

Radio-Frequency Chokes

WHEN in circuits such as the Reinartz we alter the value of a condenser in series with an inductance so as to vary the amplitude of the radio-frequency currents passing through that inductance, the condenser itself prevents the passage of the direct current to the plate circuit. It is necessary, therefore, to feed the plate circuit with direct current from the B battery by a parallel path, and if this path allows any radio-frequency current of appreciable magnitude to pass, the variable condenser designed for reaction control becomes useless, as the radio-frequency current will simply pass round the alternative path.

For this reason, in the Reinartz circuit it is essential to take steps to prevent any radio-frequency currents passing through the telephone or transformer circuit, and thus we introduce a coil of wire of sufficiently high in-

bottle, the bulk of small chips being about half that of the acetone liquid. The cement is applied to joints with a small sharpened stick, and dries solid in two or three hours if not too thickly applied.

Two strips of celluloid are cut $\frac{1}{2}$ in. wide by 4 in. long, and one strip $\frac{1}{2}$ in. wide by 4 in. long. For a base a piece is cut the shape shown, $\frac{1}{2}$ in. wide and $1\frac{1}{2}$ in. from point to point. The diagram of parts is given full size so that the celluloid may be placed over it and the lines scratched in with a sharp point. The corners of the notches should be rounded as shown so that the wire will not catch on the edge when winding.

Two holes are shown in the base through which $\frac{1}{2}$ in. screws can be placed to hold the choke in position. The position of the upright strips is shown by dotted lines.

The two $\frac{1}{2}$ in. strips are to be cemented to the centre of the inch strip, one on each side, cement being placed along each side of the joint. To do this the $\frac{1}{2}$ in. strip can be supported on edge by a strip of wood each side, the top edge cemented and the inch strip put in place, supported level by strips of cardboard packed underneath. The other $\frac{1}{2}$ in. piece is then cemented on and similarly propped up. When the cement is partly set, the supports may be taken away and the upright cemented to the base and left to dry.

A useful choke for broadcast wavelengths is made by winding 200 turns in each set of notches, making 1000 turns in all. Thicker wire may be soldered on at the ends for connecting up. A useful gauge of wire is 34's or 36's.

For short-wave a good choke can be made by omitting the notches and space-winding 30's enamelled wire about 30 turns to the inch, so that 100 turns occupy nearly the whole length of the former. If desired, the turns can be secured by a little cement applied where the turns cross the edge of the celluloid.

Value of Short Wave

THE chief characteristic that must be looked for in a short-wave valve is that it shall not be noisy, either in operation, nor by reason of its generation of a hum due to microphonic action. Bright-emitter valves are, generally, better in this regard than the dull filament kind; but the glowless, or semi-glowless valves have now been developed to such an extent that the microphonic noise can be usually reduced to almost nothing by the use of a good non-microphonic valve holder.

Incidentally a properly made holder of this type will also have a low capacity across the sockets, which helps greatly in a short-wave receiver. Unfortunately, however, the use of an anti-microphonic holder that is very free in its springs will bring another trouble in its train when the set is being used on 20 metres and below.

Swinging Detector Valve.

THE detector valve will start swinging as the tuning dial is revolved and will continue to swing, with the result that there is a continuous small change in capacity. This is quite sufficient to set up a kind of "high-speed fading" that will make distant and

faint telephony stations very difficult to read. It has not so bad an effect when the receiver is oscillating for the reception of morse signals; but when the detector is nearly on the point of oscillation quite small capacity changes will affect it badly.

The cure for this trouble is to "damp" the valves by means of small pieces of cotton wool, placed so that they will stop the swinging without bringing back the microphonic noises.

With regard to noisy working, that is a matter of test. Valves that are of the same make and class often differ quite a lot one from another.

In most cases a valve that is suited for a particular position in an ordinary receiver will work quite well in the same position in a short-wave set. For leaky grid rectification any valve with an internal resistance of from 11,000 to 20,000 ohms will do quite well.

Smaller Grid Condenser.

IT is usual, however, to use a rather smaller grid condenser than is normal to the broadcast receiver, and to put up the value of the grid resistance

very considerably. Up to 10 megohms can be used with effect and a high-resistance connected to the positive side of the filament will often be effective in reducing or removing the annoying "grid howl" that sometimes completely spoils reception by bursting out when the set should be most sensitive.

