TEST OF KEY PULSING INCOMING TRUNKS

CONTENTS

1. GENERAL INFORMATION

1.1 Description of Tests

1.11 Refer to Section 207, Paragraph 3 for the common tests to be applied to the circuits covered by this section.

1.12 The following circuits are tested by this method:

NOTE: The flashing feature in the supervisory circuit of various incoming trunks is being removed and replaced with tone. Where this change applies, disregard the flashing supervisory lamp referred to in the following paragraphs.

SD No.	Rout. Para.	Supp. Para.	See Section
25024	4	5	
25255		6	303
25294	4	5	
25306	4	5	
25351		6	303
25353	4	5	
25876	4	5	
25883	4	5	
25888	4	5	

1.2 Combined Tests

The tests described in Paragraph 6 may be made at the same time as the test of the no test connector, Section 303, Handbook 63.

1.3 Manload: Two men are recommended.

1.4 Distribution of Routine Test Calls

1.41 The routine test calls should be distributed through the A sender link and controller circuits as follows in order to check all paths.

(a) On four of the cycles, make busy the B subgroup of links. On each successive cycle, leave only one subgroup, 0, 1, 2, or 3, available using a different subgroup on each cycle.

(b) On four other cycles, repeat the above test with the A subgroup of links made busy.

(c) Make the sender subgroups busy for tests (a) and (b) by blocking operated the associated GB relay.

(d) If the routine test requirements are met before all crosspoints have been checked, the remaining paths may be tested on a supplementary test basis.

(e) If there are levels on the secondary switches which are not equipped with sender circuits, verify the wiring for properly soldered connections.

1.5 TSL Crosspoint Test

The crosspoint test described in Paragraph 3 is made to test the TSL crosspoints referred to in Paragraph 12, Section 212 of this handbook.

2. TEST EQUIPMENT

2.1 Test Sets and Accessories

Amt	ITE	Description	With ITE
1	4011	Miscellaneous Trunk Test Set	
1	4042	Hand Telephone Set	4023
1	2448	AC Lamp and Power Voltmeter Set	

2.2 Cords

Amt	ITE	Lgth	Cdrs	One End	Other End	With ITE
1	9598	12'	2	110 Plug	110 Plug	4023
1	9637	12'	3	110 Plug	325A Plug	4010
2	9650	6'	4	137 Plug	Tel. Set	4023

3. TSL CROSSPOINT TEST

Refer to Section 212, Paragraph 12 Handbook 62.)

NOTE: See Paragraph 4.2.

3.1 Complete three test line or individual idle line test calls over each trunk by routing one call through each sender subgroup. Busy out the sender subgroups not used. One tester originates the call while the other tester observes that the proper sender is selected. The sender selected is indicated by a momentary flash of an associated S lamp located on the terminating trouble indicator frame.

4. ROUTINE TEST OF TRUNKS SD-25024, 25294, 25306, 25353, 25876, 25883, 25888

4.1 Setup for Test (Used for Tip Party Test Only)

4.11 Patch the jacks of ITE-4011 as follows:

(BG-LP) T and R to (OR) T and R
(REV) T1 to (OR) T1
(REV) R1 to (OR) R1
(CW) T and R to (OR) T2 and R2
(REV) R to (TD) R

4.12 Using ITE-9637 patch the 0 jack of ITE-4011 to the vertical of any assigned tip party line. Connect 48 volts battery and ground to the A jack. Plug a telephone set into the TEL jacks.

4.13 Operate DD-CW and STO keys.

4.2 Test Line Test

4.21 Insert the calling cord of a special service cord into the jack of the trunk under test. (On alternate cycles of test use the auxiliary jacks at the same position.) Operate the KP key and when a sender is attached, key the number of the incoming trunk test line.

4.22 Momentarily operate the ring forward key. Ringing is started which is heard in the telephone set. Note that audible ringing tone is returned to the operator at the A position. The test line applies a pretrip and trip test to the R relay after which the cord supervisory lamp is flashed six times. Tick-tock tone is heard in the switchboard telephone set.

4.23 Remove the cord from the trunk jack to restore the circuits to normal.

4.3 Tip Party Test

4.31 Reinsert the cord and make a call to the tip party number connected to the test set. Operate the DG key and note that the ringing is not tripped. Operate the REV key to trip the ringing.

