

on the ground immediately under the aerial. Five or six feet on either side of this make narrow, shallow trenches running the whole length of the aerial and parallel with it. They can be made quite easily with the point of a pickaxe. In these bury lengths of the bare cabled wire generally used for aërials, connecting the ends of the wires together close to the house. To the junction of the two wires fix the end of the earth lead. The triple joint should be soundly soldered by "sweating" the wires together. Any plumber will undertake the job if it is beyond your own powers.

This form of earth has many great advantages. Once the wires are buried they are entirely out of the way and will require no further attention for years. In wet weather they act as a true earth, since moisture-laden soil is a good conductor. In dry weather very little loss of efficiency is observed, for even if the soil becomes desiccated the wires have a counterpoise effect. In fact many who have put this hint into practice have found that they no longer have such a huge difference, as once was the case, between dry weather and wet weather signal strength.

In Clay Soils.

GIVEN clay soil at a reasonable depth one of the best forms of earth connection is an ordinary seven-pound biscuit tin whose labels have been

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scrubbed off. An earth lead of seven-stranded wire can be soldered to it at as many points, thus ensuring a good contact. The tin is buried at a depth sufficient to ensure contact with clay and an iron pipe long enough to reach a foot or so above the surface of the soil is placed within it. A few small holes may be drilled in the tin. When the earth is in position the mouth of the pipe protrudes from the ground. In dry weather water can be poured into it. The water percolates through the holes drilled in the tin, moistening the surrounding clay and ensuring a good contact at all times.

It is, however, of no use making a first-rate earth plate unless you assure yourself that the contact between it and the low potential end of the aerial coil is as good as it can be. There may be a high resistance between this point of the coil and the aerial terminal of the set if thin wire is used for the connection or if proper joints are not made. Other possible points at which resistance may occur are in the earth wire itself, if this is of too small gauge or between it and the receiving set should there be a dirty or loose connection at either end of the lead-in tube.

It often pays to experiment with earths of different kinds if one is anxious to obtain the best results from a receiving set designed for long-distance work. Don't be content with any kind of earth connection put in haphazard. Try the water-pipe, the buried earth, and the counterpoise. It is most interesting to compare the results obtained by these different systems, and often it is found that one of them gives a surprising improvement both in the quality of reception and in the number of stations added to the log.

A De Luxe Earth.

AN earth—a de luxe type—that experiment has shown to be remarkably efficient may be installed in the following way. To a copper plate measuring some four feet by two a strap of copper tape long enough to reach to the terminal of the lead-in tube is riveted. It must be riveted, and not soldered or brazed, in order to preclude all possibility of electrolytic action. The plate is buried vertically beneath the aerial. The connecting strap must be kept well away from walls and so on, a distance piece provided with an insulator being used if need be. The strap should also be taut, so that it cannot sway in a wind. To ensure a low resistance contact the earth plate is packed round with coke or some similar moisture-holding material.

For all kinds of earth plate the riveting tip is a good one for soldered connections are not to be relied upon underground, and there is no doubt that they do give rise to electrolytic action owing to the presence of several dissimilar metals at the joint. In some very acid soils biscuit "tins" or other iron earth plates are destroyed very rapidly, and rivetted copper is much to be preferred.

ALTHOUGH, theoretically, the anode bend method of detection is capable of giving better quality than the grid leak method of detection, the latter is very much more sensitive.

CUTTING a crystal in two and using the new bright surface instead of the old dirty one will often result in a great improvement in crystal set reception.

Using Fixed Condensers

MOST amateurs have one or two spare fixed condensers on hand, but not everyone knows that a great many sets would greatly benefit by the addition of a ".001." The idea is that in condenser-controlled reaction sets (popularly called "Reinartz reaction") the reaction condenser should have a fixed condenser of about .001 mfd. in series with it, to prevent H.T. shorts.

To insert the condenser, first of all examine the connections to the reaction condenser. In most sets you will find that one of its sets of plates is connected to H.T. positive (possibly via reaction coil), and the other set of plates is connected to the filament wiring. All you have to do is to break one of these leads and connect to condenser in series. In other words, cut the lead and take one of the ends to one side of the fixed condenser and the

other to the other side of the fixed condenser.

There will be no alteration to reaction effects, etc., but now, if the reaction condenser plates are accidentally shorted, no damage will result from stray H.T.

Technical Tips

VALVES of the high magnification type generally make extremely good detectors in short-wave sets.

L.F. TRANSFORMERS, L.F. chokes, and similar highly inductive windings, should not be placed close together, and their cores should be arranged at right angles to one another.

BE sure to give your valves the correct grid bias, as failure to do this results in imperfect reception, and an unnecessary strain upon the H.T. battery.



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