

DIAL TONE MARKER CIRCUITS

TESTS USING OFFICE TEST FRAME TEST CIRCUIT SD-27633-01 (J23260)

NO. 5 CROSSBAR OFFICES

1. GENERAL

PAGE

1.01 This section describes a method of testing dial tone marker circuits used in small No. 5 crossbar offices equipped with office test frame test circuit SD-27633-01 (J23260).

1.02 This section is reissued to provide a new test to detect an open lead in the primary winding of the DCT relay. Change arrows are used to emphasize the more significant revisions. This reissue affects Equipment Test Lists.

PAGE

A. Service Observing Feature:

This test checks that the marker recognizes a calling line that is on service observing, with or without unigauge.

5

B. Crossed Line Hold Magnet Check Feature—XLH Relay:

This test checks the line hold magnet cross-detection feature of the marker.

6

C. Manual Originating Feature:

This test checks that the marker can serve calls originated by a customer with manual service.

7

D. Deleted:

7

E. Failure To Match Feature:

This test checks that the marker recycles after a failure to match.

7

F. Junctor Subgroup Selection Feature:

This test checks the operation of the junctor subgroup sequence (JSQ0-5) and step position (STP1-2) relays.

8

G. Channel Preference and Selection Feature:

This test checks the channel preference and selection feature of the marker.

10

H. False Cross and Ground Test Feature—FCG Relay:

This test checks the marker false cross and ground test feature. It also checks that the marker cancels this test under heavy traffic conditions.

12

I. Continuity Test Feature:

This test checks the marker linkage continuity test feature.

13

J. Heavy Traffic Feature:

This test checks the marker timing feature associated with a heavy traffic condition.

14

K. Route Advance or Recycle Feature—All Registers Busy:

This test checks that the marker functions properly for route advance or recycle when all registers are busy, and office is or is not equipped with overload announcement trunks.

14

L. Transfer of Start Lead Feature:

This test checks that the marker recognizes a transfer of marker start lead within a marker connector.

15

M. Timing Features:

This test checks that the marker timing circuits are functioning.

16

N. Surge Operation of Hold Magnet Feature:

This test checks the

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surge operation of hold magnet feature.	17
O. Unigauge Feature: This test checks that the marker recognizes a line equipped with range extension and passes this information to the originating register.	18
P. Open Lead in Primary Winding of DCT Relay (DCT Diode Provided): This test checks that the marker will block and provide a trouble indication after detecting an open lead in the primary winding of the DCT relay.	19
1.04 Tests A, B, C, E, L, and O require action at the line link frame.	
1.05 Tests A, B, H, and I require action at the dial tone marker.	
1.06 Tests B, K require verification at the dial tone marker.	
1.07 During Tests A, B, H, I, and M the dial tone trouble register will score. During Test E the failure to match register will score. The reporting of these register operations shall be in accordance with local instructions.	
1.08 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 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.	
1.09 Test O requires action at the line link frame, and verification at the trunk link frame.	
1.10 When lamp display control feature (option YR) is provided at the trouble indicator and	

connector circuit (TIC), a stored trouble condition is indicated by a lighted red DR lamp. Momentary operation of the LD key will cause the trouble indicating lamps to light. These lamps will be extinguished with the momentary operation of the RLS key. Application of this feature will prevent trouble lamp displays from occurring in unattended offices.

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.

2.02 322A make-busy plugs as required.

2.03 Testing cords as required, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord). (Used with connecting tools as required, specified in paragraphs 2.12 through 2.17).

2.04 32A test set.

2.05 Blocking and insulating tools as required. Apply tools as covered in Section 069-020-801.

2.06 Patching cord, P3E cord, 8 feet long, equipped with two 310 plugs (3P6E cord).

2.07 Patching cord, P3U cord, 7 feet long, equipped with one 310 plug and one 351A plug (3P27B cord) (for regular crossbar switches) or one P3BE cord, 7 feet long, equipped with one 310 plug and one 459A plug (for small crossbar switches).