4.32 Release the DG key and operate BG. The BG and BG1 lamps light.

4.33 Release REV, STO and BG keys.

4.4 Busy Line Test

4.41 Make a call to the office "permanent busy" line. The cord supervisory lamp flashes at 60 I.P.M. and line busy tone is heard.

4.5 Overflow Test

4.51 Make a call keying the overflow test line number. The cord supervisory lamp flashes at 120 I.P.M.

5. SUPPLEMENTARY TESTS OF TRUNKS SD-25024, 25294, 25306, 25353, 25876, 25883, and 25888

5.1 Ringing Tests

NOTE: These tests are made on circuits arranged for full selective and semiselective ringing.

5.101 For a test line select a four party line other than a coin line which has all four parties assigned. If such a line is not available select four lines which will meet the following conditions or cross-connect a temporary four party line:

Full Selective Party	Full Selective Ringing	Relays Operated in Inc. Trunk	Semi-Selective
1st	MR SUP- on Ring	RC	MR1 on Ring
2nd	MR SUP- on Tip	RC RV	MR1 on Tip
3rd	MR SUP+ on Ring	RC RP	MR2 on Ring
4th	MR SUP+ on Tip	RC RV RP	MR2 on Tip

5.102 Patch the jacks of ITE-4011 as follows:

(BGLP) T and R to (OR) T1 and R1
(MTB) T to (RES) 1
(MTB) R to (OR) R
(RES) 2 to (OR) T
(CW) T and R to (OR) T2 and R2

Set the RES switch on No. 4 terminal and operate RES1 key to (500) operate DD-CW and STO keys.

5.103 Connect the ITE-4011 set to the test line as described in Paragraph 4.12.

5.104 Make a call to the first party line number (see Chart in Paragraph 5.101) and momentarily operate the ring forward key. Note that ringing induction is heard at the A board.

5.105 Full Selective: Observe that the needle of the B meter vibrates with the greater swing to the right while ringing current is applied.

5.106 Semiselective Observe that the needle vibrates while ringing current is applied. Note that only one ring is received during each ringing interval.

5.107 Operate the LP key and note that ringing is tripped. Check talking between the A board and the test set.

5.108 Make a call to the second party line number and observe the same results as in Paragraph 5.106, except that for full selector the needle has the greater swing to the left.

5.109 Operate the LP key and note that ringing is tripped. Check talking.

5.110 Make calls to the third and fourth party line numbers and observe the following:

(a) Full Selective: The operation is the same as given in Paragraphs 5.106 to 5.109 for the first and second parties except that the needle swings to the left for the third party and to the right for the fourth party. Check talking on each test.

(b) Semiselective: Check for two complete rings in the first ringing interval. This is to check the "pick up" lead. Make this check on both the third and fourth party tests. Otherwise the test operations are as given in Paragraph 5.106 to 5.109.

(c) Semiselective: Perform the following additional check on the pick up lead. Connect an R-1824 pencil lamp to 48 volt battery and to miscellaneous punching 58 (PU lead) of vertical terminal strip on trunk unit. The lamp lights periodically; approximately 3 seconds lighted and 3 seconds extinguished. With a grounded test receiver HELD WELL AWAY FROM THE EAR, check that 2 one second intervals of ringing separated by an interval of one second are received at miscellaneous punching 56(MR R2 lead) of vertical terminal strip on trunk unit during the interval in which the pencil lamp is extinguished. Any reception of ringing during the interval in which the lamp is lighted indicates that either the incorrect PU or MRR2 lead from the ringing machines has been used.

5.2 Premature Disconnect

5.21 Insert the A board calling cord into the jack of the trunk to be tested. Operate the KP key and when a sender is attached remove the cord. Observe that the equipment restores to normal.

5.22 Repeat Paragraph 5.21 but remove the cord before a sender is attached. The equipment restores to normal.

5.3 Line Busy Before Ringing and Rering

5.31 Originate a call to a cross-connected subscriber line but do not operate the ringing start key at the A board. When the line hold magnet operates, plug an ITE-4042 hand telephone set into the switch vertical jack and operate the key as if to start a test call. Check talking between the A board and hand set. Release the hand set key. Operate the ringing start key at the A board. Ringing is heard at the handset. Ringing induction may or may not be heard at the A board depending on wiring of the cord circuit. Operate the handset key and sgain check talking. Restore all equipment to normal.

