OUTGOING TRUNKS

TESTS USING MANUAL OUTGOING TRUNK TEST FRAME SD-95476-01

NO. 5 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of testing outgoing trunks from No. 5 crossbar offices using manual outgoing trunk test circuit SD-95476-01.

1.02 The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes. Equipment Test Lists are not affected.

(a) To add Fig. 1 through 7.

(b) To add paragraphs 1.04, 1.06.

(c) To make minor changes, as required.

1.03 The tests covered are:

PAGE

A. Operator Trunks: This test checks the rering features and the ability of the trunk to return supervision when the operator answers. . . . 3

B. Test Line Tests—Panel Call Indicator Trunks: This test checks the ability of the trunk to return audible ringing tone and reverse battery supervisory features. The test line also applies test requirements to the tripping relay. 4

C. Test Line Tests—Revertive Pulse Trunks: This test checks the supervisory features of trunks to tandem offices. On other trunks it checks ringing and supervisory features of the trunk as well as electrical tests of the A or L relays and tripping relays. . 5

D. Test Line Tests—Multifrequency Pulse Trunks: This test checks the supervisory features of trunks to tandem offices. On other trunks it checks supervision and the return of audible ringing tone from the terminating office. 6

E. Test Line Tests—Dial Pulse Trunks: This test checks the supervisory features of trunks to tandem offices. On other trunks it checks supervision and the return of audible ringing tone from the terminating office. 7

F. BELLBOY® Personal Signaling System Trunks: This test checks that proper supervision and announcement is received over the trunk. 9

G. Trunks to 6A Teletypewriter Switchboard: This test checks the supervisory and reseizure features of these trunks. 9

1.04 ▶These tests may affect service, traffic measurements, and/or require an operator, and need to be coordinated with the personnel responsible for these functions.◀

1.05 A list should be prepared for each trunk group, where required, containing the following information: The trunk number, A relay operate, A relay nonoperate, and L relay nonoperate compensating resistances necessary for test purposes. For multifrequency trunk groups, include the type of start pulsing signal. For dial pulse trunk groups, include the type of start pulsing signal and the type of pulsing required.

1.06 ▶The trunk compensating resistance list should contain the minimum loop resistance value for oridinary operation and the maximum

loop resistance to be used for testing the various trunk groups under extreme conditions.

1.07 Information for determining the required compensating resistances may be obtained from trunk test frames and marker and decoder cross-connection records.

1.08 The A relay operate compensating resistance should be of such value that, when added to the trunk loop resistance, the sum is as near as possible to, but not more than, the maximum external circuit loop resistance value for supervision as covered on the circuit drawing.

> ***Note:*** In the case of trunks to tandem having through supervision, no A relay operate compensating resistance should be added.

1.09 The A relay nonoperate compensating resistance should be of such value that, when added to the trunk compensating resistance the L relay nonoperate compensating resistance, 500 ohms (CH relay winding in the test circuit), and the trunk loop resistance, the sum is as near as possible to, but not less than, the value required to produce the nonoperate current test value for the A relay.

1.10 The L relay nonoperate compensating resistance should be of such value that, when added to the trunk compensating resistance, 500 ohms (CH relay winding in test circuit), the trunk loop resistance and any compensating resistance in use at the distant end when the incoming selector is in the incoming advance position, the sum is as near as possible to, but not less than, the value required to produce the nonoperate current test value of the L relay.

1.11 Lamps and keys associated with jack T1 have a 1 in the designations as ON1, SDR1, etc. Lamps and keys associated with jack T2 have a 2 in the designations, as ON2, SDR2, etc. In these tests, jack T1 is used and reference is made to the associated lamps and keys.

1.12 Reference to particular lamps means that only these lamps need be checked for that particular test. Other lamps may be present, but are not involved with the feature being tested.

1.13 ***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. When a condition does not apply, all tests designated by that letter should be omitted.

2. APPARATUS

2.01 Manual outgoing trunk test frame (SD-95476-01).

2.02 Head telephone set.

2.03 32A test set, for use in testing via "tie line."

2.04 322A (make-busy) plugs.

