

MODERN HETRODYNE EXCITER in W2FBS's attractive station console has the two-tube differential keyer unit built right into it. Exciter will be described in the July-August, 1961 issue. In addition to four one-kilowatt power amplifiers for the DX bands, the station also has a **PI-NETWORK ANTENNA TUNER** at right (see *G-E HAM NEWS*, May-June, 1960, page 3). World map in background contains 260-odd pins representing the present DXCC score on CW at W2FBS.

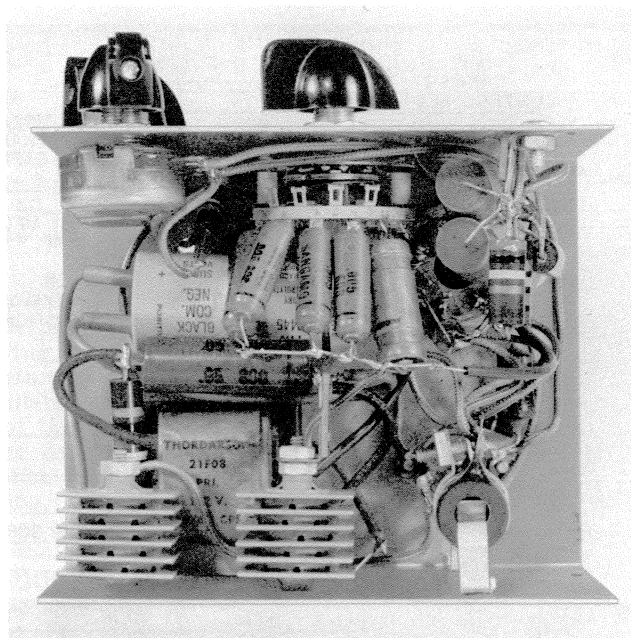
TWO-TUBE DIFFERENTIAL KEYER (continued from page 5)

the key open, adjust R_2 until minus 80 to 90 volts is measured at grid pin 7 of this socket. Use a voltmeter with a resistance of at least 5 megohms (scale of 250 volts or higher on a 20,000-ohm per volt meter, or vacuum tube voltmeter).

Plug in the 12AU7-A and 6BL7-GT tubes and, with the key still open, minus 105 to 110 volts should be read at cathode pin 3 on the 12AU7-A socket. The screen voltage to the power amplifier should be about minus 50 volts with the key open. With the keyer connected to the amplifier screen grid circuit in

the transmitter (or with a 10,000-ohm, 10-watt resistor from the screen grid voltage terminal to ground), check the screen voltage with key up and key down. Adjust R_2 over its range with the key closed, and a screen voltage from about plus 25 to 300 volts should be read.

This keyer can be built into an existing exciter if desired. It is ideal for replacing less satisfactory keying systems in transmitters in the 20 to 300-watt power input class. A keyer of this type has been operated with excellent results on the 150-watt **SINGLE BANDER** transmitter



BOTTOM VIEW showing locations of major components: T_1 , D_1 and D_2 , and the bias voltage divider on rear wall; potentiometers R_1 and R_2 , and tap switch for selecting different values of capacitance for C_2 on front wall; and other components in middle of Minibox type chassis.

models (See *G-E HAM NEWS*, November-December, 1957; and January-February, 1958, Vols. 12, No. 6, and 13, No. 1 issues).

If you've been having keying problems — chirps, clicks, thumps, back-wave, etc. — try this easy-to-construct packaged keyer unit in your transmitter. Or, add it in place of a less satisfactory keying system for improved CW performance. The 6BL7-GT twin triode will pass sufficient current to key the screen grid voltage of two, three, or even four transmitter stages which require about the same screen grid voltage.

LOW-COST RF WATTMETER (continued from page 3)

6

6 mum power output. Then set R_2 for full-scale deflection of the meter. Throw S_1 toward the RF source to read reflected power. Adjust capacitor C_1 until a definite null is observed on the meter. A false null may be indicated at minimum capacitance, so check C_1 to see that the null occurs with C_1 at greater than minimum capacitance.

Reverse the connections to the wattmeter and repeat the adjustment just described with C_2 . This will set the reflected power null for the other half of the instrument. Run through it a couple of times to be sure of

the settings. A carefully built wattmeter will show almost true zero reflected for a full scale forward reading. This assumes that a 50-ohm non-reactive load and 50-ohm coaxial cable are used.

ACCURATE CALIBRATION of the RF wattmeter is not difficult, even though the authors were able to check their results against a commercially made RF wattmeter. If a good 50-ohm dummy load with low reactance is available, an RF ammeter and Ohms Law can be used to calibrate the RF wattmeter. Either a 0—1 (for transmitters with up to

50 watts output), 0—3 (for up to 450 watts), 0—4 (for up to 800 watts) or 0—5-ampere (for up to 1,250 watts) RF ammeter can be used.

There is a trick to connecting an RF ammeter into a coaxial cable. Be careful not to disturb the 50-ohm surge impedance and this takes a bit of doing! For frequencies in the range of 3-30 megacycles a wide strip of thin copper sheet or flat copper braid can be used to connect the outside braid together at the point where you open the cable to insert the meter. Insulate the meter