5.4 Reorder: Originate a call to a cross-connected subscriber line except that less than four digits are keyed. A reorder signal, flashing the cord supervisory lamp at 120 IPM is received at the A borad. Remove the cord. The equipment restores to normal.

5.41 Repeat the test except that more than four digits are keyed. A reorder signal is received. Restore the equipment to normal.

5.5 Multiple Check: Make a test line test from each multiple jack; one test using the regular jack and one test using the auxiliary jack.

5.6 Register Tests

5.61 Peg Count Register: At the register rack operate the BAT key which connects battery to the registers. Check the reading of the register associated with the group of trunks under test. Manually operate and release the F relay of each trunk and observe that the register scores each time.

5.62 Paths Busy Register: Check the reading of the register. Block operated the SL relay of each trunk. The register scores once when all relays are operated. Release and reoperate each relay in turn and note that the register scores once as each relay is reoperated. Release all SL relays.

5.63 Repeat 5.62 operating the LC, instead of the SL, relays.

5.7 Idle Trunk Indicating Lamp and Power Supply Check

5.71 Check that the ac power supply is connected to the idle trunk indicating relay circuit. Check that the lamp associated with the first trunk is lighted.

5.72 Partially insert a cord into the first trunk jack at the A board. The second trunk lamp lights. Continue the test by partially inserting cords into the succeeding trunk jacks and note that as each cord is inserted the associated lamp is extinguished and the succeeding lamp lights. Remove all cords at the completion of the test.

5.73 Make a continuity test of the S1 lead between the SL and LC relays. Check for ground on B7 of LC relay.

5.74 Verify that all lamps in the line burn with uniform brightness when the trunk is the next assigned idle trunk, and are extinguished when the trunk is made busy.

5.75 Check that the voltage at the middle lamp of a group of ac lamps is not less than 4.0 volts and the voltage at this midpoint shall be adjusted at the transformer to be as near 4.0 volts as possible. The voltage shall be adjusted to meet these limits under the conditions given in (a),(b) and (c) below. This test should be performed on at least ten circuits in each lineup.

NOTE: When testing extensions to existing multiple a new check of the "midpoint" voltage should be made made since the middle lamp has been shifted by the addition of the lamps in the extension.

(a) When the normal line voltage is applied to the primary of the transformer.

(b) When the maximum load is applied to the secondaries of both transformers of the unit.

(c) When the load is balanced; that is, when no current is flowing in ground return lead.

5.76 The voltage on the ac lamp leads is regulated by changing the connections to the taps on the transformer. The adjustment should be made so as to have the voltage at the middle point of the multiple not less than 4.0 volts but as near to 4.0 volts as possible. The voltage limits on the line current supplied to the primaries of the transformers can be obtained by consulting the Telephone Company power representative. The ac lamp voltage and power voltage should be measured using the Telephone Company's ac meter or if this is not available, the ac lamp and power voltmeter, ITE-2448.

5.77 Trunk Busy Awaiting Sender Release: Manually operate LC relay (or the ST1 relay for SD-25353) in the trunk circuit. Check for the busy condition at the sleeve of the trunk jack with a special service cord.

6. SUPPLEMENTARY TEST OF TRUNK FROM A BOARD NO TEST SD-25255 AND SD-25351

6.01 General

6.011 This test may be made at the same time as the test of the no test connector described in Handbook 63, Section 303.

6.02 Idle Line (Individual)

6.021 Connect a handset ITE-4042 to a cross-connected individual subscriber line in office A.

6.022 Insert the calling cord of a special service cord into the regular jack for office A of the trunk under test. Operate the KP key and when a sender is attached, key the number of the line connected to the handset.

6.023 When the subscriber line hold magnet operates, operate the handset C key and the talking key at the position. Check talking between the A board and handset. Check that the sleeve of the associated office B jack is busy (800 ohm battery).

