New Zealand Radio History

BY NORMAN WHITE. (Prizewinner in Competition No. 7)

MANY of the listeners of today take the Radio as a matter of fact and never stop to think of the early pioneers. My first contact with Wireless, as it was then called, was in Balclutha in the year 1914, and as I was then in short pants the massive spark coil and its huge sparks were always attractive. Mr. Gerald Aitken and his brothers were always making some experimental equipment, and as I lived beside them I saw many wonderful pieces of apparatus. The start of the War World I caused a break in experiments, and then I shifted away south and in 1919 I received a school prize and in it was described "How to Make a Wireless Transmitter and Receiver," using a spark coil and a Coherer type receiver. I set to work, and by using a Ford coil as the transmitter and making the receiver as described, using a relay and a bell, and the coherer was made in the form of a glass tube, having silver and nickel fillings mixed and brass rods entering each end. After many trials and adjustments, the "outfit" worked well and gave quite good signals for over a mile. As I was in the country and not having others to practice with, the use of such a Wireless was very limited, and soon it was put up on the shelf. The next time that Wireless came my way was in 1922, when the Brighton Carnival was on outside Dunedin at Xmas time, and I met a pal with a coil of wire, and on enquiring what he was going to do with it, he said that he was making a wireless set. I was very interested and so set to to make one also. In 1923 the two stations started in Dunedin and came on the air for the two-hourly transmissions, 8–10 p.m. My first program received was copied down item by item, and next morning checked them with my pal. Mr. Norman Arundel had his station erected in Moray Place, and had the big 4-wire aerial strung between the Y.M.C.A. building and the station building on the corner, using two steel towers for supports. This was one of the most powerful stations in New Zealand and was 200 watts. Mr. F. O'Neill also had a station in Moray Place, but on the south side, and not in as good a locality, owing to no high buildings being handy to erect the aerial on. (Mr. F. O'Neill was later on the Lamphouse staff, I believe.) The most prominent feature of these early stations was the relay of the local dance orchestras, and the most prominent item was "by special request," "Yes, We Have No Bananas," played at least six or seven times a night by the Savoy Orchestra. The 500-watt station was voted 1273 and commenced transmitting on April 21, 1923. These stations cost a big price to erect, as the valves were as much as £100 each, and were then not the rugged ones like today, but were very fragile. One station had the misfortune to have a "blow up" one night and all was not so good. Mr. N. Arundel was later at the helm of Station 42W, in the Hotel Excelsior Buildings, and later, so I believe, at the helm of Johnson's Radio School in Wellington. Receiving sets were very dear also, and the usual price ran in the region of £10 per valve, and not in a Flesh polished cabinet. I also had quite some contact with wireless with Pro-
The tubes employed in this little receiver are of the Midget type, but performance is equal to that of other low voltage sets using the larger valves. Broadcast stations brought in at good volume on the phones with the Single 1S4 and stepped up by the second tube for speaker reception. A good permanent magnet speaker should be used for best results. In country districts the added gain should be a help for broadcast reception with the phones. With a good aerial and earth, the stronger tubes is infinitely superior to any resistance-capacity combination at the low value of B voltage employed. The step-up in signal voltage provided by the secondary to primary turns ratio of the transformer is particularly valuable.

The second tube operates as a small power amplifier to provide louder signals for the phones, or to drive a small permanent magnet speaker when the incoming signals are sufficiently strong. The primary impedence of the speaker transformer is not critical, and either 7000 or

short-wave stations should be tuned in on the phones, at night, without any difficulty. Using an aerial 30ft. high and 30ft. long, the original receiver, at 10 p.m., brought in Saigon, Singapore, Tokyo, Berlin and the BBC at good phone strength, and other stations playing musical items. Plenty of Morse signals were also available. The B voltage employed was 1S2 volts for the plates and the amplifier screen, and 9 volts for the detector screen.

CIRCUIT.

The first 1S4 operated as a regenerative grid-leak detector, the audio signal voltages in the plate circuit being transferred to the grid of the second tube by the audio transformer. The use of transformer coupling between the two 10,000 ohms may be used. If the latter is a push-pull type, the centre tap should not be used, the end of this lead being insulated and tied out of harm's way. As the circuit stands, the grid of the amplifier is biased about 2 volts negative with reference to the mid-point of the filament. This condition allows for maximum sensitivity, but distortion will occur if the volume is not maintained at a low level. By disconnecting the transformer secondary from earth, and connecting a 1½ volt torch cell between the end of the winding and the negative filament, the grid may be biased a further 1½ volts negative. This will improve the signal handling capability of the tube considerably, but the sensitivity will be reduced. This is a matter for experiment by the constructor.
COILS.

The broadest coil used in the original receiver had 15 turns for the aerial, 110
turns for the grid coil, and 25 for re-
anction. If the set is to be used in city
and suburban areas, an additional five
turns on both aerial and reaction are
advised to liven up performance. A
Hiker's coil could be modified by re-
moving 10 turns from both aerial and
reaction for a trial. If reaction is too
fierce, remove another five turns from
the reaction coil. In country districts,
the Hiker's coil could be used with about
10 reaction turns removed. If the detec-
tor refuses to oscillate, try removing 5
turns from the bottom end of the aerial
winding.

For short-wave reception use 24-gauge
D.C.C. or enamelled. A close-wound
coil requires 3 turns for the aerial, 5
turns grid, and 12 turns for reaction,
the windings being spaced about & in.
apart.

A better short-wave coil may be wound
by spacing the grid-winding turns apart
from each other so that the overall
winding length on the former is 1 in.
Heavier wire like 20-gauge enamelled is
better still, and the winding length may
be increased to 1 1/2 in. Wind 7 turns
with 24 D.C.C., or 8 turns with 20-gauge
enamelled. The aerial winding may be
4 turns, and reaction 12 turns as before,
either 24-gauge or 26-gauge wire being
suitable.

In all cases the detector may refuse to
oscillate if the bottom of the aerial
coil is too close to the grid coil. If a

(Continued on page 17)
SMALL ADVERTISEMENTS

An advertisement in the Radiogram will quickly dispose of your surplus radio parts. Hard to obtain goods are often brought to light through a small Radiogram advertisement. Advertising on this page costs 2d. per word payable in advance. To ensure inclusion, your instructions should be received by us on the 15th of the month preceding date of publication. Advertisements addressed c/o "New Zealand Radio" cannot be accepted. Address instructions to "The Radiogram," 11 Manners Street, Wellington.

FOR SALE—Hiker's One Kit Set, £2. B. Jackson, Ohakea.

FOR SALE—2A4 Valve, good condition. I. MacDonald, 70 Hamilton Road, Wellington.

FOR SALE—pair brand new Headphones at 2/7. Write W. Chee, Kaioura.


FOR SALE—Park's Blue Diamond Vacuum Fm (Ode), 90/-, K. Keely, 57 Church Street, Devonport, Auckland.

FOR SALE—Morse Oscillator with valve, 30/-; pair headphones, Frost, best offer. D. Isaac, Pukekawa, Bulls.

FOR SALE—Two Hiker's One Sets, 35 valves, Batteries, less 'phones, £2/15/- each. G. Carlison, Otane, H.B.


FOR SALE or Exchange for Small Gramophone—Hiker's One Radio. Write Mr. L. H. Roberts, Appleby R.M.D., Richmond, Nelson.

FOR SALE—Hiker's One Parts, less phones, Coils, Condensers, Switches, etc. Write Mr. Lee, 60 Fearon Ave, Mt. Buckhill, Auckland.

FOR SALE—Morse Code Oscillator, complete with valve, phones and Marshall Key, £2/10/-, H. L. Armstrong, Whangarei.

FOR SALE—One small 2 base Accord, good condition, £1, nearest offer. Apply C. D. Williams, Boys' High School, New Plymouth.

FOR SALE—Hiker's Two, in cabinet, complete Headphones, Batteries, Aerial Dial. As new, £6/10/-, K. Hyland, Thornton Rd, Whakatane.

FOR SALE—Dual Wave Hiker's Two, no phones, complete and Philips' B Eliminator, also 33 valve; £5/10/- the lot. Write 131 Tramway Road, Invercargill.

FOR SALE—Bicycle Dynamo with Headlamp, also Hiker's One Set. Wanted—Book of Juvenile and new or good condition 49 valve. Willie Chee, Kaioura.

FOR SALE—Dual-wave Octal Hiker's Two. Just made. Complete with Batteries and a pair 222 B.B.C. 'Phones, £5/-/-/. Write B. Crowley, 10 Wallace Place, New Plymouth.

FOR SALE—Hallisters Sky Champion, model 2201; Communications Receiver, 8 valve; also 12in. Celestion Speaker. Price £20/-; Apply Robb 4309, R. Vincent, 22, Ropita St, Fitzroy, New Plymouth.

FOR SALE—Single "19" receiver, partly constructed, 15/-; phone 7/6; "Radio Amateur's Handbook," 1943, 7/6; "Amateur" bicycle dynamo, 7/6; Morse Key and Buzzer, 6/-; Pollard, Chalmers Avenue, Ashburton.


FOR SALE—627, 6AS, 1F0, 1CB, 49, 10/- each; 6F8, £5; 260-120 volt Stepdown, 25/- and £1. 400v. 150 M.A. 6Y3. V. Transformer, £2/10/-, Electric Motor, pickup, H.M.V. offer; 2000 Vari-Condensers, 5/-; Junk Box, 39/-, Freight forward. Write Rahob 12808, 4 Johnson's Ave, Frankton Junction.

November 1, 1945. THE NEW ZEALAND RADIOGRAM

SMALL ADVERTISEMENTS—continued.

TO SELL—Electric DX Unit 5 valves, 2000 ohms field, 20 volt transformer, less Earphones, £10 or nearest offer. H. A. Scott, 30 Waterloo Road, Lower Hutt.

WANTED—Small, cheap Box Camera, with 2 or 3 inches of film. R. Kidson, Ohamepe.

"SUPREME" 2 amp, Battery Chargers, £11/3/-. The Lamphouse.

REPAIRS to Meters, Valve Testers, etc.—Write for tender for specification. Constructors' meters wired and corrected, 12/-, plus postage. Spencer Bros., 801 Kiwi St, Wanganui.

THE ENSIGN BATTERY WELDER will operate from a 6-volt storage battery and may be used for all light welding work. Complete, £2/12/6. The Lamphouse.

LAMHOUSE DATA BOOK—96 pages, crammed full of facts, figures and tables. The Radioamateur's Ready Reference. Get your copy now. 3/-, Postage, etc., 1d. The Lamphouse.

PLASTIC CABINETS!—Just the thing to modernise or fit the small set to. Available in four colours. Write, sending a stamped, addressed envelope for particulars, etc., to Walker & Smith, Radio and Sound Specialists, Box 221, Wanganui.

AT LAST!—Radio that weighs only 9lbs. In four colours—ivory, red, green, brown. Plastic cabinets, 4in. x 6in., with 5 types of single-ended tubes. Fully guaranteed. Write, sending stamped addressed envelope, price, for particulars, etc., to Walker & Smith, Radio and Sound Specialists, Box 221, Wanganui.

