

ORIGINATING MARKER TEST

8-11-72  
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1. GENERAL INFORMATION

- 1.1 Refer to Originating Marker Tests per Section 172 for General Information, Test Procedure, Records and Requirements, Test Equipment and Test Setup. This section describes tests of the trouble indicating features.
- 1.2 When applying ground or battery where specified in this section, use Test Receiver R-9572.

2. TROUBLE ALARMS

- 2.1 On all tests in this section, when a trouble indicator record is received on a call not originated at the trouble indicator or sender test frame, the marker trouble release register (DTR) operates, the marker trouble alarm (minor alarm) operates and the TI lamp lights.
- 2.2 The minor alarm (trouble alarm) becomes a major alarm when any marker attempts to seize the trouble indicator before the record of a previous trouble is released.

3. TROUBLE INDICATOR SEIZURE

- 3.1 Momentarily operate the XX1 or XX2 relay and observe that the marker trouble alarm (minor alarm) operates, lamp T1 lights, the DTR register associated with the marker under test scores once, and the DR lamp associated with the marker under test lights. Momentarily operate the ACO key and check that the alarm is retired.
- 3.11 With the record in the trouble indicator again operate the XX1 or XX2 relay momentarily. Observe that the major alarm sounds and the DTR register scores once.
- 3.12 Release the trouble indicator to retire the alarm and extinguish the lamps.
- 3.2 Cause a record to be taken in the trouble indicator from some marker other than the one under test. Leave the record in the trouble indicator and then momentarily operate the XX1 relay of the marker under test. Observe that the DL lamp associated with the marker under test lights but the DR lamp does not light. Release the trouble indicator.
- 3.3 Verify that relays DR and SL of the trouble indicator associated with the marker under test, when operated one at a time, ground the TIL lead to marker trouble alarm circuit and operate the minor alarm without lighting the TI lamp. The marker trouble alarm circuit (relays CA, CB, TR) must be normal when this test is made.
- 3.31 Verify that relay RL1 of the trouble indicator when operated brings in the minor alarm without lighting the TI lamp.
- 3.4 Trouble Alarm
- NOTE: The tests described in Paragraphs 3.41 to 3.421 require full selector sender test frame test calls.
- 3.41 Block relay CK1 of the marker normal, cross 6B and 7B contacts of marker relay SDT and make a full selector sender test frame test call to the marker under test. Observe that lamps SDT and TI light, the trouble alarm operates and the associated DTR register scores once for each trial.
- 3.411 Remove the cross from relay SDT and repeat the test call. Observe the same test results except that the DTR register does not operate. Remove the block from relay CK1.
- 3.42 Insulate 3T and 4T contacts of marker relay ST3 and make a trouble release sender test frame test call. Observe that the marker times out, lamps SDT and TI light, the trouble alarm operates, marker relay SDTA does not operate and marker relay TIB operates after the trouble indicator has been seized. Repeat the test as required.
- 3.421 Remove the insulator from relay ST3 and repeat the test call. Observe that marker relays TR, SDTA and TIB operate, the trouble indicator is not seized and the marker returns to normal.
4. TRANSMITTING RELAYS
- 4.1 At the XTS on a marker bay cross and ground the primary and secondary windings of the OB-0 relay (terminals OB-OP and OB-OS). Observe that the marker immediately connects to the trouble indicator and that the XX1, XOB, TI, DR and EC lamps light.
- 4.11 Repeat the test for the primary and secondary winding of the relays OB (1-9) as equipped.
- 4.2 Make test similar to 4.1 on the OG-0 relay. Observe that the marker immediately connects to the trouble indicator and that the XX1 and XOG lamps light.
- 4.21 Repeat the test for windings of relays OG (1-5).
- 4.3 Make test similar to 4.1 on CR-0 relay. Observe that the marker immediately connects to the trouble indicator and that the XX1 and XCR lamps light.
- 4.31 Repeat the tests for windings of relays CR (1-9).
- 4.4 Make test similar to 4.1 on CL-0 relay. Observe that the marker immediately connects to the trouble indicator and that the XX1 and XCL lamps light.
- 4.41 Repeat the test for windings of relays CL (1-7) as equipped.
- 4.5 Ground the secondary windings of relays SGO and SG1 (terminals SG-OS and SG-IS). Observe that the marker immediately connects to the trouble indicator and that the XX1 and (X05 or XSG) lamps light.
- 4.6 When OFF-9300 feature is provided make test similar to 4.1 on SG and SG1 relays. Observe that the XX1 and (X05 or XSG) lamps light at trouble indicator.
- 4.7 Make a test similar to 4.1 on SB-0 relay. Observe that the marker immediately connects to the trouble indicator and that the XX1 and XSB lamps light.
- 4.71 Repeat the test for windings of relays SB (1-9).

4.8 Make a test similar to 4.1 on SG-0 relay. Observe that the marker immediately connects to the trouble indicator and that the XX1 and XSG lamps light.

4.81 Repeat the test for windings of relays SG (1-5). (As furnished.)

5. TRANSMITTING LEADS

5.1 Ground the following leads, as equipped, one at a time at terminal strip OMC-B on the marker frame.

5.2 When the first lead used for test is grounded observe that the marker immediately connects to the trouble indicator and that the XT, XX1, T1, DR and EC lamps light.

5.3 As each of the remaining leads are grounded observe that the marker immediately connects to the trouble indicator, lamps XT, XX1, and a lamp to agree with the lead grounded light.

