

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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AT&T Co Standard

GENERAL
KS-8455 TEST SET

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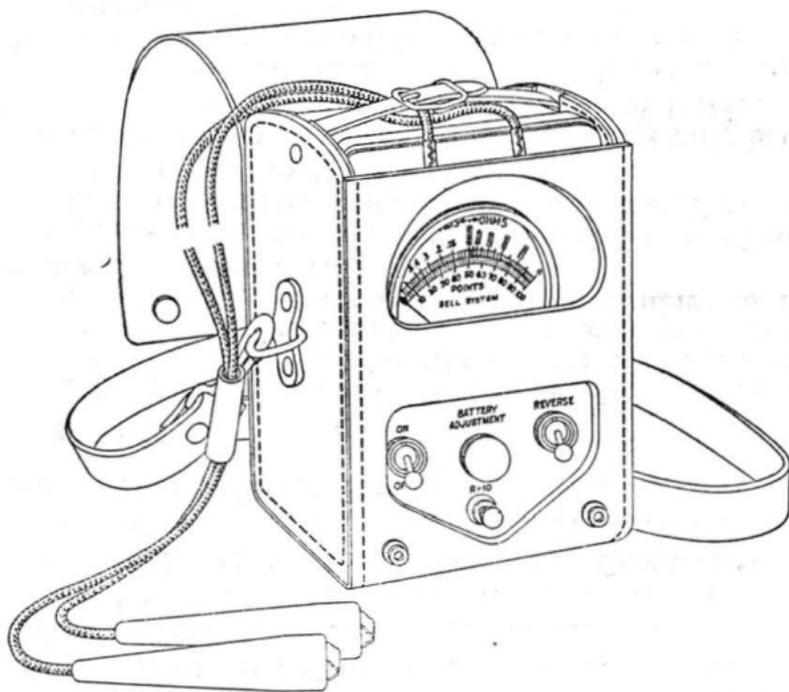
1. GENERAL

1.01 This section covers the use of the KS-8455 Test Set which is intended primarily to aid in locating troubles in distribution plant in community dial office areas. This set may also be used to advantage to detect troubles in other office areas. For example,

- where access to local test desk facilities is difficult as may be the case when large P.B.X. installations are remotely located;
- where the test desk cannot be reached readily because of the type of equipment or volume of traffic;
- where the test desk cannot be reached because of defective plant conditions as may exist in floods or storms.

2. DESCRIPTION OF TEST SET

2.01 The test set and leather carrying case are illustrated below:

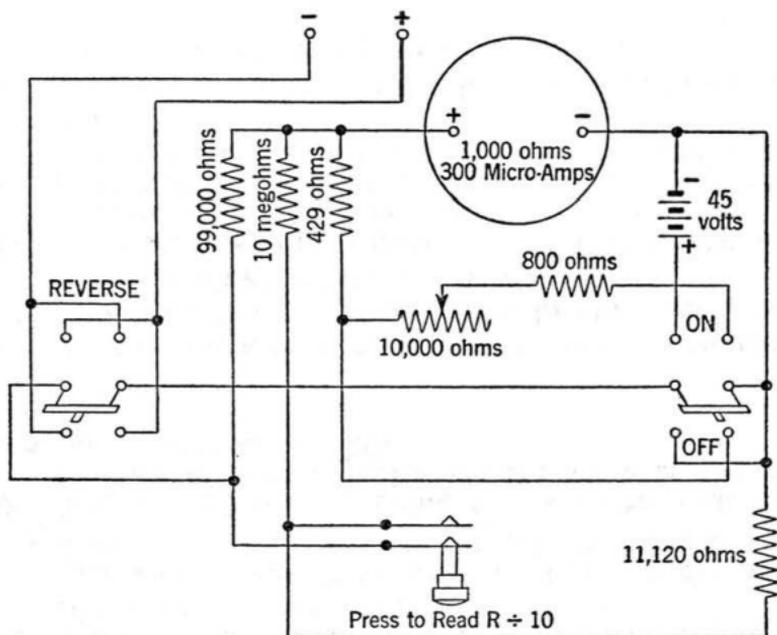


KS-8455 TEST SET

The KS-8455 Test Set is made up of the following parts:

