

## RURAL CORD CIRCUITS (FULL AND SEMI-UNIVERSAL) AND ASSOCIATED OPERATORS TELEPHONE CIRCUITS

### 1. GENERAL

1.01 This section covers the detailed methods to be followed in making transmission tests on rural cord circuits and associated operator's telephone circuits, and replaces the information given in 3A (e) of Section K21.01.

1.02 Information covered in this section is listed as follows:

1. General
2. Testing Methods
  - (A) Cord Circuits.
  - (B) Operator's Telephone Circuits

1.03 Reference should be made to Section K20.01 for general testing methods, and to Section K20.11 for general testing apparatus requirements.

### 2. TESTING METHODS

#### (A) Cord Circuits

2.01 These circuits may be arranged to complete common battery to common battery, magneto to magneto, or common battery to magneto connections. For each of these combinations there is a different arrangement of equipment associated with the tip and ring conductors of the cord circuit which is controlled by the sleeve circuit.

2.02 Obtain the proper sleeve condition for the cord circuit to be tested.

Note: This is accomplished by connecting the sleeve conductors of two switchboard cords having the same type of plug as the cord circuit under test, respectively, to the  $S_1$  and  $S_2$  terminals of the transmission measuring set. These cords are inserted in spare switchboard jacks of the proper type to establish the cord circuit condition.

2.03 Insert the answering and calling cords of a cord circuit to be tested in the sending and receiving jacks of the transmission measuring set.

2.04 Figure 1 shows schematically the connections for the test.

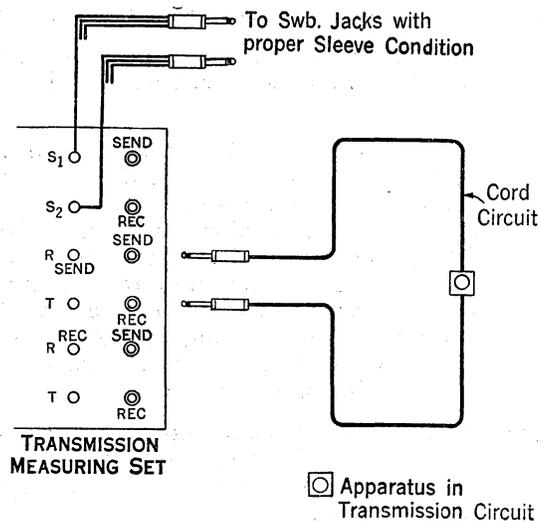


Figure 1

2.05 Restore to normal any keys associated with the cord circuit under test.

2.06 With the transmission measuring set in the measuring condition, perform the operations outlined in paragraphs 2.07 and 2.08.

Note: If A.C. continuity tests are regularly made on the cord circuits, these operations may be omitted.

2.07 Manipulate the cords and plugs in the following manner to detect possible cutouts or faulty connections: Pull on each cord directly downward and downward at an angle to the right and to the left, and shake the cord. Hold the plug in the jack with one hand and grasp the cord with the other hand approximately four inches from the plug. Move the cord about the plug with a cranking motion. Turn the plug around in the jack so as to cause the jack springs to make contact at all possible points to the tip and ring of the plug.

2.08 Test all keys associated with the cord circuit for cutouts in the normal and operated position (except ringing and splitting keys in the operated position) by tapping the key top lightly using the rubber eraser end of a pencil.

For lever type keys, move the levers slightly forward and backward while exerting a slight pressure to the left and right to take up any play or side lash.

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For plunger type keys, directly connected in the transmission circuit, move the plungers with a circular motion and test for plunger-spring clearance by depressing the plungers slightly.

- 2.09 Measure the transmission loss of the cord circuit with the keys normal.
- 2.10 Measure the current supply of each cord.
- 2.11 Repeat the above procedure for each of the remaining cord circuits of the same type.
- 2.12 In cases in which more than one cord circuit arrangement is provided, the other arrangements are tested in the same manner as just outlined in paragraphs 2.03 to 2.10 inclusive, it being necessary to obtain the proper sleeve condition for the arrangement of the cord circuit to be tested. This is obtained by changing the sleeve connections to the proper switchboard jacks as outlined in paragraph 2.02.
- 2.13 Measure the transmission loss of each cord circuit with the keys normal and, if not previously measured, the current supply of each cord.

### (B) Operator's Telephone Circuits

- 2.14 Figure 2 shows schematically the connections for the tests of the operators' telephone circuits.

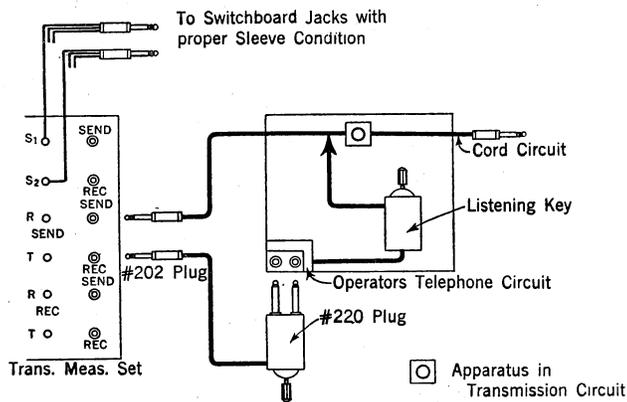


Figure 2

- 2.15 Insert the No. 220 plug in the telephone set jack associated with the position under test, with the key of the plug in the normal position.
- 2.16 On the transmission measuring set, connect the sending T and R terminals, respectively, to the receiving T and R terminals.

Note: When a transmission measuring set of the No. 3 type is used, these connections are made through the jack contacts of the set when a dummy plug is removed from a jack other than the one to be used in this test.

- 2.17 From the results of tests on the cord circuits of the position, choose a cord circuit which shows no transmission troubles and use it to make the following tests of the operator's telephone circuit.
- 2.18 Insert the plug (answering or calling as the case may be) of the cord circuit to which the operators' telephone circuit is connected when in the talking condition, in the proper type sending jack of the transmission measuring set.

Note: When the listening key of a cord circuit is operated, the telephone circuit is bridged on one end of the cord circuit, depending on the wiring arrangement of the latter circuit. Transmission measurements of the telephone circuit wiring should be made using the cord adjacent to the telephone circuit bridge.

- 2.19 Measure the transmission loss with all keys of the cord circuit normal.
- 2.20 Operate the listening key associated with the cord circuit so that the operator's telephone circuit is connected across the cord circuit in the talking condition.
- 2.21 Measure the transmission loss.

Note: The difference between the measurements made in paragraphs 2.19 and 2.21 will be the loss of the operator's telephone circuit in the bridged condition.

- 2.22 Remove the strapping between the sending and receiving T and R terminals of the transmission measuring set.
- 2.23 Insert the No. 202 plug associated with the No. 220 plug in the receiving jack of the transmission measuring set.
- 2.24 Operate the key of the No. 220 plug to the T position.
- 2.25 Measure the transmission loss.

Note: The difference between the measurements made in paragraphs 2.19 and 2.25 will be the loss of the operator's telephone circuit in the transmitting condition.