

HOW THE CONVERTER IS HOOKED UP
 FIGURE 3: The Hammarlund-Lynch "5" is shown here as an example of broadcast receiver with which the PR converter may be used. The converter gets its operating voltages from the same units which supply the broadcast receiver.

Use the PR Short-Wave Converter for Television Wavelengths

By CARL DORF

THE magic short wave and its fascinating possibilities for reception over great distances is bringing many new enthusiasts into this field of radio reception. In addition, with the prospects of regular broadcasting of television becoming more certain every day, the new unit will serve to make these broadcasts, which are transmitted on short waves, available to the experimenter in this fascinating new field.

The POPULAR RADIO Laboratory has been working on this problem strenuously for the past six months and has evolved a converter unit that, it is believed, must successfully solve the problem of short-wave reception with present-day receiving sets.

The new unit is shown on the cover of the magazine and has been designated the PR short-wave converter. It needs no batteries other than those used with the set and no connections other than an antenna and ground and the insertion of a plug into the detector socket of the receiver in use.

The new unit is built entirely en-

Here is POPULAR RADIO'S contribution to the interest in short-wave reception—an easily built, easily installed and inexpensive converter that may be plugged into any receiver for the reception of short waves. Every fan should be anxious to open up this new field where the future of radio and television is now being made.

closed in a standard aluminum box shield, except for the tuning coil, which is mounted on top and which is of the plug-in type for changing wavelengths. It will receive, with the regular set of plug-in coils, on wavelengths continuously from 15 meters up to 130 meters, and can be made for regular broadcast reception by the addition of a standard

wave coil, which also plugs into the same sockets.

As will be seen from Figures 1 and 2, all of the tuning is done with a single knob located on the front of the converter, to which is attached a drum dial of a new type that insures velvety operation at all frequencies. Regeneration is controlled by a small knob on the right side of the unit and hand capacity has been entirely eliminated. This is an important consideration for short-wave work.

The circuits used in the new converter contain no tricks or eccentricities, but employ a modified form of short-wave circuit that has been thoroughly tested by pioneers in short-wave work.

How to Construct the Converter

In constructing the short-wave converter, the first job will be to drill the necessary holes in the aluminum box shield, I, for mounting the instruments. It will probably be best to start by preparing the front panel, II.

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POPULAR RADIO WORK SHEET

THE PR SHORT-WAVE CONVERTER

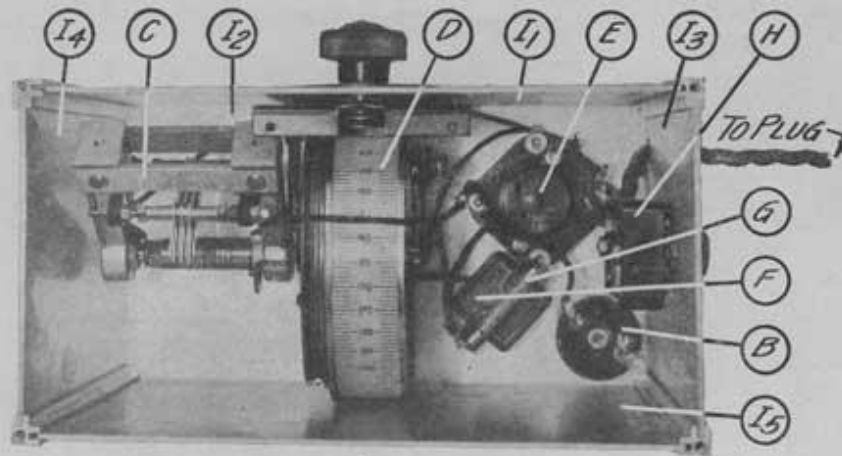


FIGURE 1: THE LAYOUT OF THE PARTS.