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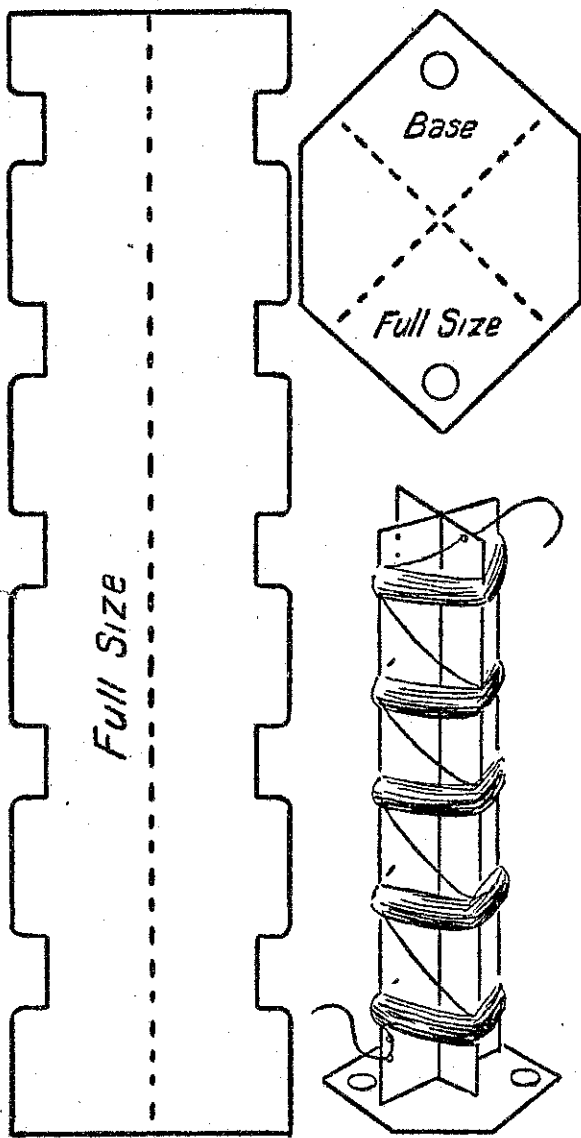
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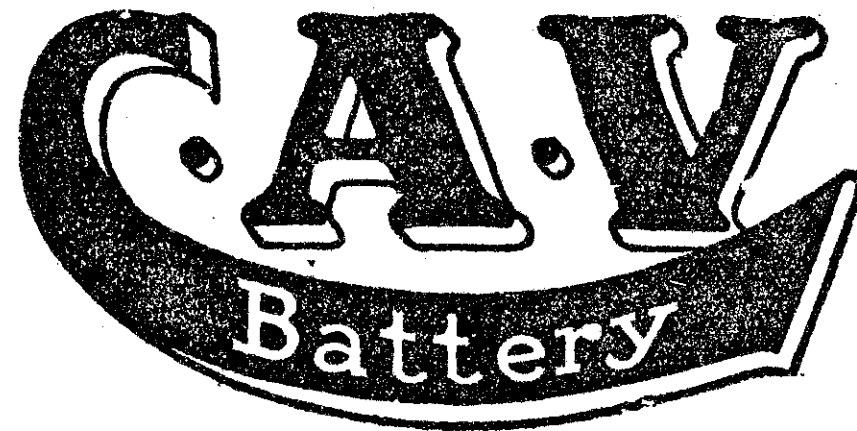
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Radio-Frequency Choke

ductance and low self-capacity to obstruct the passage. Unfortunately, it is impossible to design any coil to have no self-capacity, and every radio-frequency choke possesses this property in some measure. Bearing this in mind, it will be seen that any radio-frequency choke consists of an inductance shunted by a capacity (Which latter, however, may be very small indeed), and is thus a circuit capable of resonance, provided the ohmic resistance is not too high. The d.c. resistance must be reasonably low, otherwise it would unduly restrict the passage of the direct current to the plate from the B battery.

A good r.f. choke can be made on a celluloid frame constructed from strong motor-hood celluloid joined with cement made by dissolving chips of the celluloid in liquid acetone which may be obtained from a chemist. The cement should be of a creamy consistency, and is best made in a small



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