



TABLE I — PARTS LIST DIFFERENTIAL KEYER

- C₁.....Paper capacitor, .02 mfd, 400 V. DC working (try values from .01 to .05 mfd for fast or slow "break" in keying).
 C₂, C₃.....40 mfd, 150-volt working electrolytic capacitors.
 C₄.....0.1-mfd, 400-volt paper, see text.
 D₁, D₂.....Selenium, Germanium or silicon diode rectifiers, 380-volt peak inverse rating, 50 milliamperes DC current rating.
 R₁, R₂.....500,000-ohm, 2-watt potentiometer.
 R₃.....100,000 ohm, 2-watt potentiometer.
 R₄.....1 megohm, ½ watt, see text.
 T₁.....6.3-volt, 1 ampere filament transformer, 115-volt Primary (Thoradson T-21F08 or equivalent).

FIG. 2. SCHEMATIC DIAGRAM of complete keyer. Connections to typical oscillator or mixer control grid, negative bias for power amplifier control grid, and keyed screen grid voltage for power amplifier, are shown at right side of diagram. All resistances are in ohms, ½-watt rating, unless otherwise specified. All capacitances are in microfarads.

NOTE: A tap switch with several positions and a set of paper capacitors from .01 to .05 microfarads, can be inserted at point "X" in place of C₁. This provides adjustable sharpness of "break" characteristic of keyer.

mitter or exciter being controlled with this keyer is needed to drive a large r.f. power amplifier.

The rise of the amplifier screen grid voltage is delayed by C₁ charge-exponentially through R₁ and the 100,000 ohm resistor. The sharpness of the keying on the front of the keying characters is thus adjusted by the setting of R₁. Increased resistance increases the rise time and softens the keying.

The value of C₁ also shapes the tail of each keying character; more capacitance here softens the "break." Several values of capacitance can be cut in by a tap switch at this point to provide easy adjustment of both "make" and "break." Either a set of capacitors ranging from .01 to .05 microfarads, in steps of .005 microfarads; or, several .005 microfarad capacitors can be added to the circuit with a progressive shorting switch.

Negative bias for the keyer and r.f. amplifier is provided by connecting a 6.3-volt filament transformer (T₁) to the 6.3 volt supply for the 12AU7-A tube, and rectifying the 115-volt winding output. A voltage doubler provides about minus 200 volts bias. A lower bias voltage for the r.f. amplifier is obtained from the voltage divider. The 6BL7-GT keyer tube should be run from a separate 6.3-volt AC source, with the center tap connected to the amplifier screen voltage lead to keep the heater-cathode voltage of the 6BL7-GT within its rating.

CONSTRUCTION of W2FBS's keyer is in a 4 x 5 x 3-inch Minibox (Bud CU-3005, or Premier MC-1005). All parts except the terminal strip and tubes are inside the box, as shown in the photo on this page. Controls were mounted on one side, and the bias transformer was mounted in-

side on the opposite wall. This model has the tap switch added to select different values of C₁ for soft or sharp "break" characteristics.

W2FBS has constructed another model of this keyer for the heterodyne exciter in his transmitter. All parts above the horizontal dotted line in the schematic diagram, Fig. 2, are inside a 2¼ x 2¼ x 5-inch Minibox (Bud CU-3004). The box is mounted on the main chassis of the exciter, with the other keyer parts located inside the main chassis below the Minibox. This complete exciter will be described in the July-August, 1961 (Vol. 16, No. 4) issue of *G-E HAM NEWS*.

ADJUSTMENT, after a check of the wiring, is simply a matter of applying 6.3 volts AC and measuring the output of the bias supply. With the 12AU7-A tube out of the socket and

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