PCHG	LEAD GROUNDED	PCHG	LEAD GROUNDED
%03	SG5	31	OB2
04	AID	32	OB4
05	ODN	33	SO
¢13	SSO	35	CR1
*14	CL5	36	CR2
15	CL1	37	CR3
16	CL2	38	CR4
17	CL3	39	CR5
18	CL4	40	MI-0
19	SD	41	MI-1
20	OG1	42	MI-2
21	OG2	43	MI-4
22	OG4	44	MI-7
23	OG5	45	7DG
28	TW	46	SK2
29	SD1	47	SK3
30	OB1	49	2L

% When OFF - 9300 or coin service improvement  
 ¢ Lamp OB5  
 \* When equipped

6. MESSAGE REGISTER LEAD

6.1 Ground the MR leads to the district link frames at punching 58, terminal strip DIST-A. Observe that the marker immediately connects to the trouble indicator and that the XX1 and MR lamps light. Remove ground from punching 58.

7. TL RELAY WINDINGS

7.1 Ground punchings TLO and TL1 on the XTS of a route relay bay. Observe that the marker immediately connects to the trouble indicator and the TLO, TL1 and XTL lamps light. Remove ground from TLO and TL1 punchings. Repeat the test on punchings TL2 and TL3, TL4 and TL5, TL6 to TL14, inclusive and observe that associated TL lamps light.

8. TL LEADS

8.1 Momentarily ground punching 30, terminal strip OFF-EA. This is lead TLO to the even office frames. Observe that the marker immediately connects to the trouble indicator and the XTL1 lamp lights.

8.2 Repeat the preceding test on the other TL leads to the even and odd office frames as follows:

PCHG.	T.S.	LEAD
31	OFF-EA	TL1
to	"	to
39	"	TL9
40	"	TL10 (If Equipped)
to	"	to
44	"	TL14 (If Equipped)
30	OFF-OA	TLO
to	"	to
39	"	TL9
40	"	TL10 (If Equipped)
to	"	to
44	"	TL14 (If Equipped)

8.3 Cross leads TL-0 and TL-2 at the OFF-EA-T.S.; operate key F corresponding to any odd district frame and make a test call which requires the use of trunk level relay TL-0 or TL-2. Observe that the marker immediately connects to the trouble indicator, lamp XTL1 and one of lamps KEL (0-9) or KER (0-9) light. Remove the cross.

8.31 Cross leads TL-4 and TL-6 at the OFF-OA-T.S.; operate key F corresponding to any even district frame and make a test call which requires the use of trunk level relay TL-4 or TL-6. Observe that the marker immediately connects to the trouble indicator, lamp XTL1 and one of lamps KEL (0-9) or KER (0-9) light. Remove the cross.

NOTE: To avoid blocking of the test by the operation of the NS- and SP- relays, the two leads crossed for test should both be associated with split or non-split trunk levels at the office frames. If this condition does not prevail on the particular job under test, any two TL leads may be substituted for TL-0-TL-2 or TL-4TL-6, provided the other conditions of the test are met.

## 9. LC LEADS

- 9.1 Momentarily ground lead LCO (for even office frames) at OFF-EB T.S. terminal 30. Observe that the marker immediately connects to the trouble indicator and lamp XLCE lights.
- 9.11 Repeat the test on leads LC1 to LC9 (for even office frames) by connecting momentary ground to terminals 31-39, respectively, of OFF-EB T.S.
- 9.2 Momentarily ground lead LCO (for odd office frames) at OFF-OB T.S. terminal 30. Observe that the marker immediately connects to the trouble indicator and lamp XLCO lights.
- 9.21 Repeat the test on leads LC1 to LC9 (for odd office frames) by connecting momentary ground to terminals 31 to 39, respectively, of OFF-OB T.S.
- 9.3 Cross two LC leads at the OFF-EB T.S. and make a test call to an even district frame. Observe that the marker immediately connects to the trouble indicator and lamp XLCE lights. Remove the cross.
- 9.31 Cross two LC leads at the OFF-OB T.S. and make a test call to an odd district frame. Observe that the marker immediately connects to the trouble indicator and lamp XLCO lights. Remove the cross.

## 10. TG RELAY WINDINGS

NOTE: Use a code assigned to a trunk group that is not sub-divided.

- 10.1 Cross two GS punchings at the XTS on a marker bay. Make a test call that requires the use of one of the crossed GS leads. Observe that the marker immediately connects to the trouble indicator and that the XGS lamp lights. Remove the cross.

- 10.2 Cross two GE punchings at the XTS on a marker bay. Make a test call that requires the use of one of the crossed GE leads. Observe that the marker immediately connects to the trouble indicator and that the XGE lamp lights. Remove the cross.

## 11. O RELAY WINDINGS

- 11.1 Cross the windings of two O relays at terminal strip MISC as follows:

PCHG.	OFFICE FRS.
50	0 and 1
51	2 and 3
52	4 and 5
Etc. to	Etc. to
59	18 and 19

- 11.2 Make a test call to a trunk group located on an office pair whose associated O relay is crossed. Observe that the marker immediately connects to the trouble indicator and that the XOF lamp lights. Remove the cross.

## 12. PRE-SELECTED TRUNK

- 12.1 Block operated one of the K relays; for example, relay KEL-0. Make a test call and observe that the marker times out and no CH lamp lights indicating that a channel was not selected. Remove the block from the K relay.

