Installation Engineering Handbook 62
Western Electric Company, Incorporated
Columbus Works

Section 225.2

9-8-72

Replaces: Section 225.2
Dated: 6-18-71

TERMINATING MARKER AND TERMINATING MARKER APPLIQUE TESTS TIME MEASURE

CONTENTS

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1. GENERAL INFORMATION

1.1 Refer to Terminating Marker and Terminating Marker Applique Tests per Section 225 for General Information, Test Procedure, Records and Requirements, Test Equipment, and Test Set Up. This section describes tests of the time measure functions of the marker and marker applique circuits.

1.2 To make the timing measurements required in this section, use Stop Watch R-3314. Unless otherwise specified, timing begins when the test call is started.

2. FIRST TIMING STAGE

NOTE: This test checks that the marker times out if registration is not complete before the first timing stage had elapsed.

2.1 Block operated relay CK1 and make a test call. Observe that the marker times out in 1.2 to 2.5 seconds, relay TML1 does not operate and lamps CKG, K2, K3 and LE light. Remove the block from relay CK1.

2.2 Block operated relay CK2 and make a test call. Observe that the marker times out in 1.2 to 2.5 seconds, relay TML1 does not operate and lamps CKG, K1, K3 and LE light. Remove the block from relay CK2.

2.3 Block relay CK3 operated and TML1 non-operated and make a test call. Observe that the marker times out in 1.2 to 2.5 seconds and lamps CKG, K1, K2, LE, FC and AK light.

2.31 Remove the block from relay TML1 and block normal relay TM1. Repeat the test call and observe that marker times out in 1.2 to 2.5 seconds and lamps CKG, K1, K2, LE, FC and AK light. Remove the blocks from relays CK3 and TM1.

2.4 Block relays CL1, CK2 and CK3 non-operated. Make a test call and observe that the marker times out in 1.2 to 2.5 seconds, relay TML1 does not operate and lamp CKG lights. Remove the blocks from relays CK1, CK2 and CK3.

2.41 Insulate contacts 3 and 4 bottom of relay TR3 and make a test call. Observe that the marker times out in 1.2 to 2.5 seconds, relay TML1 does not operate, and lamp CKG lights. Remove the insulator from relay TR3.

3. SECOND TIMING STAGE

NOTE: This test checks that the marker times out after the seizure of the number group connector if the line test is not complete before the second timing stage has elapsed.

3.1 Block relay L-O normal. Make a test call to a line number whose position in the twenty block corresponds to position L-O. Observe that the marker times out in 1.2 to 2.5 seconds, lamps CKG, K1, K2, K3, TBK, LE, FC, AK and TE light and lamp MKO does not light. Remove the block from relay L-O, except when testing markers 0 or 1, on which the following test is required.

3.2 Operate key NT and repeat the test call. Observe the test results described in Paragraph 3.1 except that lamps NT and SPL also light.

4. THIRD TIMING STAGE (AFTER REGISTRATION)

NOTE: This test checks that the marker times out after registration is complete if the number group connector is not seized before the third timing stage has elapsed.

4.1 Block normal relay NK and make a test call. Observe that the marker times out in 7.7 to 9 seconds, lamps CKG, K1, K2, K3 and LE light, L-, and MKO do not light. Remove the block from relay NK.

5. THIRD TIMING STAGE (AFTER LINE TEST)

NOTE: This test checks that the marker times out after the line test is complete, if the line choice connector is not seized before the third timing stage has elapsed.

5.1. Block normal relay IK1, and make a test call to a ring party line number, (terminal NF cross-connected to terminal RF at the block relay frame). Observe that the marker times out in 7.7 to 9 seconds, lamps CKG, K1, K2, K3, RF, L- and TBK light, LE, MKO and FC do not light.

5.11 Make a test call to a PBX line number. Observe test results as described in Paragraph 5.1 except that lamp HF lights instead of RF.

5.12 Make a test call to a tip party line number, if tip party line numbers are available. Observe test results as described in Paragraph 5.1 except that lamp TF lights instead of lamp RF. Remove the block from relay IK1.

5.2 Block normal relay IN and make a test call to an unassigned line number, (NF and NC terminals at the block relay frame not cross-connected). Observe that the marker times out in 7.7 to 9 seconds, lamps CKG, K1, K2, K3, L- and TBK light, RF, HF, TF, LE, MKO and LLG- do not light. Remove the block from relay IN.

6. FOURTH TIMING STAGE (MATE FRAME LOCKOUT)

NOTE A: This test checks that the marker times out after the line choice connector is seized, if the incoming secondary select magnets are not checked operated before the fourth timing stage has elapsed.

NOTE B: This test is required with or without incoming mate frame operation.

6.1 Block relay MKO normal and make a test call. Observe that the marker times out in 1.2 to 3.8 seconds and lamps CKG, K1, K2, K3, TBK, FC, AK, TK, and TE light. Remove the block from relay MKO.

