TESTING AND ADJUSTING CIRCUIT PER SD-61389-01 FOR 1000-CYCLE, TWO-TUBE RINGERS

DESCRIPTION

1. GENERAL:

1.1 This section describes the equipment covered by Drawing SD-61389-01 for testing and adjusting the following 1000-cycle, two-tube ringer equipment:

1000-20-cycle Terminal Ringers
1000-20-cycle Intermediate Ringers
1000-135-cycle Intermediate Ringers—(1000-cycle branch)

2. GENERAL DESCRIPTION:

2.1 The equipment, exclusive of the jacks, is located on a panel arranged for relay rack mounting. As shown in Fig. 1, the various keys, meters, etc., are mounted on the front of the panel.

2.2 The jacks associated with the test panel are usually located in a miscellaneous jack strip mounted above the test panel.

2.3 The equipment provides for the following features:

(a) Making Routine Tests of the Ringers.

(b) Making Tests of Ringer Vacuum Tubes.

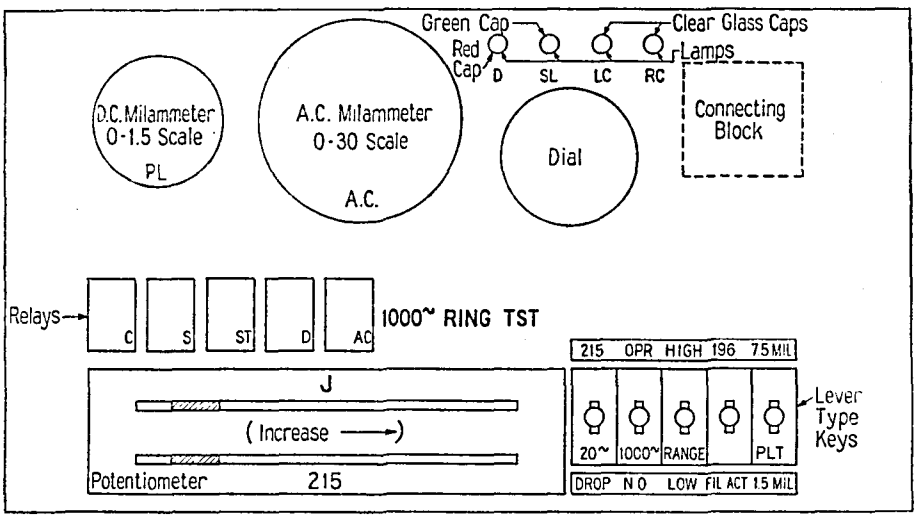
(c) Applying Electrical Test and Adjust Current Values to the A. C. Relays of the Ringer.

2.4 Connection is made between the test panel and the ringers by means of cords and plugs. If the ringer to be tested is adjacent to the test panel, direct connection is made by means of double-ended cords. If the ringer is at a distance from the the testing equipment, a test trunk is also required, one end of this trunk being connected to the ringer and the other to the testing equipment, by means of double-ended cords. This trunk appears as a pair of jacks marked TST TRK, L and D at the test bay and in such of the ringer bays that all ringers can be reached from the jacks by means of cords and plugs.

3. DESCRIPTION OF PARTS:

3.1 Five lever-type keys are provided, with functions as follows:

3.2 The 20-CYCLE key, when operated to the DROP position, applies 20-cycle current through a potentiometer and AC milammeter to the ringer connected for test. When operated to the 215 position, it applies 20-cycle current through a potentiometer and AC milammeter to any



FRONT OF PANEL

Fig. 1.

No. 215 type relay placed in the connecting block of the test set.

3.3 The 1000-CYCLE key, when operated to the OPR position, applies 1000-cycle current to the ringer at a voltage corresponding to one milampere attenuated by 22 db in a 600-ohm circuit. This condition is considered an "operate" test for terminal ringers and allows a 2 db margin over the actual rated range of the ringer. When the 1000-CYCLE key is operated to the NO position the voltage applied to the ringer is 8 db less than for the OPR position. This is considered a "non-operate" test and is for the purpose of guarding against a ringer being in too sensitive an adjustment and thus aids in preventing a ringer from being falsely operated on interfering impulses.

3.4 The RANGE key, when in its HIGH (normal) position, sets up the proper condition for sending the correct value of 1000-cycle current into ringers wired for high sensitivity, that is, ringers with all of the windings of the input transformer RC in use. This is the normal condition for terminal ringers and 1000-20-cycle intermediate ringers arranged for use as terminal ringers. The key is operated to the LOW position in cases of ringers wired for reduced sensitivity, that is, with one of the windings of the input transformer RC unused. This is the normal condition for intermediate ringers and for special cases of terminal ringers used as intermediate ringers. The voltage applied to the ringer is increased by approximately 5 db when this key is operated to the LOW position.

