

of them. The make you mention is first class. However, see the advertisements in this issue and you will get some idea as to what types of valves are offering.

G. B. (Auckland): I have a six-valve electric set, but only local stations come in well. Australians are very faint. I have a reasonably good aerial and a good earth.

A.: In all probability the condensers are out of alignment and we do not advise you to attempt to put them into alignment yourself. Call in a reliable radio serviceman and ask him to trim them up for you. You will then find that you will get very much better results.

E. A. B. (Hastings): I wish to use a helix with an iron core to attract a piece of iron to complete a circuit. What number of turns must I employ? The mains are 230 volts d.c.

A.: You will require a d.c. lamp of about 30 watts, and this must be connected in series with the helix. To make the helix, take a piece of soft iron rod about 1/2 in. in thickness and 6 in long, or perhaps less, and wind round this one layer of, say, 22 d.s.c. wire. There is no need to put any insulation in between the iron and the wire. You will

find, we think, that this will operate quite satisfactorily. Do not use this device without the lamp in series. You will find that it will light every bit as brightly as an ordinary lamp. Nothing in the helix is critical except perhaps that you have soft iron and not steel.

NUMBSKULL (Levin): What length of aerial should I use with an all-wave set?

A.: Not more than 100 feet and make it as high as possible. Two poles are preferable to one.

2. Is there any advantage in having an aerial higher than 40 feet?

A.: Yes, providing you do not thereby add too much to the length.

3. At present I have a 120ft. aerial 30ft. high, and experience difficulty in separating stations up to 20 on the dial. Can I remedy this?

A.: Below 20 the stations are very closely packed. However, a shorter, higher aerial would probably be more effective. The use of a .0001 or .0003 condenser in series with the aerial would sharpen up tuning a great deal.

L. I. B. (Christchurch): Can you give me particulars of a short-wave adapter suitable for an electric eight-valve superheterodyne midget set?

A.: Yes; one of the superheterodyne type of sets would be quite satisfactory, but you must couple it to the grid of the intermediate frequency valve. Before you interfere with your set in this manner we should strongly advise you to write to the New Zealand agents for the set (Box 462, Auckland).

2. How is the (R1-10) speaker strength of a station being received arrived at?

A.: Unfortunately it is all a matter of comparison. You must take R9 (R10 is never used) as the strength of your local station and grade between this and audibility. You will find a table with more information on the subject in this month's "Radio Log."

3. I wish to use headphones on the above set. Could you give me particulars of how this will be done?

A.: Yes, look in the constructional columns of this week's "Radio Record."

F. C. G. (Wanganui): I have a set which satisfies me in all respects but in that I cannot get the American stations as strongly as I wish, or as many of them as I would like. I am advised to have a screen-grid valve fitted instead of a 227 detector. Do you think the result would be worth the expense and trouble?

A.: No. However, on this point you could obtain more information by writing to the Wellington distributors for your set. If you look at one of their advertisements you will soon find the address. Also, judging by its performance, there cannot be very much wrong with your type of set.

2. Is there any reason why an efficient man should not be able to fit one of the 10 in. speakers in my set? Have heard one of these speakers and consider them the last word as far as tone and volume are concerned.

A.: He should have no difficulty at all, providing he understands matching it into the circuit.

3. The set distorts when on full volume.

A.: We do not know of any set with three stages of radio amplification that does not.

"PEANUT" (Christchurch): I wish to build a transformer to supply a transmitter employing one UX 245 valve. Could I use the wire, a sample of which I enclose, for the job?

A.: The gauge of the wire is 30 d.s.c., and is not particularly suitable for the job you wish to perform. The trouble with this type of wire is that coupling takes up far too much space. It is better to use enamelled wire and layer insulate it. To use the gauge you mention would produce a very bulky transformer.

2. Which transformer in the "Guide" should I construct for a 245 transmitter?

A.: The 100-watt will be quite satisfactory.

3. Should I double the number of turns for the h.t. and take out the centre tap if I use the "slop" rectifier described in the "Radio Record" article "Breaking Into the Amateur Game"?

A.: Yes, if you use it in the full-wave rectification circuit.

"BEGINNER" (Auckland): I have an eight-valve s.g. set and the selectivity is not what it should be. My valves are 15 months old. Do you think it would help if I replaced my power valve and detector?

A.: Selectivity trouble is rarely due to defective valves, but it has been traced to this cause. Generally to improve the selectivity of a factory-built set you can do very little other than shortening your aerial, or the use of a .0001 or .0003 condenser in series with the aerial, which is the same thing as shortening it. If your valves are 15 months old, then we

certainly think you should replace the detector, the rectifier and the two push-pull power valves. If you replace the whole set you would probably get far better results.

