Installation Engineering Handbook 62
Western Electric Company, Incorporated
Columbus Works

Section 225.8
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TERMINATING MARKER AND TERMINATING MARKER APPLIQUE TESTS

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 Subscriber Line Overflow Register and the Line Overload Control features of the Terminating Marker Circuit.

NOTE: When the Subscriber Overflow Registers are scored by the arrangement using number group cross connections, the Terminating Equipment Test Set, ITE-4010, and the Outgoing Trunk Test Frame is required to originate the test calls.

1.2 Description of Tests

1.21 The test of Subscriber Line Overflow Register Circuits includes the associated operating features in the Terminating Markers.

1.211 Two circuit arrangements are used for scoring Subscriber Line Overflow Registers as follows:

(1) By means of an overflow register connector in the marker and

(2) By means of number group cross connections.

Both arrangements are covered in this section.

1.212 When testing the Subscriber Line Over flow Register Circuit that uses a connector in the marker, observe on relay T that there is no excessive sparking between the left contact and the armature.

1.22 Two circuit arrangements are available for controlling line overload as follows:

(1) Jack Panel Method and

(2) Twenty Block Cross-Connection Method.

Tests are provided for both arrangements in this section.

2. OVERFLOW REGISTER CIRCUIT USING CONNECTOR IN MARKER

2.1 Check of Register Circuit and Markers

NOTE 1: If any number specified in the following tests is in a PBX group, it will be necessary to simulate a busy condition on all succeeding lines as well as the line called.

NOTE 2: If any number specified is in the first twenty block of an allotted PBX, this number should not be used. Use other numbers that will check for four digits specified.

2.11 Insert a 329A short circuit plug in the office selection jack OS associated with the number selection circuit (jacks TH 0-9, H 0-9, T 0-9 and U 0-9) under test.

2.12 Insert 329A short circuit plugs in jacks (TH)0, (H)1, (T)2 and (U)3 of the number selection circuit under test. This causes busy calls to line number 0123 to score the overflow register.

2.13 Make a busy line test call to number 0123 from the terminating trouble indicator using marker 0. Observe that the overflow register (OFL) associated with the number selection circuit under test operates once.

2.14 Move the short circuit plugs to the TH, H, T and U jacks corresponding to number 1234. Make a busy line test call to this number using marker 0 and observe that the overflow register again scores once.

2.15 Proceeding as described in the previous paragraphs use marker 0 to make busy line test calls to numbers 2345, 3456, 4567, 5678, 6789, 7890, 8901 and 9012. Observe in each case that the overflow register operates once.

2.16 As described in Paragraphs 2.11 through 2.15, make busy line test calls to numbers 0123, 1234, 2345, 3456, 4567, 5678, 6789, 7890, 8901 and 9012 using each number selection circuit.

2.161 Use a different marker with each number selection circuit until each marker has been used once, then any marker may be used.

2.162 If more markers than number selection circuits are equipped, the following numbers should be used to check the markers not used on the above tests:

2.163 Using Marker 0, block operated relay LKO, make a busy line test call, observe that the Subscribers Line Overflow Register does not operate. Repeat the test using Marker 1. Remove the block from relay LKO.

2.17 With the register circuit arranged for observing on a line, make a busy line call to any line other than the line that is being observed upon.

2.171 Check that relay TR of the translation circuit operates and that relays TC and T of the translation circuit operate twice on this call.

2.172 This test does not have to be made using each number selection circuit but should be repeated two or three times per job.

2.18 Check for shorts on the jacks of the number selection circuits by momentarily connecting ground to the sleeves of the jacks, one at a time, and observing that relays of the associated number check circuit do not operate while the ground is applied as follows:

Momentarily Ground Sleeve	Does Not Operate
Jacks (TH) 0-9	Relay TH
" (H) 0-9	" H
" (T) 0-9	" TN
" (U) 0-9	" U

2.2 Marker Preference Circuit

NOTE: Block normal relay TC of the translation circuit during the following tests to prevent the translation circuit from functioning each time an MP relay is operated.

2.21 Block operated relay HLD of the transsation circuit. Check that direct battery is present on contact 4B and that ground is present on contact 1T of the highest numbered MP relay.

2.211 Momentarily operate all other MP relays, one at a time, and check that the battery and ground are removed while each MP relay is operated. Release relay HLD.

2.22 Ground lead STO at punching 6, bottom row of terminal strip on the first marker preference unit. Relay MPO operates.

2.221 Momentarily ground leads ST1, ST2, and ST3 (punchings 7, 8, and 9 respectively) one at a time and observe that relays MP1, MP2, and MP3, respectively, do not operate.

2.222 Momentarily apply ground to lead REL at punching 3, top row, same terminal strip. Observe that relay MOP releases and relay (CO)O operates and locks.

2.223 Remove the ground from lead STO and observe that relay (CO)O releases. Ground lead ST1, punching 7, bottom row. Relay MP1 operates.

2.224 Momentarily ground lead STO and observe that relay MPO does not operate. Momentarily ground lead REL and observe that relay MP1 releases and relay (CO)1 operates and locks.

