 to the S connector on the test set. Connect leads 0-9 of this cord to the top winding terminal, either magnet, of relays (LC) 0-9 respectively.

**NOTE:** Equip leads of cord ITE-9947 with alligator clips for connection to relay winding terminals.

11.14 On terminal strip MCA make connections, using cord ITE-9639 and insulated alligator clips to obtain the following association:

<u>Pchg.</u>	<u>MCA T.S. Lead</u>	<u>Test Set Jack</u>
6	SSA	T of SM
8	SSB	R of SM

11.15 Insert the H plug of an ITE-9690 cord into the JG jack of the test set.

**11.2 Test Operations**

**NOTE:** Once or twice per day verify that crosses between the T, R and S conductors stop the test circuit.

11.21 Test set lamps HO and SO should be lighted to begin the test. Momentarily operate key RS to light these lamps if they are not lighted.



11.22 Operate and leave operated keys BZ, XPT and ST on the test set. Block operated 0 select magnets on all primary switches.

11.23 Insert 325A plug end of cord (ITE-9690) connected to jack JG of the test set into test jack of vertical 0 (left) of primary switch 0. If the link from this vertical to left horizontal 0, secondary switch 0, is continuous and free from trouble the test set buzzer operates. The test set automatically advances and checks the remaining links to primary switch 0 (left). The hold magnets on primary switch 0 operate in turn over the S lead from the secondary switch.

11.24 After the ten links from primary switch 0 have been checked relay LCI of the district link frame is operated by the test set in turn operating secondary select magnet No. 1 on each secondary switch (0-9).

11.25 Remove the 325A plug from vertical 0 (left) of primary switch 0 and insert it into vertical 0 of primary switch 1 (left). Check the ten links from verticals 0-9 (left), primary switch 1 to left horizontal 1, secondary switches 0 to 9 in a similar manner to the links from vertical 0-9 (left), primary switch 0. Continuing in this manner check the 100 links on the left half of the frame.

11.26 When the links on the left half of the frame have been checked, move the ten ITE-9690 cords to vertical 9 (right) of secondary switches 0-9 and test the links on the right half of the frame in the same manner as for the left half.

11.27 Remove the test set and release the 0 select magnets on all primary switches.

12. SECONDARY HOLD MAGNETS

12.1 Setup for Test

12.11 Connect 48 volt battery and ground to the A jack of ITE-4033, link frame test set using an ITE-9598 cord.

12.12 On terminal strip MCB obtain the following association:

T. S. MCB	
Pchg.	Leads
35 to 39	S-OL to S-4L
15 to 19	S-OR to S-4R

Connect the receptacle plug of an ITE-9947 cord to the A connector on the test set. Connect plugs 0, 2, 4, 6 and 8 of this cord to terminals 35-39 and plugs 1, 3, 5, 7 and 9 to terminals 15-19 respectively.

12.13 Connect the receptacle plug on an ITE-9947 cord to the B connector on the test set. Connect leads 0-9 of this cord to bottom winding terminal of relays JCO to JC9 respectively.

NOTE: These connections and the following operations are based on the assumption that 10 or less district link frames are installed. If more than 10 district link frames are installed, there will be more than 10 JC relays and no one JC relay will cut in 20 junctor sleeve leads (leads S-OR to S-9R and S-OL to S-9L). For example, if 20 JC relays are installed, each JC relay will cut in 10 junctor sleeves ( $20 \div 20 = 10$ ); if 18 JC relays are installed each JC relay will cut in 11 junctor sleeves ( $20 \div 18 = 11$ ); etc. When more than 10 JC relays are installed connect jacks (C) 0-9 of the test set to the bottom winding terminal of relays (JC) 10-19, respectively, as provided, and operate these relays by operating keys (C) 0-9. Key CB should be operated.

12.2 Test Operations

12.21 When testing original installations operate keys IG, T2, BB and X and leave them operated. When testing additions operate T3 instead of T2 key.