7. FOURTH TIMING STAGE (MARKER RELEASE)

NOTE: This test checks that the marker times out after the channel hold magnets are checked operated if the marker is not released before the fourth timing stage has elapsed.

7.1 Block normal relay GLH and make a test call. Observe that the marker times out in 1.2 to 3.8 seconds, lamps CKG, K1, K2, K3, TBK, FC, AK, TK, BC, GJ, GC and SL light, MKO and GLH do not light. Remove the block from relay GLH.

8. FIFTH TIMING STAGE

NOTE: This test checks that the marker times out after the incoming secondary magnets are checked operated if the channel hold magnets are not checked operated before the fifth timing stage has elapsed.

8.1 Block relay SL1 normal. Make a test call and observe that the marker times out in 2.5 to 3.8 seconds, lamps CKG, K1, K2, K3, TBK, FC, AK, TK, BC, GJ, SL, GC, and MKO light and GLH does not light. Remove the block from relay SL1.

9. SIXTH TIMING STAGE (TM-7)

NOTE: This test checks that the marker functions to release the number group, incoming, line choice and marker connectors, give a trouble release signal, cause a major alarm, and release itself for service or make itself busy if the trouble indicator fails to cause the marker to release before the sixth timing stage has elapsed after time out.

9.1 Operate trouble indicator key BAT and block normal marker relay TR. Make a test call and observe that, within 1.3 seconds after relay TM6 operates, relays TM7 and TM10 operate; marker lamp TA, marker applique lamp MTA, and trouble indicator lamps DT and MB associated with the marker under test light; relays NK, NK1, IK, IK1, LK, CBR, and CBS, if equipped, release. Momentarily operate marker key AR to silence the alarm and to extinguish the lighted lamps. Repeat the test as required.

9.11 Repeat the test call and check that a momentary ground is connected to lead TRL to the marker connector (T.S. TMC, Terminal 04).

9.2 Manually operate relay XRL which locks. Observe that relays TMS2, TM4, TM5, TM6, TM7, TM10, CBR and CBS operate. Remove the block from relay TR.

10. TIME OUT ON BUSY BACK

NOTE: This test checks that the marker times out on busy back calls after the incoming link frame is seized, if the marker is not released before the second timing stage has elapsed.

10.1 Block relay SRL normal and make a test call to a busy line number. Observe that the marker times out in 2 to 3 seconds and lamps BB, LE, FC, AK, TE, TC and RV light.

10.11 Insulate 7B and 8B contacts of relay BB and repeat the test call. Observe that the marker times out in 8 to 9 seconds and lamps BB, LE, FC, AK, TE, TC and RV light. Remove the block from relay SRL and the insulator from relay BB.

11. TIME OUT ON REORDER

NOTE: This test checks that the marker times out on reorder calls after the IK1 relay operates, if the marker is not released before the second timing stage has elapsed.

11.1 Operate key RO, block relay SRL normal and make a test call. Observe that the marker times out in 2 to 3 seconds, and lamps RO, OF, LE, FC, AK, TE, TC, RV and RC light. Remove the block from relay SRL.

12. IMMEDIATE CONNECTION TO THE TROUBLE INDICATOR

NOTE: This test checks that the marker does not await time out in order to connect to the trouble indicator when relay X is operated.

12.1 Block normal timing relays TMS1, TMS2, and TML1. Momentarily operate relay X and observe that the marker immediately connects to the trouble indicator and that lamp X lights. Remove the blocks from relays TMS1, TMS2 and TML1.

13. OVERLAP OPERATION

NOTE: This test checks that the marker re-cycles first stage timing on successive calls.

13.1 Insulate 4T an/ 5T contacts of relay TM1 and block non-operated relay LK. Make a test call and observe that relay TMS1 does not operate, relay TMS2 operates and the marker times out in 2.5 to 3.8 seconds.

13.11 Remove the insulator from relay TM1, insulate 3T and 4T contacts of relay TMS1 and repeat the test call. Observe that test results as described in Paragraph 13.1. Remove the insulator from relay TMS1 and the block from relay LK.

14. TIME OUT ON NUMBER CHECKING CALLS TO PBX GROUPS REQUIRING END OF BLOCK HUNTING

NOTE: This test is made only on markers 0 and 1. In case relay PG1 fails to release after operating to re-cycle the timing, a circuit is closed to operate relays TML1 and TML2 and time out the marker in 1 to 3 seconds.

14.1 Block operated relays TMW and NK and insulate contacts 3B and 4B of relay SPL. Momentarily connect ground to 4B spring of relay SPL and observe that relay TML1 does not operate. Manually operate relay PG1. Again, momentarily connect ground to the 4B spring of relay SPL and observe that relay TML1 operates while ground is applied. Remove the blocks from the relays and the insulation from relay SPL.

15. TM LEAD

NOTE: This test checks that the marker times out when the marker is not in use, if ground is not removed from the TM lead before the fourth timing stage has elapsed.