VALUES FOR SELL—Two 8-inch Speakers, 2500 ohm fields, single or parallel connected, 15/- and 25/-, in good condition. Price as set and dies and voice, ½ inch, 1 inch, 1 inch, as new, 2½/-/-. S. Turner, Romilly St, Westport.

"RADIO-CRAFT"—"Radio and Television" and all overseas publications can be obtained for Rahob. Write for particulars of subscription rates. Barrits & Co., Bellett Terrace, Wellington.

RADIO SERVICEMEN'S EXAMINATION

Mackenzie's Engineering Academy specialists in coaching practical and theoretical examinations for the district examination by correspondence or by Class tuition. Write or call for particulars.

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INTERNATIONAL CORRESPONDENCE SCHOOLS (N.Z.) LTD.

182 WAKEFIELD ST, WELLINGTON

Dept. 2, WAKEFIELD CHAMBERS,
N.Z. Radio History
(Continued from Page 1)

Professor Jack, of the Otago University College, where he had been experimenting on the Radio Wave before the war, was able to give the small number of Radio listeners the thrill of hearing speech and music for the first time. A broadcast demonstration of the Professor's work was, to put it mildly, just covered with apparatus. In the years following the reception was improved and the hours of transmissions increased to being quite a form of interesting entertainment. In 1925 the Radio service has improved and many very nice receivers were in evidence. Quite a long stride from the first adver
tised advertisement in the Timaru Herald in July 1905, known as the Telric Wireless Tele
gram Outfit, in the form of spark coil and ether receiver, at the price of $7.50, and later the Telenia one at $10.
During these years I had been building various types of receivers and thought it was great fun to try different types of circuit changes.
In 1922 I joined the staff of H. Nimmo and Sons, Ltd., Wellington, on the radio service and electrical mainte
nance, and during my three years there I saw many changes in the Radio equipment as offered for sale. This has been just my little connection with Radio, and I will now do my best to set down, in the best of the early his
tory as I know it.

1920—Professor Jack, of the Otago University College, started transmitting speech and music.

Then the radio "Hams" started with their home-made gear, and could be heard chatting away. The age Morse, Frank Bell using the cell 4AA, Jack Orbell as 3AA, I. O'Meara as 2AC, V. Stone as 3AB, P. Potty as 3AB, Max Davies and Norman Edwards in Anckland with 1AA. These stations were all home-made using small power, but were the forerunners of broadcasting as it is today.

1922—The first organised transmitting station started in Auckland by Doug Shipard, using the large power of 5 watts, and at Wellington Charlie For
est started, using a similar transmitter. During the year the Auckland Radio Club was formed under the name Auckland Radio Service Company, and, as members, were Ernie R. Boucher, W. A. Boucher, and J. W. Truscott, and was well known to Auckland Radio men of to
day. Their transmitter was in Scott's Hall, and they put on their first transmission on the morning of December 2nd.

1922—AUCKLAND INCREASED POWER

1923—The following year had increased, and there was a definite need for some alternative programmes, so the Radio Service Company had the call sign 1AA (using 6 w k.w.) by the Radio Service Company, as an improvement on their first set. The Rev. Jasper Cooper was on deck and still is very active on the air from 1ZB.

April 21st: Station 4YB, Dunedin, started, using 60 watts—the most powerful station in N.Z.

Dunedin also had the stations 4YA and 4YO giving good service.

Christchurch had the station 3AD, run by the Radio Society, Christchurch, and transmitting on Wed. and Sun.

Nelson had the station 2YA; but this station was then only on for the one day, Wednesday.

Wanganui came to light with the station 2AI, run by the Wireless Club on Monday and Friday.

Gisborne had quite a gang of Radio enthusiasts, and Percy Stevens used the call 2AD on Wednesday, and 3AI on Saturday.

Wellington was on the air with two stations, the call 2YB and 2YM, operated by the Wellington Broadcasters on Monday and Friday, and the Do

25

minion Radio Company, Tuesday, Thursday, Saturday, Wednesday and Thursday, respectively.

When we turn the switch these days, no matter at what time of the day or night, there is some station to be heard, and how many ever stop to think of those people that have made it all possible. The big advancements in long-distance transmissions, using only small rigs and power, mostly home-made and often very crude.

1924—The year of "Miracles."
The first contact with overseas stations was made on May 30, 1924. 2AC worked the Argentinian station 1AC, operated by Sonor Carlos Bragato. This was followed by others contacting RB5 in Japan, and the greatest thrill was yet to come in the form of a station in the United States by Station Z4AA with

Frank Bell at the helm. This was sure going places, and it opened up yet another new so-called "Hams" on the evening of September 21st, 1924.

From then on these wizards of the air colleges and foreign countries on their two-way contacts.

All these contacts were on the wave

length of 90 metres and using low power. The art of long-distance transmis

sion has started and distance had just ceased to be any handicap; and on the 18th of October 1925, he excelled all his previous coups and worked two-way with an English station worked by Cecil Grady, of London, using the call sign G2SZ (who later was chief engineer for All India in Delhi).

This marks the beginning of real overseas transmission, and the ranks of listeners were gradually increasing, the number being as high as 2000; and on July 12, 1925, the Government ar

ranged with Mr. Harris and Mr. Good

to form a company for organised broadcasting. This was the result of previous investigations made in 1922 by Mr. W. Goodfellow, then manager of the New Zealand Co-operative Dairy Company, Limited. He was very interested in the possibility of using the radio as a means of giving farmers the necessary

reports on conditions relative to farming. At this time many of the fac

tories were being electrified, and under the control of Mr. A. R. Harris, who also was connected with the Dairy Company, Harris went to Australia to procure further data and put in a report for the Postmaster-General, Mr. J. G. Coates, for a licence to erect a station at Hamilton. This was agreed to, and the firm of A. R. Harris and Company <br> was given the order to supply and erect a 500-watt station at cost. Operating costs were to be collected by making the service a co-operative one and a small fee charged for each transmission, and the idea was to put all stations under one control, but this did not eventuate, so that in 1925 negotiations were again opened.

On August 22nd the Radio Broad

casting Company was formed and arranged to erect two 500-watt stations, one at Auckland and one at Christchurch for music transmissions. Music programmes were to be as they were wanted at places to be arranged.

During all this time the number of listeners has been gradually increasing, and when the Broadcasting Co. was formed the number topped some 2000, but within six years this had risen to some 60,000, and during this time many more stations were erected at various localities; the power at Wellington had been increased ten times. The Company issued a report in August, 1931, as fol

1. (a) The Company has established and maintained broadcasting stations in all four of the latest improvements, at the four main centres. Power has been increased 10 times.

(b) A nation-wide service has been created, designed to cater for all sections of the community, and created a service which, to the great joy of the audience, is required under its licence, as to hours of transmission.

(c) Listeners increased from 3000 to over 60,000.

(d) Early in 1929 a scheme for increasing the efficiency of broadcast coverage, by erecting extra relay stations.

The Company has provided programmes of the widest diversity and ac

cceptability by:

(a) Organising, classifying and utilising all available talent in the Dominion.

(b) Presenting the leading artists of the world by means of re-broadcasts.

(c) Producing special recordings of features broadcast in other countries, thereby giving New Zealand listeners a richer and fuller entertainment not obtainable by other means.

(d) Regular broadcasts of interesting and educational programmes, by high qualified speakers; daily news, market reports, and descriptions of sporting events.

(e) Assembling a musical library, comprising 18,000 items, many unobtainable in New Zealand.

6. Union of the events of local national and Imperial significance by means of relays and rebroadcasts, and has freely co-operated with local organ

isations in the propagation of anything of public welfare.

4. The appointment of 32 official li

sensors and public committees, which bring to the service of broadcasting the specialised knowledge of leading critics of a wide range of listeners' interests.

These committees make recommenda
tions to the company with regard to:

(a) Entertainment, music, drama

(b) Church services and broadcasts of religious nature.

(c) Special events

(d) Service to primary producers.

5. The Company has scrupulously safeguarded the political, moral, and social aspirations and sensibilities of the listening public.

(To be continued next month.)
COMPLETE LIST OF AUSTRALIAN SHORT WAVE TRANSMITTERS, POWERS AND SCHEDULES

(By Your DX Advisor.)

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<tbody>
<tr>
<td>VLC-4</td>
<td>15315 50,000</td>
<td>10.30 a.m.-12.15 p.m., 1.55-2.45 p.m. 3 p.m.-5 p.m.</td>
</tr>
<tr>
<td>VLA-6</td>
<td>15200 100,000</td>
<td>3.15-4 p.m., 5.10-5.45 p.m., 6.55-7.25 p.m., 6 p.m.-11.15 p.m.</td>
</tr>
<tr>
<td>VLG-7</td>
<td>15160 10,000</td>
<td>8.45 a.m.-10 a.m. (Sun to 10.15 a.m.), 11.15 a.m.-12.15 p.m.</td>
</tr>
<tr>
<td>VLR-3</td>
<td>11850 2,000</td>
<td>9.20 a.m.-noon, 1.45 p.m.-7.45 p.m.</td>
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<tr>
<td>VLG-4</td>
<td>11850 10,000</td>
<td>4.15 a.m.-4.45 a.m.</td>
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<tr>
<td>VLG-4</td>
<td>11840 10,000</td>
<td>3.10 p.m.-4.40 p.m., midnight-2.00 a.m., 3.00 a.m.-3.45 a.m.</td>
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<tr>
<td>VLG-10</td>
<td>11700 10,000</td>
<td>8.10 p.m.-9.55 p.m., 9.00 p.m.-11.45 p.m.</td>
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<tr>
<td>VLG-3</td>
<td>11710 10,000</td>
<td>1.55-2.45 p.m., 3.00-4.00 p.m. (Sundays to 4.30 p.m.), 6.00-6.30 p.m., 6.55 p.m.-7.25 p.m., 7.30 p.m.-7.55 p.m.</td>
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<tr>
<td>VLG-2</td>
<td>9650 50,000</td>
<td>7.30 p.m.-8.45 p.m., 4.15 a.m.-4.45 a.m.</td>
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<tr>
<td>VLG-6</td>
<td>9620 10,000</td>
<td>1.45 p.m.-7.15 a.m.</td>
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<tr>
<td>VLG-5</td>
<td>9615 50,000</td>
<td>9 p.m.-9.45 p.m., 1.00 a.m.-2.45 a.m., 3.00 a.m.-3.45 a.m.</td>
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<tr>
<td>VLR</td>
<td>9650 10,000</td>
<td>2.15 a.m.-2.30 a.m., 2.35 a.m.-2.45 a.m.</td>
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<tr>
<td>VLR</td>
<td>9650 2,000</td>
<td>8.00 a.m.-9.00 a.m., 8.00 a.m.-1.30 a.m.</td>
</tr>
<tr>
<td>VLC-5</td>
<td>9540 50,000</td>
<td>Midnight-12.15 a.m.</td>
</tr>
<tr>
<td>VLG-2</td>
<td>9520 2,000</td>
<td>10 a.m.-1.45 p.m., 10.30 p.m.-3.30 a.m.</td>
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<tr>
<td>VLA</td>
<td>7250 100,000</td>
<td>1.35 a.m.-2.30 a.m., 2.55 a.m.-3 a.m., 4.15 a.m.-3.40 p.m.</td>
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<tr>
<td>VLQ</td>
<td>7240 10,000</td>
<td>8 a.m.-12.10 p.m.</td>
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<tr>
<td>VLQ</td>
<td>7215 10,000</td>
<td>7.30 a.m.-1.30 a.m.</td>
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AIR MAIL SCHEDULES FROM RADIO BRAZZAVILLE

Times | Main Transmitter, 50,000 watts. | 6000 watts. | 6600 watts. |
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<tr>
<td>5 p.m.</td>
<td>11970. beamed to France</td>
<td>9940 kes to France</td>
<td>17527 ke to France</td>
</tr>
<tr>
<td>9.45 p.m.</td>
<td>15035 kes, beamed to Syria</td>
<td>11970 kes to France</td>
<td>11970 kes to Far East</td>
</tr>
<tr>
<td>3.45 p.m.</td>
<td>15035 kes, beamed to Africa</td>
<td>17527 ke to South America</td>
<td>11970 kes to South America</td>
</tr>
<tr>
<td>11.45 a.m.</td>
<td>11970 kes to South America (Silent)</td>
<td>11970 kes to North America (Silent)</td>
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News Broadcasts in English are at 11.15 a.m. to Far East; 6.45 and 8.45 a.m. to Europe; 10.15 a.m. and 11.30 a.m. to North America.

