

## TYPES "A" AND "B" COMPOSITE RINGER TEST PANEL DESCRIPTION AND APPLICATION

### 1. GENERAL:

- 1.1 This section describes equipment for testing and adjusting types "A" and "B" composite ringers as covered on Drawing ES-60066-01.
- 1.2 The equipment described provides for the following features:
  - (a) Making routine tests of the ringers.
  - (b) Applying electrical testing and adjusting values to the 20-cycle and 135-cycle relays of the ringers on an alternating current basis.
  - (c) Checking the frequency of the 135-cycle ringing current supplied from either the home office or a distant connecting office.
  - (d) Observing the operation of the ringers while they are connected to their respective toll lines under service conditions.

### 2. DESCRIPTION OF EQUIPMENT ARRANGEMENTS:

- 2.1 In general, the equipment is arranged so that it can be connected to the ringers to be tested by means of cords and plugs and so that the features mentioned in paragraph 1.2 can be controlled by the operation of keys and a dial.
- 2.2 The main control equipment, such as the meters, dial, keys, jacks, etc., are mounted on panels for location either in ringer jack boxes or on relay racks. These panels are located adjacent to the ringer jacks whenever possible. The associated apparatus, such as relays, resistances, etc., are mounted on the relay rack. Jacks are provided at the coil rack or relay rack where the 20-cycle and 135-cycle relays of the ringers are located, so that the testing and adjusting circuit can be controlled from these points. Fig. 1 shows the main control equipment arranged for mounting on an 84" floor mounted relay rack mounting. Fig. 2 shows the control equipment arranged for mounting in ringer jack boxes where spare space is available in such boxes. This control equipment may be mounted at the toll testboard if the ringer jacks are located at

this point and space is available. For this case, the testing and adjusting circuit has the jacks which are marked LCXX and DCXX in Fig. 1 and Fig. 2, replaced by cords and plugs.

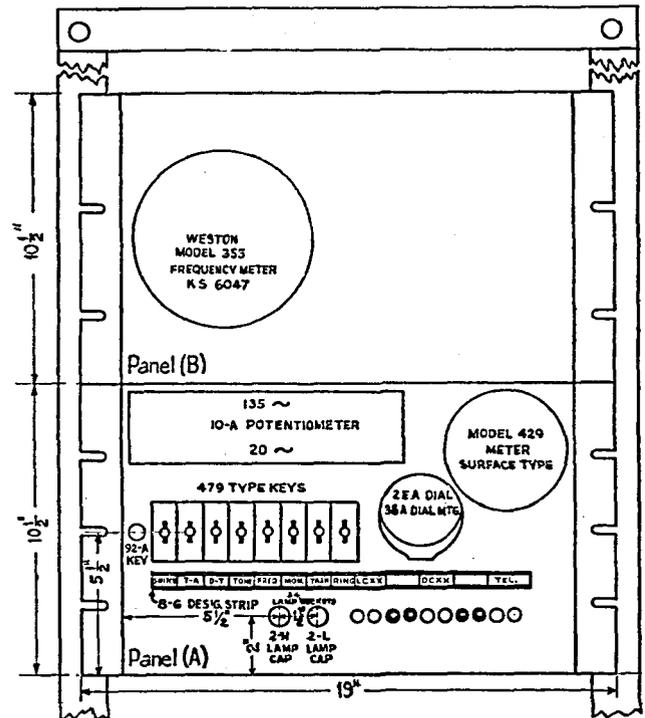


Fig. 1.

- 2.3 The functions of the various pieces of equipment are as follows:

#### Jacks:

- 2.4 Four jacks, two of them designated LCXX and two DCXX, are provided for associating the testing and adjusting set with the ringer to be tested. The LCXX jacks are to be connected to the line-jacks of the ringer and the DCXX jacks to the drop jacks of the ringer. If the control equipment of the testing circuit is located at a distance from the ringer jacks, the testing and adjusting circuit is either extended to the ringer panel, where it appears as jacks or as cords and plugs, or patching trunks are provided between the control equipment and the ringer jacks.
- 2.5 Two jacks designated TEL are provided for an operator's telephone set.