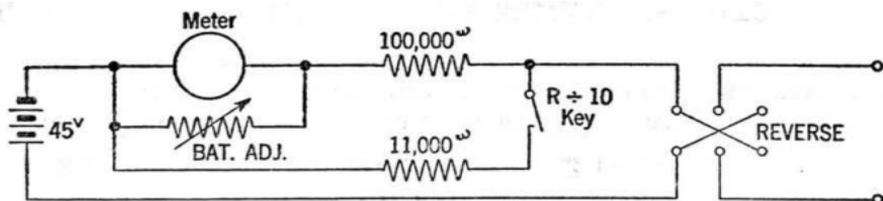
- (a) KS-8455 Test Set, List 1—Complete set except battery
- (b) KS-8455 Test Set, List 2—Volt-Ohmmeter only
- (c) KS-8456 Carrying Case
- (d) W2CE Cord
- (e) No. 455 Eveready Battery

202 A simplified circuit diagram is shown below:

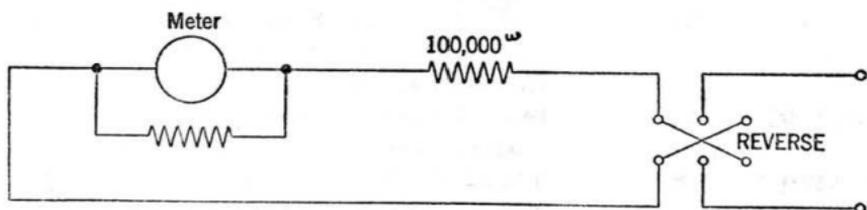


This circuit consists essentially of a microammeter, resistances, 45 volt battery, and switches which permit setting up a voltmeter or ohmmeter circuit.

(a) Ohmmeter circuit; ON-OFF switch at ON.



(b) Voltmeter circuit; ON-OFF switch at OFF.



2.03 The ohmmeter circuit is used for:

- (a) Determining insulation resistance of a line, between wires or between one wire and ground.
- (b) Making ballistic tests to detect opens or to check bridged condenser connections.

The meter scale is calibrated to read insulation resistance directly in ohms, megohms, or "points" which correspond approximately to the "points" reading obtained on the voltmeter in the No. 2 Test Cabinet usually provided in community dial offices. The range of the ohmmeter is 0 to 2 megohms with the (R÷10) key in the normal position; with this key depressed the range is 0 to .2 megohms.

2.04 The voltmeter circuit is used primarily for measuring line voltage and foreign EMF. The range of the voltmeter is 0 to 100 volts.

3. INSULATION RESISTANCE MEASUREMENTS

3.01 Before making insulation resistance measurements adjust the set as follows:

- (1) Turn ON-OFF switch to ON.
- (2) Short circuit the two cords by clipping them together.
- (3) Turn "Battery Adjustment" knob until needle is at 100 on the "points" scale.

Repeat this adjustment from time to time to compensate for any change that may occur in the battery voltage.

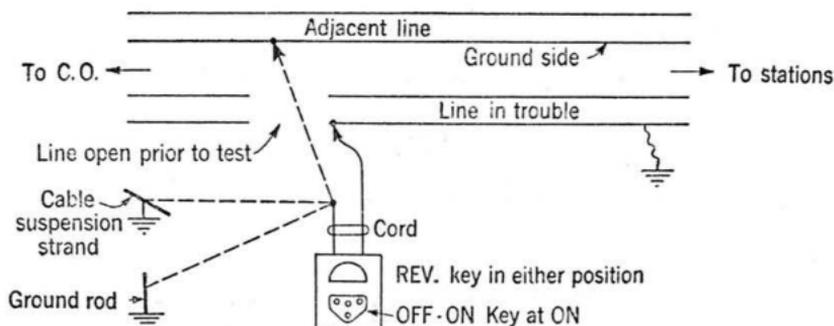
3.02 The procedures for using the KS-8455 Test Set to localize insulation faults are the same as those recommended in Section G32.205.

