

be made. Soldered joints are best, using resin-cored solder.

Any type of crystal can be used, but if a cat's-whisker type is preferred it could be placed on the baseboard.

Tuning is accomplished by turning the knob until full volume is obtained. The fewer the turns of wire put on the lower the wavelength that can be received, but lowering the range in this way cuts off higher wavelengths. The construction allows of turns being easily taken off both sides of stator and rotor if found necessary. The materials required are specified on previous page, approximate cost also being given.

#### Good Record.

I GET with a crystal set and two-stage amplifier six Australian and six New Zealand stations, total 12 stations to its credit, yet since I have bought a new B battery I have not heard an Aussie. What is the cause of this?

If all the batteries are connected up to the set and left alone for a few days will the batteries run down? I use a C battery, as I find it helps a great deal.

Also, I used to get 2YA on 30 on the dial and now I get it best at O, and I would be very pleased if you could help me in any way, as the set has functioned very well up till the present. It also whistles when I shift the detector, if I try to tune in Australians. — E. POWELL (Christchurch).

ANSWERS: The failure to log the Australians is due in all probability to the very adverse atmospheric conditions at the present time (see notes by "Switch").

Provided the filament circuit is broken by a rheostat or switch batteries will not run down if not disconnected. You are wise in using a C battery; it adds materially to the quality of the music.

It appears that your coil is too long for 2YA. Try taking off a few turns. This should bring 2YA in at a position other than O and with added strength. The alterations in dial reading may be due to a new valve, aerial or earth changes, or the dial slipping.

#### Request for Circuits.

I WONDER if you could supply me with a few good crystal circuits in the "Radio Record"? I have a crystal set, but do not think it is a good one. I wish to compliment you on the way you set about giving crystal owners information in your special "Crystal Corner" in the "Record." — K. A. DIXON (Paekakariki).

ANSWER: In essence there is no difference in crystal circuits. Adaptations are made merely to satisfy some particular requirement. In volume II, No. 24, a few of these were discussed. Other adaptations will be given from time to time.

#### Reception in Paekakariki.

AFTER following your instructions as far as possible I still find no results. My apparatus is now as follows: Aerial, height about 20ft. mast end and 11ft. high lead-in end. The length is now just on a 100ft. I am using two insulators each end. The aerial runs parallel to the beach, which is north and south. Is this right? The lead-in is at the south end. Does this make any difference? Earth, a kerosene tin filled with water, buried just a little below the surface of the sand, with a wire con-

## Long and Short Aerials

### Comprehensive Research by Correspondent

A. E. ELLESTON, writing from Reefton, states his conclusions on the use of long and short aerials for broadcast work. Many valuable conclusions have been arrived at, and listeners who desire the best results can do no better than to consider the results obtained by Mr. Elleston.

IN looking through the pages of the "Radio Record," I have noticed writers wishing to know of practical results achieved with equipment not used in the ordinary way for wireless reception. I am therefore writing you of results which I have obtained with long aerials. I do not pose as an authority on aerial systems, the results of my experiments are given for what they are worth, and in the spirit that we learn from one another, either verbally or recorded.

#### The Long and Short Aerials.

FOR nearly four years now I have had two aerials, one 512ft. long and the other 125ft., the former is 7/22 copper and the latter No. 16. The aerials are at right-angles to one another, and are directional, the long one to Sydney, the other to the New Zealand stations.

The set used in the experiments is a three-valve reflex, aerial coming direct to the grid, and is tuned by a .00035 variable condenser. In addition, there is a variable neutralising condenser of two plates, the plates are very close together, and for safety sake are painted with an insulating substance.

The aerial on which the experiments were made is, as stated, above 512ft. long, it is supported by an iron pipe mast 50ft. high at the receiver end.

The other mast, 36ft. high, is on an abrupt hillside, the top of this mast is 116ft. higher than the other.

The first thing was to note the difference in condenser readings between the long and short aerials, using one ground, and that having a fixed condenser in it. Readings were three degrees less on 1, 2, and 3YA. Signals as a general rule are a great deal louder

nected to the top of the tin, and straight in through window to set. I also tried varying the tapping.

I wish to make the crystal and valve, but do not want to until I know that I will be able to use it.

Thanking you for your information in the last number of the "Radio Record" and hoping that this time I will be satisfied. — K. A. DIXON (Paekakariki).

