

WIRELESS WEEKLY

January 5th, 1923

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A Wireless Set in Every Home at a Nominal Cost of 22/6 !

THE SMALLEST AND SIMPLEST SET IN THE WORLD—Measuring 3 x 3 x 1.

Solid Cedar Cabinet, Ebonite Top. Every Part made in Australia. Lasts a Lifetime, and Brings Wireless Signals to Every Home.

No Experience or Examination Necessary.

No Batteries or Upkeep.

The First Cost, the Only Cost. Before Ordering a Big Set from your Dealer, Buy a "JUNIOR" Outfit from him for 22/6, and Learn to take Signals Every Night in your Own Home, from Ships and other Operating Stations. Outfit Guaranteed.

If you Post your 22/6, plus 1/- postage, YOU will receive your Outfit in due course from the Inventor—

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We specialise in Country Orders.

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F. B. COOKE,
Manager.

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We have large stocks of Quality Radio supplies for the Amateur and Experimenter.

Complete Sets also parts to build your own including 3000 ohm Head Sets and Loud Speakers.

SEND FOR PRICE LISTS

Mail Orders please state Licence No. if allotted.

W. HARRY WILES,

**Importer and Supplies of
Everything Electrical.**

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One door from Pitt Street,

SYDNEY.

ESTABLISHED 1904.

January 5th, 1923

WIRELESS WEEKLY

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The Radio College.

23 LANG STREET,

Cnr Grosvenor Street (near Wentworth Hotel)

Complete Receiving Station available.

Will commence on Tuesday, January 2nd, 1923.

Courses in Principles and Practice of Radio Telegraphy and Telephony.

- (A) ONE MONTH COURSE, 2 days per week 30/-
Lectures will include Crystal and Valve Reception.
- (B) FULL COURSE, 3 months, 2 days per week 25 5s.
Leads to complete knowledge required by new Regulations, including Morse Code, Practice and Elements of Radio Telegraphy.
- (C) POSTAL COURSE, comprising same subject as (B) 24 4s.
Courses may be arranged for either day or night. Prospectus on application.
Enrolment by post or personally.

If you require a license inform us, and we will take the necessary steps.
Apply to Principal,

MR. F. BASIL COOKE, F.R.A.S. Late Wireless Instructor to A.I.F.

DANISH HIGH-POWER RADIO STATIONS.

The commission appointed about two years ago by the Danish Ministry of Public Works to look into the question of a high-power radio telegraph station has now submitted a report recommending that necessary legislation be secured to permit erection and operation of a transatlantic radio station. The majority report favours installation of the Valdemar Poulsen arc, while the minority recommends that selection of type be deferred, pending further investigation. In addition to commercial service to the United States and Canada, it is hoped to establish direct communication with Greenland. The report points out that the sooner the station is completed the greater the probability that a considerable portion of the radio traffic between the United States and Eastern Europe will be routed via Denmark, and thus aid greatly in developing commerce between those countries.

ALTERNATING CURRENT SUPPLY FOR AMPLIFIER TUBES.

There has been developed at the Bureau of Standards an amplifier which uses 60-cycle alternating current to supply power for both the filaments and plates. The necessity of storage batteries and dry batteries is thus eliminated. The final form of amplifier uses five tubes and a crystal detector, there being three radio-frequency stages and two audio-frequency stages. A description of this amplifier is contained in a paper by P. D. Lowell, which appeared in the July, 1922, issue of the journal of the American Institute of Electrical Engineers, pages 488-490. It is expected that this paper will also be available as a publication of the Bureau of Standards in the near future.

HUMORS OF WIRELESS

"Listening-In" is not without its moments of humour. There is the classic joke, hoary among pre-war wireless men, of the junior operator, who, muddled about call-letters and mistaking the coast station of Ushant for a ship, signalled, "Where are you bound for?" The operators on dozens of ships huffed themselves on hearing this, but when, after profound thought, the French operator replied, "Mister, I am Ushant. I do not budge," they enshrined the incident in their hearts together with the story of the Japanese operator who gave a general call, and added, "All gentlemen, honourable embarkery affixed muddilyand unable to coming out," meaning that his ship had stuck on a mudbank and could not get off.

 * A TALK WITH "WIRELESS WEEKLY." *

A calm survey of the state of amateur wireless in Australia cannot be made without the observer becoming pessimistic.

At the present moment there is nothing doing, and from all appearances there is very little to look forward to. A bad state of affairs to start the New Year with.

The forthcoming Trans-Pacific tests stand out as a shining spot in the gloom.

In Australia, of all countries, wireless should be playing a big part. We have tremendous distances that can be bridged by the magic ether waves; communication can be speedily made with remote places, and entertainment provided for the lonely settlers in the "out-back."

The reader might ask: "Is this anything to do with the amateur?"

Our answer is decidedly in the affirmative. The amateur, in our opinion, should not be content to concentrate on his own particular set and, perhaps, his own club or society. He should take a broad view of things, and, if his heart is really in the science, work to see it put on that plane from which it will benefit the whole community.

Who knows better than the amateur the need for the things mentioned? The people who should be getting the benefit of the wonderful invention do not know, in most cases, what is being denied them. This is because they have had no opportunity to test and study wireless.

The clubs would do well to move in the direction of educating the public to the use of wireless; not so much in the city, but the dweller

in the country. There are keen experimenters scattered throughout the country districts, and these should be induced to give demonstrations and lectures, and the powerful city clubs and societies could then busy themselves with the authorities.