4. GROUNDS

4.01 To test for a fault to ground proceed as follows:

- (1) Open the line at a convenient location such as at a cable terminal or bridging point.
- (2) Connect one clip to ground. A suitable ground connection may be secured from the suspension strand or other associated grounded plant, from the grounded side of an adjacent line, or from a temporarily driven ground rod.
- (3) Connect the other clip to the wire to be measured.
- (4) Throw ON-OFF key to ON.

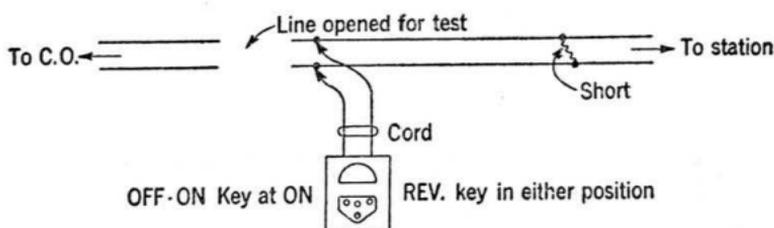
(5) Read meter deflection. If read on the ohm or megohm scale, the reading indicates the insulation resistance of the measured wire to ground; if read on the "points" scale, the insulation resistance is obtained in terms of points.



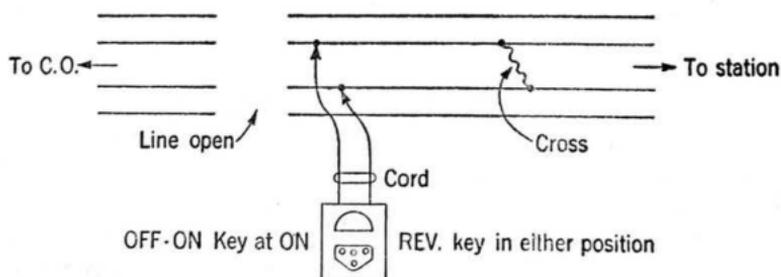
5. SHORT CIRCUITS AND CROSSES

5.01 To test for short circuits between wires of a pair or a cross between the wires of different pairs the procedure is the same as in Part 4, except that the clips shall be placed across the wires under test as shown in the following diagrams.

(a) Test for short.



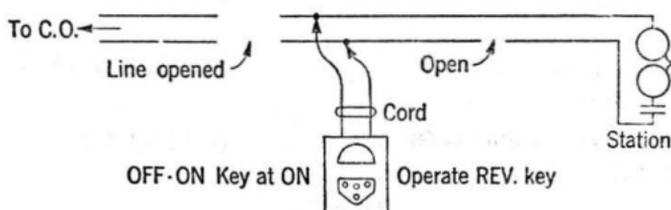
(b) Test for cross.



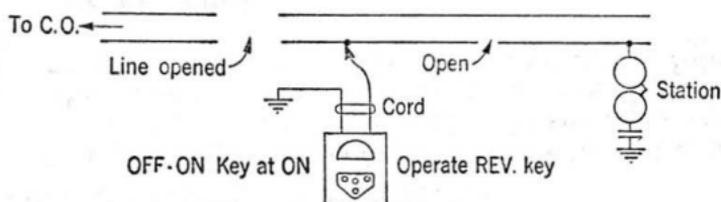
6. BALLISTIC TESTS

6.01 The KS-8455 Test Set can be used in the same manner as the office voltmeter to detect opens or the presence of a condenser on the line. Methods of making these tests are indicated by the following sketches.

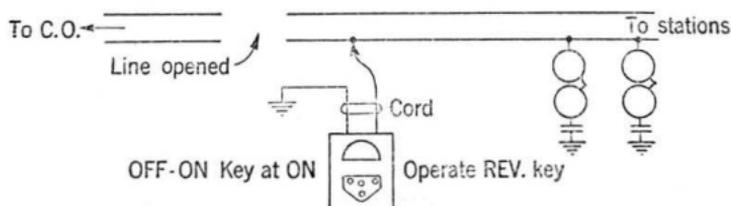
(a) Test for open on an individual line.