2.225 Remove ground from lead ST1 and observe that relay (CO)1 releases. Ground lead ST2, punching 8, bottom row. Relay MP2 operates.

2.226 Momentarily ground lead REL and observe that relay MP2 releases and relay (CO)2 operates and locks. Remove ground from lead ST2 and observe that relay (CO)2 releases.

2.227 Ground lead ST3, punching 9, bottom row. Relay MP3 operates. Momentarily ground lead REL and observe that relay MP3 releases and relay (CO)3 operates and locks. Remove ground from lead ST3 and observe that relay (CO)3 releases.

2.23 Check each marker preference unit as described in Paragraphs 2.22 through 2.227. The second unit consists of relays (MP) 4-7 and (CO) 4-7; the third unit of relays (MP) 8-11 and (CO) 8-11; etc. Similar punching numbers are used for the tests on each unit.

NOTE: Remove the block from relay TC.

2.24 Connect ground to contact 2T of relay TR, operate relay TR and check that ground is connected to lead REL at punching 3, top row of the terminal strip on the first marker preference unit. Remove ground from 2T spring of relay TR.

2.241 Check that relays TH, H, TN, U, and PH of each number check circuit when operated ground lead REL at punching 3, top row of the terminal strip on the first marker preference unit.

3. SUBSCRIBER LINE OVERFLOW REGISTERS BY NUMBER GROUP CROSS-CONNECTIONS

NOTE: These tests should be made using the terminating Equipment Test Set, ITE-4010, and the OGT Test Frame, except the number check calls which can be made from the trouble indicator.

3.1 Individual Line

3.11 Where cross-connection information is not provided, temporarily cross connect the ALF, ANF, ALS, and ANS punchings of the Subscriber Line Overflow Traffic Register Circuit to the punchings of a spare line circuit.

3.12 All register circuits should be used and at least one register circuit should be cross connected in each number group connector. The cross connections are as follows:

Register Ckt.		Spare Line
ANF	to	NF
ALF	to	RF
ANS	to	NS
ALS	to	LS

NC to HG as required

3.13 Insert a 322A plug into the CCT jack at the terminating trouble indicator frame. Make a test call to the spare line used for test. Observe that the marker completes the call OK and that the OFL register associated with the register circuit to which the called line is cross connected does not operate.

3.14 Busy the spare line by grounding its LS punching. Again make a test call to the spare line and observe that a busy signal is received, that the associated register scores and that the marker SG relay operates momentarily on this call as a verification of the marker sleeve guard feature.

3.15 With the spare line still busy, make a number check call to the line and observe that the associated register does not score and relay CT of the register circuit operates. Manually operate relay CT and verify continuity between leads ANF and ALF, and between leads ANS and ALS.

3.16 The tests of Paragraphs 3.13 through 3.15 should be made to one number group connector from each marker (tests of Paragraph 3.15 can be made only with Markers 0 and 1) and to all number group connectors from one marker. All Register circuits should be checked. Remove the cross connections and busy conditions at the completion of test.

3.2 Lines in Allotted PBX

3.21 Using an allotted PBX group, temporarily cross-connect the last line in one number group to a register circuit and temporarily cross-connect the last line in the other number group to another register circuit in a similar manner to that described in Paragraph 3.11.

3.22 Busy all lines of the PBX except the last line in one number group. Make three calls to the directory number of the PBX. Observe that each call is com-

pleted OK to the one idle line and that the OFL registers associated with the two register circuits used for test do not operate.

3.23 Busy all lines of the PBX. Make four calls to the directory number of the PBX. Observe that a busy back signal is received and that the OFL registers of the two register circuits alternately score on these calls.

3.24 The tests of Paragraphs 3.22 and 3.23 should be made to one allotted PBX using all markers.

4. LINE OVERLOAD CONTROL (JACK PANEL METHOD)

NOTE 1: Disregard the reference to jacks OA and OB if the marker serves only one 10,000 number series.

NOTE 2: Block relay and LDF cross-connections may be disregarded for this test.

4.1 Peremptory Busy (Figures AP and Y) (AK or AL): Insert 329A make busy plugs into jacks P, OA, TH9, H8, T7 and U6. Make a test call to a line number 9876 in 10,000 number series A. Observe that the marker immediately connects to the trouble indicator and that lamps BB, RV, TC, IF, CKG, K1, K2, K3, CON, GT2, RL and TRL light, and that lamps NGC- and LCF- do not light.

4.11 Repeat the test using line numbers 8765, 7654, 6543, 5432, 4321, 3210, 2109, 1098, 0987. On one of the tests insert a plug into jack OB and make a test call to 10,000 number series B. Observe the same test results.

4.12 With make busy plugs in jacks P, OA, TH9, H8, T7 and U6, make test calls to line numbers 8765, 7654, 6543, 5432, 4321, 3210, 2109, 1098, and 0987 associated with 10,000 number series A.

