

Letter to "Galena."

"RECORD FAN" (Christchurch), writes, asking for details of a crystal set that he can get 2YA with. His brings in 3YA well, but "not a whisper from the capital city."

It is to be feared that he cannot be helped. A weak spot is suggested, but one evidently does not exist. He would be advised to try Pentode's full wave crystal. If that will not get Wellington from Christchurch, then nothing will. Other questions are:—

"Could you tell me how high it would be necessary to erect an aerial to enable crystal to work loudspeaker on local station—that is, without batteries, valves, etc.? I am told it is done in Wellington with 60ft. aerial."

Sorry, but we think you are expecting too much of an ordinary crystal set. The full wave set may bring in 3YA at loudspeaker strength, but it is too much to expect an ordinary crystal to do that. It must be borne in mind that 2YA is ten times the power of 3YA. 10 x 60 height of aerial—(Is this logic?)

"Would a 50ft. aerial sloping to set end, 35ft., be less effective than a horizontal one of 50ft.? Would the effect, if any, be very noticeable?"

So much depends on local conditions that it would be difficult to say with precision which would be the better. It is to be expected that the horizontal one of 50 feet would be better (see article on "Receiving Aerials" in our special issue last week). In any case, there would be little difference.—"Galena."

Distortion on a Crystal Set.

DISTORTION on a crystal set, followed by one or more stages of audio amplification, can easily take place if any high frequency currents pass through to the audio side. When constructing a set of this nature, always include a fixed condenser across the primary terminals of the first L.F. transformer. This often gives increased signal strength by preventing choking of the high frequency by the iron cored coil of the transformer.

Load Signals from Crystal.

UNFORTUNATELY, any crystal set, no matter how good it is, always is under a disadvantage as compared to the valve set. This disadvantage is that all the energy used to work the crystal set has to be derived from the broadcasting station. There is no supply of local energy of any type such as batteries, etc., by which signals can be strengthened, and, consequently, no matter what is done to the set, the limit is soon reached.

Getting Louder Reception.

HOWEVER, although all the power to work a crystal set must in the

Our Crystal Corner

By "Galena"

first instance come direct from the broadcasting station, there are several ways of making the best of this instead of letting some of it be wasted. First and foremost a good aerial and earth connection must be used, and if the crystal owner has not tried experimenting with these at all, he should certainly try some of the tips, etc., which appear in the "Record" from time to time, so as to get the maximum efficiency out of this part of the set.

It stands to reason that the more energy the aerial can pick up the more will be received in the 'phones, so be sure to have a good high aerial and as far away from screening, etc., as possible, and a really good earth connection, as short as possible, without any waste owing to bad joints in the earth leads, dirty terminals, dirty insulators, or leakage through nearby metal pipes, etc.

Having got the very best strength it is possible to get into the crystal set, it will be found that the best way to get results in any other room is to use fairly thick wire—say No. 16 gauge—and to keep the leads as short as possible and well separated. Instead of taking two long leads to any additional room, it is generally necessary only to take one lead provided that you can find a really good earth plate in the other room as well.

For instance, if the set is in the back room of the house, and you want to listen in the front room as well, there is generally no necessity to take two wires, one from each telephone terminal. If you have an earth plate buried just outside the front room window, and a lead from that is shorter than the lead from the set would be, you can connect that earth plate to one of the new telephone leads, the other telephone terminal to the long wire which goes to the set itself, and then try connecting this first to one telephone on the set, and then to the other. On one connection it will give no results at all, because that is the terminal which is joined to the earth in the set, but on the other telephone terminal on the set it will be found good results may be secured in this way (much better generally than could be obtained by having two wires, one to each telephone terminal).

Use of More Crystals.

CAN signals be amplified by using a number of crystals? This is a question which many beginners ask themselves. They think that, since one crystal can produce good signals, two or more crystals should be capable of producing very good signals. This is false reasoning, however; it is no more correct than it would be to say that because you can eat a good dinner off one table you can a very good dinner off two or more tables!

It is sometimes suggested that improved results can be obtained by using two crystals in parallel, but although there is theoretical justification

for this advice it is rarely carried out in practice.

"Pentode" suggests a method by which this may be done, but it will be seen that it is a little more complicated than two crystals arranged in parallel.

It is a good plan, however to connect up two crystals in parallel with the object of using them alternately.

Should one crystal be thrown out of adjustment accidentally the other could be rapidly substituted. This has the advantage of preventing any loss of signals when the first crystal is thrown off its sensitive contact in the middle of a song or speech from a broadcasting station. Moreover, it affords an opportunity of testing the efficiency of different crystals by comparing the sensitivity of one crystal with a number of others.

Resistance of 'Phones.

TELEPHONES are usually referred to as "low" or "high" resistance telephones. This is because there is inside each earpiece a coil or coils of fine wire. The coils are wound round the limbs of a magnet, and the received currents pass through them. The effect of the received currents passing through the wire is to increase the pull

of the magnets on the diaphragms of the 'phones, and the number of turns of wire used has an important bearing on the extent to which the pull increases. Unfortunately, also, the amount of wire in the coils affects the resistance of the circuit as a whole. The more the wire the greater is the resistance. It is therefore advisable to use different kinds of 'phones, with different kinds of receivers.

'Phones which have a resistance of 8000 ohms (4000 each earpiece), are likely to give the best results with a crystal receiver. For working with a valve receiver that contains three or more valves, low resistance 'phones are more suitable. The wire used in a winding with a resistance of 8000 ohms is very fine and liable to become damaged if dropped. A happy medium is the 'phones with a resistance of 4000 ohms, or 2000 each earpiece

Lead-in Wires.

FOLLOWING are extracts from the Fire Underwriters rules, referring to the lead-in. These are important and should be carefully noted by all set owners:—

- Lead-in wires shall be of copper or other approved metal which will not corrode excessively, and in no case shall they be of smaller cross sectional area than 0.0045 sq. in. (7/.029") or No. 14 S.W.G.
- External lead-in wires shall be installed in accordance with Rules 1 (a) and (b).
- Lead-in wires shall enter building through a non-combustible non-absorptive insulating bushing.
- Within a building lead-in wires shall not be installed contiguous to any part of an electrical installation.



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