

ORIGINATING MARKER TEST

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| <p>1. <u>GENERAL INFORMATION</u></p> <p>1.1 Refer to Originating Marker Tests per Section 172 for General Information, Test Procedure, Records and Requirements, Test Equipment, and Test Setup.</p> <p>2. <u>TRUNK SELECTION TEST</u></p> <p>2.1 Select a trunk group in ground supply 1 or 3 consisting of 40 trunks, if available, to be used for this test.</p> <p>2.11 If a trunk group of 40 trunks is not available, use one of the following trunking arrangements: (1) a trunk sub-group of 40 trunks and block the "walking" circuit for trunk sub-groups in order to reach the chosen sub-group on each test call, or (2) two or more trunk groups. Which used together will cover the trunk test range - ELO to EL9, OLO to OL9, ERO to ER9 and ORO to OR9 - of the marker.</p> <p>2.12 If two or more trunk groups are used, they should overlap on the marker test range in order to prove the transfer features of the T relays.</p> <p>2.2 Make 40 test calls from an even numbered district link frame to the trunks chosen for test. (More than 40 calls will be required if two or more trunk groups are used due to the overlap.)</p> <p>2.21 After each call busy the trunk that was just selected. A trunk may be busied by grounding its S1 lead at the OGTTF, the MDF, or at the office link frame secondary switch.</p> | <p>2.22 As indicated by the K lamps, observe that the trunks are selected in the following order with reference to the following chart: Left to right, top to bottom, considering that the last trunk (OL9) is followed by the first trunk (ELO) and the trunk group may start at any point in columns 1 and 3 and end at any point in columns 2 and 4.</p> <p style="text-align: center;">K Lamps</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td>(0)ELO</td> <td>(1)OLO</td> <td>(2)ER1</td> <td>(3)OR1</td> </tr> <tr> <td>(4)EL2</td> <td>OL2</td> <td>ER3</td> <td>OR3</td> </tr> <tr> <td>(8)EL4</td> <td>(9)OL4</td> <td>(10)ER5</td> <td>(11)OR5</td> </tr> <tr> <td>(12)EL6</td> <td>OL6</td> <td>ER7</td> <td>OR7</td> </tr> <tr> <td>(16)EL8</td> <td>(17)OL8</td> <td>(18)ER9</td> <td>(19)OR9</td> </tr> <tr> <td>(20)ERO</td> <td>(21)ORO</td> <td>(22)EL1</td> <td>(23)OL1</td> </tr> <tr> <td>(24)ER2</td> <td>OR2</td> <td>EL3</td> <td>OL3</td> </tr> <tr> <td>(28)ER4</td> <td>(29)OR4</td> <td>(30)EL5</td> <td>(31)OL5</td> </tr> <tr> <td>(32)ER6</td> <td>OR6</td> <td>EL7</td> <td>OL7</td> </tr> <tr> <td>(36)ER8</td> <td>(37)OR8</td> <td>(38)EL9</td> <td>(39)OL9</td> </tr> </table> <p>2.23 Busy the last trunk in the test trunk group and make a test call to the group. Observe by the indicating lamps that the call is directed to the alternate route or common sub-group of trunks if there is one, and if not, to the overflow group of trunks.</p> <p>2.3 Remove the busy condition from the trunks located on the odd office link frame, but leave the busy condition on the trunks on the even office link frame.</p> <p>2.31 Insert a make busy plug into the OMB jack of the odd office link frame. This will cause the B0 relay of the marker to operate and busy all trunk test relays associated with the odd office link frame.</p> | (0)ELO | (1)OLO | (2)ER1 | (3)OR1 | (4)EL2 | OL2 | ER3 | OR3 | (8)EL4 | (9)OL4 | (10)ER5 | (11)OR5 | (12)EL6 | OL6 | ER7 | OR7 | (16)EL8 | (17)OL8 | (18)ER9 | (19)OR9 | (20)ERO | (21)ORO | (22)EL1 | (23)OL1 | (24)ER2 | OR2 | EL3 | OL3 | (28)ER4 | (29)OR4 | (30)EL5 | (31)OL5 | (32)ER6 | OR6 | EL7 | OL7 | (36)ER8 | (37)OR8 | (38)EL9 | (39)OL9 |
| (0)ELO | (1)OLO | (2)ER1 | (3)OR1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4)EL2 | OL2 | ER3 | OR3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (8)EL4 | (9)OL4 | (10)ER5 | (11)OR5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (12)EL6 | OL6 | ER7 | OR7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (16)EL8 | (17)OL8 | (18)ER9 | (19)OR9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (20)ERO | (21)ORO | (22)EL1 | (23)OL1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (24)ER2 | OR2 | EL3 | OL3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (28)ER4 | (29)OR4 | (30)EL5 | (31)OL5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (32)ER6 | OR6 | EL7 | OL7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (36)ER8 | (37)OR8 | (38)EL9 | (39)OL9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