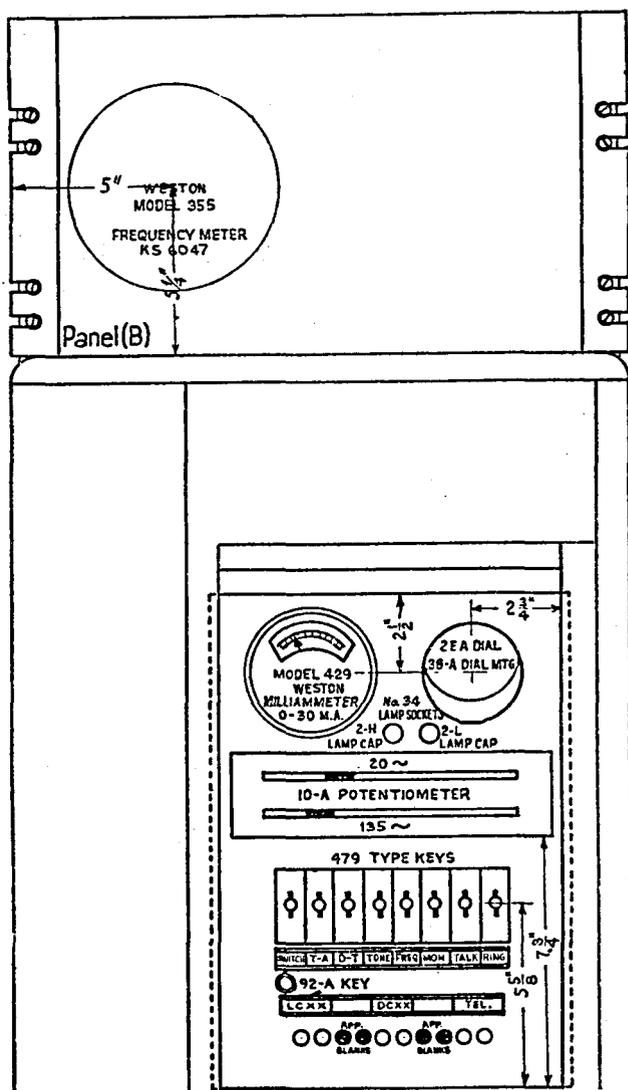


Fig. 2.

2.6 Three jacks located at the coil or relay racks and designated L, TA and TA-1 are used for connecting the portable test set to the testing and adjusting circuit for controlling the application of the 135-cycle and 20-cycle ringing current to the ringer under test, and for performing the "operate" and "non-operate" tests by means of the portable test set dial.

#### Keys:

2.7 Two keys S1 and S are provided. These are so wired that when depressed they apply 20-cycle or 135-cycle current, respectively, to the potentiometers through the T-A key.

Note: The S1 key was not provided on some installations.

2.8 There are eight lever type keys. The functions of these keys are as follows:

- (a) The SWITCH key when operated connects the DCXX jacks (or cords) to the testing and adjusting circuit.
- (b) The T-A key is operated to its 20-CYCLE position when 20-cycle tests or adjustments are being made, or when measuring the frequency of the home office 135-cycle ringing source, and to its 135-CYCLE position when 135-cycle tests or adjustments are being made.
- (c) The D-T key when operated to its O (operate) position, places the application of the 135-cycle current under control of the dial mentioned below. When operated to the N-O position it connects the dial for the "non-operate" test mentioned below.
- (d) The TBL TONE DROP key when operated during tests or adjustments connects trouble tone to the drop of the toll line with which the ringer is associated, and also under control of the SWITCH key, connects a 20-cycle receiving current with bridged equipment simulating a short toll switching trunk to the drop side of the ringer under test.
- (e) The FREQ key when operated to its LINE position and with all other keys normal, connects the frequency meter to the line making it possible to read the frequency of the 135-cycle current from a distant connecting office. When this key is operated to the CXX position with the SWITCH key operated, and the T-A key operated to the 20-CYCLE position and the S1 key depressed, 20-cycle current is applied to the ringer. This in turn applies 135-cycle current to the test circuit and the frequency meter is connected to the line side of the ringer, making it possible to read the frequency of the 135-cycle supply of the home office.
- (f) The MON key when operated to its LINE position, enables the testman to monitor on the toll

line while a ringer is under test. It also enables the tester to monitor on the toll line if the LCXX jacks (or cords) only are connected with the ringer line jacks. In this case the line is cut through without the ringer. With both the LCXX jacks (or cords) and the DCXX jacks (or cords) connected to the ringer, the operation of the MON key to the CXX position (with all other keys normal) enables the testman to monitor on the toll line with the ringer cut in as for regular service.

