

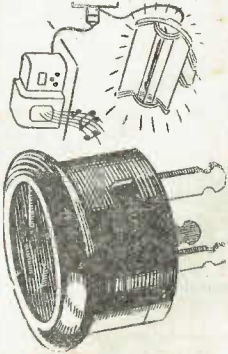
THE ELECTRIC LAMP HOUSE LTD.
11 MANNERS STREET, WELLINGTON.

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2
WELLINGTON, N.Z.
PERMIT No. 270

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Single Pole Double Throw Aerial-Earth Switches. Bakelite base. British. Cat. No. RS490

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Two-way Bakelite Light Adaptors, with switch Cat. No. RG220

6/6

THE LAMPHOUSE

11 Manners St., Wellington, C.1

6^D

The New Zealand
RADIOGRAM

Volume 12, No. 11. WELLINGTON, N.Z. NOVEMBER 1, 1945.
(Registered as a Newspaper). Published in Wellington on the first day of every month.

New Zealand Radio History

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

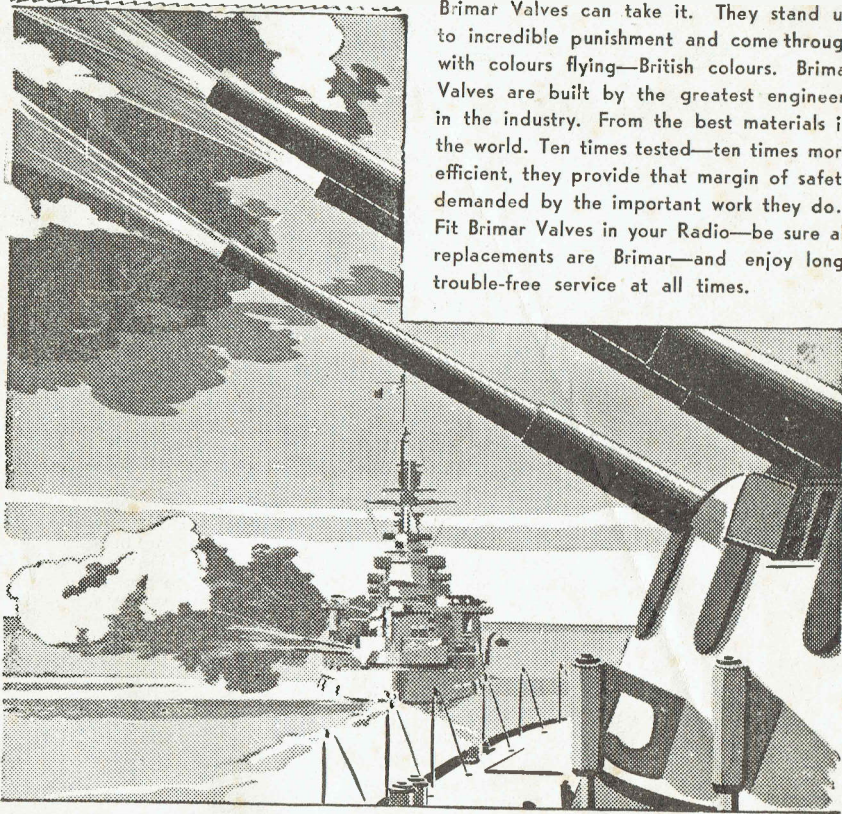
MANY of the listeners of today take the Radio as a matter of fact and never stop to think of the early pioneers. My first contact with Wireless, as it was then called, was in Balclutha in the year 1914, and as I was then in short pants the massive spark coil and its huge sparks were always attractive. Mr. Gerald Aitken and his brothers were always making some electrical equipment, and as I lived beside them I saw many wonderful pieces of apparatus. The start of the World War 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 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 programme 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 slung 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 300 watts. Mr. F. O'Neill also had a station in Moray Place, but on the north 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 called 4YB 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 4ZW, 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 flash polished cabinet. I also had quite some contact with wireless with Pro-

(Continued on page 8)

BRIMAR VALVES

CAN 'TAKE' IT



Shattering jar of mammoth guns . . . pounding crash of giant seas . . . yet Brimar Valves can take it. They stand up to incredible punishment and come through with colours flying—British colours. Brimar Valves are built by the greatest engineers in the industry. From the best materials in the world. Ten times tested—ten times more efficient, they provide that margin of safety demanded by the important work they do. Fit Brimar Valves in your Radio—be sure all replacements are Brimar—and enjoy long, trouble-free service at all times.

OBTAINABLE FROM ALL RADIO DEALERS.

Standard Telephones and Cables Pty. Ltd., C.P.O. Box 638, Wellington; P.O. Box 982, Christchurch; P.O. Box 362, Wanganui; Electric Lamphouse Ltd., 11 Manners Street, Wellington; Mr. G. E. Tyler, Napier; Swan Electric Co. Ltd., P.O. Box 307, Auckland.

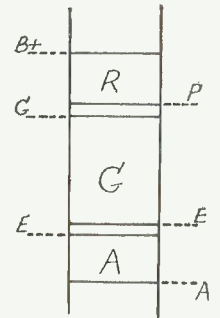
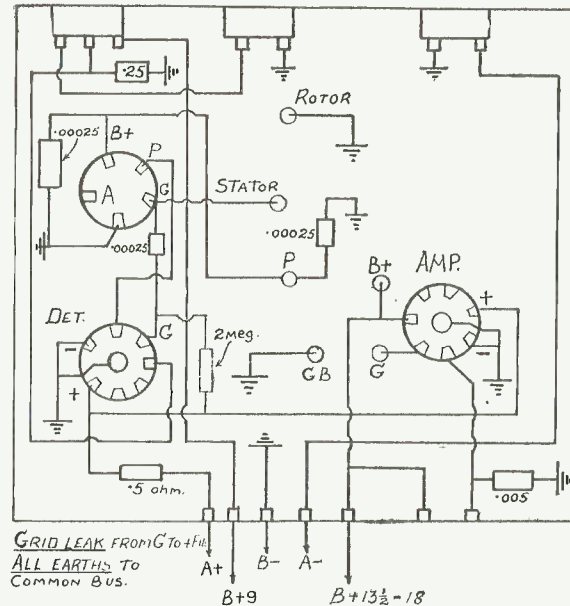
THE DOUBLE 1S4

By F. H. ADAMS.

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 are 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 impedance of the speaker transformer is not critical, and either 7000 or



COIL CONNECTIONS

Position of A and R may be reversed—Preferred design is shown.

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 13½ volts for the plates and the amplifier screen, and 9 volts for the detector screen.

CIRCUIT.

The first 1S4 operates 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 .7 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.

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 with instructions. To ensure inclusion, your instructions should be received by us on the 15th of the month preceding date of publication. Advertisements addressed c/o "Radiogram" or "Lamphouse" can not be accepted. Address instructions to "The Radiogram," 11 Manners Street, Wellington, C.1

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

FOR SALE—24A Valve, good condition. I. MacDonald, 79 Hamilton Road, Wellington.

FOR SALE—1 pair brand new Headphones at 27/-. Write W. Chee, Kaikoura.

FOR SALE—Electric Gramophone, Radio Parts, Books. Bargain. Jones, Box 423, Wanganui.

FOR SALE—Palec 230v. A.C. All-wave Oscillator, as new. What offers? W. Kehely, c/o Hasties, Cambridge.

FOR SALE—Parker Blue Diamond Vacuum Pen (Blue), 90/-. R. Keely, 57 Church Street, Devonport, Auckland.

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

FOR SALE—Two Hiker's One Sets, 33 valves, Batteries, less 'phones, £2/15/- each, posted. G. Carlson, Otane, H.B.

FOR SALE—Lighting Plants, 12, 32, 110 and 230 volt. Cyril Caddigan, 36 Hekonui Rd., Otahuhu, Auckland, S.E.7.

FOR SALE—Tricklecharger, 1 amp, as new, £4. 10-watt Amplifier, valves new, £14. McLaughlin, Te Pai, R.D. Mata-mata.

FOR SALE or Exchange for Small Gramophone—Hiker's One Radio. Write Mr. L. 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. Roskill, Auckland.

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

FOR SALE—One small 2 base Accordion, good condition, £4, nearest offer. Apply C. D. Williams, Boys' High School, New Plymouth.

FOR SALE—Hiker's Two, in cabinet, complete Headphones, Batteries, Aero Dial. As new, £4/10/-. K. Hyland, Thornton R.D., Whakatane.

FOR SALE—Dual Wave Hiker's Two, no 'phones, complete valves and Phillips' 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 on Art of Ju-Jitsu and new or good condition 49 valve. Willie Chee, Kaikoura.

FOR SALE—Dual-wave Octal Hiker's Two. Just made. Complete with Batteries and a pair of Brandes B.B.C. 'phones. £4/5/-. Write B. Crowley, 10 Wallace Place, New Plymouth.

FOR SALE—Hallcrafters Sky Champion, model S20; Communications Receiver, 8 valve; also 12in. Celestion Speaker. Price £80. Apply Rahob 4360, R. Vincent, 22, Rophia St., Fitzroy, New Plymouth.

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

FOR SALE—Magnavox Sin. Electro-Dynamic Speaker; 2000 ohm field (just rewound), good order, 24/6. Valves practically new. 6A8G, 6J8G, 6G8G, 6J7G, 6V6G. £2/10/- lot. K. Hyland, Thornton R.D., Whakatane.

FOR SALE—Stirling's Radio Manual, 3rd edition, £1. Radio Handbook, 1944, 6/6. Bronze Jeweller's Lathe, adjustable tool holder, £4/10/-, worth £10. Back numbers Radio Craft, 9d. each. A. Lemin, Milton Road, Greymouth.

FOR SALE—6F7, 6A8, 1F6, 1C6, 49, 10/- each; 6F6, 5/-; 27S, 4/-; 240-120 v. Stepdown, 25/- and £1. 400v. 150 M.A. 6.3 v. Transformer, £2/10/-. Electric Motor, pickup, H.M.V. offer; .0005 Variable Condensers, 5/-; Junk Box, 30/-. Freight forward. Write Rahob 12898, 4 Johnson's Ave., Frankton Junction.

SMALL ADVERTISEMENTS.—Continued

TO SELL—Electric DX Unit 5 valves, set of 4 coils, 230-110V. step-down transformer, less Earphones, £10 or nearest offer. H. A. Scott, 30 Waterloo Road, Lower Hutt.

WANTED—Small, cheap Box Camera, with film if possible. R. Kidson, Ohaupo.

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

REPAIRS to Meters, Valve Testers, etc.—Write or send your tester for quotation. 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.

LAMPHOUSE DATA BOOK—96 pages, crammed full of facts, figures and tables. The Radioman's Ready Reference. Get your copy now. 3/6, 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 and Smith, Radio and Sound Specialists, Box 221, Wanganui.

AT LAST!—Radios that weigh only 9lbs. In four colours—ivory, red, green, brown. Plastic cabinets, 9½in. x 6½in., with 5 latest type single-ended tubes. Fully guaranteed. Write, sending stamped addressed envelope, for price, particulars, etc., to Walker & Smith, Radio and Sound Specialists, Box 221, Wanganui.

WANTED TO SELL—Two 8-inch Speakers, 2500 ohm fields, single or push-pull pentode, 15/- and 25/-, in good condition. One set of pipe stocks and dies and vice, ½ inch, ¾ inch, 1 inch, as new. £2/10/-. S. Turner, Romilly St., Westport.

VALVES FOR SALE, new—Four 6F7's, four 41's, two 6J5's, three 6K6's, one each 6SC7, 12SK7, 12J5, 12A6, 12SR7, 16Z9; some with seals intact; about half price, or £5 the lot. Also 5-valve set Dual Wave, as new, with Sin. E.M. Speaker, as new, less cabinet, £15. W. H. Scott, 14 Sentinel Road, Herne Bay, Auckland.

"RADIO Fundamentals Explained," a book published by Druleigh College. Reduced price, 2/6, postage 3d. extra. Order from The Lamphouse.

"RADIO-CRAFT" — "Radio and Television" and all overseas publications can be obtained for Rahobs. Write for particulars of subscription rates to Barnes & Co., Boulcott Terrace, Wellington.

RADIO SERVICEMEN'S EXAMINATION

MacKenzie's Engineering Academy specialises in coaching prospective candidates for the above examination by correspondence or by Class tuition.

Write or call for particulars.

23 AITKEN STREET, WELLINGTON

PERSONALISED RADIO TUITION.

Specially written courses of Home Study tuition for all radio exams. Each student taken individually by highly qualified practical experts. Success assured. Special course of Radio Fundamentals, £6. For free particulars all instruction, write Druleigh Radio College, Box 1225, Auckland, today!

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Published Monthly by A. G. HULL.

Devoted exclusively to Technical Radio.

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KEEPING STEP WITH RADIO PROGRESS

The purpose of the I.C.S. Radio Courses is to prepare men for success in the various branches of radio reception work and to satisfy the demand of the radio industry for technically trained men.

Write to-day for free descriptive booklet—it will not place you under any obligation.

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 since about 1920, and he gave the small number of Radio listeners the thrill of hearing speech and music for the first time. My first impression of the Professor's gear was that somebody had run wild with many coils of wire and spare parts, as the long bench was, to put it mildly, just covered with apparatus. In the years following the receivers and transmitters improved and the hours of transmissions increased to being quite a form of interesting entertainment. In 1925 I had the thrill of installing a Fada 8 valve receiver, and it was a great set, and many good stations were received on it in Dunedin. In 1927 I was on the installation of the Radio gear in the Wellington Public Hospital, and many were the problems that had to be overcome, such as the interference from the X-ray and the local generating set and the balancing of the various circuits. During the following years the Radio was improving, and the first Wellington Radio Exhibition was a great success and many very nice receivers were in evidence. Quite a long stride from the first set advertised for sale in America in early 1905, known as the Telimco Wireless Telegraph Outfit, in the form of spark coil and coherer receiver, at the price of \$7.50, and later at an increase to \$10. During these years I had been building various types of receivers and thought it was great fun to hear the overseas stations. In 1932 I joined the staff of H. Nimmo and Sons, Ltd., Wellington, on the radio service and electrical maintenance, and during my three years there 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 a few facts of the early history 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 both on phone and Morse, Frank Bell using the call 4AA, Jack Orbell as 3AA, I. O'Meara as 2AC, P. Stevens as 2AD, Bob Patty as 2AE, Max Davies and Norman Edwards in Auckland with 1AA. These stations were all home-made and using small power, but were the forerunners of broadcasting as it is today.

1922.—The first organised transmitting station started in Auckland by Doug. Shepherd, using the large power of 5 watts, and at Wellington Charlie For-

rest 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. These names will be well known to Auckland Radio men of today. Their transmitter was in Scott's Hall, and they put over a very notable transmission of the general election in December, 1922.

1922 — AUCKLAND INCREASED POWER.

1923.—The following now had increased, and there was a definite need for some alternative programmes, so the first 1YA was started on April 13th (using 4 k.w.) by the Radio Service Company, as an improvement on their first set. The Rev. Jasper Calder was on deck and still is very active on the air from 1ZB.

