



Sure to Get it at Grace Bros.

**It is Safer and Cheaper to Buy**

## **The Best Wireless Set**

Broadcasting will soon be in full swing. Buy your set now and become an experienced operator before broadcasting actually starts. We are now in a position to quote for complete experimental transmitting and receiving Stations in the Country and will send our Wireless Staff for the installation and operation. All enquiries fully answered by mail.

Send for our Booklet

**" ALL ABOUT WIRELESS "**

On receipt of 6d. in stamps we post it free.

# **GRACE BROS. LTD.**

**Broadway, Sydney**



Vol. 2.

March 30, 1923.

No. 13

## A Talk with Wireless Weekly.

### AMATEURS BEWARE.

Some few months ago Amateur Wireless Regulations were issued by the Federal Government. These regulations were not what the amateur wanted, but they were a lot better than was expected, and it behoves all amateurs to carry them out to the letter.

At the present moment we have under 2000 licensed amateurs in Australia. Yet, on a Sunday evening we believe that at least that number listen-in for Mr. Maclurean to start his Radiophone experiments in New South Wales alone.

A great deal of interference has been caused lately in the use of valves by inexperienced experimenters, and we suggest that all bonifide experimenters holding licenses keep their eyes open for new stations in their vicinity, and make sure that the new man holds a license.

Commercial stations must be safeguarded, and the man who has a station working without a license, even though he is capable of working it, is doing the amateur cause a tremendous amount of harm.

Even during the last few days an illegal station has been interfering with one of the commercial stations of this State. **AMATEURS SEE YOU HOLD A LICENSE.**

A meeting of those interested in broadcasting is being called by the Postmaster-General, on April 9th, when a decision is to be made regarding Broadcasting in Australia. Some interesting developments should take place within the next few weeks, which should tend towards broadcasting being an established fact in this country.

"Wireless Weekly" is delighted to see and hear so many new experimental transmitting stations. Those who have already started have met with great success from the reports we have to hand.

"Wireless Weekly" has pleasure in announcing, especially to its country readers now in Sydney, that by special arrangement with Radio College, free demonstrations of Wireless Telephony will be given daily during Easter Week. Further particulars of this splendid chance to learn something of this most wonderful and interesting science will be given on Page 11.

---

*If you wish to hear Real Wireless Music take advantage of Wireless Weekly's offer on Page 11.*

### WIRELESS INSTITUTE DINNER :: N.S.W. DIVISION ::



From Left:—Messrs. Gregory, Rowland, Perry, Calville, Maclurdy ("Wireless Weekly"), Mingay, Spencer Nolan, Marsden, Cooke (Vice-President), Renshaw, Crawford (Radio Inspector), Tatham, Knogh, Charlesworth, Ingram, Crocker, Steane (Vic.), Schultz, Stowe, Maclurean.  
(See Letterpress, page 15).

#### Wireless Pests Again.

J. W. Robinson writes:—

Dear Sir,

Your issue of March 23 contains a letter written by Mr. H. C. Walker, in which he criticises the attitude I adopted in my article on "Wireless Pests," the previous week.

I am not the least resentful at Mr. Walker's criticism, in fact I was pleased to read his letter. If I express my views in print, I do so solely for the good of the movement, and some solid criticism can do much towards helping us all. I

am afraid, however, that in grasping the shadow of my article, Mr. Walker has missed the substance. My remarks on "Wireless Pests" were made simply to express the view that no person should be allowed to use a valve unless he proves himself capable of handling the apparatus. In putting forward this view, I supported the action of the authorities in demanding an operating speed of twelve words per minute from applicants, but I did not for one moment claim that a Morse speed of 12 words makes an amateur a valve expert. Mr. Walker agrees that inexperienced persons should not be allowed to use valves, but he proceeds to criticise me on the question of Morse qualification.

Now, if Mr. Walker will read my article carefully he will notice that I state "the stipulation that the operator be capable of receiving 12 words per minute is made merely because it is considered that any person who has attained this speed has progressed sufficiently to be allowed to use a valve set." Surely this statement cannot be interpreted as meaning that I consider that a man who can take 12 words Morse knows all about valves. I am sure Mr. Walker is the only one who has taken it that way. I quite agree that a technical test would be a good deal better, but if it were applied, how long would it take the authorities to consider each applicant?

In considering any question relating to the amateur movement, we must be practical. We all know what an appalling system is employed by the Wireless Department. We remember the weary wait for sensible regulations, and now we are beginning to realise that the main qualification necessary for a license is patience. The system of "centralisation," which compels all applicants to post forms to Melbourne, and then results in letters, notifications, receipts and licenses chasing each other all over the continent for weeks on end, has already caused delays which are more than irritating to the amateur. What would happen if an amateur test were to be included in each technical application? At the present time, although there are many exceptions (some of which have been named by Mr. Walker), the greater portion of amateurs who

FOR THOSE WHO CANNOT WHISTLE



**WIRELESS GOODS**  
at City Prices

Valves, Crystals, Sliders, etc.

**Oscillation House**

Late P. L. Stonwell & Co.  
82 King Street, Newtown  
G. Caletti, Wireless Manager  
Phone : L1106

**"REMLER" RADIO EQUIPMENT**

This line of Radio Goods, being of excellent workmanship and appearance, can be recommended to give efficient service. It includes Remler-Giblin Inductance Coils, Cunningham Vacuum Tubes, Dials, Grid Leaks, and Condensers, Rheostats, etc.

**MULLARD VALVES.**—We have a full range of these Valves, Transmitting, Rectifying, Receiving, and Amplifying, made to specifications of British Army and Navy.

**BECO HONEYCOMB COILS** are ideal for tuning. They are Australian made, and are guaranteed.

**BURGIN ELECTRIC CO.**

WIRELESS ENGINEERS

352 KENT STREET, SYDNEY

SHIPS YOU SHOULD HEAR THIS WEEK.

We publish each week under the above heading ships that should be nearing or departing from our coast:—

ANATINA	BPW	EASTERN PLANET	KUPD
HALLE	DHE	LAS VEGAS	KUQM
LARGS BAY	VZBS	OSTERLEY	MOY
MESOPOTAMIA	PVA	TAHITI	MYN
MOLDAVIA	GDVZ	TELAMON	ZKA
NORTHUMBERLAND	ZBL	BULLA	VJP
SUYA	VJI	CLAN MACQUARIE	GVL
TAIYUAN	GVBF	EASTERN MOON	KUDX
TANGO MARU	JTG	JAVA	PGK
TREGENNA	GDGX	JERVIS BAY	VZDK
WAIMANA	GNE	KATHLAMBA	GLF
WEST JAPPA	KUKJ	MAKAMBO	VZB
BENDIGO	GBFQ	MORINDA	VJF
CHANGSHA	GVBC	OMAR	GBLF
DEMOSTHENES	MGK	YNGAREN	SHIP

can send and receive 12 words a minute know more than a little about wireless. If we had a system whereby all licenses were granted in their respective States and districts, then we could advocate a technical test, because we would be able to have it carried out. At present, however, I can hardly imagine technical test papers flying backwards and forwards between Melbourne and other parts of Australia. Why, we would never see a complete license in this generation.

No, Mr. Walker, the Morse test has its disadvantages, but I don't think we had better discard it until we get some better system.

