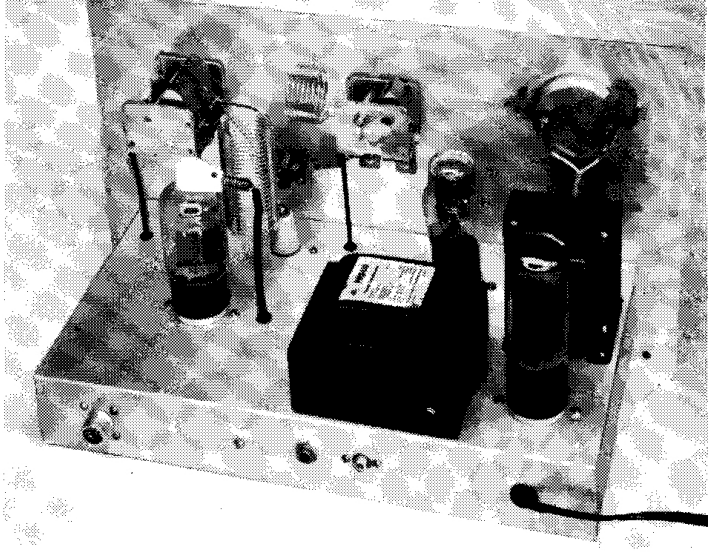

This rear view of the transmitter clearly shows the placement of all components above chassis. The loading capacitor, C_8, is at the left, L_3 is the vertical coil and L_2 the horizontal one. Rubber grommets are used to prevent chafing and to furnish additional insulation on the leads coming from below chassis.

give a balanced appearance. A procedure similar to the above should be followed for making the back panel. Dimensions from the bottom and sides of the rear panel are the same as at the front.

When all the holes are drilled you are ready to mount and wire the various components. There are several different types of broadcast-replacement variable capacitors on the market. Some of these have holes tapped in the front of the frame so that they may be mounted directly on the panel using machine screws and spacers. Others have mounting holes only in the bottom. In this case, the capacitor can be mounted on a pair of L-shaped brackets made from strips of aluminum.

Both L_2 and L_3 are supported by their leads. One end of L_3 is connected to the stator of C_8 and the other end to a junction on top of a one-inch-long steatite stand-off insulator. L_2 has one end connected to the stator of C_6 and the other end to one of the terminals on S_1.

Wiring

If this is your first construction job, there are a few points about soldering that will bear mentioning. Use rosin-core solder — not acid-core. Apply the tip of the soldering iron to the work, and let the work get hot enough to melt the solder. If you apply the solder to the end of the iron it will melt and get around the contact being soldered but may not make a good connection. The work should be hot enough to melt the solder. Always be sure that the contact or point being soldered is clean. (Many beginners make the mistake of trying to solder enameled-covered wire without first removing the enamel!) Never use more solder than necessary to cover the connection. Large gobs of solder are unsightly and contribute nothing to the connection and may cause shorts between wires or terminals.

In wiring gear, most builders start off by first wiring the power-supply circuit, including the filament wiring and the heater circuit. After that, it is a case of starting at the crystal and continuing through toward the output until the unit is wired.

The voltage-dividing network consisting of R_6 and R_7 provides the correct voltage for operating the keying monitor obtained at the junction of R_6 and R_7. R_6 is 1.65 megohms, and this value is obtained by using two 3.3-megohm 1-watt resistors in parallel. These resistors and other small components can be mounted most easily on insulating lug strips.

Adjustment and Testing

When the unit is ready for testing, a 15- or 25-watt electric light will serve as a dummy load. One side of the lamp should be connected to the output lead and the other side to chassis ground. An appropriate crystal should be plugged into the crystal socket, and a key connected to the key jack. S_2 may now be closed and the transmitter allowed to warm up.

Set C_8 at maximum capacitance (plates completely meshed) and close the key. Quickly tune C_6 to resonance, as indicated by a dip in the cathode-current reading. The reason we say "quickly" is because it is easy to damage a tube by running it out of resonance for too long a time. Gradually decrease the capacitance of C_8 and retouch the tuning of C_6 as you see the loading increase. The loading will be indicated by the lamp lighting and by larger values of cathode current. Once the load lamp lights up, you merely tune for maximum brilliance. The cathode current should read between 90 and 100 milliamperes when the oscillator is fully loaded. C_1 should be adjusted for best keying characteristics.

When you have satisfied yourself that the transmitter is working on each band, you are ready to put a signal on the air. The author has described some coax-fed antennas that are easy to construct and which present no problems in getting them to work properly. A one-element rotary for 15 meters was described in January, 1955, *QST*[2] and also appears in the 1956 and 1957 *Handbooks*. Another system which can be used for 80, 40, and 15 meters was described in February, 1957, *QST*.[3,4] When either of these antenna systems is substituted for the dummy load, the adjustment procedure is the same, and the cathode current at resonance will rise in the same manner as the loading is increased. If the builder lives in an area that has television channels where harmonic TVI is a possibility, a low-pass filter should be used with the transmitter.[5]

[2] "A One-Element Rotary for 21 Mc.," *QST*., Jan., 1955.
[3] "A Novice Three-Band Antenna System," *QST*, Feb. 1957.
[4] "The Evils of Multiband Antenna Systems — and The Cure," *QST*, March, 1957.
[5] McCoy, "The Tin-Can Low Pass," *QST*, Sept. 1954.