(b) Test for open on a party line.



(c) Ballistic test for grounded ringers.



6.02 Having made the connections illustrated operate reverse (Rev.) key back and forth slowly enough so that needle will return to zero at the end of each swing. If the needle deflects off the scale, keep the R-10 key depressed while operating the reverse key.

7. VOLTMETER TESTS

7.01 To use the KS-8455 Test Set as a d-c voltmeter, place the ON-OFF key in the OFF position. Connect the clips across the circuit on which the voltage is to be measured. If the voltmeter reads backwards operate the reverse key. The reading on the points scale is the value of the applied potential in volts.

7.02 The $R \div 10$ key should not be depressed when taking voltmeter readings.

8. STRAPPED SLEEVE METHOD OF TESTING IN COMMUNITY DIAL OFFICES

8.01 In many instances testing with the KS-8455 Test Set may be facilitated by utilizing the operation of the cutoff relay which removes battery and ground from the line in trouble. This permits tests to be made at various locations on the line both "ahead" and "towards" the central office, and allows certain tests to be made on open wire sections without cutting the line. This test is made as follows:

(1) Tie the sleeve of a spare connector terminal to the sleeve of the connector terminal of the line in trouble at a common appearance (location of the common appearance differs in different types of offices). The strap may be removed after the tests, at the convenience of the tester, as no trouble will be caused while it is in place in the office with a standard strap or shunt cord.

(2) At the testing location of the line in trouble, connect a dial hand test set to an adjacent working line, if available, and dial the spare connector terminal.

—If a busy signal is encountered, it is an indication that the line to be tested is busy or has become permanent.

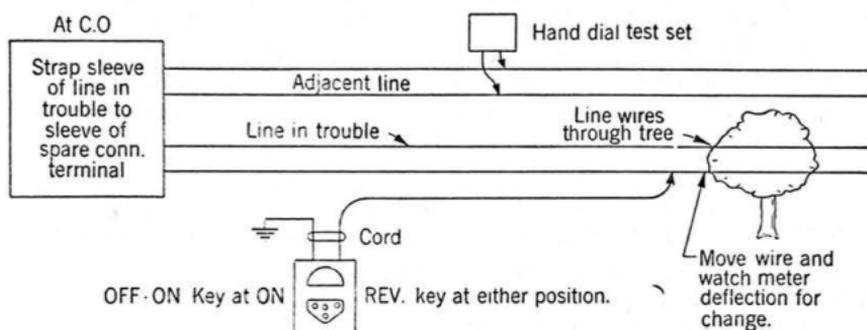
—If a ringing signal is heard, it is an indication that the cut-off relay has operated and the line to be tested is open at the central office. As long as the connection to the spare connector terminal is held up and the ringing signal is heard, the line to be tested will remain in this condition.

(3) If an adjacent line is not available for dialing the spare connector terminal, and if the fault on the line in trouble is not of sufficient value to interfere with dialing, use the hand test set on the line in trouble to call the test desk or operator at the master office. Have the test deskman or operator dial the spare connector terminal and hold the connection for a prearranged length of time, say two minutes. With the "Talk-Mon."

key on the dial hand test set in the monitoring position, the combinationman may monitor on the line while the test deskman is placing the call. Evidence of the operation of the cut-off relay will be a click in the receiver of the hand set or a change in the volume of line noise.

(4) After the battery and ground have been removed from the line, proceed with the desired tests.

8.02 A typical application of this method of testing is illustrated by the following sketch.



9. MAINTENANCE OF TEST SET

9.01 Reasonable care should be exercised in handling the test set. The set should be protected against unnecessary shocks or jars.

9.02 The battery should be replaced when it is impossible to adjust the meter needle to 100 on the points scale by use of the battery adjustment knob.

9.03 To replace the battery remove the set from the leather case. Remove the panel on the back of the set by taking out the four screws which hold it in place. Disconnect the old battery from the terminals (snap fasteners) and replace it with a new one. The terminals are so arranged that it is impossible to reverse the polarity.