2.05 Three P3F cords, 4 feet long, equipped with one 310 and one 309 plug (3P12A, 3P12B, 3P12C, or 3P12D cords).

3. PREPARATION

All Tests

STEP	ACTION	VERIFICATION
1	Restore all keys to normal.	
2	Operate KR key momentarily.	
3	Operate DISC1 and DISC2 keys momentarily.	
4a	If trunk has battery on tip and ground on ring when called end is "off hook"— Operate RS1 key.	

STEP	ACTION	VERIFICATION
5	Patch T1 jack to T jack of trunk.	BY1 lamp extinguished (indicating an idle trunk).
6b	If trunk (typical SD-26085-01) connects to DP-loop to CX converter (typical SD-26110-01)— Patch MB1 jack to MB jack of trunk. Patch D1 jack to D jack of trunk.	
7c	If trunk (typical SD-26085-01) connects to MF-loop to CX converter (typical SD-27009-01)— Patch MB1 jack to MB jack of trunk.	BY1 lamp extinguished (indicating an idle trunk).
8d	If testing via "tie line" at master test frame— Patch MB jack of tie line to MB jack of trunk.	
9d	Patch T jack of tie line to T jack of trunk.	
10d	Insert plug of 32A test set into RC jack.	
11d	Insert plug of head telephone set into TEL jack.	
12d	At manual outgoing trunk test frame— Insert make-busy plug into MT jack, where provided, of tie line used.	
13d	Operate RC key.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Operator Trunks		
14e	If trunk circuit requires closure of battery and ground from test circuit to signal operator— Operate BAT key.	
15f	If trunk terminates in dry bridge that is replaced, when operator answers, with battery on ring and ground on tip of OGT test frame jack— Operate BAT and RS1 keys.	
16g	If trunk is to PBX attendant— Operate SOTT1 key.	
17	Operate TLK1 key.	SUP1 lamp lights.
18	At switchboard— Operator answers.	At manual OGT test circuit— SUP1 lamp extinguished.

STEP	ACTION	VERIFICATION
		Note: If testing trunk to information desk, SUP1 lamp remains lighted.
19h	If trunk is arranged to rering operator— Request operator to observe rering signal. Operate momentarily SX or R±key, as required, for type of rering signal.	At switchboard— Operator receives rering signal.
20i	If trunk is to toll switchboard from PBX subscriber— Request operator to ring on trunk.	SUP1 lamp lights momentarily.
21	Restore all keys.	
22	Operate DISC1 key momentarily.	
23	Remove patching cords.	

B. Test Line Tests—Panel Call Indicator Trunks

14e	If trunk is a direct trunk— Operate PCID key.	
15e	Operate TH, H, T, U, and STA register keys, as required, for test line.	
16f	If trunk is a tandem or sender tandem trunk— Operate PCIT key.	
17f	Operate TAN H, TAN T, TAN U, TH, H, T, and U keys as required, for test line.	
18	Operate A RY OPR COMP RES keys as required.	
19	Operate TRK COMP RES keys as required.	
20	Operate TST1 and TTLK keys.	SDR1 lamp remains lighted when selections are completed. ◗Test responses will depend on type of test line being used. See Fig. 1 through 7 for test responses.◖
21	Restore TST1 key. Operate DISC1 key momentarily.	
22	Remove patching cords.	
23	Restore all keys.	
24	Operate DISC1 key momentarily.	

STEP	ACTION	VERIFICATION
C. Test Line Test—Revertive Pulse Trunks		
14	Operate RP key.	
15e	If trunk is over carrier facilities— Operate TRK COMP RES 0 key and omit Steps 16f through 20i.	
16f	If trunk has 24V on supervisory relay— Operate TFV key.	
17	Operate required TRK COMP RES and A RY OPR COMP RES keys.	
18g	If a nonoperate test on trunk A relay is desired— Operate ANO key.	
19h	If nonoperate test of L and A relays on battery cutoff panel trunks is desired— Operate PRE OPR A and L RYS and required L RY NON OPR COMP RES and A RY NON OPR COMP RES keys. ***Note 1:*** When no A RY NON OPR COMP RFS setting is given—Set these keys to 4000. ***Note 2:*** To compensate for nonoperate test of L relay in panel repeater incoming trunks operate RICR key.	
20i	If nonoperate test of A relay is on panel incoming trunk— Operate L RY NON OPR COMP RES keys.	
21j	If trunk is common to two units and test line is in office "B"— Operate HF key.	
22k	If trunk is to crossbar tandem office— Operate TAN T and TAN U register keys, as required, for revertive test trunk circuit.	
23l	If trunk is to other than crossbar tandem office— Operate TH, H, T, and U register keys, as required, for test line.	
24	Operate TST1 key.	SDR1 lamp remains lighted when selection are completed.

