

**COMPLETING MARKER TESTS—PART 9**  
**USING OFFICE TEST FRAME TEST CIRCUIT SD-27633-01 (J23260)**  
**NO. 5 CROSSBAR OFFICES**

**1. GENERAL**

**1.01** This section is Part 9 of a series of sections for marker tests previously covered in Section 218-423-501.

**1.02** This issue affects Equipment Test Lists.

**1.03** The tests covered are:

**AP. Station Ringer Test Feature:** This test checks the marker route relay cross-connections for station ringer test code. . . . . **2**

**AQ. Heavy Traffic Timing Feature:** This test checks that the marker recognizes a heavy traffic condition. . . . . **3**

**AR. Timing Feature:** This test checks that the marker timing circuits are functioning. . . . . **3**

**1.04 Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 3 or 4 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.

**2. APPARATUS**

**2.01** The apparatus required for each test is listed in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

TABLE A

APPARATUS	TESTS		
	AP	AQ	AR
Office Test Frame (OTF)	1	1	1
Trouble Indicator and Connector Circuit (TIC)	1	1	1
322A (make-busy) Plug		✓	✓
Tools (2.02)			✓
Stopwatch (2.03)		1	1
32A Test Set		1	1
Cord (2.04)			2
Cord (2.05)			✓

✓ As Required

**2.02** Blocking and insulating tools as required. Use tools and apply as covered in Section 069-020-801.

**2.03** KS-3008 stopwatch or equivalent.

**2.04** Patching cord, P3E cord, 8 feet long, equipped with two 310 plugs (3P6E cord) (used for patching from ITT jack to T jack of incoming trunk).

**2.05** Patching cord, W3M cord, 15 feet long, equipped with one 320 plug, one 360A tool, one 360B tool, one 360C tool (3W4B cord), and one KS-6278 connecting clip (used to connect SP jack to unit terminal strip).

3. PREPARATION

STEP	ACTION	VERIFICATION
<b>All Tests</b>		
1	At OTF— Restore all keys and switches.	
3	Set L-L switch to 0.	
3	Set PS switch to 11/56.	
4a	If TOUCH-TONE® dialing is desired— Operate TT key.	

4. METHOD

AP. Station Ringer Test Feature

5	Set A through G DIAL switches to select station ringer code and originating test line (OTL) number.	
6	Set CST, CSU switches for class of service having access to route selected.	
7b	If coin class of service is used— Operate CN key.	
8	Operate 7D, OTL, MCB keys.	
9	Operate MKR_ key for marker under test.	
10	Operate REC key.	
11	At TIC— Momentarily operate RLS key.	All lamps extinguished.
12	At OTF— Operate ST key.	At TIC— DL_, FS_, LC_, LV_, TB_, FBK lamps lighted identifying station ringer test trunk.
13	Restore ST key.	If coin class of service is used— CR lamp momentarily lighted. CND lamp lighted.
14b	If coin class of service is used— Restore CN key.	CND lamp extinguished.
15	At TIC— Momentarily operate RLS key.	All lamps extinguished.
16	Restore all keys and switches.	

STEP	ACTION	VERIFICATION
<b>AQ. Heavy Traffic Timing Feature</b>		
5	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
6	At OTF— Operate OTL, 7D, MCB keys.	
7	Set CST, CSU swithes to select a non-PBX class of service.	
8	Set A through G DIAL switches to select intraoffice code and any test line number.	
9	Operate MKR_ key for marker under test.	
10	At marker— Insert plug of 32A test set into RC jack.	
11	Momentarily operate white (ST) button on 32A test set; when HTR relay operates, <i>start timing</i> .	Within 1.5 seconds— HTR relay released.
12	Momentarily operate red (RL) button on 32A test set.	
13	Momentarily operate OAT1 relay; when HTR relay operates, <i>start timing</i> .	In not less then 2 seconds— HTT relay operated. HTR relay released.
14	Remove plug of 32A test set from RC jack.	
15	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
16	At OTF— Restore all keys and switches.	
<b>AR. Timing Features</b>		
<b>Work Timer</b>		
5	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
6	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
7	At OTF— Operate MCB, MKR_ keys for marker under test.	
8	Operate OTL, 7D keys.	
9	Set A through G DIAL switches to select an intraoffice code and any test line number.	
10	Set CST, CSU switches for class of service having access to route selected.	
11	At marker— Insert plug of 32A test set into RC jack.	
12	Block operated SP relay.	
13	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	Within 1 second— WT relay operated. At TIC— DL_ lamp lighted for marker under test.
14	Momentarily operate red (RL) button on 32A test set.	
15	At TIC— Operate RLS key.	All lamps extinguished.
16	At marker— Remove blocking tool from SP relay.	
17	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
18b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
19	At marker— Remove plug of 32A test set from RC jack.	
20	At OTF— Restore all keys and switches.	