April 21st: Station 4YB, Dunedin, started, using 500 watts power—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., Sat., and alternate Sundays.

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

Wanganui came to light with the station 2AH, run by the Wireless Club on Tuesday and Saturday.

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

Wellington was to the fore with two stations, using the calls 2YB and 2YM, operated by the Wellington Broadcasters on Monday and Friday, and the Dominion Radio Company, Tuesday, 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 at all possible, and were then, as now, the Radio experimenters or "Hams," as they are called? These so-called Hams or cranks have been the means of all the big advancements and long-distance transmissions, using only small rigs and power, mostly home-made and often very crude.

1924—The year of "Miracles."

First contact with overseas stations was made on May 30, 1924. 2AC worked the Argentine station RCBS, operated by Senor Carlos Braggio. This was soon followed by others contacting RCBS, and the greatest thrill was yet to come in the form of a contact with the United States by Station Z4AA with

Frank Bell at the helm. This was sure going places, and it opened up yet another channel for the so-called "Hams" on the night of September 21st, 1924. From then on these wizards of the air collected many foreign countries on their two-way contacts.

All these contacts were on the wavelength of 90 metres and using low power. In such a short time space had parted and distance had just ceased to be any handicap; and on the 18th of October, 1924, Frank Bell excelled all his previous coups and worked two-way with an English station worked by Cecil Goyder, of London, using the call sign G2SZ (who later was chief engineer for All India in Delhi).

This marked the beginning of real overseas reception, and the ranks of listeners were gradually increasing, the number being as high as 2000; and on July 18th, 1925, the Government arranged with Mr. Harris and Mr. Goodfellow 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 the farmers the necessary reports on conditions relative to farming. At this time many of the factories in his district were being electrified, and under the control of Mr. A. R. Harris, who also was connected with the Dairy Co. Mr. A. R. Harris went to Australia to procure further data and put in a report. This was duly filled in, and such were the outstanding points in favour that an application was made to 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 was given the order to supply and erect a 500-watt station. The operating costs were to be collected by making the service a co-operative one and a small fee charged. This proposal was withdrawn, and the idea was to put all stations under one control, but this did not eventuate, and so in 1925 negotiations were again opened.

On August 22nd the Radio Broadcasting Company was formed and arrangements were made to erect two 500-watt stations, one at Auckland and one at Christchurch for music transmissions. More stations were to be erected as they were wanted at places to be arranged.

During all this time the number of listeners was gradually increasing, and when the Broadcasting Co. was formed the number topped some 2000, but within six years this had risen to some 66,000. Also 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 follows:—

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

(b) A nation-wide service has been created, designed to cater for all sections of the community, and created a service more than four times that required under its licence, as to hours of transmission.

(c) Listeners increased from 3000 to over 66,000.

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

2. The Company has provided programmes of the widest diversity and acceptability by:—

(a) Organising, classifying and utilising all available talent in the Dominion. Over 40,000 individual contracts with artists have been completed without a single misunderstanding.

(b) Presented the leading artists of the world by means of recordings.

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

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

(e) Assembling a musical library, comprising 16,000 items, many unobtainable in New Zealand.

3. It has broadcast events of local, national and Imperial significance by means of relays and rebroadcasts, and has freely co-operated with local organisations in aiding the propagation of anything of public welfare.

4. The appointment of 32 official listeners' and 14 public committees, which bring to the service of broadcasting the specialised knowledge of leading citizens, representative of a wide range of listeners' interests.

These committees make recommendations to the company with regard to:—

(a) Entertainment, music, drama and sport.

(b) Church services and broadcasts of religious nature.

(c) Children's work.

(d) Service to primary producers.

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

(To be continued next month.)

COMPLETE LIST OF AUSTRALIAN SHORT WAVE TRANSMITTERS, POWERS AND SCHEDULES

(By Your DX Advisor.)

Call.	Kilo-cycles.	Power in Watts.	Schedule.
VLC-4	15315	50,000	10.30 a.m.-12.15 p.m., 1.55-2.45 p.m. 3 p.m.-5 p.m., 5.10-5.45 p.m.
VLA-6	15200	100,000	3.15-4 p.m., 5.10-5.45 p.m., 6.55-7.25 p.m., 9 p.m.-11.15 p.m.
VLG-7	15160	10,000	8.45 a.m.-10 a.m. (Sun. to 10.15 a.m.), 11.15 a.m.-12.15 p.m.
VLR-3	11880	2,000	9.20 a.m.-noon, 1.45 p.m.-7.45 p.m.
VLG-5	11880	10,000	4.15 a.m.-4.45 a.m.
VLG-4	11840	10,000	5.10 p.m.-5.40 p.m., midnight-2.00 a.m., 3.00 a.m.-3.45 a.m.
VLC-7	11840	50,000	6.00 p.m.-6.40 p.m.
VLW-3	11830	2,000	3.30 p.m.-10.15 p.m.
VLA-4	11770	100,000	10.30 a.m.-12.15 p.m., 1.55 p.m.-2.45 p.m., midnight-12.30 a.m.
VLG-10	11760	10,000	8.10 p.m.-8.55 p.m., 9.00 p.m.-11.45 p.m.
VLG-3	11710	10,000	1.55 p.m.-2.45 p.m., 3.00 p.m.-4.00 p.m. (Sundays to 4.30 p.m.), 6.00-6.40 p.m., 6.55 p.m.-7.25 p.m., 7.30 p.m.-7.55 p.m.
VLC-2	9680	50,000	7.30 p.m.-8.45 p.m., 4.15 a.m.-4.45 p.m.
VLQ-3	9660	10,000	1.45 p.m.-7.15 p.m.
VLC-6	9615	50,000	9 p.m.-9.45 p.m., 1.00 a.m.-2.45 a.m., 3.00 a.m.-3.45 a.m.
VLG	9580	10,000	2.15 a.m.-2.30 a.m., 2.35 a.m.-2.45 a.m.
VLR	9580	2,000	8.00 a.m.-9.00 a.m., 8.00 p.m.-1.30 a.m. To 2 a.m. Sundays: 8.00 a.m.-1.30 a.m. Sundays.
VLC-5	9540	50,000	Midnight-12.45 a.m.
VLW-7	9520	2,000	10 a.m.-1.45 p.m., 10.30 p.m.-3.30 a.m.
VLA	7280	100,000	1.35 a.m.-2.30 a.m., 2.55 a.m.-3 a.m., 4.15 a.m.-4.30 p.m.
VLQ	7240	10,000	8 a.m.-12.10 p.m.
VLQ2	7215	10,000	7.30 p.m.-1.30 a.m.

AIR MAIL SCHEDULES FROM RADIO BRAZZAVILLE

Times.	Main Transmitter, 50,000 watts.	6000 watts.	600 watts.
5 p.m.	11970 beamed to France	9940kes to France	17527kc to Far East
9.45 p.m.	15595kes. beamed to Syria	11970kes to France	17527kc to France
10.30 p.m. to 1 a.m.		11970kes to Far East	17527kc to South America
4 a.m.-10 a.m.	9440kes to France	11970kes to South America	(Silent)
10 a.m. - 11.45 a.m.	9440kes. to North America	11970kes to North America	(Silent)
11.45 a.m. - 1 p.m.	9440kes. to South America	11970kes to North America	(Silent)

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 6J5G oscillator is coupled to it by means of the suppressor-injection method. The output of the 6J7 is fed into the I.F. transformer, which, in turn, is connected to the pentode section of the 6F7 dual-purpose tube. After amplification, the signal is led into another I.F. transformer and thence to the triode section of a 6F7 tube which acts as a second detector. After rectification, the signal is then handled by the 6J5G or 6C5 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 a 6K6G pentode, or this tube may follow the 6J5G or 6C5, 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.

6.3v. A/C. or 6v. accumulator.

"B" Supply.

Batteries, vibrator power-pack or an 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.

1st Det.		
L2 (grid.)	L5 (aerial)	L8 (grid.)
30T tapped	7T	30T tapped
At 9T		At 9T
No. 1 set.		
L3 (grid.)	L6 (aerial)	L9 (grid.)
12T tapped	4½T	12T tapped
At 5T		At 5T
No. 2 set.		
L1 (grid.)	L4 (aerial)	L7 (grid.)
7½T tapped	2½T	7½T tapped
At 3T.		At 3T
No. 3 set.		

Coils are closewound on sections of 1½in. 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 1st detector coil, are separated from this coil by ½in., but this distance is later adjusted to suit requirements once the receiver is operating. Then the coils are treated with Insuvan to finally fix them into place, as the windings must be rigid once the coils are completed. An alternative aerial connection (which eliminates the aerial coils in each coil set) is directly to the grid of the 6J7. This simplifies the coil construction slightly, but the aerial series condenser is left in whichever method you choose.

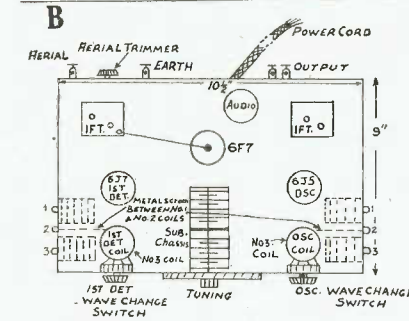
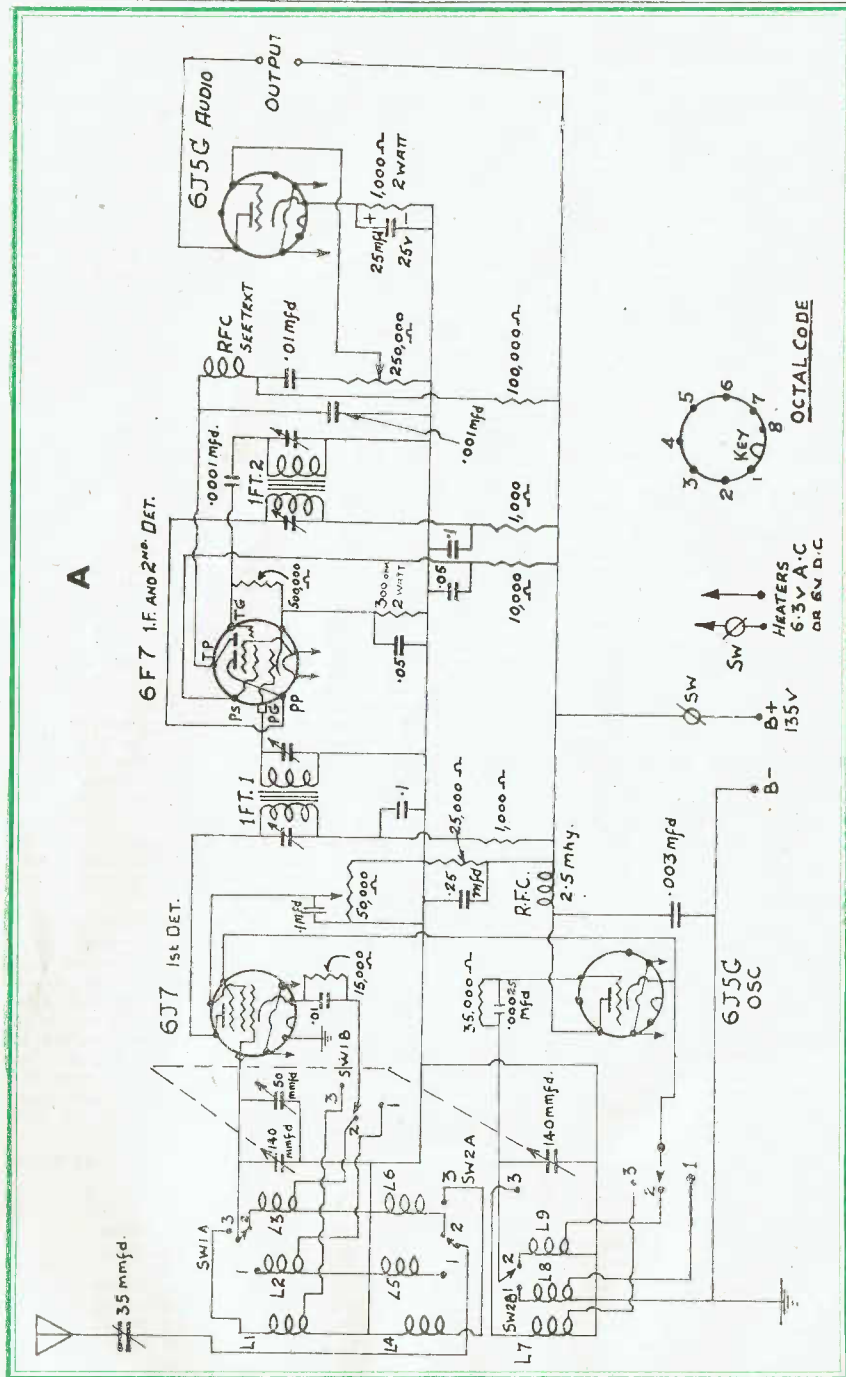
The sections of former holding each separate coil are fitted to discs of three-ply which fit inside the coil former, and are cemented into place. This allows the coil to be mounted to the chassis by means of one bolt through the centre of the disc. This treatment is applied to only two sets of coils, the higher frequency (No. 3 set) coils being mounted directly on to the wave-change switches, but held off slightly by means of stiff wire leads.

The range covered by the coils is as follows:—

- No. 1 set—65-140 metres.
- No. 2 set—35-65 metres.
- No. 3 set—14-35 metres.

It will be noted that there is an overlap between each coil and that if only the main shortwave bands are to be covered, the No. 1 set may be eliminated.

The lay-out of the receiver follows diagram B.



Numbers one and two 1st Det. and oscillator coils are shown 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 1in. 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-change switches are 3 pole, 3 position types and are identified in Circuit A. Any other type may be used providing they will do the job as stated, and if only two sets of coils are used, as previously suggested, there is no 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 456 kc/s., and the output one receives first attention. Tune in a weak station and adjust the regeneration control till the signal clears 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. With an insulated screwdriver 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., turns are removed or added to either the detector or oscillator grid coils until the difference between their tuned circuits is equal to 456 kc/s., or the I.F. The oscillator must operate on a frequency 456 kc/s. higher than that to which the detector is tuned. In case neither the oscillator nor the 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 separated, and, if necessary, they must be shielded by covering the leads under suspicion with shielding braid. This shielding is well grounded to the chassis. If lack of oscillation is due to insufficient turns in the regeneration sections, then the cathode tap must be moved to include one or two more turns in the circuit. This move is made towards the grid end of the coil.

TUNING NOTES.

Signals are tuned in by rotating the slow-motion dial which operates the ganged 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 tuning dial 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 amazement 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-pointed conductor (such as the spread-out 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 Geissler tubes, these also may be illuminated by the high frequency discharge.

Now the construction.

The whole arrangement depends for its operation on a small spark coil. A Ford ignition type is the most satisfactory, but any other make will do, as long as it gives a spark of $\frac{1}{4}$ in. to 1 in.