Mr. Walker has asked me to think the matter over. I promise faithfully that I will do so. However, while I am thinking, will Mr. Walker please calculate how long it would take the authorities to issue a valve license with a technical test included in the application. He can base his calculations on the fact

that it takes three months to issue a simple crystal license, with no conditions and four to four and a half months to get out a valve license even when the application carries with it a certificate of proficiency regarding Morse operating, as demanded by the Department.

EDITOR

Interference with commercial radio stations must be prevented, and as a safeguard it was presumably considered necessary by the authorities that users of valves should be able to read Morse signals at a speed of 12 words per minute. This is necessary so that a commercial station which is being interfered with by a radiating valve, can send out a message at reduced speed informing the interfering station to desist.

RE EXAMINATION.

Re examinations: The fact is well known that examinations are held frequently in Sydney, in cases

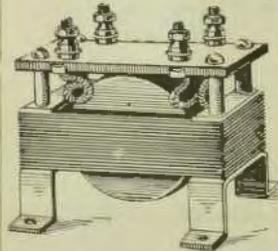
where applicants for experimental licenses have not satisfied the Controller as to their technical qualifications to conduct experiments scientifically, and to adjust and control the apparatus they propose to operate.

EXPIRATION OF THE FLEMING VALVE PATENT.

On November 7th last the Fleming valve patent, which has been the cause of radio litigation for many years, expired, and in the opinion of many persons in and out of radio, one of the serious hindrances to radio progress has been removed. The expiration of this important British patent gives to the American inventor of the three electrode tube, Dr. Lee de Forest, the right to make free use of his own invention, heretofore denied to him. Shorn of all legal and technical terminology, Dr. Fleming had in his valve a mere rectifier of high frequency current, perhaps of less value in a commercial sense than even the crystal detector. It is conceded that the Fleming valve was never in any sense a good radio detector for practical purposes. The De Forest patents on the audion or three-electrode vacuum tube, number over twenty. Rights to manufacture the audion and to use it in long-distance telephone communication, as well as in the radio field, have been granted under the form of a lease to the Western Electric Company, which is the manufacturing agent of the American Telephone and Telegraph Company, and also through an exchange of patents to the General Electric Company, Westinghouse Electric and Manufacturing Company, and the Radio Corporation of America.

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 1¼ x 1¾ in. It is provided with feet in order that it may be mounted in any desired position.

Price - 45s.

Postage 6d.

**Homecrafts** Melbourne  
P.H. MELROY.  
211 SWANSTON STREET

March 30, 1923.

**WIRELESS WEEKLY**

5

**Radio  
Equipment**

at  
**ANTHONY  
HORDERNS'**

**Note these Prices**

Murdock's Double Head sets, 2000 ohm. 35/- set

Crystal Type Receiving Sets from 50/- set.

Valve Type Concert Receiving Sets, £16/10/-

Myers' Valves, 35/- each.

Expanse V24, 37/- each.

Expanse QX Valves, 37/- each.

All Types of Terminals, Screws, etc., Condensers and Parts, Honeycomb Coils, Crystals, Resistances, Knobs and Dials, Studs, Detectors.

And other parts necessary for the Radio Enthusiast.

Electrical Dept., 1st Floor

**Anthony Hordern & Sons,**

LIMITED  
Brickfield Hill, SYDNEY  
Box : 2712 G.P.O.  
Telephone : CITY 9440

**Radio Notes.**

**BILLIONS OF ELECTRONS IN A COPPER WIRE.**

A small copper wire will have in it billions of copper atoms, each with its planetary electrons playing their invisible game about their own nucleus. There is quite a little distance in any atom between the nucleus and any of the electrons for which it is responsible. There is usually a greater distance still between one atom group and any other.

On the whole, the electrons hold pretty close to their own circles about their own nuclei. There is always some tendency to run away and play in some other group. With twenty-nine electrons, it's no wonder if sometimes one goes wandering off and finally gets into the game about some other nucleus. Of course an electron of some other atom may come wandering along and take the place just left vacant, so that nucleus is satisfied.

**STREAMS OF WANDERING ELECTRONS.**

It is these wandering electrons which are affected when a battery is connected to a copper wire. Every single electron which is away from its home group and wandering around is sent scampering along toward the end of the wire, which is connected to the positive plate or terminal of the battery and away from the negative plate.

That's what the battery does to them for being away from home, it drives them along the wire. There's a regular stream or procession of them from a negative end of the wire toward the positive. When we have a stream of electrons like this we say we have a current of electricity.

**THE REFLEX CIRCUIT.**

The reflex circuit is the latest arrangement to attract the attention of radio amateurs, following close on the heels of the Armstrong super-regenerative circuit. The reflex circuit is an ingenious device for using vacuum tubes twice over; that is to say, a given radio signal is passed through a certain number of

Continued on Page 11.

**NEW RADIO BOOKS.**

**Radio for Amateurs—How to Use, Make, and Instal Wireless Telephone and Telegraph Instruments** by A. Verrill, 11/-, posted.

**Book of Wireless Telegraph and Telephone**, by A. F. Collins, 8/-, posted.

**Oscillation Valve: Elementary Principles of its application to Wireless Telegraphy**, by Rangay 9/-, posted.

**Radio Experimenter's Handbook**. By P. Coursey, 5/-, posted.

**Wireless Telegraphy and Hertzian Waves**, by S. Boltone, 4/10, posted.

**Wireless Telephone: What It Is and How It Works**. By P. Coursey, 5/-, posted.

**Making Wireless Outfits**. By N. Harrison, 4/-, posted.

**Calculations in Telegraphy and Telephone**. By H. Few, 3/-, posted.

**Experimental Wireless Construction**. By A. Morgan, 2/9, posted.

**Wireless Construction and Installation for Beginners**. By A. Morgan, 2/9.

**A.B.C. of Wireless: A Popular Explanation**. By P. Harris, 10d., posted.

**N.S.W. Bookstall Co. Ltd**

**JUST LANDED—3 SPECIALS**

1. The famous genuine "Baldwin" mica diaphragm, amplifying Head sets. Recognised as the perfect Concert 'phone. Price £4/18/6.

2. Thordarson Audio - frequency Transformers; totally shielded with aluminium casing. Ratio 5 to 1. Price £2.

3. Westinghouse W.D.—11 Dry Cell Tube—the Valve that every experimenter has been waiting for. Operates from a 14 volt dry cell—no heavy Storage "A" Battery required. THE Valve for portable set.

**UNIVERSAL ELECTRIC CO.**

244 PITT STREET, SYDNEY

**MODELS**

ENTIRELY NEW LIST and Handbook of Model Engines, Boilers, Locomotive Parts and Dynamos. Price 1/-. **BOLTON**, "Daily Telegraph" Building, Sydney.

**O. BURNABY BOLTON**

Daily Telegraph Building,  
KING STREET, SYDNEY.

# MAKE YOUR OWN

## Chemical Rectifiers for Plate Voltage Supply

Undoubtedly the greatest problem that faces the amateur when he starts using thermionic valves for reception or transmission is that of obtaining a cheap but reliable source of high tension current, says E. H. Robinson in "The Wireless World."

