

CALL WAITING FEATURE
TESTS USING MASTER TEST FRAME
NO. 5 CROSSBAR OFFICES

1. GENERAL

PAGE

1.01 This section describes methods for testing dial tone marker circuit (SD-26001-01), completing marker circuits (SD-25550-01 and SD-26002-01), call waiting circuit (SD-27787-01), and call waiting link circuit (SD-27788-01) using the master test control circuit (SD-25800-01), master test frame (MTF) trunk test circuit (SD-25918-01), and MTF voltmeter test circuit (SD-25792-01) in No. 5 crossbar offices arranged for call waiting service.

1.02 This section is reissued for the following reasons:

- (a) To revise Tests B, K, T, V, W, X, Z, AA, AB, AM, AN, AO, AQ and AR to provide for recognizing wetting battery from the call waiting circuit during alerting tone.
- (b) To add 1.11 for listing tests to be used when a call waiting customer is connected.
- (c) To make minor changes, as required.

This revision does not affect the Equipment Test Lists.

1.03 The tests covered are:

CUSTOMER LINE TEST

PAGE

A. Customer Regular Line Link Appearance: This test provides a ballistic check of a call waiting customer line through a line link frame and the call waiting link circuit. **10**

B. Customer Call Waiting Link Appearance: This test provides a ballistic check of a call waiting customer line through the call waiting circuit and the call waiting link circuit. **10**

DIAL TONE MARKER CIRCUIT TESTS

C. Originating Call Feature: This test checks the following: (1) The marker will pass the customer line location to the call waiting link circuit and will receive from the call waiting link circuit a mark indicating customer is or is not arranged for call waiting service. (2) The marker will establish dialing protection via level 0 in the call waiting link to prevent incoming calls completing to the customer until the dial tone connection has been released. **11**

D. Continuity Test Failure Feature: This test checks that if a dial tone marker fails on continuity test on the customer's line, it will release the level 0 (dialing protection) hold magnet in the call waiting link, take a trouble record and then complete the dial tone job via the hold off-normal contacts on the call waiting link. **11**

E. Crossed LP Relay Detection Check: This test checks that on an originating call, the dial tone marker will detect if two LP₋ relays have been operated in the call waiting link circuit and will cause a stop progress indication to be passed to the call waiting link circuit, then will continue to set up the connection to an originating register, and will take a trouble record upon disconnect. **12**

F. Hold Magnet Check: This test checks that on an originating call, should the line hold magnet check fail in the call waiting link, the dial tone marker will cause a trouble record to be taken, then continue to set up the connection to an originating register. **12**

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<i>G. (Reserved for Future Test)</i> . . .	13

COMPLETING MARKER CIRCUIT TESTS - ORIGINATING CALLS

<i>H. Originating Call From Call Waiting Line Routed to Permanent Signal:</i> This test checks the ability of the completing marker to maintain level 0 (dialing protection) in the call waiting link while a call waiting customer line is being routed to a permanent signal trunk.	13
<i>I. (Reserved for Future Test)</i> . . .	14

COMPLETING MARKER CIRCUIT TESTS - TERMINATING CALLS

<i>J. Customer Regular Line Link Appearance Busy, Call Waiting Appearance Idle:</i> This test checks that when the marker finds the regular line link appearance busy, the following functions are completed: (1) Marker determines from the call waiting link if customer has call waiting service. (2) When customer has call waiting service, a call waiting circuit is attached to his line and the call waiting circuit number is received from the call waiting link circuit. (3) Marker recycles, passes the circuit number to the number group and receives the line location of the selected call waiting circuit. (4) Marker sets linkage to the line link frame appearance of the call waiting circuit. (5) Marker check of linkage and release. . . .	14
<i>K. Call Waiting Customer Regular Line Link and Attached Call Waiting Circuit Line Link Appearances Busy:</i> This test checks that when the marker finds both the regular line link and the customer attached call waiting circuit line link appearances busy, a busy indication is returned to an incoming call.	14
<i>L. Call Waiting Customer Connected to Level 0 on Call Waiting Link:</i> This test checks that when a call waiting	

customer is connected to level 0 (dialing protection) on the call waiting link, a busy indication will be returned to a terminating call. 15

M. Call Waiting Circuit Identification:
This test provides a means of checking that the marker may receive all call waiting circuit numbers from the call waiting link circuit. 17

N. Customer not Arranged for Call Waiting Service: This test checks that a non-call waiting customer on a line link frame arranged for call waiting service will be denied call waiting service. . 17

COMPLETING MARKER CIRCUIT TESTS - MISCELLANEOUS

<i>O. Crossed LP Relay Detection Check:</i> This test checks that on a terminating call, the marker will detect if two LP ₂ relays have been operated in the call waiting link circuit and will cause a stop progress indication to be passed to the call waiting link circuit and a trouble record taken.	18
<i>P. Stop Progress:</i> This test checks that on a terminating call, when the call waiting link circuit detects a trouble, it will send a stop progress indication to the marker, which in turn will cause a trouble record to be taken.	19
<i>Q. (Reserved for Future Test)</i> . . .	19
<i>R. (Reserved for Future Test)</i> . . .	19

CALL WAITING LINK CIRCUIT—ORIGINATING CALLS

S. Originating Call Feature: This test checks the following: (1) The marker will pass the customer line location to the call waiting link circuit and will receive from the call waiting link circuit a mark indicating the customer is or is not arranged for call waiting service. (2) The marker will establish dialing protection via level 0 in the call waiting link to prevent incoming calls from

completing to the customer until the dial tone connection has been released. 19

T. Call Waiting Customer Call Waiting Link Appearance: This test provides a ballistic check of a call waiting customer line through the call waiting circuit and the customer vertical on the call waiting link. 20

U. Call Waiting Customer Level 0 Test: This test provides a means of testing level 0 (dialing protection) on a customer vertical in the call waiting link. 20

CALL WAITING LINK CIRCUIT TESTS—TERMINATING CALLS

V. Terminating Call via Call Waiting Circuit: This test checks that when a completing marker finds the customer regular line link appearance busy, the following functions are completed: (1) Marker determines from call waiting link if customer has call waiting service. (2) When customer has call waiting service, the call waiting link circuit attaches a call waiting circuit to the customer line and passes the number of preferred call waiting circuits to the marker. (3) Marker recycles, passes the circuit number to the number group and receives the line location of the selected call waiting circuit. (4) Marker sets linkage to the call waiting circuit from the incoming trunk and releases. (5) Call waiting alerting tone is sent to the customer. (6) When customer flashes the switchhook, call on regular line link appearance is put on hold, incoming call via the call waiting circuit is connected to customer. (7) When customer goes on-hook, all linkage released. 21

W. Call Waiting Customer Regular Line Link and Attached Call Waiting Circuit Line Link Appearances Busy: This test checks that when the customer line link and the attached call waiting circuit line link appearances are both busy, the marker will receive a non

call waiting mark from the call waiting link and will cause a busy signal to be returned to the terminating call. 22

X. Call Waiting Circuit Reserve Test: This test checks that when a call has been terminated to a customer line via a call waiting circuit and the calling party goes on-hook while the regular appearance remains busy, a subsequent call to the call waiting customer while he remains off-hook is completed via the same call waiting circuit. 23

Y. Call Waiting Customer On-Hook—Two Terminating Calls: This test checks that when the customer is being rung from an incoming call on the regular line link appearance, a second incoming call will receive a busy indication. 23

Z. Call Waiting Circuit Selection: This test checks the selection of a particular call waiting circuit. This test also verifies the directory number assignment of the call waiting circuit in the call waiting link circuit. 24

CALL WAITING LINK CIRCUIT TESTS—MISCELLANEOUS

AA. Call Waiting Link Made Busy: This test checks that a made busy call waiting link may be seized for testing, but may not be seized for service. 24

AB. Call Waiting Circuit Made Busy: This test checks that a made busy call waiting circuit may be seized for testing. 25

AC. Call Waiting Circuit Preference: This test provides a method for checking call waiting circuit preference in the call waiting link circuit. 26

AD. All Call Waiting Circuits Busy: This test checks that when all call waiting circuits are busy, the call waiting link circuit sends an NCW mark to the marker indicating that a busy indication is to be returned by the marker to the incoming call. 29

