

**INCOMING SELECTOR CIRCUITS**  
**FROM PANEL LOCAL, OFFICE TANDEM, AND PANEL SENDER TANDEM OFFICES**  
**MANUAL TEST USING TEST SET SD-20050-01**  
**BATTERY CUTOFF RELAY PANEL OFFICES**

**1. GENERAL**

**PAGE**

**1.01** This section is reissued to cover flash removal. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.02** The tests covered are:

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<b>A. Test Line Test:</b> This test checks the following features: .....	4
(1) Nonoperate test on the incoming L relay	
(2) Incoming and final selection	
(3) Terminal hunting for an idle test line	
(4) Operate test on L relay	
(5) Operate test on A relay	
(6) Ringing current to test line	
(7) Tripping and supervisory relays in the incoming circuit	
(8) Trip test to R relay	
(9) Talking battery received is of the proper polarity	
(10) Soak-release test to S (supervisory) relay	
(11) Release test to A relay	
<b>B. Test Line Test With Commutator Resistance Test:</b> This test is to detect excessive resistance between A, B, and G commutators and commutator brushes of incoming selectors. ....	5

**C. Test Line Test With Capacity Test:** This test checks the incoming L relay for overstepping with added capacity to the fundamental circuit during incoming and final selections to simulate maximum trunk loop conditions. .... 5

**D. Brush Continuity Test:** This test checks continuity of incoming multiple brushes serving banks not having access to final multiple test lines not checked by Test G. .... 5

**E. Brush Continuity Test With Commutator Resistance Test:** This test checks excessive resistance between the A, B, and G commutators and commutator brushes of the incoming selector on a brush continuity basis. .... 6

**F. Brush Continuity Test With Capacity Test:** This test checks the L relay for overstepping on maximum trunk loop condition on a brush continuity basis. .... 6

**G. Time-Out Test:** This test checks the ability of the incoming selector to time-out of the selection beyond position in case final selections are not completed within a certain interval and also a brush continuity test of the brush selector. .... 6

**H. Busy-Line Test:** This test checks the operation of the incoming selector on a busy line condition. .... 7

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**I. Telltale Test:** This test checks the ability of the incoming circuit to advance under control of the X commutator where the incoming selector goes to telltale on incoming selections and detect any chatter of brushes. . . . . 7

**J. Bell Ringing Test:** This test checks the ringing on party lines and for making rapid ringing tests. . . . . 8

**1.03** The tests are intended for use in testing those individual incoming selector circuits, which are not tested by an incoming selector test frame. They may also be used to supplement the test frame tests and to check the operation of incoming circuits on a manual basis.

**1.04** The tests are made at the incoming selector frames and the test set is connected to the proper jacks by means of patching cords. On tests directed to final multiple test lines or to other test lines in the final multiple, the number of the final terminal assigned to the test line is set up on the numerical keys before starting the test. On tests to final multiple test lines, the test set checks the operation of the incoming L and A relays and the test line tests the tripping and supervisory features of the incoming. The other test lines are used to check features not tested by the final multiple test line.

**1.05** Any incoming circuit on which a failure is encountered when making a test should be left busy at the originating end until the trouble has been cleared.

**1.06** To restore test set to normal when blocked on a trouble condition during test, momentarily operate TBL key.

**1.07** Test set is provided with a step-by-step control feature for canceling the automatic advance during the progress of a test cycle in order to make observations on a particular test.

**1.08** Operate the STP key and then momentarily operate ST key to start test. The test set stops after the nonoperate test of the L relay and after each selection consisting of incoming brush, incoming group, and final units selections has been completed. The NOL lamp lights as an indication that the nonoperate test of L relay has been completed satisfactorily.

**1.09** To advance test set under this condition, momentarily operate ST key. After the desired selections have been checked, restore the STP key and the test set proceeds with the remaining operations of test.

**1.10** Remote control feature provides a method of starting, advancing, and restoring test set while observing the operation of the incoming circuit.

**1.11** With test set keys required for a particular test in an operated position, insert plug of a 32A test set into EX-K jack of test set. If it is desired to control test in steps, operate STP key.

**1.12** To start the test or to advance the test set in steps where the STP key is operated, depress WH key of 32A test set. To restore test set to normal, depress RED key on 32A test set.

**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. Where a condition does not apply, all steps designated by that letter should be omitted.