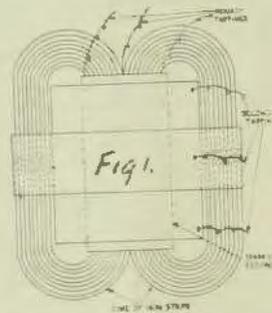
Where electric lighting mains are laid on it is cheaper to derive one's H.T. from this source than to buy dry batteries, especially when more than one hundred volts is required, and as many municipal lighting supplies are alternating current I shall confine my remarks to the use of the latter. In the writer's opinion the man who has access to A.C. is much better off than the man who has D.C. at 200 volts, because A.C. can be transformed up or down without serious loss to any desired voltage. With D.C., on the other hand, one cannot obtain more than the supply voltage, and to obtain less it is necessary to insert wasteful resistances or potential dividers.

The device which I am about to describe is cheap to make and will give a smooth current of 50-100 milliamperes at voltages from 500 downwards, suitable for transmission or for receiving amplifiers.

### TRANSFORMER.

Almost any type will do as long as the primary is suited to the voltage of the A.C. mains and the secondary gives an effective voltage of a little higher than the required high tension voltage. As both periodicity and voltage vary considerably in different localities, it is impossible to give specific values for the windings of the transformer. The writer's transformer, which works off 40 volts at 90 cycles, is made out of an old 2-in. spark coil. The original primary was removed and another inserted consisting of 1lb. of 20 gauge D.C.C. copper wire wound neatly on a core made up of 30 flat strips, 1/4-in. by 1 1/2-in., cut from ordinary tinplate (tinned iron). After insertion of the primary the strips were bent over, as shown in Fig. 1, to

form a closed magnetic circuit. As a matter of fact it was found necessary to unwind some of the secondary from the inside in order to make a space large enough to accommodate the primary. This was easy enough as the secondary had been wound in layers separated by waxed paper and not in sections. There are tappings on both primary and secondary so that a large range of voltages is obtained from



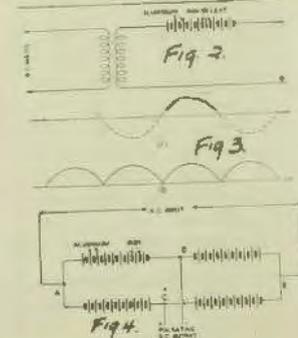
1,000 volts downwards. The transformer is fairly efficient considering its simplicity and cheapness.

### RECTIFIER.

The action of the rectifier depends on the well-known fact that an electrolytic cell containing an aluminum electrode and in iron one dipping into a saturated solution of ammonium phosphate will allow current to pass from iron to aluminum but not in the reverse direction, provided that the alternating E.M.F. applied to the cell does not exceed about 80 volts. If therefore we wish to suppress one half of the cycle of A.C. at say 500 volts, we must use a unit of about six such cells in series. Such an arrangement is shown in Fig. 3a, by the thick lined humps, with inactive periods between them. Half-cycle rectification is somewhat difficult to render smooth by means of chokes and condensers; fortunately however, we can, by a slight elaboration of the rectifier, utilise the

suppressed portion indicated by the dotted lines in Fig. 3a, and obtain in the output circuit a pulsating unidirectional current of the nature indicated in Fig. 3b. The arrangement of the cells is shown in Fig. 4. There are four units of several cells each, and it will be seen that if an alternating electromotive force is applied at A and B the output at points C and D will have a constant polarity, C always being positive and D negative.

As the currents required in valve work are very small, usually only a few milliamps, the rectifier cells may be quite small. The writer's own rectifier is made up of 24 test-tubes, 5ins. long by 5/8ins. diameter, each about half-filled with a saturated solution of ammonium phosphate. The electrodes are simply 16 gauge tin or lead fuse wire in gauge galvanised iron wire respectively, dipping about one inch below the surface of the electrolyte, this giving ample electrode surface



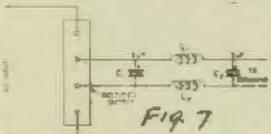
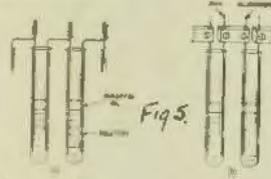
for ordinary purposes. The experimenter is advised, however, to use 16 gauge tin or lead fuse wire in place of the iron wire as the latter, although perfectly satisfactory while it lasts, becomes eaten away after continued use. Connection between electrodes in successive cells has been made as shown in Fig. 5a by bending the iron wire into the shape indicated, inserting one end of the

aluminium wire into the spiral portion and hammering the joint on a flat surface so that the iron wire nips the aluminium firmly. In view of the fact that the electrodes need renewing occasionally, the arrangement in Fig. 5b would be more satisfactory; here the short brass connectors with set-screws will allow any electrode to be replaced in a moment.

The whole rectifier is mounted in a wooden test-tube rack, such as may be seen in any chemical laboratory, and occupies an overall space 2ins. x 1 1/4ins. base by 7in. high. This rectifier is designed to give four or five hundred volts for transmission, but for receiving purposes where voltage of only 30-90 are required fewer cells may be used; four groups of 3 cells each will be more than sufficient.

**SMOOTHING OUT A.C. RIPPLE.**

In order to render the pulsating D.C. obtained from the rectifier suitable for ordinary purposes it is necessary to convert it into a continuous and uniform flow of current, otherwise there would be a terrific hum in the phones in the case of a receiver, or in the emitted



carrier-wave in the case of a transmitter. This is effected by passing the current into a 3-mfd condenser C1 (Fig. 7), thence through chokes L1 and L2 of two or three henries inductance each, and into another 3-mfd. condenser C2. From C2 leads are taken to the valve circuits. L1 and L2 may be the secondaries of two small induction coils. The writer is using the secondaries of two old Ford ignition coils which were picked up cheap, the usual core consisting of a bundle of soft iron wires being retained. With such a smoothing device it is practically impossible to get A.C. ripple in the output, even with half-

cycle rectification. The condensers C1 and C2 may be of the Mansbridge rolled type which can be bought very cheaply.

**MISCELLANEOUS DETAILS.**

Various details should be attended to in order to get the best results. First, the electrolyte should be a saturated solution of pure ammonium phosphate, but though very cheap it is cheaper and will work, though less efficiently. A copious sludge may form after a few days' use, but the presence of this does not seem to matter. Sodium bicarbonate and borax are often recommended as substitutes for ammonium phosphate, but though very cheap, they are in the writer's experience inferior, and it is better to pay twice as much and use ammonium phosphate. Ammonium molybdate is stated to be the best electrolyte, but as its cost is prohibitive the writer has not tried it.

A good plan is to float half an inch of paraffin oil on top of the electrolyte. This prevents "creeping" of the salt in solution, retards evaporation, improves insulation, and lessens corrosion of the aluminium just where it enters the solution.

In connection with the use of Mansbridge condensers I ought to add a word of warning, particularly to those who intend to use several hundred volts across them. Always light your valve filaments before switching on input into H.T. supply; if the H.T. is switched on with the filaments out an excessive potential may build up across the condenser and break down the dielectric. Mansbridge condensers will stand 500 volts, but not much more, and if higher voltages are contemplated, then each 3-mfd. condenser will have to be replaced by two 6-mfd. ones in series. Breakdowns are indicated by a crackling noise in the condenser.