2.08 One 420J diode.

Note: Polarity of diode is indicated on the body of the diode, thus—

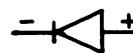


TABLE A

APPARATUS		TESTS															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Plug	(2.02)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Cord	(2.03)	✓	✓			✓	✓	✓	✓			✓	✓		✓		
Test Set	(2.04)	✓			✓	✓	✓	✓		✓		✓		✓	✓		✓
Tools	(2.05)	✓	✓			✓	✓	✓		✓	✓	✓		✓			✓
Cord	(2.06)			✓													✓
Cord	(2.07)			✓													✓
Diode	(2.08)					✓	✓										
Plug	(2.09)					✓											
Resistor	(2.10)									✓							
Stopwatch	(2.11)										✓			✓			
Tool	(2.12)	✓				✓	✓									✓	
Tool	(2.13)	✓							✓				✓		✓		
Tool	(2.14)	✓	✓										✓				
Tool	(2.15)					✓	✓	✓	✓				✓				
Tool	(2.16)	✓															
Tool	(2.17)															✓	
Tool	(2.18)															✓	
Meter	(2.19)	✓															
Test Circuit	(2.20)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Headset	(2.21)	✓										✓					

✓ As required

2.09 One 349A make-busy plug.

2.10 One 68,000 or 30,000 ohm, 1/4 watt radio-type resistor obtained locally. (See Test H.)

2.11 One KS-3008 stopwatch or equivalent.

2.12 KS-6278 (connecting clip) tools as required. (Used for making test connections to ground, 420J diodes, battery, and surge tester.)

2.13 639A (relay contact connector) tools as required. (Used for making test connections to fixed contacts of wire-spring relays using the 651B or 651D relay contact connector holder.)

2.14 419A tools as required. (Used for making test connections to make contacts of wire-spring relays and connections to the line relay and the sleeve leads of the crossbar switch at the line link frame.)

2.15 624A (terminal contact connector) tools as required. (Used for making test connections to winding terminals of wire-spring relays.)

2.16 651D (relay contact connector holder) tools as required.

2.17 651B (relay contact connector holder) tools as required.

2.18 Surge tester made up locally. Use a G. E. NE-5 lamp or equivalent, in a 47B lamp socket. Solder one terminal of the jack to a 10,000 ohm, 1/4 watt radio-type resistor. Obtain resistor locally.

Note: The NE-5 lamp will break down between 120 and 150 volts and sustain on 60 to 80 volts.

2.19 Volt-ohm-milliammeter KS-14510 L1 or equivalent.

2.20 Office test frame (OTF), SD-27633-01 (J23260).

2.21 52-type head telephone set or equivalent.

3. PREPARATION

Test B

3.01 Consult office records for an unassigned line vertical on the same line link frame associated with the originating test line.

3. PREPARATION (cont)

STEP	ACTION	VERIFICATION
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All Tests Except C, L, and O

1	At jack, lamp, and key circuit— Insert make-busy plug into M_D_MB jack for dial tone marker under test.	
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All Tests Except J

2	At OTF— Operate DIAL key.	
3	Operate MKR_ key for dial tone marker under test.	
4	Set L-L switch to 0.	

All Tests Except C, J and O.

5	Operate OTL key.	
6	Set CST, CSU switches for flat rate class of service.	

Test C

3.02 Consult office records for an unassigned line vertical on a line link frame having a manual class of service.

Test F

3.03 Obtain junctor distribution pattern information from office records.

Test O

3.04 Consult office records for unassigned line verticals on all line link frames having unigauge operation.

STEP	ACTION	VERIFICATION
Tests A, E, F, G, I, K, M, N, and P		
7	At dial tone marker— Insert plug of 32A test set into RC jack.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Service Observing Feature		
8	At OTF Operate TLK key.	
9	At marker under test— Connect ground to 10M contact terminal of TK relay.	
10	Connect testing cord between 7M contact terminal and 7B of TR2A relay.	
11	Insert plug of 52-type head telephone set in TEL jack.	
12	Momentarily operate white key on 32A test set.	OBS1, OBS2 relays operated. Dial tone heard.
13	Momentarily operate red key on 32A test set.	Dial tone removed.
14	Remove testing cord from TR2A relay.	
15	Block nonoperated OBS2 relay.	
16	Momentarily operate white key on 32A test set.	At TIC— Display registered. DR, OBS, TK lamps lighted (refer to paragraph 1.10).
17	Momentarily operate RLS key.	Display released.
18	At dial tone marker— Momentarily operate red key on 32A test set.	
19	At line link frame— Block operated TR1 relay on line link frame associated with OTL key.	
20	At dial tone marker— Momentarily operate white key on 32A test set.	Dial tone heard. At TIC— No display registered (refer to paragraph 1.10).