The first thing that should be done by the Government is to arrange that the nightly weather reports from the coast stations are sent out by radio telephony and also by telegraphy at a rate of not more than twelve words a minute. This would enable the man on the land to obtain speedy information about the weather, which is of vital importance to him.

Other things, such as entertainment, should also be taken up by the amateurs.

Put some "pep" into things, and get Radio into its proper place in the scheme of things.

Get Your Wireless Gear at

ELECTRICITY HOUSE

387 GEORGE STREET (OP. STRANO). TEL. 2961 CITY

Condenser Plates, 2/- per doz.; Condenser Spindles, 2/9 per set; Condenser Ends, 1/9 pair; Honeycomb Coils, from 3/6; Honeycomb Mountings, 3/- each; Filament Resistances, 7/6 each; Calibrated Dials, 1/6 each; Knobs, 1/6, 2/-, 2/6 each; Contact Studs, 1/9 per doz.; Switcharms, 3/-, 4/6; Terminals, 6d. each; Phone Condensers, 1/6; Grid Condensers, 1/6; Variable Condensers, 25/-, 30/-.

Murdocks Phones, 37/6; Myers Valves, 35/-.

Catalogues, 9d. each including wiring and other diagrams. All makes of Telephones and Valves.

Crystal Cups, 1/-; Detectors, 5/- each; Loose Couplers 45/-; Cabinets, Ebonite, Bakelite and all round materials.

INTERVALVE TRANSFORMER, 45/-.
Closed Iron Core.

Works Manager: RAYMOND McINTOSH.
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 General Manager: J. S. MARKS.

All communications to the Firm.

SALE & EXCHANGE

Three Lines (approximately 15 Words), may be inserted in this Column for 9d.

Extra Lines or part thereof, at 6d per line.

FOR SALE.—Valve set, also crystal set, complete, with aerial, 'phones, absolute bargain, £2/10/. Ring Y 1833.

FOR SALE.—Drummond, 4in. round bed lathe, in splendid order £30. In first case, Box 378, G.P.O.

FOR SALE.—1/4 h.p. 6 volt Century Dynamo, for £12. Box 378, G.P.O.

Wireless Set, comprising aerial, tuning panel, detector, panel, two stages, audio frequency, sep. panel, pair Brown' 2000 ohm. adjustable 'phones, batteries, &c., for sale, complete or separately. No reasonable offer refused. Box 378, G.P.O.

FOR SALE.—Accumulator, 8 v., 60 amp., £3; valve and rheostat, 27/6; 40 v. B battery (in case), 15/; V. condenser (23 plates), 12/6; Murdock's 'phones, 3000 ohm., 30/- (all new). W. Greenland, 50 York Street.

January 5th, 1923

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DO YOU KNOW YOUR HONEYCOMB COILS ?

Many amateurs have tried honeycomb coils for amateur reception and have found them unsatisfactory. When asked what the matter is with them, they will usually bring up the two following arguments: First, they will not oscillate well on amateur wave-lengths, and second, they are hard to tune with, and one cannot tune quickly enough, says G. Robson in an American Magazine.

In all probability these same amateurs did not keep their coils long enough to really know them. Although one must really know his set in order to keep it working efficiently; this is particularly true in the case of honeycomb coils. Once you know all the peculiarities and know how to tune with them, you can run a honeycomb coil set with as much ease as a regenerative set.

Going back to the first argument of oscillating, this is something I never had much trouble with except when I first had the coils and did not know much about them. There are several things to look for if the set does not oscillate properly. Try grid condensers of various capacities; see that the leads from the coils do not cross each other; have the grid condenser as near to the grid connection as possible. In damp weather the straps may become wet and thereby short circuit the coils; this will make oscillating difficult. I dried and shellacked the straps, thereby overcoming this trouble. Examine the wires on the honeycomb coil holder which connect the holder to the binding posts in back, as they might be broken. I had this trouble once as the wire had become broken inside the insulation and it was quite a while before I found the cause of the set not working. Sometimes, but very rarely, the coils do not make perfect contact with the holder; make sure the coils are not "upside down" so to speak. For instance, if you have the bottom connection of the primary going to the ground, make sure that the lower connection on the secondary goes to the "A" battery, and that the lower connection on the tickler goes to the plate. Another

amateur and myself had a peculiar occurrence with our sets. Neither of our sets would oscillate unless the "A" battery was reversed so that the minus terminal went to the secondary instead of the plus. This being contrary to theory, we could never see through it. One bulb that I had was so critical that it would not oscillate properly unless I had a grid lead of a certain size in the grid circuit. A different hook-up will often make all the difference in the world.

All these things can be easily remedied, so, take a good look at your set, and, noticing the various "causes of trouble" that I have mentioned, fix it up. There may be others, but these are the chief things that I have looked for during my experience with honeycomb coils.

In my hook-up the primary condenser shunting the primary is not necessary, but it works a little better with it. On my set, I rarely used it, as I just set it where amateurs came in best and left it there. A .001 mfd. condenser is better than a .0005 mfd. one across the secondary; the larger capacity gives a greater range.

The second argument, that honeycomb coils are hard to tune with and that one cannot tune quickly, is all wrong. I have used both honeycomb coils and regenerative sets and I will say that I can tune just as quickly with my honeycomb coils as with the regenerative set. It may be because I am more familiar with the coils, but that is just what I am trying to bring out. If one knows his honeycomb coils and knows how to tune with them, they will work all right. The secondary condenser is the only one that

needs to be varied to tune in the various stations. The tickler coil, of course, has to be moved frequently to vary the oscillations. I was always able to quickly change when a station was fading, but always had trouble with the "ones" swinging, although I could keep on reading them by changing to a different wave-length.