STEP	ACTION	VERIFICATION
25	Operate TTLK key.	▶Test responses will depend on type of test line being used. See Fig. 1 through 7 for test responses.◀
26	Restore TST1 key.	
27	Operate DISC1 key momentarily.	
28	Remove patching cords.	
29	Restore all keys.	

D. Test Line Tests—Multifrequency Pulse Trunks

14	Operate MF key.	
15e	If trunk requires DELAYED DIAL start signal— Operate DPL key.	
16f	If trunk is a 4-wire trunk with E and M lead signaling— Operate EM4W key. ***Note:*** These trunks are tested by the test circuit as WINK start signal and do not require use of DPL key.	
17g	If trunk is a 4-wire trunk with reverse battery supervision— Operate MF4W key.	
18	Operate TRK COMP RES 0 key.	
19h	If trunk is a 2-wire trunk— Operate A RY OPR COMP RES keys as required. ***Note:*** For trunks over carrier facilities, operation of these keys is not required.	
20i	If test code 103 is to be used— Operate TAN H, TAN T, and TAN U register keys.	
21i	Operate TST1 and TTLK keys.	When connection is established to test line— TSUP lamp extinguished.
22i	Momentarily operate SX or R±key, as required, for type of rering signal.	TSUP lamp flashes.

STEP	ACTION	VERIFICATION
23j	If three digit test code other than code 103 is used— Operate TAN H, TAN T, and TAN U register keys, as required.	
24j	Operate TST1 and TTLK keys.	When connection is established to test line— TSUP lamp flashes.
25k	If test code required is more than three digits— Operate TH, H, T, and U register keys as required.	
26k	Operate TST1 and TTLK key.	SDR1 lamp remains lighted when selection are completed. ▶Test response will depend on type of test line being used. See Fig. 1 through 7 for test responses.◀
27	Restore TST1 key.	
28	Operate DISC1 key momentarily.	
29	Remove patching cords.	
30	Restore all keys.	

E. Test Line Tests—Dial Pulse Trunks

14	Operate DP key.	
15e	If trunk requires dialing on a DELAY DIAL start pulse basis— Operate DPL key.	
16f	If trunk requires dialing on loop basis— Operate LPD key.	
17g	If trunk requires resistance dial pulsing— Operate LRD key.	
18h	If trunk requires battery and ground dial pulsing— Operate BGD key.	
19i	If trunk requires GO start pulsing to step-by-step offices— Operate GO key.	
20	Operate A RY OPR COMP RES keys, as required.	

STEP	ACTION	VERIFICATION
	Note: For trunks over carrier facilities, operation of these keys is not required.	
21	Operate TRK COMP RES keys, as required.	
	Note: For trunks in which the originating relay equipment repeats pulses, for trunks over carrier facilities, and for 4-wire E and M lead type trunks, operate key 0.	
22j	If trunk is 4-wire trunk with E and M lead supervision— Operate EM4W key.	
	Note: These trunks are tested by test circuit as WINK start signal trunks and do not require use of DPL key.	
23k	If test code 103 is to be used— Operate TAN H, TAN T, and TAN U register keys.	
24k	Operate TST1 and TTLK keys.	When connection is established to test line— TSUP lamp extinguished.
25k	Momentarily operate SX or R±key, as required for type of rering signal.	TSUP lamp lights.
26k	Momentarily reoperate rering key used in Step 25k.	TSUP lamp flashes.
27l	If three digit test code other than code 103 is used— Operate TAN H, TAN T, and TAN U register keys, as required.	
28l	Operate TST1 and TTLK keys.	When connection is established to test line— TSUP lamp flashes.
29m	If test code required is more than three digits— Operate TH, H, T, and U register keys, as required.	
30m	Operate TST1 and TTLK keys.	SDR1 lamp remains lighted when selections are completed. ▮Test responses will depend on type of test line being used. See Fig. 1 through 7 for test responses.▮
31	Operate TST1 key.	