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STEP	ACTION	VERIFICATION
21	At dial tone marker— Momentarily operate red key on 32A test set.	Dial tone removed.
22	At line link frame— Remove blocking tool from TR1 relay.	
23	At dial tone marker— Remove blocking tool from OBS2 relay.	
24	Remove ground from TK relay.	
25	Remove plug of 32A test set from RC jack.	
26	Remove plug of 52-type head telephone set from TEL jack.	
27	At OTF— Restore all keys and switches.	
28	At marker under test— Block operated OBS1 relay.	Ground present at 10F of TK relay.
29	Block operated LOLA relay.	+130V battery present at 10F of TK relay.
30	Remove blocking tools from OBS1, LOLA relays.	
31	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	
B. Crossed Line Hold Magnet Check Feature—XLH Relay		
7	At line link frame— Connect sleeve of originating test line vertical to sleeve of an unassigned vertical on same line link frame.	
8	At OTF— Operate ST key.	At TIC— Display registered. DR, XLH lamps lighted (refer to paragraph 1.10).
9	At OTF— Restore ST key.	
10	At TIC— Momentarily operate RLS key.	Display released.
11	At dial tone marker— Block operated HTR relay.	

STEP	ACTION	VERIFICATION
12	At OTF— Operate ST key.	At TIC— No display registered (refer to paragraph 1.10). At OTF— Dial tone heard.
13	Restore ST key.	Dial tone removed.
14	At dial tone marker— Remove blocking tool from HTR relay.	
15	At line link frame— Remove connection between sleeves of originating test line and unassigned vertical.	
16	At OTF— Restore all keys and switches.	
17	At jack, lamp, and key circuit— Remove 322A make-busy plug from M_D_MB jack.	

C. Manual Originating Feature

5	At line link frame— Patch from SP jack to a manual class of service line vertical.	
6	At OTF— Using P3E cord, patch from OTL jack to SP jack.	
7	Operate TLK, OTLP keys.	
8	Operate ST key.	At switchboard— Operator answers on manual trunk.
9	At OTF— Restore ST key.	Connection released.
10	Remove patching cord from OTL, SP jacks.	
11	At line link frame— Remove patching cord from SP jack and manual class of service line vertical.	
12	At OTF— Restore all keys and switches.	

D. Deleted

E. Failure to Match Feature

STEP	ACTION	VERIFICATION
8	At line link frame associated with originating test line— Insert make-busy plug into JS0 jack.	
9	At dial tone marker— Connect positive side of 420J diode to upper winding terminal of STP2 relay and negative side of 420J diode to upper winding terminal of TCHK relay. <i>Note:</i> Without this connection the TCHK relay will not operate in cases where no junctor exists when the JSQ0 and STP2 relays are operated.	
10	Block nonoperated TCH1 through TCH9 relays.	
11	Momentarily operate white key on 32A test set.	Observe STP1, STP, STP2, FMP, RF, RCY relays operated. STP1, STP, STP2, FMP relays released and then reoperated. Marker repeats this sequence until red key is operated momentarily on 32A test set.
12	Momentarily operate red key on 32A test set.	Marker released.
13	Remove blocking tools from TCH1 through TCH9 relays.	
14	Remove diode from STP2, TCHK relays.	
15	At line link frame— Remove make-busy plug from JS0 jack.	
16	At dial tone marker— Remove plug of 32A test set from RC jack.	
17	At OTF— Restore all keys and switches.	
18	At jack, lamp, and key circuit— Remove 322A plug from M_D_MB jack.	
F. Junctor Subgroup Selection Feature		
8	Momentarily operate white key on 32A test set.	JSQ0 relay operated. <i>Note:</i> If JSQ0 relay does not operate, momentarily operate red key on 32A test set and repeat Steps 9 and 8 until JSQ0 is operated.
9	Momentarily operate red key on 32A test set.	

