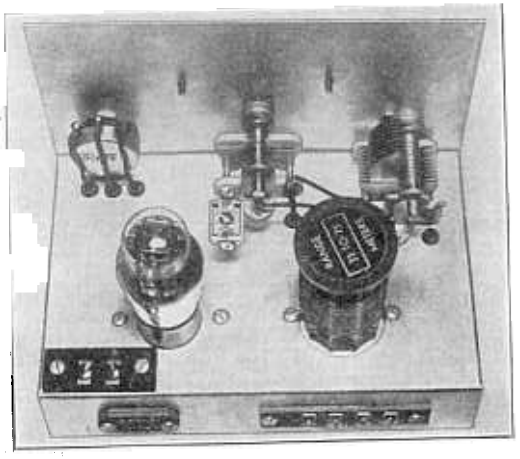
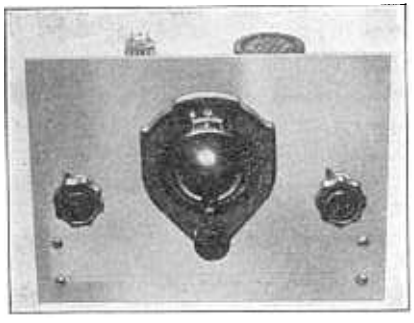
One Tube Battery Set for Beginner



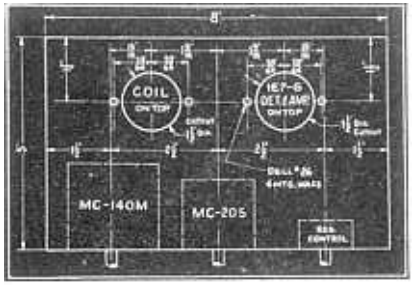
This view clearly shows the arrangement of parts for the one-tube battery set.

This one-tube battery operated receiver is intended for the beginner. It is advisable to start with a one-tube set because of its simplicity of construction. Many budding short wave enthusiasts have become discouraged for the simple reason that the first set was entirely too complicated. This receiver, while employing only one tube, will provide no end of entertainment insofar as short wave code and phone reception are concerned. The type of construction employed deserves careful consideration. Many beginners start with the so-called bread-board model and usually end up with considerable grief. We strongly recommend that the chassis and panel method be employed in all types of receiver. The use of metal panels and chassis provides excellent shielding, permits much more effective common or ground circuits, and eliminates nearly all body capacity effects.

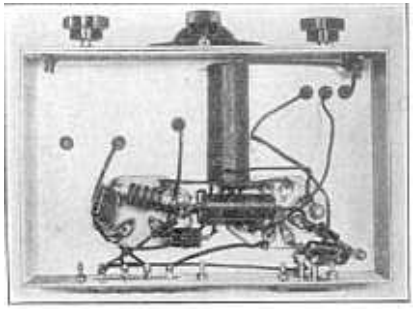
It is true that more efficient multi-tube receivers can be constructed with tubes intended for operation from a power pack. But the simple one and two-tubers that the beginner builds usually employ batteries for the simple reason that the complication of power supply construction, together with the hum troubles that may be encountered, are eliminated. The tube employed in this receiver consumes a very small amount of power and therefore batteries can be economically used. The tube, a 1E7-G, is a twin pentode. That is, there are two sets of elements contained in the single glass envelope. In the circuit employed in this receiver the tube actually functions as two separate pentodes. One section is employed as a regenerative detector while the other serves as a resistance coupled audio amplifier. There are many other tubes of the battery type which might have been selected for this receiver. However, this one provides the best performance. Standard Hammarlund plug-in coils are employed to cover a range of from 17 to 270 meters. These coils are tuned with two condensers. One is an "MC-140-M" and serves as a band setting condenser. Connected in parallel with this condenser is an "MC-20-S" which is used for band-spread tuning. For maximum efficiency, band spread tuning is absolutely necessary in any short wave receiver. The antenna is coupled directly to the grid side of the tuned circuit with an "MEX" padding condenser which serves as an antenna trimmer. Regeneration is controlled with a 50,000 ohm potentiometer connected in the screen grid circuit.



Panel layout showing the placement of controls.



Drilling specifications for the chassis.



Bottom view showing wiring, condensers, and resistors.

Complete drilling details are given in the drawing. After the chassis has been prepared and the parts have been mounted, wiring is the next step. Employ a good grade of "push-back" wire and carefully solder all connections. All connections that go to the common B-minus, or chassis, are connected to a soldering lug placed underneath the nearest screw. All leads and connections should be as short and direct as possible.

There are four power terminals on the receiver—two for the "A" battery, and two for the "B" battery. Since no rheostat is mounted in the receiver, an external resistor must be employed. This is indicated as "R" in the A-plus filament lead. The reason for this resistor is that the receiver requires two dry cells connected in series which provide three volts and the tube only requires two volts. We suggest that a 10-ohm variable resistor be employed in the position marked "R". This control can be mounted on the panel and should be adjusted so that the receiver performs properly. However, use care not to turn the rheostat on too far and thus damage the tube. A volt meter connected across the filament terminals of the tube will aid adjustment. Naturally, it should read two volts for proper operation.

Best results were obtained with 90 volts applied to both the screen and the plate. However, some tubes may require less screen voltage. We suggest that the experimenter first try 45 and then 90. Tuning hints and suggestions will be found in the introductory part of this manual.

Parts List

HAMMARLUND

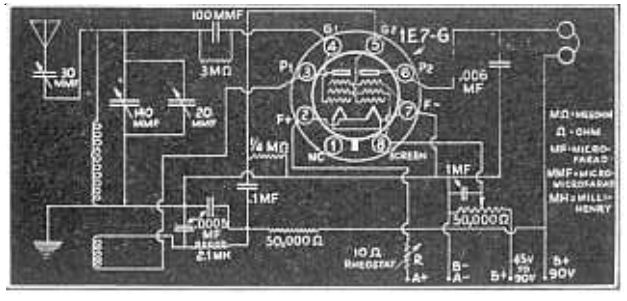
1—MC-20-S Band spread cond.
1—MC-140-M Band setting cond.
1—MEX antenna trimmer
1—CHX 2.1 mh. R.F. choke
1—S-4 4-prong socket
1—S-8 8-prong socket
1—SWK-17-270 meter plug in coil set

CORNELL DUBILIER

1—.006 mf. mica cond.
1—100 mmf. mica cond.
2—300 mmf. mica cond.
1—.1 mf. paper cond.
1—1 mf. paper cond.

I. R. C.

1—3 meg.-1/2 watt resistor
1—1/4 meg.-1/2 watt resistor
1—50,000-1/2 watt resistor
1—50,000 ohm potentiometer

MISC.

1—Chassis, 8 x 5 x 2"
1—Panel 8 x 6 x 1/16" (alum.)
1—Twin terminal strip
1—Phone strip
1—4 lug terminal strip