As to what coils to use, I cannot say. The only way to try is to see which coils work best on the wave-lengths desired. It all depends on the bulb and the size of the aerial. With one bulb on amateur wave-lengths I used L25 primary, L35 secondary, and L50 tickler. With another bulb, I used L75 tickler. One amateur whom I knew had to use a L100 for tickler on amateur waves, while another used only an L3 tickler. This is one point which cannot be specified, and must be determined by the amateur in experimenting until the right coils are found.

Just Received from America.

MAKE YOUR OWN SETS.

TWENTY RADIO PHONE DIAGRAMS and hook ups of Crystal and Audion Receiving Circuits, Amplifying Circuits, Regenerating and Sending Circuits 3/6

How to Make Detector and Amplifier Units 3/6

How to Make a Short Wave Regenerative Receiver 3/6

14 Radio Formulae and Diagrams for the advanced Radio Student 3/6

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BURGIN RADIO COLLEGE.

New Course Commences on MONDAY, 8th JANUARY.
Full Course, 3 Months, 3 Nights per week £5 5s.
Progressive and other part courses—Terms on Application.
Send for Particulars, PRINCIPAL,

O. F. MINGAY, C/o BURGIN ELECTRIC CO.,

352 KENT ST., SYDNEY.

THE TESTS.

Official Reply to Mr. Stowe.

The Editor, "Wireless Weekly,"—
Dear Sir,—
The Trans Pacific Radio Tests Organisation Committee, N.S.W. Section has considered the letter from Mr. H. A. Stowe, published in your last issue and would be pleased if you would give prominence to our reply:—
The Organisation is of such huge dimensions that it could not be run without sufficient funds and the balance of money remaining over after all expenses have been paid will be devoted to prizes.
The entrance fee of 10/- was not fixed by this committee but was unanimously agreed upon by delegates representing every radio club in Sydney and suburbs.
This committee is only carrying out the resolutions carried by the delegates at the meeting held on the 6th December, 1922.
As most stations will be probably operated by at least five experimenters on account of the long duration of the tests, the cost would only work out at 2/- each experimenter.
American amateurs are spending a lot of money erecting special stations, for these tests and it is our obligation to do our best to receive them.
Serious workers have no objection to paying the 10/- in order to secure efficient organisation.
A considerable amount of money will have to be spent on cablegrams to America for checking purposes.
How could the experimenters taking part be informed of the time and nature of the tests if it were not through some organisation?
If the clubs were to stand the cost of organisation, what organisation would give the necessary information to the clubs, and why should clubs not taking part be called upon to share the expenses. The only persons paying are those taking part and this is more equitable.
If the clubs were to share the expenses, who would decide as to which clubs were to pay, and at what rate?
When the number of entrants is known, the various clubs will be notified, and they will be asked to make the necessary arrangements in their own districts in regard to interference.
In order to bring about the grouping system, which it is proposed to adopt it is essential that applications be called in order to divide the congested wireless areas into groups. This, of itself, justifies a central organisation.
Mr. Kingsley Love of Melbourne, and his committee are the organisation with whom the American Amateurs are in consultation, and it is their special desire that they communicate only with one central organisation.
The Waverley Radio Club does not derive any benefits from the funds of the organisation and all papers and accounts are being kept distinctly apart.

CARE OF TELEPHONES

Do not forget that the telephone is one of the most delicate and sensitive of all inventions. It will respond to currents which are far too small to actuate other common apparatus. With a crystal detector you cannot get results from a 75-ohm telephone, such as is used by the telephone companies. Your telephones should have a resistance of at least 1000 ohms. But remember that the resistance of a telephone is no guide to its sensitiveness. In radio, telephones are rated by the direct current resistance of their coils for the sake of convenience only. In these telephones it is necessary to have a large number of turns in the coils about the magnets, in order that the feeble currents that pass through them may actuate the magnets sufficiently to vibrate the diaphragms, and consequently it is essentially the number of turns and efficiency of the winding that determine the telephone's efficiency.

Sometimes when adjusting the knobs and dials of sensitive, closely regulated outfits the signals will die down as soon as the hand is removed. This is due to the capacity effect of the body. To get around it, cover the back side of the panel with tin foil or sheet copper, using care to see that the metal does not touch contacts, rods or wires. This is called a shield. At the point nearest the ground, connect the shield with the ground.

What chance would the experimenters have of receiving the signals if every experimental station in the congested wireless areas were operating simultaneously?

In closing I would like to state that the committee sincerely trust that every experimenter in New South Wales will fill in either Form No. 1 or Form No. 2 at the earliest possible moment since if it is known what stations are taking part in the tests, and their geographical location, it will be possible to make arrangements favorable to all experimenters taking part in the tests.

Yours faithfully,
F. H. HARVEY, Hon. Sec.,

Trans Pacific Radio Tests Organisation Committee, N.S.W. Section.
"Lourdes," Bronte.

WIRELESS BROADCASTING IN NEW ZEALAND

800 PERMITS ISSUED. NOT YET A SUCCESS.

About 800 permits for listening in have been issued to amateurs of wireless, and another 300 or 400 are under consideration. Some 20 licenses for sending have been issued, but the regulation under the Act have not yet been gazetted.