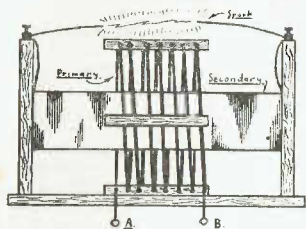
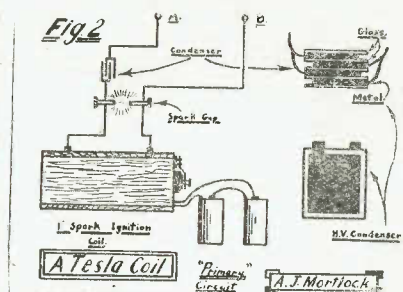


Fig. 1
A Tesla Coil
A. J. Mortlock

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 $\frac{1}{2}$ 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 do, the wire being of such a thickness as to maintain rigidity with no trouble.

The secondary coil is wound on a cardboard tube about 2 in. diameter and 10 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 5 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 3-16th inch, 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



2ZB, October 5th, 10.45 p.m.—The Inkspots sing "Every Night About This Time."—Rahob 8614.

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

2ZB, Oct. 13th: Time is two minutes past twelve and "I'm Falling in Love with Someone."

2ZB, Oct. 14th, 12.7 p.m.: Richard Tauber sings "Somewhere Over the Hill" for Claudia.

Announcer 1ZB, 10.30 a.m., 9th October: Your radio licence should be removed—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 (Rahob 13994); A. B. Dick, Secretary (Rahob 13745). The members attending the meeting were: K. Hussey, P. Hing, C. Delaney, S. Kane, G. Hurley, I. Gould, G. Holland.

Second meeting (September 30).—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 3d. per meeting, and this money is to purchase radio parts. Today we erected an aerial, and K. Hussey brought along a Hiker's One. G. Hurley brought one along, but we could not get it to go (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 Sundays, 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 completed 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 evenings. 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 built one for the job 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 alternate Fridays. The dates for the Junior nights are 2nd, 16th, 30th November and 14th December, at the Club Room, 5 Abbott's Chambers, 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.

MOTUEKA.

This is Motueka calling. We extend a hearty welcome to the following new members:—Messrs. W. York, J. Thomson, R. McGraph and Stilwell. Mr. York will be of great assistance as he has seen War service dealing with Radio and signalling, etc., in His Majesty's New Zealand Navy. Our Club set is nearing completion and we hope to be able to report next month that we have been getting good results from it.

The Club will be holding a dance at the end of the month to raise funds. The Club has appointed Mr. S. Waters to be organiser of the Club social activities.

We feel that to keep the junior members interested we should devote some evenings to cards and socials, etc. This is Motueka signing off.—B. F. McKay, Secretary.

NAPIER.

The Napier Branch is now in full swing. Meetings are held once a fortnight in the committee room of the Pirates Football Club's gymnasium, 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 yearly 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. Bonica 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 of the material covered by the course, and "Hints and Kinks" given by members.

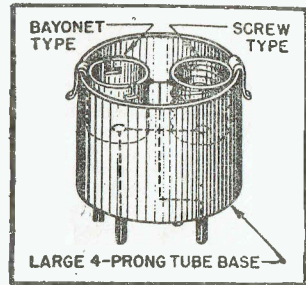
We need more members and we would like to appeal to Napier radio fans to come forward and join the Club. We know there are many fans in Napier who would like to join, so let's hear from you! Contact either J. H. McKee, President, 15 Shamrock St., or E. F. Oliver, Secretary, 107 Milton Road.

HINTS.....KINKS

The following Hints and Kinks have been sent in by readers. Rahobs, help your Club by contributing to this column.

PILOT BULB TESTER.

Using only two snap-on panel-lamp sockets and a 4-prong tube base, it is



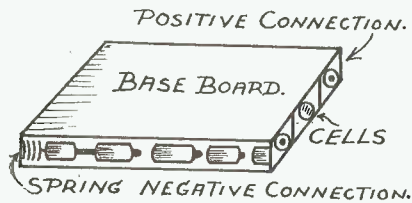
mounted above, I find it very convenient to use ordinary torch cells for B. supply, mounting these beneath the base board in pockets made by glueing strips of wood just far enough apart so as to allow the cells to slide in end to end, just as they do in a torch. The grid bias supply can be obtained by 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.

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 on inserting into any 4-prong socket of a radio or analyzer it is possible to test bulbs.

HIKERS' 2 BATTERY SET.

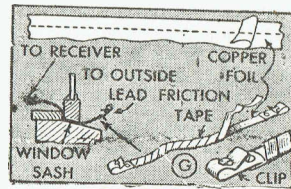
As I am a Rahob and take interest in radio sets, etc., I herewith enclose a suggestion in connection with the Hikers' 2 Battery Set.



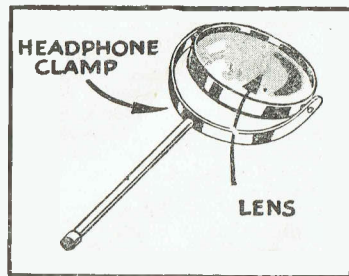
Cover for cells, which can be screwed in after cells are inserted. Old springs from disused torches should be fastened to the cover in order to press cells together, affording a good contact.

If the set is built on a wooden base board, with all wiring and components

LEAD-IN STRIP.



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



Use a radio-headphone clamp for a magnifying glass handle. Drill two holes in the lens-holding rim.

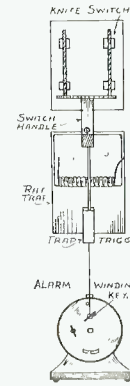
A TIME SWITCH.

(By Rahob 12836.)

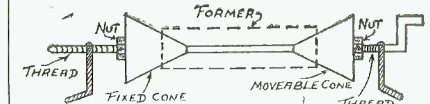
Parts required: An insulated switch, an alarm clock, and a rat trap of the spring tensioned type.

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 fly up, disengaging 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.



4. Here is a way to hold the former securely on amateur coil winders. The diagram explains itself.



—Rahobs 10647 and 8332.

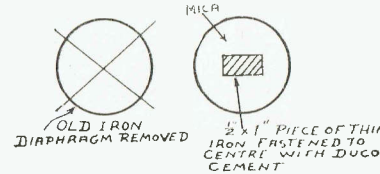
The Double IS4

(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 higher voltage than what is necessary for good reception will only shorten the life of both valves and batteries.

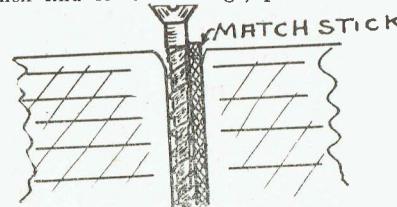
1. Ordinary headphones can be improved by removing the old iron diaphragms and substituting thin mica



discs of the same size. Flatten iron 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.

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ANSWERS TO WITTIQUIZ.

- (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, 105 Princes Street, Invercargill, DX adviser to the Radio Hobbies Club, and Short Wave Editor to the New Zealand DX Club's bulletin, "New Zealand DX-TRA." All communications to the above address will receive prompt attention. Times in NZDST (12 ahead of GMT), frequencies in kilocycles.

BROADCAST

Japan.—Armed Forces Radio Network, Tokio, can be heard on 590 and 990 kcs. to sign off at 2 a.m. daily. It is presumed that these are the former JOAK1, Tokio, 100kw., and JOCK2, Nagoya, 10kw. transmitters.

Pacific.—Verifications from WXLD, Armed Forces Radio Service, Saipan, give the power as 1000w. on 660kcs., and stated mine was the first report from New Zealand. WVTM, Manila, verified by letter, broadcasting on 1300kcs., 1000w., to 2.05 a.m. daily, but is expecting to increase the schedule shortly. At present these stations are known to be in operation by the Australian Army Amenities Service. 9AA, Port Moresby, 1250kcs. 500w.; 9AB, Lae, 1070kcs. 200w.; 9AC, Torakina, Bougainville, 1280kcs. 200w.; 9AD, Morotai Is., 1180kcs. 200w.; 9AE, Jacquinot Bay, N. Britain, 1370kcs., 200w.; 9AF (1340), 9AG (1240), 9AH (960) are being installed. Verifications have been received from 9AF and 9AH 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), Hilversum (997), Bari (1059), Oran (1180) and Rome (1355). BBC transmitters on 1122 and 1474 kcs. have been heard with news at 6 a.m.

Transmitters of the Forces Broadcasting Unit, Middle East.—Khartoum, 572kcs.; Radio Levant, Beirut, 731kcs.; Bagdad, 767kcs.; Jerusalem—JCPA, 795kcs.; Jerusalem—JFPA, 950kcs.; Jerusalem—JCLA, 1080kcs.; Alexandria, 1122kcs.; Cairo, 1350kcs.; Cairo, 1450kcs.

SHORT WAVE

Holland.—PCJ, Philips Radio, Hilversum, Holland, has been testing for Australasia each night from 9.30 to 10.30 p.m. on 15220kcs. Strength is very good, and reports are requested by the announcer, Eddy Startz, well-known announcer of the "Happy Station" in pre-war days.

Japan.—American Forces Network, Tokio, 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 JLU2, 9525, have been heard contacting San Francisco at midnight.

China.—XGOO, Shanghai, the former German-operated station XGRS, is now broadcasting under Allied control, and is well received with news at 12.40 a.m. on 11685kcs.

British Guiana.—ZFY, "The Voice of Guiana," Georgetown, British Guiana, 1000w., can be heard opening at 10.40 p.m. and followed through morse till 11 p.m. when BBC news is relayed.

Java.—A very interesting station at present is "The Voice of Free Indonesia." Bandoeng, Java, which broadcasts daily 11.30 p.m.—12.30 a.m. on 12270 and 18135 kilocycles. Strength on the former transmitter is very good, and interesting, and highly-coloured propaganda broadcasts are made in English against the Dutch, from this new "Indonesian Republic." Broadcasts come from Bandoeng over the former Batavia transmitters.

Argentina.—LRA-1, "Radio Del Estado," Buenos Aires, 7000w., an old-timer, has made a welcome reappearance on 9690, 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 HJCAR.

LRV. "Radio Belgrano," Buenos Aires, 9640, heard at 11 p.m. at good strength, and also broadcasting on 6090 kcs. **LRX.** "Radio el Mundo," Buenos Aires, is another good signal, with transmission opening at 10.30 p.m. on 9660kcs.

Colombia.—HJCAR, "Radiodifusora Nacional," Bogota, 2500w., can now be heard at good strength till signing off at 4.24 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, now operates on this schedule. 6080kcs., 3.55–7.45 p.m.; 8565kcs., 8 p.m.–4.15 a.m.; 6080kcs., 4.30 a.m.–12.15 p.m.

BBC's Pacific Service is now transmitted from 6 to 10 p.m. on GVZ (9640), GRX (9690), GSN (11820), GRV (12040) throughout, 6–8.45 p.m. on GRM (7120) and 6.30–10 p.m. on GSI (15260). 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 15050kcs. transmitter being heard at midnight in the European service.

(Continued on page 22.)

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.

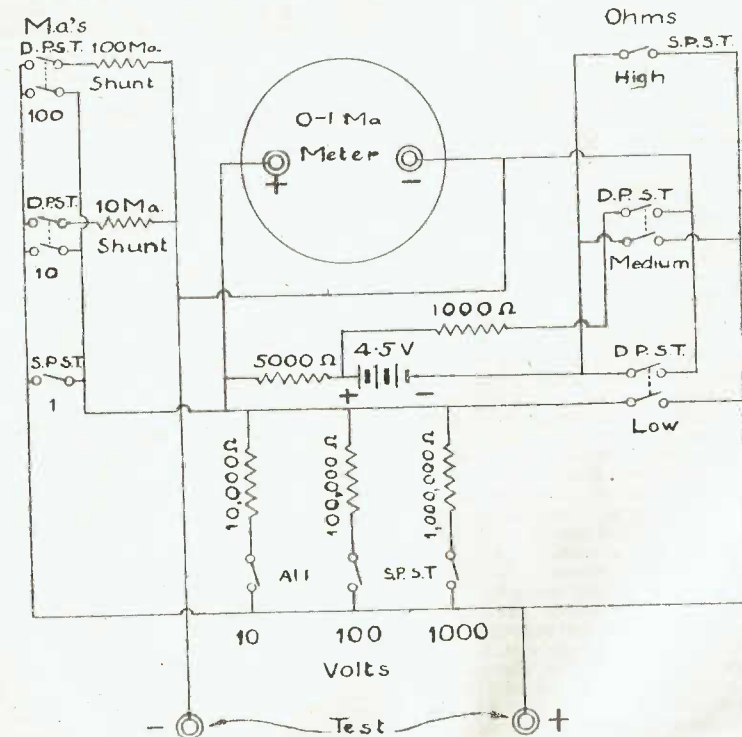
Seven resistances are used, and they should be accurately calibrated against an accurate ohmmeter, or, better still, a bridge type megohmmeter. For preference, wire-wound units should be used, as these components do not tend to alter their original resistance with age or unthinking abuse. However, if 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 modi-

fication 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 this 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-



sistance readings is shown, and the right hand figures indicate the resistance. The left hand column represents the marking on the dial scale in hundredths of a milliampere. These figures may not necessarily be accurate in all cases, but it is a simple matter for you to plot your own chart using known accurate resistors, and this chart will serve as a general guide.

LOW	MEDIUM	HIGH
3-1	80-100	1-500,000
9-3	66-300	4-100,000
14-5	56-500	8-50,000
25-10	40-1,000	13-30,000
38-20	32-1,500	18-20,000
54-40	26-2,000	30-10,000
58-50	13-5,000	50-4,000
71-100	7-10,000	56-3,000
		75-1,000
		82-500

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

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 panel at a point $3\frac{1}{2}$ in. from the left-hand side of the panel and high enough for the convenience of the component. The filament 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 handy placed.

FINAL NOTES.

Any 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 left-hand side of the chassis towards the rear, instead of as shown. This position is optional.

The condenser shown in the grid lead of the 6F7 triode section may range from .0001 mfd. (as shown) to .00025 mfd. Either value is permissible. The R.F.C. shown in the triode plate lead of the 6F7 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 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 I.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 ganged tuning condenser. If necessary, the shield between the sets of 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.



(By H. VERNON WHEATLEY.)

(Answers on page 25)

100%—Superlative. Right on the bull's-eye.

80%—Just off the bull.

60%—Not so good.

40%—Re-load and re-aim.

(1) You have all heard the expression "undamped" in relation to types of radio waves. Can you give a neat description of the term.

(2) We all know what a tuner is with its coil and parallel condenser, but can you state whether such a circuit is an open or closed oscillatory circuit?

(3) There are umpteen different types of radio tubes—some we never use and are not likely to. However, some of them go under various popular names, and even these are becoming legion. For example, there is the "Teletron." What is it?

(4) Supersonic means, above audibility. Which, then, of the following frequencies could be termed supersonic? (a) 18,000; (b) 25,000; (c) 28,000; (d) 19,000; (e) 17,500; (f) 10,000; (g) 26,000; (h) 12,000 cycles per second.