- 2.32 Make a test call, or test calls if more than one trunk group is used, and observe that the call is directed to the alternate route or common sub-group of trunks, if there is one and if not, to the overflow trunk group.
- 2.33 Remove the busy condition from the trunks on the even frame and remove the make busy plug from the OMB jack.
- 2.4 Make 40 test calls from an odd numbered district link frame to the same group of trunks used for test in Paragraph 2.2.
- 2.41 Busy trunks after each call as for the previous test. Observe that the trunks are selected in the reverse order, that is, right to left, bottom to top, the first trunk selected being in column 1 or 3.
- 2.42 As before, busy the last trunk in the order of selection and make a test call to the trunk group. Observe that the call is directed to the alternate route or common sub-group of trunks, if there is one, and if not, to the overflow group of trunks.
- 2.5 Remove the busy condition from the trunks located on the even office link frame, but leave the busy condition on the trunks on the odd office link frame.
- 2.51 Insert a make busy plug into the OMB jack of the even frame. This will cause the BE relay of the marker to operate and busy all trunk test relays associated with the even frame.
- 2.52 Make a test call, or test calls if more than one trunk group is used, and observe that the call is directed to the alternate route or common sub-group of trunks, if there is one, and if not, to the overflow group.
- 2.53 Remove the busy condition from the trunks on the odd office link frame and remove the make busy plug from the OMB jack. Also remove the block from the "walking" circuit for trunk sub-groups if this circuit was blocked.
- 2.6 Using a trunk group divided into exactly two sub-groups make the following tests to verify the trunk selection features of the marker. Use a trunk group that has an alternate route of exactly two sub-groups of trunks if this is available.
- 2.61 Busy all trunks of one sub-group and make two test calls to the trunk group. Making two calls to the code point representing this trunk group will insure that a call has been made to the sub-group with the all trunks busy condition. Observe that on both calls a trunk is selected in the sub-group not made busy.
- 2.62 Busy all trunks in both sub-groups and make a test call to the trunk group. Observe that the call is directed to the alternate route if there is one, and if not, to the overflow group of trunks.
- 2.621 If the alternate route or overflow trunks are divided into exactly two sub-groups of trunks make all trunks of one sub-group busy and repeat the above test three or four times. Observe that in each case a trunk is selected in the idle sub-group of the alternate route or overflow trunks. Remove the busy condition from the alternate route or overflow trunks.
- 2.63 Remove the busy condition from the trunks in the sub-group made busy on the tests per Paragraph 2.61. Make two test calls and observe that on both calls a trunk is selected in the idle sub-group.
- 2.64 Remove the busy condition from the trunks in the other sub-group.
- 2.7 Check that when relay TBL is manually operated:
- (a) Locks to ground from 3T and 4T of ST2 relay operated through the make contacts of relay PT. Insulate 9 and 10T (ST2) to operate relay PT.
- (b) Opens the battery path from 3B and 4B contacts of relay ST2 operated to 3B of the JC (0) relay.
- (c) Locks to ground on 1T (TBL) relay (DK lead). Apply ground to 6B (PS1) to make this test. Block the TB relay normal during this test.
- (d) Opens the ground path from 8T and 9T of the CK6 relay operated to 1B(PS1) and 3B (OVA) relay.