STEP	ACTION	VERIFICATION
32	Operate DISC1 key momentarily.	
33	Remove patching cords.	
34	Restore all keys.	
F. BELLBOY Personal Signaling System Trunks		
14	Operate, in sequence, DP, LPD, and GO keys.	
15	Operate TH, H, T, and U keys for an unassigned BELLBOY number. ***Note:*** Unassigned number may be either a nonworking or an out-of-block number.	
16	Operate A RY OPR COMP RES keys, as required.	
17	Operate TRK COMP RES keys, as required.	
18	Operate TST1 and TTLK keys.	SDR1 lamp remains lighted when selections are completed. Ringing tone heard. TSUP lamp lights. Ringing tone removed. If subscriber trunk— Intercept announcement heard. If operator trunk— 120 ipm reorder tone heard.
G. Trunks to 6A Teletypewriter Switchboard		
	Note: Before starting this test, request 6A switchboard operator to answer the test calls in talk mode.	
14e	If trunk circuit requires closure of battery and ground from test circuit to signal operator— Operate BAT key.	
15f	If trunk terminates in dry bridge that is replaced, when operator answers, with battery on ring and ground on tip of OGT test frame jack— Operate BAT and RS1 keys.	
16	Operate TLK1 key.	SUP1 lamp lights. Audible ringing tone heard.
17	At switchboard— Operator answers.	Ringng tone removed. SUP1 lamp extinguished.

STEP	ACTION	VERIFICATION
18	Request operator to leave ANS cord plug in trunk jack and observe cord lamp and trunk lamp.	
19	Restore TLK1 key.	
20	Operate DISC1 key momentarily.	
21	Operate TLK1 key.	SUP1 lamp lights.
22	At switchboard— Operator answers.	At manual outgoing trunk test frame— SUP1 lamp extinguished. At switchboard— Steady cord lamp was followed by flashing cord lamp. When operator removed cord plug from trunk jack, cord lamp extinguished and trunk lamp lighted. When operator reinserted cord plug into trunk jack, trunk lamp extinguished.
23	Advise operator that test is completed.	
24	Restore all keys.	
25	Operate DISC1 key momentarily.	
26	Remove patch cords.	

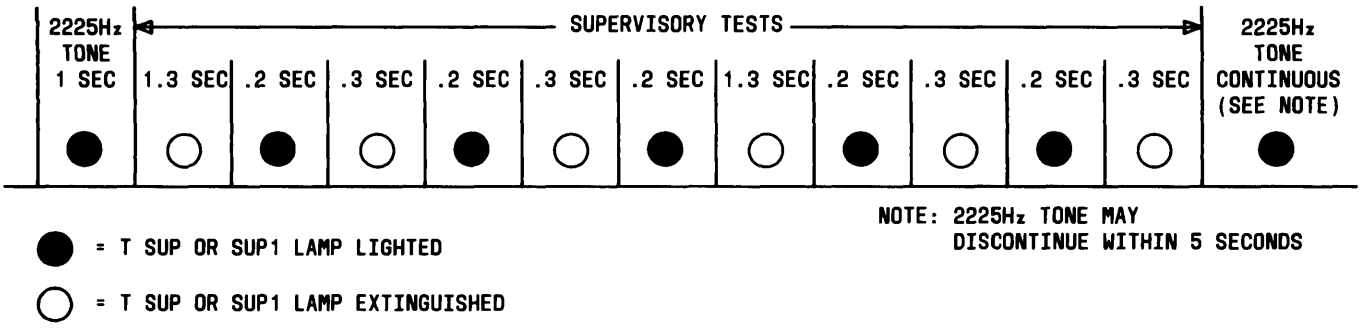
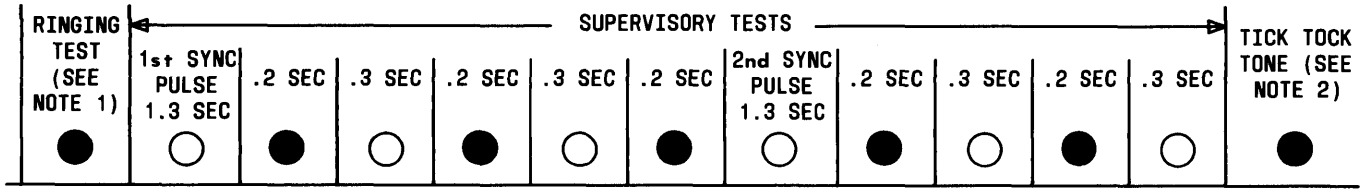