(5) Once upon a time experiments were made in stereophony. What was the big idea?



I would like to express my appreciation for the splendid magazine which you publish every month. I have been a member of the Club since 1943, and in my opinion the "Radiogram" has improved immensely. As I am still a secondary school pupil and have not a great capital I like building small one, two and three-valve sets. If you continue to publish one of these circuits occasionally, as you do now, I will remain contented.

In closing, I hope the Club continues with its work of educating amateurs in the future.—Rahob 8646.

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 pondering over the "Radiograms" and also assembling the kit sets which you sent so promptly to me. Once again thanking you and wishing 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 a 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 Annual. I think the Circuit Book, and more recently the Data Book, a great idea, and along with the Instruction Course are a great help in the learning of radio.

The Postman's Knock pages certainly add to the Club spirit, and I consider that even the downright abusive letters add to the fun (?) to a certain extent.

(I might state here that I rather like the variety of contributions of one much-abused H. Vernon Wheatley.)

As for the circuits, I am all for the 1.4 volt type, from one valve up, and believe this type has done much to popularise the hobby, particularly in isolated areas, where radio is more truly appreciated. Now as a suggestion I would like to see some eliminator circuits, or combined portable and mains jobs. I believe many people would build up good portables, if they could take them indoors and plug them into some sort of mains unit, and so con-

serve batteries whilst operating as an additional or bedside radio. They would also fill the bill for those of us (and there are many) who don't stay in one place. Wishing the Club every success.—Rahob 6876.

Thanking you for your prompt attention to my order, No. 3322, which arrived today.

I have built the "Sky Sweeper," using valves 6D6, 6C6, 42 and 80, and wish to say that the performance and tone are all up to the mark. Using a new 10,000 ohm. Potentiometer for the volume control, however, I could only get a movement of about 15 degrees from nothing to full on. Substituting a 15,000 appeared to have fixed this, and the increase is now a gradual one instead of all or nothing as was the case with the 10,000 ohm. I was wondering if other Rahobs had experienced anything after this manner.—Rahob 14076.

This is the first occasion that I have written to you, and I must say that I greatly appreciate the "Radiograms" and also the Annuals. I am only a beginner, and until I joined your Club I knew nothing of the various components which make up a wireless, but since receiving the "Radiograms" I have learnt a great deal. I heartily agree with the remarks of brother Rahob 8846, in the August "Radiogram," who, like myself, is also a beginner, where he suggests notes in the "Radiogram" for beginners.

I have read Australian Radio publications, but none of them cater for the beginner as your Club does; but, say an article each month for us beginners would greatly assist us to understand the functions of each part that goes to make up a set.—Rahob A444.

I wish to acknowledge with thanks receipt of my membership card and badge, and also the Lamphouse Annual and September "Radiogram," both of which I find exceedingly interesting.

I have built the Octal Hiker's One and find it a great little set, having logged quite a number of Aussie stations so far. I have been unable to procure the wire to wind the correct coil for this set, and have been using the 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. NBS, Wellington, is called at 10 p.m. irregularly on 9558kcs.

Uruguay.—CXA—10, "Radio Electrica," Montevideo, 10,000w., is being heard regularly from noon to signing off at 2.17 p.m. on 11900kcs. 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 12270kcs. 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)

Metreband	Call Sign	Frequency
49	GRC	2880
	GRB	6010
	GWS	6035
	GSA	6050
	GRR	6070
	GWM	6090
	GSL	6110
	GWA	6125
	GRW	6150
	GWK	6165
	GRO	6180
	GRN	6195
41	GRS	7075
	GRM	7120
	GRT	7150
	GRK	7185
	GWL	7205
	GSW	7230
	GWI	7250
	GSU	7260
	GWN	7280
	GRJ	7320
31	GRI	9410
	GWF	9490
	GSB	9510
	GWJ	9525
	GWB	9550
	GSC	9580
	GRY	9600
	GWO	9625
	GVZ	9640
	GWP	9660
	GWT	9675
	GRX	9690
	GRH	9825
	GRU	9915
25	GRG	11680
	GVW	11700
	GVV	11730
	GSD	11750
	GVU	11770
	GVU	11800

Metreband	Call Sign	Frequency
25	GSN	11820
	GVQ	11840
	GSE	11860
	GVX	11930
	GVY	11955
	GRV	12040
	GRF	12095
19	GWC	15070
	GWG	15110
	GSF	15140
	GSO	15180
	GSI	15260
	GWR	15300
	GSP	15310
	GRE	15375
	GWE	15435
	GRD	15450
16	GVP	17700
	GRA	17715
	GVQ	17730
	GSG	17790
	GSV	17810
	GRP	17870
	GRQ	18025
	GVO	18080
13	GSH	21470
	GSJ	21530
	GST	21550
	GRZ	21640
	GVR	21675
	GVS	21710
	GVT	21750
11	GSQ	25750
	GSK	26100
	GSR	26400
	GSS	26550

HOBBIES CLUB CONFERENCE

It has been proposed that a conference of delegates from various Radio Clubs be held in Wellington at Easter, or on the King's Birthday week-end in 1946. Would clubs who are interested and who would be prepared to send a delegate to the Conference please communicate with Headquarters?—Rahob 1.

PEN FRIENDS WANTED



Rahobs wishing to contact other readers may have their names, addresses and interests published at a cost of 1/- for each announcement, which must not exceed 25 words.

Rahob 13678, W. Chee, West End, Kaikoura, wishes to correspond with a fellow Rahob in Australia interested in stamps. Age about 13 years.

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You will receive a Rahob 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.

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NAME

ADDRESS

TOWN

(Radiogram, Nov., 1945.)

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Christmas Suggestions

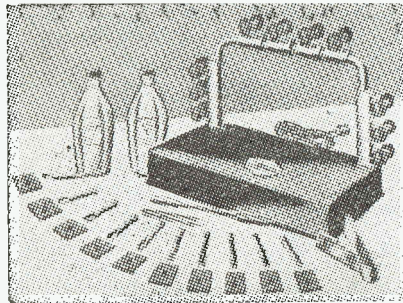
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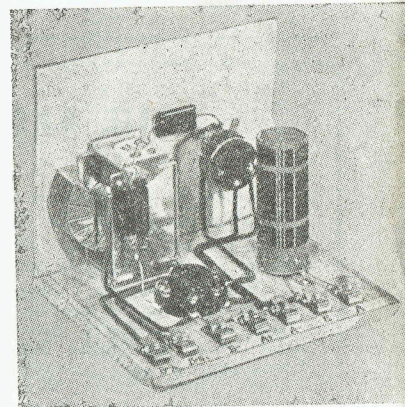
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- RK2005—"Popular One" (Midget Series), with Batteries £2/7/6 Post Free.
- RK2006—"Oxford" Crystal Set Kit 17/6. Postage 8d.

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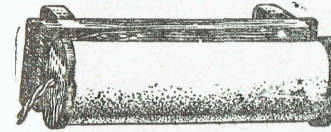
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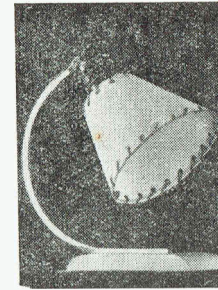


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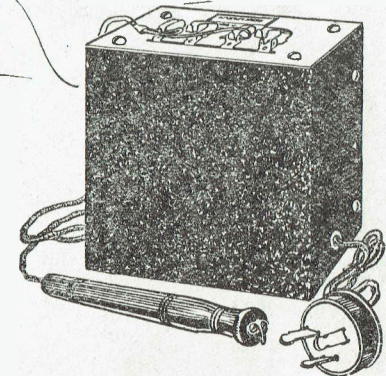
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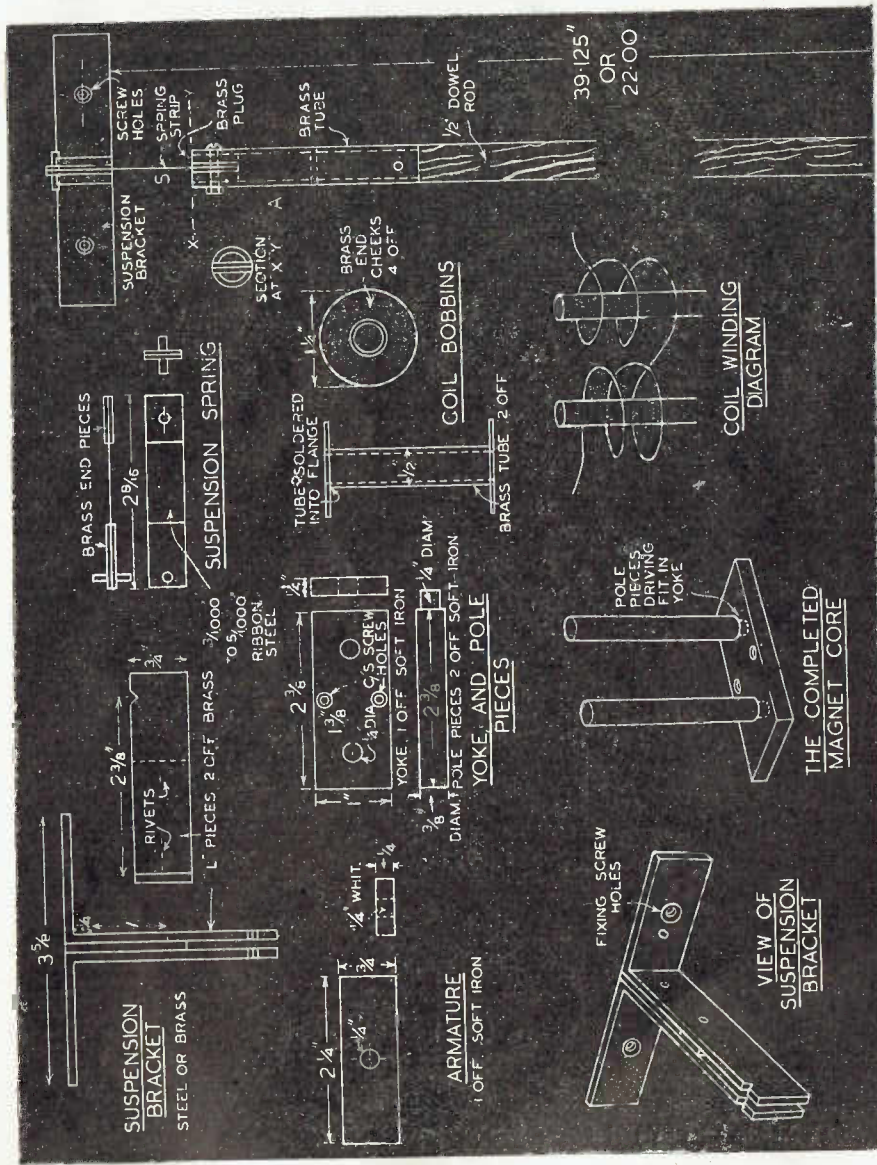
Poker Work is a fascinating instructional hobby. The "Homecraft" Set is the electrical answer to the original "poker," and can be used with safety by either young or old. Different tappings enable the artist to vary the heat on the point, at will. Supplied complete.

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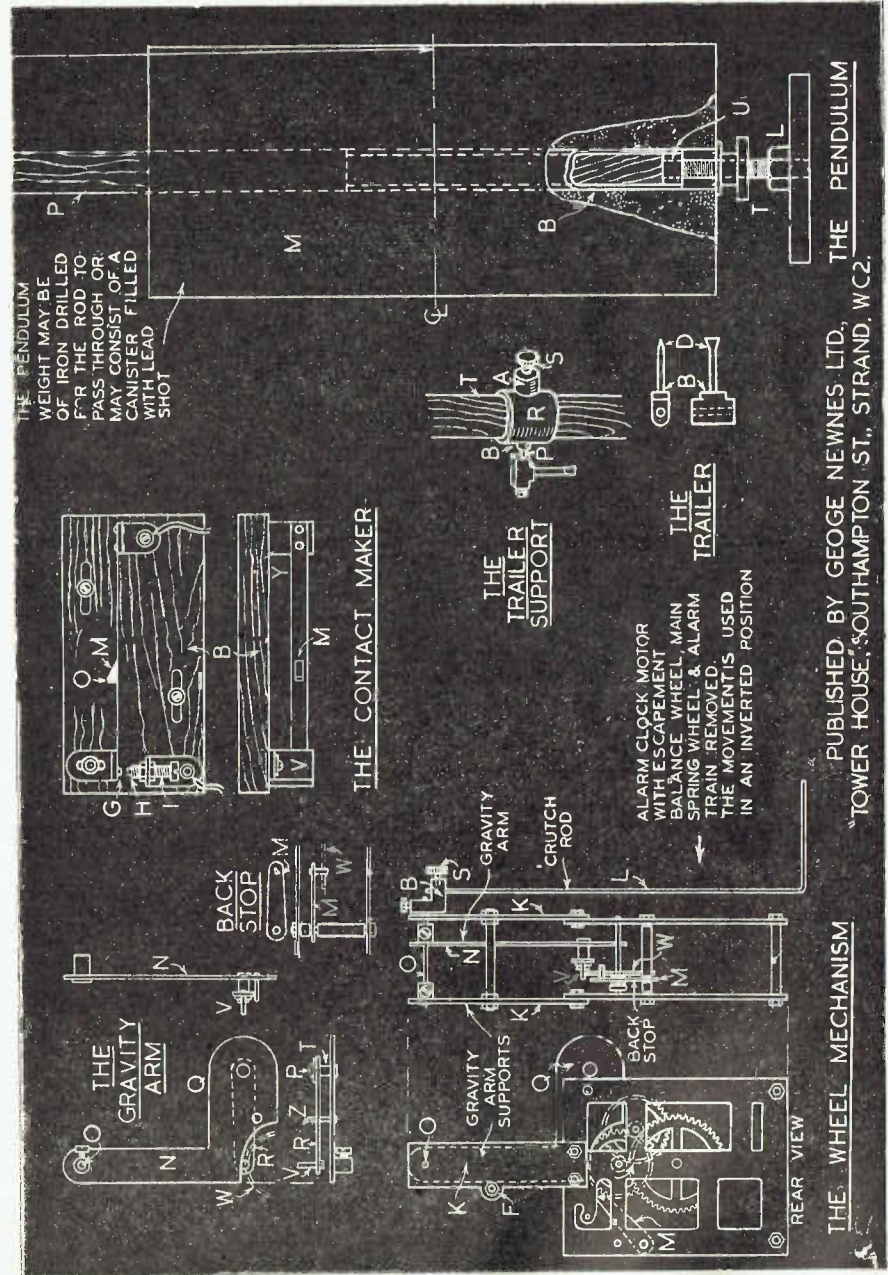
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THE MASTER



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.