## 13. LEADS ZA-ZJ (WHERE EQUIPPED)

- 13.1 Momentarily ground lead ZA to punching 05, terminal strip DIST-Z. Observe that the marker immediately connects to the trouble indicator and the XZ lamp lights.
- 13.2 Repeat this test and observe that the same results are obtained on leads ZB-ZJ as follows:

PCHG.	T.S.	LEAD
06	DIST-Z	ZB
07	"	ZC
08	"	ZD
09	"	ZE
15	"	ZF
16	"	ZG
17	"	ZH
18	"	ZI
19	"	ZJ

14. LEADS TC, OT AND TP

14.1 Momentarily ground the following leads one at a time and observe that in each case the marker immediately connects to the trouble indicator and the XTC lamp lights.

PCHG.	T.S.	LEAD
00	DIST-A	OT
02	"	TP
03	"	TC

15. ZA1-ZJ1, TC1, OT1, ODR, OOV AND KP1 RELAY WINDINGS

15.1 Block operated the 7 and 8T contacts of relay ST1. Momentarily ground (through a test receiver) the ZA and ZB terminals on the marker XTS. Observe that the marker immediately connects to the trouble indicator and the XC, ZK, ZA1 and ZB1 lamps light. Momentarily operate the ST5 relay to release the ZA1 and ZB1 relays.

15.2 Repeat the above test crossing and momentarily grounding the following leads at the XTS terminals as indicated and observe that the associated lamps light.

LEADS	LAMPS
ZB - ZC	ZB1 - ZC1 XC, ZK
ZC - ZD	ZC1 - ZD1 " "
ZD - ZE	ZD1 - ZE1 " "
ZE - ZF	ZE1 - ZF1 " "
ZF - ZG	ZF1 - ZG1 " "
ZG - ZH	ZG1 - ZH1 " "
ZH - ZI	ZH1 - ZI1 " "
ZI - ZJ	ZI1 - ZJ1 " "
OT - ZA	OT1 - ZA1 " "
TC - ZA	TC1 - ZA1 " "
¢ZPS - ZA	PS1 - ZA1 " "
# KP - ZA	RO - ZA1 " "
*ODR - ZA	ZA1 " "
OOV - ZA	ZA1 " "

¢ Located in Route Relay Bay  
# Provide solid ground to operate KP relay  
\* (DIALING OPERATOR)

Remove block from ST1 relay.

16. MI1-MI9, TC1, ODR, OOV AND KP RELAY WINDINGS (FIG. 39 EQUIPPED)

16.1 Block operated the 7 and 8T contacts of relay ST1. Momentarily ground (through a test receiver) the MI1 and MI2 terminals on the marker XTS. Observe that the marker immediately

connects to the trouble indicator and the XC, ZK, MIA and MIB lamps light. Momentarily operate the ST5 relay to release the MIA and MIB relays.

16.2 Repeat the preceding test crossing and momentarily grounding the following leads at the XTS terminals as indicated and observe that the associated lamps light.

LEADS	LAMPS
MI2 - MI3	MIB - MIC XC ZK
MI3 - MI4	MIC - MID " "
MI4 - MI5	MID - MIE " "
MI5 - MI6	MIE - MIF " "
MI6 - MI7	MIF - MIG " "
MI7 - MI8	MIG - MIH " "
MI8 - MI9	MIH - MIJ " "
¢ZPS - MI2	MIPS - MIB " " OT1
# KP - MI2	RO - MIB " "
*ODR - MI2	MIB " "
*OOV - MI2	MIB " "

¢ Located in Route Relay Bay  
# Provide solid ground to operate KP relay  
\* Dialing Operation

17. LEADS ZS AND ZO (WHERE EQUIPPED)

17.1 Momentarily ground lead ZS at punching 53, terminal strip DIST-A. Observe that the marker immediately connects to the trouble indicator and the XZS lamp lights. Remove ground from punching 53.

17.2 Block operated relay CIF1 and repeat the test by momentarily grounding lead ZO at punching 51 terminal strip DIST-A and crossing contact 11M of relay BK relay when "AR" wiring is used. Observe same results with lamps ZO and ZS lighted. Remove ground from TS, cross from BK relay, and block from CIF1 relay.

18. LEADS CK, BK, SPE, SPO, NSE, NSO, SSA, SSB, PSA AND PSB

18.1 Block the XK1 relay normal. Momentarily ground contact 5B of NSO relay and observe that the marker does not connect to the trouble indicator. Remove block from the XK1 relay.

18.2 Momentarily place a solid ground on these leads one at a time as indicated below and observe that in each case the marker immediately connects to the trouble indicator and the XK lamp lights.

PCHG.	T.S.	LEAD
06	DIST-A	SSA
08	"	SSB
03	OFF-EA	NSE
04	"	SPE
06	OFF-EB	PSA
07	"	PSB
08	"	SSA
09	"	SSB
03	OFF-OA	NSO
04	"	SPO
04	OFF-OB	CK

12T Contact SPL Relay BK  
5B Contact NSO Relay BK

19. LEADS S AND LS TO DISTRICT LINK, LEADS LS TO OFFICE LINK AND PRIMARY WINDING OF CT RELAYS

19.1 Momentarily ground the following leads one at a time and observe that in each case the marker immediately connects to the trouble indicator and the XCH lamp lights.

PCHG.	T.S.	LEAD
19	DIST-A	LS9R to District
24	DIST-B	S9R to District
19	OFF-EB	LS9R to Office
BP-R9	XTS-B	Primary Winding of CT R9 Relay

20. LEAD SL

20.1 Momentarily ground lead SL at punching 07 terminal strip DIST-A and observe that the marker immediately connects to the trouble indicator and the XSL lamp lights.

21. JC LEADS

21.1 Check that direct ground is present on leads (JC) 0-19, as equipped, at terminal strip DIST-A, punchings 30-49, on the marker frame.