STEP	ACTION	VERIFICATION
10	Momentarily operate white key on 32A test set.	Observe that JG_ relay associated with JSQ0 and STP1 relays operated as shown in Table B.
11	Momentarily operate red key on 32A test set.	
12	Repeat Steps 9 and 10 five times.	Observe that JG_ relay operated for junctor step position 1 (STP1) relay operated as shown in Table B for all JSQ_ relays.
13	At OTF— Operate FS_ key to direct test call to a trunk link frame.	
14	At dial tone marker— Block nonoperated all TCH_ relays except one which will be used for test. Note: TCH_ relay which is <i>not</i> blocked nonoperated must be associated with a junctor in subgroup selected in Step 10 and must be on a junctor switch that has an available junctor when JSQ0 and STP2 relays are operated.	
15	Connect the positive side of 420J diode to upper winding terminal of STP1 relay and negative side of 420J diode to bottom terminal of J_ resistor associated with TCH_ relay that is used for test as determined in Step 14.	Observe that JSQ0 relay operated.
16	Momentarily operate white key on 32A test set.	Observe that the JG_ relay associated with STP2 and JSQ0 relay is operated as shown in Table B.
17	Momentarily operate red key on 32A test set.	
18	Remove blocking tools from TCH_ relays.	
19	Remove diode connection from J_ resistor only and connect it to upper winding of STP relay.	Observe that JSQ0 relay is operated. Note: If JSQ0 relay is not operated, repeat Steps 17 and 16 until JSQ0 relay is operated. Then perform Step 17.
20	Momentarily operate white key on 32A test set.	Observe that JG_ relay associated with JSQ0 and STP2 relays is operated as shown in Table B.
21	Momentarily operate red key on 32A test set.	

STEP	ACTION	VERIFICATION
22	Momentarily operate white key on 32A test set.	Observe that JG_ relay associated with STP2 and JSQ1 relays is operated as shown in Table B.
23	Momentarily operate red key on 32A test set.	
24	Repeat Steps 22 and 23 three more times.	Observe that JG_ relay associated with STP2 and JSQ2, 3, 4 relays are operated in sequence as shown in Table B.
25	Remove diode from STP1, STP relays.	
26	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	

G. Channel Preference and Selection Feature

Note: Generally channel preference for first trial is in numerical sequence 0 through 9, and for second trial 5 through 9, and then 0 through 4. However, if the marker cross connections for this preference have been changed, channel preference for first trial is 5 through 9, and then 0 through 4, and for second trial 0 through 9.

8	Momentarily operate white key on 32A test set.	Observe that JSQ0 relay operated.
		Note: If JSQ0 relay is not operated, proceed to Step 9, and repeat Steps 9 and 8 until JSQ0 relay is operated.
9	Momentarily operate red key on 32A test set.	

TABLE B

NUMBER OF TRUNK LINK FRAMES	STP1 OR STP2 RELAY OPERATED	JSQ RELAY OPERATED						
		0	1	2	3	4	5	
2	STP1	0	1	2	0	1	2	
2	STP2	3	4	3	4	3	4	
2-3	STP1	0	1	2	0	1	2	
2-3	STP2	1	2	0	1	2	0	
3	STP1	0	1	2	0	1	2	
3	STP2	3	3	3	3	3	3	
4	STP1	0	1	0	1	0	1	
4	STP2	2	2	2	2	2	2	Juncture
5	STP1	0	1	0	1	0	1	Subgroup
5	STP2	1	0	1	0	1	0	Selected

