

A.: This is because the set is then on the verge of oscillation.

4. Volume cannot be obtained without the valves overloading. This is a new feature.

A.: It appears you are oscillating, and this can be caused by a defective valve, a broken or bad connection in aerial or earth system. Look over these, particularly where joints have been made. See that the grid-leak is making a good contact, and if you can try the use of another one.

**LONGEARS (Westland):** Would a crystal set work two miles out of Invercargill?

A.: That we cannot say definitely. Your best plan would be to write to the Invercargill station and see how far they get crystal reception. Such a set should work quite well.

2. Can an amplifier be attached to a crystal set and what would be the price? A.: You can attach any variety of amplifiers to a crystal set, and a good one would cost you about £3.

**STETSON (Milton):** Will you give me the specifications for a 2 amp. charger using a Tungar bulb? The iron to be 1 1/2 in. wide.

A.: You will find most of the information you require in either the 1930 or the 1929 "Listeners' Guide." The number

of turns on the secondary will of course depend on the voltage you require. You should use 18 gauge wire for the secondary.

**D. (Blenheim):** Where could I get instructions for making a cheap Morse code transmitting set?

A.: We will shortly be commencing upon a series of articles which should suit your purposes.

2. I have a two-valve home-made set. What would I need to make it into a three-valve set?

A.: Another valve. Instructions for hooking up another one were given recently.

**MAGNET (Wellington):** Specifications for short-wave coils will be published in the near future.

**EDE (Palmerston North):** The "B" accumulator in the 1930 "Guide" charges well and gives full voltage, but it will not hold its charge.

A.: Plates to form properly take a good deal of charging, so although this is the eighth time do not lose heart. See our replies to "Resistance." Also look for an internal short-circuit in the battery such as the plates touching or thick sediment.

**SCREEN GRID (Ngaio):** I am using a high voltage dynamic speaker from my powerpack which supplies the Loftin-White, but there is a pronounced hum which is not present when using a magnetic speaker. How can this be overcome?

A.: It seems very much as though your powerpack is not delivering the current that is necessary. It requires a very good powerpack to stand a drain of 60 m-amps at 400 volts. If the drain on your speaker were to cause a drop in the initial voltage the symptoms you speak of would appear. All the resistances are planned out for working on 400 volts, and if you go below this the bias chiefly is altered and the circuits become out of phase and the hum is caused. Apart from that we are at a loss to understand why your set should hum, particularly as it does not hum with another speaker. If you measure the voltage and find it to be correct, then have the speaker tried out on another set. See our article this week on another method of connecting up the speaker.

2. The L.W. is slightly unsteady on the higher notes.

A.: Unsteadiness in the L.W. in any shape or form is due generally to the failure of the outfit to adjust itself to the bias required, and this traces down usually to a defective grid-leak resistance in the bias supply of the 245.

3. The 245 valve passes 36 mls. when used without an r.f. choke, but with it it consumes 33 mls. How can I reduce the current to 30 mls. as per the specification?

A.: Either the voltage delivered to the 245 is too high or the main chain of resistances too low, or the bias not properly adjusted. You should try another grid-leak in the circuit already mentioned.

4. Would heavy gauge sheet metal be suitable for the tuner chassis if aluminium shield cans are used for the coils?

A.: According to the dictates of theory iron shielding is not advised where radio frequency currents abound, though probably in a case such as this it would be quite satisfactory.

**W.W. (Gisborne):**—Would you send me a copy of the "Record" describing the way to make a good crystal set?

A.: We have some excellent descriptions ready, and they will be published in the very near future. If you keep an eye on the paper you must see them when they come out.

2. If one had two sets on two separate aerials running to one pair of phones, would the results be better?

A.: No. To get full way rectification, which, by the way, you are aiming at, it would be necessary to use a special hook-up, such as was described in the 1929 "Guide." This is an experimental set, and cannot always be relied upon to give good results. So much depends upon the maximum of the crystals, the coils and the condensers.

**G.B. (Lower Hutt):**—In a back issue of the "Record" there was an article dealing with the construction of a trickle charger using aluminium.

A.: The description appeared in our issue dated November 16, 1928. It is a rather tricky circuit, and by the way it contravenes the existing regulations. Your better plan would be to make a proper trickle charger with a transformer.

**BEGINNER (Dunedin):** Is it correct to place a resistance for resistance control regeneration in the B+ lead of an adapter?—Yes.

2. Can the resistance be placed in the B— lead when this lead is joined to A—?

A.: If you want to do this you must place the resistance between A— and B—, and so they will have separate leads to the set.

3. I have tried out the resistance control regeneration but oscillation is difficult to control. Would it be improved if resistance is placed in the negative lead?

A.: It is unlikely but it would be worth while trying. The difficulty of controlling regeneration is due probably to the design of your resistance and the layout of your set. The radio frequency choke should be between the plate of the valve and the transformer of your ordinary broadcast. On the other end of this winding of the transformer is the resistance and by-pass condenser. The hook-up is shown in sketch No. 11 in the accompanying diagram.

4. The resistance seems to be affected by hand capacity.

A.: You will find it will be prevented when you make the alterations in the circuit suggested.

5. Should the number of turns on the aerial coil be altered for each waveband?

A.: Yes, but the best plan is to do away with the aerial coil and bring the aerial through a condenser to the grid terminal of a coil. The aerial coil is usually about half the secondary.

6. Is the layout of my circuit correct?

A.: We do not undertake altering layouts for correspondents, for it is a big job, but you will find if you reverse the positions of the tuning condenser and the resistance, turn the coil round so that the secondary terminals are facing the condenser, and move the valve socket over you will have a better layout. The plate lead is far too long. It must be shortened if good results are to be expected. Your hook-up No. 2 is quite wrong. You are passing the current for your "A" battery through a 100,000 ohms resistance. The result will be that the valve will not light.

**ANXIOUS (Devonport):**—I have built a shortwave set exactly to specifications, and can only get Morse stations. The set has been tested and found O.K. I can oscillate only on part of the dial.

A.: You could try increasing the "B" voltage, as this should make your set oscillate more readily, but failing this we would advise you to get in contact with the local branch of the organisation, who

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