Fig. 1—Synchronous Test Line—4A, 4M, 4E Toll Offices and Crossbar Tandem Offices



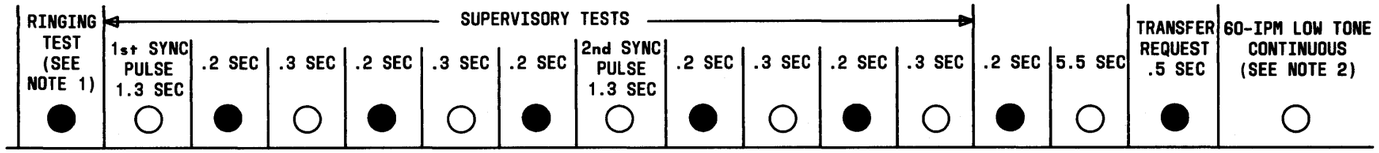
● = T SUP OR SUP1 LAMP LIGHTED

○ = T SUP OR SUP1 LAMP EXTINGUISHED

NOTES:

1. IF MORE THAN TWO COMPLETE TONE CYCLES OF AUDIBLE RINGING HEARD, IT INDICATES A RING TRIP FAILURE. IF 120 IPM LOW TONE IS HEARD, IT INDICATES A PRE-TRIP FAILURE
2. IF TESTING PANEL TRUNKS, DO NOT DISCONNECT BEFORE THIS POINT IN THE TEST

Fig. 2—Synchronous Test Line—Panel, Crossbar, and ESS Offices

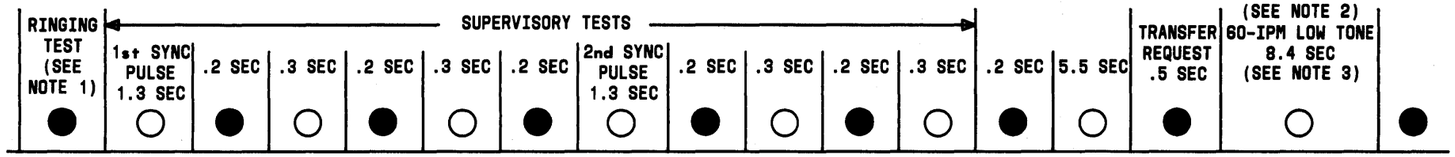


● = T SUP OR SUP1 LAMP LIGHTED

○ = T SUP OR SUP1 LAMP EXTINGUISHED

NOTES:
1. IF MORE THAN TWO COMPLETE TONE CYCLES OF AUDIBLE RINGING HEARD, IT INDICATES A RING TRIP FAILURE. IF 120-IPM LOW TONE IS HEARD, IT INDICATES A PRE-RING TRIP FAILURE
2. WHEN 60-IPM LOW TONE IS HEARD, IT INDICATES A SUCCESSFUL TRANSFER

