Installation Engineering Handbook 61
Western Electric Company, Incorporated
Columbus Works

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ORIGINATING MARKER TEST

Replaces: Section 172.4
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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.

1.11 During the test of the markers, the regular lockout circuit (MP relays) and the emergency lockout circuit (E relays) on the district link frames should be used alternately at regular intervals as a means of exercising these circuits.

1.12 During the test of the markers, the regular lockout circuit (even office frame) and the emergency lockout circuit (odd office frame) on the office link frames should be used alternately at regular intervals as a means of exercising these circuits.

1.13 During the test of the markers, make busy channels so that a different (0L to 9R) channel is used for each cycle. It is not necessary to perform sufficient routine test cycles to use each of the channels. The channels should be busied at the following points.

(1) District Link Frames - MB Jacks

(2) Office Link Frames - PMB Jacks

1.2 A circuit test consists of making the tests described in Paragraph 2 once on one circuit.

2. ROUTINE TEST

NOTE 1: Odd and even numbered district link frames should be used on alternate cycles in order to verify group end and group start cross-connections. With keys AR and OF normal, the group end cross-connections are tested on calls from odd numbered districts and the group start cross-connections are tested on calls from even numbered districts. With key AR or OF operated, the group end cross-connections are tested on calls from even numbered districts and the group start cross-connections are tested on calls from odd numbered districts.

NOTE 2: A different class of service should be used on each cycle. If a sufficient number of cycles are not required to permit a check of each class of service, the remaining classes are checked on test calls made on a supplementary test basis.

NOTE 3: When two party message rate service is provided, make several tip party calls on each routine cycle. Operate the TP key in addition to the other keys described in Section 172. Observe the TP, TP1 and TP2 lamps light on regular service local test calls and lamps TP, TP1 and TPK light for special service (zero operator) local test calls and that the RP1 lamp does not light.

NOTE 4: Route relays used for the district junctor routine test are not checked on the marker routine test. The district junctor routine test amply tests these route relays.

NOTE 5: Complete one or more test calls to each route relay as described in the following paragraphs. Refer to Section 172 for information on making test calls and checking lamp indications. When more than one call is made to a route relay on a routine cycle, the second, third, etc., calls are made to check the TL, GS, GE and ST cross-connections to the G and GP relays for each sub-group of trunks assigned to the route relay under test. On these calls pay particular attention to the TL, K and OF lamps to verify respectively the TL, GS or GE and ST cross-connections.

2.1 Complete one test call to

(1) each route relay assigned to a trunk group that is not sub-divided.

(2) each route relay assigned to a common or second choice sub-group of trunks (all route relays in ground supplies 2 and 4).

2.2 Complete two test calls to

(1) each route relay assigned to a trunk group that is sub-divided into exactly two sub-groups.

(2) each route relay assigned to the first choice sub-groups of trunks in a trunk group that is divided into 3 sub-groups.

2.3 Complete twelve test calls to

(1) each route relay assigned to the first choice sub-groups of trunks in a trunk group that is divided into four or more sub-groups.

(2) each route relay assigned to an overflow or permanent signal trunk group that is divided into three or more sub-groups.

NOTE: In order to check some route relays on test calls, it is necessary to perform additional operations and check additional features over and above those covered in Section 172, as follows:

2.31 Alternate Route: Operate the AR key and make the test call to the original route relay. The marker sets up the call over the alternate route and the indicating lamps should light to agree with the routing as provided by the alternate route relay.

2.311 On these calls, observe that (1) the AR lamp lights, (2) the start and end points for channel test are shifted ten channels (from channel L0 to L5 for the start and channel R9 to R4 for the end) as indicated by the CH lamps and (3) the direction of testing for an idle trunk is reversed as indicated by the K lamps.

2.312 The group end cross-connections will be tested on calls from even numbered district link frames and the group start cross-connections on calls from odd numbered district link frames.

2.32 Route Relay Assigned to a Second Choice or Common Sub-Group of Trunks: The second choice or common route relay is in ground supply 2 when the associated first choice route relay is in ground supply 1 and is in ground supply 4 when the associated first choice route relay is in ground supply 3.

2.321 When testing a common route relay in ground supply 2, operate GS1 key and make a test call to the first choice or original route relay. Observe that the indicating lamps light to agree with the routing for the common route relay.

2.322 When testing a common route relay in ground supply 4, operate keys GS3 and AR and make a test call to the original route relay. Observe that the indicating lamps light to agree with the routing for the common route relay.