AMATEUR SHORTWAVE SUPERHET

(By H. Vernon Wheatley.)

This superheterodyne is extremely versatile, and by the use of regeneration in the first detector, a degree of sensitivity is obtained that could otherwise only be gained by preceding the first detector with a tuned R.F. stage.

The electron-coupled first detector has its regeneration network in the cathode circuit for the sake of stability, and the output of the 6SK7 oscillator is coupled to it by means of the suppressor-injection method. The output of the 6J7 is fed into the L.F. transformer, which, in turn, is connected to the pentode section of the 6FT dual-purpose tube. After amplification, the signal is led into another L.F. transformer and thence to the triode section of a 6FT tube which acts as a second detector. After rectification, the signal is then handled by the 6J5G or 6ES R/C/C, audio stage. A volume control is incorporated in this stage so that the volume may be adjusted without upsetting the setting of the regeneration potentiometer.

If necessary, the triode audio tube may be substituted with this coil by putting a 6SKG pentode, or this tube may follow the 6J5G or 6CS, thus giving a two-stage amplifier.

It can be seen that a comparatively low B+ supply is all that is needed to adequately power the receiver, and this increases the versatility of the set, for it can be operated by using any of the following methods:

Complete A/C, powered.
Filaments.
63v. A/C, or 6v. accumulator.
"B" Supply.
Batteries, vibrator power-pack, or any A/C or D/C power-pack. This list covers all contingencies, and it will be appreciated that the receiver can be used as a straight A/C or battery operated set or any combination between these two methods.

Coil Data.

The coil network looks a bit complicated in Circuit A, but in reality it is very simple. If you have any difficulty in understanding it, an identification of the various coils will perhaps help you.

Coils L2, 5 and 8 are the lower frequency ones and are switched in on position 1. L3, 6 and 9 are the "middle" S.W. coils and are switched in on position 2. Position 3 switches in L1, 4 and 7, which are the higher frequency coils. Circuit A shows the wavechange switch on position 2. Plug-in coils, using the data given, may be used instead of the coils/switch details shown.

At 9T No. 1 set.
30T tapped TT 30T tapped TT At 9T

At 5T No. 2 set.
12T tapped 4T TT At 5T

At 3T. No. 3 set.
7T tapped 2T TT At 5T

Cocks are close wound on sections of 14 in. former just large enough to hold the required number of turns. L2, 5 and 8 are wound with 28 g. D.C.C. and the rest with 24 g. D.C.C. The aerial turns, which are wound at the grid end of the first detector coil, are separated from this coil by about a foot. The diode, or this tube may follow the 6J5G or 6SC, thus giving a two-stage amplifier.

It can be seen that a comparatively low B+ supply is all that is needed to adequately power the receiver, and this increases the versatility of the set, for it can be operated by using any of the following methods:

Complete A/C, powered.
Filaments.
63v. A/C, or 6v. accumulator.
"B" Supply.
Batteries, vibrator power-pack, or any A/C or D/C power-pack.

This list covers all contingencies, and it will be appreciated that the receiver can be used as a straight A/C or battery operated set or any combination between these two methods.

Coil Data.

The coil network looks a bit complicated in Circuit A, but in reality it is very simple. If you have any difficulty in understanding it, an identification of the various coils will perhaps help you.

Coils L2, 5 and 8 are the lower frequency ones and are switched in on position 1. L3, 6 and 9 are the "middle" S.W. coils and are switched in on position 2. Position 3 switches in L1, 4 and 7, which are the higher frequency coils. Circuit A shows the wavechange switch on position 2. Plug-in coils, using the data given, may be used instead of the coils/switch details shown.
Numbers one and two 1st Det. and oscillator coils are shown on the sub-chassis by means of dotted lines, and are mounted in the positions shown. A metal screen, extending the depth of the chassis and about 1", beyond the depth of the coils is mounted between each set of Nos.1 and 2 coils, and if after completion there is instability apparent, then each, or only one, No. 2 coil may be re- mounted at right angles to its fellow No. 1 coil. The wave-chance switches are 3 pole, 3 position types and are identified in Circuit A. Any other type may be used if connection made to No. 1 position on the switch, or a two position type may be used. Care must be taken when placing the coils to avoid intercoupling or absorption losses. The two oscillator coils may have to be mounted at right angles in respect to the 1st detector coils, but this is only a possibility. Both No. 3 coils, however, definitely have to be positioned above the chassis. Any wiring from the coils to the switch must be kept as short and as direct as possible.

COMPLETION AND LINING UP
Once the receiver is correctly wired, the lining-up process may take place. The I.F. transformers, by the way, are iron-cored types and have been pre-tuned to 465 kcs, and the output one receives first attention. Tune in a weak station and adjust the regeneration control till the signal lines up and re-adjust the "padder." If the signal becomes too loud, re-tune to a weaker station or turn out the aerial series condenser. Do not reduce the volume by lowering the audio volume control. While the tuning is proceeding, a calibrated meter or a neutralising tool, turn the grid section trimmer of the output I.F. transformer until the signal is peaked to a maximum volume. If it becomes too loud, the input will have to again be reduced. Repeat the procedure with all the trimmers, excepting the one across the primary of the input transformer, and working away from the second detector. The lower the signal you are peaking the I.F.'s upon, the better, for these circuits cannot be sharply peaked upon strong input signals (either an oscillator or a transmitted signal). If the trimmer across the primary of the input transformer is adjusted it will "throw out" all the other adjustments previously made. This trimmer is critical, and this portion of the pre-tuned I.F. transformer should not be touched. When the I.F.'s are aligned the aerial series condenser is adjusted, too, until there are no dead-spots on the tuning scale, and the regeneration is then set for maximum sensitivity.

If the oscillator and 1st detector do not track properly—that is, produce the correct I.F.'s in the receiver in proper time—to either the detector or oscillator grid coils until the difference between their tuned circuits is equal to 465 kcs, or the I.F. The oscillator must operate on a frequency 456 kcs, higher than that to which the detector is tuned. In case the oscillator nor detector oscillates in the normal way, this may be due to insufficient turns in the regeneration circuit or to intercoupling, which has been previously mentioned. Any "live" R.F. leads must be kept well well-separated, and if necessary, they must be shielded by covering the leads under suspicion with shielding braid. This shielding is well mounted to the chassis. If lack of oscillation is due to insufficient turns in the regeneration sections, then the cathode tap may be moved to include one or two more turns in the circuit. This move is made towards the grid end of the coupling condenser.

TUNING NOTES
Signals are tuned in by rotating the slow-motion dial which operates the tuned tuning condenser. When a signal is tuned in, the "padder" is adjusted carefully to obtain the best signal strength and sensitivity. The aerial series condenser is also carefully adjusted. The adjustments to these two controls must be made skilfully, and the same applies to the regeneration control.

PANEL LAYOUT
To obtain a degree of balance in the appearance of the panel, the components need to be placed intelligently, after taking into account the electrical side of the question. The aerial section control is mounted centrally and the two switches are mounted 2in. from the edge of each side of the panel, and high enough from the top of the chassis to give ample room for the body of the switch and its associated No. 3 coil. The regeneration potentiometer is located directly beneath the 1st detector coil switch, and beneath the chassis. The audio volume control is set in an identical position.

(Continued on page 20.)
LET'S EXPERIMENT

(By A. J. Mortlock.)

The Tesla coil to be described here was, as its name suggests, invented by Nikola Tesla, the man who first produced artificial lighting. While the model we are considering here is of little practical use, it can be used for some of the most exciting electrical experiments imaginable. See with what startled amusement people will view you when you draw a miniature flash of lightning to your hand from one of the output terminals. In a dark room you can produce amazing effects by drawing the charge from the coil to a many-needled conductor (as the spreadout end of a multi-strand wire).

Ordinary electric light lamps may be illuminated by presenting the brass base of the lamp to one of the output terminals of the high frequency coil. If you are lucky enough to possess some of those vacuum tubes used for medical purposes or the well-known Geisler tubes, these also may be illuminated by the high frequency discharge.

Now the construction.

The whole arrangement depends for its results on this coil. A Ford ignition type is the most satisfactory, but any other make will do, as long as it gives a spark of 2½ to 3½ in length. The high-frequency coil in Figure 1 is constructed on a wooden stand as pictured. The primary of this coil is constructed of 8 to 10 turns of No. 10 or 12 copper wire on a diameter of 4 in., the turns spaced 3½ in. apart. It is necessary to construct this primary coil as in the diagram and not on an ordinary 4 in. diameter former. It is quite easy to bend the wire being of such a thickness as to require a good deal of rigidity with no trouble. The secondary coil is wound on a cardboard tube about 2½ in. diameter and 10½ in. long, the winding being one layer of No. 28 enamelled or cotton covered magnet wire. The high voltage condenser is composed of half a dozen glass plates, 4 in. by 5½ in., with tinfoil or thin metal sheets between them. These sheets are cut half an inch small all round to prevent leakage (see Figure 2); alternate sheets are connected to common terminals.

The auxiliary spark gap across the secondary of the Ford coil may be a couple of zinc rods; brass or copper will also do. This gap is set short, about 3½ to 4½ in. in length, and the number of Tesla coil primary turns varies until best results are obtained.

In conclusion, it is well to remember that all values are approximate and should vary slightly in every case. If you desire a bigger spark (up to about 6 in. in length) try varying the number of plates in the condenser and the length of the spark on the Ford coil.

Slips at The Mike

22B, October 5th, 10.45 p.m.—The Inkspotts sing "Every Night About This Time."—Bob Smith.

During the Seddon Shield match at Blenheim, Saturday, Sept. 15th, 2YN, the announcer said the referee had put the serum and called for a whistle. I mean blown the whistle and called for a serum.