21.2 Block relay ST2 operated and check that battery through 150 ohms is present on the 1T spring of the last JC relay. Momentarily operate the other JC relays one at a time and check that battery is removed from, and ground connected to, the 1T spring of the last JC relay when each JC relay is operated. Remove the block from relay ST2.

21.3 Cross two JC leads at terminal strip DIST-A, punchings 30-49 and make a test call that will use one of the crossed leads. Observe that the marker times out and a failure of the BK check is indicated (BK lamp not lighted) or if marker arranged for marker speedup, lamp BBK not lighted. Remove the cross.

22. CROSSED DISTRICT PRIMARY SELECT MAGNETS

22.1 Connect ground through the R-9572 test receiver to lead B to district link (T.S. DIST-B, terminal 03). Make a test call and observe that the marker immediately connects to the trouble indicator and that lamps XSM1, MS and A light.

23. LEADS SML AND SMR

23.1 Momentarily ground the following leads one at a time at the punchings indicated and observe that the marker immediately connects to the trouble indicator and the XSM lamp lights.

PCHG.	T.S.	LEAD
08	OFF-EA	SML to Even Office
09	"	SMR " " "
08	OFF-OA	SML to Odd Office
09	"	SMR " " "

23.2 Operate key F corresponding to an even district frame, cross leads SML and SMR to the even office frames at punchings as indicated in Paragraph 23.1. Make a test call. Observe that the marker immediately connects to the trouble indicator, lamp XSS and one of lamps KEL (0-9) or KER (0-9) light. Remove the cross.

23.21 Operate key F corresponding to an odd district frame, cross leads SML and SMR to the odd office frames and make a test call. Observe that the marker immediately connects to the trouble indicator, lamp XSS and one of lamps KOL (0-9) or KOR (0-9) light. Remove the cross.

24. S1 LEADS TO OFFICE LINK

24.1 Momentarily ground one at a time leads S1 (OR-9R) at punchings (10-19) on terminal strip OFF (OA and EA). Observe that the marker immediately connects to the trouble indicator and the XS1 lamp lights in each case.

24.2 Repeat the above test on leads S1 (OL-9L) at punchings (20-29) on terminal strip OFF (OA and EA). Observe the same results.

25. S LEAD TO OFFICE LINK

25.1 Ground the S lead of a trunk at the OFF-EB or OFF-OB T.S. The terminals for the S leads are as follows:

- | PCHG. | T.S.  | LEAD |       |
|-------|---|------|-------|
| 40    | OFF (OB & EB)   | S-OR | 27.2  |
| to    |   | to   |       |
| 49    |   | S-9R |       |
| 50    | OFF (OB & EB)   | S-OL |       |
| to    |   | to   |       |
| 59    |   | S-9L | 27.21 |
| 25.2  | Make a test call using the trunk selected for test and observe that the marker immediately connects to the trouble indicator and that lamp XS lights.   |      |       |
| 25.3  | Insulate 2B-3B (option HR) or 1B-2B (option HS) relay DT1 and make a test call. Observe that the marker times out; and that lamp XS does not light. Remove the ground from lead S and the insulator from relay DT1.   |      |       |
| 26.   | <u>CROSSED DC LEAD</u>  |      |       |
| 26.1  | Ground lead DC by connecting to terminal 14 of OMC-T.S. (A). Observe that the marker immediately connects to the trouble indicator and that lamp XDC lights.  |      |       |
| 26.2  | Insulate 2T and 3T contacts of relay CK6 and make a test call. Observe that the marker immediately connects to the trouble indicator, lamp XDC lights and marker relay DK does not operate.   |      |       |
| 26.3  | Make a full selector sender test frame test call and observe that the trouble indicator is not seized. Remove the ground from lead DC and the insulator from relay CK6.   |      |       |
| 26.4  | Insulate 2B and 3B contacts of marker relay RL and make a test call. Observe that the marker times out and lamp AK lights. Remove the insulator from relay RL.  |      |       |
| 27.   | <u>RL AND TRL LEADS</u>   |      |       |
| 27.1  | Momentarily ground lead RL at T.S. OMC-B, terminal 06, and observe that the marker immediately connects to the trouble indicator and that lamps XRL and RL light.   |      |       |
| 27.11 | Cross 4T and 5T contacts of marker relay SR. Make a full selector sender test frame test call. Observe that the marker immediately connects to the trouble indicator and that lamps XRL and RL light. Remove the cross from relay SR, unless the following test is to be performed immediately. |      |       |
| 27.12 | Block operated relay CK6 cross 4T and 5T relay SR. Observe that the marker immediately connects to the trouble indicator and relay XRL operates. Remove the cross from 4T and 5T relay SR. Release relay CK6.   |      |       |
|       |   |      | 27.22 |
|       |   |      | 27.21 |
|       |   |      | 27.22 |
|       |   |      | 28.   |
|       |   |      | 28.1  |
|       |   |      | 28.11 |
|       |   |      | 28.12 |
|       |   |      | 28.2  |
|       |   |      | 28.21 |
- NOTE: On additions, if a new district link frame is being installed, the new frame should be used for the performance of tests prescribed in Paragraph 27.22, otherwise, tests should be performed during a light traffic period.
- 27.22 Connect ground to any district link MCA-T.S. terminal 01, (TRL lead between the district link MCA relays and the district link LC relays). Operate key F corresponding to the selected district link frame and make a test call. Observe that the marker immediately connects to the trouble indicator and lamps XRL, AK and TRL light. Remove the ground from T.S. MCA.
28. GROUNDED OR OPEN DK-DK1 LEADS
- 28.1 Insulate 5B and 6B contacts of relay ST5 and make a test call. Observe that the marker times out, lamp DK lights and marker relay DK does not operate. Remove the insulator from relay ST5.
- 28.11 Insulate 6T and 7T contacts of marker relay TB. Make a test call and observe that the marker times out, marker timing relay TM1 does not operate, marker relay DK operates and lamp DK lights.
- 28.12 Block operated OVA relay. Make a test call and observe that the marker does not time out. Remove the insulator from relay TB and release relay OVA.
- 28.2 Ground lead DK by connecting to DIST T.S. (B) terminal 00. Make a test call and observe that lamp XDK lights immediately, the marker times out, lamp DK lights and lamp AK does not light. Remove the ground from lead DK.
- 28.21 Block relay TMS normal, ground lead DK1 at the MISC. T.S. terminal 32. Make a test call and observe that lamp XDK lights, the marker times out and lamp CKG lights. Remove the block from relay TMS and the ground from lead DK1.

