Types of Aerial

(Continued from page 3.)

If you have an aerial 50 feet high and it passes over the roof of a building 30 feet high and this roof is connected to earth, then your aerial is not as good as that of your neighbour whose masts are only 30 feet high. Furthermore, a high aerial brings in a considerable amount more noise than a low one. It is interesting to note that whereas static decreases rapidly as height decreases, the signal strength does not decrease as rapidly. This is why many people have two aerials, one only 10 or 15 feet above the ground. They use this on nearby stations when interference is bad. If your aerial is too high try the effect of a series condenser of .00025 mfds.

So much for the height, the length and the situation. Let us consider the other practical points as regards the lead-in, the masts and the insulators, for they are all important. Select good large insulators, and do not be afraid of using plenty of them. The egg insulator is the most common one and you will recognise it by its shape. There is a hole at each end and a groove which runs from this hole down the longer part of the insulator. When connecting the aerial to the halyard arrange the insulator so that one passes through the other like two interlocked rings. This means that if the insulator breaks the wires hold one another. Insulators need cleaning fairly regularly. To facilitate this arrange your aerial on pulleys so that it may be lowered, but do not do as I did when erecting my masts—have the halyard wires thinner than the space between the pulley wheel and its frame. The wire will most certainly jam before the masts are halfway up, and it is not the easiest of tasks letting the mast down and putting it up again, especially if they are steel and liable to break. Specially tarred rope is better than a wire for a halyard.

For the actual aerial wire select fairly heavy stranded wire, with an enamelled coat, as it is much better than the plain wire, which corrodes. Now I know some of you will object to enamelled wire, saying that enamel is an insulator, and therefore must retard the radio waves reaching your set. It certainly is an insulator, but not against the high frequency waves sent out by the transmitter. You will remember I explained to you what frequency meant last week. Directly the waves strike the aerial wire they pass right through the enamel and become changed in form to travel along the outside of each separate wire to your set. If the wire becomes corroded the electricity passing along the skin is retarded. Rubber insulated wire is good, but it is heavy and usually expensive.

SEE that the lead-in drops straight to the set and prevent it turning corners. If possible, arrange your aerial to run back under the overhead wire, The lead can be taken from the dead centre, in which case the length of your aerial is equal to the lead-in plus the distance from the junction to one end. On the other hand, it may be taken from one end, which is the best.

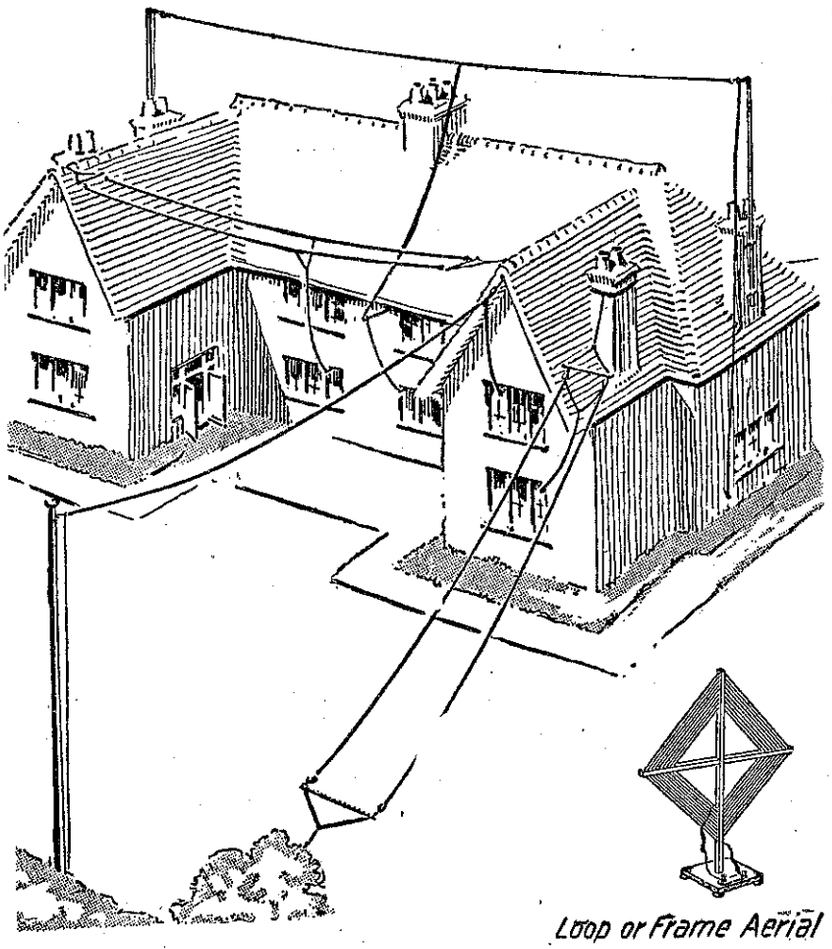
The lead should be insulated, so that it has no chance of touching any metal objects. Keep it off the side of the house by a stay and an insulator. Particularly avoid twisting it round anything, as this, as those who are technically versed can see, decreases the capacity to earth, and allows some of the power to escape.