22B, Oct. 13th: Time is two minutes past twelve and "I'm Falling in Love with Someone Else."—Jim O'Brien.

22B, Oct. 14th, 12.27 p.m.: Richard Tindler sings "Somewhere Over the Hill" for Clarinda.

Announcer 12B, 10.30 a.m., 9th October: Your radio licence should be renewed—er, renewed—immediately.

OHAKUNE.

We have at last got the Radio Hobbies Club in full swing. The meeting held on the 9th September was a great success. We had an attendance of nine, and the officers elected were:—D. P. O'Brien, President and Treasurer (Radiobusters, Ranfurly); Mr. M. M. O'Brien, Secretary (Radiobusters, Ranfurly); R. S. O'Brien, Hon. Secretary (Radiobusters, Ranfurly); G. P. O'Brien, Hon. Secretary (Radiobusters, Ranfurly); G. P. O'Brien, Hon. Secretary (Radiobusters, Ranfurly). The members attending the meeting were: K. Hussey, P. Hine, G. Delawie, S. Kane, G. Hurley, I. Gould, G. Holland.

Second meeting (September 30th)—Since last meeting we have changed our rooms from the R.S.A. Hall to the Railway Station Social Hall. We pay no rent and we have our own lockers. Each member pays 3½ d. per meeting, and this money is to purchase radio parts. Today we were attended, and K. Hussey brought along a Hiker's One. G. Hurley brought along one, but we of course, got it to (I think it wants rewiring). We intend building a Hiker's One and selling it, and with the proceeds we will build another set and sell it, and so on. We have no proper instructor, but we will manage by ourselves. Meetings are to be held once a week—on Saturdays, from 2 p.m. to 3.30 p.m.—D. P. O'Brien, President.

AUCKLAND.

Well, folks, first of all we have to advise that the club meter is now complete and available for use. It is available at the Club at 7.30 p.m. for checking purposes as well as for conducting various experiments on Junior members. We extend our sincere thanks to our President, Mr. Walker, for the many hours of his time which he gave in building up the unit. Also our thanks to Mr. Rhodes for the cabinet. We were unable to obtain a suitable switch, and Mr. Walker gave one to us which was quite an achievement and will provide many years of use.

We would remind readers of our Junior Section, now in operation, and its benefits. We now have Junior and Senior nights on alternating weeks. The dates for the Junior nights are 2nd, 16th, 30th November and 14th December, at the Club Room, 275 Karangahape Road.

Our membership is steadily increasing and we now have 147 members. Next month we will tell you about our current competition.—J. Forrest, Secretary.

NAPIER.

The Napier Branch is now in full swing. Meetings are held once a fortnight in the committee room of the Napier Football Club’s gymnasium at McLean Park. The first meeting dealt with forming the Club and deciding upon a programme to be followed each night. Officers were elected and the first annual subscription was fixed at 2s. 6d.

At the second meeting our President, Mr. J. McKee, gave a lecture to beginners on the Radio Symbols, how to recognise them and how to read a plan. Mr. E. Bonjes began a course for beginners on "Radio Fundamentals," taken from the "Australasian Radio World," by Charles Aston. This course will be continued during each meeting. The remainder of the evening was spent in a discussion on the material covered by the course, and "Hints and Kinks" given by members.

We need new members and we would like to appeal to Napier radio fans to come forward and join the Club. We know there are many fans in Napier who would like to join, so let’s hear from you! Contact either J. H. McKee, President, 15 Shanrock St., or E. F. Oliver, Secretary, 107 Milton Road.
PILOT BULB TESTER.
Using only two snap-on panel-lamp sockets and a 4-prong tube base, it is possible to make a simple pilot lamp tester.

The pilot bases (one for bayonet and the other for screw types) are wired to the filament prongs so that an inserting into any 4-prong socket of a radio or analyzer it is possible to test bulbs.

HIKERS' 2 BATTERY SET.
As I am a Rahob and take interest in radio sets, etc., I herewith enclose a suggestion in connection with the Hikers' 2 Battery Set.

Antenna lead-in strip made from paper-covered copper foil obtained from scrap building material. Puts stock clips are bolted to each end; the strip is then carefully wrapped with weather-proof tape.

Cover for cells, which can be screwed in after cells are inserted. Old springs from disused torches should be fastened to the cover in order to press cells together, affording a good contact.

If the set is built on a wooden base board, with all wiring and components mounted above, I find it very convenient to use ordinary torch cells for B, supply, mounting these beneath the base board in pockets made by gluing strips of wood just far enough apart so as to allow the cells to slide in end to end, just as they do in a torch. The grid bias supply can be obtained by inserting a metal disc between the second-to-last and last cells. To this a wire can be soldered which goes to the respective terminals. The enclosed diagram will show how the cells are connected.

The little trouble incurred in this idea will pay good dividends as B batteries are kept very compact and at the same time the set looks as though mounted on a proper chassis, especially if it has a coat of silver paint.

A TIME SWITCH.
(By Rahob 12885.)

Parts required: An insulated switch, an alarm clock, and a rat trap of the spring tensioned type.

The knife switch is connected in the circuit through which the current for the light or whatever the circuit is flows. Beneath the switch handle the rat trap should be fastened either by nails or screws to the wall. When the trap trigger is pulled, the spring will by up, dis-engaging the blades of the switch.

A length of wire should be connected to the trap trigger and tied to the alarm winding key of the clock. When the prescribed time arrives the key will tighten the wire, pull the trigger, release the spring, and the switch handle will be thrown up.

1. Ordinary headphones can be improved by removing the old iron diaphragm and substituting thin micro-
discs of the same size. Flatten from pieces in a vice and smooth with a file before cementing at centre to contact magnets.

2. If the end turns of a coil do not lie in place properly, try this one: Put a pinch of powdered resin on the offending place and apply the tip of a hot soldering iron for a second. The resin will solidify and hold the wire as well as varnish.

3. If you bore a hole for a screw and then find it is too large, put a wooden safety match stick down the side of the hole and then insert the screw. This will hold it securely.

The Double IS4
(Continued from page 5)

large aerial is used it may be necessary to couple it to the aerial winding through a variable condenser. As the plates are gradually swung out of mesh, a point will be reached where the detector commences to oscillate.

This little receiver is designed on orthodox lines, and there should be no difficulty in getting it to perform. It must be realised, however, that it is not suitable for high voltages. The maximum B voltage for the plates and the amplifier screen is 18 volts, and for the detector screen 9 volts. For battery economy and for phone reception the amplifier screen may be dropped to 9 volts. A high voltage at this point is necessary for good reception only will shorten the life of both valves and batteries.

RAHOB LIBRARY

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ANSWERS TO WITTIZUZ.

(1) Remaining constant, or a train of constant amplitude oscillations.
(2) Closed.
(3) Another name for a cathode ray tube.
(4) B, C, G. All frequencies over 20,000 C.P.S.
(5) An attempt to obtain an illusion of "depth" in broadcast reception.
**Girdling The Globe**

DX observations of the month by Arthur T. Cushen, 103 Princess St., Invercargill, D.L., adviser to the Radio Hobbies Club, and Short Wave Editor to The New Zealand Club’s bulletin, “New Zealand DX-TRA.” All comments are welcomed and will be used without payment. At the start of each month, DXRA will circulate DXRA’s monthly bulletin and address will receive prompt attention. Times are NZST (12 ahead of GMT); frequencies in kilocycles.

**BROADCAST.**

Japan.—Armed Forces Radio Network, Tokyo, can be heard on 590 and 990 kcs. to go off at 2 a.m. daily. It is presumed that these are the former JORL, Tokyo, 100kw., and JOOK. Nagoya, 10kw. transmitters.

Pacific.—Verifications from WXL, Armed Forces Radio Service, Saipan, give the power as 1000w. on 6000kcs., and stated that the first report was from New Zealand. WWVT, Manila, verified by letter, is broadcasting on 1500kcs., 1000w., 2:05 a.m. daily, but is expected to increase the schedule shortly. At present these stations are known to be in operation by the Australian Army Amenity Service. 9AA, Port Moresby, 1292kcs., 500w.; 9AB, Lae, 1070kcs., 200w.; 9AC, Truk, 1292kcs., 200w.; 9AD, Morotai Is., 1780kcs., 200w.; 9AE, Jiquicot Bay, N. Britain, 1570kcs., 200w.; 9AF (1340), 9AG (1240), 9AH (940) are being installed. Verifications have been received from 9AF and 9AG when they were testing from Melbourne.

Europe.—American Forces Network, Munich, 1250, and a further AFN transmitter on 1490 have been heard at 6 a.m. Other good signals are Milan (814), Hamburg (1095), Geneva (1150), and Rome (1260), RBB transmitters on 1122 and 1474 kcs. have been heard with news at 6 a.m.


**SHORT WAVE.**

Holland.—PCJ, Philips Radio, Hilversum, Holland, has been testing for Australasia each night from 8:30 to 10:30 p.m. The signal is very good, and reports are welcomed from the “Happy Station” in pre-war days.

Japan.—American Forces Network, Tokyo, broadcasts on 9600 and 7540 daily from 9:30 a.m. to 2 a.m. next day, and are best received after 7 p.m. News broadcasts are given at 9 p.m. and midnight. JLS, 9650, and JU72, 9250, have been heard contacting San Francisco at midnight.

**China.—**XQIO, Shanghi, the former German-operated station XGSR, is now broadcasting under Allied control, and is well received with news at 12:40 a.m. on 11885kcs.

**British Guiana.—**ZFY, “The Voice of Guiana,” Georgetown. British Guiana, 1000w., can be heard operating at 10:40 p.m. and followed through Morse till 11 p.m. when BBC is relayed.

**Java.—**A very interesting station at present is “The Voice of Free Indonesia,” Randoe, Java, which broadcasts daily at 11:30 p.m. on 12270 and 18135 kilocycles. Strength on the former transmitter is very good, and interesting, and highly-colored propaganda broadcasts are made in English against the Dutch, from this new “Indonesian Voice.” The signals come from Randoe off the former Batavia transmitters.

**Argentina.—**LRRA—“Radio Del Estado,” Buenos Aires, 7000w., an oldtimer, has made a welcome reappearance on 9600, and can be followed from opening at 11 p.m. till after midnight. The same transmitter has also been heard signing off at 4 p.m. with chimes, but suffers interference at this time from HJCAB.

**LJYR.** “Radio Belgrano,” Buenos Aires, 9640, heard at 11 p.m. at good strength, and also broadcasting on 9600 kcs. LNN, “Radio el Mundo,” Buenos Aires, is another good signal, with transmission opening at 10:30 p.m. on 9600kcs.

**Colombia.—**HJCAB, “Radio Estudiar Nacional,” Bogota, 2500w., can now be heard at good strength till signing off at 2:34 p.m., after a news broadcast in Spanish. For many months this transmission has been covered by GRX, London.

**Britain.—**American Forces Network, London, using BBC transmitters but American assigned frequencies, new operating on this schedule. 6000kcs., 5.75 p.m.; 8005kcs., 8 p.m.—4.15 a.m.; 9090kcs., 4.30 a.m.—12.35 a.m.

