Questions and Answers

IN BRIEF.

L.S. (Nelson) asks for the details of a five-valve receiver that will bring in the American stations. A powerful set will be described in our "Listeners' Guide," which will be out in the course of a couple of months or so. No one, however, can guarantee a set to bring in the American stations.

Valves Die Off.

MY receiving set is a five-valve set, factory made. When I plug in the valves light up, and the programme comes through good, but then it fades away, until in about half a minute or so it fades out completely and the valves die out. There is no other disturbance, it just dies out. The A, or wet, battery shows good readings, also the B and C batteries. I have examined and found nothing wrong with the connections of them. The wiring also appears to be good. I have tested with a new valve on all sockets, and still the same results. It is the same with headphones, as I thought the plug of the loudspeaker might be wrong.

After it has been standing a day the programme comes good for, say, half a minute; if I plug in again in ten minutes or so it just lights up, and very small portion of the programme comes through, and dies away, about ten or 15 seconds.—J.C. (Nelson).

ANSWER.—The fact that the valves light up to die off a few minutes later seems to suggest that there is a fault somewhere in the filament wiring of the set, probably between the A battery and the valves. This would account for the reception dying out as it does. The test should be that described in the "Beginners Corner" and in "Construction" some time ago: i.e., by using a pair of telephones and a dry battery.

Take the instrument and test out every piece of wire and every component lying in this circuit. First examine the A battery terminals to make certain that they are not corroded. From here follow the A battery end and one end at the binding post. If a good strong click is not heard it can be taken for granted that corrosion has taken place in the lead between the A battery and the set. Likewise, test the other wires in the filament circuit. Test very carefully resistances, if they are in the circuit, and the rheostat. The rheostat quite frequently gives trouble of this description, for after being in use some time a rheostat, other than the very finest quality, makes a faulty contact, and the slightest jar, or even a great fluctuation in current, may cause the contact to be broken. Examine this carefully, then, to see that the connections are sound, clean, and solid. Any loose parts should be tightened up. If the rheostat is at all doubtful it can be tested by the 'phone method with the moving arm in different positions.

Test also the valve sockets by this method, although it appears that the trouble lies in a lead common to these rather than to the sockets themselves.

General Points.

"IN Trouble," Miramar, writes asking several questions, which are answered as under:—

1. Is the use of a condenser across the primary terminals of a transformer illegal?

ANSWER: Certainly not. In fact, some transformer makers include them in their transformer, viz., Ferranti. However, such a condenser can be easily placed across the primary of any transformer and it is advisable to do so.

2. Is there any difference in the efficiency of an aluminium or brass condenser?

ANSWER: Yes. The brass condenser is slightly more efficient than aluminium, and in consequence is higher in price. The aluminium, being lighter is particularly useful for light receivers of the portable type. The difference between the two is very slight.

3. How would fixed condensers be placed in the audio side of the receiver and what capacity is best?

ANSWER: There are several places in the audio side where condensers may be placed:—

(a) Across the primary of the audio transformer. Here a .0001 condenser is quite suitable;
(b) Between the terminals of the telephones. Here the value should be approximately 2mfds.
(c) Across the B battery.
(d) Between the B positive and the earth.

An advantage can be secured by placing a radio frequency choke between the first audio transformer and the regeneration coil of the detector circuit. If this alteration is made, a condenser of .0001 should be placed between the coil side of the RFC and the A negative.

4. Do these condensers cut down the signal strength, and do they improve the tone?

ANSWER: The improvement in tone is worth any slight reduction in the signal strength.

5. What is the best way of toning down loud signals? Is it by inserting a variable condenser on the aerial before it reaches the set? If so, what would be the capacity of the condenser, and how would the strength of the signals suffer when the plates of the condenser were together? Would the condenser be used in a parallel or in series?

ANSWER: Yes. The best method of controlling volume is to place a midget variable condenser in series with the aerial lead. The capacity should be .0001.

6. Is an amperite as good as a rheostat for the audio? If so, why?

ANSWER: Yes, except with an occasional valve, amperites could be used to advantage. These are always connected in series with the valve filaments and the battery. Care should be taken in selecting that the correct amperite for the particular valve is obtained. A chart has been prepared and may be obtained from any dealer who stocks amperites. However, other resistance may be used.