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AE. Crossed Select Magnet Test: This test checks that the call waiting link circuit will detect crossed select magnets on the call waiting link, send a stop progress indication to the marker which in turn will cause a trouble record to be taken.	30
AF. Crossed Hold Magnet Test—Dial Tone Marker Usage: This test checks that on a dial tone job, the call waiting link circuit will detect crossed hold magnets on the call waiting link, send a stop progress indication to the marker which in turn will cause a trouble record to be taken.	30
AG. Crossed Hold Magnet Test—Completing Marker Usage: This test checks that on a terminating call, the call waiting link circuit will detect crossed hold magnets on the call waiting link, send a stop progress indication to the marker which in turn will cause a trouble record to be taken.	30
AH. Hold Magnet Check—Dial Tone Marker Usage: This test checks that on an originating call, should the line hold magnet check fail in the call waiting link, the dial tone marker will cause a trouble record to be taken, then continue to set up the connection to an originating register.	31
AI. Hold Magnet Check—Completing Marker Usage: This test checks that on a terminating call, should the line hold magnet check fail in the call waiting link circuit, the completing marker will time out and cause a trouble record to be taken.	31
AJ. Standing Cross Test: This test checks that when the SXT relay operates in the call waiting link circuit, a stop progress indication is passed to the marker which will cause a trouble record to be taken.	32

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AK. Operator No-Test Call—Call Waiting Customer Connected to Level 0.	32
AL. Operator No-Test Call—Customer Regular Line Link Appearance Busy, Call Waiting Appearance Idle	33
AM. Operator No-Test Call—Call Waiting Circuit Attached to Customer Call Waiting Link Appearance.	34

CALL WAITING CIRCUIT TESTS—TERMINATING CALLS

AN. Terminating Call Completed via Call Waiting Circuit: This test checks alerting, transfer, and disconnect features of the call waiting circuit. This test also checks the handling of new terminating calls following disconnect of previous calls. This test also provides test procedures to be applied at the call waiting link frame in order to allow observation of circuit operation.	35
AO. Terminating Call Completed via Call Waiting Circuit When Call Waiting Customer Returns to On-Hook Condition: This test checks that when a call waiting customer returns to an on-hook condition without answering a waiting call, the call waiting circuit will pass ringing from the incoming trunk to the customer telephone set. This test also checks that a transfer flash of greater than 1.2 seconds will cause the linkage to be released in the call waiting link.	38
AP. (Reserved for Future Test)	39
AQ. Call Waiting Circuit Reserve Test: This test checks that when a call has been terminated to a customer line via a call waiting circuit and the calling party goes on-hook while the regular appearance remains busy, a subsequent call to the call waiting customer while he remains off-hook is completed via the same call waiting circuit.	39

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CALL WAITING CIRCUIT TESTS—MISCELLANEOUS	
AR. T1 Timer Test: This test checks that a second alerting tone from the call waiting circuit is sent to the call waiting customer in 8.3 to 15 seconds following the first alerting tone.	40
AS. T2 Timer Test: This test checks that when the call waiting link circuit has selected a call waiting circuit, linkage must be established between the incoming trunk and the selected call waiting circuit in 3.5 to 6.2 seconds, otherwise the call waiting circuit will return to an idle condition.	41
AT. TM2 (SB), TM1 (SM), and TM (TO) Timers: This test prescribes the testing of the following times in the call waiting circuits: TM2 (SB) timer - 200 ms, TM1 (SM) timer - 60ms, and TM (TO) timer -1.2 seconds.	41
1.04 Tests B, S, AA, and AC will deny call waiting service to the customer or customers on the selected line link frame.	
1.05 The CWRL lamp lighted on test calls via the customer vertical appearance in the call waiting link indicates that the customer has gone off-hook, causing the test call to be released.	
1.06 The master test frame must be released upon receipt of dial tone to avoid routing the customer line to permanent signal.	
1.07 Lettered Steps: A letter a, b, c, etc, added to a step number in Parts 3 and 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.	
1.08 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 selection of circuits and test conditions are not given. Precise instructions for the use of these variable means are given in Section 218-106-301.

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

1.10 The statement between the asterisks (* ___ *) after action or verification statements is added to clarify the function being simulated in the test procedures of Part 4.

1.11 Tests A, B, and V verify cross-connections when call waiting service is given to a customer.‡

2. APPARATUS

Tests A Through F, H, J Through P, S Through AB, AD Through AO, AQ, AR, AS

2.01 Master test control circuit SD-25800-01.

2.02 Master test frame trunk circuit SD-25918-01.

Tests A, B, K, T Through AB, AD, AG, AI, AM, AN, AO, AQ, AR, AS

2.03 Voltmeter test circuit SD-25792-01.

Tests B, K, T, U Through AB, AM, AN, AO, AQ, AR

2.04 1011G dial hand test set (handset), equipped with 2W38A cord assembly, consisting of W2CK cord, 310 plug, and 471A jack to be used in TM2 jack of trunk test circuit or CW jack at call waiting link frame. (TALK-MON switch in TALK position.)

Tests V, AN, AO, AR

2.05 1011G dial hand test set (handset), equipped with 2W38A cord assembly, consisting of W2CK cord, 310 plug, and 471A jack to be used in TM1 jack of trunk test circuit. (TALK-MON switch in TALK position.)

SECTION 218-111-501

Tests AC, AN

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

Tests AN, AR, AS

2.07 KS-3008 stopwatch or equivalent.

3. PREPARATION

Tests AN, AS

2.08 32A test set.

3. PREPARATION

Note: Refer to 1.08, 1.09

STEP	ACTION	TEST														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	At MTF — Restore all keys and switches.	X	X	X	X	X	X		X		X	X	X	X	X	X
2	Momentarily operate RL key.	X	X	X	X	X	X		X		X	X	X	X	X	X
3	Select LT class of test.	X	X	—	—	—	—		—		—	X	—	—	—	—
4	Select DT class of test.	—	—	X	X	X	X		—		—	—	X	—	—	—
5	Select INC class of test.	—	—	—	—	—	—		—		X	—	—	X	X	X
6	Select ORIG class of test.	—	—	—	—	—	—		X		—	—	—	—	—	—
7	Select A- through D-digits assigned to a particular line arranged for call waiting service.	X	X	—	—	—	—		—		—	—	—	—	—	—
8	Select A- through D-digits assigned to any line arranged for call waiting service.	—	—	—	—	—	—		—		X	X	—	X	—	X
9	Select any line location arranged for call waiting service on a particular line link frame.	—	—	X	X	X	X		X		—	—	X	—	—	—
10	Set FT-, FU- switches to select line link frame associated with selected line or line location.*	—	X	—	—	—	—		—		X	X	—	X	—	—
11	Select incoming class of call (OA, OB, etc) and associated translator indication.	X	X	—	—	—	—		—		X	X	—	X	X	X
12	Select office designation when selected line is in theoretical or extra-theoretical number series.	X	X	—	—	—	—		—		X	X	—	X	X	X
13	Select class of service, rate treatment as required for selected line location.	—	—	X	X	X	X		—		—	—	X	—	—	—
14	Select originating class of call and associated translator indication.	—	—	—	—	—	—		X		—	—	—	—	—	—
15	Select incoming trunk class.	—	—	—	—	—	—		—		X	—	—	X	X	X
16	Select originating register group	—	—	X	X	X	X		—		—	—	X	—	—	—
17	Select dial tone marker.	—	—	X	X	X	X		—		—	—	X	—	—	—
18	Select special marker 0 or 1.	X	X	—	—	—	—		—		—	—	—	—	—	—
19	Select completing marker.		—	—	—	—	—		X		X	X	—	X	X	X
20	Set CWC- switch to select a particular call waiting circuit.		X	—	—	—	—		—		—	X	X	—	—	—
21	Operate CWTV key.*		—	X	X	X	X		X		X	X	X	X	—	X
22	Operate CWCV key.*		X	—	—	—	—		—		—	—	—	—	X	—
23	Operate LBL key.		—	—	—	—	—				X	X	—	X	X	X
24	Operate TLK key.		X	X	X	X	X				X	X	X	X		
25	Plug hand telephone set into TM1 jack.		—													
26	Plug hand telephone set into TM2 jack.		X										X			

* CWT lamp will light when FT-, FU- switches are set and CWTV or CWCV key operated.

— Omit Step.