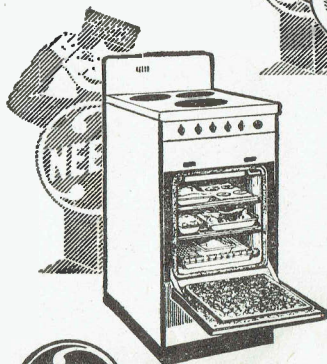
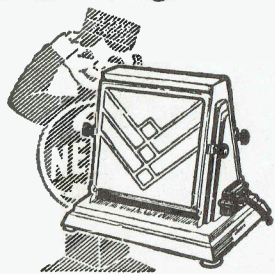
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The Neco family of Electrical Servants has been doing urgent war jobs, and you won't have seen them lately. But, they'll be back soon — all the better for their war-time experience — brighter, quicker, more dependable than ever. It will be a growing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



The NEECO family

Made by
THE

NATIONAL ELECTRICAL

AND ENGINEERING COMPANY LIMITED

Branches All Main Centres.

N.3.5

PUZZLE CORNER



(By "Starlight.")

Hang on to your seats, gentle readers! We actually received for service a Silver Marshall 34. This amazed 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 criticise? 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 unbolt 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 no-contact between frame and chassis would be very likely. Our ohm-meter 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 hit and miss 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 dud condensers—a 600 mmfd. mica and a .005 mfd. paper. They caused a frequency shift of about 250 K/c 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.



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

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PHOTOGRAPHIC RECORD

Three photographs were received from Rahob A126, Australia—one taken at Mount Wellington, Hobart, one at Murray River, Mildura, and one at Port Arthur.

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

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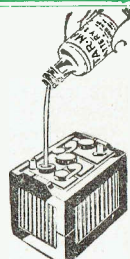
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RG211—Miniature S.C. Motor Car Lamp Adaptors	1/4
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RA351—Clamp Insulators. Yankee Knob	7d.
RA356—Cleat Insulators pair	7d.
RA361—Large Egg Insulators, each	9d.
RA360—Button Insulators	6d.
RA362—Shackle Insulators each	1/-
RA327—House Service Insulators, ea.	2/4
RA402—9in x 3/8in. Ebonite Lead-in Tubes	1/-
RA404—9in. x 1/2in. Ebonite Lead-in Tubes	1/3
RA414—Galvanised Cleats	1/3
RA431—Aerial and Earth Plates. Bakelite Plates with two terminals. Ivory or brown	3/2
RA285—Indoor Spring Aerials. In coiled form. Stretch across room	3/3
RA296—No Mast Brush Aerials. Easily mounted. Ideal for flat-dwellers, etc.	19/-
RA310—"Notenna" Aerial Eliminator. Neat and compact. Does away with outside aerial	8/5
RA298—"Ensign Line Filter. Cuts out man made interference	£1/1/6

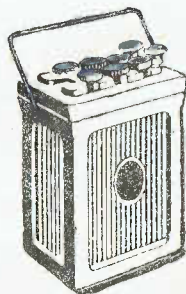
AMPLIFIERS.

Cat. No. (Type)	Each.
RR850—"Victory Senior" Amplifier, 10 watt output. Ideal for Dance Halls, Public Meetings and small outdoor gatherings, 4 valves (without speaker)	11 12 6
RR852—"Victory Senior" Amplifier with Pre-amp. Stage. Same as above, but with two inputs, i.e., Microphone and Gramophone may be used together	13 12 6
Suitable Speaker for the above amplifiers is RS921 Rola F12 Speaker	2 18 3

BATTERIES.



Cat. No. (Type)	Each.
RA 20—2v. 100 amp. Wet Radio Battery	1 17 0
RA22—2v. 140 amp. Wet Radio Battery	2 3 0
RA23—6v. 100 amp. Wet Radio Battery	4 7 10
RA24—6v. 140 amp. Wet Radio Battery	5 6 2
RA26—6v. 160 amp Wet Radio Battery	6 3 3
RA40—6v. 9 Plate Motor Car Battery	3 10 11
RA41—6v. 11 plate Motor Car Battery	3 19 6
RA42—6v. 11 Plate Motor Car Battery (squat)	3 19 6
RA43—6v. 13 Plate Motor Car Battery	4 6 4



BATTERIES—Continued

Cat. No. (Type)	Each.
RA44—6v. 13 Plate Motor Car Battery (squat)	4 6 4
RA45—6v. 15 Plate Motor Car Battery	4 17 11
RA46—6v. 15 Plate Motor Car Battery (squat)	4 17 11
RA47—6v. 17 Plate Motor Car Battery	5 15 7
RA48—6v. 17 Plate Motor Car Battery (squat)	5 15 7
RA49—6v. 19 Plate Motor Car Battery	6 7 4
RA50—12v. 7 Plate Motor Car Battery	5 19 3
RA51—12v. 9 Plate Motor Car Battery	6 7 4
RA52—12v. 11 Plate Motor Car Battery	8 0 3
RA53—12v. 11 Plate Motor Car Battery (squat)	8 0 3
RB42—45v. Eveready (770) Superdyne Dry Radio Battery, Heavy Duty	1 6 6
RB43—45v. Eveready (772) Medium Duty Dry Radio Battery	1 1 9
RB44—45v. Eveready (762) Portable Radio Battery	0 15 3
RB51—9v. Eveready (773) C. Battery	0 4 9
B39—6v. Eveready Hotshot Battery	1 3 4
RB50—4 1/2v. Eveready (711) C. Radio Battery	0 3 6
RB55—1 1/2v. Eveready (X250) Heavy Duty A. Radio Battery	1 5 11
RB56—1 1/2v. Eveready (741) Medium Duty A. Radio Battery	0 9 9
RB57—1 1/2v. (Eveready) (742) Portable A. Radio Battery	0 5 1
RB40—1 1/2v. (Eveready) No. 6 A. Radio Battery	3/9 1/2
RB30—Eveready Penlite (915) Torch Cells	8 1/2d. ea.
RB31—Eveready Standard (950) Torch Cells	8 1/2d. ea.
RB32—Eveready Baby (935) Torch Cells	8d. ea.
RB33—Eveready Bijou (712) Torch Cells	10d. ea.
RB35—Eveready Flat Torch Batt.	0 1 6
RB36—Eveready Cycle Battery	1 10

RA70 — TARMAG, The Battery Tonic.

Charge for 6-volt Battery, 2/9.

RA70A—Charge for 12-volt Battery 5/6



BATTERY CABLES.

RW101—5-wire Battery Cable .. Foot	1/-
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BELLS AND BELL MATERIAL.



Cat. No. (Type)	Each.
RG315—"Vigilant 3in. Bells N.Z.-made.	10/-
RG319—"Busy Bee" Bakelite Buzzers	7/-
Suitable Batteries for above are: Dry Cells (2 necessary)	
RB40—1 1/2v. Radio A. Battery	3/9 1/2
RB50—4 1/2v. Radio C. Battery	3/6
RG338—Heavy Duty "Goltone" Bell Transformers	1 2 6
RG326—Cubist Bell Pushes	1 7
RG334—Round Bell Pushes	1 9
RW117—20 gauge S.C.C. Enamelled Wire. Makes good bell wire. Single strand. 60ft. Coil	2 6
RS118—Insulated Bell Staples, per dozen	3 1/2d.
Per packet 100	2 3

BICYCLE LAMPS.

Cat. No. (Type)	Each.
RT802a—Bakelite English Cycle Lamps, complete with Globe and Battery	6 10
RT805a—Metal "Mandaw" English Cycle Lamps. Complete with Globe and Battery	7 10

BLOCKS.

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

RG79—3 1/2in., Round	each 0 5
----------------------	----------



RG83—3 1/2in. x 3 1/2in. square	each 0 8
RG80—6in. x 3in., rectangular,	each 0 10
RG81—9in. x 3in., rectangular,	each 1 3
RG82—6in. x 6in., square,	each 1 9
RG78—ERA BLOCKS, complete with Connectors	2 6

BOOKS.

	Per Copy.
RB100—"Lamphouse Circuit Book," approx. 200 Radio Circuits, Amplifiers, Receivers, Tuners, etc. 80 pages	2 6

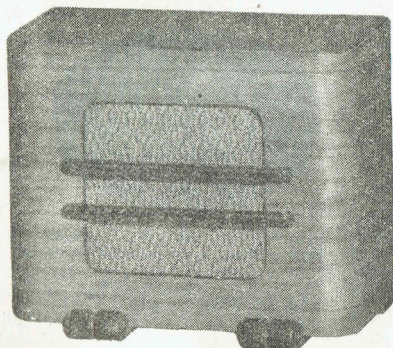
BOOKS—Continued.



- | | | |
|--|-------------------|-----|
| RB101 — "Lamphouse Instruction Course." An ideal Radio Course in fundamental theory. 48 pages | Per Copy
s. d. | 2 6 |
| RB102—"Radio Fundamentals Explained." Simple yet practical explanation of Radio principles. 70 pages | | 2 6 |
| RB103—"Lamphouse Data Book." A new addition to the Lamphouse Publications. Crammed full of interesting facts and charts. A necessity in any Radio Library. 96 pages. | | 3 6 |

Postage, etc., on above Books, 2d. copy.

CABINETS.



- | | |
|---|------|
| Cat. No. (Type) | Each |
| RC183—"Victoria" Speaker Cabinets. Inside measurements, 11in. wide, 8½in. high, 5½in. deep. Outside meas. 11½ wide, 9½ high, 6½ deep. Walnut veneer | 32/6 |

CHASSIS.

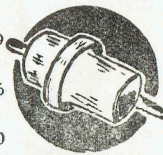
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|--|-----------------|
| Cat. No. (Type) | Each
£ s. d. |
| RC1003—Battery Chassis, 15in. x 7in. x 2½in. Punched; 8 valve holes, 5 coil holes, 2 electrolytic holes. Cadmium plated ... each | 6/6 |

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 |

CHOKES.

- | | |
|-------------------------------------|-------|
| Cat. No. (Type) | Each |
| RC140 — R.F. Chokes, 10 M.A. | 1 9 |
| RC141 — L.F. Chokes, 30 H. 50 M.A. | 16 6 |
| RC142 — L.F. Chokes, 30 H. 100 M.A. | 1 3 0 |



- | | |
|------------------------------------|------|
| RC143—Vibrator Chokes (A) 4.5 ohms | 4 5 |
| RC144—Vibrator Chokes (A) 5 ohms | 11 6 |
| | 12 3 |

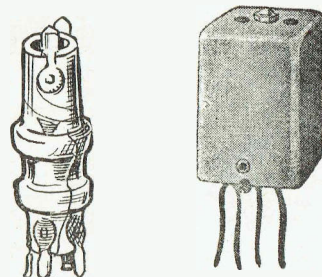
CLIPS.

- | | |
|---|------|
| Cat. No. (Type) | Each |
| RC18—Insulated Crocodile Clips ... | 1 7 |
| RC19 — Alligator Clips, Cadmium plater | 8 |
| RC20—5 amp. Pee Wee Bulldog Battery Clips | 6 |
| RC21—15/25 amp. Ditto... | 1 0 |
| RC22—50 amp. Ditto... | 1 9 |
| RC22A—30 amp. Battery Clips, Spring type... | 1 4 |
| RC23—Screen Grid Clips for Glass Valves ... | 1 |
| RC24—Screen Grid Clips for Metal Valves | 1 |



- | | |
|---|-------------|
| RT41 — Fahstock Clips | 3 |
| RG512—Paper Clips for Nippy Lamps | 1 0 |
| RG514 — "Klipsit" 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 |

COILS.



- | | |
|---|-----------------|
| Cat. No. (Type) | Each
£ s. d. |
| RC449—Portable Coil Kits. Complete with Frame, Aerial, I.F. Trans., Trimmers, etc. | 2 9 0 |
| RC530—Oxford T.R.F. Aerial Coils | 3 3 |
| RC531— " " R.F. Coils | 3 3 |
| RC532— " " R.F. Coils, with reaction | 3 9 |
| RC533—Midget T.R.F. Aerial Coils | 5 6 |
| RC534—Midget T.R.F. R.F., with reaction Coils. Carefully matched and designed for use .00035 mfd. Condenser | 5 6 |
| RC362—Ready Wound Hikers One Coils | 3 9 |
| RC266—Ready Wound Crystal Set Coils | 4 0 |

BROADCAST AND SHORTWAVE COILS.

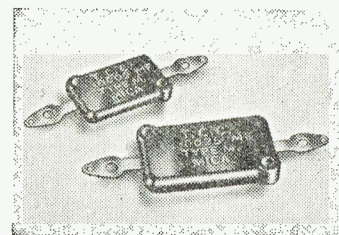
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|---|-----|
| Broadcast Coils matched for use with .000385 mfd. Ganged Condenser. | |
| Shortwave Coils matched for use with 420 mmfd. Ganged Condenser. | |
| RC550—465 K.C. Shortwave Aerial Coils (unshielded) | 5 6 |
| RC551—465 K.C. Shortwave Oscillator Coils (unshielded) | 5 0 |
| RC552—465 K.C. Shortwave R.F. Coils (unshielded) | 5 6 |
| Shielded Coils are supplied in grey sprayed, cracked finished Cans. Dimensions—1½in. high, 1¾in. width, 1¾in. length. | |
| RC553—465 K.C. Broadcast Aerial Coils (unshielded) | 5 6 |
| RC554—465 K.C. Broadcast Oscillator Coil (unshielded) | 5 0 |
| RC555—465 K.C. Broadcast R.F. Coil (unshielded) | 5 6 |
| RC556—465 K.C. Broadcast Aerial Coil (shielded) | 8 3 |
| RC557—465 K.C. Broadcast Oscillator Coil (shielded) | 7 6 |
| RC558—465 K.C. Broadcast R.F. Coil (shielded) | 8 3 |

CONDENSERS, ELECTROLYTIC.

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

CONDENSERS, FIXED.

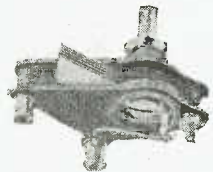
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|-----------------------------------|-----|
| RC637—.5mfd. Generator Condensers | 3 6 |
| RC679—.0001mfd. Mica Condensers | 1 4 |
| RC679A—.00015mfd. Mica Condensers | 1 3 |
| RC680—.0002mfd. Mica Condensers | 1 3 |
| RC680A—.00025mfd. Mica Condensers | 1 1 |



- | | |
|--|------|
| RC682—.0005mfd. Mica Condensers | 1 7 |
| RC692—.00005mfd. Mica Condensers | 1 6 |
| RC693—.1mfd. Mansbridge block Condensers | 9 |
| RC694—.25mfd. Mansbridge Block Condensers | 11 |
| RC695—.5mfd. Mansbridge 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 |

CONDENSERS, TRIMMERS.

Cat. No. (Type)	Each s. d.
RC886—Trimmer Condensers, single, 30mmfd.	1 2
RC887—Trimmer Condensers, 2 bank 30mmfd.	1 6

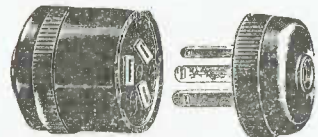


CONDENSERS, VARIABLE.

