TOLL LINE CIRCUITS
FEATURES OTHER THAN RING-UP RELAYS
NO. 9 (SPECIAL) OFFICE

1. GENERAL

1.01 This section outlines the following tests on toll line circuits in No. 9 (special) offices.

(A) A-C. Continuity Test.
(B) Jack Cutout Test
(C) Transfer Key
(D) Jack Sleeve Test

1.02 This issue, which replaces Issue A, covers changes in the method of making a-c. continuity and jack cutout tests and lists additional minimum test plugs for use under certain conditions.

1.03 This routine should be made during periods of light load.

1.04 In scheduling the tests it is desirable to combine tests (A) and (B) and arrange to perform test (C) in connection with tests of ring-up relays as covered in Section A235.281.

1.05 A description of the KI-1500 test set is outlined in Division A700.

2. APPARATUS

Tests (A) and (B):

2.01 A-C. Continuity Test Circuit S-KS-1019, G-2108, K-2232, or equivalent.

2.02 No. 525 Receiver equipped with an R2AC Cord terminating in a No. 110 or No. 78 Plug, as required.

2.03 No. P3E Cord equipped with a No. 110 Plug on one end and a No. 123A Gauge, 244 or B-2243 (as provided) Test Plug on the other end, with a No. 121A Cord Weight attached to the cord about two inches from the test plug. (For use where No. 141 jacks are provided.)

2.04 No. P3E Cord equipped with a No. 78 Plug on one end and a L-3443 Test Plug on the other end, with a No. 121A Cord Weight attached to the cord about two inches from the test plug. (For use where No. 112 jacks are provided.)

Test (C):

2.05 No. KI-1500 Test Set, or equivalent.

2.06 No. P3E Cord equipped with two No. 110 Plugs, or, one No. 110 and one No.78 Plug, as required.

2.07 No. L-3441 Cord.

Test (D):

2.08 No. 35C or 35D Test Set, or equivalent.

2.09 No. P3E Cord equipped with two No. 110 Plugs, or, one No. 110 and one No.78 Plug, as required.

3. TEST SET PREPARATION

Tests (A) and (B):

3.01 When the K-2232 (portable type) a-c. continuity test set is used, obtain the battery and ground by inserting the plug of any common battery cord into the BATT jack of the test set prior to starting the test. Depress the 34-ohm key and note that the interrupter starts vibrating.

3.02 When the S-SK-1019 a-c. continuity test circuit is provided, it will be necessary to place battery on the sleeve of the CON jack at an adjacent position in order to operate the BT relay in the test circuit.

3.03 Using a P3E cord equipped with a test plug, insert the No.110 or No.78 plug into the test circuit jack designated CON, TEST or LINES.

3.04 Before making an a-c. continuity test, the operation of the tone interrupter should be checked by inserting the plug attached to the test receiver into the REC jack of the test circuit. While listening in the test receiver, partially insert the test plug, associated with the P3E cord, into the jack of an idle line, so that the tip of the plug makes contact with the ring of the jack and the sleeve of the plug makes contact with the sleeve of the jack. If tone is received, it is an indication that the interrupter is functioning properly.

3.05 Upon receiving the tone, complete the insertion of the plug into the jack and note that no tone or a slight tone is heard in the receiver. A slight tone can be expected and is not an indication of trouble. After testing several line circuits, the tester should become familiar with the volume of tone which is heard on normal lines.

Test (C)

3.06 Before using the KI-1500 test set, care should be taken to see that the Ward Leonard resistance (300 ohms) is in the generator supply leads. This may be either in a generator supply circuit per drawing KI-1501, Fig. 3, or, in case generator and generator ground supply is obtained from the switchboard ringing mains, the resistance in the set may be cut in by turning the switch designated RES to the terminal marked IN. When generator supply is obtained from the circuit KI-1501, Fig. 5, this switch should be turned to the terminal marked OUT.

