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:

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

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.

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.

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.

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.

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

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

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 ordinary operation and the maximum

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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

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Restore all keys to normal.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Operate KR key momentarily.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Operate DISC1 and DISC2 keys momentarily.</td>
<td></td>
</tr>
<tr>
<td>4a</td>
<td>If trunk has battery on tip and ground on ring when called end is “off hook”— Operate RS1 key.</td>
<td></td>
</tr>
</tbody>
</table>
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. | BY1 lamp extinguished (indicating an idle 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. | 
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. |
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STEP ACTION VERIFICATION

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.

20i If trunk is to toll switchboard from PBX subscriber—
Request operator to ring on trunk.

21 Restore all keys.

22 Operate DISCl 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 TSTl and TTLK keys.

SDR1 lamp remains lighted when selections
are completed.

21 Restore TST1 key.
Operate DISCl key momentarily.

22 Remove patching cords.

23 Restore all keys.

24 Operate DISCl key momentarily.

Note: If testing trunk to information desk,
SUP1 lamp remains lighted.

At switchboard—
Operator receives rering signal.

SUP1 lamp lights momentarily.

Note: Test responses will depend on type of test
line being used. See Fig. 1 through 7 for
test responses.
## C. Test Line Test—Revertive Pulse Trunks

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Operate RP key.</td>
<td></td>
</tr>
<tr>
<td>15e</td>
<td>If trunk is over carrier facilities— Operate TRK COMP RES 0 key and omit Steps 16f through 20i.</td>
<td></td>
</tr>
<tr>
<td>16f</td>
<td>If trunk has 24V on supervisory relay— Operate TFV key.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Operate required TRK COMP RES and A RY OPR COMP RES keys.</td>
<td></td>
</tr>
<tr>
<td>18g</td>
<td>If a nonoperate test on trunk A relay is desired— Operate ANO key.</td>
<td></td>
</tr>
<tr>
<td>19h</td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**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. |
### 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.

22i. Momentarily operate SX or R± key, as required, for type of ringer signal.

   **When connection is established to test line—**
   TSUP lamp extinguished.

   **TSUP lamp flashes.**
STEP   ACTION

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.

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.

27  Restore TST1 key.

28  Operate DISCl 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.

VERIFICATION

When connection is established to test line—TSUP lamp flashes.

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.
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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.

25k Momentarily operate SX or R± key, as required for type of rering signal.

26k Momentarily reoperate rering key used in Step 25k.

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.

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.

31 Operate TST1 key.

When connection is established to test line—
TSUP lamp extinguished.

TSUP lamp lights.

TSUP lamp flashes.

When connection is established to test line—
TSUP lamp flashes.

SDRI 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.
STEP ACTION
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.

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 RSI keys.
16 Operate TLK1 key.
17 At switchboard—Operator answers.

VERIFICATION
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.

SUP1 lamp lights.
Audible ringing tone heard.
Ringing tone removed.
SUP1 lamp extinguished.
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**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. | SUP1 lamp lights.  
20 | Operate DISC1 key momentarily. | At manual outgoing trunk test frame—SUP1 lamp extinguished.  
21 | Operate TLK1 key. | At switchboard—Steady cord lamp was followed by flashing cord lamp.  
22 | At switchboard—Operator answers. | 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. | 

---

**SUPERVISORY TESTS**

<table>
<thead>
<tr>
<th>225Hz TONE</th>
<th>SUPervisory TESTS</th>
<th>225Hz TONE CONTINUOUS (SEE NOTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SEC</td>
<td>1.3 SEC</td>
<td>.2 SEC</td>
</tr>
<tr>
<td>●</td>
<td>○</td>
<td>●</td>
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</tbody>
</table>

**NOTE:** 225Hz TONE MAY DISCONTINUE WITHIN 5 SECONDS

● = T SUP OR SUP1 LAMP LIGHTED
○ = T SUP OR SUP1 LAMP EXTINGUISHED

---

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

---

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### RINGING TEST (SEE NOTE 1)

<table>
<thead>
<tr>
<th>1st SYNC PULSE</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
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### SUPERVISORY TESTS

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<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
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</tbody>
</table>

### TICK TOCK TONE (SEE NOTE 2)

| ○              |        |        |        |        |        |        |        |
| ○              |        |        |        |        |        |        |        |

### 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

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

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### Ringing Test

<table>
<thead>
<tr>
<th>1st Sync Pulse</th>
<th>2nd Sync Pulse</th>
<th>Transfer Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3 sec</td>
<td>1.3 sec</td>
<td>5.5 sec</td>
</tr>
</tbody>
</table>

#### Notes:

1. If more than two complete tone cycles of audible ringing are 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.

---

#### Supervisory Tests

- **Test 1st Sync 2nd Sync (See Pulse .2 sec .3 sec .2 sec .3 sec .2 sec Pulse Note 1)**

<table>
<thead>
<tr>
<th>1st Sync</th>
<th>2nd Sync</th>
<th>Transfer Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>.2 sec</td>
<td>.2 sec</td>
<td>.5 sec</td>
</tr>
</tbody>
</table>

- **0** = T SUP OR SUP1 LAMP LIGHTED
- **0** = T SUP OR SUP1 LAMP EXTINGUISHED

---

**Fig. 3—Synchronous Test Line—Centrex Trunk Phase II—No. 5 Crossbar Offices**
RINGING TEST (SEE NOTE 1)

<table>
<thead>
<tr>
<th>1st SYNC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>PULSE .2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
<th>PULSE 1.3 SEC</th>
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SUPERVISORY TESTS

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<th>.3 SEC</th>
<th>.2 SEC</th>
<th>.3 SEC</th>
<th>.2 SEC</th>
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</table>

TRANSFER REQUEST .8 SEC

<table>
<thead>
<tr>
<th>60-IPM LON TONE 8.4 SEC (SEE NOTE 2)</th>
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</table>

NOTES:

1. IF MORE THAN TWO COMPLETE TONE CYCLES OF AUDIBLE RUSHING 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 80-IPM LOW TONE MAY BE HEARD ON APM TEST LINES.

Fig. 4—Synchronous Test Line—Centrex Trunk Phase III—No. 5 Crossbar Offices
<table>
<thead>
<tr>
<th>AUDIBLE RINGING</th>
<th>TRIP RINGING</th>
<th>(SEE NOTE)</th>
<th>SUPERVISORY TESTS</th>
<th>REPEATS TILL DISCONNECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1.5 SEC</td>
<td>1-1.5 SEC</td>
<td>.5 SEC</td>
<td>1-1.5 SEC .2 SEC .3 SEC .2 SEC .3 SEC .2 SEC .3 SEC 1.8-2 SEC 5.5 SEC .2 SEC 5.5 SEC</td>
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<td>●</td>
</tr>
</tbody>
</table>

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