RC912—.00005mfd. Midget	12 2
RC913—.00015mfd. Single gang ...	11 9
RC914—.0003mfd. Single gang ...	10 3
RC915—.0005mfd. Single gang ...	12 6
RC918—.0003mfd. Mica spaced midget	7 6
RC919—.0005mfd. Mica spaced midget	8 9
RC920—.0001mfd. Mica spaced midget	7 0
RC923—420mmfd. 3-gang	16 6

CONNECTORS, ELECTRICAL.

Cat. No. (Type)	Each s. d.
RG20—American Parallel Two-pin Cord Connectors	2 3



RG21—Ditto, Body only	1 7
RG25—Titegrip 3-pin Cord Connector Body	2 1
RG26—Titegrip 3-pin Cord Connectors, Complete	3 1
RG27—3-wire Porcelain Connectors	1 3
RG28—2-wire Porcelain Connectors	10
RG29—1-wire Porcelain Connectors	6

CONNECTORS, RADIO. MICROPHONE CONNECTORS.

RC1—Amphenol Shielded Connectors for Microphone, Pick-ups, Speaker, etc. Female Connector for single wire. Shell of Connector and screen of wire used for second conductor	4 3
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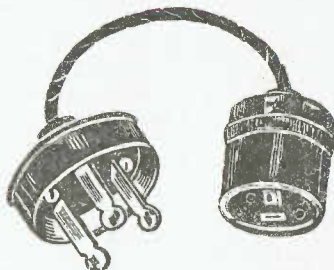
CONNECTORS, RADIO—(Continued)

Cat. No. (Type)	Each s. d.
RC2—Similar to the above, but Male Connector for chassis mounting	4 3
RC3—As above for cord connection	4 3
RC7—Microphone Connectors for 2 conductor cable, fully shielded. Chassis Mounting Female Connector	7 6



RC8—Male Connector for the above	7 6
RC9—Female Cord Connector, as above	5 0
RC10—Microphone Connector for 3-wire Conductor. Female chassis mounting	7 6
RC12—Female Connector, as above, for cord connection	7 6
RC11—Male Cord Connector, suitable for use with Cat. Nos. RC10 and RC12	7 6
RC15—4 Conductor Shielded Connector, female	10 0
RC16—As above. Male Connector	10 0
RP270—Chassis Plugs and Sockets. Miniature 3-pin type. Sockets mount on chassis. ... Per pair	1 3
RT27—Terminal Strips. Two terminal screws mounted on insulated strip	7

CONVERSION ADAPTORS.



RG501—3-pin Plug to Parallel Socket	3 7
RG502—3-pin Plug to Lamp Socket	3 6
RG503—2-pin Tee Plug to Parallel Socket	3 0
RG504—2-pin Tee Plug to 3-pin Socket	3 11
RG505—2-pin Tee Plug to Lamp Socket	2 10
RG506—2-pin Parallel to 3-pin Socket	4 0
RG508—2-pin Parallel Plug to Lamp Socket	2 11
RG510—Light Adaptor to Parallel Socket	3 7
RG511—Light Adaptor to 3-pin Socket	4 2

CORDS, ELECTRICAL.



RE800 — Appliance Cords. Approximately 6ft. good asbestos flex, with appliance plug for fitting into Jug, Iron, Toaster, etc., on one end, and 2-pin Parallel Plug top on other

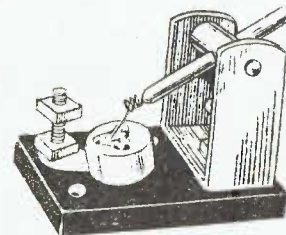
Cat. No. (Type)	Each s. d.
RE801—As above, with 2-pin T Plug top	4 8
RE803—Similar to above, but with approx. 6ft. of Rubber flex and 3-pin Plug	6 6
RE51—Lighting Extension Cords, 10ft. flex with Lamp Socket on one end and light adaptor on other	6 8
RE52—Ditto. Holder with Switch. Extra long lengths can be made up at 1/2 yard extra.	11 8

CORDS, RADIO.

RC203—Brandes Headphone Cords ..	4 8
RW101—5-wire Battery Cord Per ft.	1 0

CRYSTAL SETS AND SPARES.

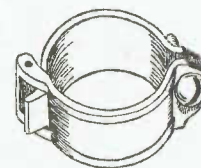
RC290—"Economy" type Crystal Sets. Tapped Coil. No variable condenser (without phones) ..	14 6
RC266—Crystal Set Coils. Ready wound on 3in. former	4 0
RC268—Hertzite Crystals and Catwhisker, British make	1 4



RC253—Oxford Crystal Detectors, as illustrated above	4 11
CK2006—The Oxford Crystal Set Kit of Parts	17 6

EARTH MATERIAL

Cat. No. (Type)
RA 436 — 3/4 in. Brass Earth Clamps ... 10d.
RA437 — 3/4 in. Brass Earth Clamps 1/-
RA438 — 1 in. Brass Earth Clamps 1/3
RA 433 — Copper Earth Tubes 3/2
RA431 — Earth and Aerial Plates 3/2



ELECTRICAL AND RADIO ACCESSORIES (GENERAL)

Cat. No. (Type)	Each s. d.
RG38—Fixed Shade Carriers	2 3
RG38A—Cream Sprayed Fixed Shade Carriers	2 3
RG32—Ceiling Roses	1 6
RG515—3/4 in. Bakelite Bushes	6 6
RS118—Insulated Staples, Doz., 3/4d. Per 100	2 3
RS119—Coppered Staples ..Per doz.	2
RS213—5/32 in. x 6in. threaded Brass Rods	8
RS244—Large Rubber Grommets ..	3
RS211—Coil, feet, 1d. each, 10d. doz.	

ELECTRICAL APPLIANCES.

RE82—Monarch Bed Warmers. The Electrical answer to the old-fashioned hot water bottle ..	1 8 6
RE82a—Ditto, Complete with 5ft. flex and Plug	1 14 6
RE85—"Hayman" Infra Red Lamps. Floor model. These lamps are in use in many of the leading N.Z. hospitals ..	12 10 0
RE86—Ditto, Table Model	8 5 0
RE87—Spare Elements for above 2 0 0	

RE 88 — Monarch Medical Coils. (Shocking Machine) .. £1/12/6
RE90—The "Homecraft" Poker Work Machine .. £3/10/-

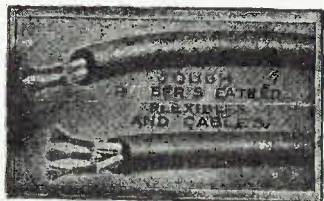


RE95 — Garage Inspection Hand lamps without Flex £1/0/6
RE105 — "Gloria" Home Permanent Waving Outfits (complete) £5/17/6

Spares for above—See Appliance Spares page 43.

RE540—Coylrod 750 watt Tank Heaters	1 6 0
RE541—Coylrod 1000 watt Tank Heaters	1 6 0
RE542—Coylrod 1500 watt Tank Heaters	2 5 0
RE547—Coylrod 3 heat 2500 watt Tank Heaters	2 5 0
RE543—Fixing Flanges for above	5 3
RE2039—1 gallon Speedee Electric Urns	4 10 0
RE2040—2 gallon Speedee Electric Urns	5 17 6
RE2041—3 gallon Speedee Electric Urns	7 3 6
RE2042—4 gallon Speedee Electric Urns	8 17 6
RE850—Electroway Imitation Coal Fire Radiators. Limited quantity.	16 14 0
RE836—"Komfee" 1000 watt One Bar Radiators	3 10 0

FLEX.



Cat. No. (Type)	Per yd.	s.	d.
RW95—3 wire Workshop Flex	2	0	
RW96—2 wire Workshop Flex	1	9	
RW97—2 wire Rubber Covered Flex	1	4	
RW200—3 wire Rubber Covered Flex	1	6	

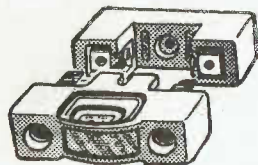
See WIRES.

FORMER COIL.

Cat. No. (Type)	Each.	s.	d.
RF80—1in. x 6in. Coil Former	1	3	
RF81—1½in. x 6in. Coil Former	1	10	
RF81a—1½in. x 3in. Coil Former	1	0	
RF83—1½in. x 6in. Coil Former	2	3	
RF86—2in. x 6in. Coil Former	1	8	
RF87—2½in. x 6in. Coil Former	2	4	
RF88—3in. x 5in. Coil Former	2	1	

FUSES.

RG40—5 amp. Range Fuses	8	
RC41—10 amp. Range Fuses	8	
RG41a—10 amp. Pyrex Range Fuses	10	
RG42—15 amp. Range Fuses	8	
RG42a—15 amp. Pyrex Range Fuses	10	
RG43—20 amp. Range Fuses	8	



RG160—5 amp. Fuse Blocks	2	7
RG161—10 amp. Fuse Blocks	2	7
RG352—10 amp. Fuse Wire	1	
RG356—½lb. Reels 15 amp. Fuse Wire	4	3
RG357—½lb. Reels 10 amp. Fuse Wire	2	11
RG358—½lb. Reels 5 amp. Fuse Wire	3	1
RS167—5 amp. Motor Car Fuses	4	
RS168—10 amp. Motor Car Fuses	4	
RS169—20 amp. Motor Car Fuses	4	

HEADPHONE SPARES.

RC203—Headphone Cords	4	8
RC288—Bakelite Ear Caps for Brandes Phones	3	6
RC289—Diaphragms for Brandes Phones	1	3
RT29—Solderless Phone Tips	1	3

HOLDERS, LAMP.

Cat. No. (Type.)	Each.	s.	d.
RG51—Cord Grip Lampholders, without Skirt	1	6	
RG53—Cord Grip Lampholders, without Skirt, with Switch	6	6	
RG54—Batten Holders, with Skirt	3	5	
RG56—Batten Holders, without Skirt	2	8	
RG58—Bakelite Batten Holders, with switch, without skire	6	6	
RG59—½in. Bakelite Holders	2	9	
RG62—½in. Conduit Thread Brass Lampholders	2	11	
RG63—½in. Bakelite Holders	2	0	
RG68—Edison Screw Batten Holders	3	0	
RG69—Edison Screw Cord Grip Holders	2	16	
RG70—Goliath Edison Screw Lampholders	5	6	
RG71—Edison Screw Lampholders	3	3	
RS223—Bakelite Miniature Screw Fuse Holders	1	3	



HYDROMETERS.

Cat. No. Type.	Each.	s.	d.
RM300—Eagle Full-size Glass Tube Hydrometers	7	6	
RM302—Junior Midget Ball Hydrometers	3	4	
RM303—Guidor English Hydrometers	8	3	
RM304—Spare Floats for above	3	6	



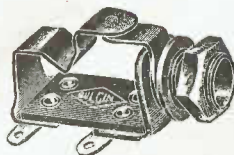
INDICATOR PLATES.

RD33—Oblong Indicator Plates Marked 0-10	2	0
RD341—Round Indicator Plates, marked 0-10	2	8

INSULATING TAPE.

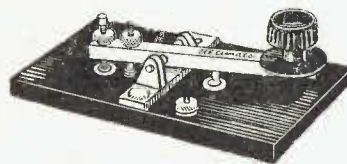
Cat. No. (Type.)	Each.	s.	d.
RS237—Small reels Insulating Tape	1	3	
RS238—Large reels Insulating Tape	2	9	

JACKS.



RJ8—Twin Tip Jacks, 8d. ea.	
RJ20—Single Tip Jacks (insulated), 1/1	
RJ22—Bulgin S.C. Jacks	2/10
RJ23—Bulgin S.C.C. Jacks	4/6

KEYS, MORSE.



Cat. No. (Type.)	Each.	s.	d.
RH3—"Buzzagraph" Morse Code Combination Practice Sets, complete with Battery	25	6	
RH5—Heavy duty Morse Keys with Solid Crackled Finish base	25	0	
RH110—W. & G. Morse Practice Set. Consists of light key and buzzer mounted on bakelite base	8	9	
RH111—"Ultimate" Heavy Morse Keys	17	8	

KIT SETS.

RK2004—The "Improved Hiker's One," complete with Batteries, Less Headphones	2	13	6
RK2005—The "Popular One," using the 1S4 Midget Valve. Complete with Batteries. Less Headphones	2	7	6
RK2006—Oxford Crystal Set Kit	17	6	

KNOBS.

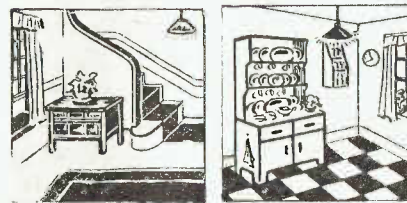
RD4—Conical 8-sided Knobs (Brown)	1	0
RD7—Cross Pattern Knobs (Brown)	1	0



RD5—2in. Hand Grip Instrument Knobs (Black), 2/5	
RD6—Small Pointer Knobs (Black), 1/4 each	
RD10—Semi Pointer Knobs (Black), 2/- each	

RD11—Small Coloured Pointer Knobs	1	4
RD12—Assorted Bakelite Brown Knobs	1	6

LAMPS, ELECTRIC.



LAMPS, HOUSEHOLD.

OSRAM STANDARD VACUUM BULBS.
Clear and frosted 240v.
Low intensity, small consumption lamps for passages, halls, etc., or where it is necessary to have a small lamp burning over a long period.

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

AN OSRAM FOR EVERY PURPOSE.

GAS-FILLED, CLEAR OR PEARL, 240 V.	Each.	s.	d.
RL215—40 watt	2	2	
RL216—60 watt	2	3	
RL217—75 watt	3	3	
RL218—100 watt	4	0	
RL219—150 watt	7	0	
RL220—200 watt	10	3	

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

RL600—15 watt	2	2
RL601—25 watt	2	2
RL602—40 watt	2	2
RL603—60 watt	2	3
RL604—75 watt	3	3
RL605—100 watt	4	0
RL606—150 watt	7	0
RL607—200 watt	10	3
RL608—300 watt	16	1

OSRAM GAS-FILLED CLEAR BULBS.

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

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.

RL588—300 watt	14	6
RL589—500 watt	14	6
RL589—500 watt	20	9
RL590—1000 watt	33	3

LAMPS FOR HOUSE LIGHTING PLANTS.

Low voltage globes with Standard bayonet cap base. Used mainly for house-lighting plants in country districts.

Cat. No. (Type)	Each. s. d.
6 VOLTS	
RL500—10 watt	2 7
RL501—15 watt	2 7
RL502—25 watt	2 7
RL503—40 watt	2 7
12 VOLTS	
RL504—10 watt	2 7
RL505—15 watt	2 7
RL506—25 watt	2 7
RL507—40 watt	2 7
RL511—60 watt	3 4

25 VOLTS	
RL550—15 watt	2 5
RL551—25 watt	2 5
RL552—40 watt	2 2
RL553—60 watt	2 3

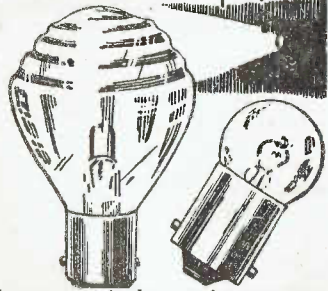
32 VOLTS	
RL560—15 watt	2 5
RL561—25 watt	2 5
RL562—40 watt	2 2
RL563—60 watt	2 3

ROUGH SERVICE LAMPS.