7. What value of rheostat should be used on a 4-volt valve in the audio stage?

ANSWER: The correspondent here has not made his question clear. Does he wish to use a 4-volt valve with a 6-volt battery, or does he want it to control volume? If it is the former, use a 30ohm rheostat; if of the latter, a smaller capacity would do. A fixed resistance would do equally well.

8. Could a 6-volt detector valve be used with a 4-volt audio if a separate A battery is used, and the two negatives connected?

ANSWER: By using two batteries, the correspondent is looking for trouble, as well as expense. The uses of rheostats or fixed resistances is far to be preferred when valves of different capacities are being used.

9. What is the fuction of a R.F.C.? Can it be used on the short waves if it is specified in the detector of the long wave circuit, or must it be subtracted?

ANSWER: A choke coil is a coil of great reactance or impedence, whose purpose is to limit the flow of alternating or pulsating current of certain frequencies through part of a circuit in which the choke is placed. The high frequency choke must oppose the passage of high frequencies, but must not choke back the audio frequencies. A choke should be used in the detector circuit of a short wave receiver.

Power Interference.

I AM considering building a 3-valve receiver, and would be pleased to have your advice on these questions. I am using a 2-valve set (O.V. 1), but results are not as good as I would like. I require a set to give 'phone work from the local, and from the Wellington station. Quality is the main consideration, and although the set has been improved by carrying out your suggestions, I would like it better still. I am only half a mile from 1YA, and on the car line, and so troubled by power noises.

1. Would you advise Browning Drake or Hammerlund Roberts circuit (1.V.1.) in the circumstances?

2. Would the use of a 22g. copper cabinet clear up reception if earthed? (This apart from the screening of the R.F stage.)

3. Would the use of silver plated wire for the wiring of a set, in place of the usual tinned bus wire, improve a set by lowering the resistance?

I am a plater by trade, and it would mean practically no extra cost to soften and give a good coating to some copper wire of a suitable gauge. I understand radio currents flow more on the outside of a conductor, and if this is so, the plated wire would be much the same as solid silver wire. "Switch," of the R.R., seems to like the Browning Drake, but I have gained the impression that it might not be selective enough so close to 1YA.

ANSWER.—(1) Both circuits are more or less suitable, but the correspondent would be well advised to consult the local manufacturers of the Hammarlund, Roberts receiver, Messrs. Johns, Limited, for further information on the use of this circuit locally.

(2) Yes, screening always helps to reduce noise. The RF stage could well be screened.

(3) Silver-plated wire would certainly make a slight difference, but for anyone other than the correspondent, who is in the trade, the experiment would hardly be worth the expense.

Regarding selectivity, the correspondent will have great difficulty to get any set that will cut out 1YA within half a mile. The use of a wave trap may help to solve the difficulty.

The use of a counterpoise instead of an earth may also help to reduce noise, while care should be taken with regard to the direction of the aerial. It should be at right angles to the car lines.

Four-Volt Valves.

IN the "Notes and Comments" in this week's "Record" (dated January 18) I notice a paragraph whereby a listener has been advised to use a four-volt valve in his radio frequency stage of a Browning Drake receiver. This was done by "Switch," who was surprised at the results obtained from "distant" stations.

My receiver is a four-valve Browning Drake, using one stage of radio frequency. I use a six-volt battery for A supply, and a wet B battery of 112 volts. The valves I use are dull emitters, viz., detector PM5, radio frequency PM6, audio amplifiers PM6, and PM256.

Will you kindly advise whether this is the correct combination for my particular machine?

Also, let me know what type of four-volt tube to employ in R.F. stage, as indicated by "Switch," and whether this should manifest the vast improvement in sensitivity claimed by him. I use a Bradley stat on R.F. tube, and separate rheostats for detector and amplifier.

I have logged about 20 "outside" stations (American and Japs.), in addition to the usual Aussie and N.Z. stations. The aerial I employ is an inverted L, with two well-insulated masts, each 62 feet high. Locality—on a hill, and clear of all screening effect, and wires whatever. The situation, in fact, is little short of ideal, but in