It may occur to the reader that where voltages not exceeding 100 or so are required the transformer could be dispensed with and the rectifier worked direct off the mains; but here a difficulty arises as one side of the mains is always earthed. If, as is usual, a part of the valve circuit is connected directly to earth, half the rectifier becomes short-circuited and rendered inoperative. This trouble however may be overcome by inserting a fixed condenser in the earth lead of the set as shown in Fig. 8. A transformer (not auto-coupled) is preferable, as it is safe

Anglo-American Book Shop.

**WILLIAMS AND SON**

(late Halisms).

Q.V. BUILDINGS.

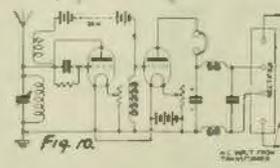
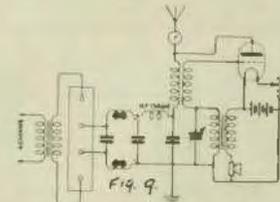
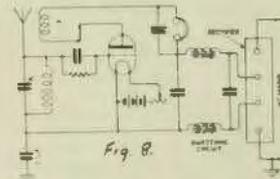
**450 GEORGE STREET, SYDNEY.**

All the Latest Wireless Books and Magazines in stock, posted anywhere

or and gives greater flexibility of adjustment of voltage.

**RESULTS OBTAINED.**

The rectifier described above has been used both for receiving and transmitting with very satisfactory results. The telephony transmitter circuit is shown in Fig. 9. When the filament is lit with an accumu-



later the carrier wave is absolutely free from ripple and several other stations report that the C.W. is as pure as if the dry cells were being used for H.T. The transmitter is capable of putting over 0.3 amps. into a 30ft. (double) aerial on a wavelength of 400 metres. If the fila-

Continued on page 10

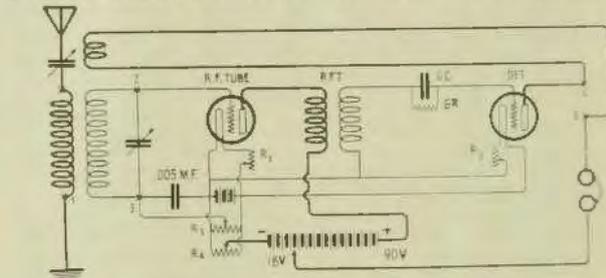
# Radio-Frequency Amplification

FROM THE GROUND UP.  
 With Some Simple Details for Applying it to Your Present Receiver  
 With Little Difficulty, and a Series of Six Graduated Circuits.  
 (By ARTHUR H. LYNCH)

Much of the trouble experienced by listeners-in is directly due to an exaggerated ambition for long distance. Many of them read descriptions of new forms of receivers, for which great claims are made, and they decide to have one—and have it immediately. As a rule, their knowledge of the set is confined to a few technical terms which they repeat in parrot fashion to some harassed dealer who is just as much in the dark as they are. Not more than a few days ago, a youngster asked me to draw a diagram and tell him how to make a radio compass. In the course of the conversation that followed, he described his single-tube receiver, which had been assembled from units bought one at a time, after comparatively long periods of saving. He spoke of the purchase of his storage battery as a great event, and prided himself on a pair of 'phones that cost eight dollars—and he wanted a radio compass, for he had read of the great work being done by the U.S. Navy at its compass stations. He had a notion that

And this lad is just like a great many others, and they are not all youngsters. It is a mighty good thing for the person just being initiated into the vagaries of radio to be satisfied with a good single-tube,

Before attempting radio frequency or any other involved arrangement, it is best, therefore, that you master the operation of your detector tube, for much can be accomplished by proper filament adjustments at



three-circuit, regenerative receiver, until he has mastered it. It takes a lot of skill to get the best from a receiver of this type, and vacuum-tube detectors themselves offer plenty of opportunity for experiment before the best working point

various plate voltages. A potentiometer is of great value. And regeneration is not the sort of thing that takes care of itself—it requires skill. One of the great advantages of the three-circuit receiver is found in the variable coupling between primary and secondary. Properly employed, it is helpful in cutting out stations that would otherwise interfere. Do you know how to use it properly? If you feel that you are getting the best possible results from your receiver, and want to increase your receiving range, or desire to use a loop antenna, the following pointers on radio frequency may help you to avoid some of the pitfalls.

There is no use in trying to use radio-frequency unless you are willing to go to the trouble of using it properly, and more than one stage is recommended for use only by those who have mastered a single stage satisfactorily.

We are taking it for granted that you are using a potentiometer in connection with your detector tube, but if this is not the case, the wire connecting the centre post of R4 to the negative terminal of the 'B' battery may be used to connect that terminal to the negative terminal of the 'A' battery (Fig. 1).

The parts needed: 1 radio-frequency transformer, 1 vacuum tube socket,

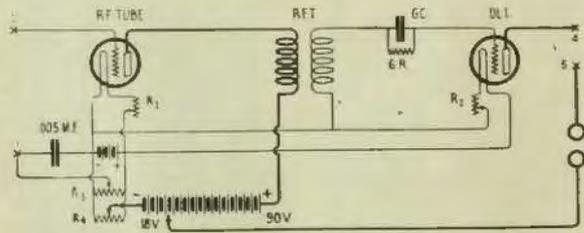


FIG. 1

a radio compass could be made in a few minutes by adding a loop or something to his outfit. He thought it would be a fine thing to carry around and locate stations that interfered with his receiving. He also had some very vague ideas about radio-frequency and super-regeneration and many other technical subjects of which he knew little more than the name, but he was anxious to try them all—at once.

is found. Two steps of audio-frequency amplification do not cause much additional difficulty, and are helpful when you desire to use a loud speaker. They add but little to the distance over which you can receive, however. Of course, there are some receivers to be had which embody rather complicated circuits, but are made for operation by an unskilled person, and some of them are good, although they are not cheap.

1 rheostat, 1 potentiometer (200-ohm), 1 fixed condenser (.005 mfd.). It is possible to do without the potentiometer and the fixed condenser, but the results obtained are not satisfactory.

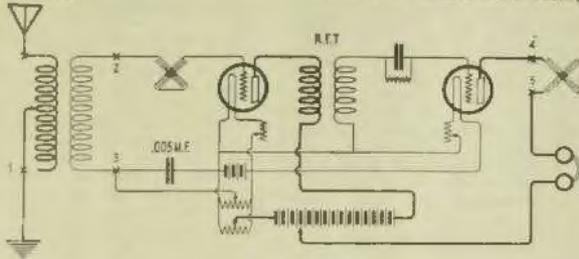


FIG. 3

Tunit is merely plugged in, in place of the three multi-layer coils.

For those who would employ a loop antenna, there are two methods available—the non-regenera-

**A SIMPLE ARRANGEMENT.**  
The circuit illustrated in Fig. 1 may be used in conjunction with any type of tuner, and is comparatively easy to handle. It is a simple matter to add an audio-frequency amplifier or additional stages of radio-frequency. By employing this arrangement with a standard multi-layer coil mounting, a number of variations are made possible with little loss of time.

