COMPANY PRIVATE

Installation Engineering Handbook 62
Western Electric Company, Incorporated
Columbus Works

Section 225.6
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TERMINATING MARKER AND

TERMINATING MARKER APPLIQUE TESTS

SPECIAL CALLS

CONTENTS

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. The tests of this section are performed only on Markers 0 and 1.

1.2 When the DID feature is furnished, the tests of the No Test, No Hunt, and Extra Numbers provisions are made from and DID Test Circuit, SD-27766-01, for the affected equipment.

2. NUMBER CHECKING

2.01 Operate keys MAN, NCL and NCF. Keys (F) 0-10 should be normal for this test. Insert a 322A MB plug into jack NS0. Make a test call to a line number in position 0 of a twenty block. Observe that the test call is completed, lamps RC, RV, SPL, NC, F1 and F4 light and that none of the LLG- lamps light.

2.02 Move the MB plug from jack NS0 to jack NS1 and start a test call to a line number in position 1 of a twenty block. Observe the same test results. Remove the MB plug.

2.03 Make test calls to line numbers associated with twenty block positions 2-19, inclusive. In each case have the MAN, NC and NCF keys operated and a 322A-MB plug in the NS jack which corresponds in number with the position of the called line in the twenty block. Observe in each case that the test call is completed, lamps RC, RV, SPL, NC, F1 and F4 light and that none of the LLG- lamps light. Remove the MB plug.

2.04 Make twenty test calls, as described in the preceding paragraphs, to the first line number (twenty block position 0) of a terminal hunting group of twenty or more lines. Insert a 322A-MB plug into a different NS jack for each of the test calls. Observe that the test calls are completed and that lamps RC and RV light for each. Remove the MB plug.

NOTE: On one of the test calls observe that the XGA relay of the number group connector circuit used for test operates. This verifies that the marker operates the XGA relay for converting last lines of special groups into intermediate lines.

2.05 Insert a MB plug into jack NS0 and operate an F key instead of key NCF. If the marker is arranged to receive a ground signal (G wiring and app.) from toll trunks as an OK number check signal, operate keys TOL and NCT. If the marker is arranged to receive a 135 cycle signal (F wiring) from TOL trunks, operate keys TOL and NCL. In either case, make a test call to a line (not a free line) associated with twenty block position 0. Observe that the test call is completed and that lamps RV and RC light.

2.06 Using a terminal hunting group of more than twenty lines, make a test as follows to check that the number checking call progresses to the succeeding twenty block relay. Block non-operated relay HT16 of the marker. Operate keys MAN, NCL and NCF. Insert a 322A-MB plug into jack NS0. Key the number of the eighteenth or nineteenth line in the first twenty block (do not key the first line or any line from 0 to 16 in the first twenty block and do not

use for this test the twenty block containing the directory number of an allotted PBX). Make the test call and observe that lamps RV and RC light. Also observe on this test that relays PG and PG1 operate and release and that relay TMS2 releases and reoperates to recycle timing. Remove the block from relay HT16. Remove the MB plug.

2.07 Refer to the paragraph on jump hunting in Section 225.7. With keys MAN, NCL and NCF operated make test calls to jump hunting groups 1 to 9. Insert a 322A-MB plug into jacks NS2, NS4, etc; to NS18, in turn, for the test calls to jump hunting groups 1 to 9, respectively. Observe that the marker jump hunting circuit functions, the test calls are completed and that lamps RV and RC light for each of the test calls. At the spare twenty block of the number group connector, replace the cross-connections on terminals NC0 to NC9 with cross-connections to NC10 to NC19 respectively, also replace the cross-connections on terminals NF0 to NF9 with corresponding cross-connections to terminals NF10 to NF19. Make number checking test calls to lines 10-19 on the spare twenty block. Insert the MB plug into jacks NS0 to NS18, in turn, using one even numbered jack for each of the ten test calls. Observe that the jump hunting circuit functions, the test calls are completed and that lamps RV and RC light for each test call.

2.08 With all NS jacks vacant, make a number check test call to the 0 terminal of a twenty block arranged for terminal hunting (NF to HF) over terminals 0-18 and for jump hunting (NF to JF and NC to JC0 from terminal 19 to any twenty block and terminal 0. Arrange the twenty block jumped to for terminal hunting over terminals 0-18 and for last line condition (NF to RF) at terminal 19. This opens the path of the 135 cycle current, causing a number check failure and checks the ability of the marker to complete this function before timing out. Observe that lamp RV lights and that lamp RC does not light.

2.09 With all NS jacks vacant, make a number check test call to an individual line number. Observe that the test call is completed, lamp RV lights and that lamp RC does not light.