L. F. O. (Christchurch): Here is an interesting point raised by this correspondent. He says: "My Differential One" continues to give good results. Over 100 New Zealand amateurs have been logged on shortwave. For speaker reception I couple the "Differential One" to an a.c. broadcast set through a 34-1 audio transformer, whose secondary leads go into the gramophone jack. This has proved quite satisfactory.

"PUSH-PULL" (Mata Mata): What are the resistances required for a power pack for the a.c. Radiogram using one 224, two 227, two 245 valves? The transformer will supply 300 volts, 100 mamps, and the choke has a drop of 17 volts.

A.: Between your maximum "B" voltage, 233 volts, and "B-1" you will require a tapped resistance totalling 20,500 ohms. This could well take the form of a 75 watt dissipation resistance, and you could get the clips and place them at the correct intervals. These are the resistances between the taps. Between the maximum and the first tap you will need 5000 ohms. This will deliver 180 volts. Between this tap and the next you will require 8500 ohms to provide 75 volts for the screen. To break this down to 45 volts for the detector you will need 2500 ohms and between this and "B-1" 4500 ohms. The bias resistances are all given in the back of the "Radio Guide" which you must be using if you wish to deal with the "Radiogram Five." You will find them on page 169, but, if you have a first edition, note that the grid bias of the 224 is 4000 ohms and not 400 ohms. Note that for pushpull amplification you halve this, thus for the 245's in pushpull you will require 7500 ohms.

2. What pushpull output transformer would you advise with the Radiogram, O.P.3C or O.P.4C?

A.: O.P.3C, ratio of 9 — 1
15 — 1
22 — 1
O.P.4C, ratio 25 — 1
40 — 1
66 — 1

"CRYSTAL" (Auckland): The query was answered last week under the nom-de-plume "G.O.," Auckland.

We note your request for a future article on Crystal Sets, and shall see what we can do for you.

"AUTO MECH." (Mt. Albert): There was published some time ago in the "R.R." a circuit diagram of an a.c. short-wave super heterodyne adapter. In the list of components in this circuit the detector grid bias resistance was given as a variable resistance having a minimum of 50,000 ohms, whereas in the "R.R." issue of the "Guide" the value was given as 3000 ohms. Which is correct?

A.: The 5000 ohms, as given in last week's "R.R."

2. If unable to procure 60 ohms centre tapped resistor for the filament supply, would a 50 or 75 ohms be satisfactory?—Yes, quite.

3. What should be the capacity of the condenser C5 when the input stage of a receiver is of the tuned type?

A.: As stated. It does not make much difference if the arrangement is coupled to a tuned r.f. stage. Once the set is tuned it will be quite satisfactory.

Mr. Radio Fan
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"Radio Physics Course," by Ghirardi, 14/8.
"Radio: A Study of First Principles," by Burns, 13/2.
"Mathematics of Radio," by Rider, 11/2.

"Radio Amateur Handbook" (Handy's) 8th edition, 5/3.
"Radio Amateur Call Book" (June, 1931), 5/3.
"A.R.R.L. Log of Amateur Stations," 2/-.
"Radio Log and Lore," 2/- (The World's best Log of the World).
"Radio Log" (N.Z. Monthly), 7d. per copy.
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Gernsback's Official Radio Service Manual (complete directory of all commercial wiring diagrams), invaluable to servicemen, 22/6. Published price.
101 Hook-Ups, "Radio News," 2/6.
Short-Wave Manual, 1930, "Radio News," 2/3. Complete A.C. S.W. with P-P, etc., etc.
1001 Radio Questions and Answers, 1930, "Radio News," 2/9. D.C. to A.C. etc. Handbook, 1930, "Radio News," 2/9. Radio Wrinkles, etc.
"Radio," U.S.A. National Trade Magazine, 1/9.
"Cameron's Sound Motion Pictures Encyclopedia," 18/6.
"Wireless: The Magic Carpet," 5/- (Technical Editor "Radio Record" says no set owner should be without it.)
"Practical Radio Telegraphy," by Nilson and Hornung, 18/-.
"Practical Radio Repairing Hints," by Rider, 13/- (Don't miss it.)
"Practical Radio Construction and Repairing," by Moyer and Westrol, 15/6.
"Radio Times" (English weekly), 4d. per copy.

THIS LIST—

"All About the All-Electric," 1/9.
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"How Radio Receivers Work," by Roberts, 8/-.
"Radio Design," Vol. 3, No. 4, 1/1 per copy.
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