The essential points in the circuit, at which the variations may be made, are represented (Fig. II.) by X, X1, X2, X3, X4 and X5, which corresponds to the primary, secondary and tickler plugs of a standard coil mounting, X1 and X2 indicate the points between which the antenna tuning coil primary is plugged in. X2 and X3 are the secondary terminals, and the wiring to their right and to the left of X4 and X5 should be made in a permanent manner with "bus" wire if it is available.

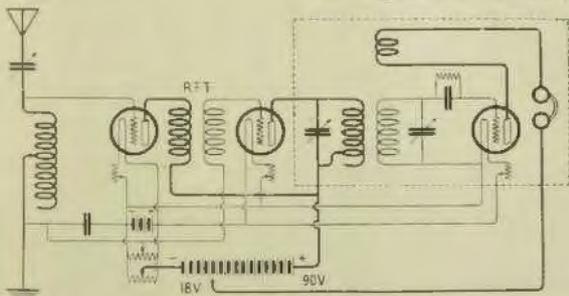


FIG. 4

tive and the regenerative. The difference is found in that portion of the circuit between X4 and X5. Where regeneration is not desired, it is but necessary to connect a short piece of wire between these two points.

But regeneration is usually de-

Where a standard regenerative circuit is employed, the connections are made as in Fig. II. In order

sirable, and is obtained by connecting a variometer between X4 and X5.

The loop itself should be provided with two flexible leads, twisted together and attached to a plug, which may be used in place of the secondary coil of the three-coil regenerator. When a loop antenna is employed the regular antenna should be removed from the set, and the primary coil should also be taken out.

The condenser used to tune the loop may be mounted on the base of the loop itself or in the usual position on the panel, where it is used to tune the secondary when the outside antenna is employed.

You will notice that the grid of the amplifier tube is connected through the secondary, or loop, as the case may be, to the center terminal of the potentiometer, R3. It is possible, by this arrangement, to impose a suitable voltage on the grid under the control of the potentiometer knob. A potentiometer used in this manner is frequently

called a "stabiliser." Where more than one stage of radio-frequency is employed, it is a good practice to have all the grids connected to this terminal, as shown in Fig. V.

The plate of the amplifier tube is supplied with 90 volts, and none but a hard tube should be employed. The plate voltage of the detector tube is twice variable, because a "B" battery with taps is used, and a potentiometer, R4, is also in circuit.

Tuning of the various arrangements is apparent to those who understand the tuning of other circuits, so there is no need of discussing it here. For those who are not familiar with this form of tuning, it would be well to read "Regenerative Radio Reception," page 58, "Radio Broadcast" for November, and "Paris and Honolulu Are Calling You," page 132, "Radio Broadcast" for December, "Tuned and Transformer-Coupled R.F."

Where a standard regenerator or a variocoupler and twin-variometer outfit is to be fitted with

radio frequency, it is possible to take advantage of two stages, with a single R.F. transformer. In these instances, which are illustrated in Figs. V. and VI., the tuning of the antenna circuit is accomplished by means of a coil, which may be a multi-layer or a tapped single-layer coil in series, with a variable condenser, the antenna and ground. For loop reception, it is but necessary to connect the loop and its shunt condenser between the grid and negative battery lead of the first amplifier tube.

By the arrangement shown in these two figures, the primary of the tuner is shunted by a variable

used in operating below 600 metres. Very few of them perform very well at 200 metres. Most radio-frequency transformers are designed to function at greatest efficiency on the broadcasting wave of 360 and 400. Some very ambitious claims that do not hold water are made by certain of the manufacturers, and it is well for you to procure your radio-frequency transformers from dealers who know and can be relied upon telling the truth concerning their wave-length range.

X, X1, X2, X3, X4, X5 indicate the standard multi-layer, or spider-web coil mountings.

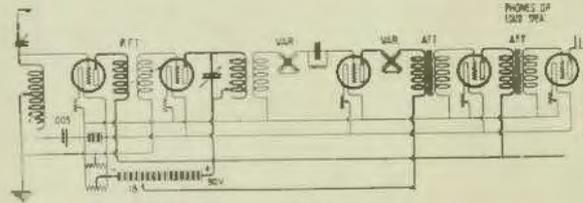


FIG. 6

condenser (23 or 43 plate), and may be tuned to any wave length within the limit of its inductance and capacity. The secondary circuit in Fig. V. may be tuned by the condenser, and in Fig. VI. by the variometer. Here we have two tuned circuits forming primary and secondary of the second radio-frequency transformer—in other words we have one step of transformer-coupled and one step of tuned radio-frequency amplification.

These circuits are more difficult to operate than the single-stage, transformer-coupled variety we have considered, but there are many experimenters who will derive a great deal of pleasure from the two-stage arrangement. Some fellows revel in complexities—and more power to them!

Before signing off, we must point to the two stages of audio-frequency illustrated in Fig. VI. They follow immediately after the detector assembly, and no trouble should be experienced with applying them to any of the foregoing circuits. If you want to do yourself a favour, don't attempt too much at once, or, like the fellow who bites off too much, you won't be able to chew.

The following symbols are used in the figures, and the capacities and values of inductances are those

R1 and R2 are receiving filament rheostats.

R3 and R4 are 200 ohm potentiometers.

RFT indicates the R.F. transformer.

G and L are the grid condenser and leak resistance; .005 is a .005 mfd. condenser.

#### AIRPLANE PILOTED BY RADIO.

Experiments by French engineers, have demonstrated that it is quite feasible to guide airplanes by means of radio waves, without the presence of a pilot in the machine. The first such flight, made without a person on board the airplane, took place on November 25, at Paris. A 300 horse-power Voisin plane took off from the field alone, circled above it for several hours, and then descended. Its every movement was directed by engineers Demareay, Bauche and Percheron, operating a special radio transmitter located in a hut on the outskirts of the flying field.

#### Chemical Rectifiers for Plate Voltage Supply

Continued from page 7

ment is lit off 6 volts A.C. a slight ripple is introduced.

When receiving I sometimes use my power valve (an A.T. 40) as a note magnifier as shown in Fig. 10. An ordinary 36-volt battery is used on the detecting valve (an R) and 300-400 volts from the rectifier and the amplifier. The form of coupling between the two valves seems to give less distortion of received telephony than transformer coupling. The choke L may be a pair of high resistance phones or the secondary of an ignition coil. Absolutely no A.C. hum is detectable in the telephones and the magnification of signals which are fairly strong in the first place is enormous.

I claim the following advantages of the chemical over the thermionic rectifier for A.C. rectification:

1. Much cheaper to instal (mine cost me only a few shillings).
2. Cheaper to run as there are no filaments to light.
3. Less fragile.
4. Much less resistance to currents in the right direction, consequently less loss in potential than with a thermionic valve.

A freshly made up set of cells should work without requiring attention for a month or two, according to the duty it has to perform.

N.B.—I do not wish to be responsible for the untimely electrocution of any innocent reader, so I will add a warning about H.T. transformers. Although an H.T. transformer such as I have described does not give such high maximum potentials as, say, a 2-in. spark coil, it is capable of delivering through the human body much larger currents and must be treated with respect accordingly. The H.T. side must be well insulated and nothing connected to it should be touched without first making sure that the input current is switched off. It is advisable to switch off the current feed to the transformer primary, prior to the valve filaments, first to avoid breakdown of the Mansbridge condensers, and secondly to ensure that the condensers are discharged before touching the apparatus. Also make sure that the primary windings are suited to the mains off which they are to work.