Proceed to METHOD

SECTION 218-111-501

3. PREPARATION

Note: Refer to 1.08, 1.09

STEP	ACTION	TEST														
		P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	At MTF — Restore all keys and switches.	X			X	X	X	X	X	X	X	X	X	X	X	X
2	Momentarily operate RL key.	X			X	X	X	X	X	X	X	X	X	X	X	X
3	Select LT class of test.	-			-	X	X	X	X	X	X	X	X	X	-	X
4	Select DT class of test.	-			X	-	-	-	-	-	-	-	-	-	-	-
5	Select INC class of test.	X			-	-	-	-	-	-	-	-	-	-	X	-
6	Select ORIG class of test.	-			-	-	-	-	-	-	-	-	-	-	-	-
7	Select A- through D-digits assigned to a particular line arranged for call waiting service.	-			-	X	X	-	-	-	-	-	-	-	-	-
8	Select A- through D-digits assigned to any line arranged for call waiting service.	X			-	-	-	X	X	X	X	X	X	X	X	X
9	Select any line location arranged for call waiting service on a particular line link frame.	-			X	-	-	-	-	-	-	-	-	-	-	-
10	Set FT-, FU- switches to select line link frame associated with selected line or line location.*	-			-	X	X	X	X	X	X	X	X	X	X	X
11	Select incoming class of call (OA, OB, etc) and associated translator indication.	X			-	X	X	X	X	X	X	X	X	X	X	X
12	Select office designation when selected line is in theoretical or extra-theoretical number series.	X			-	X	X	X	X	X	X	X	X	X	X	X
13	Select class of service, rate treatment as required for selected line location.	-			X	-	-	-	-	-	-	-	-	-	-	-
14	Select originating class of call and associated translator indication.	-			-	-	-	-	-	-	-	-	-	-	-	-
15	Select incoming trunk class.	X			-	-	-	-	-	-	-	-	-	-	X	-
16	Select originating register group.	-			X	-	-	-	-	-	-	-	-	-	-	-
17	Select dial tone marker.	-			X	-	-	-	-	-	-	-	-	-	-	-
18	Select special marker 0 or 1.	-			-	X	X	-	-	-	-	-	-	-	-	-
19	Select completing marker.	X			-	-	-	X	X	X	X	X	X	X	X	X
20	Set CWC- switch to select a particular call waiting circuit.	-			-	X	-	X	X	X	X	-	X	X	-	-
21	Operate CWTV key.*	X			X	-	-	X	X	X	X	X	X	X	X	X
22	Operate CWCV key.*	-			-	X	X	-	-	-	-	-	-	-	-	-
23	Operate LBL key.	X			-	-	-	X	X	X	X	X	X	X	X	X
24	Operate TLK key.				X	X	X	X	X	X	X	X	X	X	X	X
25	Plug hand telephone set into TM1 jack.				-			X	-	-	-	-	-	-		
26	Plug hand telephone set into TM2 jack.				X			X	X	X	X	X	X	X		

* CWT lamp will light when FT-, FU- switches are set and CWTV or CWCV key operated.

- Omit Step.

Proceed to METHOD

3. PREPARATION

Note: Refer to 1.08, 1.09

STEP	ACTION	TEST														
		AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1	At MTF — Restore all keys and switches.	X	X	X	X	X	X	X	X	X	X	X		X	X	X
2	Momentarily operate RL key.	X	X	X	X	X	X	X	X	X	X	X		X	X	X
3	Select LT class of test.	-	-	X	-	X	-	-	X	X	X	X		X	X	X
4	Select DT class of test.	X	X	-	X	-	X	X	-	-	-	-		-	-	-
5	Select INC class of test.	-	-	-	-	-	-	-	-	-	-	-		-	-	-
6	Select ORIG class of test.	-	-	-	-	-	-	-	-	-	-	-		-	-	-
7	Select A- through D-digits assigned to a particular line arranged for call waiting service.	-	-	-	-	-	-	-	-	-	-	-		-	-	-
8	Select A- through D-digits assigned to any line arranged for call waiting service.	-	-	X	-	X	-	-	X	-	X	X		X	X	X
9	Select any line location arranged for call waiting service on a particular line link frame.	X	X	-	X	-	X	X	-	-	-	-		-	-	-
10	Set FT-, FU- switches to select line link frame associated with selected line or line location.*	-	-	X	-	X	-	-	X	X	X	X		X	X	X
11	Select incoming class of call (OA, OB, etc) and associated translator indication.	-	-	X	-	X	-	X	X	X	X	X		X	X	X
12	Select office designation when selected line is in theoretical or extra-theoretical number series.	-	-	X	-	X	-	-	X	X	X	X		X	X	X
13	Select class of service, rate treatment as required for selected line location.	X	X	-	X	-	X	X	-	-	-	-		-	-	-
14	Select originating class of call and associated translator indication.	-	-	-	-	-	-	-	-	-	-	-		-	-	-
15	Select incoming trunk class.	-	-	-	-	-	-	-	-	-	-	-		-	-	-
16	Select originating register group.	X	X	-	X	-	X	X	-	-	-	-		-	-	-
17	Select dial tone marker.	X	X	-	X	-	X	X	-	-	-	-		-	-	-
18	Select special marker 0 or 1.	-	-	-	-	-	-	X	X	-	-	-		-	-	-
19	Select completing marker.	-	-	X	-	X	-	-	-	-	X	X		X	X	X
20	Set CWC- switch to select a particular call waiting circuit.	-	-	X	-	X	-	-	-	X	X	X		X	X	X
21	Operate CWTV key.*	X	X	X	X	X	X	X	X	X	X	X		X	X	X
22	Operate CWCV key.*	-	-	-	-	-	-	-	-	-	-	-		-	-	-
23	Operate LBL key.	-	-	X	-	X	-	X	X	X	X	X		X	X	X
24	Operate TLK key.	X	X	X	X	X	X	X	X	X	X	X		X	X	X
25	Plug hand telephone set into TM1 jack.											X		-	-	
26	Plug hand telephone set into TM2 jack.										X			X	X	

* CWT lamp will light when FT-, FU- switches are set and CWTV or CWCV key operated.

- Omit Step.

Proceed to METHOD

4. METHOD

STEP	ACTION	VERIFICATION
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CUSTOMER LINE TESTS

A. Customer Regular Line Link Appearance

Note: Refer to 1.11.

19	Momentarily operate ST key.	If selected line is busy or connected to a call waiting circuit— BY lamp lighted. Proceed to Step 25. If selected line is idle— BY lamp not lighted. S lamp lighted. Proceed to Step 20.
20	Operate VMT1 key.	
21	Operate G key.	Steady voltmeter reading when line is fully charged.
22	Operate T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
23	Restore T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
24	Restore G, VMT1 keys.	Voltmeter returns to zero deflection.
25	Momentarily operate RL key.	All lamps extinguished.
26	Restore all keys and switches not required in next test.	

B. Customer Call Waiting Link Appearance

Note: Refer to 1.04 and 1.11.

27	Operate ANS key.	
28	Momentarily operate ST key.	If selected line is busy— BY lamp lighted. If selected line is connected to a call waiting circuit— BY, NCW lamps lighted. Proceed to Step 36. If selected line is idle— CWH lamp lighted. Proceed to Step 29.

STEP	ACTION	VERIFICATION
29	When CWH lamp is lighted— Momentarily operate ST key.	CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆
30	Restore ANS key.	◆PK2,◆ CWSV lamps extinguished.
31	Operate VMT1 key.	
32	Operate G key.	Steady voltmeter reading when line is fully charged.
33	Operate T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
34	Restore T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
35	Restore G, VMT1, CWCV keys.	CWT, CWH lamps extinguished. Voltmeter reading returns to a zero deflection.
36	Momentarily operate RL key.	All lamps extinguished.
37	Restore all keys and switches not required in next text.	
38a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	

DIAL TONE MARKER CIRCUIT TESTS

C. Originating Call Feature

25	Operate NTC key.	
26	Momentarily operate ST key. (Refer to 1.06.)	CWK, CWL, LOK lamps lighted. Dial tone heard. *Level 0 set in call waiting link and continuity through level 0 to test vertical.*
27	Restore CWTV key.	CWT, LOK lamps extinguished. Dial tone silenced.
28	Momentarily operate RL key.	All lamps extinguished.
29	Restore all keys and switches not required in next test.	

D. Continuity Test Failure Feature

25	Operate NTC key.	
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STEP	ACTION	VERIFICATION
26	Operate RLH key. *Opens tip and ring leads. *	
27	Momentarily operate ST key. (Refer to 1.06.)	CWL, RLH, CWSP lamps lighted. LOK lamp not lighted. Dial tone heard. Trouble record taken. CWK, CWF, GLH designations perforated. CON, HTR designations <i>not</i> perforated. (If HTR designation is perforated [marker in heavy traffic], operate RL key and momentarily operate ST key until HTR designation is not perforated.) *DT marker fails on continuity, releases, then test is made through off-normal contact of test vertical.*
28	Restore CWTV key.	CWT lamp extinguished. Dial tone silenced.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore RLH key.	
31	Restore all keys and switches not required in next test.	

