

Rear and bottom views showing placement of parts and wiring.

## The "Metal Tube Two"

THE "Metal Tube-Two" receiver is for the more advanced short wave experimenter. Two of the newer metal tubes are employed. One is a 6J7 regenerative detector and the other, a 6C5 triode, is a resistance coupled audio amplifier. This combination provides about the ultimate in simple short wave receivers. It is especially sensitive and will produce extremely loud signals. Loud enough, in fact, to operate a small speaker.

This receiver is designed to operate from the power supply described in another part of this book. Two-hundred-fifty volts are required for the B-supply and 6.3 volts A.C. for the heaters.

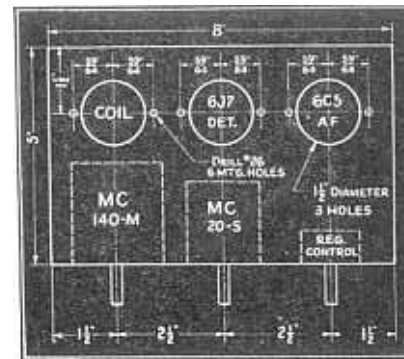
As in the one-tube set previously described, we also employ standard Hammarlund SWK plug-in coils in this one. In simple receivers the plug-in coil method is unquestionably the most satisfactory, because there is no danger of dead spots due to absorption caused by unused windings. Here too, we have also employed the band-spread system shown in the smaller set.

The tickler is connected in the plate circuit for obtaining regeneration. In the diagram, the tickler is shown at the top of the grid coil while actually it is wound at the bottom of the coil form. However, the connections remain identical. It is drawn at the top merely as a convenience. In order to eliminate feed

back in the audio stage, and to keep all traces of R.F. out of the grid circuit of the audio amplifier, a filter consisting of a 2.1 mh. R.F. choke and two .0005 mf. condensers, is employed in the B-plus side of the tickler circuit.

Regeneration is controlled by varying the voltage applied to the screen grid of the 6J7 regenerative pentode detector. The 50,000 ohm potentiometer and the 100,000 ohm resistor, are connected in series across the B-supply, that is, between the B-plus and B-negative, in order to obtain the correct voltage for the screen grid. The adjustment of this regeneration control is covered in the introductory part of the Manual and need not be discussed here.

The 30 mmf. trimmer, connected in series with the antenna, serves for varying the antenna coupling. Once set for the highest frequency coil, this condenser will need no further adjustment unless an extremely weak signal is encountered. Closing the condenser plates (increasing capacity), will increase the sensitivity and thus bring up the strength of the weak signal. However, as the capacity of this condenser is increased, the set automatically tunes broader. There is an optimum adjustment; one which provides sufficient signal strength without interference from stations transmitting on adjacent channels.



Drilling dimensions for chassis.

The diagram contains the circuit for an additional pentode power amplifier. This amplifier, when added to the main receiver will provide full speaker volume on all popular short wave stations. The .006 mf. condenser connected between the plate of the 6C5 and the B-minus should be connected between the plate of the 6F6 and B-minus when the additional audio stage is employed. The parts list does not contain the items employed in the additional amplifier. Also, the chassis on which the original receiver is built is not large enough for the second amplifier. We suggest a 10" chassis—one extending 2" farther to the right. The drilling of the 8" portion will, of course, remain the same. The panel should also be correspondingly larger.

This receiver has been found to operate best on an antenna from 40 to 75 feet long. Consisting of a single wire, the antenna should be mounted in the

clear and away from all trees, roofs, etc. A receiver is only as good as the antenna with which it is used. A good antenna system and you will be well repaid.

The beginning amateur will find the ideal set with which to start today thousands are in use by hams

### Parts List

#### HAMMARLUND

- 1—MC-140-M Band setting cond.
- 1—MC-20-S Band-spread cond.
- 1—MEX antenna trimmer (30 mmf.)
- 1—CH-X r.f. choke
- 1—S-4 socket
- 2—S-8 sockets
- 1—SWK-4, 17 to 270 meter plug-in coil set

#### CORNELL DUBILIER

- 1—100 mmf. mica condenser
- 2—500 mmf. mica condensers
- 1—.006 mf. mica condenser
- 1—.1 mf. paper condenser
- 2—1 mf. paper condensers

#### I. R. C.

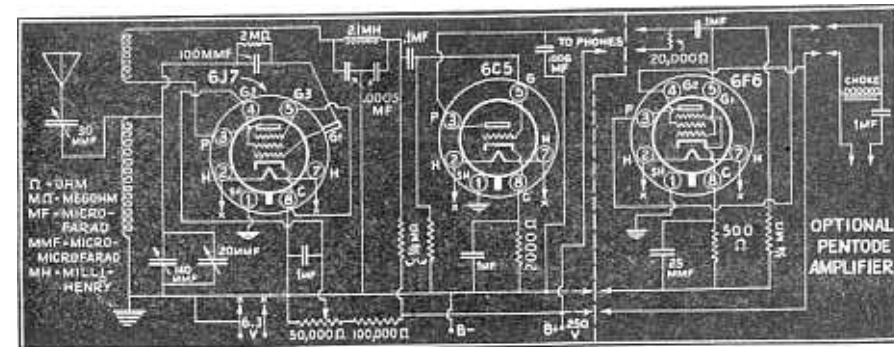
- 1—2 meg. 1/2 watt Resistors
- 2—1/4 meg. 1/2 watt Resistors
- 1—2,000 ohm 1 watt Resistor
- 1—100,000 ohm 1 watt Resistor
- 1—50,000 ohm potentiometer

#### MISC.

- 1—8 x 5 x 2" Chassis
- 1—8 x 6 x 1/16" Panel (aluminum)
- Terminal strips, screws, etc.
- 2—Knobs
- 1—Dial

#### R. C. A.

- 1—6J7 metal tube
- 1—6C5 metal tube



Wiring diagram with optional amplifier stage.