Bringing it through the walls to the set is a problem. On one hand we must consider the efficiency of the installation, and on the other the house itself. The best way is certainly to bore a hole through the wall and take a piece of heavily insulated wire through. A less destructive plan is to have a flat strip of copper and solder the aerial lead-in to one end and the wire that is going to the set to the other. Do not use spring clips, as they become corroded and the efficiency is very greatly decreased thereby. If there has been any necessity for joints in your aerial system see that they are soldered and covered well with insulated tape. Try if possible not to have joints, as no matter how carefully they are made they are less efficient than an unjoined aerial.

Now that we have brought the aerial inside we must take it to the set, and here again we must remember the principle that the lead must go as direct as possible. If you have to cross a room it will be better to run underneath the carpet or linoleum than around the picture rail, but if you want good reception make an effort to have this inside lead as short as possible. Above all, do not twist it round nails. If the wire needs support use a stand-off insulator made by having special insulators in dresser hooks.

NOW that the aerial installation is complete let us look for a moment at the ground. With the increase in electrically-operated sets this is losing a great deal of its importance for many of them earth automatically through the mains. Some, I have found, work better without an ordinary earth, but usually a good earth is a slight improvement. With battery sets a good earth is absolutely essential if good results are to be expected. Take your wire from the set as short a distance as possible to a good contact with the ground. This can be a cold-water pipe, a buried copper plate, an old washing copper buried, sheets of iron buried, or a pipe driven 6 feet in the ground.

Here are some facts which will no doubt interest you:—Moist warm earth is the best conductor; cold and dry the worst. Nothing is to be gained by surrounding or filling the earth with charcoal, but salt and water poured over the earth connection ensures a good contact. The diameter of the earth pipe is of no importance, and when several pipes are used they must be separated by 6 feet or more to be effective; 6 feet is the optimum depth in which they should be driven. Not infrequently electrical interference is introduced through the water pipe. Gas and hot water pipes must never be used as earth contacts, neither must the earth be shared with that of the telephone or electric light. Shifting your earth is frequently a means of lessening power interference.



Classes of aerials in common use. Of these the inverted L type shown in left foreground is the most common.

WE have now completed an installation. Let us return to the aerial and consider one or two of the sidelines. Multiple wire aerials attract a great deal of attention, and not a few have asked if two wires are not better than one. If separated by about six feet they are, but they will not give anything like double the stregnth of one aerial. With an aerial of standard length there is nothing to be gained with multiple wires. Where aerials have to be very short extra wire will be of use. Spreaders of hardwood, well painted, should be used to keep the wires apart.

The electric mains can be used as an aerial if a special adaptor is used. It is not, however, as good as an outside aerial. Inside aerials attract a good deal of attention, principally because they are easily erected and are not unsightly. They can be either between the ceiling and the roof, across the room, or round the picture railing. Although very useful where an outside aerial cannot be erected, it will not bring in very strong signals.

The loop aerial is not very much used. It needs a special aerial circuit, and its action is different from the ordinary aerial. Do not think you can attach the loop to your ground and aerial and binding posts and expect to get results. It must repace the first coil in your set. Loops were compulsory with superheterodyne receivers until an improved model was brought out, which can be worked from an ordinary outside aerial.

Another type of aerial which is very popular in country districts is the Beverage aerial. This is about 850 feet long, but only 6 to 9 feet from the ground, and of ordinary galvanised wire. The distant end is connected to earth through a resistance of about 600 ohms. It is strongly directional and must point in the direction from which the signals are to be received. It brings in very little static, but the stations come in very well. It is well worth trying if one has the room.

The directional effect of the ordinary aerial need not be considered—only when the aerial and lead-in are in a definite proportion, which is impracticable in the ordinary installations is the directional effect of any importance.

The Mawson Expedition

SIR DOUGLAS MAWSON'S exploration ship Discovery, which is now in Hobart on route to the south polar regions, has been fitted for the second occasion with Australian-designed and manufactured wireless equipment. This will permit of weekly broadcasts from the Antarctic, giving the Australian and New Zealand public details of the progress of the expedition. Arrangements are being made for the words of the explorers to be rebroadcast by the Australian stations so that listeners may hear them on the ordinary radio receivers. The equipment includes the latest type of short-wave radio apparatus designed to withstand the severe climatic conditions. Preliminary experiments and tests of the installation have proved highly satisfactory. The set may be used for either speech or Morse, and includes emergency apparatus if any unforeseen breakage should occur.