6.024 Release the handset C key and remove the cord from the trunk jack. The equipment restores to normal.

6.025 Repeat Paragraphs 6.022 to 6.024 using the auxiliary jack associated with office A.

6.026 Connect the handset to a cross-connected individual line in office B. Repeat Paragraphs 6.022 to 6.025 using in turn the regular and auxiliary jacks associated with office B.

6.03 Idle Line (Tip Party)

6.031 Connect the handset to a cross-connected party subscriber line in office A.

6.032 At the A board, originate a call to the tip party line using the regular jack associated with office A. Complete the call as on the individual line test. Release the call. Observe that the equipment restores to normal.

6.033 Repeat Paragraphs 6.032 making a call to the ring party line.

6.034 Connect the handset to an office B-party line. Repeat Paragraphs 6.032 and 6.033 using the regular jack associated with office B.

6.04 Overflow

6.041 Insert the special service calling cord into the trunk jack of the trunk under test (office A or B). Operate the KP key and when a sender is attached, key the number of the overflow test line.

6.042 The cord supervisory lamp flashes at 120 I.P.M.

6.043 Release the call by removing the calling cord.

6.05 Busy Line

6.051 Connect the handset to an individual cross-connected subscriber line in office A.

6.052 Originate a call from the handset to the zero operator. Check transmission. Hold the connection by locking the handset C key.

6.053 Originate a call to this line (now held busy).

6.054 A double connection will be made to the handset line. The cord supervisory lamp will remain lighted. (When X wiring is provided, the supervisory lamp will be extinguished.) Check talking between the handset and the key pulsing position.

6.055 Release the handset C key and restore the zero operator's equipment. The cord supervisory lamp is extinguished. (When X wiring is provided, the cord supervisory lamp will light.) Talking is not possible between the key pulsing position and the handset.

6.056 Remove the calling cord to restore the equipment to normal.

6.057 Repeat this test to a line in office B.

6.06 No Test Vertical Busy (Overflow)

6.061 Repeat Paragraphs 6.051 to 6.052.

6.062 Connect ground to the H lead of the no test connector associated with the switch of the subscriber line used for test. This operates the no test hold magnets and makes them test busy.

6.063 Originate a call from the key pulsing position over the trunk under test to the line just made busy.

6.064 The cord supervisory lamp will flash at 120 I.P.M. Talking is not possible between the key pulsing position and the handset.

6.065 Restore all equipment to normal.

6.066 Repeat this test to a line in office B.

6.07 False Busy (Y Wiring)

6.071 Insert a switch make busy plug No. 325C in the vertical of the subscriber line in office A just used. The hold magnet operates.

6.072 Originate a call from the key pulsing position to this line.

6.073 The cord supervisory lamp flashes at 60 I.P.M.

6.074 Restore all equipment to normal.

6.075 Repeat this test to a line in office B.

6.08 Premature Disconnect

6.081 Originate a call from the key pulsing position over the trunk under test using the office A jack. Before an A sender is attached, remove the calling cord from the trunk jack. Observe that the trunk equipment restores to normal. Check that the sleeves of all associated jacks are "busy" until the A sender disconnects from the link.

6.082 Repeat Paragraph 6.081 except that the calling cord is not removed until the A sender is attached.

6.083 Repeat Paragraphs 6.081 and 6.082 using the jack associated with office B.

➔ Arrowed lines indicate new or changed information.

6.09 Reorder: Originate a test call to any cross-connected subscriber line except that less than four digits are keyed. A reorder signal, keyset release and flashing of the cord supervisory lamp at 120 I.P.M. is received at the A board. Remove the cord, originate another call but key five digits instead of the required four. The reorder signal is again received.

6.10 Register Tests

6.101 All Paths Busy: Block operated the SL relay of each trunk. Release and reoperate each relay in turn and observe that the associated PB register scores each time.

6.102 Peg Count: Operate the BAT key (traffic register rack) associated with the peg count registers. Operate and release the F1 relay of each trunk and observe that the peg count register scores each time.

6.11 Test of JC Leads: The JC leads are tested in conjunction with the test of the no test connector described in Handbook 63, Section 303.

6.12 Crosspoint

(See Paragraph 3.)

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To add note listed under general information.

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