Vacuum Type Lamps with special reinforced filaments for places where ordinary lamps have a short life, due to excessive vibration. Mainly used in garage hand-lamps or machine lights.

RL237—40 watt B/C base	3 0
RL238—60 watt B/C base	3 0
RL609—40 watt E/S base	3 0
TL610—60 watt E/S base	3 0

Motor Car Lamps!



We can supply Lamps for any type of car, including types with special caps, and if you are in doubt about the type to order, send a sample.

6/8 VOLT SINGLE CONTACT SINGLE FILAMENT LAMPS

Cat. No. (Type.)	Candle Power	Wattage	Location	Each. s. d.
RL300	6	5	Tail	1 5
RL302	15	12	Stop	2 4
RL303	21	20	Head	2 4
RL304	32	25	Head	2 4
RL305	50	35	Head	2 4

6/8 VOLT DOUBLE CONTACT SINGLE FILAMENT LAMPS.

RL306	6	5	Tail	1 5
RL308	15	12	Stop	2 4
RL309	21	20	Head	2 4
RL310	32	25	Head	2 4
RL311	50	35	Head	2 4

12/16 VOLT SINGLE FILAMENT SINGLE CONTACT LAMPS.

RL312	6	5	Tail	1 5
RL314	15	12	Stop	2 4
RL315	21	20	Head	2 4
RL316	32	25	Head	2 4
RL317	50	35	Head	2 4

12/16 VOLT SINGLE FILAMENT DOUBLE CONTACT LAMPS.

RL313a	6	5	Tail	1 5
RL315a	15	12	Stop	2 4
RL316a	21	20	Head	2 4
RL317a	32	25	Head	2 4
RL318	50	35	Head	2 4

6/8 VOLT DOUBLE FILAMENT HEAD LAMPS WITH STANDARD DOUBLE CONTACT CAP.

Cat. No.	Candle Power	Equivalent Wattage	Each. s. d.
RL319	21/3 (Ford)	20/3	2 9
RL320	32/6	25/5	2 9
RL321	21/21	20/20	3 6
RL322	32/32	25/25	3 6
RL323	50/50	35/35	3 6

12/16 VOLT DOUBLE FILAMENT HEAD LAMPS WITH STANDARD DOUBLE CONTACT CAP.

RL327	21/3	20/3	2 9
RL328	32/6	25/5	2 9
RL329	21/21	20/20	3 6
RL330	32/32	25/25	3 6
RL331	50/50	35/35	3 6

6/8 VOLT LAMPS WITH SPECIAL CAPS.

Cat. No.	Location	Wattage	Cap	Each. s. d.
RL350	Head	25/25 Prefocus	836	4 10
RL351	Head	35/35 Prefocus	836	4 10

12/16 VOLT LAMPS WITH SPECIAL CAPS

Cat. No.	Location	Wattage	Cap	Each. s. d.
RL373	Head	25/25 Prefocus	836	4 10
RL374	Head	35/35 Prefocus	836	4 10

LAMPS, DIAL.

Cat. No. (Type)	Each. s. d.
RL818—2v. Battery Panel Lamps, Miniature Bayonet Cap Base	1 4
RL119—2v. Battery Panel Lamps	1 4
RL120—2.5v. Panel Lamps	1 4
RL121—3.8v. Panel Lamps	1 4
RL122—6v. Panel Lamps	1 4
RL123—6v. S.B.C. Panel Lamps	1 4
RL124—6v. Round Bulb Dial Lamps	1 4



LAMPS, TORCH AND CYCLE.

RL1—6 volt 3 watt Dynamo Cycle Lamps	1 9
RL2—6 volt 1.8 watt Dynamo Cycle Lamps	1 9
RL99—2.5 volt Prefocus American Base Torch Bulbs	1 9
RL112—2.5 volt Torch Bulbs	0 10
RL113—3.5 volt Torch Bulbs	0 10
RL103—4 volt Torch Bulbs	0 11
RL109—6 volt Torch Bulbs	1 2



MOTORS.

Cat. No. (Type)	Each. £ s. d.
RM665—Robbins & Myers' 1/4-h.p. S.P. Motors	6 15 0

NUTS AND BOLTS.

Cat. No.	Per doz. s. d.
RT248—1/2 in. x 6BA Brass Nuts and Bolts, Round head	6
RT430—1 in. x 6BA Brass Nuts and Bolts, Round head	0 7
RT424—1/2 in. x 4BA Brass Nuts and Bolts, Round head	7 1/2
RT426—1 in. x 4BA Brass Nuts and Bolts, Round head	9
RT421—1/2 in. x 2BA Brass Nuts and Bolts, Round head	10d. doz.
RT423—1 in. x 2BA Brass Nuts and Bolts, Round head	1 1
RT446—1 in. x 1/2 in. Brass Nuts and Round head	9
RT441—1/2 in. x 1/2 in. Metal Nuts and Bolts	6



MIXER BOWLS.

Cat. No. (Type)	Each. £ s. d.
RE823—Universal Mixer Bowls, large	1 14 6
RE824—Universal Mixer Bowls, small	1 1 0
RE833—Dormeyer Mixer Bowls, large	17 6
RE834—Dormeyer Mixer Bowls, small	10 6

PANELS.

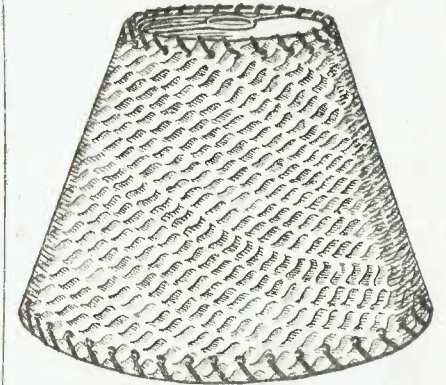
Highly-polished Radio Panelling. Black, mirror-like finish. Easily worked and can be cut, drilled or sawn. Ideal for instrument Panels, etc.

Cat. No. (Type)	Each. s. d.
RP510—5 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	2 0
RP511—8 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	3 0
RP512—11 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	4 0
RP513—5 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	4 0
RP514—8 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	6 0
RP515—11 1/2 in. x 6 1/2 in. x 1/16 in. Panica Panel	8 0
RP516—5 1/2 in. x 6 1/2 in. x 3/16 in. Panica Panel	6 0
RP517—8 1/2 in. x 6 1/2 in. x 3/16 in. Panica Panel	9 0
RP518—11 1/2 in. x 6 1/2 in. x 3/16 in. Panica Panel	12 0

PARCHMENT LAMPSHADES.

Low-priced attractive Lampshades, Parchment with wire frames. Illustrations give shape, but decorations are in numerous designs. Colours available are: Pink, Blue, Green, Brown, Orange, Yellow and Red.

Types marked "hole" are for standard hanging lights, while types marked "clip" are for clipping on to a Lamp Bulb, as used for Table Lamps, etc.



Shape 1.—Bottom diam., 10in.; Top diam., 5in.; Height, 7in. "Standard Empire."

Cat. No.	Each
Cat. No. RZ1P—Plain (Hole)	3 11
Cat. No. RZ1D—Decorated (Hole)	4 9
Cat. No. RZ1AP—Plain (Clip)	3 11
Cat. No. RZ1AD—Decorated (Clip)	4 9

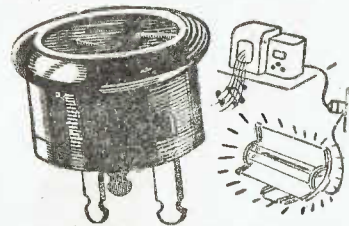


Shape 15.—Bottom, 10in.; Top, 4in. Height, 6in. Squat Empire, especially suitable for Table Lamps.

Cat. No. (Type)	Each s. d.
RG84—Parallel Two Pin Plug	8
RG85—Two-pin Tee Plug Tops	7
RG87—English Round Pin Plug Tops	1 6
RG89—Side entry 3-pin Plug Tops	1 3
RG90—New Type Speedee Hand-grip 3-pin Plug Tops	1 0

PLUGS, ELECTRICAL.

Cat. No. (Type)	Each s. d.
RG84—Parallel Two Pin Plug	8
RG85—Two-pin Tee Plug Tops	7
RG87—English Round Pin Plug Tops	1 6
RG89—Side entry 3-pin Plug Tops	1 3
RG90—New Type Speedee Hand-grip 3-pin Plug Tops	1 0



RG100—Double 3-pin Plug Tops for using 2 appliances from the one point	2 1
RG112—Titegrip plain appliance plugs	1 0

PLUGS, RADIO.

Cat. No. (Type)	Each s. d.
RP268—Bulgin Phone Plugs	4/6
RP252A—4-pin Speaker Plugs, Shielded	1/6
RP253a—5-pin Speaker Plugs, Shielded	1/3
RP254—6-pin Amphe-nol Speaker Plugs 1/-	
RP255—7-pin Amphe-nol Speaker Plugs, 10d.	
RP256—Octal Amphe-nol Speaker Plugs 1/-	
RP270—Midget 3-pin Chassis Plugs and Sockets	Pair 1 9

POTENTIOMETERS.

Cat. No. (Type)	Each s. d.
RP24—10,000ohm Wire-wound Potentiometer	6 9
RP50—25,000 ohm Carbon 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—500,000ohm Carbon Potentiometer	6 9
RP55—1 megohm Carbon Potentiometer	6 9
RP57—2 megohm Carbon Potentiometer	6 9
RP64—500,000 Carbon Potentiometer, with switch	5 6
RP30—400 ohm Wire-wound Potentiometer	8 3
RP31—1000 ohm Wire-wound Potentiometer	9 6
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

PULLEYS.

Cat. No. (Type)	Each s. d.
RM700—4in. x 3/4in. Motor Pulley	7 9
RM701—4in. x 3/8in. Motor Pulley	7 9
RM702—4in. x 1/2in. Motor Pulley	7 9

Smaller types also at present procurable.

READING LAMPS.

Cat. No. (Type)	Each s. d.
RF902—Swan Neck Wall Lamps, polished wood base; Chromium bracket, 9in. Complete with shade and globe. Switch mounted in base	1 17 6
RF907—Tubular Parchment Lamps. Clip-on bed or can be screwed to wall. Length, 11in., diameter 3 1/2in. Modern and attractive. Various colours	1 7 6



READING LAMPS—Continued.

Cat. No. (Type)	Each s. d.
RF908—Coloured base, Swan Neck Lamps. Really attractive. Can be screwed to bed or used as Table Lamp. With switch	2 2 6
RF910—Diamond Shape Wall Lamp. Polished wood diamond-shaped base. Comp. with parchment Shade, Globe, Switch, etc.	1 12 6

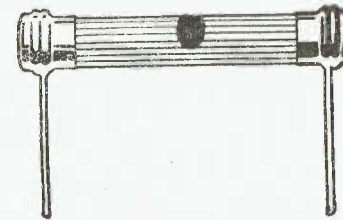
RECTIFIERS.

RA175—1/2amp Dry Rectifiers	1 7 6
RA189—2amp Bulb Rectifiers	1 18 6
RA190—6amp Bulb Rectifiers	3 10 0
RM13—1m. 0-1 M.A. Meter Rectifiers	1 9 6

RESISTORS.

PRACTICALLY ALL SIZES OF 1/2 AND 1 WATT AT PRESENT AVAILABLE.

I.R.C. American Brand, 1/2 watt	0 8
Do., 1 watt	0 9



SCREWS, WOOD.

Cat. No. (Type)	Each s. d.
RT470—1/4in. x 1g. Bright Mild Steel	3
RT471—3/8in. x 2g. Bright Mild Steel	3
RT472—1/2in. x 5g. Bright Mild Steel	3
RT473—3/4in. x 3g. Bright Mild Steel	3
RT474—5/8in. x 6g. Bright Mild Steel	4
RT475—3/4in. x 4g. Bright Mild Steel	4
RT476—3/4in. x 6g. Bright Mild Steel	4
RT477—3/4in. x 8g. Bright mild steel	5
RT478—1in. x 4g. Bright Mild steel	5
RT479—1in. x 6g. Bright Mild steel	5
RT480—1in. x 8g. Bright Mild steel	6
RT481—1 1/4in. x 8g. Bright Mild Steel	6
RT482—1 1/2in. x 10g. Bright Mild steel	7
RT483—1 1/2in. x 6g. Bright, Mild steel	7
RT484—1 1/2in. x 9g. Bright Mild steel	8
RT420—Self-tapping Screws, 3/8in. x 6in.	Per gr. 4 9

SHIELDS.

Cat. No. (Type)	Each s. d.
RS20—Goat Valve Shields	1/5 pair
RG177—3-pin Brown Plush Plug Bases	2 4
RG178—3-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 s. d.
RS614—Amphenol 4-pin Chassis Sockets	8
RS615—Amphenol 5-pin Chassis Sockets	8
RS616—Amphenol 6-pin Chassis Sockets	8
RS619—Amphenol 8-pin Chassis Sockets	8
RS621—5-pin Amphenol Sockets with special baseboard mounting shell	2 6
RS624—Octal Amphenol Sockets, as above	2 6
RS631—4-pin Wafer Sockets, 8d.	
RS632—5-pin Wafer Sockets, 8d.	
RS633—6-pin Wafer Sockets, 8d.	
RS635—Octal Wafer Sockets, 8d.	
RS636—Loctal Wafer Sockets	1 2
RS637—Midget Button-valve Sockets as used with Midget tubes, 154, etc.	2 0
RS638—P. Valve Sockets (Philips)	1 7



SPARES.

GLORIA PERMANENT WAVING MACHINE SPARES.

Cat. No. (Type)	Each s. d.
RE106—Heating Clamps	4 3
RE107—Curling Rods	2 2
RE108—2 1/2oz. Bottles Waving Solution	3 3
RE109—10oz Bottles Waving Solution	10 9
RE110—2 1/2oz. Bottles Setting Lotion	2 2
RE111—10oz. Bottles Setting Lotion	5 6
RE112—Dampers	4 6
RE113—Winders	4 4
RE114—Rubber Pads	Per doz. 5 0

IRON SPARES.

RE508—Fitzall Iron Elements	3 9
RE508A—Fitzall Iron Elements, (Niccob Brand)	7 0
RE504—Fitzall Iron Elements, 110 volts, 8/8	
RE491—Electro-way Iron Elements, 14/-	



SPARES—Continued.

Cat. No. (Type.)	Each s. d.
RE400—Iron Terminal Pins	8
RE405—Iron Handles (wooden)....	1 9
Iron Cords—See Cords.	

JUG SPARES.

