

Locating Noise in Receivers

INTERNAL noise in a receiving set is a difficult problem to the average listener. Usually he can locate ordinary defects in a receiver such as grounded circuits, burnt out by-pass condensers and defective resistances. But it takes an expert to locate and overcome the elusive internal noises that are often encountered.

The purpose of this article is to help the listener locate and overcome these difficult problems.

Radio receivers are very sensitive devices and once noise gets into the receiver it is amplified and passed on to the speaker in the same way speech and music are passed on. Some of these noises originate outside the receiver and some originate inside. All noises cannot be eliminated or reduced, but a great many can. The causes of noises arising in the receiver are so numerous that it would be futile to attempt to describe each one separately. These noises may be due to poor design, poor construction, or defective parts. Fortunately, there are certain noises which can be classified into a few major groups.

Mechanical and Electrical Noises.

UNDER these two broad general classifications of noise in a receiver we have first a noise which reaches the ear by way of the loudspeaker, which is the amplified impulse through the regular amplifying system. Second, there are noises which reach the ear directly without being transmitted electrically through the receiver. These latter noises are frequently as troublesome a source of disturbance as the former. As typical examples of the first class we have intermittent opening and closing of contacts in a circuit. This may be in

Probably one of the most frequently recurring questions asked by correspondents to the "Questions and Answers" page deals with noise in receiving sets. Below is published an article which deals comprehensively with the causes of many phases of noise and outlines a cure for them. Read through the article carefully, then cut it out and keep it somewhere handy to consult when the set becomes noisy.—Tec. Ed.

the form of a defective connection or a defective condition of one or more of the parts used in the receiver.

As examples of the mechanical noises, we have noise due to vibration of the laminations in a power transformer or rattles in a cabinet door caused by vibration. Some mechanical noises are heard even though the speaker is disconnected or a resistance network substituted for the speaker. A simple check can be made to determine whether the disturbing noise comes from the speaker or not. Substitute a 4000 to 8000-ohm resistance for the speaker. While the resistance may not match the speaker output exactly it will place enough load on the apparatus under test to show whether or not the noises are of a mechanical nature. If the noise is still present it does not come from the speaker and must be traced in the set. This test, of course, is not applicable where the noise, although not coming through the speaker, is caused by speaker vibration affecting some part of the receiver, for example, rattling cabinet doors due to excessive output from the speaker. Here the amateur must use his judgment in applying the tests.

Noises may further be classified according to the nature of the noise as follows:—

Scratching noises, clicks, crashes, rattles, and grating noises, generally due to poor construction or defective parts.

Whistling, generally due to regeneration, poor valves, and oscillation.

Ringling noises, gradually increasing in intensity. These are called microphonic noises—sometimes due to poor

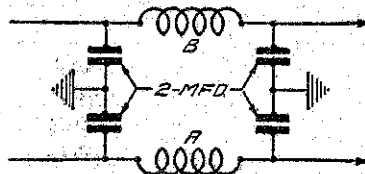


Fig. 1. This portable filter is suggested by the author to filter out line noises and should prove valuable to the service man. It consists of 150 turns enamelled or d.c.s. wound in sections on a 2in. former.

design—defective parts—defective valves, or too much volume.

Hum—generally due to poor construction—defective parts, faulty design, or poor valves.

Determine Origin.

IN investigating a noisy receiver, the first thing to do is to determine whether the noise comes from outside or inside the receiver. In the case of a battery set this can generally be definitely determined by disconnecting the aerial from the set. If the noise disappears it shows that it comes from the outside and that the set is O.K. If the noise still persists, however, the indications are that it originates in the set and it becomes a matter of diagnosing the trouble in the manner outlined in this article.

In the case of electric sets this test is not conclusive. If disconnecting the aerial causes the noise to stop, its source is generally external to the receiver. If noise is still present, it may still come in from the outside through the power line and get into the receiver by way of the power pack.

A line filter of simple design can be quickly and easily connected to the line of the ordinary a.c. set to filter out line noises. Figure 1 shows an arrangement which has been used successfully for this purpose.

If the noise is appreciably reduced after connecting the filter between line and receiver, it indicates that the noise originates outside the set and comes in on the line. If the noise is still present it will be reasonable to assume that its source is in the receiver and it can be eliminated.

Irregular Noises.

UNDER this heading come all sorts of crackles, scratchings, gratings, hissing and frying noises. The first three types are most frequently due to poor contacts. These arise from various causes. The most important are poor soldering and poor contact between valve prongs and socket spring contacts.

Poor soldering may result in a loose and therefore intermittent contact which is readily detected and observed by moving the lead to see if it is loose. The presence of a large amount of resin around a soldered joint is always a sure indication of a poor joint. The continuity tester to be described later will help greatly in locating high resistance contacts. The presence of a green substance at a joint is a definite sign of corrosion and indicates a likely source of noise. The only thing to do in a case of this sort is to re-solder the joints properly. A poorly soldered joint is a source of noise in any circuit, power pack, audio or radio, since it causes irregular variations of current.

In battery sets such irregular noises arise due to poor contact at the battery terminals. To avoid corrosion in storage battery terminals, it is best to use vaseline on the terminals. Weak batteries are also frequent sources of sputtering and crackling noises. The storage battery should be kept in condition by keeping it filled with distilled water and not allowing the voltage to fall below 1.8 volts. Frequently, it is a single cell in a battery that is the source of trouble, shown by a drop in voltage of the battery when it is operating under load. This is especially true of the storage battery. A hydrometer test may show correct gravity but a voltage test will show up a defective cell even if it has correct gravity if the voltage test is made while the battery is under load.

Valve and Valve Contacts.

SPECIAL attention should be paid to these because they are often a source of noise. A gassy valve in-

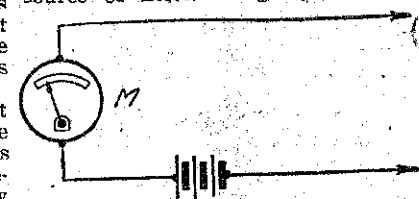


Fig. 2. A simple continuity tester is illustrated in this drawing. It consists of a voltmeter in series with a 4.5 volt C battery, and a set of test leads.

icated by a blue haze in the valve when working, causes irregular changes in plate current, thereby producing noise. The best remedy for this is to use a new valve even though the old valve may show correct operating characteristics. However, the abnormal condition causing the blue haze in the old one has more than likely ruined it.

Loose elements in valves will cause noise. Tapping the valve with your

Before buying Radio

We ask but one thing—

Hear the "SILVER MARSHALL"

The manufacturers of Silver-Marshall make a bold claim that their set is BEST by TEST—you will endorse this claim immediately you enjoy a demonstration, for Silver-Marshall is unquestionably in a class by itself.

SILVER-MARSHALL

Radio Sets and Radio Parts

Complete S.-M. Receivers
and Cabinets.

Short-wave Sets, Chassis
and Parts.

FACTORY IMPORTS,
LTD.,

N.Z. Distributors.

THOS. BALLINGER &
CO. LTD.,

96 Tory Street, Wellington.

Victoria Street, Wellington.

TO RADIO DEALERS.—Write to either of the above for particulars of available dealer territory.