STEP	ACTION	VERIFICATION
10	From Table B determine which junctor subgroup should be selected for junctor step position 1 (STP1) with JSQ0 relay operated.	
11	From local junctor distribution information, determine which juncctors may be used for this test. <i>Note 1:</i> When a channel is to be checked and its junctor is found plugged busy before start of this test, proceed to next preferred channel for checking momentary operation of junctor hold magnet. Upon completion of this test, do not restore to service juncctors which were plugged busy before start of this test. These channels should be tested at another time. <i>Note 2:</i> When a channel is to be checked and it is found to be busy on a service call (junctor hold magnet operated), proceed to next preferred channel for checking momentary operation of junctor hold magnet. If busy channel becomes idle during progress of this test, it immediately regains its position in the preference chain. Therefore, when each of the less preferred channels is to be checked, note whether or not junctor hold magnet (of channel found busy) has released.	
12	Block nonoperated JSQ1, JS0, SQA relays. <i>Note:</i> This will cause marker to use JSQ0 relay only.	
13	Momentarily operate white key on 32A test set.	CH_ relay (of most preferred idle channel for first trial) operated momentarily.
14	Momentarily operate red key on 32A test set.	
15	Block nonoperated TCH_ relay corresponding with CH_ relay operated in Step 13.	
16	Repeat Steps 13, 14, and 15 until the least preferred CH_ relay has been operated.	CH_ relay (of next higher preferred idle channel for first trial) operated momentarily.
17	Remove blocking tools from all TCH_ relays.	
18	Connect upper winding of D relay to upper winding of TR2A relay.	
19	Block nonoperated XTRK relay.	

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STEP	ACTION	VERIFICATION
20	Momentarily operate white key on 32A test set.	CH_ relay (of most preferred idle channel for second trial) operated momentarily.
21	Momentarily operate red key on 32A test set.	
22	Block nonoperated TCH_ relay corresponding with CH relay operated in Step 20.	
23	Repeat Steps 20, 21, and 22 until the least preferred CH_ relay has been operated.	CH_ relay (of next higher preferred idle channel for second trial) operated momentarily.
24	Remove test connection between D relay and TR2A relay.	
25	Remove blocking tools from TCH_ relays.	
26	Remove blocking tools from XTRK, JS0, JSQ1, SQA relays.	
27	Remove plug of 32A test set from RC jack.	
28	At OTF— Restore all keys and switches.	
29	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	

H. False Cross and Ground Test Feature—FCG Relay

8a	If FCG relay is 280 type— At marker— Connect 68,000 ohm resistor between 10F and 11F of FAK relay.	
9b	If FCG relay is 316 type— At marker— Connect 30,000 ohm resistor between 10F and 11F of FAK relay.	
10	At OTF— Operate ST key.	At TIC— Display registered. DR_ FCG lamps lighted (refer to paragraph 1.10). 2TR lamp not lighted. At OTF— Dial tone heard.
11	Restore ST key.	Dial tone removed.
12	At TIC— Momentarily operate RLS key.	Display released.

STEP	ACTION	VERIFICATION
13	At line link frame— Connect 2T of L relay associated with originating test line to upper winding of TR1 relay.	
14	At OTF— Operate ST key.	At TIC— Display registered. DR_, FCG, 2TR lamps lighted (refer to paragraph 1.10). At OTF— Dial tone heard.
15	Restore ST key.	Dial tone removed.
16	At TIC— Momentarily operate RLS key.	Display released.
17	At dial tone marker— Remove resistor from FAK relay contacts.	
18	At line link frame— Remove connection from L, TR1 relays.	
19	At OTF— Restore all keys and switches.	
20	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	

I. Continuity Test Feature

8	Insulate 11B, 12B of GT1 relay.	
9	Block nonoperated HTR relay.	
10	Momentarily operate white key on 32A test set.	At TIC— Display registered. DR_ lamp lighted. CON lamp not lighted (refer to paragraph 1.10). At OTF— Dial tone heard.
11	At dial tone marker— Momentarily operate red key on 32A test set.	At OTF— Dial tone removed.
12	At TIC— Momentarily operate RLS key.	Display released.
13	At dial tone marker— Move blocking tool so that HTR relay is blocked operated.	