2.33 Route Relays Assigned to Overflow and Announcement Signal Trunks: The route relays for overflow trunks are located in ground supply 5. Three overflow route relays may be provided; one for trunk groups to destinations that do not require dialing numerical digits, one for trunk groups to destinations requiring four numerical digits, and one for trunk groups to destinations requiring either five numerical digits or a party letter.

2.331 When there are more than two sub-groups of trunks associated with an overflow route relay, there is no common or second choice sub-group of trunks and only one sub-group of trunks is tested to locate an idle trunk. When there are exactly two sub-groups, both sub-groups are tested.

2.332 Operate the OF key and make a test call to an original route relay. The marker sets up the call to the overflow trunks and the indicating lamps should light to agree with the routing as provided by the overflow route relay. When the dial A-KP class is used, the reorder signal is received and the call is not routed to overflow trunks.

2.333 If the original route relay operates in series with any charge relay (except relay NC or KP), the auxiliary relay associated with the charge relay (for example OT1) will be released and the NC1 relay operated lighting the NC1 lamp.

2.334 If zone charge conditions, ZA to ZJ, as equipped, are set up on these calls, lamps ZA1 to ZJ1, ZS and ZL do not light indicating that relays ZA1 to ZJ1 released. These relays released disconnect the zone start (ZS) lead thereby preventing connection to the zone registration control circuit on these calls.

2.335 Observe that the indicating lamps light to agree with routing provided for the overflow route relay and not the route relay called.

2.336 Also, observe that lamps AR and OF light, the start and end points for channel testing are shifted ten points (CH lamps), and the direction of testing for an idle trunk is reversed (K lamps).

2.337 On these test calls the group end cross-connections will be tested on calls from even numbered district link frames and the group start cross-connections on calls from odd numbered district link frames.

2.34 Route Relays Assigned to Permanent Signal Trunks: These route relays are located in ground supply 5. One route relay is provided for each class of permanent signal trunks, as for example, coin and non-coin classes.

2.341 Where there are more than two sub-groups of trunks associated with a permanent signal route relay, there is no second choice or common sub-group of trunks. Only one sub-group of trunks is tested on a call to locate an idle trunk. When there are exactly two sub-groups, both sub-groups are tested.

2.342 Operate the PS key but do not operate the A, B and C keys as described in Section 172; otherwise, originate call as described in Section 172.

2.343 Where there are two or more permanent signal route relays, it is necessary to use two or more classes of service on a routine test cycle to reach each route relay.

2.35 Route Relays Assigned to Zero Operator Trunks: Operate the ZO key but do not operate the A, B and C keys as described in Section 172. Otherwise, originate these test calls as described in Section 172.

2.351 Zero operator trunk groups may be provided as required for different classes of subscribers, in which case a route relay is provided for each class.

2.352 Also, these trunk groups may be subdivided and a common or second choice sub-group of trunks provided, the same as any original or alternate route trunk group.

2.353 Where there are two or more zero operator route relays for different classes of subscribers, it is necessary to use two or more classes of service on a routine test cycle in order to reach route relay.

2.36 Route Relays Assigned to Denied Service Operator Trunks: One or two route relays, depending on the size of the trunk group, are provided for each class of denied route trunks, as for example, coin and non-coin. In order to check these route relays, make the test call to a code using a class of service that is denied connection over the called route.

2.37 Route Relays Assigned to Vacant Code Trunks: These route relays are connected to all unassigned codes, any of which may be used for the routine test. If an operator class is used on the call, the reorder signal is received; otherwise, the call is routed to the vacant code trunks.

2.38 Route Relays Associated With Route Transfer Relay RT: The RT relay, if equipped, transfers five or less code points from one set of route relays to another set of route relays. If the second set of route relays is tested from other code points, it is necessary to just check the transfer feature of the RT relay; otherwise, check these route relays in the same manner as other route relays.

2.381 Also check that the RT relay operates and the RT lamp lights when the associated RT key is operated at the A switchboard and that relay RT operates through back contacts of relay CK4A and locks to front contacts of relay CK4A. Check that relay CK4A operates when relay CK4 operates.

3. SUPPLEMENTARY TESTS ASSOCIATED WITH ROUTINE TESTS

NOTE 1: These tests should be made near the completion of the job, and in addition they probably should be made early in the test period.

NOTE 2: When calls covered on these tests are routed to the same trunk group and require identical treatment, the check of the indicating lamps can be facilitated by temporarily using colored lamp caps in the positions where lamps should light on these tests.

3.1 Unassigned Codes

3.11 Using all classes of service, make at least one test call to one unassigned code point.

3.12 Using one class of service, make a test call to each unassigned code and observe that the call is completed to the vacant level. On operator class calls, the reorder signal is received.