**BBC’s Pacific Service** is now transmitted from 6 to 10 p.m. on GYZ, 9660. GRX (9690), GSN (11520), GRY (12940), throughout 6:8:45 p.m. on GRM (7120) and 6:30—10 p.m. on GNI (13260). Many BBC frequency changes have been made and a complete list is in this issue. The transmitter GWD is without a frequency assigned, the 15420 outlet being withdrawn, but this call may be used on the transmitter, being heard at midnight in the European service.

**UNIVERSAL MULTI-TESTER**

(By H. VERNON WHEATLEY.)

This simple multi-tester about to be described is an old friend in a slightly different form. Conversion from one use to another is made by throwing toggle switches, and the instrument measures current, voltage and resistance. Seven resistances are used, and they should be accurately calibrated against an accurate ohmmeter, or, better still, a bridge type megohmmeter. For preference, wire-wound units should be used, as these components do not tend to alter the original resistance with age, or unthinking abuse. However, if the wire-wound units are unobtainable, a good quality carbon resistor may be used. In the case of the two MA shunts, the value of these will have to be determined by yourself, as they are governed by the internal resistance of the particular meter you are intending to use. These shunts definitely should be wire-wound, although it is possible, but not desirable, to modify a low value carbon resistor for this purpose. In any case, the modification of a carbon resistor to suit the circuit is a much harder job than constructing a wire-wound shunt. These shunts have to be accurately measured.

Extra voltage ranges may be added by using more S.P.S.T. switches, and the resistance values required in this particular section may be easily calculated from the three values already given.

First and foremost, your 0-1 D.C. milliammeter should be of the best quality you can obtain, as it is essentially the heart of the instrument. The accuracy of your shunts and resistances is also a very necessary item. The instrument may be mounted in a case, 6in. x 7in. and 3in. deep, and the switches mounted so that when the arms incline towards the meter they are in neutral position. The voltage switches are mounted below the meter, and the resistance and MA switches flank each side of the meter panel.

An ohms adjuster may be inserted in the circuit. A conversion chart for re-
amateur S.W. Superhet.

(Continued from page 13)

below the oscillator coil switch on the right hand side of the panel.

The"padder"is mounted below the chassis so that its shaft protrudes from the left hand side of the panel and is \( \frac{3}{4} \) from the left hand side of the panel and high enough for the convenience of the operator. The plug-in switch is located at the same position on the right hand side of the panel, and the mid-point position between these two controls is occupied by the B+ on/off switch. This panel layout gives a neat appearance and makes the controls very handily placed.

FINAL NOTES. All holes drilled in the top of the chassis to accommodate wires leading to components mounted above the chassis should be placed so that the lead will be as direct as possible.

The aerial series condenser may be mounted on the lefthand side of the chassis towards the rear, instead of as shown. This position is optional.

The condenser in the grid lead of the 6S7 triode section may range from .0001 mfd. (as shown) to .00025 mfd. The R.F.C. shown in the triode plate lead of the 6S7 tube is a standard S.W. component, but if any trouble is located in this particular section of the circuit an extra component is wired in series with the existing choke. The .01 mfd. condenser in the cathode lead of the 6S7 tube may be experimentally altered to get the best of results. Do not forget that the L.F. transformers have to be pre-tuned to the required frequency. If any difficulty is experienced over aligning the receiver (but there shouldn't be), a serviceman will carry out this task at a reasonable price and in a short time.

The 6F7 tube is shielded, and this also may have to be done to the oscillator tube. If possible, the two wave change switches may be moved in towards the centre of the panel by as much as an extra inch, but this depends upon the construction of the circuit. If necessary, the shield between the sets Nos. 1 and 2 coils beneath the chassis should have another section fitted, so that this addition extends at right angles from the section shown. This will reduce any absorption or intercoupling losses, and should be carried out, if necessary.

Volts and MA are calibrated on the dial scale or on charts. Division of the dial scale can be used to indicate values, as an alternative scheme.

Postmans Knock.

I would like to express my appreciation for the splendid magazine you publish every month. I have been a member of the Club since 1945, and in my opinion the "Radiogram" has improved immensely. As I am still a secondary school pupil and have not a lot of extra money, I would like building small two, two and three-valve sets. If you continue to publish one of these circuits in the future, you do now, I will remain contented.

In closing, I hope the Club continues with its work of educating amateurs in the future.—Rahob 5840.

I wish to congratulate you on the way you turn out our little paper, “The Radiogram.” It certainly is a big help to anyone like myself who has just touched on the outside of the radio world and who wants to get into it a little further.

Also please accept my appreciation of the services rendered to me while overseas. I spent many pleasant hours perusing the "Radiograms" and also the kit sets which you sent so promptly to me. Once again thanking you for the Club and yourself all the best.—Rahob 5834.

I have been a member of the Club for a number of years now, and though I fear I have been rather inactive member I am taking this opportunity of saying that I consider I get my money's worth in reading and studying both the Radiograms and using the Club, and receiving the "Radiograms" I have learnt a great deal. I heartily agree with the remarks of Brother Rahob 5845 in the August "Radiogram," who, like myself, is also a beginner, where he suggests notes in "Postmans Knock" for beginners. I have read Australian Radio publications, but none of them cater for the beginner as your Club does; but, say an editor each month beginners would greatly assist us to understand the functions of each part that goes to make up a set.—Rahob 4449.

I wish to acknowledge with thanks receipt of my membership card and badge, and the Lampou Annual and September "Radiogram," both of which I have read with much interest. I have built the Octal Hiker's One and find it a great little set, having only 1,000 ohms output. The make-up quite a neat little set, and stations so far I have been unable to procure the tube to wind the correct coil for 1,000 ohms. I do not have a standard Hiker's One Coil with good results. Thanks again for prompt delivery of the books, and I would like to wish the Club lots of success in the future.—Rahob 14264.
Malaya.—Singapore Radio broadcasts programmes for the Forces in SEAC daily on 11860 from 11.30 p.m. to 1.30 a.m. N.B.S. Wellington, is called at 10 p.m. irregularly on 9558.ks.

Uruguay.—CXA—10, “Radio Electricas,” Montevideo, 10,000w., is being heard regularly from noon to signing off at 2.17 p.m. on 11000ks. Strength is very good, and programme consists of classical recordings, with news in Spanish at 2 p.m.

Chile.—“Radio Ejercito,” Punta Arenas, can be heard on 22670ks to closing at 3.30 p.m. Strength is fair and programme consists of mainly Latin recordings mixed with a few English and American discs. Punta Arenas is in southern Chile and rivals Invercargill for the claim of the “World’s southernmost city.”

BBC’S CALL SIGNS AND FREQUENCIES

(By your DX Adviser)

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<td>GSY</td>
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<td></td>
<td>GWH</td>
<td>11800</td>
</tr>
</tbody>
</table>

Morse Practice Sets

BRITISH MADE KEY
AND BUZZER

Mounted on black bakelite base (as illustrated)

Usually 8/9 each

FOR ONE MONTH

5/-

THE RADIO HOBBIES CLUB

(Founded 1930)

Invest 6/- and become a member of Australasia’s largest Radio Club.

What do you get for your 6/-?

Read on and you will discover some of the many benefits you realize on such a small outlay.

You will receive a copy of this monthly magazine, the “New Zealand Radiogram,” for 12 months. This contains articles on Radio Instruction, Construction, General Interest, Hints and Kinks, DX Observations and many other interesting features. You will also receive a copy of the Lamphouse Annual, containing Catalogue Section, Station Logs, Reference Tables, Valve Charts, Technical Articles, and constructional details of several receivers from Crystal Sets to De Luxe Receivers and Amplifiers. 192 pages crammed full of interest.

You will receive a Rabob Badge, Registration Card and Club Transfer. The main club activities are: Competitions, Stamp Collection, Photographic Record, Pen-Friends and Technical Inquiry Service. A booklet giving further details will be sent on request.

WHY DELAY? ALL THIS FOR 6/-. (Subscription in Australia, 7/6.)

The Radio Hobbies Club,
C/o. Lamphouse,
11 Manners Street,
WELLINGTON, C.I.

Please make me a member of the Radio Hobbies Club.

NAME ____________________________

ADDRESS _______________________

TOWN _____________________________

(Radiogram, Nov., 1946.)

THE LAMPHOUSE, 11 Manners Street, Wellington, C.I.
Christmas Suggestions

WHAT A THRILL!

The modern version of a rubbish container—hygienic, attractive, convenient. Sprayed either cream or green. Height 13½in. Diameter, 9½in.

RU351 .............. (Post Free) 23/-

THE "GLORIA" HOME PERMANENT WAVING OUTFIT

Yes, it’s a real thrill for a boy to build his own Radio. And really, it’s not a difficult task. We supply full constructional details with every Kitset, and any boy capable of using a soldering iron would have no difficulty in assembling any one of the Kits listed below.

All Kits less Headphones,

RK2004—"Improved "Hiker’s One" with Batteries £2/13/6
RK2005—"Popular One" (Midget Series) with Batteries £2/7/6 Post Free,

FOR THE MOTORIST!


RM303 .......... Each 8/3

Postage 1/3

RM304—Spare floats for above.

MODERN—ATTRACTION!

This Lamp may be clipped on to a bed or screwed to the wall. Wooden ends and base. Cylindrical parchment shade. 11½in. × 3½in. A gift that will really be appreciated.

RF907 ............... (Post Free) 27/6

FOR DAD!

An English Electric "Solen" Soldering Iron. Domestic or Radio size. Tinned copper bit. Takes only 4 minutes to reach maximum heat and can then be used for those many odd jobs around the house.

Supplied with small reel of solder. Ready for use.

R5410A — 25/3 Post Free

SEE OUR PRICE LIST FOR MANY OTHER ATTRACTIVE GIFT LINES

THE LAMPHOUSE

11 MANNERS ST., WELLINGTON

TABLE LAMPS

Coloured Base Reading Lamps. Will stand on table or may be fastened to the wall. Chromium arm, wooden base. Colours: Green, White. Complete with parchment shade, globe, flex, etc.

RF508—£2/2/- Post Free

"HOMECRAFT" POKER WORK WORK SET

Poker Work is a fascinating instructional hobby. The "Homecraft" Set is the electrical answer to the original "poker," and can be used with safety by either young or old. Different tappings enable the artist to vary the heat on the point, at will. Supplied complete.

RE90 ........... (Post Free) £3/10/-

RE91—Spare Tips 4d, each

Buy with confidence under the Lamphouse guarantee:

"Any goods which prove in any way unsuitable may be returned undamaged within seven days from date of receipt and a refund effected in full."
In response to numerous requests we illustrate the construction of a Battery Clock. We hope shortly to be able to print constructional details of an Electric Clock.
We may be back soon

The Neeco family of Electrical Servants has been doing urgent war jobs, and you won't have seen them lately. But, they'll be back soon — all the better for their war-time experience — brighter, quicker, more dependable than ever. It will be a growing family too, there'll be many more members than the Neeco Electric Range, the Neeco Washer, Toaster and Jug shown here.