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STEP	ACTION	VERIFICATION
14	Momentarily operate white key on 32A test set.	At TIC— No display registered (refer to paragraph 1.10). At OTF— Dial tone heard.
15	At dial tone marker— Momentarily operate red key on 32A test set.	At OTF— Dial tone removed.
16	At dial tone marker— Remove blocking tool from HTR relay.	
17	Remove insulator from GT1 relay.	
18	Remove plug of 32A test set from RC jack.	
19	At OTF— Restore all keys and switches.	
20	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	

J. Heavy Traffic Feature

2	At dial tone marker— Manually operated HTR relay; <i>start timing</i> .	In 1 to 1-1/2 seconds— HTR relay released.
3	Block operated OAT1 relay; <i>start timing</i> .	HTR relay operated. Within 2 seconds— HTT relay not operated.
4	Remove blocking tool from OAT1 relay.	In 1 to 1-1/2 seconds— HTR relay released.
5	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	

K. Route Advance or Recycle Feature—All Registers Busy

8a	If office is equipped with overload announcement feature— Operate FS_ key to select trunk link frame with overload announcement trunks and originating registers on the same frame.	
9a	At jack, lamp, and key circuit— Make all originating registers on frame selected in Step 8a busy by inserting make-busy plug into ORMB_ jacks.	
10a	Operate OAN key if normal.	OAN lamp lighted.

STEP	ACTION	VERIFICATION
11a	At TC— Operate TLK key.	
12a	At marker under test— Insert plug of 52-type head telephone set into TEL jack.	
13	At marker under test— Momentarily operate white key on 32A test set.	If office is not equipped with overload announcement— RAV1, DIS1 relays operated.
		Note: Perform Step 12 immediately after the RAV1 and DIS1 relays operate, or the marker will continue to be seized by the OTF.
		If office is equipped with overload announcement— RCY1 relay operated. Overload announcement heard.
14	Momentarily operate red key on 32A test set.	Marker released.
15	Remove 32A test set from RC jack.	
16	Remove plug of 52-type head telephone set from TEL jack.	
17	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.	
18	Release OAN key if normal before test started.	OAN lamp extinguished.
L. Transfer of Start Lead Feature		
7	At line link frame— Connect 2T of L relay associated with originating test line to upper winding of TRS relay.	
8	At OTF— Operate ST key.	At TIC— Display registered. DR, TRS lamps lighted (refer to paragraph 1.10).
9	At OTF— Restore ST key.	
10	At TIC— Momentarily operate RLS key.	Display released.
11	At line link frame— Remove connection from L, TRS relays.	
12	At OTF— Restore all keys and switches.	

STEP	ACTION	VERIFICATION
M. Timing Features		
Work Timer		
8	At dial tone marker— Block operated SP relay.	
9	At TIC— Insert make-busy plug into TIC-MB jack of dial tone marker under test.	
10	At dial tone marker— Momentarily operate white key on 32A test set; start timing.	Observe WT relay operated within 1 second. Note: Perform Step 11 immediately after WT relay operates or additional attempts for dial tone will be made by the OTF.
11	Momentarily operate red key on 32A test set.	At TIC— DL_ lamp lighted (refer to paragraph 1.10).
12	Momentarily operate TIR-AR key.	DL_ lamp extinguished.
13	At dial tone marker— Remove blocking tool from SP relay.	
Short-Delay Timer for Line Link Frame Seizure		
14	Insulate 1M of LLC1 relay.	
15	Momentarily operate white key on 32A test set; start timing.	In 2.6 to 4.3 seconds— SDT relay operated. Note: Perform Step 15 immediately after SDT relay operates or additional attempts for dial tone will be made by the OTF.
16	Momentarily operate red key on 32A test set.	At TIC— DL_ lamp lighted (refer to paragraph 1.10).
17	Momentarily operate TIR-AR key.	DL_ lamp extinguished.
18	At dial tone marker— Remove insulator from LLC1 relay.	
Short-Delay Timer for Trunk Link Frame Seizure		
19	Insulate 6F of TLC relay.	
20	Momentarily operate white key on 32A test set; start timing.	In 2.6 to 4.3 seconds— SDT relay operated.

