

that only one coil has been specified and must be slipped over a five pin base.

A.: With the Differential Four there is no need to use a coil with a 5 pin base for the radio stage, or for that matter, the detector stage either. You will need to construct a coil with the secondary and primary only for the first stage. The coil will require three connections. We have designed the Differential Four to allow anyone who contemplates making it as a whole to build up this coil with three terminals. With the .0005 condenser tuning the radio stage you need 90 turns on the secondary and 35 turns on the primary. The bottom of the pri-

mary and the bottom of the secondary will be brought out to "P," the top of the secondary to "G" and the top of the primary to "F." With a .00035 condenser in the second stage you need 105 turns for the secondary and 40 turns for the reaction. The ends will come out as described for the one valve version.

2. I have a quantity of 32 d.s.c. wire on hand. How many turns must be wound on a 2in. former to cover the broadcast band if I use a .0005 tuning condenser?—55.

N.Z.D.X. (Auckland): How can I use the three valve r.c. coupled set with the frame aerial?

A.: It will be unsuitable. You should use sets with regeneration. A suitable hook-up was described some time ago for the "Rotorua Portable."

2. Is a single wire counterpoise as efficient under a double aerial as a double wire counterpoise?—Yes.

3. Must a separate wire be taken from each wire of the Pierce earth system to the set?

A.: It is better to do so, although you could couple the wires together and take a single lead to the speaker.

QUESTIONMARK (Wellington): Why is regeneration unstable with the enclosed circuit?

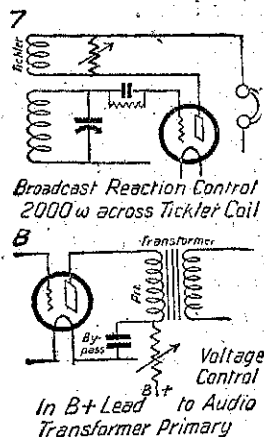


Diagram of resistance regeneration control.

A.: The circuit appears quite satisfactory. It may possibly be explained from the layout. However, try a potentiometer across the "A" supply and take the grid return to the variable tap.

2. Is resistance controlled regeneration better than ordinary condenser or differential control?

A.: Resistance controlled regeneration for shortwave is one of the best methods. We reproduce a diagram showing the method of applying this system.

QUERY (Waikato): Can you give me the legend for Figure 3 in the 1931 "Guide"?

L. L1.—1st Det. Coils.  
L2, L3, L4.—Oscillator Coils.  
RFC.—Radio Frequency Choke.  
T.—Filament Transformer.  
R.—5,000 ohm Variable Resistance.  
R1.—1,500 ohm Resistance.  
R2.—60 ohm Resistance.  
C.—1 mfd. By-pass Condenser.  
C1, C2.—0.0014 mfd. Tuning Condensers.  
C3.—0.005 mfd. Condenser.  
C4.—0.005 mfd. Semi-variable condenser.  
C5.—0.0005 to .0001 mfd. condenser.

2. Would a shield similar to a single sheet partition in s.g. receivers be suitable for separating the detector and oscillator stages of the adapter?

A.: They are probably a little light, and it will be necessary to shield the stage entirely.

3. Does "C1" need to be vernier controlled?

A.: It is not essential so long as control is finally geared.

NORTHENDER (Dunedin): What number of turns must I wind on my dynamic speaker chassis in order to make a high voltage speaker to pass 70 m. amps?

A.: You will require about 34lb. of 34 gauge wire. You will wind on approximately 19,000 turns. The resistance will be approximately 2000 ohms and will drop your voltage 120.

RADIO FAN (Otagiri): Where can I obtain particulars of the Daniell cells charger?

A.: The "Radio Record" dated November 7, 1930.

2. Would a Beverage aerial pointing N.E. be successful if it had to pass over a hedge 15 feet high?

A.: Yes, it would be quite satisfactory. It may be better, however, to take it north-west, from which direction the Australians would come in.

3. Is the underground aerial as described in the "Radio Record" some time ago successful?

A.: We do not know anything about it. It was published merely as a suggestion from a correspondent.

4. Can I use the parts of an old five-valve battery set to make a short-wave adapter?

A.: Your condensers are too large, otherwise most of the components can be used.

5. My earth is only a 3ft. pipe in dry, sandy ground. I intend to install a multi-pipe earth and then connect these to a longer one in a hollow of heavier ground. Will this be better?—Yes.

6. Would B605 improve reception or reduce the volume too much?

A.: It would give you improved tone, but would slightly drop the volume.

7. Would a 130-volt battery improve the set?—Yes. You would need 9 volts bias or 15 volts with a B605.

Our correspondent adds: "I have been saving up these questions to save postage—(Scotch, eh?) Yes, but you have forgotten our bob—too Scotch, eh?"