The NEECO family

Made by

THE NATIONAL ELECTRICAL
AND ENGINEERING COMPANY LIMITED
Branches All Main Centres.

PUZZLE CORNER

(By "Starlight")

Hang on to your seats, gentle readers! We actually received for service a Silver Marshall 34. This amused us somewhat, for we thought that these receivers, originally so rare in comparison with present-day conditions in New Zealand, were all defunct long ago. We were wrong, for here was one staring us in the face. These sets were class in their day, but they hardly measured up to even a modestly priced present-day receiver.

Who are we to criticize? So we got on to it. It was in a good state of preservation throughout, and the trouble was found to be a shorted screen grid by-pass condenser which, in turn, had caused a bleeder resistor to burn out. We replaced the pair of offenders and put the receiver on a shelf. We plan to have a serious talk with the owner of the set. He owns a very stately home, and we consider he should own a statelier radio.

We next had a trip round to a garage to unbolts a car radio whose complaint was intermittent reception. Firstly, we removed the lid — it may have been one of the tubes. However, this was not the case, and during our investigations we "jiggled" the P.M. speaker. Improvement one way and deterioration the other. A clue. The voice coil was grounded to one side of the chassis. Corrosion was noticed between part of the speaker frame and chassis. Therefore high resistance or an intermittent non-contact between frame and chassis would be very likely. Our ohmmeter proved this. We did a bit of bridging with metallic braid between the offending parts, and everything in the garden was lovely. We were pleased at getting out of it so lightly — it was a three-bolt job, and they are sometimes awkward, especially if the original installer was a bit of a bit and miles expert when it came to drilling three holes which should have been accurately placed, and not anyhow, as they usually are.

The above fault is also applicable to AC/DC receivers which use a similar method with their speakers.

A "frequency-skipper" always interests us, for we have found plenty of causes which introduce this bugbear. Our latest was prosaic. Two dual condensers — a 600 mmfd. mica and a .005 mmfd. paper. They caused a frequency shift of about 250 Kc up at the L.F. end of the dial. Our last job with this trouble was a slight case of tube trouble. The one before that, if our memory serves us at all well, was caused by an extraordinary collection of debris, possibly introduced, sub-chassis, by a mouse. Who can tell? The assurance of the owner that HE wasn't guilty led us to suspect a mouse, or even a rat. . . . He had a small son who looked capable of almost any crime, any how.

Radiotrons for RECEPTION

For sensitivity to weak signals, distortionless amplification, and clarity of speaker output, "Revalue with Radiotrons."

Radiotrons

The LONG-LIFE VALVE
N.Z. Distributors:

NATIONAL ELECTRICAL
AND ENGINEERING COMPANY LIMITED
BRANCHES ALL MAIN CENTRES.
PHOTOGRAPHIC RECORD

Three photographs were received from Ruhub A120, Australia—one taken at Mount Wellington, Hobart, one at Murray River, Mildura, and one at Port Arthur.

STAMP COLLECTION

We extend our thanks to the following Hobbes for their contribution to the Hobbes Club Stamp Collection:—

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A796 13546

OXFORD

RADIO AND CAR BATTERIES

FOR LONG LIFE

OSRAM LAMPS

LIGHT BRIGHTER LAST LONGER

15 WATT . . . 2/2
25 WATT . . . 2/2
40 WATT . . . 2/2
60 WATT . . . 2/3
75 WATT . . . 3/3
100 WATT . . . 4/-
150 WATT . . . 7/-
200 WATT . . . 10/3

In Standard Bayonet Cap or Screw-in Base.

Larger sizes for halls, etc., also available Stocked and recommended by—
THE LAMPHOUSE

MAGIC BOOKS TRICKS NOVELTIES Ventriloquism

Send 1/- Postal Note or 1/3 in Stamps for New Illustrated Catalogue No. 4 to—
STEWART'S STUDIO OF MAGIC
64 Manners Street WELLINGTON, C.I.

"Tarmag"

THE BATTERY TONIC.

The demand has gone up by leaps and bounds, enabling the manufacturers to reduce the price from 3/9 to 2/9.

TARMAG definitely improves all types of Accumulators. You can prove it for yourself. Get a battery which will not hold its charge, and treat it with TARMAG. You will be amazed at the effect.

Here is how it works—

In normal working conditions, all batteries form lead sulphates, which collect on the negative plates and between the plates. This sulphation gradually decreases the capacity of the battery and its properties of holding its charge. TARMAG effectively dissolves the sulphates and holds them permanently in the electrolyte, thereby reviving the capacity again to something like the capacity the battery had formerly.

Tried and recommended by the LAMPHOUSE.

Sufficient for 3 Cells (6 volt battery). Cat. No. RA70 . . . 2/9

2 Bottles required for a 12 volt battery.

The Electric Lamphouse Ltd.
11 MANNERS STREET, WELLINGTON, C.I.

PRICE LIST

NOVEMBER, 1945

All lines listed in our Price List are at present available from stock (subject to sales). Our terms of business are strictly "Cash With Order." We send freight free any goods purchased from us valued at £1 or over.

Buy with confidence under

"The Lamphouse Guarantee"

"Any goods which prove in any way unsuitable may be returned undamaged within seven days of receipt and your money will be refunded in full."
### ADAPTORS.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG102—Triple Parallel Plug Adaptors</td>
<td>10d.</td>
<td>Barrell type</td>
</tr>
<tr>
<td>RG104—Lamphouse 7 pin 2-way Adaptors</td>
<td>6/9</td>
<td></td>
</tr>
<tr>
<td>RG218—Single B.C. Light Adaptors</td>
<td>10d.</td>
<td></td>
</tr>
<tr>
<td>RG219—Miniature S.C. Motor Car Adaptors</td>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>RG212—Miniature D.C. Motor Car Lamp Adaptors</td>
<td>1/4</td>
<td></td>
</tr>
</tbody>
</table>

### AMPLIFIERS.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR850—“Victory Senior” Amplifier, 10 watt output, Ideal for Dance Hall, Public Meetings and small outdoor gatherings, 4 valves (without speaker)</td>
<td>11 12</td>
</tr>
<tr>
<td>RR852—“Victory Senior” Amplifier with Pre-amp. Stage. Same as above, but with two inputs, i.e., Microphone and Gramophone may be used together</td>
<td>13 12</td>
</tr>
</tbody>
</table>

Suitable Speaker for the above amplifiers is RS921 Rola F12 Speaker | 2 18 |

### BATTERIES.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA20—2v. 100 amp. Wet Radio Battery</td>
<td>1 17</td>
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<tr>
<td>RA22—2v. 140 amp. Wet Radio Battery</td>
<td>2 3</td>
</tr>
<tr>
<td>RA28—2v. 140 amp. Wet Radio Battery</td>
<td>4 7 10</td>
</tr>
<tr>
<td>RA26—6v. 160 amp Wet Radio Battery</td>
<td>5 6 2</td>
</tr>
<tr>
<td>RA26—6v. 160 amp Wet Radio Battery (squat)</td>
<td>6 3</td>
</tr>
<tr>
<td>RA26—6v. 13 Plate Motor Car Battery</td>
<td>3 19 6</td>
</tr>
<tr>
<td>RA42—6v. 13 Plate Motor Car Battery (squat)</td>
<td>3 19 6</td>
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### BATTERIES—Continued

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
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<tr>
<td>RA44—6v. 13 Plate Motor Car Battery</td>
<td>4 6 4</td>
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<tr>
<td>RA40—15 Plate Motor Car Battery</td>
<td>4 17 11</td>
</tr>
<tr>
<td>RA46—6v. 15 Plate Motor Car Battery</td>
<td>4 17 11</td>
</tr>
<tr>
<td>RA47—6v. 17 Plate Motor Car Battery</td>
<td>5 15 7</td>
</tr>
<tr>
<td>RA48—6v. 17 Plate Motor Car Battery (squat)</td>
<td>5 15 7</td>
</tr>
<tr>
<td>RA49—6v. 19 Plate Motor Car Battery</td>
<td>6 7 4</td>
</tr>
<tr>
<td>RA50—12v. Plate Motor Car Battery</td>
<td>5 19 3</td>
</tr>
<tr>
<td>RA51—12v. 9 Plate Motor Car Battery</td>
<td>6 7 4</td>
</tr>
<tr>
<td>RA52—12v. 11 Plate Motor Car Battery</td>
<td>8 0 3</td>
</tr>
<tr>
<td>RA53—12v. 11 Plate Motor Car Battery (squat)</td>
<td>8 0 3</td>
</tr>
<tr>
<td>RB42—45v. Everready (770) Super Dry Radio Battery, Heavy Duty</td>
<td>1 6 6</td>
</tr>
<tr>
<td>RB43—45v. Everready (772) Medium Duty Dry Radio Battery</td>
<td>1 1 9</td>
</tr>
<tr>
<td>RB44—45v. Everready (762) Portable Radio Battery</td>
<td>0 15 3</td>
</tr>
<tr>
<td>RB51—9v. Everready (773) C Battery</td>
<td>0 4 9</td>
</tr>
<tr>
<td>B39—6v. Everready Hotshot Battery</td>
<td>1 3 4</td>
</tr>
<tr>
<td>RB50—45v. Everready (711) C Radio Battery</td>
<td>0 3 6</td>
</tr>
<tr>
<td>RB51—45v. Everready (711) C Radio Battery</td>
<td>0 3 6</td>
</tr>
<tr>
<td>RB55—Everready (X150) Heavy Duty A. Radio Battery</td>
<td>5 11</td>
</tr>
<tr>
<td>RB56—15v. Everready (741) Medium Duty A. Radio Battery</td>
<td>0 9 9</td>
</tr>
<tr>
<td>RB57—15v. Everready (742) Portable A. Radio Battery</td>
<td>0 5 1</td>
</tr>
<tr>
<td>RB40—15v. Everready (No 6 A. Radio Battery</td>
<td>3 9/3</td>
</tr>
<tr>
<td>RB30—Everready Penlite (915) Torch Cells</td>
<td>8d. en.</td>
</tr>
<tr>
<td>RB31—Everready Standard (950) Torch Cells</td>
<td>8d. en.</td>
</tr>
<tr>
<td>RB32—Everready Baby (955) Torch Cells</td>
<td>8d. ea.</td>
</tr>
<tr>
<td>RB33—Everready Bijou (712) Torch Cells</td>
<td>10d. ea.</td>
</tr>
<tr>
<td>RB35—Everready Flat Torch Batt.</td>
<td>0 1 6</td>
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<tr>
<td>RB36—Everready Cycle Battery</td>
<td>1 0 6</td>
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### BATTERY CABLES.

