

Noise --- Its Cause and Elimination

A Non-Technical Chat on a Subject of Vast Importance

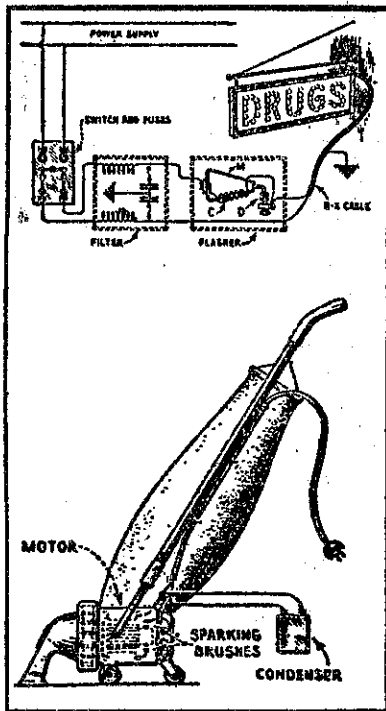
By the Technical Editor

I WONDER how many who have discarded their battery sets for a.c. ones have noticed, that though many more stations are available, there is now much more noise? And I wonder how many owners of battery sets have remarked that they would not change their present set for an electric one on account of the noise the latter picks up? No doubt a great deal of this noise is due to the greater sensitivity of the set—it brings in noise as well as entertainment—but if the set is turned down to the sensitivity level of the battery set, the noise is little, if any, greater. But the a.c. set is often more noisy and this is due to its picking up noises transmitted through the electric mains with the current that operates the radio.

This brings us to one of the greatest problems of modern radio, the suppressing of noise. Before we attempt to suppress it, let us see if we can recognise the various forms.

Noises like the signals picked up from the broadcasting station are a form of high frequency current, and consequently have the rather distressing habit of getting mixed up with them. That is the first problem—how to keep them separate.

Let us see how they reach the set. Wherever they come from, they are in the form of waves similar to the signals from the transmitting station. They can then enter the set by way of the aerial or the earth, or by the power mains. In this latter class there are two distinct types of interfering impulses. One is arising from surges in the mains, due perhaps to a switch or defective lamp upsetting the equilibrium of the current, and the other is high frequency noise caused by a spark transmitting its impulses along the wire. It is a combination of "wired" wireless and the spark transmitter of long ago. Both of these are



Suppressing noise in a flashing sign and a vacuum cleaner.

fering electrical gadgets. Here are some of the likely sources of interference of this nature: Generators and motors, arc light circuits, street cars and electric trains, sign flashers, hospital and domestic equipment, door bells, battery chargers (if of the vibrator type), lifts, moving picture equipment, switches, etc.

Now that we have classified the types, let us see how to recognise them.

To find out if the aerial is picking up noise, the most logical way is to take it off, and if the noise discontinues it is clear that the aerial is picking it up. First look for loose connections in the aerial-earth system itself and for any points that it can make contact with a ground return. Examine the ground and you might find that the clamp is corroded or rusty. Simple things should be looked to without a reminder, so we shall pass over them to the case where the antenna ground system is in good condition.

If the source of the noise is not apparent, the most sensible thing to do is to write to the district radio inspector and solicit his aid in locating the origin. If, however, it is due to some obvious cause, such as the proximity of the aerial to power lines or electrical apparatus, mitigation at least is in the hands of the listener—though complete elimination of noise can be brought

about only by the co-operation of the owner of the noisy apparatus.

If power lines are to blame, re-erect the aerial so that it points toward them. It should NEVER be parallel. Take it as far away as possible, but do not have a long and straggling lead-in. Keep the flat top very short and as high as possible. It should be borne in mind that signal strength received is proportional to the square of the effective height of the aerial, which means that an aerial, roughly speaking, when raised to twice its former height, will bring in four times as great a signal strength. Furthermore, by raising the aerial above the interfering lines, the noise pick-up will be diminished considerably. A further precaution can be taken by using armoured flex for the lead-in and earthing the armouring to a ground connection, distinct from the receiver ground. It will probably be found that the selectivity will be impaired by what amounts to lengthening the aerial. This is really a blessing in disguise, for the tuning can be sharpened up by another tuned circuit and more of the unwanted noise tuned out.

Noise from the Ground.

AS a great deal of the noise originates in the ground connection, or rather is transmitted from its source to the set via the ground, this part of the outfit deserves some consideration. Often a different ground from the one at present in use will bring about a remarkable difference in noise level.

If the present connection is to the household water system take it from here to some independent connection, consisting of a galvanised pipe sunk in moist ground. Coppers, etc., make good grounds, but it does not matter what you decide to use so long as it is efficient. Whenever armoured shielding is used connect it to a separate earth.

Noise Through the Mains.

THE simplest form of noise through the mains is that due to a power surge, but this is not worth while considering as a cause for complaint, as cases are rare. If a single pop is heard

when a switch is turned on the indications are that that switch is defective and should be tightened up. If it will not respond to this treatment, connect a 2 mfd. condenser between the points and the trouble will disappear. Under our regulations people who interfere with the mains or mains apparatus lay themselves open to prosecution, so it is better to get someone in the electrical line to do the job properly.

High frequency noise through the lines can be cleared up in either of two places, at its source, or at the point where the power enters the set. (Concluded on page 29.)

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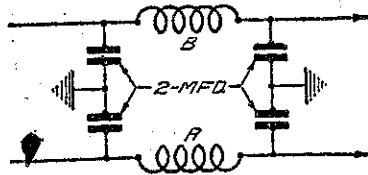
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obsolete and have no place in the modern set—but we have to eliminate them.

Sources of Noises.

LET us now set down the facts as we have them, in some sort of order, so that we can see where we are.

Interference can be picked up:—

(a) By the aerial and the earth systems. This may be due to static, over which we have no control, and which we shall not at the present discuss, or electric interference—which we shall discuss.

(b) Through the mains due to power surge.

(c) Through the mains due to high frequency impulses generated by inter-

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