LIST OF PARTS FOR BUILDING THIS UNIT

COST OF PARTS: *Not over \$30.*

- | | |
|--|---|
| A—Aero coil set, type LWT-125; | clips for grid-leak mounting, .0001 mfd., type No. 1475; |
| B—Aero choke, type No. 60; | G—Lynch resistor, 8 megohms; |
| C—National "Equitone" variable condenser, .00015 mfd.; | H—Samson neutralizing condenser, type No. 61; |
| D—National velvet vernier drum dial, type F; | I—Standard aluminum box shield, 5 by 9 by 6 inches high, made by the Aluminum Company of America; |
| E—Benjamin Cle-ra-tone socket, No. 9040; | Wire, screws, nuts, etc. |
| F—Aerovox moulded condenser, with | |

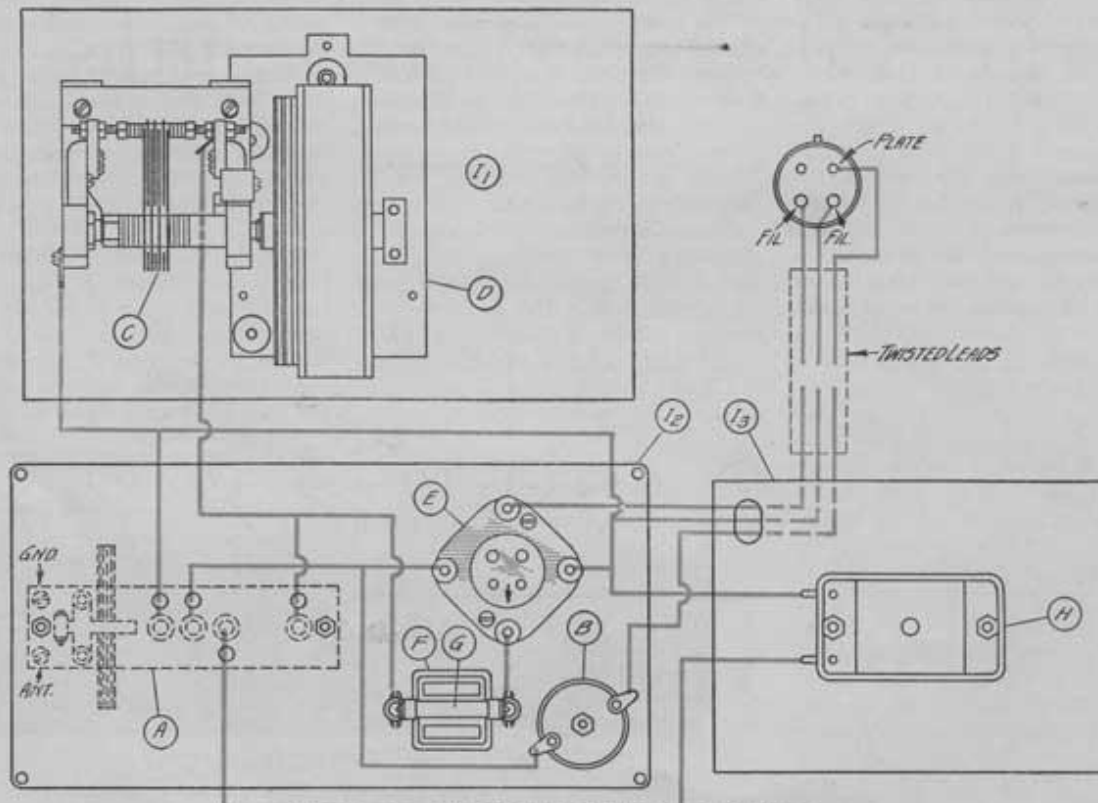


FIGURE 2: THE PICTURE WIRING DIAGRAM.

Use the PR Converter for Television Wavelengths

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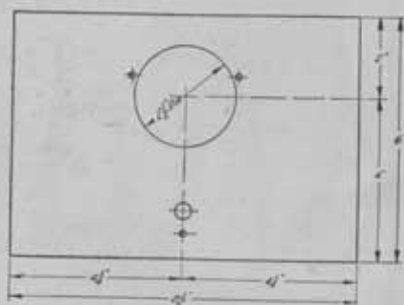


FIGURE 4: THE DRILLING PLAN FOR PANEL 11.

of the aluminum shield for mounting the drum dial, D, as shown in Figures 2 and 4. The direction sheet and template packed in the carton with this dial should be followed out in mounting this tuning dial.