<table>
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<th>Cat. No.</th>
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<tr>
<td>RW101—5-wire Battery Cable</td>
<td>Foot</td>
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### BURLS AND BELL MATERIAL.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
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<tbody>
<tr>
<td>RG13—“Vigilant” 3in. Bells N.Z. made</td>
<td>10/—</td>
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<tr>
<td>RG19—“Busy Bee” Bakelite Bells</td>
<td>7/—</td>
</tr>
<tr>
<td>Suitable Batters for above are: Bakelite, Dry Cells (2 necessary)</td>
<td></td>
</tr>
<tr>
<td>RB55—15v. Everready A Battery</td>
<td>3/3</td>
</tr>
<tr>
<td>RB56—15v. Everready C Battery</td>
<td>3/6</td>
</tr>
<tr>
<td>RG33—Heavy Duty “Golton” Bell Transformers</td>
<td>1 2 6</td>
</tr>
<tr>
<td>RS118—Insulated Bell Staples, per dozen</td>
<td>3d.</td>
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### BICYCLE LAMPS.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
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<tbody>
<tr>
<td>RT802—Bakelite English Cycle Lamps, complete with Globe and Battery</td>
<td>6 10</td>
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<tr>
<td>RT805—Metal Mundaw English Cycle Lamps, complete with Globe and Battery</td>
<td>7 10</td>
</tr>
</tbody>
</table>

### BLOCKS.

Wooden Blocks for mounting Switches, Plugs, Ceiling Plates, etc. N.Z. made. | 2 6 |

### BOOKS.

Per Copy | 6d. |

| RB10—“Lamphouse Circuit Book,” approx. 200 Radio Circuits, Amplifiers, Receivers, Tuners, etc. 80 pages | 2 6 |
THE LAMPHOUSE, 11 Manners Street, Wellington, C.1.

November 1, 1945. THE NEW ZEALAND RADIOGRAM

CHASSIS.
Cat. No. (Type) Each
RC1001 - Battery Chassis 15 in. x 7 in. x 2½ in. Punch holes; 5 coil holes, 2 electrolytic holes. Cadmium plated ... each 6/6

CHARGERS AND SPARES.
RA605 - 2 amp. Heavy Duty Supreme Battery Chargers 11 3 0
RA189 - 2 amp Tungar Charger Bulbs 1 18 6
RA190 - 6 amp Tungar Charger Bulbs 3 10 0
RA175 ½ amp Dry Rectifiers 1 7 6

CABINETS.
Cat. No. (Type) Each
RC181 - "Victoria" Speaker Cabinets. Inside measurements, 11 in. wide, 8½ in. high, 3½ in. deep. Outside meas., 11½ wide, 9 high, 6 deep. Walnut veneer 32/6

CABINS.
Per Copy s. d.
RB101 - "Lamphouse Instruction Course," An ideal Radio Course in fundamental theory. 48 pages 2 6
RB102 - "Radio Fundamentals Explained." Simple yet practical explanation of Radio principles. 70 pages (unshaded) 2 6
RB103 - "Lamphouse Data Book." A new addition to the Lamphouse Publications. Contain full of interesting facts and charts. A necessity in any Radio Library. 96 pages 3 6
Postage, etc., on above Books, 2d. copy.

CONDENSORS, ELECTROLYTIC.
Cat. No. (Type) Each
RC559 - 10mfd. 450v. Tubular Electrolytic 3 6
RC564 - 8mfd. Dry Tubular Electrolytic 5 9
RC565 - 16mfd. Dry Tubular Electrolytic 7 6
RC566 - 500mfd. 12v. Dry Tubular Electrolytic. In upright mounting metal cans 5 6
RC571 - 25mfd. 25v. Electrolytic 4 0

CONDENSERS, FIXED.
Cat. No. (Type) Each
RC637 - 5mfd. Generator Condensers 3 6
RC679 - 0001mfd. Mica Condensers 1 4
RC679A - 00015mfd. Mica Condensers 1 3
RC680 - 0002mfd. Mica Condensers 1 3
RC680A - 00025mfd. Mica Condensers 1 1

CLIPS.
Cat. No. (Type) Each
RC18 - Insulated Crocodile Clips 1 7
RC19 - Alligator Clips, Cadmium plated 8
RC20 - 5 amp. Crocodile Clips 6
RC21 - 1/25 amp. Crocodile Clips 1 0
RC22 - 30 amp. Battery Clips 9
RC23 - Spring Clip, for Glass Tubes 1 4
RC24 - Screen Grid Clips for Metal Valves 1
RT41 - Fahnsock Clips 3
RG512 - Paper Clips for Niply Lamps 1 0
RG514 - "Klipset" Buckle Cable Clips, used with flexible conduit 1
Per doz. 10
RF381 - Shade Clips. By using this clip an ordinary lampshade can be converted to fit a reading lamp without the use of a shade carrier 6
RF382 - Same as above, but sprayed cream 9

SPRING.
Cat. No. (Type) Each
RC682 - 0005mfd. Mica Condensers 1 7
RC692 - 00005mfd. Mica Condensers 1 6
RC693 - 1mfd. Manabridge block Condensers 9
RC694 - 25mfd. Manabridge Block Condensers 9
RC695 - 5mfd. Manabridge Block Condensers 9
RC705 - 001mfd. 600v. Tubular Condensers 1 1
RC706 - 002mfd. 600 Volt Tubular Condensers 1 2
RC709 - 005mfd. 600v. Tubular Condensers 1 1
RC711 - 01mfd. 600v. Tubular Condensers 1 1
RC712 - 02mfd. 600v. Tubular Condensers 1 6
RC713 - 05mfd. 600v. Tubular Condensers 1 7
RC714 - 1mfd. 600v. Tubular Condensers 1 10
RC715 - 25mfd. 600v. Tubular Condensers 2 3
RC716 - 5mfd. 600v. Tubular Condensers 3 6
THE NEW ZEALAND RADIOGRAM
November 1, 1945.

FLEX.

Cat. No. (Type) Per yd. s. d.
RW95—3 wire Workshop Flex ................................. 1 9
RW96—2 wire Workshop Flex ................................. 1 6
RW97—2 wire Rubber Covered Flex ............................ 1 5
RW200—3 wire Rubber Covered Flex .......................... 1 6
See WIRES.

FORMER COIL.

Cat. No. (Type) Per yd. s. d.
RF80—1in. x 6in. Coil Former .............................. 1 3
RF81—11in. x 6in. Coil Former ............................. 1 0
RF81a—11in. x 3in. Coil Former ............................ 0 9
RF87—11in. x 6in. Coil Former ............................. 2 3
RF86—2in. x 6in. Coil Former ............................... 1 6
RF86a—13amp. Pyrex Range Fuses .......................... 1 5
RF88—3in. x 5in. Coil Former ............................... 2 1

FUSES.

RG40—5amp. Range Fuses ...................................... 8 9
RG41—10amp. Range Fuses .................................... 8 9
RG42—15amp. Range Fuses .................................... 9 2
RG43—20amp. Range Fuses .................................... 9 2

INDICATOR PLATES.

Cat. No. (Type) Each. s. d.
RD33—Oblong Indicator Plates Marked 0-10 .......................... 2 0
RD34—Round Indicator Plates, marked 0-10 .......................... 2 8

INSULATING TAPE.

Cat. No. (Type) Each. s. d.
RS237—Small reel Insulating Tape 1 3
RS238—Large reel Insulating Tape 2 9

JACKS.

RJ8—Twin Tip Jacks, &d. ea. ................................. 1 2
RJ20—Single Tip Jacks (insulated), 1 1

HEADPHONE SPARES.

RC209—Headphone Cords ...................................... 4 0
RC288—Bakelite Ear Caps for Brandes Phones ................. 3 6
RC289—Diporphones for Brandes Phones ........................ 1 3
RT29—Soldierless Phone Tips ................................. 1 3

THE LAMPHOUSE, 11 Manners Street, Wellington, C.1.

LAMPS, ELECTRIC.

Cat. No. (Type) Each. s. d.
RL201—15 watt .................................................. 2 2
RL202—25 watt .................................................. 2 2

LAMPS, HOUSEHOLD.

OSRAM STANDARD VACUUM BULBS.

Clear and frosted 240v.

Low intensity, small consumption lamps for passages, halls, etc., where it is necessary to have a small lamp burning over a long period.

Cat. No. (Type) Each. s. d.
RL215—40 watt .................................................. 2 2
RL216—60 watt .................................................. 2 2
RL217—75 watt .................................................. 3 3
RL218—100 watt .................................................. 4 0
RL219—150 watt .................................................. 7 0
RL220—200 watt .................................................. 10 0

The same type outlined above, but using the Edison Screw (E/S standard screw base).

Cat. No. (Type) Each. s. d.
RL600—15 watt .................................................. 2 2
RL601—25 watt .................................................. 2 2
RL602—40 watt .................................................. 2 2
RL603—60 watt .................................................. 2 3
RL604—75 watt .................................................. 3 1
RL605—100 watt .................................................. 4 0
RL606—150 watt .................................................. 7 0
RL607—200 watt .................................................. 10 3
RL608—300 watt .................................................. 1 5

OSRAM GAS-FILLED CLEAR BULBS.

Cat. No. (Type) Each. s. d.
RL211—300 watt .................................................. 14 6
RL212—500 watt .................................................. 20 9
RL180—1000 watt .................................................. 33 3

Special G.E.S. large screw base.

OSRAM GAS-FILLED 110 VOLT LAMPS.

Low voltage globes as used on ships. Several districts not converted to the 240 volt supply still use this voltage. Available in B/C or E/S base.

110 VOLTS

Cat. No. (Type) Each. s. d.
RL580—15 watt .................................................. 2 2
RL581—25 watt .................................................. 2 2
RL582—40 watt .................................................. 2 2
RL583—60 watt .................................................. 2 3
RL584—75 watt .................................................. 3 3
RL585—100 watt .................................................. 4 0
RL586—150 watt .................................................. 7 0
RL587—200 watt .................................................. 10 3

110 VOLTS—Special G.E.S. Base.

Cat. No. (Type) Each. s. d.
RL588—300 watt .................................................. 14 6
RL589—500 watt .................................................. 20 9
RL589—500 watt .................................................. 20 9
RL590—1000 watt .................................................. 33 3

THE LAMPHOUSE, 11 Manners Street, Wellington, C.1.
THE NEW ZEALAND RADIOGRAM November 1, 1945.

POTENTIOMETERS.

Cat. No. (Type) Each a d.
RP24—10,000 ohm Wire-wound Potentiometer 6 9
RP25—25,000 ohm Wire-wound Potentiometer 6 9
RP51—50,000 ohm Carbon Potentiometer 6 9
RP52—100,000 ohm Carbon Potentiometer 6 9
RP53—250,000 ohm Carbon Potentiometer 6 9
RP54—500,000 ohm Carbon Potentiometer 6 9
RP55—1 megohm Carbon Potentiometer 6 9
RP56—2 megohm Carbon Potentiometer 6 9
RP64—500,000 ohm Carbon Potentiometer, with switch 5 6
RP31—1000 ohm Wire-wound Potentiometer 8 3
RP32—2500 ohm Wire-wound Potentiometer 9 6
RP33—5000 ohm Wire-wound Potentiometer 9 6
RP34—10,000 ohm Wire-wound Potentiometer 9 6

REECTIFIERS.

RA175—5amp Dry Rectifiers 1 7 6
RA189—2amp Bulb Rectifiers 1 8 6
RA190—6amp Bulb Rectifiers 3 10 0
RA13—1m. 6-5mA. Meter Rectifiers 1 9 6

RESISTORS.

