

COMBINED AND COMPLETING MARKER CIRCUITS—PART 5  
TESTS USING MASTER TEST FRAME  
NO. 5 CROSSBAR OFFICES

1. GENERAL	PAGE
1.01 This section is Part 5 in a series of sections for testing combined and completing markers.	
1.02 The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes. Equipment Test Lists are affected.	
(a) To revise test procedures to include offices arranged with Electronic Translation System (ETS).	
(b) To exclude under verification in all tests, reference to "class of test" lamps.	
(c) To make minor changes as required.	
1.03 The tests covered are:	PAGE
<b>T. Plug-Up Features—Non-PBX Line:</b> This test checks that the marker recognizes a non-PBX line placed on plug-up service. . . . .	2
<b>U. Plug-Up Feature—PBX Line</b> <b>◆ETS Not Provided:</b> ◆ This test checks that the marker recognizes a PBX line placed on trouble intercept. . . . .	3
<b>V. Nonallotted PBX or Line Circuit Group Preference Feature—◆ETS Not Provided:</b> ◆ This test checks that the marker hunts for an idle line when all the PBX lines or line circuits are within one tens block. . . . .	5
<b>W. PBX or Line Circuit Group—End of Block Hunting Feature—◆ETS Not Provided:</b> ◆ This test checks that the marker hunts for an idle line in a subsequent tens block when all the lines in the first tens block are found busy. . . . .	8
<b>X. Allotted PBX or Line Circuit Group—Marker Recognition Feature—◆ETS Not Provided:</b> ◆ This test checks that the marker recognizes a call to an allotted PBX group. . . . .	10
<b>Y. Allotted PBX or Line Circuit Group—Number Group Preference and All-Lines-Busy Feature</b> <b>◆ETS Not Provided:</b> ◆ This test checks marker preference for a number group having an idle line in an allotted PBX group. It also checks the all-lines-busy feature. . . . .	11
1.04 <b>Lettered Steps:</b> A letter a, b, c, etc, added to a step number in Part 3 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.	
1.05 The manner of selecting some circuits and test conditions at the master test frame (MTF) and its associated circuits varies depending on the apparatus options furnished with these circuits. Therefore, where variable means of selection are provided, precise instructions for the selection of circuits and test conditions are not	

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given. Precise instructions for the use of these variable means are given in Section 218-106-301.

**1.06** The location statement, At MTF—, is used to refer to all apparatus located on the four basic bays of the MTF.

**1.07** On issue 76D of SD-25800-01, a group of 18 "class of test" lamps was replaced by a single "start test" lamp designated STT. Since the designation given to the lamp is not specific, the lamp will not be called out in the section, as well as the 18 discontinued lamps, DT, ORIG, ITDO, ITNP, OGT, INC, OR, SDR, IR, MISC, IAO, MLV, LT, IMS, PTT, TVT, ATNT, and IMT.

**1.08** When the office is arranged for LAMA-C or ETS, the distributors and scanners associated with the marker and trunk used in the test call must be in service or in a *maintenance-busy* condition—not in an *out-of-service* condition. To change a scanner or distributor from an *out-of-service* to a *maintenance-busy* condition, use the procedure given in the following sections for the office arrangement.

218-798-308—Taking LAMA-C Equipment Out-of-Service

218-799-701—Taking ETS Equipment Out-of-Service.

**1.09** Additional test procedures are available for verification of leads between the completing

marker and the distributor and scanner (DAS). Refer to Section 218-122-531 for DAS application to LAMA-C or Section 218-799-321 for DAS application to ETS.

**1.10** When making tests in No. 5 crossbar offices arranged with Electronic Translation System and test verification requires a completing marker trace output (teletype printout) to determine the data used to process a call, operate the TCPO key at the master test frame (MTF). The data or trace output received at the maintenance teletypewriters (TTY) may be in a *raw* form (binary to hexadecimal numbering system), formatted into decimal and written text, or a combination of both. For additional information on trace outputs and formats used, refer to Section 218-799-102.

**2. APPARATUS**

**All Tests**

**2.01** Master test control circuit, SD-25800-01.

**Test U, V**

**2.02** Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and two 624B (terminal connector) tools (for connecting to terminal strips with wire-wrapped type terminals) or two 419A (test connector) tools.

**3. METHOD**

STEP	ACTION	VERIFICATION
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*Note:* Refer to paragraph 1.05, 1.06, 1.08, 1.09, and 1.10.