E. Crossed LP Relay Detection Check

25	Operate NTC key.	
26	Set CW switch to XCW position.	
27	Momentarily operate ST key. (Refer to 1.06.)	CWL, CWSP lamps lighted. Dial tone heard. Trouble record taken. CWF, XCW designations perforated.
28	Restore CWTV key.	CWT lamp extinguished. Dial tone silenced.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	

F. Hold Magnet Check

25	Operate NTC key.	
26	Set CW switch to LB position.	

STEP	ACTION	VERIFICATION
27a	If HTR key is provided— Operate HTR key.	
28b	If HTR key is not provided— At marker frame— Block nonoperated HTT relay.	
29b	Block operated HTR relay.	
30	At MTF— Momentarily operate ST key.	CWL, CWSP, LK2, MRL lamps lighted. Trouble record taken. HTR, CWF designations perforated. HMS designation <i>not</i> perforated.
31	Restore CWTV key.	CWT lamp extinguished.
32	Momentarily operate RL key.	All lamps extinguished.
33b	If HTR key is not provided— At marker frame— Remove blocking tools from HTT, HTR relays.	
34	At MTF— Restore all keys and switches not required in next test.	

G. (Reserved for Future Test)

COMPLETING MARKER CIRCUIT TESTS—ORIGINATING CALLS

H. Originating Call From Call Waiting Line Routed to Permanent Signal

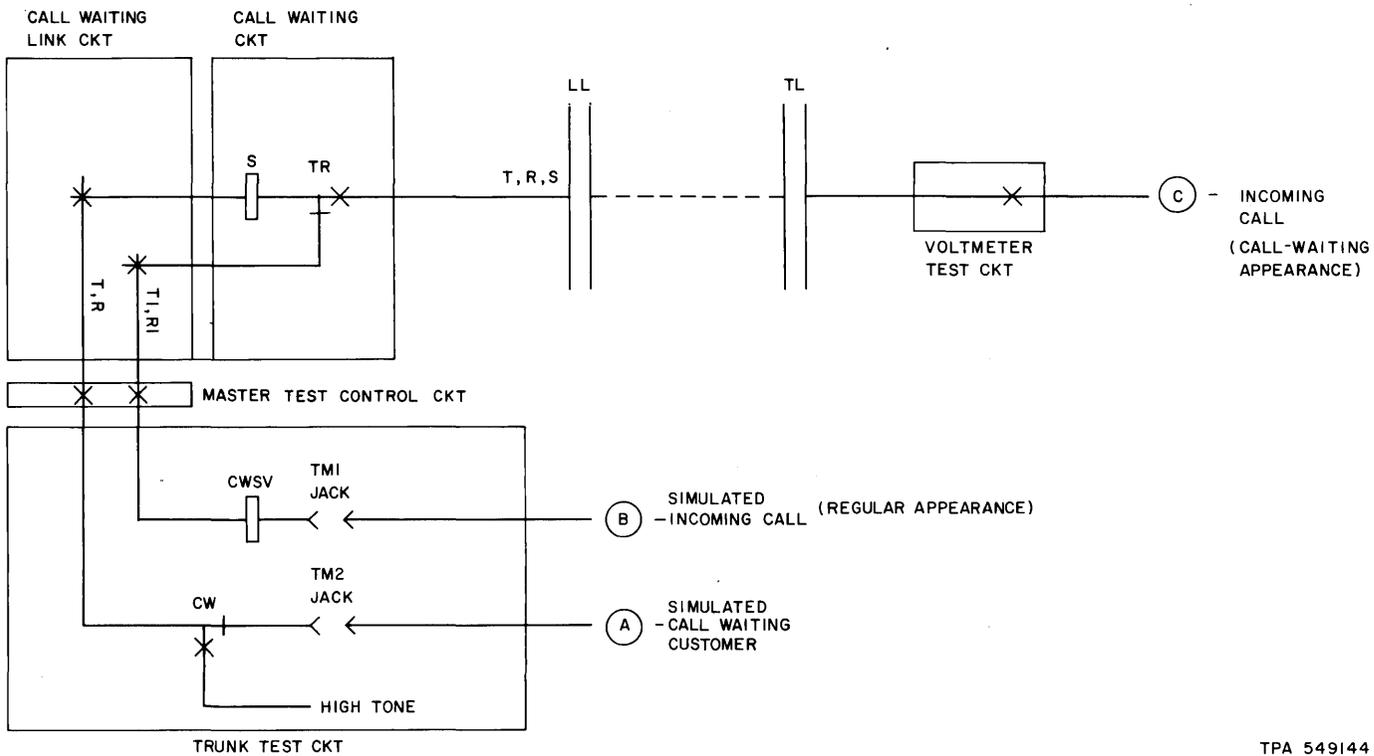
23	Select class of service, rate treatment as required for selected line location.	
24	Select PS (permanent signal) auxiliary originating translator indication.	
25	Set CW switch to PS position.	
26	Operate REC key.	
27	Momentarily operate ST key.	DIS1, LK2, MRL lamps lighted. CWK lamp lighted. Trouble record taken. CWK, PS designations perforated.
28	Restore CWTV key.	CWT lamp extinguished.
29	Momentarily operate RL key.	All lamps extinguished.

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STEP	ACTION	VERIFICATION
30	Restore all keys and switches not required in next test.	
I. (Reserved for Future Test)		
COMPLETING MARKER CIRCUIT TESTS—TERMINATING CALLS		
J. Customer Regular Appearance Busy, Call Waiting Link Appearance Idle		
25	Select any trunk link frame.	
26a	If a particular call waiting circuit is required— Set CWC switch to select particular call waiting circuit.	
27	Operate REC, ANS keys.	
28	Momentarily operate ST key.	If selected call waiting circuit is busy— BY, NCW lamps lighted. If call waiting circuit is idle— CWSV, DIS1, LK2, MRL, CWK lamps lighted. Trouble record taken. Line location of call waiting circuit designations perforated.
29	Restore CWTV key.	CWT, CWSV lamps extinguished.
30	Momentarily operate RL key.	All lamps extinguished.
31	Restore all keys and switches not required in next test.	
K. Call Waiting Customer Regular Line Link and Attached Call Waiting Circuit Line Link Appearances Busy		
27	Operate T, ANS key.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C via call waiting circuit. (See Fig. 1.)*
29	Momentarily restore ANS key. *A flashes. *	CWSV lamp remains lighted. ◆PK2,◆ S lamps extinguished. High tone heard in MTF test receiver. *A connected to C, B on hold.*

STEP	ACTION	VERIFICATION
30	Operate TM1, TM2 keys.	CWTH lamp lighted.
31	Momentarily operate RL key.	All lamps extinguished except CWT, CWSV, CWTH lamps.
32	Restore the following selections: LT class of test, Incoming class of call and translator indication, and CWC switch to OFF.	
33	Select IAO class of test.	
34	Select originating class of call and associated translator indication.	
35	Select class of service, rate treatment, as required, having access to selected line.	
36	Operate KY key.	
37	Select A_ through G_ digits having access to same line selected in Step 8.	
38	Momentarily operate ST key.	TS, NCW, DIS1, LK2, MRL lamps lighted. Busy tone heard in handset at TM2 jack.
39	Restore TM1, TM2, CWTV keys.	CWT, CWTH, CWSV lamps extinguished. Busy tone silenced.
40	Momentarily operate RL key.	All lamps extinguished.
41	Restore all keys and switches not required in next test.	
42b	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
L. Call Waiting Customer Connected to Level 0 on Call Waiting Link		
25	Operate NTC key.	
26	Momentarily operate ST key. (Refer to 1.06.)	CWL, CWK, LOK lamps lighted. Dial tone heard.
27	Operate CWH key. *Hold level 0. *	
28	Momentarily operate RL key.	All lamps extinguished except CWT, LOK lamps. Dial tone silenced. *Level 0 held by MTF.*

STEP	ACTION	VERIFICATION
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Fig. 1—Call Waiting Circuit Testing

- 29 Restore the following selections:
DT class of test, originating register group;
VG, HG, and VF of line location, marker,
and NTC key.
- 30 Select LT class of test.
- 31 Select A_ through D_ digits assigned to line
location selected in Step 10.
- 32 Select incoming class of call (OA, OB) and
associated translator indication.
- 33 Select office designation of line selected in
Step 10.
- 34 Select completing marker.
- 35 Operate LBL key.
- 36 Operate T key.