BEGINNER (Auckland): I have made the knife edge rejector from the "Radio Guide," but have not had any success two miles from IYA. What value fixed condenser should I have used?

A.: .0005 would be far better than .001, though you should not have a great deal of difficulty in cutting out IYA. This works perfectly right under the shadow of 2YA.

## Improved "A" Battery

### Developed in America

A RECENT development of paramount importance to listeners in areas not supplied with electricity has been the perfecting of a new type of

"A" (or filament supply) battery having a phenomenally long life.

Along with it has also been developed a new series of valves, of the 230—1—2 type, designed for operation with this battery. Both were evolved with the object of making it possible for set manufacturers to market a new and improved type of battery receiver which would bring to unwired homes a quality of reception hitherto possible only with a.c. receivers, but which would not require a storage battery and would be free from the weaknesses and limitations which characterised the battery set.

The Air Cell "A" Battery is a high capacity, constant voltage, air depolarised primary battery which, when used with one .15 amp. and five .06 amp. valves, gives under normal conditions an operating life of 1000 hours. Owing to the unusually constant voltage, rheostats are dispensed with.

A more complete description of this new cell will appear next week.

## Automatic Tuning

A DEVICE recently marketed in America for attachment to a certain type of radio set is so arranged that a listener may glance through the programmes in the newspaper, make settings on the tuner-control panel, and sit back in his easy chair while the set automatically changes from one station to another, according to the prearranged schedule. It provides a variation of nine stations, and permits changes every fifteen minutes, or less often, for as long as the set is operating.

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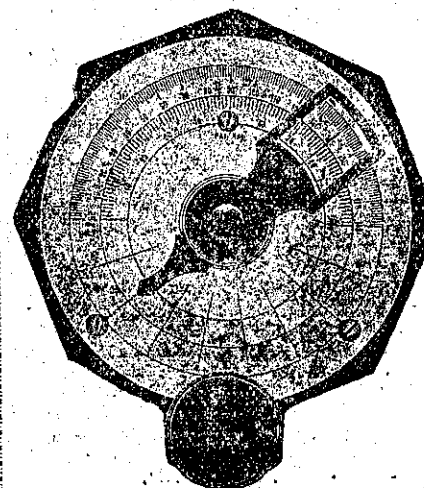
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"Principles of Radio," by Henney, 23/-.

"Modern Sets, 1931," consisting of 2, 3, 4-Valve Battery and A.C. Sets, L-W Ampfr. and Special S-W Set, designed N.Z. conditions, by A. K. Box, 1/8.

"Radio Sir," 72 pages—Don't miss this. 3d. posted. Great value.

"Practical Radio Construction and Repairing," by Moyer and Westrel, 15/6.

"Radio Times" (English weekly), 4d. per copy.

"Radio Retailing" (U.S.A.) monthly, 1/6 per copy.

"Radio Manual," by Sterling and Kruse, 26/-.

"All About the All-Electric," 1/9.

"Practical Testing Systems," by Rider, 6/3.

"Worked Examples of Electrical Technology," by Peasgood and Boyland, 18/-.

"Radio Physics Course," by Ghirardi, 14/-.

"Radio News Handbook, 1930," 2/9.

"Radio: A Study in First Principles," by Burns, 11/-.

"Radio Operating Questions and Answers," by Nilson and Hornung, 14/-.

"Radio Amateur Handbook" (Handy's) latest edition, 5/3.

"Radio Amateur Call Book," latest quarterly, 5/3.

"Radio Log and Lore" (U.S.A.), 2/-.

"Theory of Radio Communication," by Pilgate, 12/-.

"Principles of Radio Communication," by Morecroft, 41/6.

"Elements of Radio Communication," by Morecroft, 19/-.

"Direction Finding," by Keen, 27/-.

"Technical Telegraphy: Answers and Solutions," by Roberts and Burrow, 2/3.

"Collins's Wireless Diary, 1931," 4/-.

"Thermionic Vacuum Tubes," by Van der Bijl, 26/-.

"Radio Receiving Tubes," by Moyer and Westrel, 14/-.

"How Radio Receivers Work," by Roberts, 8/-.

"Radio Design," 1/- per copy.

"Radio Engineering" (a monthly issue), 21/- per annum.

"Projection Engineering" (monthly) 21/- per annum.

"Radio Citizen's Call Book," latest quarterly, March, 1931, 2/9.

"N.Z. Radio Guide and Call Book, 1931," 2/10.

"1031 N.Z. Radio Handbook," 2/10 posted.

6-Valve Neutrodyne Blue Prints and instructions with one transformer and 2 resistance coupled audio stages, 1/8.

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