One official expressed the opinion that broadcasting would have a very short run, as a knowledge of the Morse system is required to pick up news, and people would soon get tired of hearing gramophone records by wireless. It may be mentioned that a recent attempt to give a public concert was a dismal and hopeless failure.

MODELS.

Horizontal Steam Engine in parts. All laths work finished and material supplied 46/-

LISTS 6D.

O. BURNABY BOLTON,
Daily Telegraph Building,
KING STREET, SYDNEY.

MAGNAVOX RADIO.
The Rolls-Royce of Reproducers.

The one loud speaker which will reproduce music and signals in any volume without distortion and without injury to the apparatus.

Dispense with the Head-Phones,

AND LET EVERYONE IN THE ROOM HEAR.

A BIG DEMAND HAS BEEN CREATED.

BE SURE OF GETTING ONE.

Call, write, or 'phone,
MAGNAVOX, AUSTRALIA,
17, THE BANKING HOUSE,
228 PITT STREET, SYDNEY.
Phone: City 3710.

MR. STOWE AGAIN.
TO THE EDITOR.

Sir,—Will you allow me to briefly reply to Mr. Cooke in connection with my letter re Trans-Pacific Tests. Mr. Cooke says there are many reasons why 10/- fee should be charged, but does not put any forward. He says that if the clubs bore the expense they would want to control arrangements to suit all its members. Well, why not. I think that would save a lot of time and trouble, as each club would be in touch with the needs of its district. It would also be an opportunity of testing the club as to their ability to handle such local organisation. The fact that sporting interest will be taken in the test should have no place at all. It is a scientific step, and the experience and honour of the thing should amply repay.

Mr. Cooke says that I advocated that "all and sundry should go for it." That was not my words or expression at all. I said that we should encourage as many as possible to take part. I say "as possible" because everyone cannot even if they wished to; but what I want is for all who are capable, to take part. Mr. Cooke says that he considers that it would be unjust for an amateur to start his set when he had gone to the trouble to arrange his set for the test. We have got to realise that this applies the other way round also; that is, it would be unfair to that amateur also if he had gone to the trouble to prepare his set.

In this matter, I do not wish it to be taken that I am in any way trying to discourage the arrangements, on the contrary, I am very

much interested, but I want to see the thing done in a fair way, also that all may have a fair chance as much as possible, and also to try and avoid any friction, which must occur if every aspect is not taken into account. And I still think that the best way is to allow the district clubs to manage its own district, thus saving expense and trouble. There are many other points which need consideration which I am sure the committee is aware of. In conclusion, I would like to ask: Why prizes? And, suppose all who compete obtain the same degree of success, or even, say, 50% of them?—I am, sir,

H. A. STOWE.

Chatewood, Jan. 2, 1923.

BAND WITHOUT INSTRUMENTS IN STUDENT PARADE.

Mystifying the onlookers, a recent student parade at the University of Wisconsin, at Madison, furnished excellent band music in spite of a "conspicuous absence" of any instruments. The answer to the puzzling phenomenon was radio: The drum major carried, instead of the usual baton, a pole with antenna wires which extended over the heads of the marchers to a similar pole borne at the rear. The receiving set and batteries were placed on a litter and carried along under the antenna by several students, with two amplifiers or loud-speaking horns, completing the outfit, which certainly presented an unusual appearance.

"SHIELDING" YOUR RADIO SET.

Sometimes when adjusting the knobs and dials of sensitive, closely regulated outfits the signals will die down as soon as the hand is removed. This is due to the capacity effect of the body. To get around it, cover the back side of the panel with tin foil or sheet copper, using care to see that the metal does not touch contacts, rods or wires. This is called a shield. At the point nearest the ground, connect the shield with the ground.—W.J.T.

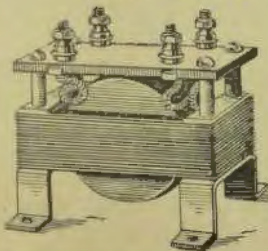
DUTCH EAST INDIES RADIO STATION.

The installation of vacuum tube transmitters of 1200-kilowatt power and a Telefunken spark set for ship-to-shore work are nearing completion at Mahabar. The high-power station is designed for direct communication with Holland. The corresponding station at Kootkijk will not be completed for several months. Radio telephone stations are being constructed in the Dutch East Indies at Soerabaya and Macassar. The radio telephone stations are not designed for broadcasting in the same way that this work is being carried on in the United States, since the stations are primarily intended for government use, and not for amateur experiment purposes.

TO CORRESPONDENTS ASKING HOW TO APPLY FOR A LICENSE.

The Radio Colleges advertised in "Wireless Weekly" inform us that applicants may write to them, and they will do the rest.

INTERVALVE TRANSFORMER.



CLOSED CORE—FOR AUDIO FREQUENCY AMPLIFICATION.

This Transformer, which is scientifically constructed, is of the shell type. It is simple, reliable and compact. Maximum results are assured. The complete measurements of this Transformer are 2½ x 11¼ x 13¼ in. It is provided with feet in order that it may be mounted in any desired position.

Price - 45s.

Postage 6d.

Homecrafts *Melb*
P. H. M'ELROY.
211 SWANSTON STREET

MAKE YOUR OWN.

MAKING ELECTRO-LYTIC RECTIFIERS.