## Wireless Music and Telephony.

"Wireless Weekly" has pleasure in offering to its readers FREE DEMONSTRATIONS IN THE RECEPTION OF WIRELESS MUSIC AND TELEPHONY. (By kind permission of Radio College.)

Demonstrations will be GIVEN DAILY.

Ring Redfern 722. Give name and address and we will arrange a time for you to "Listen-in."

Demonstrations will be held at

RADIO COLLEGE,  
23 LANG STREET  
(Second Floor).

Please note that admission will not be given till you have arranged an appointment. If you cannot get us by 'phone, fill in the form below, and post to "Wireless Weekly," Box 378 G.P.O.

Name .....

Address .....

Would be pleased to hear Wireless Music FREE, and would be glad if you will arrange an appointment for me.

### RADIO TELEPHONY FOR TRANSATLANTIC SERVICE

It is well within the range of early realisation. Several weeks ago the American Telephone and Telegraph Company conducted some interesting radio telephone tests between New York City and New Southgate, a London suburb. Although radio telephone words had been transmitted across the Atlantic before these tests, it remained for these recent tests to prove that entire conversations could be carried on with distinctness and full understanding. Mr. Thayer and Mr. Carty, of the telephone company, spoke from their offices in New York City, using the usual telephone instrument which was connected by a telephone circuit about 70 miles long, half of it being underground cable and half open wire, leading to the powerful radio-telephone transmitter at the Rocky Point station of the Radio Corporation. The distance from the Rocky Point Station of the Radio Corporation. The distance from the Rocky Point station to New Southgate is 3400 miles. For the transmission there were employed 20 of the new 10-kilowatt vacuum tubes arranged

with modulators and filters to radiate about 100 kilowatts of radio energy.

Continued from Page 5.

tubes acting as radio frequency amplifier tubes, then rectified by means of a crystal detector, as a general rule, and then passed back or "reflexed" to the same tubes as were first used, but this time serving as audio frequency amplifying tubes. Thus three tubes may be employed to do the work of six tubes. The use of a crystal detector for rectifying the radio signals is said materially to simplify the arrangement of the reflex circuit. One of the leading radio manufacturers has placed a reflex receiving set on the market, which makes use of a small two-foot loop antenna. Resting on any library table with its small loop mounted on top of the cabinet, this reflex receiver will receive broadcasting stations on a loudspeaker up to 100 miles, and, when using head 'phones, it will receive stations up to 1000 miles. By using the outside antenna greater distances can be spanned.

## Get Your Wireless Gear at Electricity House

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

Condenser Plates, 1/9 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/-.

Murdoch's 'Phones, 35/-; 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, 40/-; Cabinets, Ebonite, Bakelite, and All-round Materials.

Complete Crystal Sets, £3/10/-, £6/10/-, £7/10/-; Valve Sets, from £9 to £35, 1, 2 or 3 valve; Radiotron Valves, 37/6; Vernier Rheostats, 15/-.

INTERVALVE TRANSFORMER, 40/-  
Closed Iron Core.

UNDER NEW MANAGEMENT.

Works Manager: Raymond McIntosh.

General Manager: J. S. Marks.

All Communications to the Firm.

## Amateur Calls

Amateur Licenses issued during month of January, 1923.

### QUEENSLAND.

Call Sign	Name	Address
4 C S	Geraghty, J. A.	Christian Bros. College, Townsville. R.
4 C O	Nicoll, W.	Bardon Drive, Upper Paddington, Brisbane. R.
4 C P	Sutton, J. W.	Bowen Terrace, Brisbane. R.
4 C Q	King, F. E.	Bulliwalla Station, Clermont. R.
4 C B	Ham, G. W.	Gympie St., Northgate, Brisbane. R.
4 C T	Court, C. P.	Rosalie, Brisbane. R.
4 C H	Walker, C.	Devonport St., Clifton. R.
4 C V	Husband, N. C.	Aland St., Charters Towers. R.
4 C W	Buck, A. T.	Geebung, N.C. Line. R.
4 C X	White, A. M.	Tranby, Winton. R.
4 C Y	Bell, L. W. G.	Atherton, via Cairns. R.
4 C Z	Henry, J.	Mt. Alford, via Boonah. R.
4 D A	Eggleton, E.	James St., Toowoomba. R.
4 D B	Armati, R. G.	Stanton Hill, Townsville. R.
4 D C	Shenton, M. H.	Kingsley Terrace, Wynnum St. R.
4 D D	Stewart, A. B.	South Moulton St., Hawthorne Park Estate, Ashgrove. R.
4 D E	Kenna, V. F.	Allen St., Hamilton, Brisbane. R.
4 D F	Taylor, B. A.	Norman St., East Brisbane. R.
4 D G	Jackson, A. G.	Ashton St., Wynnum. R.
4 D H	Ashby, M. J.	C/o Jubilee Sanitorium, Dalby. R.
4 D I	Grubb, W. J.	Regent St., Charters Towers. R.
4 D J	Wriede, G. A. S.	Matthew Terrace, Caboolture. R.

### TASMANIA.

7 B C	Douglas, C. A.	Gormanston, R.
7 B D	Street, R. N.	103 Horton St., Hobart. R.
7 B E	Stipak, John	St. Helen's. R.
The undermentioned license has been cancelled—		
7 A B	Smith, A. C.	21 High St., Launceston. R.

### WESTERN AUSTRALIA.

6 B W	McLauchlan, C.	14 Clydesdale St., Victoria Park. R.
6 B X	Bice, W. R.	18 Bernard St., Claremont. R.
6 B Y	Congdon, B.	63 Gloster St., Subiaco. R.
6 B Z	Watterson, W.	88 Sixth Av., Maylands. R.
6 C A	Jewell, T. J.	367 Rokeby Rd., Subiaco. R.
6 C B	Unwin, J. J.	7 Vale Rd., Mt. Lawley. R.

### SOUTH AUSTRALIA.

5 B W	Clifford, H. G.	Renmark. R.
5 B X	Ward, S. W. H.	Stanley Flat, near Clare. R.
5 B Y	Beck, C. D.	20 Fifth Av., St. Peter's. R.
5 B Z	Letheby, P. N.	1 Sussex Terrace, Westbourne Park. R.
5 C A	Oakley, R. H.	24 Moonta Rd., Kadina. R.
5 C B	Hale, J. P.	Leigh St., Adelaide. R.
5 C C	Wilkinson, H. C.	48 Swaine Av., Rose Park. R.
The following has removed to address indicated—		
5 A L	Spurrier, L. C.	275 Ward St., North Adelaide. R.

## Expansion for Canadian Marconi

Vancouver, B. C., is to be linked with the rest of the world by radio, the Marconi Wireless Telegraph Co., of Canada, having applied for a license to erect a powerful station there at a cost of 2,000,000 dollars. The new station will use continuous wave transmitters. Other stations will be erected at Winnipeg, Toronto and Montreal, making a chain across Canada capable of handling traffic within the Dominion, with the United States, and with other countries. An expenditure of about 5,000,000 dollars will be required for the new system, which will represent a considerable expansion of the present Marconi net in Canada, which works with American and European stations daily.

