

A Diagnosis of Radio

R.F. and A.F. Chokes

I HAVE been taken to task by one of our readers for not making clear the function of radio and audio chokes. The fact of the matter is I tried to pass over a rather intricate point by generalising, but got into deep water. Unfortunately a couple of words were transposed and the sense of this kernel sentence was quite lost. However, I shall take the opportunity to explain a little more fully the work of r.f. and a.f. chokes.

The general function of a choke is to restrict certain impulses to any section of a radio circuit the constructor wishes. A radio frequency choke, which is a number of turns of fine wire, wound on an air-core former, allows direct and audio-frequency current to pass, but stops the radio frequency current. The function of an audio frequency choke, which is a larger number of turns of heavier wire on an iron core, is to allow direct and radio frequency to pass, to stop audio frequency.

It will be remembered that a condenser passes radio frequency current, but stops direct current. Its behaviour to audio frequency current, which is current alternating at a rate slower than radio frequency current, depends upon the capacity of the condenser. A small capacity will pass only radio frequency current, but the higher capacity will pass both radio frequency and audio frequency current.

It can be seen now that one of the most important factors influencing the design of the radio frequency choke is its self-capacity. If it is wound in such a fashion that there is a large capacity present between wires, then it will not block the radio frequency current, but they will pass through the

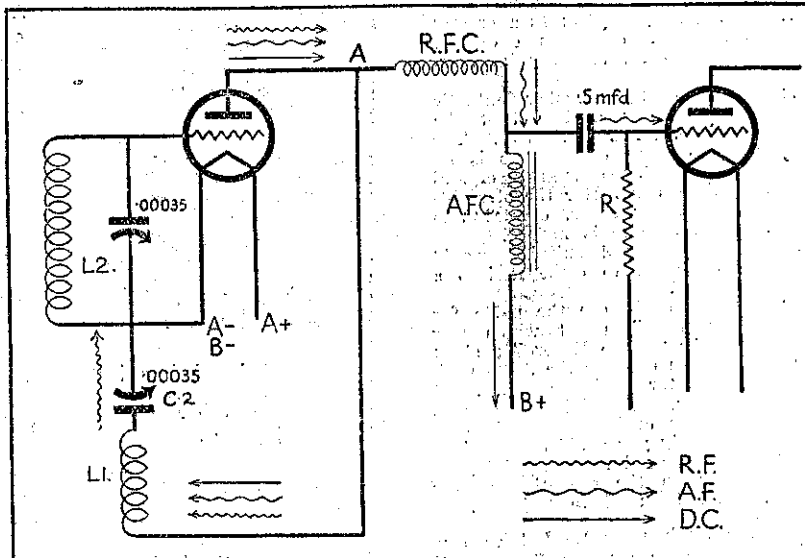
condenser part of the choke. For this reason, it is essential to see, when purchasing a radio frequency choke, that the self-capacity is very low.

The accompanying diagram shows more than can be explained in a page of words. It depicts a detector valve followed by a stage of choke capacity coupling. Now we shall start with the plate of the valve. The direct current flows toward us through the valve to the filament, and so round to its source.

by

The Technical Editor.

CHOKES AND BATTERIES



It is shown by the thick black line. Just for the time being we shall imagine that it is flowing the other way. It will not make any difference to our example, but it will make things clearer. Current passes from the plate of the valve and goes as far as the join marked "A." It now separates, and can go through the coil L1 or to the choke. Let us trace it through the coil. It can all go through the coil, but the condenser C2 is a very serious obstacle to some of the current.

It is of small capacity, usually a .0001 to .00035, so that it can pass the radio frequency, and will block the audio and direct current. Thus a certain amount of energy can be allowed to escape to earth, but it must first pass through the regeneration coil, the field of which transfers energy to the secondary coil L2, and thence to the valve. This is called regeneration. The amount of current held in the coil is determined by the setting of the condenser; the greater the capacity the more current we allow to pass back through the tickler and so to the secondary coil.

Now we will go back to the radio frequency choke. The audio frequency and direct current can pass through it, but the radio cannot and this is just what we want. The current is not wanted in the rest of the circuit. If it passes the detector stage it is likely to cause instability, so a choke is put there to keep it in its right place. Furthermore, the choke has the effect of forcing it back to the regeneration coil.