Most experiments feel the lack of direct current for recharging small storage batteries, such as are now widely used with radio apparatus; and for running small direct-current motors, electroplating, and such other purposes for which alternating current cannot be used. The residence zones of nearly all cities are, with but few exceptions, served only with alternating current. It is a very simple matter to transform the alternating current voltage to almost any other voltage, up or down, by using suitable transformers, but this does not change the character of the current. Rectification of alternating current into direct current is an entirely different matter, and is accomplished by various forms of rectifiers, or by a motor generator, all of which are rather expensive, says a writer in "Popular Mechanics."

For the ordinary requirements of the small-shop man, experimenter, or radio-set owner, a three or four-cell electrolytic rectifier provides the cheapest and most satisfactory method of rectifying the alternating current. Such a rectifier is not all that might be desired from the standpoint of efficiency, but the power demand for experimental work is not usually very heavy and therefore the technical efficiency becomes of minor importance when compared with considerations of low cost and convenience.

The rectifier here described utilizes both sides of the alternating-current wave, which makes it just twice as efficient as the single-cell type sometimes used. The latter gives a strictly pulsating current, as only one-half of the alternating-current wave is used, and as a result current flows on the direct-current side only one-half the time.

The three and four-cell rectifiers utilize both sides of the alternating-current wave, and, while the direct current from this type of rectifier is also pulsating in character the current is flowing through the output side practically all the time, and these pulsations may be greatly damped or smoothed by described by means of an inductance as will be described later on.

Direct current produced by rectification cannot be used in place of a storage battery for radio receiving on account of its pulsating character, but may be used for recharging the storage battery if it is of small size.

Either the single or multiple-cell type electrolytic rectifier may be readily constructed from materials usually at hand in the shop or laboratory, or which can be easily bought at very small cost. From my own experience I prefer the three-cell type of rectifier, but the four-cell combination gives a direct current that is slightly steadier. The instructions given apply to the construction of the three-cell type for use on 110-volt alternating circuits, but they may be readily adapted to either the single or four-cell rectifiers. This rectifier will give as much as 5 amperes for very short periods, but heats up under continuous service, at even much lighter loads. However, by increasing the surface area of the plates, using larger jars, or by water-cooling the outside of the jars, the current capacity of the rectifier may be increased as desired.

For the three-cell rectifier the following materials will be required:—

2 pieces of sheet lead, 6½ by 2 by 1-16 in.
1 piece of sheet lead, 6½ by 2½ by 1-16 in.

4 pieces pure sheet aluminium, 6½ by 2 by 1-16 in.

3 pint fruit jars

Bakelite or fiber board, about ½ or 3-16 in. thick, sufficient to make three disks, 2 2-16 in. in diameter, and three, 3 in. in diameter.

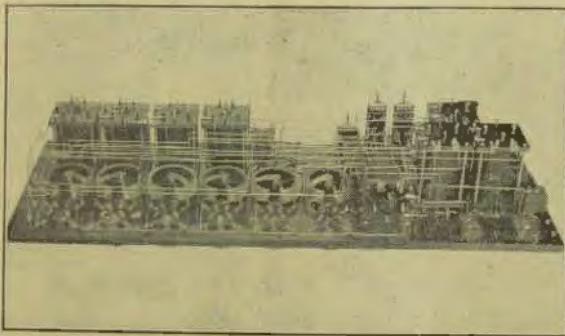
A good grade of sheet iron, or carbon rods or plates, may be substituted for the lead plates. The four aluminium and two of the lead sheets are cut into plates of the same shape and dimensions as indicated by the detail drawing marked "aluminium plate." The larger lead plate is formed to the measurements shown in the other plate-detail drawing. Three disks are cut to fit neatly inside the mouth of the jars, and three larger ones are provided to form covers. Ordinary wood may be used instead of the bakelite or fiber board, but it must first be boiled in paraffin, to prevent warping, and to increase its dielectric properties. One each of the large and small disks are fastened together to form single covers, and slots, about 1-4 in. apart, are cut in them; these slots should be just large enough to make a tight fit on the plate lugs. Two of the cells are arranged with one lead and one aluminium plate in each, while the third cell has two aluminium plates, one on each side shown in the drawing. In order of the larger lead plate. The plate lugs are offset slightly, as to hold them securely in place. If desired, holes can be drilled through the plate lugs and the lugs fitted with binding screws or posts to facilitate connecting.

The mouths of the jars should be dipped into melted paraffin for about ½ in.; this will prevent the electrolyte solution from "creeping." The jars are then filled to within about ¾ in. of the top with a 5 or 10 per cent solution of sodium bicarbonate (ordinary baking soda). The covers are then placed on the jars with the plates extending down into the

electrolyte. Make certain that no two of the plates touch each other, and connect them with No. 14 insulated copper wire. Suitable fuses and a switch should be provided on the alternating-current side, between the line and the rectifier, as a protection against accident. This switch should always be open when the rectifier is not in use.

To start the rectifier, switch on the alternating-current and close the direct-current circuit for a few minutes through about 100 ohms' resistance, such as a 100-watt lamp; this is only necessary when starting a new rectifier for the first time, but must be done in all cases, or else the device will not work.

In case a smoother current wave is desired than that furnished by the rectifier alone, an inductance may be introduced into the circuit in the manner shown. A suitable inductance is made by winding 200 or more turns of No. 16, or larger, insulated copper wire around a 1 by 1 by 4-in. laminated-iron core. Of course these inductance specifications can be changed, and the larger the core and the more turns of wire upon it, the smoother the direct current wave will be, but this will cut down the power available.