- (g) The TALK key when operated to the LINE position during tests or adjustments, connects the operator's telephone circuit to the toll line. When operated to the TRUNK position, the operator's telephone circuit is connected with the trunk to the toll testboard.
- (h) The RING key when operated to the LINE and TRUNK positions respectively, applies ringing current to the toll line or to the trunk to the toll testboard.

#### Dial:

- 2.9 This is a No. 2EA dial mounted on a dial mounting. It is so associated with the testing and adjusting circuit that it applies 135-cycle current to the ringer under test for the period of time during which the dial is returning to normal. Accordingly, the period of time (up to approximately one second) that the current is applied to the ringer can be controlled by dialing the proper digit. This dial is used also in applying a "non-operate" check test to see that the ringer will not respond and thus cause false signals when interfering impulses, such as might be caused by the operation of a subscriber's switch hook, are applied to the ringer. With the proper operating current set up, the SWITCH key operated and the T-A key operated to the 135-CYCLE position, five pulses are applied to the ringer when digit 0 is dialed. The 10 pulses sent out by the dial are reduced to five by the relay equipment. Similarly, eight and six pulses of the dial are reduced to four and three respectively, etc.

#### Meters:

- 2.10 The milammeter indicates the current values specified in the "adjustment value

table" on Drawing ES-60066-01 for adjusting the 135-cycle and 20-cycle relays. The current flowing in the relay, however, is only a portion of the current indicated on the milammeter, the ratio being dependent upon the value of the shunt resistance in the adjusting circuit and the impedance of the circuit under adjustment.

- 2.11 A potentiometer of the slide wire coil type is provided. It is equipped with two slides, one marked 135-CYCLE and the other 20-CYCLE. The resistance of the coil is 1600 ohms minimum and 1800 ohms maximum. The slides are so connected that they control the 135-cycle and 20-cycle current respectively applied to the ringer under test.
- 2.12 The frequency meter is a Weston instrument having a range of 120 to 150 cycles, and connected to a No. 218-B relay and a reactance. The No. 218-B relay responds to the incoming alternating current and in turn interrupts direct current through the reactance. The meter indicates the frequency of the alternating current supplied to the No. 218-B relay either from the home, or distant office.

#### Lamps:

- 2.13 Two lamps are provided, one with a green cap and the other with a red cap. The lighting of the green lamp indicates that the ringer is supplying 135-cycle current to the test set. The lighting of the red lamp indicates that the ringer under test is supplying 20-cycle current to the test set. In some cases, an alarm bell is provided, which operates when either of the signal lamps are lighted.

#### Remote Control:

- 2.14 The test circuit is extended to the coil rack of relay rack where the 20-cycle and 135-cycle relays are located, in order that certain tests can be made from the coil rack or relay rack. It is multiplied at convenient points terminating in jacks, mounted in a jack box, one jack being designated TA or TA-1 and the other L. A portable test set, containing a dial, a key designated O DL and a signal lamp with a red cap is provided to control the testing and adjusting circuit. The portable box is provided with a flexible cord equipped with two plugs, one plug being equipped with a black shell and the other with a red shell. The plug with the black shell should be placed in the TA or TA-1 jack and the plug with the red shell in the L jack. With the SWITCH key operated and the T-A key of the testing and

adjusting circuit operated to its 20-cycle or 135-cycle position, the operation of the O DL key of the portable test set applies 20-cycle or 135-cycle current respectively to the ringer. If the portable test set is allowed to remain in its normal position and the portable test set dial is employed, the current is applied only during the time the dial is restoring to normal. By selecting the proper digit to dial the desired time of application of the current can be controlled. This dial, as is the

case with the dial associated with the testing and adjusting circuit, is used also in applying a "non-operate" test. In making a "non-operate" test, the portable test set O DL key should be operated to the NO position.

3. CIRCUIT DESCRIPTION:

- 3.1 A detailed description of the operations of this circuit will be found in CD-60066-01.