3.13 All codes 200 to 999 inclusive should be called except the assigned codes which are checked on the routine test.

3.2 Overflow

3.21 With the OF key operated, make a test call to each assigned route relay in ground supplies 1 and 3 using all classes of service through which the route relays are connected. Observe that the call is routed to the proper group of overflow trunks. On operator class calls, the reorder signal is received. The direction of testing for an idle trunk is reversed as indicated by the lamps.

NOTE: The talking charge indication at the OTI does not change but the overflow trunk selection functions to cancel the charge condition.

3.3 Class of Service and Denied Route

3.31 Using the classes of service not covered in the routine test, make test calls to each route relay which is connected through class of service (S) relays. This includes all classes which route the call to denied service operator trunks.

3.4 Route Relay Operated From Several Points.

3.41 When a route relay can be operated from several points, such as two or more code points or RA cross-connections, check the route relay over each path.

3.5 RMR and ZMR Cross-Connections

3.51 Operate code key 0-OPR and complete a test call for each subscriber class of service for which cross-connections are provided (terminals S0 to S19). Observe that lamps OT, OT1, DK, SR, RL, MS, CK, BK, S, SID, MR and MRL light.

3.52 Operate key MR, repeat the test calls described in Paragraph 3.5 and observe the same test results for the test calls associated with classes of service which do not require line message registers.

3.521 For the test calls associated with classes of service which require line message registers, observe that the marker connects to MR1, DK, AK, SR, SL, MS, CK, BK, S, B, SIK, MRL and TRL light. Lamp MR does not light.

3.53 Key the local office code and operate keys MR and CS8 (key pulsing A switchboard senders, class 7). Make a test call and observe that lamps NC1, DK, SR, RL, MS, CK, BK, S, MR, MID and MRL light.

3.6 Dial Operator Denied Routes

NOTE: This test is required only when marker Figure V is specified.

3.61 Dial operator class of service requires cross-connections as follows:

	FIG.	TERMINAL	FIG.	TERMINAL
Vacant Code	7	R	4 or 34	SC
V	Z(ODR)			S
Permanent	7	R	4 or 34	SC
Signal	V	Z(OOV)		S
Overflow	7	R		SC
	V	Z(OOV)		S
	1 or A	D-	4	SW-
	B	DA-		

3.62 Operate code and class keys as required for a vacant code and dial operator class of call. Start a test call and observe that the test call is completed and that lamps TB5, CKG, K4, K5, DK, AK, TKE, TK, CHE and RO light. Lamps TRL, KE- and DO- do not light.

3.621 Operate key AR and OF and repeat the test call described in Paragraph 3.62. Observe the same test results except that lamp AR also lights.

3.63 Operate keys AR and OF and repeat the test call described in Paragraph 3.61. Observe that the test call is completed and that lamps TB5, AR, OF, CKG, K4, K5, DK, AK, TKE, TK, CHE and TRL light. Lamps RO, KE- and KO- do not light. Restore keys AR, OF and the operated vacant code keys.

3.64 Operate key PS and with the dial operator class key operated, start a test call. Observe that the test call is completed and that lamps TB5, CKG, D4, DK, AK, TKE, TK, CHE and RO light. Lamps K5, TRL, KE- and KO- do not light.

3.65 Operate code keys as required and make a dial operator class of test call to each code for which an S to Z (ODR, Figure V) cross-connection is specified. Observe that the test calls are completed and that lamps TB5, CKG, K4, K5, DK, AK, TKE, TK, CHE and RO light.

4. SUPPLEMENTARY TESTS NOT ASSOCIATED WITH ROUTINE TESTS

4.01 Dial 11X Service Code (Figure 64)

4.011 Operate keys per Section 172 to setup a test call; in addition operate keys CC-6 and EA. Operate the A-digit key corresponding to the "X" digit required.

4.012 Operate key ST. Call completes satisfactorily and lamps CC-2 and CC-4 light. Momentarily operate key RL.

4.02 Prefix Digit "0" on a Foreign Area Code

4.021 Operate keys to select a 10-digit foreign area code, in addition operate key CC-7. Operate key ST. Call completes satisfactorily and lamps CC-0 and CC-7 light.

4.022 Release key ST and CC-7. Momentarily operate key RL.

4.03 Prefix Digit "1" on a Foreign Area Code (Figure 63 With Code Compression and Recycle)

4.031 Operate keys to select a 10-digit foreign area code, in addition operate key PD1. Operate key ST. Call completes satisfactorily and lamp CC 2/5 and PD1 light. Momentarily operate key RL.

