

A.: After, to give a level working surface.

7. Are the chokes wound regularly or in heaps?

A.: They are left to themselves. A layer is wound on at great speed, and no attention is paid to regularly.

Trouble with the H.R.4.

WOULD you inform me of the date when "Round the World Two" was published?—"R.B." (Petone).

A.: April 26, 1928. Our supplies of this number are running very short and would advise you and prospective constructors of this very successful receiver to secure a copy of the issue before it is too late.

Loss of Volume.

ALTHOUGH I have renewed my batteries and valves I find the volume from my factory-made receiver is unsatisfactory, writes "G.E." (Point Chevalier). The carrier wave is no longer clear, but there is a shrill whistling when I try to tune in the stations. I have had to reduce the voltage on the detector to 67½ volts. The tone is not at all clear.

A.: It appears that the set is not neutralised properly. Especially where valves other than those recommended by the manufacturers are used there is trouble with the neutralising, and this would cause the howl referred to in the tuning. Other possible causes of trouble might be defective aerial and earth systems, open grid circuits or defective joints, lack of resonance in the tuned circuits if single-dial control. (See that all the tuning condensers are in step. Turn the dial to 100 and get all the moving vanes within the fixed). Burn-out resistances in the grid circuit (if the set is neutralised by this method), poor contacts between the valve prongs and the socket, shorted tuning condenser or one that is not moving when the dial is rotated, defective radio transformer, and broken-down by-pass condenser. Many of these likely defects can be remedied by the continuity test, using 'phones and cell or voltmeter and cell methods. These have been outlined in the "Radio Record" and in the "Listeners' Guide."

Weakness on a Crystal Set.

THE following troubles have been spoiling my reception of 2YA on a crystal set—"R.J.S." Wellington.

1. Reception is weak on a set comprising a four-inch coil tuned with a 32-

plate condenser. The aerial is long, but low. The phones are rusty, and one ear is silent.

A.: Probably your phones are not in the best order. The fact that one will not function shows that there is trouble here. Can you not borrow a pair to try out the set. If you are using a permanent crystal, tap it, and then try. Dirty connections are one of the most frequent of trouble causes.

2. Another aerial hangs from a tree, and the swaying in the wind breaks the insulators. Can I leave about two feet slack?

A.: Yes, but we should imagine that this would introduce a greater swaying.

Note.—We are preparing an article on aerials and earths, which should be helpful.

Overloading.

W.S.R. (Martinborough) has incorporated in his factory-made receiver the push-pull amplifier described by "Pentode," but is troubled with overloading, probably, he suggests, the detector. The following are his queries:—

1. Can I work two pentodes in push-pull?

A.: This is a difficult task owing to the very high impedance of the valve. None of the devices used in the output stage are designed for this valve, and when it is worked in push-pull the impedance is doubled, and so are the attendant difficulties.

2. Assuming that I can put out two watts of undistorted power with the 256 valves at present used, what would be the output if I used pentodes?

A.: Two 256's in push-pull deliver about 1.8 watts, and two pentodes, if correctly matched in their circuits, 2.25 watts.

3. How might I prevent overloading? but as components are now designed, the chances are against the pentodes.

A.: Do not attempt to work 2YA with all the radio stages in the circuit. Bring the aerial into the grid of detector or last radio valve. Is the speaker capable of handling the volume that can be supplied by the set? Finally pay great attention to anode and negative grid voltages.

Hum in an A.C. Receiver.

I have recently converted my 2 R.F. Browning-Drake receiver to all-electric, but I am troubled with a continuous humming. All the valves are Philips and of the cathode type. The mains is of

60-cycle frequency. Would this make any difference?

A.: There are more than one type of cathode valves made by Philips. Some are better than others, but for your circuit, presuming that you have the better for your purpose, B415, we would suggest that you have the powerpack tested, for a great deal of trouble can arise through a broken-down filter condenser. The mains frequency is normal.

2. When I switch on the set there is a surge of power than necessitates detuning, and then the set signals down to normal again.

A.: Probably a defective unit.

Band Pass Filters.

WOULD you give me constructional details of a suitable band-pass filter? asks "Band Pass" (Auckland).

A.: This is a topic that is receiving a great deal of attention in the American technical Press of late. We would advise you to obtain "Radio News," late issues for full particulars. We shall devote an article to this subject as soon as possible.

Crystal Set and Amplifier.

THERE are several points that are troubling me in the article on this subject in "All About the All-Electric," writes "S.W.S." (Silverstream).

1. Which is wound on first, the filament or the rectifier winding?

A.: It does not matter. If there is sufficient room, both may be wound on side by side.