2.8 Block non-operated the TMW, TM7, TM8 and OCB relays and then block operated the 7T and 8T contacts of relay ST1. Check that direct ground is present on the 7M spring of relay OR and that the operation of each of the following relays removes this ground: OR, OL, GT2 if provided, and TB. Check that direct ground is present on the 7M spring of relay ER and that the operation of each of the following relays removes this ground: ER, EL, GT2 if provided and TB.

2.81 Remove the block from relay ST1, TMW, TM7, TM8 and OCB relays. This checks that the marker releases and MCB relay of the even frame when the trunk selected is on the odd frame and vice versa; and also, releases the MCB relays of both frames on all trunks busy conditions.

3. GROUND SUPPLY

NOTE 1: This test should be made after the completion of the first cycle of routine of all route relays.

NOTE 2: This test verifies that each route relay is associated with the proper ground supply and checks the strapping of the TB lead at the contact springs on all route relays.

3.1 Block operated all forty T relays of the marker to simulate an all trunks busy condition in all ground supplies. (If X wiring and apparatus are furnished block operated all forty P relays instead of the T relays and also block operated the STX relay to prevent arcing at the contacts of this relay.)

3.11 Make a test call to each original route relay in ground supplies 1 and 3, observe that lamps light as indicated in the following chart. The calls should be made using even and odd numbered district link frames alternately in order to make an overall check of the all trunks busy feature at the TG relays.

<u>Condition</u>	<u>Lamps</u>
Ground supply 3; no common sub-group of trunks.	GS3, TB5
Ground supply 3; common sub-group of trunks	GS3, GS4, TB5
Ground supply 1; no common sub-groups of trunks.	GS1, GS3, TB5

<u>Condition</u>	<u>Lamps</u>
Ground supply 1; common sub-group of trunks for original route; no common sub-group for alternate route.	GS1, GS2, GS3, TB5

Ground supply 1; common sub-groups of trunks for original and alternate routes.	GS1, GS2, GS3, GS4, TB5
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3.12 Release Relay T or Relays P & STX.

4. PERMANENT SIGNAL

4.1 All Trunks Busy

4.11 Busy all trunks of a permanent signal trunk group at the OGT TEST frame. Using a hand telephone set, ITE-4042, at a line link frame, make a call to the permanent signal trunks by allowing the sender to time out. Observe that the trouble indicator takes a record of the call and the lamps indicate it was a permanent signal call. Lamps TB5, PS1, OT1 and the lamps associated with grounded transmitting leads to the sender are lighted.

4.111 Repeat this call with a record in the trouble indicator and observe that the permanent signal overflow alarm operates and the PS lamp at the district link frame lights. Remove the busy condition from the permanent signal trunks.

4.12 When the markers connect to subscriber senders that are used by dialing operators, make test calls to the permanent signal route relay from the trouble indicator (use the CS key for dialing operator class). Observe that the RO lamp lights on first and second trials and the TRL lamp on third trial.

4.2 All Channels Busy

NOTE: Probably the most convenient method of steering these calls is to insert make busy plugs in the SS jacks at a line link frame to select a particular district frame and to insert plugs in all MB jacks of the district link frame to busy all channels.

4.21 Busy, in the most convenient manner, all channels to a permanent signal trunk group. Make a test call to the permanent signal trunk group from a line link frame using a hand telephone set, ITE-4042 by allowing the sender to time out. Observe that the trouble indicator takes a record and the lamps indicate it was a permanent signal call.

Lamps CRL, PS1, OT1 light. Repeat this call with a record in the trouble indicator and observe that the permanent signal overflow alarm operates and the PS lamp at the district link frame lights. Remove the busy conditions.

4.3 District Junctor Class Leads

- 4.31 Insulate 2 and 3T contacts of the PS2 relay. Momentarily operate the AC relay and check for ground on the 1T contact of the OT1 relay. This is to check leads in the marker which operate the TC or OT relays of the district junctor, when a regular call immediately follows a permanent signal call.

