

valve base coil for the 80 metres band using a .00013 tuning condenser?

A.: 15½ turns of 26 d.s.c. wire, and for the secondary 14½ turns of 36 d.s.c. wire for the tickler.

2. How many turns will I need for the broadcast coil?

A.: You will need two broadcast coils to cover the band efficiently. The first will require 80 turns on the secondary of 30-gauge enamelled wire, and 30 turns of 36 d.s.c. for the tickler. The next coil will require 148 turns of 30-gauge enamel for the secondary, and 65 turns of 36 d.s.c. for the reaction.

MILLIMETRE (Gore).—When will the a.c. version of the Outspan Five be published?

A.: We do not know.

2. What would be the most suitable valve in the last stage with two 224 rf. and two 227 det. and 1st audio in use?

A.: One 245. If you want an a.c. circuit of the "Outspan Five" type, look up this year's "Radio Guide" and you will find information that will interest you, under the heading of "The Radiogram Five."

ADAPTOR (Invercargill). I purpose building the super het. a.c. short-wave adapter described in the 1931 "Guide," but notice that certain of the values are not specified. Please furnish.

A.: We reproduce the circuit with full details. This also answers the question of "Perplexed" (Putaruru).

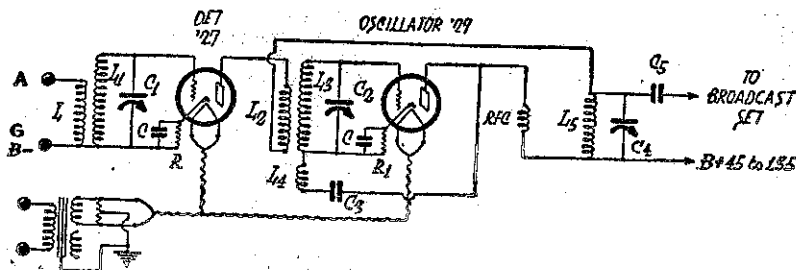
2. Would this adapter give good speaker volume on shortwave when used with a midget set?—Yes, it would be quite satisfactory.

CONTROL (Waikato). My set after going for about 10 minutes cuts off, but when I switch it on again it goes, but erratically. The filaments are still alight when the set is off. On taking the set to an expert he could not locate the trouble.

A.: It is rather strange an expert could not locate a trouble such as this. It may be anywhere, and it is difficult to tell you by correspondence where to look. Probably it is due to a loose connection or a puncturing condenser. It may even be in the speaker. One of these times when it is on take off your aerial lead and touch it to the post and note if the set recommences. The trouble may possibly be due to your aerial and earth shorting. Such a very simple thing can very often cause a great deal of trouble. Examine your earth and make quite certain it is all right. When the set has stopped pull out the last valve and see if there is a pop in the speaker. If there is go backwards, noting which valve you can pull out without causing a pop. This indicates that the trouble is in the circuit of that valve, and it will probably be beyond your ability to repair, necessitating the aid of an expert. However, having located the trouble, get in touch with your expert, tell him you have found out what is wrong with it, and ask him to put it right.

THIRD Grid (Gymouth). In answer to my query regarding the purpose of the resistance in "A" lead of the h.f. valve of the Radiogram Five, you state that its purpose was to provide bias for the H.F. valve. I fail to see this, because it would act as an extra resistance in series with the rheostat and just cut down the filament voltage.

A.: By doing so it creates a difference in potential between the filaments and the grid which is an earth potential. You



Circuit Diagram of S.W. Adapter.

L., L1—1st Det. Coils.

L2, L3, L4—Oscillator Coils.

RFC.—Radio Frequency Choke.

T.—Filament Transformer.

R.—5000 ohms Variable Resistance.

R1.—1500 ohms Resistance.

R2.—40 ohms Resistance.

C.—.1mfd. By-pass Condenser.

C1, C2.—.00014mfd. Tuning Condensers.

C3.—.0005mfd. Condenser.

C4.—.0005mfd. Semi-variable condenser.

C5.—.00005 to .0001mfd. condenser.

see there is a difference in potential on each side of the resistance; the side nearer the valve being at a higher potential than that near the earth. Therefore, the filament is at a higher potential than the grid, which is what we want for bias.

2. You state the characteristics of the Ceco pentode given in the "Guide" are correct, but I fail to see how a valve with an impedance of 5000 and amplification factor of 575 can possibly have a slope of 2000 mhos.

A.: That is a nasty one all right, and it is a case of our middle stump being sent spinning down the field. Perhaps these characteristics will suit you better. The impedance of the Ceco pentode is 300,000 ohms.