- 28.3 Close the normally open DC contacts at relay CIE (pair No. 57) and make a test call. Observe that the marker connects to the trouble indicator and that lamp XDC lights. Remove the cross from relay CIE.
29. DF RELAY CROSSES
- 29.1 Cross the 1, 2 and 3 top contacts of relay F1. Block the DF-1 relay normal and operate key F0. Make a test call and observe that the marker times out. The DF (0-1) and TK lamps light. Lamp DK does not light. Remove the cross and release relay DF1.
- 29.2 Momentarily cross 3T and 4T contacts of DF relays (0-19), as equipped, one at a time. Observe that the marker immediately connects to the trouble indicator and lamp XDF1 lights.
- 29.21 Insulate 1T and 2T contacts of trouble indicator relay XRL and repeat the test. Observe that the marker immediately connects to the trouble indicator and lamp XDF1 does not light. Remove the insulator.
30. MESSAGE REGISTER CHECK
- 30.1 Operate the MR key and CS key associated with a message rate class of service. Make a test call and observe that the marker times out and connects to the trouble indicator. The MS lamp lights but the MR and MR1 do not. Release the MR key.
- 30.2 Operate the MR1 key and again start the test call. Observe that the marker again times out, connects to the trouble indicator, and the MS and MR1 lamps light but the MR does not light. Release the MR1 key.
- 30.3 Operate the MR2 key and start a test call. Observe that the marker releases without a trouble record and the MR1 lamp is lighted. Release the MR2 key.
31. OPERATION FAILURE - RELAYS NSE, SPE, NSO AND SPO
- NOTE: On additions, if a new office link frame is being installed, the new frame should be used for the performance of tests prescribed in Paragraph 31.1, otherwise, tests should be performed during a light traffic period.
- 31.1 Block in the nonoperated position the TR or TL relay of an even numbered office link frame. The blocked relay should be associated with a trunk group on non-split levels and with a route relay in ground supply 3.
- 31.11 Make a test call to the trunk group and observe that the marker times out in the decoder stage (MS and NSE lamps do not light) and the NSO progress lamp indicates the even office link frame was not connected.
- 31.12 Operate the AR key of the trouble indicator to simulate a second trial and again make a test call to the trunk group. This call should be from an odd numbered district link frame. Observe that the call is completed OK and that a trunk on the odd office link frame is selected. Remove the block from the TR or TL relay.
- 31.13 Now block the TR or TL relay on the odd office link frame associated with the same trunk group. Make a test call to this trunk group with the AR key normal and observe that the marker times out in the decoder stage and that the NSE progress lamp indicates the odd office link frame was not connected.
- 31.14 With the AR key operated, again make a test call to the trunk group. This call should be from an even numbered district link frame. Observe that the call is completed OK and that a trunk on the even office link frame is selected. Remove the block from the TR or TL relay.
- 31.2 Make test calls similar to those described in Paragraph 21.1 to a trunk group located on split levels. Similar results should be obtained.
32. FALSE OPERATION - RELAYS NSE, SPE, NSO AND SPO
- 32.1 Marker Not Equipped With Marker Speed-Up
- 32.11 Block operated relay SPE. Make a test call to a trunk group on a non-split level. Observe that the marker times out in the decoder stage and that a trunk is not selected. Remove the block from relay SPE.
- 32.12 Repeat the test per Paragraph 32.1 with relay SPO instead of relay SPE blocked operated. Observe the same results.
- 32.13 Block operated relay NSE. Make a test call to a trunk group on a split level. Observe that the marker times out in the decoder stage and that a trunk is not selected. Remove the block from relay NSE.
- 32.14 Repeat the test per Paragraph 32.3 with relay NSO instead of relay NSE blocked operated. Observe the same results.