5. OVERFLOW

NOTE: Refer to permanent signal test for method of setting up all channels busy conditions and for steering calls. Test calls should be made during light traffic. To steer calls to the proper marker when the test call is made from the line link frame requires all markers but the one under test to be plugged busy. This should be coordinated so that markers are plugged busy just long enough to ensure proper marker seizure of the test call.

5.1 All Trunks Busy

- 5.11 Busy all trunks at the OGTF in the overflow group and in a small original route trunk group in ground supply 3. Make a test call to the original trunk group using a hand telephone set ITE-4042 at a line link frame.
- 5.111 All digits (TH, H, T & U) as well as the office code should be dialed on this call and the call should be made from a line having its message register lead gives the same results obtained on this test (See 5.4). Observe that (1) the marker makes one or three trials (depending upon whether Figure D or C is equipped) to complete the call to the overflow trunks, and (2) the sender cuts through the district junctor and releases but the district is not connected to an outgoing trunk.
- 5.112 This is checked by observing that the S, S1 and T relays (also TC if a charge code is used) of the district are operated and no cross-points associated with the district used for test are closed on the district link primary switch. Remove the busy condition from all trunks.

5.2 All Channels Busy

- 5.21 Busy all channels from a district link frame to be used for test by inserting make busy plugs in the MB jacks of the district link frame.
- 5.211 Using a hand telephone set ITE-4042 at a line link frame, make a call that will reach the district link frame whose channels are made busy. All digits should be dialed on this call, the same office code may be used and the line's message register should be cross-connected as described under 5.1. Observe that (1) the marker makes three trials to complete the call and (2) the sender cuts through the district junctor and releases but the district is not connected to an outgoing trunk.
- 5.212 This should be checked in the same manner described in 5.1. Remove the make busy plugs from the MB jacks.

5.3 Double Connection

- 5.31 Block operated relay DT3. Using a hand telephone set at a line frame make a call by dialing all digits and using a line whose message register is cross-connected. Observe that (1) the marker makes three trials to complete the call and (2) the sender cuts through the district and releases. Crosspoints may be closed on the district link frame but no crosspoint should be closed on the office link secondary switch. Release relay DT3.

5.4 Message Register Check Failure

- 5.41 Using a hand telephone set at a line link frame make a call by dialing the office code and all digits. This call should be made from a line that required a cross-connected message register but the message register should not be cross-connected at the time of this test. Observe that (1) the marker makes three trials to complete the call and (2) the sender cuts through the district and releases but the district is not connected to an outgoing trunk. Verify this as described in 5.1.

5.5 Zone Charge Overflow

- 5.51 Operate the ZOF key and make a test call at the trouble indicator to a code requiring a zone charge condition. Observe that the call is completed OK and that the ZO and TC lamps light and the ZL lamp does not light.

6. TRAFFIC REGISTERS6.1 Outgoing Trunk Group (Overflow and Peg Count Registers)

6.11 Operate the BAT key at the traffic register rack. Connect ground to terminal 2 (TR-OF) of one terminal strip TR(CAD 104) associated with each ground supply. Momentarily operate each route relay assigned for cross-connection to trunk group traffic OVFL register and observe that the associated register scores once. Momentarily operate each route relay not assigned to trunk group traffic OVFL registers and observe that none of the associated assigned registers score. Remove the ground from terminal 2.

6.111 Repeat the operation described under Paragraph 6.11 using term. 3 TR-PC of CAD 104 and observe that the PC registers score. Remove the ground from terminal 3.

6.12 Block non-operated relays DL, TM7, and TM9; block operated relays MR, SL and OF1. With a test receiver check that ground is present on make contact PC (3 or 8) of the lowest route relay assigned for overflow service, (one of relays R-00 to R-09). Release relay MR and check that this ground is removed. Remove the blocks from relays SL and OF1.

6.13 Block unoperated relay ST1; block operated relay CK6, SM and SPO.

(a) Cross the 11 and 12T contacts of relay ST1. Manually operate the JD relay and observe that it locks. Remove the block from relay SPO and observe that the JD relay releases.

(b) Block operated the GT1, GT3 and NSE relays (one at a time) and manually operate the JD relay and check that it locks.