**T. Plug-Up Feature—Non-PBX Line**

- |   |  |                         |
|---|--|-------------------------|
| 1 | At MTF—<br>Restore all keys and switches.                                  |                         |
| 2 | Momentarily operate RL key.  | All lamps extinguished. |
| 3 | Select INC class of test.  |                         |
| 4 | Select A_ through G_ digits as required to direct call to individual line. |                         |

STEP	ACTION	VERIFICATION
5	Select any trunk link frame.	
6	Select incoming trunk class as required for completion to called line.	
7	Select INC class of call with translator indication as required for completion to called line.	
8a	If 4-wire switching route is selected— Operate 4W key.	
9b	If office is arranged for multilevel preemption— Select CDP, CDA, CD control digits as required for access to called line.	
10c	If office is arranged for multilevel preemption and call is directed to line with multilevel preemption features— Operate AD key.	
11d	If office is arranged for multilevel preemption and call is directed to line without multilevel preemption features— Operate OD key.	
12	Select marker under test.	
13	Operate PU, REC keys.	
14e	◆If ETS provided and CM dump is required— Operate TCPO key.	
	<i>Note:</i> Refer to paragraph 1.10.◆	
15	Momentarily operate ST key.	LK2, DIS1, MRL lamps lighted. Trouble record taken. TBI, PUL designations perforated. ◆If ETS provided— TBI designation not perforated. Verify that line equipment number perforated on trouble record is a trouble intercept line.◆
16	Momentarily operate RL key.	All lamps extinguished.
17	Restore all keys and switches.	
<b>U. Plug-Up Feature—PBX Line—◆ETS Not Provided◆</b>		
1	At number group frame— Connect L_ terminal of any unassigned number to any LL_ terminal.	

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STEP	ACTION	VERIFICATION
2	At MTF— Restore all keys and switches.	
3	Momentarily operate RL key.	All lamps extinguished.
4	Select INC class of test.	
5	Select A_ through G_ digits as required to direct call to unassigned number selected in Step 1.	
6	Select any trunk link frame.	
7	Select incoming trunk class as required for completion to called line.	
8	Select INC class of call with translator indication as required for completion to called line.	
9a	If 4-wire switching route is selected— Operate 4W key.	
10b	If office is arranged for multilevel preemption— Select CDP, CDA, CD control digits as required for access to called line.	
11c	If office is arranged for multilevel preemption and call is directed to line with multilevel preemption features— Operate AD key.	
12d	If office is arranged for multilevel preemption and call is directed to line without multilevel preemption features— Operate OD key.	
13	Select marker under test.	
14	Operate REC key.	
15	Momentarily operate ST key.	LK2, DIS1, MRL lamps lighted. Trouble record taken. TBI, PUL designations perforated.
16	Momentarily operate RL key.	All lamps extinguished.
17	◆At number group frame— Disconnect L_ terminal to LL_ terminal connection made in Step 1.◆	
18	Restore all keys and switches.	

STEP	ACTION	VERIFICATION
<b>V. Nonallotted PBX or Line Circuit Group Preference Feature—ETS Not Provided</b>		
1	At MTF— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Select INC class of test.	
4a	If PBX group is provided— Operate A_ through G_ digits as required to direct call to lowest number of nonallotted PBX group which has largest number of terminals in single tens block.	
5b	If PBX group is not provided and line link pulsing group is provided— Operate A_ through G_ digits as required to direct call to a line requiring a nonallotted line circuit which has the largest number of terminals in a single tens block.	
6b	Set TBT_ TBU_ switches as required to select hundreds and tens block associated with line circuit group selected in Step 5b.	
7b	Operate NTL5 key.	
8	Select any trunk link frame.	
9	Select incoming trunk class as required for completion to called line.	
10	Select INC class of call with translator indication as required for completion to called line.	
11c	If 4-wire switching route is selected— Operate 4W key.	
12d	If office is arranged for multilevel preemption— Select CDP, CDA, CD control digits as required for access to called line.	
13e	If office is arranged for multilevel preemption and call is directed to line with multilevel preemption feature— Operate AD key.	
14f	If office is arranged for multilevel preemption and call is directed to line without multilevel	