Fig. 3—Synchronous Test Line—Centrex Trunk Phase II—No. 5 Crossbar Offices

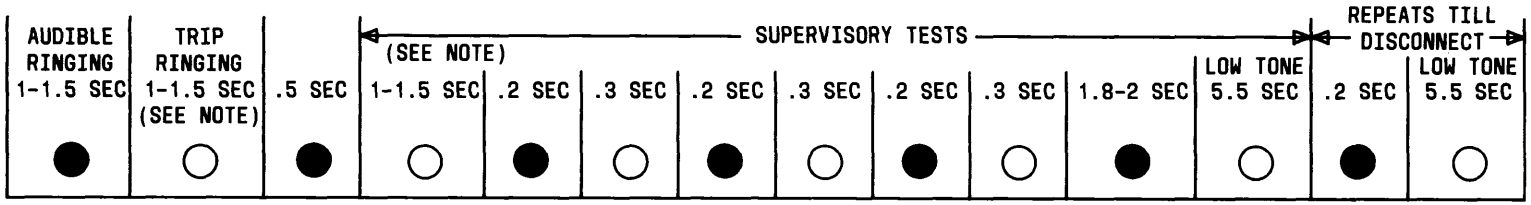


● = T SUP OR SUP1 LAMP LIGHTED

○ = T SUP OR SUP1 LAMP EXTINGUISHED

NOTES:
1. IF MORE THAN TWO COMPLETE TONE CYCLES OF AUDIBLE RINGING HEARD, IT INDICATES A RING TRIP FAILURE. IF 120-IPM LOW TONE IS HEARD, IT INDICATES A PRE-RING TRIP FAILURE
2. WHEN 60-IPM LOW TONE IS HEARD, IT INDICATES A SUCCESSFUL TRANSFER
3. 2.4 SECONDS OF 60-IPM LOW TONE MAY BE HEARD ON APM TEST LINES

Fig. 4—Synchronous Test Line—Centrex Trunk Phase III—No. 5 Crossbar Offices



NOTE: LOW TONE MAY OR MAY NOT BE HEARD

● = T SUP OR SUP1 LAMP LIGHTED

○ = T SUP OR SUP1 LAMP EXTINGUISHED

Fig. 5—Step-by-Step Test Line—(SD-31636-01 or SD-31642-01)

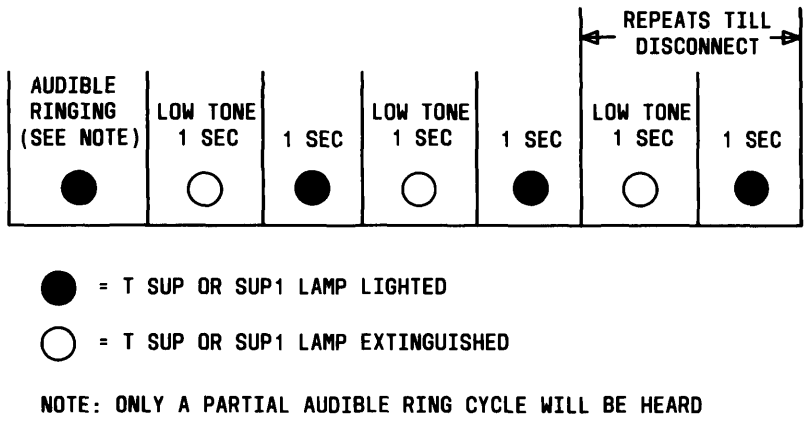


Fig. 6—Step-by-Step Test Line—(SD-31932-01 or SD-31236-01)

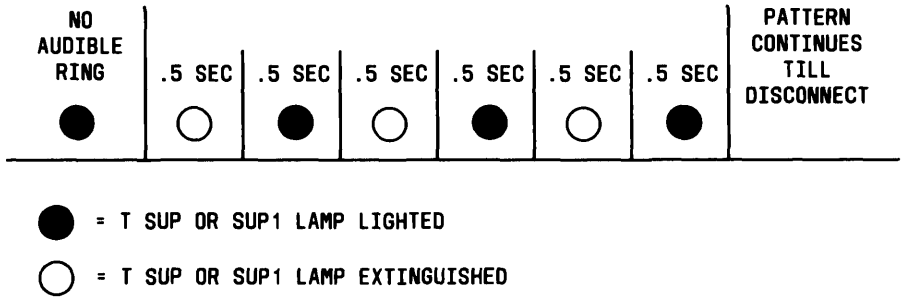


Fig. 7—Non Synchronous Test Line—Crossbar Tandem and Panel Tandem