(c) Leave the NSE and JD relays operated and check that ground is present on armature contact PC (3 or 8) of all route relays.

(d) Operate relay OF1 and note that this ground is removed from armature contact PC (3) of the overflow route relays only. Release relay OF1.

(e) On markers equipped for dialing operator calls, operate the OOV1 relay and check that ground is removed from the PC armature contacts of all route relays. Release relay OOV1.

6.14 Block relay TB-1 operated.

(a) Check that ground is connected to armature contacts OF (2 or 7) of all route relays associated with the corresponding supply circuit (Ground Supply 1).

(b) Check that ground is removed from armature contacts PC of all route relays associated with the corresponding ground supply circuit (Ground Supply 1).

(c) Check that ground is not removed from armature contacts PC of any route relays associated with the remaining ground supply circuits.

(d) Check that ground is not connected to armature contacts OF (2 or 7) of any route relays associated with the remaining ground supply circuits. Release the blocked TB-1 relay.

6.141 Repeat the test described in Paragraph 6.14 using relays TB2, TB3 and TB4.

6.142 Block operated relay TB5 and JD relays. Check that ground is connected to armature contacts of (2) of all route relays in Ground Supply 5. Operate OOV1 relay when furnished (Dialing Operator) and check that ground is removed from the armature contacts OF (2) of all route relays in Ground Supply 5. Release relays TB5, CK6, JD, SM, TM7, TM9, DL, NSE and ST1.

6.2 Originating Marker Peg Count

6.21 JA Option - Manually operate relay ST4 momentarily and observe that the marker peg count register (PC) operates. The PC key for furnishing battery at the traffic register rack should be operated during this test.

6.22 JB Option and Fig. 52 - Perform Paragraph 6.21 and verify peg count register (PC) associated with the marker seized by a rotary dial line scores.

6.221 Block operated relay MF. Repeat Paragraph 6.21 and verify peg count register (PC) associated with the marker seized by a touch tone line scores. Release relay MF.

6.3 Office Link Frame Overflow

6.31 Block operated relay CRL. Momentarily operate relays (0) 0-9, as equipped and check that their associated office link frame overflow registers score. Remove the block from relay CRL.

6.4 District Peg Count

- 6.41 With a test receiver check for the presence of ground on make contact PC (52) of a district link and connector relay MCA associated with the marker under test. Operate marker relay CHE and note that the ground is removed. Release relay CHE.
- 6.5 All Markers Busy Alarm Circuit
- 6.51 Block non-operated the B relay in the all markers busy timing control circuit which is located on the relay rack.
- 6.52 Block operated and leave operated the CBT relays, one at a time, of all markers in the same group. Observe that the associated AMB relays operate. Check that ground is not applied to the 3 and 4T contacts of the AMB relays until the AMB relay of the last marker in the group operates.
- 6.53 Check that the AMB lamp at the Originating Trouble Indicator Frame lights.
- 6.54 Remove the block from the B relay and observe that within a time interval of 50 to 60 seconds, the AMB relay of the timing control circuit operates.
- 6.55 Observe that the MBA lamp on the originating trouble indicator lights and the minor time alarm operates. Remove the block from the CBT relay of one of the markers. Observe that the AMB lamp is extinguished.
- 6.56 Operate the RLA key on the trouble indicator and check that the MBA lamp is extinguished and the alarm is silenced.
- 6.57 When the DSA switchboard is in the same building, check at the A board that the originating markers busy delay lamp (LR) is lit. Operate the common release key (RL) and observe that the LR lamp is extinguished.
- 6.58 Remove the blocks from all CBT relays.

6.6 Class of Service Peg Count

- 6.61 Block operated relay CMR. Using an ITE-9547 cord equipped with alligator clips connect ground to punching CPC. Check that ground is present on punchings MR and RMR.

6.62 When Figure 26 of SD-25317 is Specified:

- 6.621 At traffic register rack operate the CP key. Connect ground through a test receiver to punching CSP-0. Verify that the CP relay and PC register operate and lock. Remove the ground from punching CSP-0 and observe that CP relay and PC register do not release. Release CMR relay and observe that both CP relay and PC register release.
- 6.622 Repeat operation per Paragraph 6.621 for each CP relay equipped, connecting to the corresponding CSP-0-9 punching. Release the CP key. Remove ground from the CPC punching.

