

A.: The subject of direct supply eliminators and sets was discussed in the "R.R." from October 10 to 24 of that month, 1930. We would advise you to see these publications.

KENTY (Taurarunui): Will the components of my set take 180 volts without damage?—Yes, but you should apply 180 only to the last valve or two.

2. I have only two grid wires, + and —.

A.: This is no doubt the last stage, and you must use 40 volts for the 171 at 180 volts. If, however, the last two stages are connected with the same bias, then you must break the connections and take a third cap at about $\frac{1}{2}$ volts and apply it to the second last valve.

3. Could I do this myself?

A.: You could, if you know your way about a set. You must first of all accurately determine where your grid voltage goes. If there is a connection between G.B. of the last transformer and the same terminals on the second last you must cut this wire and join the end that goes to the second last transformer to $\frac{1}{2}$ volts grid bias. If this is not drawn from the same battery as is the last you must take the + terminal of the battery to the other "C" battery +. In other words, to "A—."

TROUBLED (Wellington): Shortwave coils of my "Night Hawk Two" would not oscillate till I doubled the number of turns on the reaction coil. The lowest one will not oscillate at all.

A.: You are using probably a valve that will not readily oscillate or your circuit is damped, and this accounts for your having to use more turns on the tickler. For shortwave use a 10 meg. grid leak. The last coil is more or less an experimental for there is really nothing down on that wavelength to listen to.

2. I can receive a carrier wave of a shortwave station, but I cannot tune them in.

A.: You may have to take the grid return to a variable point between A+ and A—, as shown in last week's "Record." You need a special shortwave choke if you want really good results.

3. A whining howl develops when the set is tuned to 3YA, but the set is not oscillating.

A.: It sounds like a microphonic valve. Place a rubber or lead cap over the valve and use an anti-microphonic valve socket.

4. Is my differential condenser satisfactory?—Yes.

5. There is a slight difference between the "Night Hawk Two" and the "Differential Two." Which is the better?

A.: Theoretically, they are both the same, though the layout of the "Night Hawk Two" is better than the "Diff. Two," which provides for the addition of further stages. The "Night Hawk Two"

would probably give the better result when two valves only are used.

6. Can I apply 90 volts "B" battery to a valve in a one-valve amplifier circuit, as per the enclosed? There is no "C" battery.

A.: There should be. Do not put 90 volts on the plate of a valve without adequate grid bias, which for PM4 should be about 9. The negative of the battery is connected to "F" on your transformer, and the positive to "A—."

"DISTANCE" (Hamilton): Would transformer with the primary reversed to secondary interfere with reception, for I tried it and it kept making a crackling noise?

A.: Most decidedly it would interfere with reception. Not only are you weakening your signals by turning the transformer round, but you are putting heavy current through the very fine windings of the secondary. In a very short time you will ruin your transformer. It almost sounds as if you have done so. Try a new transformer turned round the right way.

2. The middle of the transformer is the primary, is it not?—Yes.

3. My set appeared to have a wide range, Dunedin coming on on 20 and Christchurch on 60.

A.: Your dial is reversed. Dunedin should come in on 80 and Christchurch on 40, which is quite normal.

Note: Your log of 40 stations is quite creditable, but how do you incorporate a transformer in a one-valve set?

SELECTIVE (Christchurch):—I have an old artesian well. Would it be all right to put the earth wire down the pipe into the water? It is about 15 feet away.

A.: It is rather a long run, and it would be better if you could attach the wire to the pipe.

2. We do not know much about the set to which you refer, but think it should be more selective.

SEARCHER (Kaitake):—I cannot get the s.g. valve to work on my "Diff. Three." I cannot get above 2YB on the r.f. stage.

A.: The coil does not appear to be matched to the condenser, though using a .0005 condenser in the first stage will necessitate adjustment of the number of turns on the coil. Check up the turns and see if they are the same as published in the "R.R." a week or so ago.

2. The set appears to want more reaction turns.

Questions and Answers

(Continued from page 15.)

A.: Try the effect of a .0001 fixed condenser on the moving vanes to either of the fixed.

3. Does the 500 ohms. resistance and a 2 mfd. condenser make any difference to the volume?

A.: No, it was employed as a means for breaking down the battery voltage within the set. It also acts as a decoupling device.

4. Has the Diff. Four any special last stage audio?

A.: The Diff. Four is dealt with very fully this week.

5. Is the resistance and 2 mfd. condenser used as an output filter?

A.: The condenser in conjunction with a choke could be, if desired.

6. How is it that sometimes when I put the cap on the s.g. valve the set goes out of oscillation?

A.: This is due probably to their being adequate turns on the reaction condenser.

A.H.M. (Timaru):—I have constructed the Differential Three, but reaction is bad. It is very ploppy on the lower wavelength coils, and howls badly on the 80-meter band. The broadcast results are good.

A.: It appears as though you will have to incorporate the potentiometer idea of varying the grid return. Furthermore, it would be to your advantage to incorporate a special rheostat for the detector valve.