STEP	ACTION	VERIFICATION
37	Momentarily operate ST key.	LVO, NCW, BY lamps lighted. *Completing marker finds line set on level 0, returns busy indication.*
38	Restore CWH, CWTV keys.	CWT, LOK lamps extinguished.
39	Momentarily operate RL key.	All lamps extinguished.
40	Restore all keys and switches not required in next test.	

M. Call Waiting Circuit Identification

25	Operate REC, ANS keys.	
26	Select any trunk link frame.	
27	Set CWC_ switch to select call waiting circuit. (Refer to Table A.)	
28	Momentarily operate ST key.	If selected call waiting circuit is service busy— NCW lamp lighted. If selected call waiting circuit is idle— DIS1, LK2, MRL, CWK lamps lighted. Trouble record taken. Line location of call waiting circuit designations perforated. (Refer to Table A.)
29	Momentarily operate RL key.	All lamps extinguished except CWT lamp.
30	Repeat Steps 9, 12, 26 through 29 for call waiting circuit directory numbers (Table A) until all TH, H, T, and U leads have been checked on a 2/5 basis.	
31	Restore CWTV key.	CWT lamp extinguished.
32	Restore all keys and switches not required in next test.	

N. Customer Not Arranged for Call Waiting Service

24	Select any trunk link frame.	
25	Select A_ through D_ digits assigned to a particular line not arranged for call waiting service, but on a line link frame arranged for call waiting service.	
26	Momentarily operate ST key.	DIS1, MRL, BY, NCWC, NCW lamps lighted.
27	Momentarily operate RL key.	All lamps extinguished.

STEP	ACTION	VERIFICATION
25	Set CW switch to XCW position.	
26	Momentarily operate ST key.	TRL, CWSP lamps lighted. Trouble record taken. CWF, XCW/XVGB designations perforated.
27	Restore CWTV key.	CWT lamp extinguished.
28	Momentarily operate RL key.	All lamps extinguished.
29	Restore all keys and switches not required in next test.	
P. Stop Progress		
24	Select any trunk link frame.	
25	Set CW switch to XH position.	
26	Momentarily operate ST key.	TRL, CWSP lamps lighted. Trouble record taken. CWF, XHM, XCW/XVGB designations perforated.
27	Restore CWTV key.	CWT lamp extinguished.
28	Momentarily operate RL key.	All lamps extinguished.
29	Restore all keys and switches not required in next test.	
Q. (Reserved For Future Test)		
R. (Reserved For Future Test)		
CALL WAITING LINK CIRCUIT—ORIGINATING CALLS		
S. Originating Call Feature		
25	Operate NTC key.	
26	Momentarily operate ST key. (Refer to 1.06.)	CWK, CWL, LOK lamps lighted. Dial tone heard. *Level 0 set in call waiting link and continuity through level 0 to test vertical.*
27	Restore CWTV key.	CWT, LOK lamps extinguished. Dial tone silenced.
28	Momentarily operate RL key.	All lamps extinguished.
29	Restore all keys and switches not required in next test.	

STEP	ACTION	VERIFICATION
T. Call Waiting Customer Call Waiting Link Appearance		
	<i>Note:</i> Refer to 1.04.	
27	Operate ANS key.	
28	Momentarily operate ST key.	If selected line is busy— BY lamp lighted. If selected line is connected to a call waiting circuit— BY, NCW lamps lighted. Proceed to Step 36. If selected line is idle— CWH lamp lighted. Proceed to Step 29.
29	When CWH lamp is lighted— Momentarily operate ST key.	CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆
30	Restore ANS key.	◆PK2,◆ CWSV lamps extinguished.
31	Operate VMT1 key.	
32	Operate G key.	Steady voltmeter reading when line is fully charged.
33	Operate T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
34	Restore T1 REV key.	Momentary (ballistic) voltmeter deflection returning to a steady reading.
35	Restore G, VMT1, CWCV keys.	Voltmeter reading returns to a zero deflection. CWT, CWH lamps extinguished.
36	Momentarily operate RL key.	All lamps extinguished.
37	Restore all keys and switches not required in next test.	
38a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
U. Call Waiting Customer Level 0 Test		
	<i>Note:</i> Refer to 1.05 and 1.11.	
25	Operate ANS, LVOK keys.	

STEP	ACTION	VERIFICATION
26	Momentarily operate ST key.	If selected line is busy— BY lamp lighted. If selected line is connected to a call waiting circuit— BY, NCW lamps lighted. Proceed to Step 29. If selected line is idle— CWH lamp lighted. Proceed to Step 27.
27	When CWH lamp is lighted— Momentarily operate ST key.	BY, LVO, NCW lamps lighted. CWSV lamp not lighted.
28	Restore CWCV, ANS keys.	CWT, CWH lamps extinguished.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	

CALL WAITING LINK CIRCUIT TESTS—TERMINATING CALLS

V. Terminating Call via Call Waiting Circuit

27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack and not heard in handset at TM1 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C via call waiting circuit.*
29	Momentarily restore ANS key. *A flashes.*	CWSV lamp remains lighted. ◆PK2,◆ S lamps extinguished. High tone heard in MTF test receiver. *A connected to C, B on hold.*
30	Restore CWTV, TLK, ANS, T keys.	CWT, CWSV lamps extinguished. S lamp lighted. High tone silenced in MTF test receiver.
31	Momentarily operate RL key.	All lamps extinguished.
32	Restore all keys and switches not required in next test.	
33a	If no further tests are to be performed— Remove plugs of handsets from TM1, TM2 jacks.	

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STEP	ACTION	VERIFICATION
W. Call Waiting Customer Regular Line Link and Attached Call Waiting Circuit Line Link Appearances Busy		
27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C to call waiting circuit.*
29	Momentarily restore ANS key. *A flashes. *	CWSV lamp remains lighted. ◆PK2,◆ S lamps extinguished. High tone heard in MTF test receiver. *A connected to C, B on hold.*
30	Operate TM1, TM2 keys.	CWTH lamp lighted.
31	Momentarily operate RL key.	All lamps extinguished except CWT, CWSV, CWTH lamps.
32	Restore the following selections: LT class of test, Incoming class of call and translator indication, and CWC switch to OFF.	
33	Select IAO class of test.	
34	Select originating class of call and associated translator indication.	
35	Select class of service, rate treatment, as required, having access to selected line.	
36	Operate KY key.	
37	Select A_ through G_ digits having access to same line selected in Step 8.	
38	Momentarily operate ST key.	TS, NCW lamps lighted. DIS1, LK2, MRL lamps lighted. Busy tone heard in handset at TM2 jack.
39	Restore TM1, TM2, CWTV keys.	CWT, CWTH, CWSV lamps extinguished. Busy tone silenced.
40	Momentarily operate RL key.	All lamps extinguished.
41	Restore all keys and switches not required in next test.	

STEP	ACTION	VERIFICATION
42b	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
X. Call Waiting Circuit Reserve Test		
27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆
29	Restore T key.	◆PK2 lamp extinguished.◆
30	Momentarily operate RL key.	S, CWK lamps extinguished. CWT, CWSV lamps remain lighted.
31	Operate T key.	◆PK2 lamp lighted.◆
32	Set CWC switch to OFF position.	
33	Momentarily operate ST key.	S, CWK lamps lighted. CWT, CWSV lamps remain lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆
34	Restore CWTV, T, TLK, ANS keys.	CWT, CWSV, ◆PK2◆ lamps extinguished.
35	Momentarily operate RL key.	All lamps extinguished.
36	Restore all keys and switches not required in next test.	
37a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
Y. Call Waiting Subscriber On-Hook—Two Terminating Calls		
27	Momentarily operate ST key.	CWSV lamp not lighted. DIS1, MRL lamps lighted. BY, NCW lamps lighted. *Call set up from A to B, A still on hook. Marker receives NCW mark from call waiting link, sets incoming call from C to busy, and the selected call waiting circuit times out.* Alerting tone not heard in handset at TM2 jack.
28	Restore CWTV key.	CWT lamp extinguished.