6.63 When Figure 6 of SD-25317 is Specified:

- 6.631 At traffic register rack operate CP and PC keys. Connect ground through a test receiver to punching CSP-0. Connect ground through a test receiver to punching 12 of term. strip on originating marker peg count unit (Figure 5K and 6K SD-25317). Observe that CP relay operates and locks, and that the class of service register as well as the marker peg count register operate. Remove ground from punching CSP-0 and observe that CP relay and PC register does not release. Release the CMR relay and note that CP relay and class of service PC register releases.
- 6.632 Repeat operation per Paragraph 6.631 for each CP relay equipped, connecting to the corresponding CSP-0-9 punching. Release the CP and PC keys. Remove ground from punching 12 of terminal strip on originating marker peg count unit. Remove ground from the CPC punching.

6.7 Test of Coin Reroute

- 6.71 Check with a receiver that no ground is present on punchings (RR)0-3.
- 6.72 Ground in turn punchings (RRC)0-3. As each one is grounded, check that ground is connected to the associated RR punching.

7. DOUBLE CONNECTION TEST

NOTE: The operation of the double connection test feature is proved on the district junctor routine test. The following tests are made to verify that proper wiring and apparatus are used and to check the S1 leads through each K relay as this is not verified on the district junctor routine test.

- 7.1 Trunks Tested in Common with Another Group of Markers.
- 7.11 Markers 0-7 (AA and Y Wiring and Apparatus)
- 7.111 Block operated 9-10T contacts relay ST1 and observe that relays DT1 and DT2 operate.
- 7.112 Block DT1 operated and manually release and block DT2 non-operated. Observe that relay DT3 operates.
- 7.113 Remove block from relay DT2 and then relay DT1. Verify relays DT1, DT2 and DT3 are locked operated.
- 7.114 Remove block from 9-10T relay ST1 and observe that relays DT1, DT2 and DT3 release.
- 7.12 Markers 100-107 (AB Wiring and Y Wiring and Apparatus): Manually operate relay CHE and observe that relay DT1 operates. Hold relay DT1 operated and release relay CHE. Observe that relay DT3 operates.
- 7.2 Trunks Tested by One Group of Markers Only (AA and Y Wiring and Apparatus): Check as outlined in 7.11.
- 7.3 Trunks Tested in Common with Panel (X Wiring and Apparatus and AA Wiring)
- 7.31 Insulate 1-2T (App. Fig. BD) or 6-6M (App. Fig. BE) relay OR. Block operated the 9-10T contacts relay ST1. Manually operate relay DT2 and observe that relay DT1 operates.
- 7.32 Block relay DT1 operated and release relay DT2. Observe that relay DT3 operates. Release relay DT1 and verify relay DT3 is locked operated.
- 7.33 Remove block from ST1 relay and insulation from contacts of the OR relay. Verify relay DT3 releases.
- 7.4 Check of S1 Leads Through K Relays: Operate the forty K relays one at a time, and check that ground is present on terminal strip punchings as indicated below:

NOTE: With HV option, anyone of relays RPI, PT1 or PT3 operated, removes ground from the terminal strip punchings.

Operated K Relay	Pchg. - T. S.	
	OFF-EA	OFF-OA
(K) ERO to	10 to	
(K) ER9	19	
(K) ELO to	20 to	
(K) EL9	29	
(K) ORO to		10 to
(K) OR9		19
(K) OLO to		20 to
(K) OL9		29

8. OVERLAP TEST

NOTE 1: The permanent busy line cross-connection should be installed and the vacant code trunks should be working when this test is made.

NOTE 2: This test should be made during light traffic and coordinated to restore markers to service when both test calls are loaded into markers under test.