2.10 Operate keys MAN, NCL and NCF. Keys (F) 0 to (F) 10 should be normal and jacks (NS) 0-19 should be vacant for this test. Start a test call to the directory number of an allotted PBX group of lines. Observe that the test call is completed, lamp RV lights and that lamp RC does not light indicating a number check failure. Also observe that marker relays ALA and ALB operate on this call.

2.11 Make a number check test call to a line in an unequipped 500 or 100 block thereby causing relay BLK to be operated. Observe that lamp RV lights and lamp RC does not light indicating a number check failure.

2.12 Ground lead RC at the top winding terminal of relay RC1 in the marker. Operate keys MAN, NCL and NCF. Insert a MB plug into jack (NS)0. Make a test call to an individual line number associated with any twenty block position except 0. Observe that the marker times out, and that lamps (RV), (RC), & (XR) light. Remove the ground.

2.13 Operate key GS. Insert a 322A-MB plug into jack (NS)0. Short circuit condenser (NC)0 of the marker and start a number check test call as described in Paragraph 2.01 to a line number associated with twenty block position 0. Observe that lamp GS lights and that lamp RL does not light. Remove the short circuit.

NOTE: Perform this test once on marker 0 or 1.

2.14 Operate key GS and insert a 322A-MB plug into jack (NS)0. Cross leads NS0 and NS1 at contacts 2B-5B of relay NC 10. Start a number check test call to a line number associated with twenty block position 0. Observe that lamp GS lights and that lamp RL does not light. Move the MB plug from jack (NS)0 to (NS)1 and repeat the test call to a line number in twenty block position 1. Observe the same test results. Remove the cross from leads NS0 - NS1 and the MB plug from jack NS1.

2.15 Cross leads (NS2 - NS3), (NS4 - NS5), (NS6 - NS7), etc; in turn, insert a 322A-MB plug into the corresponding NS jack and start a test call to a line number in each of the corresponding twenty block positions. Observe on each of the test calls that lamp GS lights and that lamp RL does not light. Remove the cross from the NS leads and the MB plug from the NS jack.

NOTE A: Perform the tests described in Paragraphs 2.14 and 2.15 once on marker 0 or 1.

NOTE B: Cross NS leads for test at the associated relay contacts as follows:

Leads			Cross at
NS2	and	NS3	8B & 4T (NC10)
NS4	"	NS5	7T (NC10) & 2B (NC11)
NS6	"	NS7	5B & 8B (NC11)
NS8	"	NS9	4T & 7T (NC11)
NS10	"	NS11	2B & 5B (NC12)
NS12	"	NS13	8B & 4T (NC12)
NS14	"	NS15	7T (NC12) & 2B (NC13)
NS16	"	NS17	5B & 8B (NC13)
NS18	"	NS19	4T & 7T (NC13)

2.16   Operate key GS and make twenty number check test calls, one call to a line number in each position (0-19) of a twenty block. Observe that the test calls are completed, lamps RV and RC light and that lamp GS does not light indicating that leads NS are free of crosses and that the NC condensers are not short circuited. Restore key GS.

2.17   Insert a 322A-MB plug into any NS jack and make two successive number check test calls to the directory number of an allotted PBX. Observe that the test calls are completed and that lamp AL1 lights in both cases.

3.   NO TEST

3.1   Key the number of the first line in a twenty block containing PBX lines; preferably this twenty block should be one containing the directory number of an allotted PBX. Operate keys NT, MAN, and LL0. Insert a 322A-MB plug into jack NS0. Start a test call. Observe that the test call is completed and that lamps NT, SPL, NTT, L0, and CH0 light.

3.2   Key the number of the second line in the twenty block, move the MB plug from jack NS0 to NS1 and operate key LL1. With keys NT and MAN operated, start a test call. Observe that the test call is completed and that lamps NT, SPL, NTT, L1, and CH1 light.

3.3   Make test calls to line numbers 2 to 9 of the PBX group used for test in a manner similar to that described in Paragraphs 3.1 and 3.2. Use keys LL2 to LL9 and jacks NS2 to NS9, respectively. In each case observe that the test call is completed, lamps NT, SPL, and NTT light and that the corresponding (L) 2-9 and (CH) 2-9 lamps light.

3.4   With keys NT and MAN operated, LL keys normal and NS jacks vacant, make test calls to the eleventh to twentieth lines of the twenty block used for test in the preceding paragraphs. Observe that the calls are completed successfully, that lamps NT and SPL light on each call, that lamp NTT does not light, that the lighted L lamp agrees with the position in the twenty block of the called line and that the lighted CH lamp agrees with the channel selected in the regular manner which probably will be the first in the order of selection.

3.5   Block relay CH-0 non-operated, operate keys NT, MAN and LL-0. Insert a 322A-MB plug into jack NS0 and start a test call to a ring line number associated with position 0 of a twenty block. Observe that lamps BB, RV, TC, CHO, TE, NT, SPL, NTT and RL followed by TRL light. If tip line numbers are available, repeat the test call to a tip line number which is associated with twenty block position 0. Observe the same test results. Remove the block from relay CHO but leave 322A plug in NS0 jack.