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STEP	ACTION	VERIFICATION
	preemption feature— Operate OD key.	
15	Select marker under test.	
16	Operate REC, PBXH keys.	
17g	If S_ keys are provided— Operate two S_ keys corresponding to lower numbered and next higher numbered line of PBX or line circuit group in tens block.	
18h	If S switch is provided— Set S switch to position corresponding to lower numbered line of PBX or line circuit group in tens block.	
19h	Connect terminals of control bay terminal strip T1 associated with lower numbered and next higher numbered line of PBX or line circuit group in tens block.	
	<b>Note:</b> Terminal strip T1 terminals 20 through 24 and 30 through 34 are associated with S switch positions 0 through 4 and 5 through 9, respectively.	
20	Momentarily operate ST key.	PBX, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of line associated with lower numbered line.
21	Momentarily operate RL key.	All lamps extinguished.
22	Repeat Steps 17g through 21, applying reference to first and second lines to two consecutive lines in tens block (second and third, third and fourth, etc, as required) until last line in tens block of PBX or line circuit has been referred to as second line.	
23g	If S_ keys are provided— Restore S_ keys.	
24h	If S switch is provided— Remove testing cord from terminal strip T1.	
25	Select S_ corresponding to higher numbered line of PBX or line circuit group.	

STEP	ACTION	VERIFICATION
26	Momentarily operate ST key.	PBX, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of higher numbered line.
27	Momentarily operate RL key.	All lamps extinguished.
28	Operate TR2 key.	
29	Repeat Steps 17g through 24h, applying reverse order of reference to lines S_ (last will be first, next to last will be second, etc, as provided).	◆PBX, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of line associated with higher numbered line.◆
30	Repeat Steps 25 through 27, applying reference to lower numbered line of PBX or line circuit group.	◆PBX, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of lower numbered line.◆
31	Restore REC, TR2 keys.	
32i	If PBX or line circuit group just checked does not use ten terminals— Select S_ corresponding to line in tens block not used in PBX or line circuit group just checked.	
33i	Momentarily operate ST key.	PBX, BY, MRL lamps lighted.
34i	Momentarily operate RL key.	All lamps extinguished.
35i	Repeat Steps 32i through 34i as required for remaining units digits not used in PBX or line circuit group just checked.	
36j	If more than one PBX or line circuit group is in tens block— Repeat Steps 4a through 35i for remaining PBX or line circuit groups as required.	
37	Restore all keys and switches.	

STEP	ACTION	VERIFICATION
<b>W. PBX Line Circuit Group—End of Block Hunting Feature—ETS Not Provided</b>		
<b>2- and 4-Wire Office—Multilevel Preemption Not Provided—ETS Not Provided</b>		
1	At MTF— Restore all keys and switches.	
2	Momentarily operate RL key.	
3	Select INC class of test.	
4a	If PBX group is provided— Operate A_ through G_ digits as required to direct call to first line in PBX group which is in more than one tens block.	
5b	If PBX group is not provided and line circuit group is provided— Select A_ through G_ digits as required to direct call to a line requiring an allotted line circuit group to complete.	
6b	Set TBT_, TBU_ switches as required to select hundreds and tens block associated with line circuit group selected in Step 5b.	
7b	Operate NTL S key.	
8	Select any trunk link frame.	
9	Select incoming trunk class as required for completion to called line.	
10	Select INC class of call with translator indication as required for completion to called line.	
11c	If 4-wire switching route is selected— Operate 4W key.	
12	Select line in tens block corresponding to units digit of any line in second tens block of PBX or line circuit group.	
13	Operate REC, EBH keys.	
14	Select marker under test.	
15	Momentarily operate ST key.	MRL lamp lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations

STEP	ACTION	VERIFICATION
		perforated indicating location of second tens block number associated with S- operated.
16	Momentarily operate RL key.	All lamps extinguished.
17	Restore all keys and switches.	
<b>4-Wire Office—Multilevel Preemption Provided—ETS Not Provided</b>		
18	At MTF— Restore all keys and switches.	
19	Momentarily operate RL key.	All lamps extinguished.
20	Select INC class of test.	
21	Select A_ through G_ digits as required to direct call to directory number of first line in first tens block.	
22	Operate TBT_, TBU_ switches as required to select hundreds and tens block associated with line circuit group selected in Step 21.	
23	Select line in tens block.	
24	Select any trunk link frame.	
25	Select incoming trunk class as required for completion to called line.	
26	Select INC class of call with translator indication as required for completion to called line.	
27	Select CDP, CDA, CD control digits as required for access to called line.	
28	Operate AD, NGBS, 4W, REC keys.	
29	Select marker under test.	
30	Momentarily operate ST key.	LK2, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of line selected.
31	Momentarily operate RL key.	All lamps extinguished.
32	Restore all keys and switches.	