BEE DEE (Hawke's Bay): I have a single dial controlled B.D., but cannot get the results that constructors appear to get with very roughly put together apparatus.

A.: It appears to be the same trouble as many who attempt to gang the dials and receiver such as this. When using regeneration ganged condensers are rarely successful. If you use separate dials your trouble will no doubt disappear.

SHORTWAVE (Timaru): Can you supply me with shortwave coil data for s.w. and broadcast reception for a two-valve regenerative circuit? The condensers are .0001 tuning and .0003 reaction. Would you give me the number of turns to be wound on Colvern formers, 2in. in diameter?

A.: The .0001 tuning condenser is not satisfactory for broadcast and the .0003 unsatisfactory for regeneration. Reduce the latter to .00025. Specifications of shortwave coils can be found on page 15 of our issue of January 30. They are given for a 2in. diameter former using .00015 condenser, but you will find them quite satisfactory for your use. The broadcast coils for a .0001 condenser are as follow: For shortwave reception it is preferable to bring the aerial in directly to the top of the grid terminal and leave out the primary coil.

2. Could you give specifications for valve base coils?

A.: They were given for the Differential series.

3. Is the circuit suitable for all-round reception?

A.: Yes, if you employ a radio frequency choke between the junction of the tickler and regeneration condenser and the primary of the first audio transformer. Otherwise, the set is O.K.

U.X. (Te Kuiti): What is the inductance necessary in the choke of an impedance coupled audio amplifier?

A.: Your best plan in making a s.g. audio amplifier is to use resistance coupling is to use a plate resistance of 100,000 ohms, a coupling condenser of .5 mfd. and a grid resistance of $\frac{1}{2}$ meg.

2. How does such a stage compare with a stage of 227 with the transformer?

A.: The s.g. valve is not altogether successful as an audio amplifier except

in an L.W. circuit. You would be safer to use the 227 with a transformer.

3. Does a differential condenser necessitate much detuning?—No; less than other methods of reaction.

4. Will there be any decrease in efficiency if I put a layer of celluloid under the windings of the valve base coil and then give them a coat of cement?—No.

PROTON (Gisborne): What number of turns of the enclosed wire on a 2in. former is required for an aerial coil with a .0005 condenser using .0001 reaction? The coils will be for short-wave.

A.: It is impracticable to tune short-wave coils with a .0005 condenser. You will need a .0001 in series with it to reduce the capacity to less than .0001. The number of turns are: Sec. 25, tic. 9, sec. 13, tick. 5, sec. 7, tick. 6, sec. 4, tic. 5.

2. What numbers are required for regenerative detector coil? These are valve base coils.—Same.

3. What gauge is the enclosed enamelled wire?—18.

4. Are heterodyne wave-metres expensive and can any set use one?

A.: You will find full particulars about them in "Handy's Handbook," which will be a good investment if you are at all interested in short-wave reception.

A.E.B. (Auckland): When using a Daniell cells charger comprising four cells I found the voltage of my accumulator jumped to 2.5 volts. Is this serious?

A.: The normal voltage should be 2.2, and the extra is due to the rather high potential of the current delivered by the charger. You would reduce it by taking out one cell, but you may have difficulty then in keeping the battery charged. It will probably be quite satisfactory.

W.M.E. (Miramar): I wish to use my L.W. and the amplifier for the Diff. Three. How can I obtain the B supply from the L.W.?

A.: You will probably have great trouble in coupling the two sets together, especially with the regenerative detector. The radio section of the L.W. is some what troublesome. You could tap your B current off from the higher potential end of the 200 ohms potentiometer. The best method of coupling will be from the secondary of the audio transformer following the detector, but experience has shown us that such an arrangement is rarely successful.

TRANSMITTER (Kerepeti): Is it possible to obtain a circuit of the short-wave receiver used by "Switch"?

A.: It is a commercial receiver, but if you wrote "Switch" enclosing a stamped and addressed envelope for reply he would probably give it to you.

JACK (Wellington): See also reply to the above.

BRITISH PARTS (Pt. Waikato): What are the characteristics of the 112 type of valve as different from the 112A?

A.: The 112 requires $\frac{1}{2}$ an amp. of filament current.

2. Where can I obtain information on making the Leclanche type B batteries?

A.: Full details were given in an article "For the Sheer Joy of Construction," published in the "Radio Record" some months ago.

3. What m. amp. drain could be taken from such battery?

A.: No more than 10 m. amps.

4. Does the pentode handle as much power output as an ordinary power valve with the same plate voltage?

A.: According to recent figures published in the "Guide," no. Much, however, depends upon the design of the power valve with which the comparison was made. They have a very high undistorted power output.

5. Could the tuned anode circuit be arranged as below without loss of efficiency?

A.: Yes, the circuit should be quite satisfactory, the blocking condenser being about .001.

(Note: With regard to your request for a test of the speaker we shall try to obtain one to review.)

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