The All-wave "Round the World" Two

A Revision of One of Our Most Popular Receivers

Just about twelve months ago "Pentode" described the "Round the World" Two, and he claimed that it was reliable and did not suffer from the usual drawbacks associated with short-wave receivers. Results have shown this to be a very modest claim, for the set has been constructed by hundreds of radio enthusiasts and we have received numerous congratulatory letters. Only twice has there been something serious to hamper the constructor, and of these one did not follow the instructions. So many have called upon our stocks of the original number of the "Radio Record" in which the receiver was described, that our supplies have long since been exhausted. The numerous demands for a redescription have prompted us to redescribe the set and incorporate a few improvements, including broadcast coils and an extra stage.

WHEN analysed, most short-wave sets will be found to consist of a detector-valve in one of its most simple forms, followed by one or two stages of transformer coupling. Simplicity is the keynote of efficiency, and although stunt circuits have been published, they have not held their own against the very simplest. Either they have been unstable in operation and difficult to tune, or inefficient in general performance.

Referring to the theoretical diagram, it can be seen to consist of a single detector with a single stage of audio amplification, to which another stage can be easily added. The audio-frequency path from the detector-valve will be seen to be taken from the opposite end of the reaction coil to the usual method, as this was found to give smoother reaction control with less body capacity. The dotted line showing the earth connection was found to be unnecessary in a number of cases, sufficient capacity to earth being produced by the various battery cables, etc.

Mounting the Components.

AN ebonite panel, 12in. long by 6in. high, will give ample room for well spacing, and the baseboard measuring at least 9in. from back to front will allow the coils to be placed at a distance from the metal plates of the condenser. It is small points like this which make all the difference, and an overcrowded receiver suffers from the disadvantage that it is extremely sharp in tuning, often making a station impossible to retain when the hand is taken from the controls.

Screw the panel to the front edge of the baseboard, using two brackets if no cabinet is to be used. The two condensers are mounted on the front, the one of smallest capacity being on the left. Choose condensers having low loss features, and if no pigtail connection is provided between the moving plates and the terminal, solder on a small length of flexible stranded wire. Without this positive connection, the chances are that many unexplained noises will accompany every movement of the tuning controls.

In the centre is mounted the detector rheostat, the resistance of which is chosen to suit the particular valve used. If of .25 ampere consumption, a rheostat of 15 ohms will be sutaible, but if of .1 amp. consumption (which we recommend) then a 30 ohm rheostat will give better control. On the right hand bottom corner is mounted the speaker or 'phone jack. As the coils play such an important part, their construction will be given in detail.

To obtain a complete wavelength range of from 10 to 70 metres, a set of coils will have to be made, consisting of 4, 5, 6, 8 and 12 turns. This may seem a large number of separate coils, but they also cover the reaction coils, and allow of a smaller tuning condenser, making for ease of tuning.

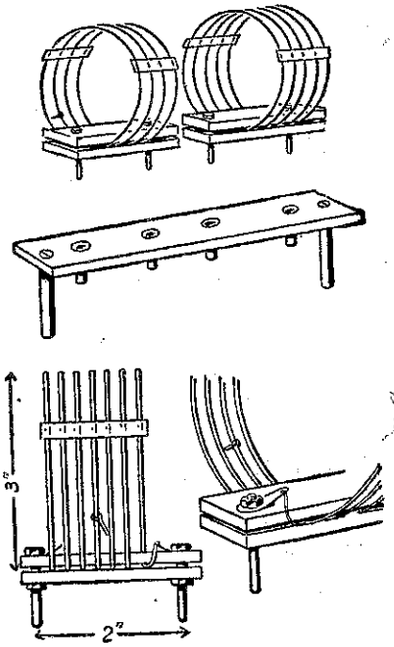
Data for the Coils.

PROCURE a length of cardboard tubing of 3in. outside diameter, and cut into three longitudinal sections. The tube will need to be about 9 or 10 inches long in order to possess a good grip while winding the coil. Now fasten the three sections together with adhesive tape or gummed paper, and wrap round two or three turns of brown paper. This makes an ideal former on which to wind any self-supporting coil. The wire used is 18 S.W.G. tinned or enamelled copper, and a length of about 32 feet will be necessary. Perhaps the easiest way of making a neat job is to fasten one end to a tree or post, and, taking the free end in the pliers, stretch the wire until it is perfectly straight. Fasten the end of the wire to one end of the former, and using thick string as a spacing medium, wind on the two together. This string should be at least the diameter of the wire, but preferably slightly larger. One-eighth inch spacing between wires results in an extremely efficient inductance.

It should have been mentioned that before winding on this wire lay three strips of celluloid along the former, equidistant, winding the wire round the whole. The reason for this will be apparent presently.

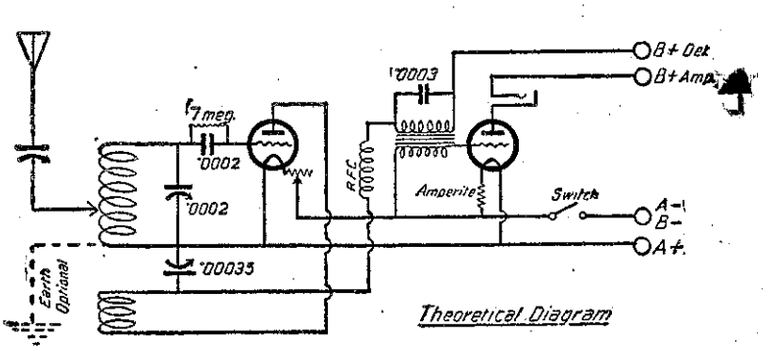
A full forty turns in one length is required, which is cut up presently. After making the remaining end tight in a similar way to the first, end, proceed to unwind the spacing string.

Fairly thick celluloid cement is used to paint on, along each of the celluloid strips, thus holding the wire firmly, and keeping a constant spacing between turns. When thoroughly dry dismantle the cardboard former, taking care not to damage the coil. We now have a self-supporting, low loss coil, which will have to be divided into smaller coils, each having the following number of turns, 5, 6, 7, 9 and 13 turns.



Components for "Round-the-World" Two

- 1 Variable condenser (low loss .0002 m.f.d.).
- 1 Variable condenser, .00035 m.f.d.
- 2 Fixed condensers, .0002 with leak, 7 meg. and .0003 m.f.d. condenser.
- 2 Anti-microphonic valve sockets.
- 1 15-30 ohm Rheostat.
- 1 Audio transformer (1-5 ratio).
- 2 Vernier dials.
- 1 Midget neutralising condenser.
- Panel and baseboard.
- 1 doz. Terminals.
- 18 gauge enamelled or tinned copper wire.
- 1 Amperite.
- 44 Valve pins and sockets.
- Ebonite strips, etc.



Theoretical Diagram

Mounting the Coils.

FOR the base a number of valve pins and sockets will be needed. Four sockets will fulfil this side of our requirement, but each coil having two contacts will necessitate the use of 10 valve pins. Choose ones having about ¼in. of tapped metal at one end, and if no shoulder is provided, two nuts to each pin will be required.