4.04 Prefix Digit "1" on a Foreign Area Code (Figure 60 SD-25016-0130 and Figure 39 SD-25018-0110)

4.041 Operate keys to select a 10-digit foreign area code, in addition operate key CC-8. Operate key ST. Call completes satisfactorily and lamps CC-1 and CC-7 light. Momentarily operate key RL.

4.05 Code Compression and Sender Recycle

4.051 Operate keys to select a code compression and sender recycle test call. Operate key ST. Call completes satisfactorily and lamp LA lights. Momentarily operate key RL.

4.052 Operate key EA and a key CC- for one compressed code. Repeat the test call. Call completes satisfactorily and lamp EA and proper lamps CC- light. Momentarily operate key RL.

4.053 Repeat Paragraph 4.052 for each compressed code.

NOTE: Unused compressed codes will give a vacant code or other routing as required.

4.054 Restore to normal keys ST, EA and CC-.

4.06 Trouble Reroute - Subscriber Sender SD-27810-01

4.061 Operate keys per Section 172 to setup a test call. In addition, operate key OF-1. Operate key ST. Call completes to overflow or announcement route. Momentarily operate key RL.

4.07 AMA Check

4.071 Operate keys per Section 172 to setup a test call. In addition, operate keys IND-M and IND-.

4.072 Operate key ST. Call completes satisfactorily, two MI- lamps light corresponding to the IND- key operated and lamp MIN lighted. Momentarily operate key RL.

4.08 Toll Diversion

4.081 Operate keys to select a code requiring the toll diversion feature.

4.082 Operate key ST. Call completes satisfactorily and lamp TDVK lighted. Momentarily operate key RL.

4.09 ANI Check - Ring Party

4.091 Operate keys to select a code requiring the ANI feature.

4.092 Operate key ST. Call completes satisfactorily and lamps ANI (Option KH only), TK1 and SIK light. Momentarily operate key RL.

4.10 ANI Check - Tip Party

4.101 Operate keys to select a code requiring the ANI feature. In addition, operate key TP.

4.102 Operate key ST. Call completes satisfactorily and lamps ANI, PTK, TK1 and SIK light. Momentarily operate key RL.

4.103 Restore to normal key TP.

4.11 Dynamic Overload Control

NOTE: An office code can be arranged for route transfer and/or trunk make busy by the Dynamic Overload Control Circuit, SD-27970-01. This is determined by the COO-29 to CA- and/or CB- cross-connections in the Miscellaneous Circuit for the Originating Trouble Indicator Circuit, SD-25063-01.

4.111 Use an office code arranged for route transfer and/or trunk make busy by the Dynamic Overload Control Circuit, SD-27970-01. Operate keys to select any 7- or 10- digit call.

4.112 Operate key ST. Verify call completes satisfactorily over regular trunk group for the office code selected.

4.113 Operate switches RT and RTF to select first lead COO-29 assigned to route transfer or trunk make busy for the route under test.

4.114 Operate key ST. Verify call completes satisfactorily over reroute trunk group for the office code selected.

4.115 Repeat the tests of Paragraphs 4.113 and 4.114 for the remaining leads COO-29 assigned to route transfer or trunk make busy for the route under test.

NOTE: On COO-29 leads assigned to route transfer, verify proper RTCAO-19 lamp lights.

4.116 Repeat the tests of Paragraphs 4.111 through 4.115 for each office code arranged for route transfer and/or trunk make busy by the Dynamic Overload Control Circuit.

NOTE: When the marker is arranged for Route Transfer Peg Count (Apparatus Figure 86), verify one scoring of each register. Refer to the P10-29 to PC10-29 cross-connections of the marker to determine the proper register to be scored.

4.12 Sender Tracing

NOTE: A route relay is provided to enable tracing calling lines which cause 2 out of 5 failures in the Subscriber Sender, SD-27810-01.

4.121 Operate keys per Section 172 to set up test call. Do not operate keys A, B and C. Operate keys OF-1 and PD1.

4.122 Operate key ST. Verify call completes to proper trunk group as indicated by the lighted TL, K- and ST lamps. Lamp PD1 is also lighted.

4.123 Momentarily operate key RL. Restore key PD1 to normal.

4.124 Operate key ST. Verify call completes to an overflow trunk group.

4.125 Operate key RL. Restore all keys to normal.

Lines Presented in Script Indicate New or Changed Information

Manager, Crossbar Product Engineering
Control Center

Reason for Reissue:
To add Paragraph 4.12.