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STEP	ACTION	VERIFICATION
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
31a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	

Z. Call Waiting Circuit Selection

27	Set CWC switch to select call waiting circuit under test.	
28	Operate REC, T, ANS keys.	
29	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ Trouble record taken. Line link location assigned to call waiting circuit designations perforated.
30	Restore CWTV, ANS, T keys.	CWT, CWSV, ◆PK2◆ lamps extinguished.
31	Momentarily operate RL key.	All lamps extinguished.
32	Restore all keys and switches not required in next test.	
33a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	

CALL WAITING LINK CIRCUIT TESTS—MISCELLANEOUS

AA. Call Waiting Link Made Busy

Note: Refer to 1.04.

27	At MTF jack, lamp, and key circuit— Insert make busy plug into CWLMB_ jack associated with call waiting link circuit to be tested.	
28	Operate T, ANS keys.	
29	Momentarily operate ST key.	S, CWSV, CWK, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Test call completed via made-busy link.*

STEP	ACTION	VERIFICATION
30	Restore CWTV key.	CWT, CWSV, ◆PK2◆ lamps extinguished.
31	Momentarily operate RL key.	All lamps extinguished.
32	Operate CWTV key.	CWT lamp lighted.
33	Set CW switch to CWLB position.	
34	Operate REC key.	
35	Momentarily operate ST key.	BY, MRL lamps lighted. Trouble record taken. LB designation perforated. *Service call denied completion.*
36	Restore CWTV key.	CWT lamp extinguished.
37	Momentarily operate RL key.	All lamps extinguished.
38	Remove make-busy plug placed in Step 27.	
39	Restore all keys and switches not required in next test.	
40a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	

AB. Call Waiting Circuit Made Busy

27	Operate T, ANS keys.	
28	When call waiting circuit selected is idle— At call waiting link circuit— Operate MB switch associated with selected call waiting circuit.	
29	At MTF— Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Test call completed via made busy call waiting circuit.*
30	Restore CWTV key.	CWT, CWSV, ◆PK2◆ lamps extinguished.
31	Momentarily operate RL key.	All lamps extinguished.
32	At call waiting link circuit— Restore MB switches operated in Step 28.	

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STEP	ACTION	VERIFICATION
33	At MTF— Restore all keys and switches not required in next test.	
34a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
AC. Call Waiting Circuit Preference		
<i>Note:</i> Refer to 1.04.		
25	Select any trunk link frame.	
26	Operate ANS key.	
27	At MTF jack, lamp, and key circuit— Insert make-busy plug into CWLMB_ jack associated with call waiting link to be tested.	
28	At call waiting link under test— Insert plug of 32A test set into RC jack on miscellaneous circuit.	
<i>Note:</i> Before any further steps are performed, all call waiting circuits associated with link under test must be idle.		
29	Manually operate EP1, EP4 relays.	
30	Manually restore EP2, EP3 relays, if operated.	EP1, EP4 relays remain operated.
31	Momentarily operate ST (white) key.	CP1 relay momentarily operated. EP1 relay remains operated. EP4 relay released. EP2 relay operated.
32	Operate MB1 switch.	CB1 relay operated.
33	Momentarily operate RL (red) key.	EP1, EP2, CB1 relays remain operated.
34	Momentarily operate ST (white) key.	CP2 relay momentarily operated. EP2 relay remains operated. EP1 relay released. EP3 relay operated.
35	Operate MB2 switch.	CB2 relay operated.
36	Momentarily operate RL (red) key.	EP2, EP3, CB2 relays remain operated.
37	Momentarily operate ST (white) key.	CP3 relay momentarily operated. EP3 relay remains operated.

STEP	ACTION	VERIFICATION
		EP2 relay released. EP4 relay operated.
38	Operate MB3 switch.	CB3 relay operated.
39	Momentarily operate RL (red) key.	EP3, EP4, CB3 relays remain operated.
40	Momentarily operate ST (white) key.	CP4 relay momentarily operated. EP4 relay remains operated. EP3 relay released. EP1 relay operated.
41	Operate MB4 switch.	CB4 relay operated.
42	Momentarily operate RL (red) key.	EP4, EP1, CB4 relays remain operated.
	<i>Note:</i> Since the number of call waiting circuits assigned to a call waiting link may vary, perform Steps 43a through 63a as required to seize and make-busy all assigned call waiting circuits, then proceed with Step 64.	
43a	If more than 4 call waiting circuits are associated with call waiting link under test— Momentarily operate ST (white) key.	CP5 relay momentarily operated. EP1 relay remains operated. EP4 relay released. EP2 relay operated.
44a	Operate MB5 switch.	CB5 relay operated.
45a	Momentarily operate RL (red) key.	EP1, EP2, CB5 relays remain operated.
46a	Momentarily operate ST (white) key.	CP6 relay momentarily operated. EP2 relay remains operated. EP1 relay released. EP3 relay operated.
47a	Operate MB6 switch.	CB6 relay operated.
48a	Momentarily operate RL (red) key.	EP2, EP3, CB6 relays remain operated.
49a	Momentarily operate ST (white) key.	CP7 relay momentarily operated. EP3 relay remains operated. EP2 relay released. EP4 relay operated.
50a	Operate MB7 switch.	CB7 relay operated.
51a	Momentarily operate RL (red) key.	EP3, EP4, CB7 relays remain operated.
52a	Momentarily operate ST (white) key.	CP8 relay momentarily operated. EP4 relay remains operated.

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STEP	ACTION	VERIFICATION
		EP3 relay released. EP1 relay operated.
53a	Operate MB8 switch.	CB8 relay operated.
54a	Momentarily operate RL (red) key.	EP4, EP1, CB8 relays remain operated.
55a	Momentarily operate ST (white) key.	CP9 relay momentarily operated. EP1 relay remains operated. EP4 relay released. EP2 relay operated.
56a	Operate MB9 switch.	CB9 relay operated.
57a	Momentarily operate RL (red) key.	EP1, EP2, CB9 relays remain operated.
58a	Momentarily operate ST (white) key.	CP10 relay momentarily operated. EP2 relay remains operated. EP1 relay released. EP3 relay operated.
59a	Operate MB10 switch.	CB10 relay operated.
60a	Momentarily operate RL (red) key.	EP2, EP3, CB10 relays remain operated.
61a	Momentarily operate ST (white) key.	CP11 relay momentarily operated. EP3 relay remains operated. EP2 relay released. EP4 relay operated.
62a	Operate MB11 switch.	CB11 relay operated.
63a	Momentarily operate RL (red) key.	EP3, EP4, CB11 relays remain operated.
64	Restore MB2 switch.	CB2 relay released.
65	Manually operate EP1, EP4 relays.	
66	Manually restore EP2, EP3 relays, if operated.	EP1, EP4 relays remain operated.
67	Momentarily operate ST (white) key.	CP2 relay momentarily operated. EP1 relay remains operated. EP4 relay released. EP2 relay operated.
68	Operate MB2 switch.	CB2 relay operated.
69	Momentarily operate RL (red) key.	EP1, EP2, CB2 relays remain operated.
70	Restore MB3 switch.	CB3 relay released.

STEP	ACTION	VERIFICATION
71	Momentarily operate ST (white) key.	CP3 relay momentarily operated. EP2 relay remains operated. EP1 relay released. EP3 relay operated.
72	Operate MB3 switch	CB3 relay operated.
73	Momentarily operate RL (red) key.	EP2, EP3, CB3 relays remain operated.
74	Restore MB4 switch.	CB4 relay released.
75	Momentarily operate ST (white) key.	CP4 relay momentarily operated. EP3 relay remains operated. EP2 relay released. EP4 relay operated.
76	Operate MB4 switch.	CB4 relay operated.
77	Momentarily operate RL (red) key.	EP3, EP4, CB4 relays remain operated.
78	Restore MB1 switch.	CB1 relay released.
79	Momentarily operate ST (white) key.	CP1 relay momentarily operated. EP4 relay remains operated. EP3 relay released. EP1 relay operated.
80	Momentarily operate RL (red) key.	EP4, EP1 relays remain operated.
81	Restore all MB_ switches.	All CB_ relays released.
82	Remove plug of 32A test set from RC jack on miscellaneous circuit.	
83	At MTF jack, lamp, and key circuit— Remove make-busy plug placed in Step 27.	
84	Restore all keys and switches not required in next test.	
AD. All Call Waiting Circuits Busy		
25	Operate ANS key.	
26	Set CW switch to CWCB position.	
27	Momentarily operate ST key.	DIS1, MRL lamps lighted. CWSV, BY, NCW lamps lighted.
28	Restore CWTV key.	CWSV, CWT lamps extinguished.
29	Momentarily operate RL key.	All lamps extinguished.

