

## NO. 546-A TEST PANEL FOR TERMINAL AND INTERMEDIATE RINGERS DESCRIPTION

### 1. GENERAL

1.01 This section describes the No. 546-A test panel used for testing and adjusting the following types of terminal and intermediate ringers and toll switching trunks outgoing end:

- 135-20 Cycle Terminal Ringers.
- 20-20 Cycle Intermediate Ringers.
- 135-20 Cycle Intermediate Ringers.
- 135-135 Cycle Intermediate Ringers.
- 1000-135 Cycle Intermediate Ringers (135 cycle side only).
- 20-20 Cycle Ringers (for relaying ringer).
- Toll Switching Trunks Outgoing End - (using 22-A-1 repeater).

1.02 This section is reissued to omit the use of the No. 258-A (dummy) plug under equipment features when testing 20 cycle branch of ringers associated with 22 type repeaters, terminal or through line and to add a precaution to be taken before making any tests of the 218 type relays.

1.03 The test circuit is so arranged that a simple check test can be made before connecting to or testing ringers, to insure that the test circuit is operating satisfactorily.

1.04 When ringers are not within patching distance of the test panel, ringer test trunks are provided, for connections

to the test panel and the terminal or intermediate ringers.

### 2. EQUIPMENT FEATURES

2.01 The testing equipment, consisting of keys, milammeter and associated potentiometer, switches, 218 type relay connecting blocks, dial, relays and lamps, is assembled on a panel arranged for relay rack mounting as shown on Fig. 1.

2.02 Patching jacks designated L, D, 20 CYCLE and 20 CYCLE ADJ associated with the test circuit are provided for connecting the ringer under test to the test panel, or, through trunk as required. They are located in a separate jack panel in the test panel bay.

### 3. OPERATING FEATURES

3.01 The L and D jacks are used to connect the ringer under test or adjustment to the test panel, 20 CYCLE jack for full voltage test on J type relays and the 20 CYCLE ADJ jack is used when adjusting the 196 or J type (20 cycle) relays.

3.02 Two 218 type relay connecting blocks designated TEST and ADJUST are provided for making tests and adjustments. A 218 type relay (known to be in adjustment) must be inserted in the TEST connecting block when making tests. The ADJUST connecting block is used for holding 218 type relays which are to be adjusted. When using the test panel, the 218 type relay

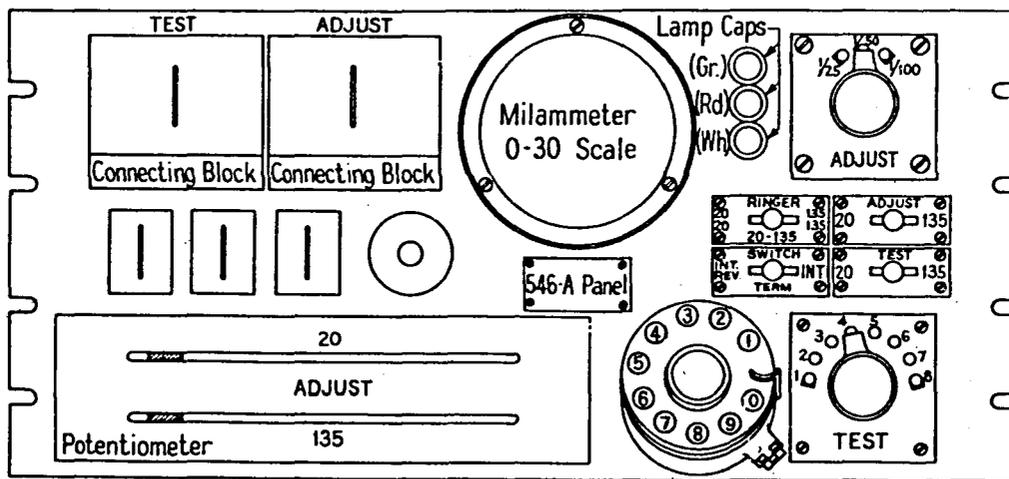


Fig. 1 - Front of Panel

should be removed from the connecting block that will not be in use during the tests or adjustments.