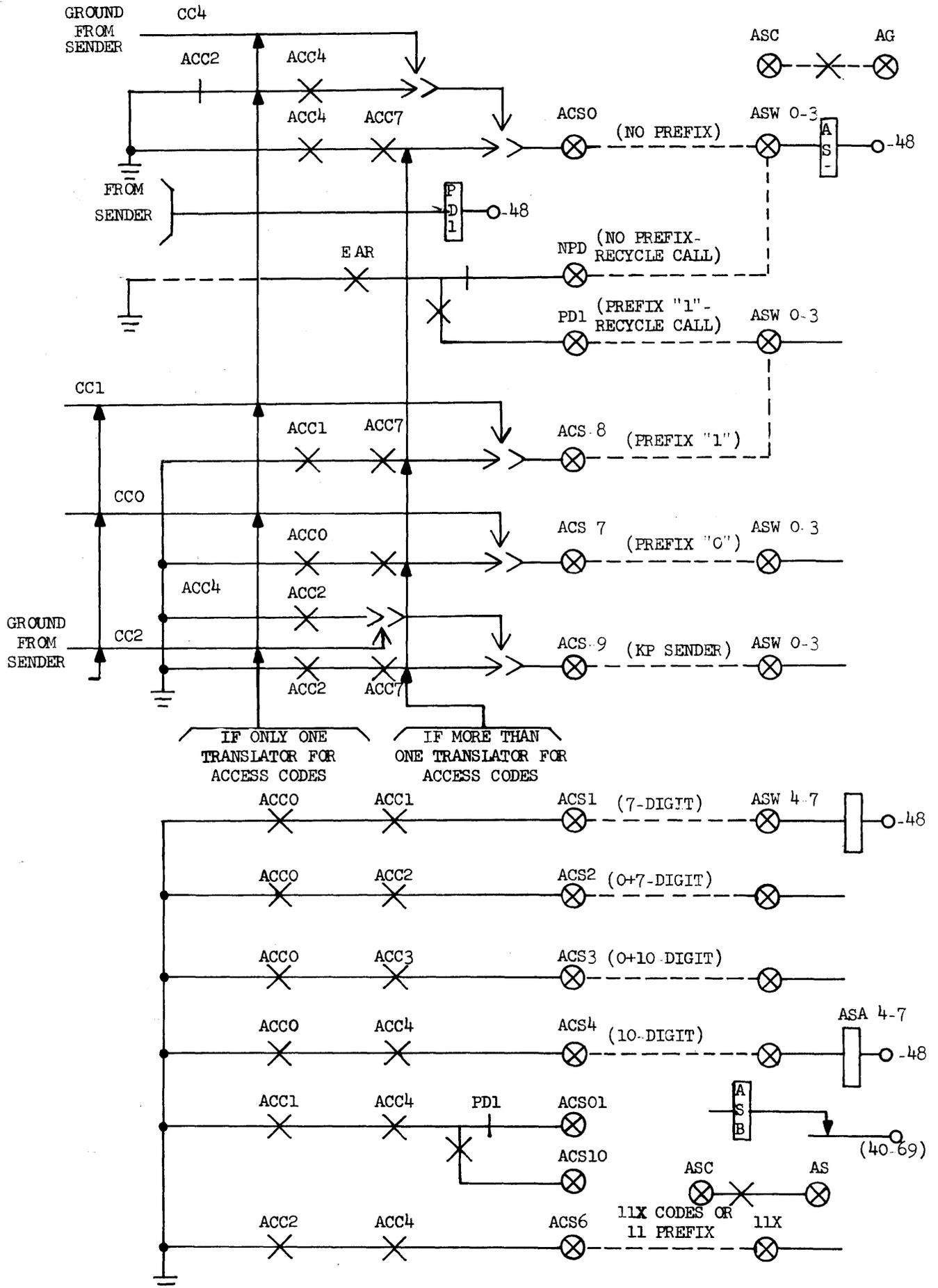


FIG. 1 - ACCESS AND INTERCHANGEABLE CODE SCREENING

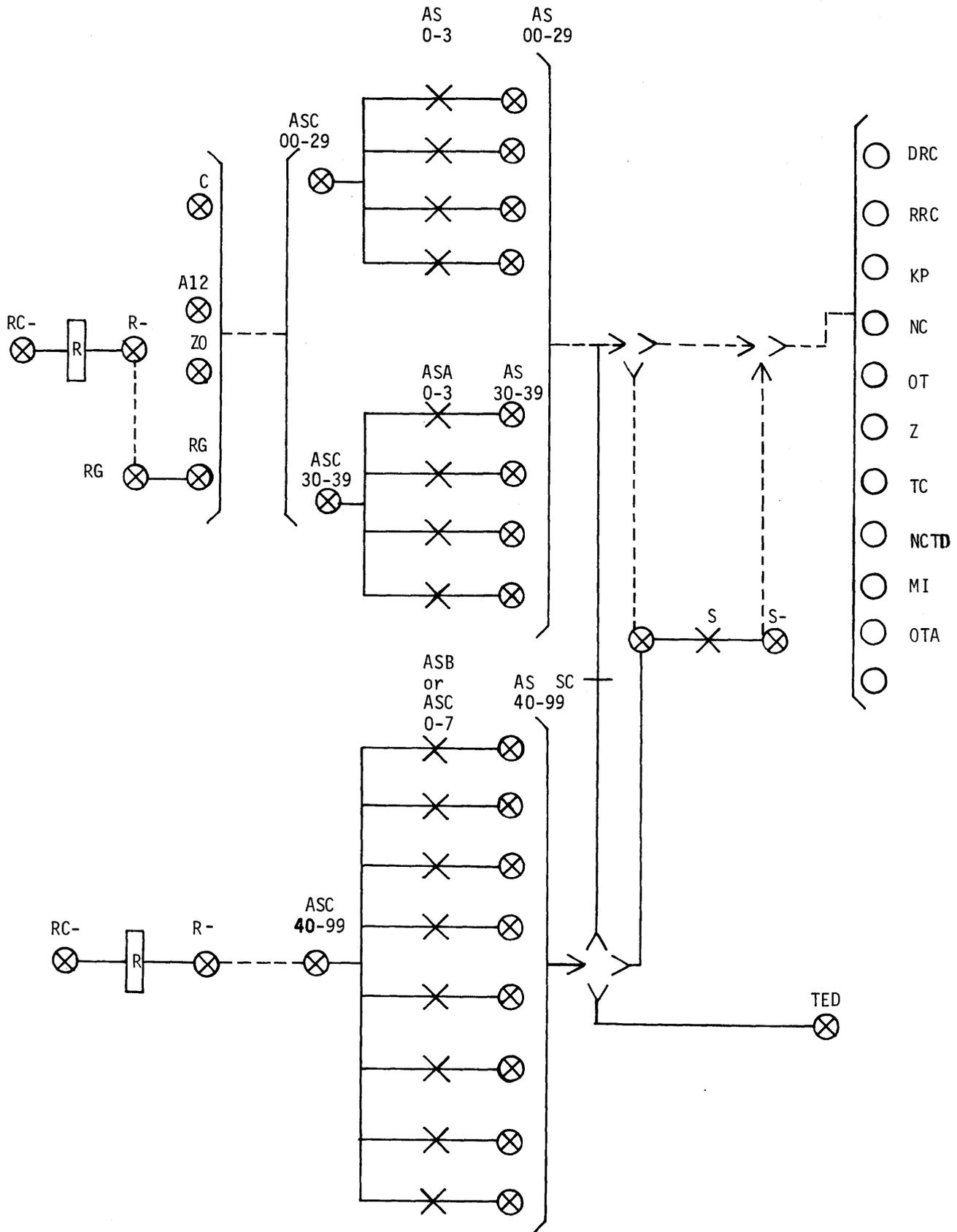


FIG. 2 - ACCESS AND INTERCHANGEABLE CODE SCREENING

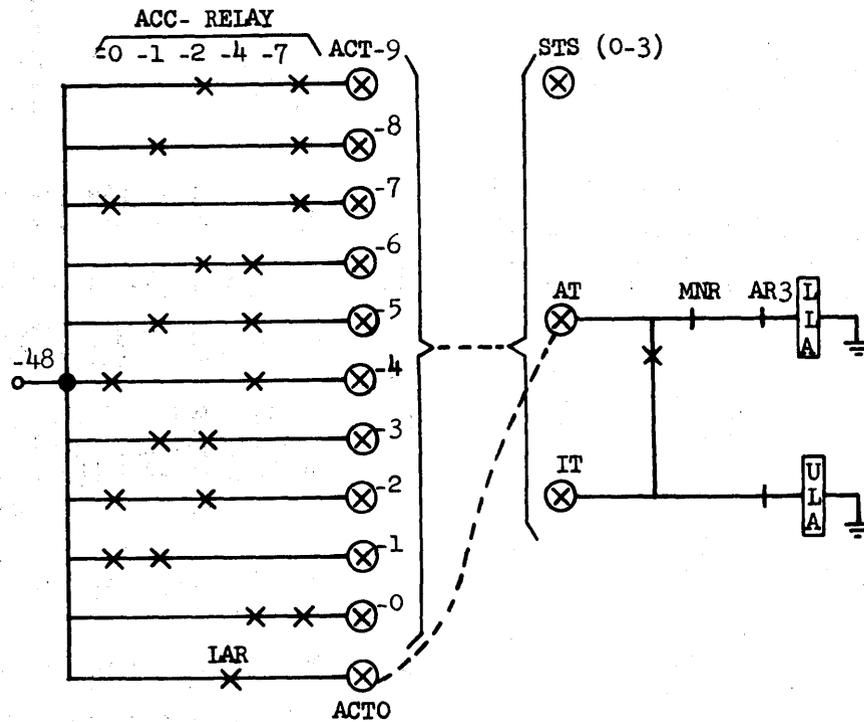


FIGURE 3 - ACCESS CODE TRANSLATOR START

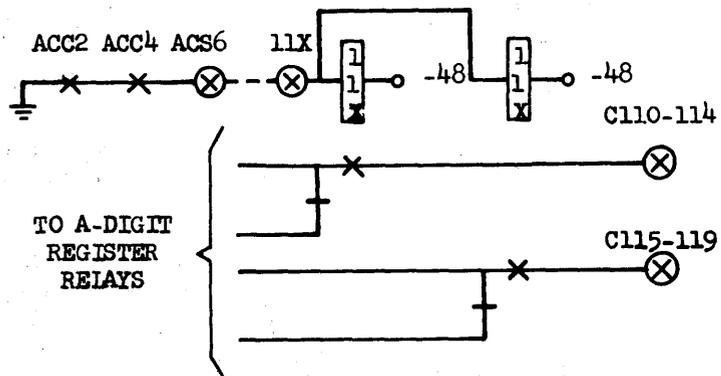


FIGURE 4 - 11X CODES

32.2 Marker Equipped With Marker Speed-Up

TABLE A

32.21 Block relay XK normal and ground 7T, relay SPE. Make a test call to a trunk group on a non-split level. Observe that the marker times out in the decoder stage and that a trunk is not selected. Remove ground from 7T, relay SPE.

GRD. PCHG on RC TS	GRD. RELAY	Present At CONTACT
C-110	A-5	1B
C-111	A-1	4T
C-112	A-1	6B
C-113	A-1	4B
C-114	A-5	6T
C-115	A-2	6T
C-116	A-2	3B
C-117	A-2	4T
C-118	A-2	1B
C-119	A-5	4T

32.22 Repeat the test per Paragraph 32.21 with relay SPO instead of relay SPE. Observe the same results.

32.23 Ground 7T, relay NSE. Make a test call to a trunk group on a split level. Observe that the marker times out in the decoder stage and that a trunk is not selected. Remove ground from relay NSE.

