The All-wave "Round-the-World" Three

Broadcast Coils and Adding an Extra Stage

THE broadcast coils must be constructed in the same general manner as was the short-wave coils, but with this important difference: that there will be one instead of two coils for each band, and the wire will be left on the former instead of removing it. It could be removed, of course, and celluloid strips used to support the wire, but as this will be necessarily very fine, it is not practicable to do so.

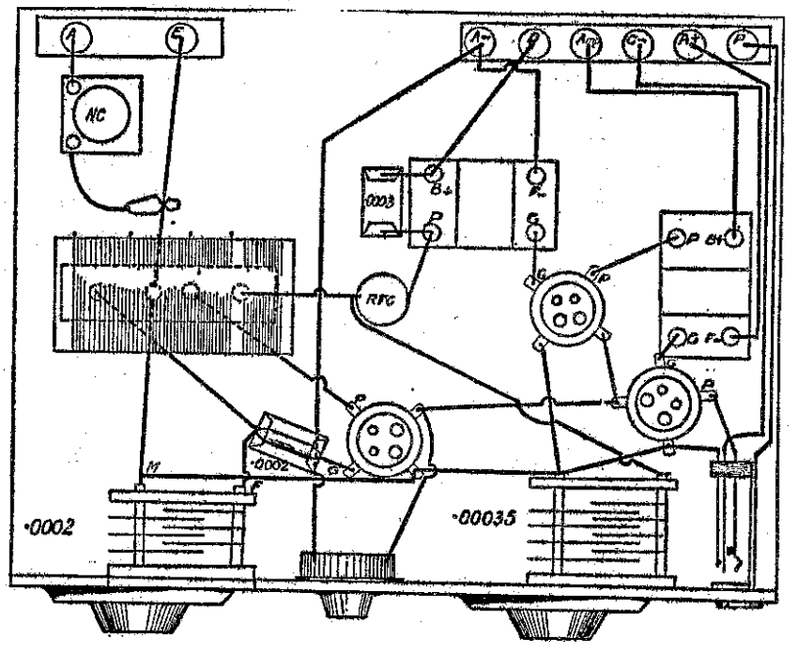
Two coils will be necessary; one to cover the band from 160 to 300 metres, and the other from 280 metres to 500. This is necessary because of the small capacity of the tuning condenser. Secure two pieces of ebonite or cardboard former, each a little over four inches long. Upon the one that is to be used for the higher wave-band, mark out 3 inches, leaving the most spare at one end, and wind full of 18 DCC wire unspaced, or 20 gauge enamelled wire spaced by half its own width. Secure the ends temporarily, and then at one end where there is the most space, wind 20 turns of 24 gauge DCC wire for the tickler. Separate the two coils by half an inch.

Obtain four strips of ebonite each 4½ inches long and 1-8-inch wide, and upon two of them mount four valve prongs so that they will coincide with the grips on the valve sockets on the existing short-wave base.

The valve prongs will be secured by a nut or nuts as was described last week, but they will be secured to a single strip and not passed through two. Near each end of these four strips drill a small hole which will latterly take a nut and bolt. If solder lugs are handy, attach them to the valve pins as was done for the short-wave bands.

Bring the wires that were temporarily secured to the former on to the lug, securing the secondary top and bottom to the lugs which connect with the grid and A+ respectively. The tickler coil will be connected to the socket grip which connects with the .0005 condenser, and the plate of the detector valve. Now take one of the free strips and put it inside the coil that is now attached to the strip with the prongs. It will be necessary now to bolt these two strips together, but as they must not rest upon one another tightly, slip a spare battery terminal on the screw to separate them. Bolt the upper and lower strips together, and it will be found that a neat and durable plug-in coil has been made.

Prepare the next coil for the higher wave-band in the same manner. This time use 24 DCC wire wound on for three inches, leave a space of ½-inch and wind on 25 turns of 26 gauge DCC wire. For the secondary, 24 gauge enamel wire may be employed if spaced by half its own width. This coil is now prepared as the smaller one was. The aerial must be brought into taps on the secondary. Clean the wire at the grid end, the centre, and about the 18th from the bottom. Try different tappings, until the best is found. It will be found that the broadcast band can now be covered fairly efficiently, although the same degree of efficiency cannot be expected as with a 2-valve set specially built for the short-waves. A constructor may expect to tune in his local station at loudspeaker strength and the other Australian stations on the 'phones. If he wants better reception he must add another stage.



ALL-WAVE ROUND WORLD THREE.

The lay-out diagram of the All-Wave "Round the World" Three. It will be noted that the lay-out and wiring has been planned not for appearance, but for utility. All plate and grid leads are straight and direct, battery wires are bunched where possible and sometimes longer than necessary. The dotted lines indicate wiring passing under a component. As laid off above, there is no call for solder except to the valve sockets, terminals, lugs, etc. The wiring is strictly point to point.

Adding Another Stage.

BY adding another stage greatly improved results can be expected. However, for short-wave work the extra stage introduces further noises, but is worth while if speaker work is contemplated. The audio valve in the original Round-the-World Two is unbiased, for this is unnecessary in 'phone work, but when a third stage is added, the constructor looks forward to speaker reproduction from several stations, and he wants a certain amount of quality. This can be provided by a suitably biased final stage with a well-selected valve.

The extra requirements consist of a transformer 3½/1 ratio, a valve socket, a valve, another terminal, a smaller grid leak (2 megs.), and the writer suggests another jack to incorporate automatic filament breaking when the plug is removed. This does away with the necessity of an extra switch and facilitates operation.

It will be necessary to do a certain amount of rearranging. In the first place, for best results, the 3½/1 ratio transformer should be used immediately following the detector, leaving the higher ratio until the last. That is easily done. When this part of the work is complete, the layout can be followed and is self-explanatory. The remarks concerning layout and wiring that were given last week are equally true here, and no difficulty should be experienced in following the diagram given herewith. A point worth noting is to keep the two transformers with their cores at right angles to one another. Otherwise, reception may be marred by audio oscillation. More of this has been dealt with in our article, "Oscillation: Its Cause and Cure."

Suitable Valves.

THE selection of valves in a set such as this is of paramount importance, and the accompanying table shows the six-volt valves we have tried in this circuit with good results.

The appropriate grid-bias can be obtained from the instructions accompanying the valve. Generally speaking, a 9-volt "C" of the Lissen type will be most suitable, as the appropriate bias can easily be found by merely adjusting the plug. Use the highest bias compatible with good reception.

Four-volt valves of the types indicated are able to be used quite well.

Valves for the All-Wave "Round the world" Three.

Valve.	Detector	First audio	Second audio
Mullard	PM6D	PM5X	PM6
Cossor	610HF	610LF	610LF
Osram	DEH610	DEL610	DEL610
Radiotron	201A	201A	201A
660	HF610	LF610	LF610

Drilling a Panel

BY far the best way of making large holes in panels, for mounting edgewise or thumb-control dials, and so on, is to mark them out first of all with a scriber, then to drill a series of holes, thirdly to cut away the webs with a suitable saw, and lastly to trim up with a file. A good saw for the purpose is one known as a metal keyhole saw, and since it costs only a few shillings it cannot be regarded as an expensive addition to the workshop equipment. The pistol-grip handle is very comfortable to use, and the worn-out blades are easily replaced. It is often an advantage to grind new blades to a rather sharper upper point than that with which they are provided.