ANSWER: The aerial could yet be raised several feet, say, until 30ft. above the ground, while the earth should be sunk well below the sand. Owing to the sandy nature of the soil there may be a difficulty in getting a good ground connection. This may possibly prevent 2YA being heard in Paekakariki. Then there is the shielding effect of the hills to contend with.

With the crystal and valve, however, the case would be different. If this were carefully constructed there should be no difficulty in putting 2YA on the speaker.

than on the short aerial, it being more marked on days when signals are weak and in daylight reception. More noise is picked up.

On the day of the Heeney-Tunney fight, the short aerial provided better reception than did the long one, though in many cases it has been vice versa. At times, the long aerial provided entertainment when nothing could be heard on the other.

There is a certain amount of broad tuning, in my case it does not intrude very much. When noises are absent, the long aerial is an advantage. The long aerial is a great advantage to a set using a crystal detector.

My set is designed for selectivity and volume, so far I have not required a wave-trap.

#### Effect of a Ground.

I THEN tried the effect of a full ground on each end of the long aerial, making the length 550 feet, and direct to grid. The effect was that of a gigantic loop.

As I have an eliminator with a condenser in the ground lead, I tried that way for a start; the set refused to function. I then replaced the eliminator with dry batteries, there was then no difficulty in getting it to function, that is with two complete ground wires. The set became more difficult to work, with a wider swing for the neutralising condenser; it did not respond to this condenser so well in the lower as in the higher wavelengths.

Clarity was much better with two grounds than when the aerials were worked under ordinary conditions. Tuning was broad, volume was much

## RADIO DIRECTORY

### What to Buy and Where

#### CITIES

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| <b>ALTONA &amp; HAMMARLUND-ROBERTS SETS.</b>         | <b>Johns, Ltd.</b><br>Chancery Street, Auckland.                                |
| <b>ATWATER-KENT RADIO</b>                            | <b>Frank Wiseman, Ltd.</b><br>170-172 Queen Street, Auckland.                   |
| <b>BREMER-TULLY RADIO</b>                            | <b>Superadio, Ltd.,</b><br>147 Queen Street, Auckland.                          |
| <b>BURGESS RADIO BATTERIES,</b>                      | <b>All Radio Dealers.</b>   |
| <b>CROSLEY RADIO</b>                                 | <b>Abel, Smeeton, Ltd.,</b><br>27-29 Customs St. East, Auckland.                |
| <b>FERRANTI RADIO COMPONENTS</b>                     | <b>A. D. Riley and Co., Ltd. Anzac Ave.,</b> Auckland, and all leading dealers. |
| <b>GREBE RADIO</b>                                   | <b>Howie's,</b><br>Dilworth Building, Custom st., Auckland.                     |
| <b>MULLARD VALVES</b>                                | <b>All Radio Dealers.</b>   |
| <b>PREST-O-LITE. Car and Radio Battery Service</b>   | <b>L. J. Purdie &amp; Co., Ltd.</b><br>97 Dixon Street, Wellington.             |
| <b>RADIOLA RECEIVERS and Expert Radiola Service.</b> | <b>Farmers' Trading Co., Ltd.,</b><br>Hobson Street, Auckland.                  |
| <b>RADIOTRONS AND MARCONI VALVES</b>                 | <b>All Radio Dealers.</b>   |
| <b>T.C.C. CONDENSERS</b>                             | <b>A. D. Riley and Co., Ltd. Anzac Ave.,</b> Auckland, and all leading dealers. |

#### COUNTRY TOWNS

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|---|---|
| <b>ANCHORADIO, BREMER-TULLY, RADIOLA, BROWN-ING-DRAKE, AND ATWATER-KENT RADIO</b> | <b>Radio House,</b><br>Hamilton. G. S. Anchor, Manager. |
| <b>GREBE, ROGERS, CROSLEY, RADIOLA AND KING SERVICE</b>                           | <b>E. Dixon and Co., Ltd.,</b><br>Hawera.               |
| <b>SIEMENS BATTERIES, RADIOLA DEALER AND SERVICE</b>                              | <b>G. C. Carrad.</b><br>140 The Avenue, Wanganni        |
| <b>PHILIPS VALVES AND APPARATUS</b>   | <b>All Good Radio Dealers.</b>                          |