STEP	ACTION	VERIFICATION
		Note: Perform Step 21 immediately after SDT relay operates or additional attempts for dial tone will be made by the OTF.
21	Momentarily operate red key on 32A test set.	At TIC— DL_ lamp lighted (refer to paragraph 1.10).
22	Operate TIR-AR key.	DL_ lamp extinguished.
23	Remove make-busy plug from the TIC-MB jack of marker under test.	
24	At dial tone marker under test— Remove insulator from TLC relay.	
25	Block OAT relay operated; <i>start timing</i> .	In 9.6 to 15.4 seconds— MRL relay operated. TA lamp lighted. Major alarm heard.
26	Remove blocking tool from OAT relay.	
27	Momentarily operate AR key.	TA lamp extinguished. Major alarm silenced.
28	Remove plug of 32A test set from RC jack.	
29	At OTF— Restore all keys and switches.	
30	At jack, lamp, and key circuit— Remove 322A plug from M_D_MB jack.	
31	At TIC— Restore TIR-AR key.	

N. Surge Operation of Hold Magnet Feature

8	Connect free end of 10,000-ohm resistor of surge tester to -48. Connect free end of jack of surge tester to 18 fixed contact of LLC1 relay.	
9	Momentarily operate white key on 32A test set.	NE-5 lamp of surge tester momentarily flashes. Note: More than one momentarily flash may be observed, this may be disregarded.
10	Momentarily operate red key on 32A test set.	
11	Remove surge tester from 18 fixed contact of LLC1 relay.	

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STEP	ACTION	VERIFICATION
12	Repeat Steps 9 and 10 connecting the surge tester in turn to fixed contacts 21, 23 of LLC1 relay.	
13	Remove surge tester from LLC1 relay.	
14	Remove plug of 32A test set from RC jack.	
15	At OTF— Restore all keys and switches.	
16	At jack, lamp, and key circuit— Remove 322A plug from M_D_MB jack.	

O. Uniguage Feature

7	At line link frame— Patch from SP jack to a line location arranged for uniguage operation, and dedicated to OTF.	
8	At OTF— Using P3E cord, patch from OTL jack to SP jack.	
9	Operate OTLP, REC keys.	
10	Set RSG switch to ORB.	
11	Set RSS switch to select originating register used in test.	
12	Operate FS_ key to select trunk link frame used in test.	
13	Operate ST key.	At TIC— LOLL lamp lighted (refer to paragraph 1.10). At originating register used in test— LOLP relay operated.
14	At TC— Restore ST key.	
15	At TIC— Momentarily operate RLS key.	All lamps extinguished.
16	Repeat Steps 7, and 13 through 15 for each line link frame having uniguage line verticals.	
17	Repeat Steps 11 through 15 for each trunk link frame.	

STEP	ACTION	VERIFICATION
18	At line link frame— Patch from SP jack to a line location <i>not</i> arranged for unigauge operation.	
19	At OTF— Operate ST key.	At TIC— LOLL lamp <i>not</i> lighted (refer to paragraph 1.10). At originating register used in test— LOLP relay <i>not</i> operated.
20	At OTF— Restore ST key.	
21	At TIC— Momentarily operate RLS key.	All lamps extinguished.
22	At line link frame— Remove patching cord.	
23	At OTF— Remove patching cord.	
24	Restore all keys and switches.	
P. Open Lead in Primary Winding of DCT Relay (DCT Diode Provided)		
8	Insulate contact 5M of LLC1 relay.	
9	Momentarily operate white key on 32A test set.	At TIC— Display registered. DR lamp lighted. DCT1 lamp not lighted (refer to paragraph 1.10). At OTF— Dial tone heard.
10	At dial tone marker— Momentarily operate red key on 32A test set.	At OTF— Dial tone removed.
11	At TIC— Momentarily operate RLS key.	Display released.
12	At dial tone marker— Remove insulator from LLC1 relay.	
13	Remove plug of 32A test set from RC jack.	
14	At OTF Restore all keys and switches.	
15	At jack, lamp, and key circuit— Remove make-busy plug from M_D_MB jack.◀	