A SUPER AMPLIFIER.

Photo kindly lent by Mr. W. Veitch

NOISELESS MICA CONDENSERS.

Many of the troublesome noises in elaborate radio receiving circuits are due to imperfect condensers. To this end attention is now directed to the mica condensers which can be obtained in various sizes and capacities, and which eliminate the usual disturbances. The latest type of mica condenser represents a novel departure in condenser design. The outer casing is of seamless brass or copper tubing. The interior is built up after the best practice of alternate layers of clear ruby India mica and brass or copper sheets. The tubing is partially flattened and the condenser is inserted, after which powerful presses complete the operation by flattening the condenser into its final form. This process is claimed to produce constant and equal pressure over the entire plate area and does away with the troublesome noises. The metal case protects the plates and reduces hysteresis losses to a minimum. These condensers are said to withstand a potential of several thousands volts, if desired.

THE COLVILLE-MOORE

WIRELESS SUPPLIES.

☞ **Make your Own** ☞

COMPLETE PARTS FOR

Spark Transmitters

C. W. Transmitters

Valve Receivers

Crystal Receivers

Loose Couplers

Valves QX Myers

Expanse B. Radiohorn,

200, 201, 202.

SMALL SHIPMENT—

MURDOCH PHONES

☞ **35/- Each.** ☞

10 ROWE STREET.

THE SPARK OF FATE.

BY F.T.S.

The lack-lustre eyes of the sick woman roamed round the little room following the movements of her husband as he endeavored to prepare a meal. With a wan, pathetic, little smile she guided his clumsy movements, and from time to time the man looked over to her for directions.

"Don't worry, Betty, old girl," he said. "I'll get through somehow."

Accustomed though he was to the life of the bush he was unused to the methods on which his wife insisted and which her illness demanded, and he found things extremely hard.

He glanced over at the frail little figure on the bed. Poor Betty. How she had suffered all these long, weary months, with no other companions than himself and the black tribes round the station.

Mentally he cursed for bringing her to such a place, where the drab monotonous existence is but one day after another, in a long, weary procession of months and years. Nothing to listen to but the clamour of the none too friendly blacks, the singing of the cicadas, the sighing of the wind through the tree-tops, and the dull roar of the surf outside the bay.

The plantation was situated on the shores of a little river which emptied into the bay. At night they would sit out on the verandah and listen to the murmur of the sea, and know that not so very far away were ships, and life, and movement.

Jack Thompson had brought his young wife to the plantation immediately after their marriage, and the next year had been such a prosperous one that he had resolved to sell the station and return to civilisation. But his wife's illness had prevented him from doing so, and as day succeeded day the girl grew weaker and weaker and her husband knew that only with medical attention could he hope to save her.

She had assured him that her illness was trifling and he had believed until he realised that she was very sick. Man is very ignorant at times.

The steamer called every three months and it was not due for a month yet, and he knew that it would be impossible to leave her.

The thought was maddening. He could have sent a blackfellow, but all the tribes in the neighborhood had gone off on one of their periodical hunting trips and the workers on the plantations flatly refused. Jack suspected that a black man, whom he had punished some time previously was behind the mutiny, and neither threats nor promises could induce them to help him. For the past few days they had seemed restless and he was vaguely uneasy.

The terrible inaction was becoming unbearable and he decided at last, to leave his wife for the time that would be necessary before he could return with a doctor, when the calamity happened. The blacks had risen in open revolt, and joined by a tribe which had returned from hunting, they surrounded the homestead.

The inherent hate of the white man which had been born with them gained the ascendancy over their naturally timid natures and the siege of the homestead offered no loophole of escape to the defenders. All day long Jack patrolled the house and from time to time his rifle cracked thunderously in the narrow confines of the room. Far away, on the fringe of the forest, would come an answering scream that caused a grim smile to settle for an instant on the man's lips.

One less! He laughed mirthlessly. What difference would one be to the hundred who surrounded the house.

Betty bore it all in good spirit and her husband could see that it was now but a matter of time before her final collapse. Bitterly he reflected that the bush

would soon claim another victim.

He had formulated numerous plans of getting a message through, but one after another he dismissed as impracticable. The only one that offered any hope of success was that of sending the dog with a message telling of their plight. Early next morning he looked across into the bush. Everything was very quiet, but he knew that somewhere near the trees the blacks were there, waiting . . . waiting . . .

Cautiously opening the door he stroked the dog's head.

"You're our last chance, old fellow," he said, and released his hold on the collar. The dog bounded straight towards the trees. Jack watched him reach to within 20 feet of the bush, pull up short in his tracks and fall, transfixed by a spear.

"We're done for, Betty," he told his wife. His spirits had been so low that he felt that nothing really mattered now.

"If only we had a wireless set, Jack," she said, and immediately laughed at the improbability of the idea.

Her husband started. Suddenly his face became eager and he rushed to a trunk which stood at the far corner of the room, and lifted the lid. It was filled to the top with books and papers. Almost madly, he searched among the magazines until he found one that bore an American name. Feverishly he turned over the pages, found what he wanted and smiled brightly. Turning to his wife, he said, "There's still a chance, old girl, and he held the book before her.

In big black headlines, printed across two pages was: "How to make a Wireless Transmitter."

From numerous drawers and boxes he emptied a remarkable collection. Coils of wire, pieces of grass, scraps of metal and a number of dry cells. These last he tested. They were in good con-

dition despite their years of dis-

use. At the end of a couple of days his spark coil began to take shape and after a week of untiring work it was at last finished.