12.22 Operate key B0 to operate relay (JC)0. Operate key A0 and observe that the proper district link secondary hold magnet, as described in Paragraph 13.23, operates and releases. Its associated hold magnet on the office link primary switch will also operate and release but this need not be observed. If these associated magnets should be grounded, they will not release and if crossed with other magnets the T2 or T3 and X relays in the test set operate and the X lamp lights. In order to detect that these relays will operate if there is a cross between the magnets, operate key B1 while key B0 is still operated and observe that the X lamp lights. Release keys B0 and B1. With key A0 still operated to ground jack (B) 5 or lead S-OL, operate relay (JC) 1 by operating key B1. Observe that the proper hold magnet operates and releases. Release key B1 and operate key B2 to operate relay (JC) 2 and observe that the proper hold magnet operates and releases. Continue in this manner checking the ten hold magnets on the left half of switch 0.

12.23 While making this test it is necessary to use the Office Junctor Assignment Chart ED-25016-011 to -016 or ED-25012-011 to -016 and JC cross-connection drawing T-25031-09 and T-25031-18 to -24 as required by job information to verify that the proper hold magnet operates and releases and it is necessary to take into consideration the

number of the district link frame under test. Certain hold magnet assignments are fixed while others vary according to the size of the job and the district link frame being tested.

12.24 Release key A0 and operate key A1 to ground jack (B) 6 or lead S-OR. Operate and release keys B0 to B9, in turn, thereby operating and releasing relays (JC) 0-9, respectively. Check that the ten hold magnets on the right half of switch 0 operate and release while the JC relays are operated. Release key A1.

→ 12.25 Continue as described in 12.21 to 12.24 checking the secondary hold magnets on switches 0 to 4.

12.26 When the switches 0 to 4 have been checked, remove plugs 0 to 9 and make connections to give the following associations:

T.S. MCB Pchg.	Leads	Cord ITE-9947 Leads
45 to 49	S-5L to S-9L	0, 2, 4, 6, 8
25 to 29	S-5R to S-9R	1, 3, 5, 7, 9

Check the secondary hold magnets on switches 5 to 9 as described in Paragraphs 12.21 to 12.25.

13. CHECK OF MR AND MR1 LEADS

NOTE: This test should be made once from any district link frame. The multiple of the MR and MR1 leads between MCA relays is tested per Paragraph 6.

13.1 MR Lead

Apply ground through a test receiver to the stationary spring side of contacts 58 of the MCA (0-7) relays as provided, one at a time, on the district link frame used for test. Observe that as each spring is grounded that the MR relay in the associated marker circuit operates. Disregard the operation of other relays or indications that may be received.

13.2 MR1 Lead

Apply battery through a test receiver to the stationary spring side of contacts 59 of the MCA (0-7) relays as provided, one at a time, on the district link frame used for test. Observe that as battery is applied to each spring that the MRK relay in the associated marker circuit operates. Disregard the operation of other relays or indications that may be received.

→ Arrowed lines indicate new or changed information.

14. CHECK OF CB LEAD (Q WIRING PROVIDED)

14.1 Using a test receiver check for presence of ground on the operating spring side of contacts 55 of all MCA (0-7) relays, as provided, on the district link frame under test.

14.2 Apply ground through a test receiver to the stationary spring side of contacts 55 of the MCA (0-7) relays as provided, one at a time, and check that this ground is present at the 10T contact of the proper DF- relay in each marker circuit of the group associated with the district frame under test.

14.3 Repeat this test from each district link frame.

15. TRAFFIC REGISTERS

15.1 Peg Count: Operate the BAT key at the traffic register rack. Connect ground to punching 52 on the terminal strip for MCA relays. Operate and release each LC relay, one at a time, and observe that the associated peg count (PC) register scores. One register is associated with each class of district junctor circuits per district link frame. Remove the ground from punching 52.

16. MISCELLANEOUS CIRCUITS

Check miscellaneous circuits not checked on other tests as follows:

- (1) Test Battery Supply
- (2) Fuse Alarm. Check that the fuse alarm is not stopped when the FA lamp is burned out or removed.
- (3) Permanent signal overflow alarm. Momentarily connect ground to punchings 7 on the terminal strip for MCB relays. Observe that the PS lamp lights and the alarm sounds. Momentarily operate the PS key and observe that the PS lamp is extinguished and the alarm is silenced.

NOTE: The test of the remote control jack (F) is covered on the originating trouble indicator test method.

R. E. RAHMES

Engineer of Installation

Reason for Reissue:  
To revise marker multiple test and remove ITE-4026 fixture.

Replaces Section 135 dated 5-16-57.