Next drill the top panel, I2, as shown in Figures 2 and 5, for mounting the coil frame, the socket, E, and the choke coil, B. Also drill the four holes for passing through the necessary connections from the coil frame to the instruments mounted within the box shield. The coil frame is fastened to this panel by means of two machine screws and nuts. Looking at the front of the top panel, the machine screw on the right-hand end of this coil frame should be passed through to the socket, E. This one screw is used for fastening both instruments. The other side of the socket, E, is attached to the top panel by means of a machine screw and nut.

Next fasten the choke coil, B, to the top panel with the mounting bolt and nuts provided with this instrument.

Now drill the side shield, I3, for mounting the neutralizing condenser, H. A hole about $\frac{3}{8}$ inch in diameter should be drilled in the upper left-hand corner of this panel for passing through the twisted leads of the connector plug. The neutralizing condenser, H, is fastened to this side panel by means of two machine screws and corresponding nuts. Two spacing washers approximately $\frac{1}{4}$ inch thick should be inserted between this instrument and the panel.

Next fasten the grid condenser, F, that is equipped with grid-leak clips, to the grid terminal of the socket, E.

The tuning condenser, C, is attached to the drum dial, D, by means of the special bracket furnished with the dial.

How to Wire the Short-Wave Converter

The picture wiring diagram in Figure 2 shows the instruments in their correct positions. The instruments mounted within the box shielding are outlined in solid black lines, while the coil assembly, A, which is mounted on top of the box shield, is shown in dotted lines.

The same holds true of the wiring.

The heavy red wires are the connections to the instruments within the box shield and the dotted lines are the connections to the coil assembly, A.

The connector plug may be made from the base of a burnt-out UX type of valve. Remove the glass and other matter from the base and solder the two filament leads and the plate lead of the connector plug to their respective prongs. To avoid mistakes, check these instructions against the detail drawing in Figure 2.

When the wiring has been completed, the grid-leak, G, should be inserted in the grid-leak clips and the sides of the box shield should be inserted into the of the aluminum shield for mounting fastened with the aluminum screws.

How to Install and Operate the Short-Wave Converter

The antenna and ground connections are taken off the Hammarlund-Lynch "5" receiver, or any standard broadcast receiver with which this unit is to be used, and applied to the antenna and ground posts of the converter. Next insert the connector plug of the short-wave converter into the detector socket of the broadcast receiver. For details of connection, refer to Figure 3.

The vacuum valves recommended for the short-wave converter and the Hammarlund-Lynch "5" receiver are as follows: A Zetka ZD valve in the valve socket of the converter; two CeCo Himu valves in the first and second low-frequency stages and a CeCo type valve in the last low-frequency stage in the Hammarlund-Lynch "5" receiver.

The filament voltage of the valve in the short-wave converter is controlled from the filament voltage source used in the broadcast receiver.

The primary of the coil assembly, A, should be loosely coupled to the grid coil. All tuning is done with the variable condenser, C. Regeneration is controlled by the neutralizing condenser, H. This regeneration control should be adjusted for most satisfactory reception at each particular wavelength received.

The various short-wave ranges may be covered by interchanging the coils. It is recommended that a log be kept of the dial setting and coil used on each station received.

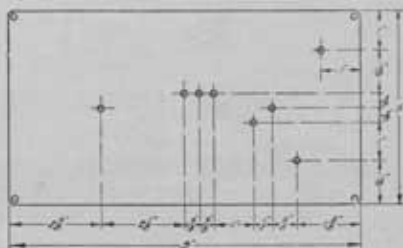


FIGURE 5: THE DRILLING PLAN FOR PANEL 12.