## 2. APPARATUS

### All Tests

**2.01** Incoming and final selector test set SD-20050-01 (J24710A).

**2.02** 184 (make-busy) plugs, as required.

**2.03** Four patching cords, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).

**2.04** 32A test set used for remote control.

### Tests A, B, C, H, and J

**2.05** Operator's telephone set to check for tone or the audible ringing signal.

### Test G

**2.06** KS-3008 stopwatch.

### Test J

**2.07** 1011G dial handset equipped with a W2CK cord.

3. PREPARATION

STEP	ACTION	VERIFICATION
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All Tests

1	At originating office of trunks associated with incoming selector to be tested — Make trunks busy according to local office procedures.	
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*Note:* The number of trunks to be made busy at one time should depend on size of trunk group and volume of traffic at time of test. At no time should an entire trunk group be made busy.

2	At test set — Operate all keys except the numerical keys to normal.	
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3	Connect BAT-G1 jack on test set to A jack on incoming frame jack panel using P3E cord.	
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*Note:* To avoid possible grounding of the battery supply leads, connect the cord to the test set first and when disconnecting remove the cord from the test set last.

4	Operate INC, MS keys.	
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5a	If checking trunk hunting feature of incoming selector circuit — At final selector frame — Insert 184 make-busy plug into TMB (or MB) jacks.	
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6	Connect TST jack of test set to T jack of selector to be tested using P3E cord.	
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*Note:* To avoid releasing a service connection, do not connect to the T jack of a selector which is off normal.

7	Operate ICR keys as follows:	
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COMPENSATING RESISTANCE IN INCOMING	OPERATE KEYS
0	None
300	ICR-300
600	ICR-600

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STEP	ACTION	VERIFICATION
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8b	If testing balanced incoming selector circuits — Operate BAL key.	
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Tests A, B, C, and J

9	Connect operator's telephone set to TEL jack.	
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Tests A, B, C, D, E, F, H, I, J

10c	If testing incoming selector circuits equipped with an L relay of the N type — Operate LG- TRK key.	
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4. METHOD

STEP	ACTION	VERIFICATION
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A. Test Line Test

11	Operate NO-L key.	
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12	Depress TH, H, T, U keys for final multiple incoming selector test line.	
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13	Momentarily operate ST key.	
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INC lamp lighted.

Observe the incoming selectors for sluggish up drive, slipping sequence switch drive disc, etc.

Test proceeds to connect to test line.

Audible ringing heard in receiver for at least one ringing interval.

SUPV lamp lights six times consisting of one long flash followed by two short flashes, then another long flash followed by two short flashes.

*Note:* A short flash may precede the first long flash.

Tick-tock tone heard in receiver.

14	Momentarily operate DISC key.	
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Test set restores to normal.

Observe that the trip magnet operates during down drive of incoming selector.

INC lamp extinguished.

15d	If repeat test is desired — Operate REP key.	
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16d	Repeat Step 13.	
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STEP	ACTION	VERIFICATION
17d	When desired number of repeat tests have been completed — Restore REP key to normal.	Tick-tock tone heard in receiver.
18d	Repeat Step 14.	
19	Repeat Steps 1 through 18d on all selectors to be tested.	
20	Restore all keys to normal and disconnect all cords.	
21	At originating office of trunks — Restore to service all trunks made busy.	
<b>B. Test Line Test With Commutator Resistance Test</b>		
11	Operate INC-COM key.	
12	Perform Steps 11 through 19, Test A.	
<b>C. Test Line Test With Capacity Test</b>		
11	Operate CAP key.	
12	Perform Steps 11 through 19, Test A.	
<b>D. Brush Continuity Test</b>		
11	Operate IBC key.	
12	Depress TH, H keys for incoming selector to make required brush and group selections for tripping brush under test and directing incoming selector to a working group of trunks.	
13	Momentarily operate ST key.	INC lamp lighted. Observe that proper incoming brush is tripped, proper incoming group is selected, and for any irregular operations such as sluggish up drive, slipping sequence switch drive disc, etc. BC lamp lighted. Busy-back tone heard in receiver.
14	Momentarily operate DISC key.	BC, INC lamps extinguished.
15d	If repeat test is desired — Operate REP key.	
	<i>Note:</i> When making brush continuity tests on 4-party full selective ringing incoming selector circuits, the repeat test cannot be made.	