4.121 Observe that each of the test calls is completed (lamp RL followed by TRL); lamp BB does not light, relays TNS and HNS do not operate, and with a test receiver check that momentary ground is not connected to the common sleeve of the U jacks. Repeat each test call as required.

4.13 Remove the make busy plugs from jacks TH9, H8, T7, and U6. Insert make busy plugs into the jacks for the next line number in the series (8765) and make test calls to line numbers 9876, 7654, 6543, 5432, 4321, 3210, 2109, 1098, 0987. Observe test results as described in Paragraphs 4.12 and 4.121.

4.14 Continue the tests in the same manner until each of the ten line numbers has been tested as described in Paragraphs 4.12, 4.121, and 4.13. Remove the MB plugs from the jacks. Repeat the tests described in Paragraphs 4.12, 4.121, 4.13, and 4.14 on all markers.

4.2 Normal Busy (Figures AP, Y, and AK): Insert 329A plugs into jack N, and jacks OA, TH, H, T, and U for any line number. Operate all NS keys or insert 322A MB plugs into NS jacks if installed and make a test call to the selected line number.

4.21 With a test receiver test for a momentary ground on the sleeves of all the associated N jacks, repeating the test as required.

4.22 After the first marker has been tested, it will be satisfactory to test for a momentary ground on only one N jack for each of the remaining markers. Repeat the test on all markers.

4.3 Normal Busy (Figures AP, Y and AL): Insert plugs into the N jacks of all markers and into jacks OA, TH, H, T, and U for any line number. Operate all NS keys or insert 322A MB plugs into NS jacks if installed and make a test call to the selected line number.

4.31 With a test receiver check for a momentary ground at 2T of ZB relay in each marker. Repeat the test on all markers.

5. LINE OVERLOAD CONTROL (TWENTY BLOCK CROSS-CONNECTION METHOD)

NOTE: Marker cross-connections are required for this test as follows:

(a) Pchg. (ST) (for the hundred block containing the line number to be operated with overload control) to one of (SH 0-19)

(b) Split hundreds cross-connection for the twenty block containing the line number to be operated with line overload control are as follows:

For a non-allotted twenty block.
SH-HB to NG-HB (one of 0-24)
SH-ST " NG-ST (one of 0-24)
SH-TB " TB (one of 0-4)
AL to NAL or NAF, non-allotted line number on non-allotted free line number respectively

For an allotted twenty block
SH-HB to ZB
ZB-HB " ALC-HB
SH-ST " ALC-ST
ST-TB " ALC-TB
AL to AL or AF, allotted line number or allotted free line number respectively
AL1-ST to NG-ST (one of 0-24)
AL1-HB " HG-HB (one of 0-24)
AL1-TB " TB (one of 0-4)
AL2-ST " NG-ST (one of 0-24)
AL2-HB " NG-HB (one of 0-24)
AL2-TB " TB (one of 0-4)

5.1 Peremptory Busy (Figures AP ans Z) (AK or AL): Insert a 329A plug into jack P and make a test call to any line number in the twenty block cross connected for line overload control.

5.11 Observe that the marker immediately connects to the trouble indicator and that lamps BB, RV, TC, IF, CKG, K1, K2, K3, CON, GT2, RL, TRL light and lamps NGC- and LCF- do not light. Remove the make busy plug from jack P. Repeat the test on all markers.

5.2 Normal Busy (Figures AP, Z, and AK): Insert a 329A plug into jack N and operate all NS keys (0-19) or insert 322A plugs in all NS jacks (0-19) if installed.

5.21 Make a test call to any line number in the twenty block cross connected for line overload control.

5.22 With a test receiver check for momentary ground on the sleeves of all the associated N jacks, repeating the test as required.

No changes indicated due to extensive revision

Reason for Reissue:
Make a general revision to update to current engineering standards.

5.23 After the first marker has been tested it will be satisfactory to test for a momentary ground on the sleeve of only one N jack for each of the remaining markers. Repeat the test on all markers.

5.3 Normal Busy (Figures AP, Z, and AL): Insert a 329A plug in jack N of all markers and operate all NS keys, or insert 322A MB plugs in NS jacks (0-19) if installed.

5.31 Make a test call to any line number in the twenty block cross connected for line overload control.

5.32 With a test receiver check for a momentary ground on T2 of ZB relay of all remaining markers, repeating the test as required. Repeat the test on all markers.

5.4 Traffic Register Test: Repeat one of the test calls described in Paragraphs 4.11 or 5.1. Observe that the associated register (PC) at the traffic register rack scores once.

5.41 Insulate contacts 1B - 2B of relay OF and repeat the test call. Observe that the register does not score.

5.42 Remove the insulator from relay OF and all make busy plugs from the jacks. Repeat the test on all markers.

5.5 Cross Detection Test: Momentarily connect ground through a test receiver to contact 3T of relay BB and observe that relay XOB operates.

5.51 Insulate 2B - 3B contacts of relay ZB and repeat the test. Observe that relay XOB does not operate.

5.52 Remove the insulator from relay ZB. Repeat the test on all markers.

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