

Methods of Improving Reception



It is intended this week to run over the whole radio installation, from aerial to loudspeaker, giving a summary of all likely sources of trouble and hints for their remedy. Unless a really efficient receiver is used, distance work is out of the question this summer, but a great deal of improvement, both in regard to the sensitivity and tonal qualities of the set, can be obtained by an occasional overhaul. It is difficult to write an article that will apply to every individual set, so likely faults that can occur in the more popular circuits will be enumerated. Even if the reader has an efficient commercial receiver, the accessories he uses, batteries, valves, etc., need occasional inspection, and an instrument will be described for checking the batteries and valves irrespective of the receiver.

The Aerial and Earth Systems.

COMMENCING with the aerial and earth system. The strength of the broadcast reception depends, in the first place, entirely on the amount of energy fed into the receiver from the aerial. This is quite evident. Unless a really powerful receiver is used, good reception cannot be expected from a poor aerial. Length of aerial, except in the case of a crystal set, has very little bearing on aerial efficiency. A longer aerial certainly does collect more energy than a short one, but other factors are brought into play, and these "other factors" counterbalance any improvement gained with a long aerial. In England the greatest length of aerial and lead-in permissible is 100ft., and in practice an aerial of this length proves most efficient. This is speaking of the conditions most likely to be met in the average home installation.

The greatest point to note regarding aerial efficiency is the effective height. This is not always height from the

ground, but distance from nearby conductors, such as trees, buildings, etc.

It is said that to increase the effective height of the aerial by 12ft. is to add the efficiency of another valve. Many listeners, not satisfied with their distant reception, buy or construct extra H.F. boosters. Besides being a rather expensive item in the first place, the extra valve needs feeding, and the majority of such boosters add another tuning dial to manipulate.

THE hot, dry summer, with its bad radio atmosphere, is with us, and, unless the receiver is in first-class condition, the owner will lose much of the enjoyment derived from radio. In this article "Pentode" describes how the amateur who knows little or nothing about his receiver, may set about tuning his set to maximum efficiency.

If no tuning dial exists, then the circuit employed is such that much amplification from this extra accessory cannot be expected.

Before speculating in more sensitive apparatus overhaul the aerial. If practicable raise it to 40, 50, or even 60 feet. The writer spent most of last summer travelling around the East Coast. In several cases set owners were advised to raise their aerials. As a result, stations that were inaudible previously came in on the speaker when the set was connected to the higher aerial.

Examine and clean the insulators. In districts near the sea especially, as the salt is carried with the mists that blow in from the sea and collects on the insulators. During the evening, moisture will collect with the salt and form a conductor through which the minute high frequency currents can leak away to earth.

Give the earth, too, all the attention it deserves. Remember that ord-

inary iron piping will soon rust when buried, and iron oxide is a bad conductor of electricity. In preference to a solution of salt for the earth, pour a solution of bluestone, copper sulphate, around the pipe, as this tends to plate the exposed iron with metallic copper. Besides being illegal, gas pipes make a poor earth connection, as the joints are seldom electrically good. Red lead and tow are not good conductors.

panel and baseboard can be readily taken out of the cabinet, peep inside and inspect all the soldered joints. Some fluxes used for soldering tend to corrode the copper after a few months' exposure. The only remedy here is to thoroughly clean the joint and resolder with fresh wire if necessary. Certain kinds of insulated sleeving used on commercial receivers is inclined to absorb moisture and grow a fungus. If this is very bad the whole set needs removing, and is best put into the hands of a practical dealer.

There are small adjustments, however, that can be done by anyone. Clean the variable condensers and solder a pigtail flexible connection between the moving plates and the frame. This will remedy most of the crackling noises experienced when tuning in.

Because a 2 meg. grid leak is universally used is no indication that this suits all valves. For distance work a higher resistance 3 to 7 megohms will usually be found more suitable. If stability is not obtained by neutralising the high-frequency waves, test all grid resistances with a pair of 'phones and a 4½ volt battery. If any are found to be defective consult the local dealer as difficulty may be experienced in obtaining this resistance already wound. Several commercial machines use this method of damping, and defective resistances are a common source of trouble. The symptoms are instability and absolute lack of sensitivity.

Testing Ganged Condensers.

If the receiver employs ganged condensers, each of the stages should be tested to see if they are all in resonance. To do this accurately needs special apparatus, but a right indication can be obtained by the following procedure.—

Make sure that each condenser on the common shaft is readily accessible. Tune in a distant station to maximum strength, and insert a piece of mica about 1-16in. thick between the fixed and moving vanes of each condenser separately. Mica has a higher dielectric value than air and the effect of a mica separation between the plates is to slightly increase the capacity of that condenser. No metal parts must be touched with the hands and the mica should preferably be mounted on the end of a short length of ebonite rod, similar to a fish slice.

If the signal strength is increased when the mica is between the plates of any one condenser, carefully bend the end vane, whether fixed or moving, slightly towards its neighbouring vane.

The Arrester.

THE insurance companies demand the use of a lightning arrester. Whatever make is purchased, always examine carefully before installing. At the back is usually found a cavity that has been filled in with wax. See that the wax is quite intact, and is not loose in the hole.

The arrester is usually screwed to the wall outside the house. Between the component and the wall is a good trap for moisture, and if the inside of the arrester is damp woe betide the chance for D.X. results.

If the wax is loose or cracked put the whole arrester in the oven, unless it is made of ebonite or bakelite, and heat up sufficiently for the wax to melt and drive off any moisture inside.

Inspect the lead-in tube and clean the joint between lead-in terminal and aerial. A touch of solder will remedy any trouble here for ever. Many cases have been brought to the writer's notice of set owners using twisted flex for connecting between the aerial and earth of the set to lead-in and water pipe. There is no doubt that this is still done in various homes. This is a deadly practice, even though it is much neater.

Aerial and earth wires must be kept separate if good results are to be expected.

Inspecting the Receiver.

NOW let us turn our attention to the receiver itself. In the commercial sets very little can be done as they are usually built of components with very little latitude for adjustment. If the

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