A Good Three-Valve Set

The "Pentode" Three

By "Pentode"

GLANCING through the pages of an English or American radio magazine, one may come across a circuit that is considered to be just the thing for local conditions, and the cost of components just suit one's pocket, only to find, when on the shopping expedition, that quite a number of the components are unobtainable in New Zealand. Very often the specifications of these standard parts are not given, and the builder is forced to turn his attention to the assembly of a machine more or less out of date.

As a result of numerous inquiries, this receiver has been designed and built to suit the man who wants utmost efficiency from every stage, and the components to be readily obtainable in this country.

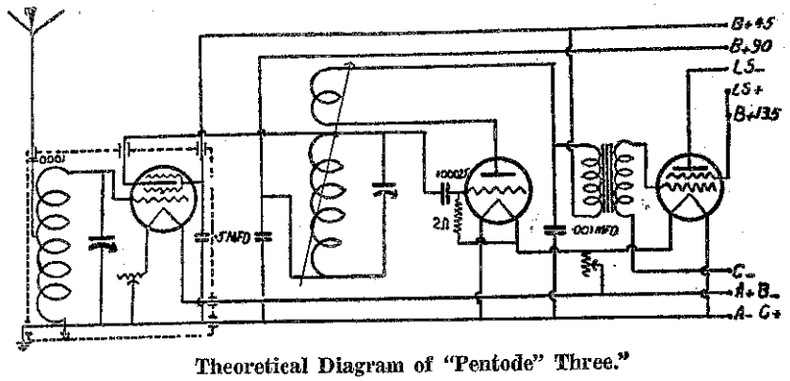
There are many who do not care to wind their own coils. In England, standard coils and bases are obtainable already wound, and circuits are given for the use of these. Practically the only standard coils in New Zealand are the well-known Browning-Drake kit and the Neutrodyne. The "Pentode Three" has been designed especially to utilise the Browning-Drake aerial coil and regeneroformer. Each of their components is readily obtainable here. If battery voltage is used as recommended, the tonal qualities are all that can be desired, and although reaction is employed, the receiver is non-radiating and cannot annoy neighbours through howling valves.

The B.D. Kit.

ONE or two commercial B.D. kits include two tuning condensers, in which case they may be omitted from the list. Whatever make of components are utilised, the general layout will have to be checked over to make sure that all parts will fit in without undue overcrowding.

To suit the high impedance of the screened grid valve itself, there has to be a high impedance in the anode. The circuit is known as the tuned anode method of coupling, and the small primary winding, inside the regeneroformer is not used. To prevent small losses this can be removed.

The writer has in mind one or two commercial B.D. kits in which the detector screws directly to the front panel with the variable tickler or reaction coil above. If the reader has one of this type, the layout of the detector and audio section will have to be altered to suit.



Theoretical Diagram of "Pentode" Three."

The Screening Box.

THE only part requiring much attention is the screening box. This is made of No. 2A gauge aluminium, and when finished measures 6½ inches square wtih removable lid. Some builders may prefer to use sheet copper, in which case a thinner gauge can be used, and all the seams soldered.

The sheet of metal will have to have overall measurements of 19½in. by 19½ in. Mark and cut to a shape similar to the used for the screening box for the "Rotorua Portable" described in the special issue, but make each side 6½ inch x 6½ inch. Half an inch is allowed for overlap, and the holes can be drilled after the box has been made. Four small nuts and bolts will be required to hold the box together, and four wood screws into the baseboard hold the side and base firmly together.

A lid will have to be made 6½in. square, and the constructor can easily do this without any help. In order that the screening box will not project over the top of ebonite panel, the baseboard will have to be ½in. thick. Cut this from a piece of dry wood to measure 18in. x 7in. x ½in., and screw the panel to the front edge. Brackets will hardly be required as the box will hold the whole rigid. On the extreme left-hand side of the panel and one and a half inches from the end, fix one of the 20 ohm. rheostats. Three and a quarter inches from the centre hole of the rheostat drill a hole large enough to take the spindle of one of the tuning condensers. Unscrew these two components from the panel, and lay the screening box along the back, flush with the panel. The side of the box on which the nuts and bolts are fastened will have to be at the rear, so that a perfectly flat edge is presented to the panel. Now, with a sharp point mark the box through the holes in the front panel, and drill to the same size. Before fixing the box finally into place drill four holes one-eighth of an inch diameter along the back and right-hand side and half an inch from the bottom. Reference to the diagram will show where these are placed. To earth the metal screen a nut and bolt with a soldering lug can be fixed in the centre of the back of the box, half an inch from the bottom.

Before fixing the panel, drill holes to take the remaining components to be screwed to the ebonite. The two megohm grid leak is seen to be close to the panel, and due to the grid coil being at a high positive potential the leak cannot be fitted directly across the condenser. Unless a special holder is provided, two small metal clips can be screwed to the panel to hold the grid leak.

Now fit the box to the front by clamping between the condenser and the holding nut. The rheostat also passes through both the ebonite and the metal. Four small wood screws are screwed through the double thickness of metal at the bottom, into the baseboard. Behind the first rheostat lies the grid coil for the high frequency valve. Unless the small .0001 m.f.d condenser is provided with insulated feet, a slip will have to be made so that neither of the connections come in contact with the screen. A valve socket and .5 m.f.d. condenser complete the components inside the box,

At either end of the rear of the baseboard are fixed terminal strips, each with two terminals. A longer strip fitted with six terminals is fastened in the middle (see diagram). The remainder of the components will have to be arranged according to their sizes and shapes. As has been stated before, different types of coils have various methods of mounting, and the builder will have to arrange his parts to suit the parts themselves.

The Wiring.

WHATEVER the arrangement, the point-to-point wiring will be the same, and by following the wiring diagram no difficulty should be experienced. The points marked X in the high frequency section are leads taken direct to the metal screen. Small soldering lugs can be fixed under the wood screws or nuts and bolts that hold the box together, and the wires soldered on direct. If the end plates of the condenser are of metal, then this component is already earthed. If the rheostat of the high frequency