**Short-Delay Timer for Number Group Frame Seizure**

21	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
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STEP	ACTION	VERIFICATION
22	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
23	At OTF— Operate MCB, MKR_ keys for marker under test.	
24	Operate OTL, 7D keys.	
25	Set A through G DIAL switches to select an intraoffice code and any test line number.	
26	Set CST, CSU switches for class of service having access to route selected.	
27	At marker— Insert plug of 32A test set into RC jack.	
28	Block nonoperated SNG2, NGK relays.	
29	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL_ lamp lighted for marker under test.
30	Momentarily operate red (RL) button on 32A test set.	
31	At TIC— Operate RLS key.	All lamps extinguished.
32	At marker— Remove blocking tools from SNG2, NGK relays.	
33	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
34b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
35	At marker— Remove plug of 32A test set from RC jack.	
36	At OTF— Restore all keys and switches.	

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STEP	ACTION	VERIFICATION
<b>Short-Delay Timer for Trunk Link Frame Seizure—IAO Call</b>		
37	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
38	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
39	At OTF— Operate MCB, MKR_ key for marker under test.	
40	Operate OTL, 7D keys.	
41	Operate FS0 key.	
42	Set A through G DIAL switches to select an intraoffice code and any test line number.	
43	Set CST, CSU switches for class of service having access to route selected.	
44	At marker— Insert plug of 32A test set into RC jack.	
45	Block nonoperated FS0 relay and all equipped FTC_ relays except FTC0.	
46	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL_ lamp lighted for marker under test.
47	Momentarily operate red (RL) button on 32A test set.	
48	At TIC— Operate RLS key.	All lamps extinguished.
49	At marker— Remove blocking tools from FS0 and all FTC_ relays.	
50	Remove plug of 32A test set from RC jack.	
51b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	

STEP	ACTION	VERIFICATION
52	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
53	At OTF— Restore all keys and switches.	
<b>Short-Delay Timer for Line Link Frame Seizure—IAO Call</b>		
54	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
55	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
56	At OTF— Operate MCB, MKR_ key for marker under test.	
57	Operate OTL, 7D keys.	
58	Set A through G DIAL switches to select an intraoffice code and any test line number.	
59	Set CST, CSU switches for class of service having access to route selected.	
60	At marker— Insert plug of 32A test set into RC jack.	
61	Insulate 1M of LLC2 relay.	
62	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL_ lamp lighted for marker under test.
63	Momentarily operate red (RL) button on 32A test set.	
64	At TIC— Operate RLS key.	All lamps extinguished.
65	At marker— Remove insulator from LLC2 relay.	
66	Remove plug of 32A test set from RC jack.	

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STEP	ACTION	VERIFICATION
67	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
68b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
69	At OTF— Restore all keys and switches.	
<b>Short-Delay Timer for Sender Connector Frame Seizure—Outgoing Call</b>		
70	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
71	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
72	At OTF— Operate MKR_ key for marker under test.	
73	Operate OTL, 7D keys.	
74	Set A through N DIAL switches as required to select an outgoing route requiring senders.	
75	Set CST, CSU switches for class of service having access to route selected.	
76	At marker— Insert plug of 32A test set into RC jack.	
77	Block nonoperated SKA, SKB, TK relays.	
78	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <b>start timing.</b>	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL.. lamp lighted for marker under test.
79	Momentarily operate red (RL) button on 32A test set.	
80	Remove blocking tools from SKA, SKB, TK relays.	
81	Remove plug of 32A test set from RC jack.	