- 8.1 Make busy all markers but the one under test, block non-operated relays SL, OCB, TMW and TMBB, dial two successive calls, using two hand set telephones ITE-4042, the first one to the permanent busy line and the other to a vacant code (dial four numerical digits if required). When the two calls are registered in the marker, remove the block from the SL relay and then the time-out relays. Check that the first call is completed as a busy line test, and the second call is completed to a vacant code trunk, as indicated by a vacant code tone.
- 8.2 Again block non-operated relays SL, OCB, TMW and TMBB. Dial one call to the busy line. When the call has progressed to the marker stage, operate manually the XDC relay and release the SL and the time-out relays. Observe that the trouble indicator record is made of the call and that a trouble release is immediately given the sender.
- 9. REROUTE OF SPECIAL CODE OFF-9300 AND OB5

NOTE: The test of 9.1 is required only when Figure 0 is furnished.

- 9.1 Operate code key OFF and make a test call. Observe that the test call completes and that lamp SG-5 lights. Operate key AR and repeat the test call. Observe that the test call is completed and that lamp SG-5 does not light.

- 9.2 Make a test call to a route relay which is cross-connected to the winding of SG1 relay. Observe that the test call completes and that lamp OB5 lights, indicating an "over five" brush selection.
10. ORIGINATING SENDER LOAD CONTROL
- 10.1 Using the originating trouble indicator make a test call operating the SLC key instead of the A, B and C code keys. By means of the display on the trouble indicator, observe that the proper trunks are selected for the class of service key depressed. Repeat this test using all classes of service on all markers.
11. TERMINATING SENDER LOAD CONTROL
- 11.1 Block operated the RT relay in the terminating load control timing circuit. At the originating trouble indicator operate the RT key associated with the first marker. Observe that the route transfer relays (RT) 0-9 used for terminating load control operate this marker. The associated RTR lamps light at the trouble indicator frame. (See Paragraph 11.7 for test of auxiliary signals.) The (T-RTA) lamp lights at the trouble indicator. Check that the ALM lead to the alarm circuit is grounded at 1B of RT for App. Fig. 32 & 4B of RT for App. Fig. 33. It is not necessary to check all alarms as these are tested during other tests of the marker.
- 11.2 Block operated the CK4A relay in the first marker and release the RT key. Check that relay CK4B is operated and RT relays remain operated. Release and reoperate the CK4A relay. The RT relays release. Operate the RT key and observe that the RT relays do not operate. Release the RT key and CK4A relay.
- 11.3 Operate (T-RTA) key at the trouble indicator frame. The (T-RTA) lamp is extinguished and (T-RTG) lamp lights. Manually operate and release each RT relay in the marker that is used for terminating load control. The (T-RTA) lamp flashes. Release the (T-RTA) key. Lamp (T-RTG) is extinguished.
- 11.4 Repeat the tests outlined in Paragraphs 11.1 to 11.3 on each marker.
- 11.5 From the trouble indicator make a test call on each marker using the office code routed through the normal contacts of each RT relay.
- 11.6 Operate the RT key associated with each marker at the trouble indicator. Make the same test calls specified in Paragraph 11.5 and observe that the tests are routed to overflow. Disregard the alarms and the (T-RTA) lamp during this test. Operate and release (T-RTA) key at the end of the test to extinguish the lamp. Remove block from RT relay in control timing circuit.
- 11.7 Check of Auxiliary Signal
- 11.71 DA A Board in Same Building (V Wiring at RT Keys): Operate and release each RT key at the trouble indicator frame and note that the LC lamp of the switchboard auxiliary signal circuit flashes.
- 11.72 Distant A Switchboard (T Wiring at RT Keys): At the HMDF connect ground to T1 punching associated with the RT keys and connect battery through a test receiver to the R1 punching. Operate and release each RT key and note continuity of the T1-R1 leads as each key is operated and absence of continuity when all keys are normal.
12. ROUTE TRANSFER
- NOTE: Perform tests per Paragraph 12.1 only when App. Fig. 31 of SD-25016-01 is furnished to transfer calls from A board to long distance and per 12.2 when Route Transfer Control Circuit SD-25473-01 is used to transfer calls from local to centralized commercial PBX.
- 12.1 Using the trouble indicator make a test call using a code arranged for route transfer. The test call will be routed regular as the RT relays are now normal. Now operate the RT key associated with the marker under test located at the A board. The associated RT lamp at the trouble indicator frame lights and RT relay in the marker operates. Now make a test call using the same code and the call will be routed according to the cross-connections on the operated contacts of the RT relay. Repeat the test using all codes arranged for route transfer on this basis. Repeat the tests outlined in this paragraph on all markers.
- 12.2 Perform tests similar to those outlined in Paragraph 12.1 operating the RT relays in the marker by operating the control key referred to in SD-25473-01 at the local PBX board if X wiring is furnished or by crossing the A and B leads if Y wiring is furnished. Observe that the associated RTR lamp at the trouble indicator lights and the RT relay in the marker operates.