PRACTICALLY ALL SIZES OF 1/4 AND 1/2 WATT AT PRESENT AVAILABLE.
1/4, 1/2 watt 0 8 9

SCREWS, WOOD.

Counter Sunk Heads, Gimlet Points.

Cat. No. (Type) Each a d.
RT470—1in. x 1g. Bright Mild Steel 2 3
RT471—1in. x 2g. Bright Mild Steel 2 3
RT472—1in. x 3g. Bright Mild Steel 2 3
RT473—2in. x 1g. Bright Mild Steel 2 3
RT474—1in. x 2g. Bright Mild Steel 2 3
RT475—1in. x 4g. Bright Mild Steel 2 3
RT476—2in. x 6g. Bright Mild Steel 2 3
RT477—2in. x 8g. Bright Mild steel 2 3
RT478—2in. x 6g. Bright Mild steel 2 3
RT480—1in. x 8g. Bright Mild steel 2 3
RT481—1in. x 8g. Bright Mild steel 2 3
RT482—1in. x 10g. Bright Mild steel 2 3
RT483—1in. x 10g. Bright Mild steel 2 3
RT484—1in. x 10g. Bright Mild steel 2 3
RT485—1in. x 10g. Bright Mild steel 2 3
RT486—1in. x 10g. Bright Mild steel 2 3
RT487—1in. x 10g. Bright Mild steel 2 3
RT488—1in. x 10g. Bright Mild steel 2 3
RT489—1in. x 10g. Bright Mild steel 2 3
RT490—1in. x 10g. Bright Mild steel 2 3
RT491—1in. x 10g. Bright Mild steel 2 3
RT492—1in. x 10g. Bright Mild steel 2 3
RT493—1in. x 10g. Bright Mild steel 2 3
RT494—1in. x 10g. Bright Mild steel 2 3
RT495—1in. x 10g. Bright Mild steel 2 3
RT496—1in. x 10g. Bright Mild steel 2 3
RT497—1in. x 10g. Bright Mild steel 2 3
RT498—1in. x 10g. Bright Mild steel 2 3
RT499—1in. x 10g. Bright Mild steel 2 3
RT500—1in. x 10g. Bright Mild steel 2 3

SHIELDS.

Cat. No. (Type) Each a d.
RS20—Goat Valve Shields 2 4
RG17—3-pin Brown Plush Plug Bases 2 4
RG18—5-pin Ivory Ditto 2 9

SOCKETS, ELECTRICAL.

RG86—T-pin 15 amp. Wall-plug bases 2 3
RG96—10/15 amp. 3-pin Wall-plug bases 1 10

SOCKETS, RADIO.

Cat. No. (Type) Each a d.
RS61—4-pin Chassis sockets 8
RS65—4-pin Chassis sockets 8
RS66—6-pin Chassis sockets 8
RS619—Amphenol 8-pin Chassis sockets 8
RS631—Amphenol sockets with special baseboard mounting shell 2 6
RS64—Octal Amphenol socket, as above 2 6
RS631—4-pin Wafer Sockets, 8d. 8
RS632—3-pin Wafer Sockets, 8d. 8
RS633—6-pin Wafer Sockets, 8d. 8
RS634—Octal Wafer Sockets, 8d. 8
RS636—Loctal Wafer Sockets 1 2
RS637—Midget Button-valve Sockets, as used with Midget tubes 1 7
RS638—P. Valve Sockets (Philips) 1 7

SPARES.

GLORIA PERMANENT WAVING MACHINE SPARES.

Cat. No. (Type) Each a d.
RE106—Heating Clamps 4 5
RE107—Heating Rods 4 5
RE108—2oz. Bottles Waving Solution 3 3
RE109—1oz. Bottles Waving Solution 1 9
RE110—2oz. Bottles Setting Solution 1 0 9
RE111—1oz. Bottles Setting Solution 5 6
RE112—Dampers 4 4
RE113—Winders 5 0
RE114—Rubber Pads 5 0

IRON SPARES.

RE508—Fitzall Iron Elements 3 9
RE509A—Fitzall Iron Elements (Nico Brand) 7 0
RE504—Fitzall Iron Elements 110 volts, 8/8
RE511—Self-tapping Screw Drills, in way Iron Elements, 14/7

THE LAMPHOUSE, 11 Manners Street, Wellington, C.1.
### SOLDERING MATERIAL AND SPARES—Continued.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS394—&quot;Speedee&quot; Light Duty Soldering Irons</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>RS406—&quot;Speedee&quot; Light Duty Soldering Irons</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>RS407—Spare Elements for above</td>
<td>2oz. tin</td>
<td>5</td>
</tr>
<tr>
<td>RS408—Copper Bit for above</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>RS409—Element Cover for above</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

### SWITCHES, ELECTRICAL—Continued.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG118—Miniature switches for low voltage circuits, coloured bakelite, 2/3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>RG18A—Ditto, chrome plated</td>
<td>2/3</td>
<td>1</td>
</tr>
<tr>
<td>RG119—5 amp. Insulated Wall Switches, 1/11</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

### SWITCHES, RADIO.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS438—Telen 4-point P.P. Switches</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>RS439—P.P. Battery Switches, S.P.</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>RS443—S.P.D.T. Toggle Switches</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>RS444—S.P.D.T. Toggle Switches</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>RS445—S.P. On-Off Switches</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>RS450—S.P.D.T. Knife Switches</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

### SWITCH PLATES.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG182—Brown Bakelite, for 1 switch</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>RG193—Brown Bakelite, for 1 plug</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RG183—Brown Bakelite, for switches</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>RG185—Brown Bakelite, for 1 switch and 1 plug</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>RG186—Ivory Bakelite, classic type, for 1 switch</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>RG187—Ivory Bakelite, classic type, for 2 switches</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>RG189—Ivory Bakelite, classic type, for 1 switch and 1 plug</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>RG194—Brown Bakelite, for 1 switch, classic type</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>RG195—Brown Bakelite, for 1 switch and 1 plug, classic type</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>RG196—Brown Bakelite, for 2 switches, classic type</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

### TERMS.

<table>
<thead>
<tr>
<th>Cat. No. (Type)</th>
<th>Each.</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT2—Two-way Terminal Strips Each 2d.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>RT41—Fahnestock Clips, each 3d.</td>
<td>2/3</td>
<td>1</td>
</tr>
<tr>
<td>RT2—Small Pear Soldering Lugs, Doz. 3d.</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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**THE LAMPHOUSE, 11 Manners Street, Wellington, C.1.**
TEST EQUIPMENT

RM10—0–1 M.A. Meters Used but in excellent condition 2196
RM6—Telson Triple Range Meters 170
RM50—Meter Fuses 9
RM13—1M. 0–1 M.A. Meter Reckangers 196
RM12—20–6–20 Car Meters 156
RM1—Test Prods 70
RM7—Pifco Test Prods 150

PANELS FOR METERS—(See Panels)

TRANSFORMERS.

Cat. No. (Type) Each
RE650—6.3 v. 60 M.A. Power Transformer 81/19/6
RE651—6.3v. 100 M.A. Power Transformer 82/1/0
RE652—6.3v. 150 M.A. Power Transformer 82/19/6
RE653—2.5v. 60 M.A. Power Transformer 82/19/6

TRANSFORMERS, SPEAKER.

Cat. No. (Type) Each
RE714—Single Pentode Speaker Transformers 101
RE715—Push Pull Pentode Speaker Transformers 128
RE716—Single Triode Speaker Transformers 128
RE717—Push Pull Triode Speaker Transformers 128
RE730—Speaker Transformer Coils, Single Pentode 610
RE731—Speaker Transformer Coils, Single Triode 76
RE732—Speaker Transformer Coils, Push Pull Pentode 76
RE733—Speaker Transformer Coils, Push Pull Triode 76
RE705—Rola Speaker Transformers, 10,000 C.T. 186
RE706—Rola Speaker Transformers, 7,000 180

TOASTER, SPARES.

Cat. No. (Type) Each
RE622—Electroway Toaster Elements 76
RE620—Coloured Trays for Speebee "Hostess" Toasters (Drilled) 39
RE614—Ditto (Plain) 211
RE719—Coloured Trays for Speebee "Tiffin" Toasters 76
RE941—Spares Racks for above 6
RE946—Moulded Cord Graps for Speaker Toasters Pair 5
RE918—Spares Knobs for Speebee Toasters 3
RE919—Spares Knobs for "Tiffin" Toasters 3
RE945—Spares Springs for Speebee Toasters 3
RE949—Spares Springs for "Tiffin" Toasters 3
RE942—Spares Moulded Plywaths for Plain Toasters Pair 28

VACUUM CLEANER SPARES.

RE238—Carbon Brushes 16
RE239—Springs for Carbon Brushes 10

VACUUM CLEANER REPAIRS.

We undertake the repairs on all makes of Vacuum Cleaners. However, when an armature or field coils is rewound the time taken on repairs is usually in the vicinety of 6 to 8 weeks. Minor repairs can be effected in approximately two weeks. Armature Rewinds: Approx. 1919s. 6d. Field Coil Rewinds: Approx. 5s. 6d.

WELDER, SPARES.

RE9—Carbon Electrodes 26
RE13—Brass Electrodes 6
RE14—Steel Electrodes 6
RE15—Packets Flux 6

GENERAL.

RU1—Electroshine, For silver finishing any metal object 23
RU1—Model Steam Engine 1176
RU4—Magnets 6
RU6—Model Kittyhawk Planes, Seats 20
RU7—Ditto, Cream Bakelite 46
RU140—K.W.H. Counters 26
RU151—3 in. Oiler 1104
RU156—New Grip Cement, Mends anything Tube 17
RU158—Rubber Solution 1 tube 10

WINCHARGERS.

Solve your battery charging and lighting worries with a Wincharger. The ideal installation for farms, baches, etc. Supplied complete.

Cat. No. (Type) Each
RA260—6v. De Luxe Model 234
RA267—12v. De Luxe Model 3917

WIRE—Continued.

Cat. No. (Type) Each
RW74—40 gauge Tin plated Copper Wire, approx. 2 lb. reels 180
RW78—7/029 V.I.R. Cable 1 Yard 08

WIRED—Continued.

Cat. No. (Type) Each
RW117—60S. Cls 20 gauge D.C.C. Wire, Makes excellent bell wire 26
RW156—Connectore Stranded Push Back Wire 101
RW157—Connectore Solid Push Back Wire 101
RW158—Shielded Grid Wire, Per ft. 54
RW159—Remote Connecting Wire. Assorted colours, Per foot 13
RW160—Single Shielded Microphone Cable, Per ft. 13
RW161—Raising Wire, excellent lead in 104
RW162—Twin Shielded Microphone Cable, Per ft. 193
RW97—2-core Cattybe Rubber Flex 14
RW203—3-core Cattybe Rubber Flex 14
RW847—4lb. Reels 24 gauge Nich. rone Wire 129
RW848—4lb. Reels 26 gauge Nich. rone Wire 150

THE LAMPHOUSE, 11 Manners Street, Wellington, C.I.