During the last couple of days it had dawned upon him that their food supply was dangerously low and unless help arrived within a week their position was hopeless.

He knew that it would be impossible for him to make the receiving unit of the station, because of the difficulty of the 'phones. Besides, he reflected it was not necessary.

The transmitter, he mounted on a rough unplanned board, and almost reverently connected the terminals to the batteries. Such a set had surely never been seen even in the earliest days of the science, and he had a sickening dread that it would not work.

When night fell he climbed out on to the roof and fixing one end of his aerial to the chimney he tied the other to a tree some hundred feet away. Under cover of the intense darkness he wormed his way through the grass back to the comparative safety of the house.

Everything was in readiness for the attempt. Betty, propped up in bed was infected with her husband's humor, though she had little faith in the apparatus.

Jack laid his hand in the sending key. Their fates hung in the balance. Should his instrument fail they were faced with a terrible death. His forehead was clammy and his hand trembled violently.

Pulling himself together he looked at his wife. "Here goes," he said. "This is our last hope." The muscles of his hand tensed and very slowly he depressed the key. A faint violet spark crackled across the gap. He sighed with relief, and slowly, for his knowledge was not good he sent the message of fate across space. He was unable to tell whether he was being answered, and all night long he spelt out the message telling of their predicament, beginning and ending each with the well-known S.O.S. call.

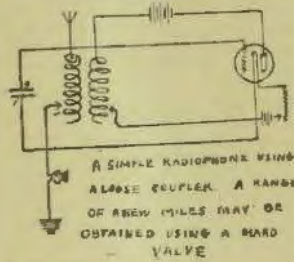
An hour before dawn the batteries gave out, and he was forced to stop.

Just at the point of dawn he

ELECTION RESULTS.

Broadcasted in New Zealand. Success in Auckland.

Election returns were "broadcasted" by wireless telephony on Thursday evening from the Scots Hall, where a half-kwt. transmitter was employed. The full power of the instrument could not



looked through the window and saw hundreds of blacks creeping on the house. Grabbing his rifle he fired rapidly at the approaching men. A spear came in through the window, grazing his shoulder in its passage and immediately afterwards another struck him in the chest. He felt his strength ebbing from him and fired despairingly at the blacks. This was the end, then. Curiously he wondered whether his aerial had been pulled down. Another spear lodged in his arm and he sank out of sight.

Consciousness was leaving him, when suddenly he heard a sound that sent a thrill of hope through him.

From somewhere amongst the trees came the crackling of rifle fire, and the dreadful rattling monotone of a machine gun. The clearing was dotted with heaps of motionless forms and with a last effort he waved to the party of bluejackets who came at the double towards the house.

Jack Thompson numbers among his dearest possessions a freak wireless transmitter which he would not have parted with for all the money in Australia, even had he been offered it—which he wasn't for the primitive apparatus had been the means of calling up the warship which had saved both his wife and himself from certain death.

be used, owing to the aerial being merely a temporary one. Using approximately a quarter of the power, it was possible to send out the results quite satisfactorily, and, according to reports received, the details were picked up at such distant points as Hamilton and Port Albert. Had it been possible to use the full power, with a permanent aerial, the news, with suitable apparatus, could, it is stated, have been received anywhere within a radius of up to about 1000 miles.

At Milford special arrangements were made for the receiving and publishing of the various results, and these were made known at Milford as quickly as in Queen Street. Milford people knew how matters were shaping half an hour in advance of those living in Takapuna. The receiving set used at Milford was in charge of Mr. E. S. Ralls. It was a two-stage amplifier, with magnovox loud speaker. In the early part of the evening some trouble was caused by the atmospheric conditions, but this passed off and the results then came through very clearly. At first the names and figures were received through the head phones, and were then announced to those waiting. Later, however, it was possible to use the magnovox to increase the volume, and with the apparatus installed on the porch of Mildford Hall the people in the street heard quite clearly the results as they came through. Several people standing at a distance of two chains from the apparatus heard names and figures quite clearly.

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LEICHHARDT AND DISTRICT RADIO SOCIETY.

The Leichhardt and District Radio Society is at present in recess, and will commence its New Year activities on January 9th, with a meeting at the new Club Room, Victory Hall, rear of Methodist Church, Johnston Street, Annandale.

All inquiries relative to the Society's activities are welcomed, and should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

NEW CLUB. CAMPSIE AND DISTRICT RADIO CLUB.

The formation of a local and district amateur radio club will no doubt be appreciated by all interested in wireless telegraphy. I take the liberty of informing all those who would like to become members both ladies and gentlemen, to attend the meeting to be held at "Loch Vennachar," Evaline Street, Campsie (opp. Loch Street), on Monday, 8th January, at 7.30 p.m.

MARRICKVILLE AND DISTRICT RADIO CLUB

At the last general meeting of this club held on 16th December, the rules governing, and re-election of office-bearers for the ensuing year, were finalised. The office-bearers are:—President, Mr. F. F. Scott; vice-presidents, Mr. Allworth, Mr. Walton; secretary, Mr. R. G. Ellis; assistant secretary, Mr. G. Round; treasurer, Mr. Edwards; committee, Miss C. O'Brien, Mr. G. Round, Mr. McQuoid, Mr. Farrell, Mr. Hemming.