3.6   Ground lead NT, punching 15, terminal strip MCB at line choice connector 0. This simulates a busy no test connector. Make a no test call to a line in line choice 0. Observe that the overflow signal lamps OF, TC, RV and RC light. The MAN, NT, SPL, and NTT lamps should also light. Remove ground from the NT lead. Remove the MB plug from the NS0 jack.

3.7   Insulate 5B-6B contacts of relay NT, operate key FS and make a no test call to an uncross-connected line number. Observe that relay CCT operates and that lamps LIN and RL, followed by TRL, light.

3.71   Make a no test call to an unequipped 500 or 100 block. Observe that relay BLK operates and that lamps LIN and RL followed by TRL light. Remove the insulator from relay NT.

4.   NO HUNT

4.1   Operate keys MAN and NH. Make two or three test calls to lines of a terminal hunting group. Observe that the NH and SPL lamps light and that the marker releases the XGA relay of the number group connector before the number group connector itself is released. Otherwise the call is similar to a regular test call.

4.11 Make busy one of the line numbers by inserting a 322A-MB plug into the corresponding NS jack or operate NS key and start a test call to the busy line number. Observe that the test call is completed and that lamps BB, RV, and TC light, indicating busy.

4.2 Operate keys MAN and NH. Make a test call to an unequipped five hundred block. Observe that the call is routed to intercept and the LIN lamp lights. The MAN, SPL and NH lamps will also be lighted.

5. REGULAR TEST DESK (NN)

5.1 Operate keys MAN and NN. Key the number of the second line in a twenty block containing the directory number of an allotted PBX. Observe that lamps SPL NN and L1 light and that the marker releases the XGA relay of the number group connector before the number group connector itself is released.

5.2 Busy all lines of the allotted PBX used for test in one of the number group connectors. With keys MAN and NN operated make three or four test calls to the directory number of the allotted PBX. Observe that in each case the call is completed to the first line in the first twenty block of the PBX group in the other number group connector and that lamps SPL and NN light.

NOTE: Make busy all lines in one number group by inserting 322A-MB plugs into jacks NS 0-19 before starting the test calls and removing the MB plugs from jacks NS 0-19, as required and in that order, when the NG lamp associated with the first number group connector seized by the marker has been observed to light momentarily.

6. EXTRA NUMBERS

NOTE: This test is made where Figure B of the terminating marker and Figure D of the terminating trouble indicator are equipped.

6.1 Make a test call to a line in each hundred block in each equipped 500 block in the "extra numbers series" (0000X-2499X). 100 extra numbers (normally one hundred block HB24) are provided for each number group. Key the number to be used for test (0000-2499) as on a call to a number in the regular subscribers number series. Operate keys MAN, NNX or NHX or NTX and make the test call. (Keys NHX, NNX and NTX should be used about equally on these calls and each key should be used at least two or three times.) Observe that the call is completed to the unnumbered line (0000X-2499X) as keyed or routed to the intercept trunks in case the extra numbers hundred block (HB24) is unequipped. Observe that lamps NN and NNX light if key NNX is operated, lamps NH and NHX light if key NHX is operated and lamps NT and NTX light if key NTX is operated. Lamp SPL lights in all cases and when the call is completed to a line in the unnumbered series the NGC, LLG, CA or CG, HB, HP and L lamps light to agree with the location of the called line. Other lamps light as described in Section 225.

6.2 Make a call to each unequipped 500 block in the extra numbers series and to an uncross-connected line in an equipped hundred block in the extra numbers series. Observe that these calls are routed to the intercept trunks.

7. LOCKOUT FEATURE OF SPECIAL MARKERS

NOTE: This checks that only one special marker can be used for completing a special call (NC, NT, NN or NH call) at a time.

7.1 Block operated relay SPL of marker 0 and observe that relay LKO of marker 0 operates. Check that the number group start battery (226 ohms) is present at 6T spring of relay SPL of marker 0. Block operated relay LKO of marker 1 and check that relay LKO of marker 0 releases. Now check that the number group start battery is removed from 6T spring of relay SPL of marker 0. Insert a make busy plug into jack DB associated with marker 1 at the trouble indicator frame.

Observe that relay LKO of marker 0 oper-
ates. Remove the plug from jack DB and
release relay SPL of marker 0 and relay
LKO of marker 1.

7.2   Repeat the above tests on marker 1. In
       this case the conditions in markers 0
       and 1 are interchanged.

No changes indicated due
to extensive revision

Manager, Crossbar Product Engineering
Control Center

Reason for Reissue:
  1. Add information required for Marker Speedup.
  2. Make a general revision to update to
     current engineering standards.