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STEP	ACTION	VERIFICATION
16d	Repeat Step 13.	
17d	When desired number of repeat tests have been completed — Restore REP key.	BC lamp lighted. Busy-back tone heard in receiver.
18d	Repeat Step 14.	
19	Repeat Steps 12 through 18d for all brushes of same selector to be tested.	
20	Repeat Steps 1 through 19 on all selectors to be tested.	
21	Restore all keys and remove all cords.	
22	At originating office of trunks — Restore to service all trunks made busy.	

**E. Brush Continuity Test With Commutator Resistance Test**

- 11 Operate INC-COM key.
- 12 Perform Steps 11 through 20, Test D.

**F. Brush Continuity Test With Capacity Test**

- 11 Operate CAP key.
- 12 Perform Steps 11 through 20, Test D.

**G. Time-Out Test**

- 9 Operate TO key.
- 10 Depress TH, H keys for incoming selector to bank and group to be tested using a different brush from that used in Test D.
- 11 Momentarily operate ST key.  
INC lamp lighted.  
Observe that proper incoming brush is tripped, proper incoming group is selected and for any irregular operations such as sluggish up-drive, slipping sequence switch drive disc, etc.  
After 15 to 30 seconds —  
BC lamp lighted.
- 12 Momentarily operate DISC key.  
INC, BC lamps extinguished.

STEP	ACTION	VERIFICATION
13c	If repeat test is desired — Operate REP key.	
14c	Repeat Steps 10 and 11.	
15c	When desired number of repeat tests have been completed — Restore REP key to normal.	BC lamp lighted.
16c	Repeat Step 12.	
17	Repeat Steps 1 through 16c on all selectors to be tested.	
18	Restore all keys and remove all cables.	
19	At originating office of trunks — Restore to service all trunks made busy.	

#### H. Busy-Line Test

11	Operate NO-L key.	
12	Depress TH, H, T, and U keys for number of permanently made busy final terminal.	
13	Momentarily operate ST key.	INC lamp lighted. Interrupted tone heard in receiver.
14	Momentarily operate DISC key.	INC lamp extinguished. Interrupted tone in receiver silenced.
15d	If repeat test is desired — Repeat Steps 13 and 14.	
16	Repeat Steps 1 through 15d on all selectors to be tested.	
17	Restore all keys and remove all cords.	
18	At originating office of trunks — Restore all trunks made busy to service.	

#### I. Telltale Test

11	Operate any TH key.
12	Restore all H keys.

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STEP	ACTION	VERIFICATION
13	Momentarily operate ST key.	INC lamp lighted. AS selector rod moves upward — Observe the trip lever of tripped brush for chatter or vibration. TT lamp lighted.
14	Momentarily operate DISC key.	INC, TT lamps extinguished.
15d	If repeat test is desired — Repeat Steps 13 and 14.	
16	Repeat Steps 11 through 15d on all incom- ing selectors to be tested.	
17	Restore all keys and remove all cables.	
18	At originating office of trunks — Restore all trunks made busy to service.	

**J. Bell Ringing Test**

11	Connect test line jack C to bell set jack D on incoming frame jack panel, using P3E cord.  <i>Note:</i> When two bell ringing test lines are provided, jack C is common to both test lines.	
12	Operate NO-L key.	
13	Operate TH, H, T, U keys for the bell ring- ing test line associated with ringing choice to be tested.	
14d	If testing 4-party full selective ringing office, ringing and tripping test for polarity of ring- ing opposite to that supplied to the final choice in which the final multiple test line is located — At frame where test is made — Connect handset to C jack.	
15d	On handset — Operate MONITOR key.	
16	Momentarily operate ST key.	INC lamp lighted. Test line bell rings in accordance with ring- ing current provided for the final group in which the test line is located. Audible ringing signal heard in receiver.

STEP	ACTION	VERIFICATION
17d	If testing 4-party full selective ringing office, ringing and tripping test for polarity of ringing opposite to that supplied to the final choice in which the final multiple test line is located — On handset — Operate TALK key.	Test line bell silenced.
18	Momentarily operate DISC key.	INC lamp extinguished. Test set restored to normal.
19	Repeat Steps 13 through 18 on all circuits to be tested.	
20	Restore all switches and remove all cables.	
21	At originating office of trunks — Restore all trunks made busy to service.	