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STEP	ACTION	VERIFICATION
30	Restore all keys and switches not required in next test.	
AE. Crossed Select Magnet Test		
25	Operate NTC key.	
26	Set CW switch to XS position.	
27	Momentarily operate ST key. (Refer to 1.06.)	CWL, CWSP lamps lighted. Dial tone heard. Trouble record taken. CWF, XCW, XS designations perforated.
28	Restore CWTV key.	CWT lamp extinguished. Dial tone silenced.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
AF. Crossed Hold Magnet Test—Dial Marker Usage		
25	Operate NTC key.	
26	Set CW switch to XH position.	
27	Momentarily operate ST key. (Refer to 1.06.)	CWL, CWSP lamps lighted. Dial tone heard. Trouble record taken. XCW, CWF, XHM designations perforated.
28	Restore CWTV key.	CWT lamp extinguished. Dial tone silenced.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
AG. Crossed Hold Magnet Test— Completing Marker Usage		
25	Operate ANS key.	
26	Set CW switch to XH position.	
27	Momentarily operate ST key.	CWSP lamp lighted. Trouble record taken. CWF, XCW, XHM designations perforated.

STEP	ACTION	VERIFICATION
28	Restore CWTV key.	CWT lamp extinguished.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
AH. Hold Magnet Check—Dial Tone Marker Usage		
25	Operate NTC key.	
26	Set CW switch to LB position.	
27a	If HTR key is provided— Operate HTR key.	
28b	If HTR key is not provided— At marker frame— Block nonoperated HTT relay.	
29b	Block operated HTR relay.	
30	At MTF— Momentarily operate ST key.	CWL, CWSP, MRL lamps lighted. Trouble record taken. HTR, CWF designations perforated. HMS designation <i>not</i> perforated.
31	Restore CWTV key.	CWT lamp extinguished.
32	Momentarily operate RL key.	All lamps extinguished.
33b	If HTR key is not provided— At marker frame— Remove blocking tools from HTT, HTR relays.	
34	At MTF— Restore all keys and switches not required in next test.	
AI. Hold Magnet Check—Completing Marker Usage		
25	Operate ANS key.	
26	Set CW switch to LB position.	
27	Momentarily operate ST key.	CWSV, TRL lamps lighted. Trouble record taken. CWF, CRS, WT designations perforated. HMS, CWK designations <i>not</i> perforated.
28	Restore CWTV key.	CWT, CWSV lamps extinguished.

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STEP	ACTION	VERIFICATION
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
AJ. Standing Cross Test		
25	Operate NTC key.	
26	Set CW switch to SXT position.	
27	Momentarily operate ST key. (Refer to 1.06.)	CWL, CWK, CWSP lamps lighted. Dial tone heard. Trouble record taken. CWK, XCW, CWF, SXT designations perforated.
28	Restore CWTV key.	CWT lamp extinguished. Dial tone silenced.
29	Momentarily operate RL key.	All lamps extinguished.
30	Restore all keys and switches not required in next test.	
AK. Operator No-Test Cal!—Call Waiting Customer Connected to Level 0		
25	Operate NTC key.	
26	Momentarily operate ST key. (Refer to 1.06.)	CWK, CWL, LOK lamps lighted. Dial tone heard. *Level 0 set in call waiting link.*
27	Operate CWH key.	
28	Momentarily operate RL key.	CWT, LOK lamps remain lighted. *Level 0 held in call waiting link.*
29	Restore the following selections: DT class of test, originating register group; VG, HG, and VF of line location, marker, and NTC key.	
30	Select LT class of test.	
31	Select A_ through D_ digits assigned to line location in Step 9.	
32	Select incoming class of call (0A, 0B) and associated translator indication.	

STEP	ACTION	VERIFICATION
33	Select office designation of line selected in Step 9.	
34	Select completing marker 0 or 1.	
35	Operate CWNT key.	
36	Momentarily operate ST key.	NCW, LVO lamps lighted. *NCW mark passed to marker.* <i>Note:</i> If NTVB lamp is lighted (call waiting link no-test vertical busy), perform Step 38, then repeat Step 36.
37	Restore CWTV, CWH keys.	CWT, LOK lamps extinguished.
38	Momentarily operate RL key.	All lamps extinguished.
39	Restore all keys and switches not required in next test.	
AL.	Operator No-Test Call—Customer Regular Line Link Appearance Busy, Call Waiting Appearance Idle	
25	Operate CWNT key.	
26	Momentarily operate ST key.	NCW, CNTT lamps lighted. *NCW mark passed to the marker to initiate no-test train.*
27	Restore CWTV key.	CWT lamp extinguished.
28	Momentarily operate RL key.	All lamps extinguished.
29	Operate CWTV key.	CWT lamp lighted.
30	Restore LBL key. *Remove busy condition for regular line link appearance.*	
31	Momentarily operate ST key.	NCW lamp lighted. CNTT lamp <i>not</i> lighted. *Call waiting link does not initiate no-test train.*
32	Restore CWTV key.	CWT lamp extinguished.
33	Momentarily operate RL key.	All lamps extinguished.
34	Restore all keys and switches not required in next test.	

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STEP	ACTION	VERIFICATION
AM. Operator No-Test Call—Call Waiting Circuit Attached to Customer's Call Waiting Link Appearance.		
27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, PK2 lamps lighted. Alerting tone heard. PK2 lamp remains lighted. *Set up from A to B, new call comes in from C. (Refer to Fig. 1)*
29	Momentarily operate RL key.	All lamps extinguished except CWT, CWSV, PK2 lamps. *Call waiting circuit remains attached.*
30	Operate CWNT key.	
31	Restore LBL key. *Customer regular appearance appears idle to marker.*	
32	Momentarily operate ST key.	NTCW, MRL lamps lighted. *Call waiting link indicates to marker to use call waiting link no-test vertical.*
33	Momentarily operate RL key.	All lamps extinguished except CWT, CWSV, PK2 lamps. *Call waiting circuit remains attached.*
34	Operate LBL key. *Customer regular appearance appears busy to marker.*	
35	Momentarily operate ST key.	NTCW, CNTT lamps lighted. *Call waiting link indicates to marker to use call waiting link no-test vertical.*
36	Momentarily operate RL key.	All lamps extinguished except CWT, CWSV, PK2 lamps. *Call waiting circuit remains attached.*
37	Operate NTVH key. *Call waiting link no-test vertical appears busy to marker.*	
38	Momentarily operate ST key.	NTVB, CNTT lamps lighted. *Verifies call waiting link no-test vertical busy.*
39	Restore CWTV key.	CWT, CWSV, PK2 lamps extinguished.

STEP	ACTION	VERIFICATION
40	Momentarily operate RL key.	All lamps extinguished.
41	Restore all keys and switches not required in next test.	
42a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
CALL WAITING CIRCUIT TESTS—TERMINATING CALLS		
AN. Terminating Calls Completed via Call Waiting Circuit		
Test Performed at MTF		
25	Plug hand telephone set into TM1 jack.	
26	Plug hand telephone set into TM2 jack.	
27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in handset at TM1 jack. ◆PK2 lamp remains lighted.◆ Start timing. In approximately 10 seconds— Second alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C. (Refer to Fig. 1.)*
29	Momentarily restore ANS key. *A flashes. *	CWSV lamp remains lighted. ◆PK2,◆ S lamps extinguished. High tone heard in MTF test receiver. *A connected to C, B on hold.*
30	Momentarily restore ANS key. *A flashes. *	CWSV lamp remains lighted. S lamp remains extinguished. High tone silenced in MTF test receiver. High tone heard in handset at TM1 jack. *A connected to B, C on hold.*
31	Momentarily operate RL key. *C disconnects.*	CWK lamp extinguished. CWT, CWSV lamps remain lighted. High tone still heard in handset at TM1 jack. *A remains connected to B, C released.*
32	Momentarily restore T key.	◆PK2 lamp lighted.◆ High tone silenced at TM1 jack.