STEP	ACTION	VERIFICATION
82	At TIC— Operate RLS key.	All lamps extinguished.
83b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
84	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
85	At OTF— Restore all keys and switches.	
<b>Short-Delay Timer for Trunk Link Frame Seizure—Outgoing Call Requiring Senders</b>		
86	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
87	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
88	At OTF— Operate MKR_ key for marker under test.	
89	Operate OTL, 7D keys.	
90	Operate FS0 key.	
91	Set A through N DIAL switches as required to select an outgoing route requiring senders.	
92	Set CST, CSU switches for class of service having access to route selected.	
93	At marker— Insert plug of 32A test set into RC jack.	
94	Block nonoperated FS <sup>0</sup> relay and all equipped FTC_ relays except FTC0.	
95	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing.</i>	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL_ lamp lighted for marker under test.
96	Momentarily operate red (RL) button on 32A test set.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
97	Remove blocking tools from FS0 and all FTC_ relays.	
98	Remove plug of 32A test set from RC jack.	
99	At TIC— Operate RLS key.	All lamps extinguished.
100b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
101	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
102	At OTF— Restore all keys and switches.	
<b>Short-Delay Timer for Line Link Frame Seizure—Outgoing Call Requiring Senders</b>		
103	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
104	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
105	At OTF— Operate MKR_ key for marker under test.	
106	Operate OTL, 7D keys.	
107	Set A through N DIAL switches as required to select an outgoing route requiring senders.	
108	Set CST, CSU switches for class of service having access to route selected.	
109	At marker— Insert plug of 32A test set into RC jack.	
110	Insulate 1M of LLC2 relay.	
111	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing.</i>	In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL.. lamp lighted for marker under test.

STEP	ACTION	VERIFICATION
112	Momentarily operate red (RL) button on 32A test set.	
113	Remove insulator from LLC2 relay.	
114	Remove plug of 32A test set from RC jack.	
115	At TIC— Operate RLS key.	All lamps extinguished.
116b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
117	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
118	At OTF— Restore all keys and switches.	

#### Overall Timeout Timing

119	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
120	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
121	At OTF— Operate MKR_ key for marker under test.	
122	Operate OTL, 7D keys.	
123	Set A through G DIAL switches to select an intraoffice code and any test line number.	
124	Set CST, CSU switches for class of service having access to route selected.	
125	At marker— Insert plug of 32A test set into RC jack.	
126	Block nonoperated SFT, WT, and all FTC_ relays.	
127	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	In 9.8 to 15.4 seconds— TA lamp lighted. Major alarm sounds.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
128	Momentarily operate red (RL) button on 32A test set.	
129	Operate AR key.	TA lamp extinguished. Major alarm silenced.
130	Remove blocking tools from SFT, WT, and all FTC_ relays.	
131	Remove plug of 32A test set from RC jack.	
132	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
133b	If no other timing tests are to be made— At TIC— Remove make-busy plug from TIC-MB jack.	
134	At OTF— Restore all keys and switches.	

**Short-Delay Timer for Trunk Link Frame Seizure—Incoming Call**

135	At jack, lamp, and key circuit— Insert make-busy plug into M_C_MB jack for marker under test.	
136	At TIC— Insert make-busy plug into TIC-MB jack for marker under test.	
137	Select from office records an incoming DP or MF trunk.	
138	Have trunk selected made busy at distant office.	
139	At relay rack frame— When trunk is idle— Patch from ITT jack to T jack of trunk selected.	
140	At OTF— Operate ITT, ITT1 keys.	
141c	If trunk selected is MF— Operate MF key.	
142c	Set MF switch to MIN L.	
143d	If trunk selected has short conductor loop— Operate SLP key.	

STEP	ACTION	VERIFICATION
144e	If trunk selected is bylink— Operate BL_ key.	
145e	Patch from BL jack to SP jack using P3E cord.	
146e	At relay rack frame— Patch W3M cord to SP jack and connect sleeve to terminal 42 on trunk unit terminal strip.	
147f	If trunk selected does not require a dial start signal— At OTF— Operate ONHK key.	
148g	If trunk selected has A relay ground shunt— At OTF— Operate GS key.	
149	At OTF— Set A through G DIAL switches as required to select terminating test line number.	
150	Set CST, CSU switches for class of service having access to route selected.	
151	Operate _D key corresponding to number of digits expected from incoming trunk.	
152	Operate MKR_ key for marker under test.	
153	At marker— Block nonoperated TFK3 relay.	
154	Momentarily operate white (ST) button on 32A test set; when OAT1 relay operates, <i>start timing</i> .	At marker— In 2.6 to 4.0 seconds— SDT relay operated. At TIC— DL_ lamp lighted for marker under test.
155	Momentarily operate red (RL) button on 32A test set.	
156	Remove blocking tool from TFK3 relay.	
157	Remove plug of 32A test set from RC jack.	
158	At TIC— Operate RLS key.	All lamps extinguished.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
159	At relay rack frame— Remove patching cord from ITT, T, SP jacks and from unit terminal strip.	
160	At TIC— Remove make-busy plug from TIC-MB jack.	
161	At jack, lamp, and key circuit— Remove make-busy plug from M_C_MB jack.	
162e	If trunk selected is bylink— At OTF— Remove patching cord from BL, SP jacks.	
163	Have trunk restored to service at distant office.	
164	At OTF— Restore all keys and switches.	