### RADIO AGAIN CARRIES LOAD.

The break in the single trans-Pacific cable late in November resulted in an immediate increase of the traffic through the stations of the Radio Corporation of America on the Pacific Coast and in Honolulu, and again demonstrated, as has been done before, the great service of which radio is capable. For a considerable period, until the cable was repaired, radio was the sole means of communication with Japan, and the most direct method of reaching China. The latter, however, was not entirely shut off from telegraphic communication with the rest of the world, being reached also by cables from London, which roundabout route, however, entails considerable delay. The Philippines,

Dutch East Indies and Guam likewise were severed from cable communication with the United States when the cable broke, and likewise were served by radio, operated at new heights of efficiency.

**ITALIAN TRAFFIC IS RELAYED.**

Suspension of direct radio communication with Italy has resulted in wireless traffic with that country going over new circuits. It is not expected that the new routes will be used after the new high power station, now being constructed near Rome, is put in operation. During the temporary suspension of direct radio communication, radio traffic from Italy for North and South America is being handled via the high-power stations of Germany, France and England, according to statements of the Ministry of Posts and Telegraphs at Rome. Full-rate and deferred messages and press telegrams may be sent via Nauen Transradio and Radio-France, and full rate and deferred messages via London Marconi.

Messages sent via Nauen are transmitted by radio from Rome and relayed at Nauen. Traffic handled by France or England is sent by land wires from Italy, and thence by radio. Messages via France or Germany will carry a rate of 20 centimes gold less than the cable rate. Deferred of full rate telegrams. Via London, the same messages would be ten centimes gold less than the cable rate. Deferred dispatches will be charged half the above rates. Press reports may be sent via France or Germany at the same rate as deferred messages, it is reported, but will not be handled via London.

**EXERCISES BY RADIO.**

A novel feature has been introduced by the WHN radio-phonc station at Ridgewood, N.Y. This station has been broadcasting morning exercises as early as 7 a.m., for the benefit of early risers, in addition to its weather report and the latest overnight Washington, foreign and domestic news. Another period of morning exercise is given at 7.30 a.m. At 8 a.m. still another period is provided for late risers. These exercises are given with music. At 9.15 a.m. the WHN station sends out a series of reducing exercises, intended especially for women, and

at 10.30 p.m., bedtime exercises with music are given in connection with final night news and the evening programme.

**RADIO AMATEURS IN FRANCE**

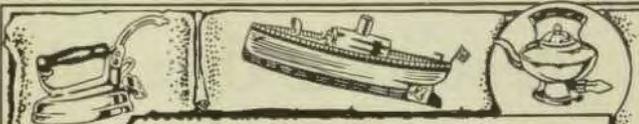
According to the Under Secretary for Posts and Telegraphs, more than 50,000 private radio installations are now in operation in France. This figure is in striking contrast with the few stations in existence but a few years past, when the French laws limited amateur radio to experimental and instructional institutions.



**RADIO SETS**  
and Parts to make your own

Send for Price List.

**ELECTRICAL UTILITIES SUPPLY CO.,**  
**RADIO HOUSE**  
605 GEORGE STREET, SYDNEY.



**The Sale is Over, and was a Great Success**

I have installed all new stocks of Electrical Goods.

**Prices are Lowest in Town**

Try me for your requirements

Yours for Everything Elect

**O'Sullivan's Electric Shop**  
296 Pitt St., Opp. W. & S. Board.

WIRELESS AND ELECTRICAL EXHIBITION.

THE WIRELESS INSTITUTE OF AUSTRALIA, N.S.W. DIVISION.

The primary object of the Exhibition is to "Boost" Wireless and Electricity, and prove to the community that these two branches of science conjointly are of immense value to the progress of our vast and sparsely populated country.

Special interesting and instructive new features in wireless will be shown.

Demonstrations in Wireless Telephony will be given daily at suitable hours.

Mr. O. F. Mingay (Bargin Electric Co.), of Tarranurra, is transmitting every evening on 250 metres wavelength. Phonograph music, general news, buzzer practice (at slow rate to allow beginners to read) are the principal items of his present programme. Mr. Mingay will be pleased to hear from those who hear him, especially distant stations.

"Wireless Weekly" will be pleased to hear from amateurs who are transmitting or intending to transmit, giving particulars of wavelength, power to be used, and probable time and dates of transmission so that all amateurs may listen in.

We would like to hear from readers, country readers especially, giving particulars of any music of telephony they may hear in the following form: Call signal (if heard), names of pieces of music heard, whether it came in strongly or not, modulation, any suggestions that you think might be an improvement.

HAVE YOU A LICENSE FOR THAT SET?

Wireless amateurs are warned that they must hold a license before they can use a wireless set. With the increasing number of experimenters, a very strict watch is being kept for breaches of the Wireless Act.

FIRE UNDERWRITERS' REGULATIONS.

TRANSMITTING STATIONS. (By "Queensland Insurance Radio Club.")

In last week's issue the rules and regulations of the Fire Underwriters' Association of N.S.W., in connection with receiving stations, were published, and the following now govern all stations in which transmission is carried on, owing to the extra risk incurred. It should be noted that the Underwriters' general regulations for electrical wiring must also be conformed to in addition to those below.

ANTENNA: Similar rules as for "receiving stations."

LEAD-IN WIRES: Similar to receiving stations, but not less than No. 16 S.W.G. to be firmly mounted, 5 inches clear of building, on insulators having not less than 5 inch creepage and air gap distance to conducting and inflammable material. The wire must pass into the building through non absorptive insulating tube, and if fragile must be protected from mechanical injury, or it may pass through drilled window pane.

PROTECTIVE GROUND SWITCH: A double throw knife switch, having break distance of 4 inches, blade not less than 1/2 inch by 1/2 inch, or standard 100 ampere single pole, double throw switch, must be connected to antenna mounted on non absorptive insulator—not slate—5 inches clear of building, preferably in direct line between lead-in and ground connection. Conductor from switch to ground must be supported securely.

PROTECTIVE GROUND WIRE: Must not be smaller than 16 S.W.G., which should be protected if necessary from mechanical injury and must not be connected to gas pipes.

OPERATING GROUND WIRE: Must be protected and supported similar to the lead-in, and should be of not less than No. 2 S.W.G., and kept respectful distance from pipes and wires.

OPERATING GROUND: This conductor should be connected to good permanent ground, such as water piping (no gas), or artificial, such as driven pipes, plates, etc.

Continued on page 15.

Make Your Own Set

We Stock All Parts

All kinds of Electrical Accessories

Call and inspect our Stocks

J. J. Hoelle & Co. 57 Goulburn Street

Factory: 49 ALMA STREET, DARLINGHURST



WIRELESS INSTITUTE.

The annual dinner of the Wireless Institute of Australia was held at the Peking Cafe, Pitt Street, on Tuesday evening, 29th inst.

The table was tastefully decorated with pink daisies and ferns.

In the absence of Mr. Bartholomew, the President, Mr. F. B. Cooke (Vice-President) took the chair.

The menu, which was the work of Mr. Charlesworth, was as follows:—

- Oscillating Olives.
- Souperogenerative Soup, with Grid Leeks.
- Crocker Dial Soup.
- Single Slide Oysters.
- Knob and Dial Pie.
- Flat Top Beef.
- Perried Rice.
- Mingayed Murrow, Stowed Sauce.
- Cooked Carrots, Unearthed Potatoes.
- Broadcasted Banns.
- Tickler Tarts.
- Eddy Currents.
- Aerated Waters, for Small Capacities.
- Quenching Beer, for Larger Capacities.
- (50 Farads and Upwards.)
- Singing Spark Cigarettes.