2. Which of the primary and which of the secondary windings are connected to the mains?

A.: The primary input and output are the only wires connected to the A.C. mains.

3. Does each layer in the primary and secondary have to be insulated if I use 36 d.c.c. wire?—Yes.

4. How is the value of "I" arrived at in the equation, $R=E/I$, and what is the bias resistance for 201A?

A.: The value of "I" must be obtained from the makers' figures or curves. Consult a chart either supplied or possessed of by dealers, and obtain the anode current consumed when the valve is properly biased. Thus, for 201A the bias with 135 volts is 9, requiring an anode current of 3 milliamperes. Thus the bias resistance is $3.9 \times 1000 = 350$ ohms approximately; a 0/400 ohm potentiometer used as a rheostat would do excellently.

5. Could I use the A.C. equipment in this circuit as an eliminator for another set; if so, what are the adjustments?

A.: The "B" part of the outfit can be used successfully, but for the filament supply the changes shown in the article must be made. For the first stage it is absolutely necessary to use an A.C. valve of the 226, or better still, of the 227 type, and wire it according to the diagram on page 31, or the text on page 36 respectively.

Text Books.

WHAT are the names of the text books suitable for study for a sea operator, and are there any text books on television worth while?—B.O. (Mar-ton).

A.: Communicate with Johnston's Wireless School, Wellington, for information concerning an operator's certificate. There are no good text books on television available as yet in New Zealand, but the "Television" magazine (Te Aro Book Depot, Wellington) is an excellent monthly publication.

Improving Reception.

DURING the year there are only three Australian stations that I can work, writes "Subscriber" (Barrytown). Even the New Zealand stations are not very good. I have a good aerial, and I think I should get better results.

A.: You have omitted the critical statement. How long have you had your set, and have the valves been renewed? This is one of the greatest factors in deciding whether a factory-built set will be good or poor. Very many owners stages is not so easy.

note that their sets are becoming weaker, but forget for how long they have had the valves. If the aerial and the earth are in good condition, and there are no high resistance joints, then the correspondent should consider a new set of valves (if the others are over 12 months old), or should have his set overhauled by the local agents.

Trouble With the H.R.4.

I BUILT the Hammarlund-Roberts 4-valve receiver, but cannot get satisfactory results. I have not heard of anyone building this set, so conclude that there are better ones for an amateur to build, writes "Gridleak" (Blenheim).

A.: The H.R.4 generally gives good results, and they are made commercially by Johns, Limited, Auckland, with whom you might correspond to advantage. Our experience has been that the Brown-ing-Drake is an easier receiver to make, and gives equally good results. It has been described in our last "Listeners' Guide."

2. Could you tell me the price of a complete transmitter, such as ZL 2 AX?

A.: You should communicate with the secretary of the New Zealand Amateur Transmitters' Association c/o Superadio, Queen Street, Auckland.

3. I am hoping to sit for an amateur transmitter's license in the near future. Could you tell me the name of a text-book containing all that is necessary for this examination?

A.: We would advise you to secure the "Radio Amateurs' Hand-book" (Handy's Hand-book), obtainable from the Te Aro Book Stores, Courtenay Place, Wellington. Price about 3/6. Again we would advise you to communicate with the secretary of the N.Z.A.R.T.A.

Hand Capacity.

I AM troubled with hand capacity on short-wave, writes J.S. (Dunedin).

A.: Not very long ago we published a very complete article on overcoming hand capacity on short-wave, and we would advise you to look up this article. You should use a high-value gridleak, about 8 megohms, and it may be necessary to shield your panel; reversing the connections to the reaction condenser is very often effective.

Local and Distant Switch.

CONCERNING this switch on factory-built received, T.T. (Dalefield) asks the following questions:—

1: Is it advisable to use the local instead of the distant switch?

A.: The local and distant switch is only a tapping on one of the coils of your set, and plugging in either to the tapping or to the whole coil controls the volume. It does not matter which one you use.

2: Does it consume more electricity on local or on distant?

A.: There is no connection between the coil controlled by the switch and the consumption.

3: Which is the hardest on valves?

A.: Again, there is no difference.

4: Will any alteration to the aerial have any effect on static?

A.: Yes, a short aerial brings in less noise than a long one, although the signal strength is thereby reduced. With a powerful set such as yours, it is generally advisable to use a short aerial, i.e., one no greater than 80 feet in all.

Technical Tips

A DECIDING factor in baseboard layout is the circuit arrangement, and on no account should positions be varied just to make the baseboard look symmetrical.

A FILTER output circuit for the telephones will often improve short-wave reception.

GENERALLY speaking, audio amplifiers can easily be added to most sets. The addition of radio frequency

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