15.1 Operate key BAT and block non-operated relay DA1. Observe that the marker times out in 1.2 to 3.8 seconds, the associated DR and MB lamps light, lamp T1 does not light, the associated register MTR scores once, the major alarm *sounds and lamp DT lights. With GS option the MTR Register will not score.*

15.11 Operate key RL. Check that relay TTIB is locked operated through 9B and 10B contacts of relay TR. Observe that marker lamp TA lights. Remove the block from relay DA1 and momentarily operate marker key AR to silence the alarm and to extinguish the lighted lamps.

15.12 If equipped with GS option, block relay CK10 operated and repeat Paragraphs 15.1 and 15.11. Verify MTR Register will score.

15.13 Release relay CK10.

15.14 Repeat the test described in Paragraph *15.1 and 15.11 using relay DA2.*

15.2 Momentarily operate, one at a time: relays OFB, BLK, LK, NK1, XFC1 and XRL. Observe that in each case relay TMS2 operates.

16. LONG TIME OUT

16.1 Ground lead DB at the 2T spring of relay DB. Observe that relay CBR, and CBS if provided, operate and that in minimum 28 seconds, maximum 58 seconds the marker time alarm (Major Alarm) operates, lamp TA at the marker lights and lamps DT and MB at the trouble indicator light (operate BAT key to light MB lamp). Check that battery is present on 2T spring of relay TM9 and absent on 1T spring. Remove the ground from spring of relay DB and momentarily operate the AR key to silence the alarm and to extinguish the lighted lamps.

16.2 Block relay X operated. Observe that the marker immediately connects to the trouble indicator and lamps X, TI and the associated DR light. Operate key RL and observe that lamps DR and X are extinguished and lamp TI remains lighted. 28 to 58 seconds later lamps DT and the associated MB light and the major alarm sounds. Remove the block from relay X and momentarily operate marker key AR and trouble indicator key RL to silence the alarm and to extinguish the lighted lamps.

17. DB LEAD

17.1 Manually operate the following relays, one at a time, and check that each one grounds the DB lead; SDT, XRL, FA, TR and the associated MT relay of the trouble indicator. Observe that relay CBR operates as a check that ground is connected to lead DB.

17.2 Insert a make busy plug in the associated DB jack at the trouble indicator frame. Check that lead DB to the terminating marker connector is grounded (T.S. TMC terminal 29). Observe that relay CBR, and CBS if equipped, operate. After 30 seconds observe that relay TM8 is not operated.

18 TIME OUT ON TROUBLE REORDER

NOTE:

(a) This test checks that the marker times out on trouble reorder calls if completion to overflow is not affected before the second timing stage has elapsed.

(b) If the number group and the line choice connector circuits are not equipped with TMB relays, block marker relay LK non-operated before starting the tests described in Paragraphs 18.1 and 18.2. Remove the block at the completion of the tests.

18.1 Block relays GT2, XFC and XFC1 normal and insert a 349A make-busy plug into jack TMB of any number group connector. Make a test call to a line number in the selected number group and observe that the marker times out in 1.2 to 2.5 seconds, lamps TC, RV, RC, CON, and GT2 light; OF and MKO do not light. Remove the make busy plug from the number group TMB jack.

18.2 Insert a 349A make busy plug into jack TMB of any line choice connector. Make a test call to a line number associated with the selected line choice and observe that the marker times out in 1.2 to 2.5 seconds, lamps TC, RV, RV, CON and GT2 light (OF lamp lights where Fig AP is equipped) MKO does not light. Remove the make busy plug from the line choice TMB jack and the blocks from relays GT2, XFC and XFC1.

NOTE: The XFC lamp may or may not light.

19. ALL MARKERS BUSY ALARM

19.1 Block normal relay B1 of the timing control circuit. Insert 322A-MB plugs into jacks DB as required for markers 0 to 9. Observe that relay B operates and the AMB lamp lights. When the B relay releases, remove block from relay B1. Check that relays B and B1 operate approximately 10 seconds after B released; thereafter, observe that relays F1, B2, F2, B3 and F3 operate in order 20, 30, 40, 50 and 60 seconds after release of relay B.

19.2 Note that when relay F3 operates the MBA lamp lights and the minor alarm sounds. When a DSA SWBD. AUX. Signal circuit per SD-25482-01 Fig. 2 is specified, check that the LR lamp at the DSA SWBD. is lit and that it is extinguished when the RL key is operated.

19.3 Momentarily remove one MB plug and observe that relays B, B1, B2, B3, F1, F2 and F3 release. Operate the RLA key to extinguish the MBA lamp and silence the alarm.

19.4 Replace the MB plug and remove anothte when the alarm reoperates. Observe that the B and F relays release. Momentarily operate RLA key. Repeat the test for each of the other MB plugs and observe the same results in each case.

Lines Presented in Script Indicate New or Changed Information

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Reason for Reissue:
(1) Make corrections to Paragraph 15.