3.07 Battery and ground may be obtained from the battery supply cord fasteners wired per Fig. 3 of the circuit KI-1501, or from the battery and ground bus bars in the switchboard section. In the latter case a 1-1/2 ampere fuse should be placed in the circuit. A spare fuse post in the rear of the section may be used for this purpose.

3.08 When circuit KI-1501, Fig. 3-C, is provided, use the L-3441 cord and insert the No. 247A plug, with the knurled side to the right, into the ± G and BATT & GRD jacks of the

test set and connect the cord conductors as follows: Red to 24-V (battery), white to G (ground), green to ± (generator) and blue to G (generator ground).

3.09 Set the SHUNT switch on the shunt indicated in the section of Division A400 covering No.101 type relays. This section also gives the a-c. current values to be set up on the KI-1500 test set.

Note: The current values should be set up before connecting the test set to the circuit to be tested.

3.10 The key designated CORD, which places battery through resistance on the sleeve of the TEST jack in order to operate the sleeve relays in the line circuit under test, should remain non-operated.

3.11 Operate the keys to the OPR and TEST positions and set up the required a-c. "operate" value of the relay to be tested by means of the potentiometer slider marked OPR.

3.12 Using the P3E cord, patch the line to be tested to the TEST jack of the test set.

Test (D):

3.13 Locate the 35C or 35D test set on the key shelf adjacent to the position in which the test is to be made. The BATT & GRD C.O. and REV keys should be normal and the GRD switch should be set in the open position. Insert any common battery cord into the TEST BATT & GRD jack of the test set.

3.14 Using the P3E cord, patch jack S of the test set to the line under test.

4. METHOD

(A) A-C. Continuity Test:

4.01 Any tone above normal indicates an unbalanced condition. (See 3.04 and 3.05). Check to see that the test plug is making proper contact with the jack, In case trouble is indicated and does not appear in the jack, open the phantom group at the M.D.F. taking care to clear the telegraph or carrier circuits in case there are any involved. If the tone remains, the trouble is in the terminating equipment.

(B) Jack Cutout Test:

4.02 Insert the minimum test plug associated with the P3E cord into the jack to be tested and while listening in the test receiver rotate the test plug between the thumb and finger. The 121A cord weight attached to the cord will provide the proper pressure requirement. Any variation in the tone in the test receiver (see 3.04 and 3.05) indicates a jack spring cutout in the jack under test or a spring contact which does not break the annunciator contacts.

4.03 Such variation of tone not cleared by the adjustment of jack springs may be due to a loose connection between the jack and the multiple wiring. A loose connection on the sleeve lug would interrupt the test tone by breaking the continuity of the sleeve circuit which controls the tone, when the G-2108 test circuit is used.

4.04 Repeat the above tests on each jack in the line circuit.

(C) Transfer Key Test:

4.04 Operate the keys of the KI-1500 test set to the OPR and REL positions.

4.06 Dial the gigit "0" which, by means of relays in the test circuit, applies the a-c. "operate" value to the No. 101 type relay for a period of approximately one second. The operation of the dial and relays in the test circuit will bring in the line signal by means of the application of the operate current to the toll line relay, without disturbing the distant operator. This relay will lock in until the operator answers.

4.07 Operate the transfer key of the circuit under test and note that the toll line signal transfers to the proper position.

4.08 Restore the REL key to normal and remove the test plug from the line under test. In some cases it may be necessary to insert a plug into the toll line jack at the secondary position in order to retire the line lamp.

(D) Jack Sleeve Test:

4.09 Depress key No. 1 of the Nos. 35C or 35D test set and move the associated resistance slides to the left until a current of .034 amperes is shown on the meter.

4.10 Without further changing of the resistance slides, test each line, making observations of the meter readings. Any considerable variation in the above current indicates some defective sleeve circuit condition such as a short-circuited or open winding in a relay or resistance, two paths to ground in parallel due to an improper cross-connection or some similar condition.

5. REPORTS

5.01 The required record of this routine should be entered on the proper form.