RE514—Spiral Jug Elements for Porcelain Jugs	1 4
RE517—Wireless Jug Elements. Cannot burn out. Fits all porcelain jugs. A.C. use only.	10 0
RE560—Complete Element for Porcelain Jug, including Spiral, Bobbin and Supports	4/3
RE485—Small Porcelain Jug Bobbin (round), 1/3	
RE486—Large Porcelain Jug Bobbin (round) 1/3	
RE563—Jug Terminal Pins	1 1
RE936—Moulded Base for Speedee Chrome Jug	2 6
RE937—Spare Handle for above....	2 9
RE938—Spare Knob for above	3
RE943—Spare Chrome Ferrule for above	1 0
RE944—Spare Terminal Block for above	1 6
RE500—Spare Rubber Washers for above Jug Cords—See Cords.	8



RADIATOR SPARES.

RE518—Speedee Small Tile Elements, 850w.	8 1
RE519—Speedee Large Tile Elements, 1000w.	9 1
RE512—Speedee Pencil Rod Elements, 9 1/2 in.	5 9
RE523—Ultimate Pencil Rod Elements, 10 in., 1000 watts	8 0
RE524—Akrad Pencil Rod Elements, 10 in.	10 6
RE525—Daly Pencil Rod Elements, Vertical Mounting end pieces, 10 in.	9 0
RE533—Round Bar, 10 in., with Spiral Element, Vertical Mounting end pieces	9 9
RE534—Electroway Short Tubular Elements	10 6
RE535—Electroway Long Tubular Elements	12 6
RE536—Electroway Small Tile Elements	12 0
RE537—Electroway Large Tile Elements	12 6



RADIATOR SPARES—Continued.

Cat. No. (Type.)	Each s. d.
RE548—Ferranti 10 in. 1000w. Elements	19 6
RE549—Ferranti 7 in. 600w. Elements	18 0
RE951—Bakelite Oblong Terminal Blocks, as used on Speedee Radiators	1 8
RE954—Pencil Rod Terminal Blocks, as used on Speedee Radiators..	9
RE955—Porcelain Biscuit for Small Bowl Fire Element, as used on Speedee Radiators	1 8
RE488—Cone Formers. Porcelain Former only unwound, suitable for bowl fires, etc.	5 3
RE506—Similar to above. Larger size	5 3
RE502a—9 1/2 in. x 1/2 in. Unwound Pencil Rod Bars	5 3
RE509—600w. Radiator Spirals	2 0
RE510—750w. Radiator Spirals	2 3
RE511—1000w. Radiator Spirals	2 6

RANGETTE SPARES.

Cat. No. (Type.)	Each s. d.
RE489—Complete Element and Cast Plate for Atlas Rangettes	4 0 0
RE510—750w. Spiral Elements for Rangettes	2 3
RE511—1000w. Spiral Elements for Rangettes	2 6
RE530—Complete Element and Cast Plate for Neeco Rangettes	2 12 6
RE532—Neeco Cast Plate only ..	9 9
RE550—Fitzall Large Range Hotplates. Comp. with Chrome surround. Fits any make of Range with Element recess between 8 1/2 and 11 in. diameter. 1,750 watts	1 18 6
RE551—Ditto. Small size. Fits all makes of Rangettes with Element recess between 6 in. and 8 in. 900 watts	1 12 0
RE570—Complete Elements and Cast Plate for Ultimate Rangette. 6 in. Diameter....	1 8 2
RE571—Ditto. Large size, 8 in. Diameter	1 13 7
RE527—Oven Elements for above ..	1 5 1
RE902—Top Circular Element for Speedee "Kitchen Companion" ..	10 3
RE905—Corner Trims (Chromium) for above	2 0
RE410—Insulating Beads Per doz.	2

SOLDERING MATERIAL AND SPARES.

Cat. No. (Type)	Each s. d.
RS406—"Speedee" Light Duty Soldering Irons	15 6
RS407—Spare Elements for above Per pair	5 0
RS403—Copper Bit for above ..	3 0
RS404—Element Cover for above ..	2 3

SOLDERING MATERIAL AND SPARES—Continued.

Cat. No. (Type)	Each s. d.
RS396—"Speedee" Heavy Duty Soldering Irons	2 15 0
RS397—Spare Elements for above Per pair	19 0
RS410—"Solon" Standard Soldering Irons	1 5 3



RS411—Small reels Resin Core Solder	7
RS413—1lb. reels Resin Core Solder	7 6
RS418—34/66 Stick of Solder ..	1 6
RS420—Small Sticks Aluminium Solder	1 8
RS423—Morton's Soldering Paste, 2oz. tin	1 8
RS424—Morton's Soldering Paste, 4oz. tin	2 6
RT2—Small Pear-shaped Solder Lugs	3
RT3—Large Pear-shaped Solder Lugs	3
RT4—Drop Shaped Solder Lugs ..	3
RT7—Double Ended Solder Lugs ..	3

SUPPRESSORS.

RR228—Distributor Car Radio Suppressors	2 10
RR229—Spark Plug Car Radio Suppressors	2 3
RA298—Ensign Line Filters, cut out man-made interference..	1 1 6

SWITCHES, ELECTRICAL.

Cat. No. (Type)	Each s. d.
RG118—Miniature switches for low voltage circuits, coloured bakelite, 2/3	
RG118A—Ditto, chrome plated, 2/3	
RG119—5 amp. Insulated Wall Switches, 1/11	



SWITCHES, ELECTRICAL—Continued.

Cat. No. (Type.)	Each s. d.
RG121—5 amp. 2-way insulated Wall Switches	4 6
RG123—5 amp. Lincoln Crabtree Insulated Wall Switch	2 8
RG124—10 amp. Ditto	3 6
RG125—15 amp. Ditto	7 6
RG127—Lincoln Crabtree one-way Ceiling Switch	6 6
RG128—Ditto, 2-way	7 6
RG138—Speedee Kick Switches for Radiators, Table Stoves, etc. ...	4 3
RG169—5 amp. Crabtree Flush Wall Switches	2 6
RG170—Titegrip 5 amp. Brown Flush Wall Switches	2 0
RG513—3 Heat Neeco Range Switches	15 0

SWITCHES, RADIO.

RS438—Telsen 4-point P.P. Switches	3 5
RS439—P.P. Battery Switches, S.P.	3 4
RS443—S.P.D.T. Toggle Switches	6 0
RS444—D.P.D.T. Toggle Switches	7 6
RS445—S.P. On-Off Rotary Switches ..	5 0
RS490—S.P.D.T. Knife Switches	1 9



SWITCH PLATES.

RG182—Brown Bakelite, for 1 switch	1 0
RG193—Brown Bakelite, for 1 plug... ..	1 1
RG183—Brown Bakelite, for 2 switches	1 8
RG185—Brown Bakelite, for 1 switch and 1 plug	2 0
RG186—Ivory Bakelite, classic type, for 1 switch	1 6
RG187—Ivory Bakelite, classic type, for 2 switches	3 6
RG189—Ivory Bakelite, classic type, for 1 switch and 1 plug	3 0
RG194—Ivory Bakelite, classic type, for 1 plug	1 8
RG195—Brown Bakelite, for 1 switch, classic type	1 6
RG196—Brown Bakelite, for 2 switches, classic type	3 0

TERMINALS.



RT27—Two-way Terminal Strips Each 7d.	
RT41—Fahnstock Clips, Each 3d.	
RT2—Small Pear Soldering Lugs, Doz. 3d.	

TERMINALS—Continued.

Cat. No. (Type)	Each £ s. d.
RT3—Large Pear Soldering Lugs, Doz. 3d.	
RT4—Drop-shaped Soldering Lugs, Per Doz. 3d.	
RT7—Double-ended Soldering Lugs Per doz. 3d.	

TEST EQUIPMENT.

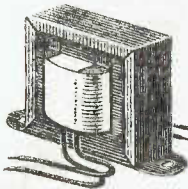


RM10—0-1 M.A. Meters. Used but in excellent condition ..	2 19 6
RM6—"Telsen" Triple Range Meters ..	1 7 0
RM50—Meter Fuses ..	9
RM13—1M. 0-1 M.A. Meter Rectifiers ..	1 9 6
RM12—20-0-20 Car Meters ..	15 6
RM1—Test Prods ..	7 0
RM7—Pifco Test Prods ..	15 0

PANELS FOR METERS—(See Panels)

TRANSFORMERS.

Cat. No. (Type)	Each £ s. d.
RT650—6.3 v. 60M.A. Power Transformer, £1/19/6	
RT651—6.3v. 100M.A. Power Transformer, £2/7/6	
RT652—6.3v. 150M.A. Power Transformer, £2/19/6	
RT653—2.5v. 60M.A. Power Transformer, £1/13/3	



RT670—Electric Hikers Transformer ..	2 0 0
RT602—Universal Output Speaker Transformer ..	17 6
RT605—Class B Transformer ..	12 0
RT616—Special Valve Testing Transformer ..	2 7 6
RT622—230/110v. Stepdown Transformer, 60w.	1 17 6
RT623—230/6v. Voltage Reducer ..	1 17 6
RT625—6/150v. 25M.A. Vibrator Trans.	1 5 0
RT632—6.3v. Filament Trans. ..	19 0

TOASTER, SPARES.

Cat. No. (Type)	Each s. d.
RE622—Electroway Toaster Elements	7 6
RE760—Coloured Trays for Speedee "Hostess" Toasters (Drilled) ..	3 9
RE761—Ditto (Plain) ..	2 11
RE759—Coloured Trays for Speedee "Tiffin" Toasters ..	7 6
RE941—Spare Racks for above ..	6
RE940—Moulded Cord Grips for Speedee Toasters .. Pair	5
RE938—Spare Knobs for Speedee Plain Toasters ..	3
RE939—Spare Knobs for Speedee "Tiffin" Toasters ..	6
RE945—Spare Springs for Speedee "Tiffin" Toasters ..	3
RE949—Spare Springs for Speedee Plain Toasters (coil) ..	3
RE942—Spare Moulded Plyths for Plain Toasters .. Pair	2 8

VACUUM CLEANER SPARES.

RE238—Carbon Brushes ..	1 6
RE239—Springs for Carbon Brushes ..	1 0

VACUUM CLEANER REPAIRS.

We undertake the repairs on all makes of Vacuum Cleaners. However, when an armature or field coils need rewinding the time taken on repairs is usually in the vicinity of 6 to 8 weeks. Minor repairs can be effected in approx. one to two weeks. Armature Rewinds: Approx. £1 19s. 6d. Field Coil Rewinds: Approx. £1 5s.

WELDER, SPARES.

RE9—Carbon Electrodes ..	2 6
RE13—Brass Electrodes ..	6
RE14—Steel Electrodes ..	6
RE15—Packets Flux ..	6

TRANSFORMERS, SPEAKER.

RT714—Single Pentode Speaker Transformers ..	10 1
RT715—Push Pull Pentode Speaker Transformers ..	12 8
RT716—Single Triode Speaker Transformers ..	12 8
RT717—Push Pull Triode Speaker Transformers ..	12 8
RT730—Speaker Transformer Coils, Single Pentode ..	6 10
RT731—Speaker Transformer Coils, Single Triode ..	7 6
RT732—Speaker Transformer Coils, Push Pull Pentode ..	7 6
RT733—Speaker Transformer Coils, Push Pull Triode ..	7 6
RT705—Rola Speaker Transformers, 10,000 C.T.	18 6
RT706—Rola Speaker Transformers, 7,000 ..	18 0

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

TRANSFORMERS, SPEAKER—Continued.

Cat. No. (Type)	Each s. d.
RT707—Rola Speaker Transformers, 7,000, large ..	18 0
RT708—Rola Speaker Transformers, 5,000 ..	18 6
RT709—Rola Speaker Transformers, 10,000 ..	18 6



TUBING.

RS1—1 mil Spaghetti Tubing Yard	0 4 1/2
RS2—2 mil Spaghetti Tubing Yard	5
RS3—3 mil Spaghetti Tubing Yard	6
RS4—4 mil Spaghetti Tubing Yard	8
RS5—6 mil Spaghetti Tubing .. Yard	1 0
RS86—Rubber Spaghetti Tubing Yd.	5
RW163—Metallic Screened Braiding, 1/8in., open to 7/16in. .. Per foot	7
RW164—3/16in. open to 1/4in. Per foot	4

VIBRATORS.

Cat. No. (Type)	Each £ s. d.
RB60—4-pin 6 volt "Electronic" Brand Vibrators ..	1 7 6
RA213 — "Akrad" Vibrator Power Pack. Input 6 volts. Output 135 volts ..	6 0 0



WINCHARGERS.

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

Cat. No. (Type)	Each £ s. d.
RA206—6v. De Luxe Model ..	23 4 0
RA207—12v. De Luxe Model ..	39 17 6

WIRE.

RW46—40-gauge Enamelled Copper Wire, approx. 2lb. reels ..	18 0
RW78—7/029 V.I.R. Cable .. Yard	0 8



RW109—Unnunciator Bell Wire, single strand ..	Foot 0 1
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WIRE—Continued.

Cat. No. (Type)	Each £ s. d.
RW117—60ft. C1s 20 gauge D.C.C. Wire. Makes excellent bell wire. Single strand ..	2 6
RW156—Connectrite Stranded Push Back Wire .. 10ft.	1 0
RW157—Connectrite Solid Push Back Wire .. 10ft.	1 0
RW158—Shielded Grid Wire Per ft.	5 1/2
RW159—Remit Connecting Wire. Assorted colours .. Per foot	1 1/2
RW160—Single Shielded Microphone Cable .. Per ft.	1 3
RW161—Ravine Wire, excellent lead-in .. Per ft.	3
RW162—Twin Shielded Microphone Cable .. Per ft.	1 3
RW166—10ft. Coils Remit Wire. Assorted colours .. Coil	1 3
RW97 — 2-core Cabtyre Rubber Flex .. Per yd.	1 4
RW200 — 3-core Cabtyre Rubber Flex .. Per yd.	1 6
RE847—1/2lb. Reels 24 gauge Nichrome Wire ..	12 9
RE848—1/2lb. Reels 26 gauge nichrome Wire ..	15 0

(See Flex)

GENERAL.

RU1—Electroshine. For silver finishing any metal object ..	2 3
RU3—Model Steam Engines ..	1 17 6
RU4—Magnets ..	6
RU6—Model Kittyhawk Planes, mottled bakelite ..	2 0
RU7—Ditto, Cream Bakelite ..	4 6
RU140—K.W.H. Counters ..	2 6
RU151—3 in 1 Oil .. Can	1 10 1/2
RU156—New Grip Cement. Mends anything .. Tube	1 7
RU158—Rubber Solution .. Tube	1 0

RU159 — Insuvarn Coil Dope, per bottle ..	2 3
RU160—Stucka Phenonic Cement Per bottle ..	2 3
RU163—8oz. tin C.M. Water Putty ..	1 8
RU165 — 16oz. tin C.M. Water Putty ..	2 8
RU166—Nu-Mould Plastic Wood ..	3 6
RU351—Kitchen Tidies .. Each	1 0 3



RU500 — "Supremacy" A modern war game Post free	19 6
RU700 — Hacksaw Blades, 6d.	
RU711 — Amber lite Pocket Screwdrivers, 1/4	
RU713—Slip joint Pliers, 3/3 each	



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