1. IF direct current were put across the heater of the cathode type a.c. valve, would everything, particularly the free bias, by means of a resistance between cathode and earth, be satisfactory?

A.: Yes; but it would take a very heavy toll of your battery.

2. Does "double tuned i.f. stages" signify that both beat frequencies are tuned and amplified instead of one as used to be the case?—Yes.

3. How can the load impedance be calculated in (a) resistance capacity coupled (b) direct coupled set? I am wondering if the optimum gain could be obtained from a valve with, say, a 50,000 ohms impedance by having a high plate resistance, and using a higher "B" to overcome the increased resistance.

A.: The load impedance in resistance capacity coupled sets is equal to the value of the resistance connected in the plate circuit. This should be considerably higher than the impedance of the valve. In direct coupled stages the impedance is automatically matched, and you do not have to worry about it, providing you get your constants correct. As you suggest, it is better to use a high value grid leak with a plate resistance detector, and increase your "B" in order to get the plate voltage at working value.

A. E.C. (Auckland).—Would it be possible to use a shortwave adapter in my all-electric receiver? Could it be plugged into the detector valve?

A.: Yes; both adapters and converters are used. Convertors are applied between

the aerial and the set and the adapter used in the detector socket. Both are obtainable commercially.

MIDGET (Lower Hutt). I have a midget five-valve s.g. set, and am employing an aerial 125ft. in length, 33ft. high at one end, and 25ft. the other. Would raising the aerial by another 10 feet and shortening it by, say, 40 feet, (a) reduce the rather broad tuning of 2YA, (b) reduce or increase the present distance-getting capacity of the set?

A.: We are inclined to think it would reduce the broad tuning of 2YA, but it is possible it would decrease the distance-getting abilities of the set. The 10 feet increase in height is a splendid idea, but the shortening by about 40, while greatly improving the selectivity, would no doubt adversely influence the DX ability.

2. On removing the earth altogether no difference is apparent either in local or distant reception. What is the explanation of this?

A.: It is quite common with a.c. sets. You are getting your earth return through the electric mains.

POWER (Auckland). I have an aerial 30ft. high, 90ft. long, including lead-in. Would a copper ball 6in. in diameter be any better?

A.: Certainly not. There is very little that can equal a good aerial such as you are using.

2. Please supply information as to the kind and size of outside aerial that will be suitable for short-wave work.

A.: Yours is excellent. The only thing to watch in a short-wave aerial is not to get it too long.

3. How far away would a short-wave station have to be before it was audible on a small speaker worked from a two-valve short-wave set?

A.: On a two-valve short-wave set you will possibly get fair speaker results from the N.Z. amateurs, 2 and 3ME, possibly POJ, and America, but they will be rather weak, we are afraid. You can rely on getting only the New Zealand hams on the speaker, and perhaps Saigon if it is coming in well.

W. E.A. (Auckland). Is an aerial 50 feet high and 50 feet long, double wire, spaced 6 to 8 feet, better than a single wire aerial of the same length and height?

A.: No. There is very little to be gained by increasing your aerial more than 100 feet for a set of the type we note you are using. Such would possibly improve a crystal set, but it would have a detrimental effect on a multi-valve set.

2. What is conductance and how is it measured?

A.: Conductance is the ability of a conductor to carry an electric current. It is measured in mhos, and is the opposite of resistance. Mho is the reciprocal of an ohm. Conductivity is equal to 1 divided by the numbers of ohms resistance. The word mho is formed by spelling the word ohm backwards.

3. Would a condenser of approximately 1 mfd. inserted in the earth lead have an effect upon static discharge caused by a leak in the tramways system?

A.: We are afraid not.

A. S.H. (Balclutha). I have built the Ranger Two and met with great success, having logged all the main N.Z. stations, several Australians, and 2 Americans and Japanese. I would like particulars of shortwave coils.

A.: Adapting the set for shortwave would entail more than making shortwave coils. You would have to use a series condenser with the tuning condenser, and, having done this, you could then construct the regeneration coil described for the Kestrel Three. You would couple the aerial to the grid of the shortwave coil through a neutralising condenser such as shown in the s.g. stage of the "Kestrel Three."

T.P.G. (Waipukurau). I am having difficulty in obtaining valves for my Cossor set. Could I use Mullard? If so, are the following correct: PM12, PM1A, PM252?

A.: Yes, they would be all right, but we suggest you use PM2 instead of the PM252. It will give you greater lift. Don't forget to ask for English valve bases when you get your valves.

WIRELESS (Dunedin).—I have built the "Ranger Two," but cannot get it to oscillate on frequencies between 1YA and 3YA?

A.: Take off 4 or 5 turns from the aerial coil and you will find it will oscillate satisfactorily.

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