3.5 The FIL ACT-196 key, when operated to the 196 position, sets up the testing circuit to apply 20-cycle current to the No. 196 relays in 1000-20-cycle intermediate ringers, through a potentiometer and AC milammeter. This key is operated to the FIL ACT position when making filament activity tests of ringer vacuum tubes and in that position reduces the 1000-cycle input to the ringer by 2 db.

3.6 The PLT key is used in taking readings of the plate currents of the detector tubes. Connection is made to the test circuit from any detector tube plate circuit by inserting a dummy plug in the tube PLT jack. When the key is operated to the 1.5 MIL position, the DC milammeter of the test set reads the actual plate current of the tubes.

Note: When the key is in its 7.5 MIL (normal) position, the milammeter is connected through a resistance network such that the meter reads approximately one-fifth of the actual plate current. This arrangement is for the purpose of protecting the meter from excessive current in case the plate current from more than one ringer, or from a ringer which is on a circuit carrying speech at the time, is connected through the meter circuit.

3.7 A Weston model No. 301 DC milammeter with a scale range of 0 to 1.5 milamperes is provided for the purpose of reading the plate current of detector tubes.

3.8 A Weston model No. 429 AC milammeter with a scale range of 0 to 30 milamperes is provided for measuring the 20-cycle current sent out by the test set. In all cases, except that of 1000-20-cycle intermediate ringers, which have No. 196 type relays, the meter reads the actual current applied to the ringer. In the case of 1000-20-cycle intermediate ringers not having a 10,000-ohm resistance in series with the No. 196-A relay, the meter reads 10 times the value of current applied to the 196 type relay. For cases where ringers of this class are used as terminal ringers and have a 10,000-ohm resistance in series with the No. 196-A relay, the relation of ten to one of the meter reading and the actual current in the relay does not hold and the meter reading for a particular relay current must be determined from the circuit drawing covering the test set.

3.9 A dial is provided to test the time required to operate a ringer from 1000-cycle current. When the dial is operated, 1000-cycle current is sent into the ringer under test for as many tenths of a second as the number dialed. For example, if 7 is dialed, current is sent into the ringer for approximately .7 of a second.

3.10 A potentiometer with two slides is provided, the slide designated J being used to adjust the 20-cycle current applied to ringers provided with J type or No. 196 type relays, and the slide designated 215 being used to adjust the 20-cycle current applied to No. 215-type relays placed in the test set connecting block.

3.11 Four lamps are provided for signaling purposes. The red lamp D lights when 20-cycle current is received from the ringer under test. The green lamp SL lights when ground has been placed on the sleeve for the purpose of operating the line cut-off relay in the normal manner. The two lamps with clear glass caps, LC and RC, light from the contacts of any No.

215 type relay being tested in the connecting block of the test set. If they light with equal brilliancy, they indicate that both the contacts of the relay are made for the same length of time. Unequal brilliancy of the lamps indicates that the relay is biased and makes contact on one side longer than on the other or that the contacts are dirty.

3.12 A No. 18-B connecting block is provided, into which No. 215 type relays are plugged for the purpose of testing and adjusting them.

3.13 Seven jacks, normally located in a jack strip above the test panel, are provided for the purpose of associating the testing and adjusting circuit with the equipment to be tested. Two of the jacks, marked 1000-CYCLE TEST, L and D, are for the purpose of making connection to the patching jacks of the ringer. Two others marked TST TEL are for the purpose of connecting an operator's telephone set to the testing equipment. The jack marked 20-CYCLE has its tip and ring wired directly to the 20-cycle ringing current supply and thus provides a source of unattenuated current for use in checking the adjustment of J relays in 1000-20-cycle ringers, to ensure against chatter. The jack is normally multipled at the ringer bays also. The remaining jacks marked CONT TRK, T and L are multipled throughout the ringer bays and are for the purpose of associating a portable control set with the testing equipment in order to control the test panel from ringers located at a distance from the test panel.

3.14 A portable control set is provided in case of the larger installations, for the purpose of applying certain tests while the attendant is at a ringer bay at some distance from the test panel. This control set consists of a small box containing a lever type key designated OPR, a lamp with a green cap and a dial. A cord is provided, equipped with a knurled double plug, and when the control set is to be used this plug is inserted into the T and L jacks of the control trunk. (For some of the early installations two No. 110 plugs, one with a black shell and the other with a red shell were provided in place of the double plug.) Either 20-cycle current or 1000-cycle current can be applied to the ringer by operating the OPR key to the 20-cycle or 1000-cycle positions, respectively. The dial can be used as in the case of the test panel dial for making timing tests of the ringer. The proper operation of the ringer is indicated by the lighting of the lamp in the portable control set.

4. OPERATING FEATURES:

4.1 The detailed methods of using this equipment are given in the sections dealing with testing and adjusting 1000 cycle, two tube ringers.

5. CIRCUIT DESCRIPTION:

5.1 A detailed description of the circuit operation is covered in CD-61389-01.