34.3 Remove the ground added in Paragraph 34.1. Relays 11X and 11X' release.

32.24 Repeat the test per Paragraph 32.23 with relay NSO instead of relay NSE. Observe the same results.

35. CC-0, 1, 2, 4 AND 7 RELAY OPERATION

32.25 Release relay XK.

35.1 Using test cord connect ground to PCH 26 TS OMC-A. Relay EAR operates.

33. CROSS-CONNECTIONS - ACCESS AND INTER-CHANGEABLE CODES

35.2 Using a test receiver momentary ground PCH 10, 11, 02, 25 and 26 TS OMC-B. Observe as each PCH is grounded the associated CC- relay operates.

33.1 The following provides general information on cross connects to be added in originating marker for access and interchangeable codes.

35.3 At completion of test remove test cord added in Paragraph 35.1. Relay EAR releases.

33.2 When the office is arranged for 0 and 1 access and/or interchangeable codes, an access code unit frame is provided. This frame has mounted on it the AS0-AS3 relays and the associated punchings for the AS00-49 contacts and ASC-00-49 common contacts of the AS relays. Also, multiple of the following punchings appear on this frame: DRC, KP, NC, OT, RG, RRC, SC, TC and Z (A-J).

36. ACC-0, 1, 2, 4 AND 7 RELAY OPERATION

36.1 Using test cord connect ground to PCH 25 TS OMC-A. Relay LAR operates.

36.2 Using a test receiver momentary ground PCH 10, 11, 02, 25 and 26 TS OMC-B. Observe as each PCH is grounded the associated ACC- relay operates.

TABLE B

33.3 See Figures 1-4 for typical cross connect information.

BLOCK OPERATED RELAYS	GROUND PRESENT AT "A" TS PCH.	BATTERY PRESENT AT "B" TS PCH.
ACC-7 and ACC-4	ACS-0	ACT-0
ACC-1 and ACC-0	ACS-1	ACT-1
ACC-2 and ACC-0	ACS-2	ACT-2
ACC-2 and ACC-1	ACS-3	ACT-3
ACC-4 and ACC-0	ACS-4	ACT-4
ACC-4 and ACC-1	ACS-5	ACT-5
ACC-4 and ACC-2	ACS-6	ACT-6
ACC-7 and ACC-0	ACS-7	ACT-7
ACC-7 and ACC-1	ACS-8	ACT-8
ACC-7 and ACC-2	ACS-9	ACT-9

34. 11X AND 11X' RELAY OPERATION

34.1 Using test cord connect ground to TS "B" PCH 11X, relays 11X and 11X' operate.

34.2 Using test cord connect ground momentary to PCH C-110 to C-119 on TS RC. Observe with a test receiver ground is present at relay contacts (per Table "A") as each PCH is grounded.

36.3 Remove test cord added in Paragraph 36.1. Relay LAR releases.

37. ACT- AND ACS- PCHG. ASSIGNMENT
- 37.1 Block operated ACC- relays and observe battery and ground present on PCH as indicated in Table "B". (CAD 50 and 51)
- 37.2 At completion of test in Paragraph 37.1 remove block from ACC-7 and ACC-2.
38. SERVICE RESULTS PLAN
- 38.1 Block relay ST1 operated. Verify relay PEG1 operates.
- 38.2 Momentarily operate relays AR and AR1 simultaneously. Verify while relays AR and AR1 are operated, relays ARA and FM2 are operated.
- 38.3 Block relay ST4 operated. Verify relay PEG1 releases and relay PEG operates. Traffic register OMPC at the Miscellaneous Circuit for the Sender Busy Frame registered once.
- 38.4 Momentarily operate key PC or relay BS at the Traffic Register Circuit. Verify the associated traffic register registered once.
- 38.5 Release relays ST1 and ST4. Relay PEG releases.
- 38.6 Block relay ARA operated. Momentarily operate relay TR. Verify traffic register OM2F at the Miscellaneous Circuit for the Sender Make Busy Frame registered once.
- 38.7 Release relay ARA.
39. ROUTE ADVANCE - ALL TSPS TRUNKS BUSY (NT OPTION)
- 39.1 Block operated an O-, AK and TK relay. Verify relays SR and SRA operate.
- 39.2 Momentarily operate relay PTK and PT3. Verify both relays lock operated and ground is absent from 8B, relay TP1.
- 39.3 Release relay O-, AK and TK. Verify relays SR, SRA, PTK and PT3 release and ground is present on 8B, relay TP1.
40. A, B AND/OR C LINKAGE OPERATIONS (MARKER SPEEDUP)
- 40.1 Setup local area test call as outlined in Handbook 61, Section 172, Paragraph 4.
- 40.2 Operate key LP and momentarily operate key ST. Verify call completes satisfactorily and lamp indications (A, B, C BK are present.
- 40.3 Operate key RL. All lamps extinguished
- 40.4 Insulate 12-12M, relay HMT1. Make a test call and verify it fails and lamp ABK does not light. Lamps (B, C) BK light.
- 40.5 Remove insulation from 12-12M relay HMT1 and insulate 11-11M relay HMT1. Make a test call and verify it fails and lamp BBK does not light. Lamps (A, C) BK light.
- 40.6 Remove insulation from 11-11M relay HMT1 and insulate 10-10M relay HMT1. Make a test call and verify it fails and lamp CBK does not light. Lamps (A, B) BK light.
- 40.7 Remove insulation from 10-10M relay HMT1.
- 40.8 Repeat Paragraphs 40.2 and 40.3.

No Changes Indicated Due  
To Extensive Revision

Manager, Crossbar Product Engineering  
Control Center

Reason for Reissue:

1. Add revisions required for Marker Speed-Up.
2. Make corrections and clarifications.