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STEP	ACTION	VERIFICATION
<b>X. Allotted PBX or Line Circuit Group—Marker Recognition Feature—ETS Not Provided</b>		
1	At MTF— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Select INC class of test.	
4a	If PBX group is provided— Select A_ through G_ digits as required to direct call to any allotted PBX line.	
5b	If PBX group is not provided and line circuit group is provided— Select A_ through G_ digits as required to direct call to any line requiring an allotted line circuit group to complete.	
6	Select any trunk link frame.	
7	Select incoming trunk class as required for completion to called line.	
8	Select INC class of call with translator indication as required for completion to called line.	
9c	If 4-wire switching route is selected— Operate 4W key.	
10d	If office is arranged for multilevel preemption— Select CDP, CDA, CD control digits as required for access to called line.	
11e	If office is arranged for multilevel preemption and call is directed to line with multilevel preemption feature— Operate AD key.	
12f	If office is arranged for multilevel preemption and call is directed to line without multilevel preemption feature— Operate OD key.	
13	Select marker under test.	
14	Operate REC key.	
15	Momentarily operate ST key.	MRL lamp lighted. Trouble record taken. AN designation perforated.

STEP	ACTION	VERIFICATION
16	Momentarily operate RL key.	All lamps extinguished.
17	Restore all keys and switches.	
<b>Y. Allotted PBX or Line Circuit Group—Number Group Preference and All-Lines-Busy Feature—ETS Not Provided</b>		
1	At MTF— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Select INC class of test.	
4a	If PBX group is provided— Select A_ through G_ digits as required to direct call to line in allotted PBX group.	
5b	If PBX group is not provided and line circuit group is provided— Select A_ through G_ digits as required to direct call to any line requiring allotted line circuit group to complete.	
6	Select any trunk line frame.	
7	Select incoming trunk class as required for completion to called line.	
8	Select INC class of call with translator indication as required for completion to called line.	
9	Select marker under test.	
10	Operate LP_ key for marker under test.	
11	Operate NGT key.	
12c	If 4-wire switching route is selected— Operate 4W key.	
13d	If office is arranged for multilevel preemption— Select CDP, CDA, CD control digits as required for access to called line.	
14e	If office is arranged for multilevel preemption and call is directed to line with multilevel preemption features— Operate AD key.	

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STEP	ACTION	VERIFICATION
15f	If office is arranged for multilevel preemption and call is directed to line without multilevel preemption features— Operate OD key.	
16	Momentarily operate ST key.	DIS1, LK2, MRL lamps lighted. NGC_ lamp lighted corresponding to preferred idle number group. (Refer to Table A.)
17	Momentarily operate RL key.	All lamps extinguished.
18	Operate NG_ key corresponding to number group used in Step 16.	
19	Repeat Steps 16, 17, 18 for remaining number group frames of allotted PBX or line circuit group.	
20	Momentarily operate ST key.	BY, MRL lamps lighted.
21	Momentarily operate RL key.	All lamps extinguished.
22	Restore NG_ keys.	
23	Operate LBL, REC keys.	
24	Momentarily operate ST key.	DIS1, LK2, MRL lamps lighted. Trouble record taken. FTT_, FUT_, VGT_, HGT_, VFT_ designations perforated indicating location of line or line circuit associated with preferred number group with recycle. (Refer to Table A.)
25	Momentarily operate RL key.	All lamps extinguished.
26	Restore all keys and switches.	

**TABLE A**  
**NUMBER GROUP CHOICES**

HUNTING GROUP DISTRIBUTED OVER	CHOICE		ORDER OF CHOICE							
	WITHOUT RECYCLE	WITH RECYCLE	NUMBER GROUP A-H CHOICE FOR MARKER NUMBER							
			0,8	1,8	2,10	3,11	4	5	6	7
5, 6, 7, or 8 Number Groups	1st	5th	A	B	C	D	E	F	G	H
	2nd	6th	E	F	G	H	C	D	B	A
	3rd	7th	C	D	B	A	G	H	F	E
	4th	8th	G	H	F	E	B	A	D	C
	5th	1st	B	A	D	C	F	E	H	G
	6th	2nd	F	E	H	G	D	C	A	B
	7th	3rd	D	C	A	B	H	G	E	F
	8th	4th	H	G	E	F	A	B	C	D
3 or 4 Number Groups	1st	3rd	A	B	C	D	C	D	B	A
	2nd	4th	C	D	B	A	B	A	D	C
	3rd	1st	B	A	D	C	D	C	A	B
	4th	2nd	D	C	A	B	A	B	C	D
2 Number Groups	1st	2nd	A	B	B	A	B	A	B	A
	2nd	1st	B	A	A	B	A	B	A	B