The next general meeting is arranged for Monday next, 8th January, at rear of 14 Park Road, Marrickville, at 8 p.m.

A large roll-up is expected. All communications may be addressed to R. G. Ellis, hon. sec., 40 Park Road, Marrickville.

ILLAWARRA RADIO CLUB.

At the last meeting the question of getting to work on a set for the club was discussed, and details as to the probable cost of main items gone into. It is proposed to start with a single valve receiving set, the design and construction of which have been left to the Technical Committee. The matter of the application for a Club License (to cover both transmitting and receiving) has been left in the hands of Mr. Gorman, who will apply for and hold the License on behalf of the club.

The next meeting of the Club will be held at the Club Room, 75 Montgomery Street, Kogarah, on Thursday, 4th January next, at 8 p.m. All interested are invited to attend.

KURING-GAI DISTRICT RADIO SOCIETY.

The next meeting of the Kuring-gai District Radio Society is to be held on January 9, 1923, in the Chatswood Memorial Hall, at 7.45 p.m. Mr. P. Kershaw will give a lecture on a subject of interest to experimenters. A key and buzzer will be available for the use of members wishing to practice Morse. If possible Mr. O. S. Mingay will have some receiving apparatus in operation.



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RADIO DIRECTION FINDER CONFERENCE.

In response to invitations sent by the Bureau of Standards, representatives of nine companies interested in the manufacture of radio direction finders recently met to confer with the Assistant Secretary of Commerce, the Bureau of Lighthouses, and the Bureau of Standards, regarding the production, cost, installation, calibration, and maintenance of radio direction finders on shipboard. It was announced that the Department of Commerce has decided to instal additional beacon stations as follows: Boston, Nantucket, Cape Charles, Columbia River, Puget Sound, and, if funds are still available, Delaware Bay, Los Angeles and Blunt Reef. These are in addition to the two new radio beacons at Diamond Shoal (off Hatteras) and San Francisco light vessel. Three other radio beacons have been in operation in the vicinity of New York harbor for over a year at Ambrose, Fire Island, and Sea Girt. A considerable number of foreign ships have been equipped with radio direction finders and are calling for radio service as they approach American shores. American shipping companies appreciate the importance of using the radio direction finder on shipboard in order to determine their locations in time of fog and in order to aid in various ways in time of distress at sea. As a result of the conference arrangements will be made through the Bureau of Lighthouses, between the manufacturers of radio direction finders, and the operators of steamships for the trial and demonstration of radio direction finding equipment under conditions of practice. It is anticipated that with the installation of the additional radio beacon stations, and the activity of the manufacturers in the production of direction finders for use on shipboard, this method will be adopted very generally as an aid to navigation.

AMATEUR CALLS

NEW SOUTH WALES.

The following is a list of Licences issued to amateurs in the State of New South Wales to the end of October, 1922:—

Call Signal.	Name.	Address.	Nature of Licence.
2 I I	C. P. M. Dixon	H. M. Gaol, Cootamundra	R
2 I J	A. H. Gray	Florence St., Killara	R
2 I K	J. Kellen	South Singleton	R
2 I L	A. J. Meagher	West Wyalong	R
2 I M	W. J. Pay	Adam St., Wentworth	R
2 I N	J. Payne	143 Avoca St., Randwick	R
2 I O	G. Ritcher	Kyleston, Bombala	R
2 I P	R. W. J. Guthrie	281 Bridge Street, Drummoyne	R
2 I Q	J. F. Morrison	1 Annesley St., Leichhardt	R
2 I R	A. M. Polkinghorne	Farm 728, Leeton	E
2 I S	A. Hinks	Mount View, Mulgoa	H
2 I T	L. Solomon	1 Mamhead Plats, New St., Bondi	R
2 I U	R. T. Simpson	12 Teakle St., Summer Hill	R
2 I V	E. Mate	Brompton, Turramurra	R
2 I W	L. K. Stephens	26 Carmray Avenue, North Sydney	R
2 I X	Burwood Radio Club	203 Burwood Road, Burwood	T
2 I Y	G. V. Stephenson	605 George Street, Sydney	R
2 I Z	D. C. McMaster	"Dalkeith," Cassilis	E
2 J A	F. W. R. Shelton	Beamish St., Campsie	R
2 J B	F. L. Holmes	Strathsaye, Roseville Avenue Roseville	R
2 J C	H. Fraser	Roderick St., Tamworth	R
2 J D	R. J. Sharpe	Fisher St., Bell Bld	R
2 J E	G. W. Tatham	58 Adelaide St., Woollahra	R
2 J F	R. G. Harivel	194 View Street, Annandale	R
2 J G	W. R. Mallam	Beardy St., Arncliffe	R
2 J H	J. E. Nolan	Bellevue Road, Double Bay	R
2 J I	W. E. Wilson	Archibald Road, Roseville	R
2 J J	R. V. Stewart	Murri St., Katoomba	R
2 J K	F. B. Smith	10 Waratah St., Rushcutters Bay	R
2 J L	H. S. Mellor	232 Burwood Road, Burwood	R
2 J M	R. C. Marsden	Victoria Road, Edgecliffe	R

(Continued next Page)

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3 A D A. U. Alcock 14 Tintern Avenue, Toorak
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3 A K H. S. Watson 158 High St., Kew
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YZL; Weimar GFCQ; Weessen-
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land GDWC; Wentworth GBCN;
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Jemadar OFI; War Krishna
GCTD; Warkworth EIO; Warla
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January 5th, 1923

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