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STEP	ACTION	VERIFICATION
33	Momentarily operate ST key.	CWK, S, lamps lighted. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in handset at TM1 jack. ◆PK2 lamp remains lighted.◆ *New call set up from C to call waiting circuit.*
34	Momentarily restore ANS key. *A flashes.*	CWSV lamp remains lighted. ◆PK2,◆ S lamps extinguished. High tone heard in MTF test receiver. *A connected to C, B on hold.*
35	Restore TLK key. *B disconnects.*	CWSV lamp extinguished. *A remains connected to C.*
36	Operate TLK key.	◆PK2 lamp lighted.◆ High tone silenced in test receiver. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in test receiver. ◆PK2 lamp remains lighted.◆ Start timing. In approximately 10 seconds— Second alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *New call set up from B via line link appearance to call waiting circuit.*
37	Momentarily restore ANS key. *A flashes.*	CWSV lamp lighted. S lamp remains extinguished. ◆PK2 lamp extinguished.◆ High tone heard in handset at TM1 jack and <i>not</i> heard in MTF test receiver. *A connected to B, C on hold.*
38	Restore CWT, T keys.	CWT, CWSV lamps extinguished. High tone silenced.
39	Momentarily operate RL key.	All lamps extinguished.
40	Restore all keys and switches not required in next test.	
41a	If no further tests are to be performed— Remove plugs of handsets from TM1, TM2 jacks.	

Test Performed at Call Waiting Link Frame

Note: This test may be interrupted at any point by momentarily operating the CRL relay on the selected call waiting circuit, then momentarily operating the RL (red) key on

STEP	ACTION	VERIFICATION
	the 32A test set. The test may then be restarted with Step 45.	
	<i>Caution: If failure is encountered or test is not completed, the call waiting circuit will be held out of service until released by one of the following methods: (1) At call waiting link frame, momentarily operate the CRL relay on the selected call waiting circuit, then momentarily operate the RL (red) key on the 32A test set; or (2) At the master test frame, restore the CWTV key, then momentarily operate the RL key.</i>	
42	At MTF— Operate T key.	
43	At call waiting link frame— Plug hand telephone set into CW jack. (TALK-MON key in TALK position.)	
44	Insert plug of 32A test set into RC jack on miscellaneous circuit for all frames.	
45	At 32A test set— Momentarily operate ST (white) key.	At call waiting link frame— Alerting tone heard in hand telephone set. At selected call waiting circuit— TRA, RS, AS relays operated. *Set up from A to B, new call comes in from C. (Refer to Fig. 1.)*
46	At call waiting link frame— Momentarily set TALK-MON switch on hand telephone set to MON position. *A flashes.*	At selected call waiting circuit— TR relay operated. TRA relay released. *A connected to C, B on hold.*
47	At call waiting link frame— Momentarily set TALK-MON switch on hand telephone set to MON position.	At selected call waiting circuit— TR relay released. TRA relay operated. *A connected to B, C on hold.*
48	At 32A test set— Momentarily operate RL (red) key. *C disconnects.*	At selected call waiting circuit— AS relay released.
49	At 32A test set— Momentarily operate ST (white) key.	At call waiting link frame— Alerting tone heard in hand telephone set. At selected call waiting circuit— AS relay operated. *New call set up from C to call waiting circuit.*

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STEP	ACTION	VERIFICATION
50	At call waiting link frame— Momentarily set TALK-MON switch on hand telephone set to MON position. *A flashes.*	At selected call waiting circuit— TR relay operated. TRA relay released. *A connected to C, B on hold.*
51	Block nonoperated RS relay. *B disconnects.*	RSA relay released.
52	Remove blocking tool from RS relay.	RS, RSA relays operated. At call waiting link frame— Alerting tone heard in hand telephone set. *New call set up from B via line link appearance to call waiting circuit.*
53	Momentarily set TALK-MON switch on hand telephone set to MON position. *A flashes.*	At selected call waiting circuit— TR relay released. TRA relay operated. *A connected to B, C on hold.*
54	At call waiting link frame— Set TALK-MON switch on hand telephone set to MON position. *A disconnects.*	At selected call waiting circuit— All relays released except AS, ASA relays.
55	At 32A test set— Momentarily operate RL (red) key.	At selected call waiting circuit— AS, ASA relays released. *Call waiting circuit idle.*
56	At call waiting link frame— Remove plugs of hand telephone set and 32A test set from CW and RC jacks.	
57	At MTF— Restore all keys and switches not required in next test.	
AO. Terminating Call Completed via Call Waiting Circuit When Call Waiting Customer Returns to On-Hook Condition		
27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in handset at TM1 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C via call waiting circuit.*
29	Restore ANS, TLK keys. *A disconnects.*	◆PK2,◆ CWSV lamps extinguished. *B released.*

STEP	ACTION	VERIFICATION
30	Momentarily operate \pm key. *Simulate ringing from incoming trunk.*	R-, R+ lamps flash while \pm key operated. *Ringing from C.*
31	Operate ANS key. *A answers.*	S lamp extinguished. High tone heard in MTF test receiver. *A connected to C.*
32	Operate TLK key.	◆PK2 lamp lighted.◆ High tone silenced in MTF test receiver. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in MTF test receiver. ◆PK2 lamp remains lighted.◆ *New call comes in from B.*
33	Momentarily restore ANS key. *A flashes.*	◆PK2 lamp extinguished.◆ S lamp remains extinguished. CWSV lamp lighted. High tone heard in handset at TM1 jack. *A connected to B, C on hold.*
34	Momentarily restore ANS key. *A flashes.*	CWSV lamp remains lighted. S lamp remains extinguished. High tone silenced in handset at TM1 jack. High tone heard in MTF test receiver. *A connected to C, B on hold.*
35	Restore ANS key for approximately 5 seconds. *A flashes greater than 1.2 seconds.*	CWSV lamp remains lighted. S lamp lighted. *Linkage released to call waiting circuit.* High tone heard in handset at TM1 jack and not heard in MTF test receiver. *A connected to B.*
36	Restore CWT, T keys.	CWT, CWSV lamps extinguished. High tone silenced.
37	Momentarily operate RL key.	All lamps extinguished. *All calls released.*
38	Restore all keys and switches not required in next test.	
39a	If no further tests are to be performed— Remove plugs of handsets from TM1, TM2 jacks.	
AP.	(Reserved For Future Test)	
AQ.	Call Waiting Circuit Reserve Test	
27	Operate T, ANS keys.	

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STEP	ACTION	VERIFICATION
28	Momentarily operate ST key.	S, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ *Set up from A to B, new call comes in from C via call waiting circuit.*
29	Restore T key.	◆PK2 lamp extinguished.◆
30	Momentarily operate RL key. *Release C from call waiting circuit.*	S, CWK lamps extinguished. CWT, CWSV lamps remain lighted. *A still connected to B.*
31	Operate T key.	◆PK2 lamp lighted.◆
32	Set CWC switch to OFF position.	
33	Momentarily operate ST key.	S, CWK lamps lighted. Call waiting alerting tone heard in handset at TM2 jack and <i>not</i> heard in handset at TM1 jack. ◆PK2 lamp remains lighted.◆ *New call from C set up through call waiting circuit used on previous call.*
34	Restore CWTV, TLK, T, ANS keys.	CWT, CWSV, ◆PK2◆ lamps extinguished.
35	Momentarily operate RL key.	All lamps extinguished.
36	Restore all keys and switches not required in next test.	
37a	If no further tests are to be performed— Remove plugs of handsets from TM1, TM2 jacks.	

AR. T1 Timer Test

27	Operate T, ANS keys.	
28	Momentarily operate ST key.	S, CWT, CWK, CWSV, ◆PK2◆ lamps lighted. Call waiting alerting tone heard in handset at TM2 jack. ◆PK2 lamp remains lighted.◆ Start timing. In 8.3 to 15 seconds— Second alerting tone heard. ◆PK2 lamp remains lighted.◆
29	Restore CWTV, TLK, ANS keys.	CWT, CWSV, ◆PK2◆ lamps extinguished.
30	Momentarily operate RL key.	All lamps extinguished.

STEP	ACTION	VERIFICATION
31	Restore all keys and switches not required in next test.	
32a	If no further tests are to be performed— Remove plug of handset from TM2 jack.	
AS. T2 Timer Test		
25	At call waiting link frame— Operate MB switch associated with selected call waiting circuit.	
26	At miscellaneous circuit for all frames on call waiting link frame— Insert plug of 32A test set into RC jack.	
27	Momentarily operate ST (white) button on 32A test set.	ON relay operated. <i>Start timing.</i> In 3.5 to 6.2 seconds— CRL relay momentarily operates. ON, RS relays released.
28	Momentarily operate RL (red) button on 32A test set.	
29	Remove plug of 32A test set from RC jack.	
30	Restore MB switch operated in Step 25.	
31	Restore all keys and switches not required in next test.	

AT. TM2 (SB), TM1 (SM), and TM (TO) Timers

These timers will be tested in accordance with timing requirements outlined in SD-27787-01.