13. LOCKING CIRCUIT FOR MRL, ST4A AND ST5 RELAYS

- 13.1 Block relay DL non-operated and momentarily operate (one at a time) the RL, SR, OF1, TLO to TL14, DFO-DF19, JD, PO-P13, MR, AR2, XBO, XBE and TG (ELO) to TG (OL9) relays and check that the MRL relay will lock operated while each relay is operated.
- 13.2 Momentarily operate the NC1, PS1, KP1, OVA, MICK, ZO, OT1, TC1, RP1, TP1, ZA1 to ZJ1 relays and the 00V1 relay when equipped (one at a time) and check that the ST5 and ST4A (App. Fig. 57) relay will lock operated while each relay is operated.

14. BK RELAY LOCK

- 14.1 Block relays XK and XX2 normal and MRL and SR operated (only block relay MRL operated if marker is arranged for marker speedup). Connect a temporary ground to contact 6B (12M in marker arranged for marker speedup) of relay BK. Manually operate the BK relay and note that it does not lock.
- 14.2 Block relay SPL operated. Manually operate relay BK and note that it locks. Release SPL and note that BK releases.
- 14.3 Repeat test operations in Paragraph 14.2 using in turn relays NSO and SPR. Before releasing SPR, remove block from relay XX2. Relay XX2 will operate causing relay BK to release. Release relays SPR, MRL, SR, XK and remove ground from relay BK.

15. TESTS OF MERCURY SLAVE RELAYS - MARKER SPEEDUP

- 15.1 Set up a normal service test call as outlined in Handbook 61, Section 172, Paragraph 4.

- 15.2 Insulate contact 1M, relay TKE. Operate key ST and verify marker completes test call using contacts 8 and 9 of mercury relay TKE (prime).
- 15.3 Remove insulation from 1M, relay TKE and momentarily operate key RL to extinguish lamp indications.
- 15.4 Repeat Paragraph 15.1 to 15.3 for each of the following relay contacts (1) 5-6T, ST1 has slave contacts 10 and 3, St1' (2) 5-6B, ST1 has slave contacts 8 and 9, ST1' (3) 5-6T, AK has slave contacts 8 and 9, AK'.
- 15.5 Insulate contact 0, Relay MCB- at a District Link Frame. Cross contacts 5 and 6B, marker relay ST5.
- 15.6 Operate key ST and verify call completes using contacts 8 and 9 of relay DK'.
- 15.7 Remove insulator from contact 0, MCB-relay and remove cross from marker ST5 relay, 5 and 6B. Momentarily operate key RL to extinguish lamp indications.

16. TIME REQUIREMENTS FOR MARKER SPEEDUP

- 16.1 Perform the timing requirements as specified in Table A of this section. Use an ITE-4325 or the equivalent J-24753A Timing Test Set.

NOTE 1: When doing timing test for HMT apparatus it is Tel. Co. responsibility to determine the final time range used in marker. (See note 333, SD-25016-01, sheets D16 and D17.) Western's responsibility is to see HMT meets stated requirement with the given conditions.

NOTE 2: In Table A under timing resistance, the HMT- resistor which corresponds to a particular time range, is the only resistance in HMT timing circuit during the test. All other HMT timing resistors are strapped.

Lines presented in Script indicate new or changed information.

ATTACHMENT

Table A on Page 10

Manager, Product Engineering
Control Center

Reason for Reissue:

To make minor corrections in Paragraphs 13 and 15.