We are now past the r.f. choke and come to the audio frequency choke, which will not allow the audio frequency current to pass, only the direct, so it has only one path, and that is to the condenser. This coupling condenser is of a high value (.001 to .5 mfd.), and consequently will allow the audio frequency current pass to the grid of the next valve. If

we have a fairly high value coupling condenser, we shall get through the low frequency as well as the higher frequencies with the result that the bass notes will be preserved. If we have a low value condenser reproduction will be tinny for the condenser will not pass the low frequency or bass notes. Just to make sure that no radio frequency current is left to interfere with the audio system of our wireless set, a condenser is often shunted across the audio frequency choke, or transformer, as the case may be. A transformer primary acts in exactly the same way as does an audio frequency choke.

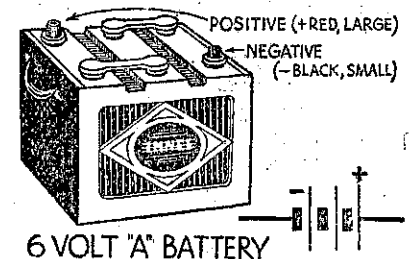
The same correspondent also asks that we go into the mathematics of radio a little, and also that we explain the working of a detector valve. While not making any promises, we shall see if we can possibly do this before our series close. We must not be too technical, and explaining detection is a very technical subject.

Batteries

THE function of a battery is to supply current to the radio set.

There are two types of battery, the wet and the dry. We shall deal with the wet battery first. A wet battery consists of plates of soft lead immersed in a solution of sulphuric acid. If these plates are connected in a circuit one set of plates being regarded as positive and one negative, current will flow between the two points. The energy for the current is drawn from the sulphuric acid, certain elements being absorbed by the lead.

For this reason the sulphuric acid gradually becomes thinner. The specific gravity falls and we say the battery requires charging. When we change it we connect a supply of current to the battery and force it through the opposite way, driving back some of the goodness that was taken out of the sulphuric acid. Wet batteries can supply usually a greater amount of current than dry batteries so that they are

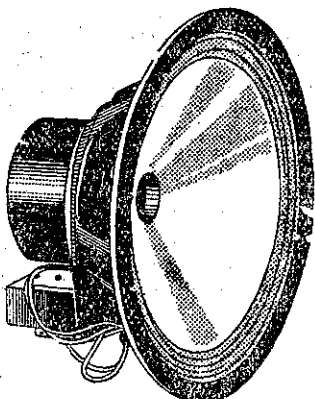


used for the "A" supply. Some are used for "B" supply, but they are smaller and cannot supply the same quantity of current as can the "A" battery.

It is important when charging wet batteries not to exceed the charging rate, specified by the manufacturers. If this is exceeded, the battery will become warm and damaged.

Never charge so that your battery is warm when finished.

If you require to charge a "B" wet battery from an "A" battery charger connect up the individual cells of the "B" battery as shown in the diagram. The point marked with a cross indi-



Jensen D.C. Dynamics

Types Available.—110-200 Volts D.C.;
Field 2,500 ohms; 180-300 volts D.C.;
Field 8,000 ohms. 6 volts D.C. takes
.4 of an amp.

Special.—Note the Cone size, 7½ in., all
Models as above £4

230 Volt. A.C. 7½ in. Cone with Dry
Rectifier £7/10/-

230 Volt. A.C. 10½ dia. with Dry
Rectifier £9/5/-

Undoubtedly the Leading Speakers of
the Year.

SPECIAL: BEFORE STOCKTAKING BARGAINS.

Siffron Output Filters	each	5/-
Beede 0-10 amp. Panel Type Meters	each	2/6
Series, Parallel Switches		1/-
Bradleyleaks 0-10 Megohms, variable		1/-
B.T.H. Scratch Filter		6/6
Electrotune Pick-up and Volume Control, head only of Pick-up		5/6
Atlas Shop-soiled Eliminator and Trickle Charger 86X, B supply, 150 volts, 30 M/A, charges 2, 4, or 6 volt. at ½ amp, uses Metal Rectifier Westinghouse. Usual Price £11/17/6. Now		£9

Send for our 1931-32 Radio Component Catalogue, at
present being printed. Fuller and bigger than ever.

DON'T MISS IT—A FULL AND COMPREHENSIVE LIST.

F. J. W. FEAR & CO.

63 WILLIS STREET

Telegraph: "FEAR."

WELLINGTON.