3.03 The key designated RINGER is provided for connecting the proper test panel receiving circuit to the ringer under test. With the key in its normal position, the 135 cycle receiving circuit is connected to the L jack and the 20 cycle receiving circuit to the D jack. With the key operated to its 20-20 or 135-135 position, corresponding receiving circuits are connected to the L and D jacks respectively. The test panel is not arranged for a 1000 cycle signal receiving circuit.

3.04 The key designated TEST, when operated to its 135 position, sends 135 cycle ringing current out through the L jack to the ringer under test; and, when operated to its 20 position, sends 20 cycle ringing current out through the D jack to the ringer under test.

3.05 The key designated SWITCH is provided for testing intermediate ringers. It should be in its normal position when testing terminal ringers, and operated to its INT position for testing intermediate ringers. When operated to its INT REV position, the L and D jacks are interchanged. This is equivalent to interchanging the patching cords used to connect the ringer under test to the test panel and permits testing the ringer in the reverse direction. The operation of this key in either direction connects a 250 ohm resistance across the 20 cycle side of the ringer to reduce the ringing voltage impressed on the ringer under test to its proper value.

3.06 The key designated ADJUST is provided for adjusting 20 cycle and 135 cycle relays. When operated to its 20 position, 20 cycle ringing current (the value being determined by the setting of the associated potentiometer) is supplied through the 20 CYCLE ADJ jack to the ringer for adjusting the J and 196 type relays. When operated to its 135 position, 135 cycle ringing current (the value being determined by the setting of the associated potentiometer) is supplied to the ADJUST connecting block for adjusting 218 type relays.

3.07 The eight point switch designated TEST is provided to adjust the 135 cycle ringing current being sent into the ringer under test. Experience has indicated that point 6 attenuates the ringing current to simulate the average length of line on which the ringer under test functions in service.

3.08 The switch designated ADJUST with three contact points, designated 1/25, 1/50 and 1/100 respectively, is provided to obtain the best results for the electrical adjustment of 218 type relays at

various current values. Step 1/25 is used for current values between .001 and .00055 ampere, step 1/50 for current values between .00055 and .00025 ampere, and step 1/100 for current values between .00025 and .00005 ampere. Step 1/25 is seldom if ever used since this current range is not required for the adjustment of the 218 type relay. Step 1/50 should be used where 135 cycle ringing current is supplied by 135 cycle interrupters in order to minimize the current drain and voltage fluctuations on the interrupter, while step 1/100 should be used where 135 cycle current is furnished by ringing generators.

3.09 The millimeter is provided to indicate the current values when adjusting 20 cycle and 135 cycle relays (the current values being regulated by a potentiometer). For J type (20 cycle) relays, the meter indicates directly the current flowing through the relay. For 196 type (20 cycle) relays, the meter indicates approximately 10 times the current flowing through the relay. For 218 type (135 cycle) relays, the meter indicates 25, 50 or 100 times the current flowing through the relay depending upon the setting of the ADJUST switch.

3.10 The potentiometer is provided to regulate the adjust current values for the J, 196 and 218 type relays.

3.11 The dial is provided to test the time required to operate the 135 cycle branch of the ringer. For example, if the digit 6 is dialed, 135 cycle ringing current will be applied to the ringer for approximately six-tenths of a second. A test of this kind is known as the "Time of Response Test."

3.12 Three lamps are provided for signaling purposes. One with a red lamp cap, and one with a green lamp cap are lighted when 20 cycle ringing current and 135 cycle ringing current, respectively, are being sent back into the test circuit by the ringer, indicating satisfactory operation. The third lamp with (a white lamp cap), is lighted when testing terminal ringers or intermediate ringers associated with 4-wire terminating circuits; to indicate that the ringer has operated satisfactorily and has placed ground on the sleeve of the ringer to operate the line cutoff relay. This lamp is also lighted when testing 1000-135 cycle intermediate ringers, to indicate that the 135 cycle branch of the ringer has operated satisfactorily.

#### 4. CIRCUIT FEATURES

4.01 Drawing SD-62314-01 shows the circuit arrangement of the test panel. Detailed circuit description will be found in the associated CD sheet.