

Figure 1.—The most effective earth is installed directly under the aerial.

EARTHS FOR EVERYBODY

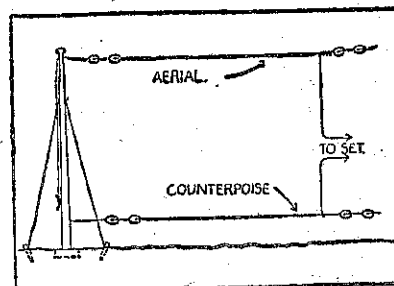


Figure 5.—A well-insulated counterpoise will often greatly minimise electrical interference.

In this article the importance of making a good ground contact is explained, and practical advice is given on the most popular methods of obtaining an earth connection which will ensure reliable results.

HAVING concluded our "Chat About Aerials" last week, we will now consider the earth, which should be just as carefully installed. In effect, the aerial and earth act as the two plates of a condenser, with the air between them as dielectric, and so to pick up the greatest amount of signal both plates should be as electrically efficient as possible. Nobody would think of using a tuning condenser with half its plates perfectly built and the other half just thrown together in a haphazard way, but this is what occurs when a receiver is connected between a first-class aerial and a poor earth.

The beginner is often confused by the bewildering variety of earths he finds are employed by his friends, and so is nonplussed when trying to decide on the best. The problem is not at all complicated, however—it is just a matter of keeping to a few common sense fundamentals.

Once the aerial has been erected there is very little choice as to the best location for the earth, for it should always be directly underneath the aerial, as shown in diagram 1. As mentioned before, the ground below the aerial acts as a condenser plate, and so the nearer the earth connection is to the ground directly under the aerial, the more efficient will be the installation.

What Is a Good Earth?

A most important qualification of a good earth is that it must have low resistance. To achieve this, the earth lead should be short, of fairly heavy gauge wire, and the earth plate or rod to which it is soldered should be buried at least four to five feet down in moist ground. We will deal with these now in turn.

A long earth lead is certainly not

desirable, because if it wanders around the room before reaching earth, it has a damping effect on the system, and in consequence tuning will be flatter. Also a long lead acts like an aerial—inefficient, it is true—but it places the set "up in the air," often making it unstable.

The wire employed should be of fairly heavy gauge, because the earth lead is really part of the aerial system, and there is not much advantage in choosing a heavy wire for the aerial and a thin one for the earth. Nothing smaller than number 16 s.w.g. should be employed. Perhaps the best wire to use is stranded aerial wire, because

might just as well be employed, because it is as cheap as bare.

The last and perhaps most important provision to ensure a good low resistance earth is that the earthing device, whether plate, tube, or water-pipe, should make ample contact with moist earth. Dry earth is a poor conductor of electricity, and for this reason, the earth-plate or rod should be buried several feet away from the house, where the ground it is buried in is not sheltered from rain by the eaves.

In earth connections, as in the aerial, perfect joints are essential, and every precaution must be taken by soldering or a very tight clipping (in the case of a water-pipe) to see this is the case.

The Best Earths.

The most common earth connection is one made to a water pipe. This generally forms an excellent earth, because these pipes run deep down under the surface of the ground, and the soil around them is generally moist because of leakage from the pipes themselves. Make certain, however, that the pipe does not ramble all over the house before going to earth, and also always choose an incoming pipe from the water main, and never hot water pipes running from a cistern. Remember that regulations prevent the use of gas pipes as earths.

Connections cannot be made to cold water pipes by direct soldering because the cold surface carries the heat away faster than the soldering iron can apply it. This difficulty is commonly overcome in three ways, illustrated below. In all cases the pipes should be sandpapered clean before the connection is made. (Continued overleaf.)

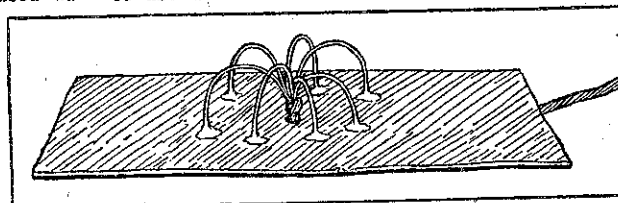
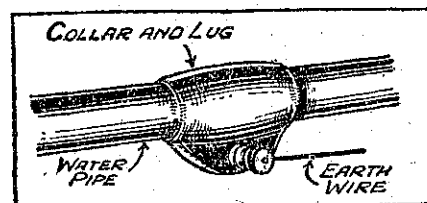
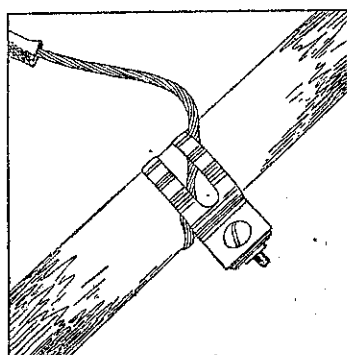
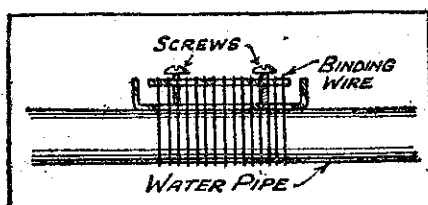


Figure 3.—A good method of ensuring a sound connection between an earth plate and lead.

of its larger surface area and also because the strands can be separated and soldered to separate portions of the earth plate to ensure the best possible connection.

It is not at all essential that the earth lead should be insulated. However, if it is not, and if it is at all slack, it will possibly be blown against a wet wall or nearby shrub, causing fading and scratching noises in the speaker. After all, enamelled wire



Three Methods of Attaching an Earth Lead to a Water-pipe.—Left and Centre: Two types of earth clips. Right: A plumber's joint. It is essential in all cases to see that the pipe is sand-papered clean and bright before making the connection.