TOASTS.

The King  
The Institute.  
Proposed by Mr. S. Tatham, and responded to by Mr. Basil Cooke.

The Visitors  
Proposed by Mr. P. Renshaw, and responded to by Mr. Crawford, (Radio Inspector), Mr. MacLardy ('Wireless Weekly'), and Mr. Steele (Victorian Wireless Institute).

Mr. S. Tatham stated that on returning from an interesting trip to America he was surprised at the strides radio had made since he left some months ago. Mr. Tatham gave an interesting summary of his trip. He stated he had studied the conditions of wireless in Canada and the States; he had the pleasure of visiting a large new trans-ocean station at San Francisco, which had

been built to communicate with Japan.

While at the West Coast he listened to Metropolitan Opera Company, in Chicago, broadcasting, and at a distance of 2,500 miles he was able to hear with ease, some distance from the loud speaker.

Mr. Tatham said he hoped Australia would soon follow suit with broadcasting. He quite expected, and was disappointed not hearing broadcasting every evening when he returned.

Mr. Crawford, in responding to the toast of the visitors, gave those present some sound advice regarding transmitting, keeping on their correct wave length, etc. He also referred to the subject of Hon. Amateur Radio Inspectors, pointing out that N.S.W. was the only State which had not already appointed their inspectors.

Mr. Crawford also answered a number of questions that were troubling different members of the Institute.

Mr. P. Renshaw, in proposing the visitors' toast, spoke feelingly on the subject of a central amateur body.

During the dinner a flashlight was taken, and appears in these columns.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

The Leichhardt and District Radio Society held its first social evening on Tuesday, March 19th, when members and a number of friends rolled up for a tuneful time. In spite of the inclement weather, the attendance was excellent, and musical items were rendered by a number of those present. On account of the prevalence of very severe lightning, the proposal to give a demonstration of the reception of telephony had to be abandoned, but, nevertheless, a very pleasant evening was spent by all present.

The next meeting is to be held in the club room, Victory Hall, rear of Methodist Church, Johnston Street, Annandale, on Tuesday next, when all interested are invited to be present, whilst all inquiries relative to the Society's activities should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

WAVERLEY AMATEUR RADIO CLUB.

At the last meeting of the Waverley Radio Club a large number of members were present. A new member was enrolled.

A committee was formed to construct and manage the Club's transmitting set. The following members were elected on the committee: Messrs. Anderson, McKenzie, Lavington, Pendergast, Bowman and Thomson.

A transmitting valve has been purchased, and all other necessary gear, and the set should be in operation in a few weeks.

A syllabus was drawn up, consisting of a series of progressive lectures, to commence from next meeting, as follows:—

SYLLABUS.

- March 29.—Electricity and Magnetism, as applied to Radio.
- March 29.—Condensers, Aerials and Earths.
- April 5.—Inductances and Tuning Apparatus.
- April 12.—Crystal Receivers.
- April 19.—Valve Receivers.
- April 26.—Audio Frequency Amplifiers.
- May 3.—Radio Frequency Amplifiers.

**RADIO COLLEGE**

Applications are now being received for forming the next class.

**23 LANG STREET**

**F. B. COOKE,**  
*Principal*

- May 10.—Heterodynes and Wave-metres.
- May 17.—Low Powered Valve C.W. Transmitters.
- May 24.—Wireless Telephony.
- May 31.—Suggestions for Experiments by Amateurs.
- June 7.—Rules and Regulations Concerning Experimenters.
- June 14.—Definitions commonly used in Radio.

All communications regarding the Club should be addressed to the Hon. Sec., 97 McPherson Street, Waverley.

QUESTIONS AND ANSWERS

P.A. Randwick asks:—

Q: I have a loose-coupler crystal set and a single slider for use as a loading coil. My aerial is 30 feet high, 100 feet long, and is a twin aerial. Is it possible for me to receive any concerts at all under these conditions? If so, will you kindly state what concerts, time and wavelength.

A: There are three or four amateurs testing with wireless music on about 400 metres wave length. There are none, however, very close to you at present, but by very careful tuning you might hear Mr. MacLurean on Sunday nights, or a few others.

E.L.S. (Ashfield) asks:—

Q: What is meant by carbon electrodes? Is it necessary to have them for a carborundum detector?

A: Carbon electrodes are not used in wireless except in the arc transmitter, are quite unnecessary for a carborundum detector.

J.G. (Hunter's Hill) asks:—

Q: Is there any other possible way of joining two wires except by soldering them? What length of coil would be needed to receive any Australian station (crystal set), aerial 100 feet single, height 45 feet one end, and 25 feet the other, lead in 12 feet, earth 14 feet?

A: If a good splice is made, joining one wire to another, it will prove a good contact for a while, but sooner or later a film of will intervene. The only satisfactory way of joining wires together for outside work is to solder them together. Please give diameter of coil and gauge of

wire. Australian stations send mostly on 600 metres. See "Wireless Weekly," Vol. 2, No. 12, for call signals.

wire of the surge and kick-back protective devices shall not be connected to the operating ground or ground wire.

Many of the amateur installations have been placed without giving much thought as to what the effect of the radio power devices will have upon the balance of the system and supply authorities may require these stations to take current from a separate transformer, and in addition to place all of the wiring in conduit, also to have it protected at each radio-transformer, rotary spark-gap, motor in generator sets, and other auxiliary apparatus. This precaution tends to preserve the quality of the light and power service in the neighbourhood and obviates fire hazards.

SUITABLE DEVICES:

Transformers, voltage reducers, keys and other devices must be suitable for radio operation.

QUESTIONS

Accompanied by the coupon below will receive a prompt reply. Please understand that 2 questions only can be answered with each coupon.—Editor.

**Question Coupon**

*To Information Editor*

AVAILABLE TILL 27-3-23

NAME \_\_\_\_\_

Address \_\_\_\_\_

FOR 2 QUESTIONS ONLY

*Continued from page 14*

POWER FROM STREET MAIN:

The circuit must be installed in approved metal conduit.

PROTECTION FROM SURGES, ETC.:

In order to protect the supply system from high potential surges and kick-backs, there must be installed in the supply line, as near as possible to each radio-transformer, rotary spark gap, motor in generator sets, and other auxiliary apparatus, one of the following:—(1) Two condensers (each of not less than 1 microfarad capacity and capable of withstanding a 600 volt test) in series across the line and mid-point between condensers grounded; across (in parallel with) each of these condensers shall be connected a shunting fixed spark-gap capable of no more than 1-32 in. separation. (2) Two vacuum tube type protectors in series across the line with the mid point grounded. (3) Non-inductively wound resistors connected across the line with mid-point grounded. (4) Electrolytic lightning arresters such as the aluminium cell type.

In no case shall the ground wire of surge and kick-back protective devices be run in parallel with the operating ground wire when within a distance of 30 feet. The ground

The experiment the Compañía del Agwi is about to make will be watched with great interest by thirty other oil companies, and it is probable that soon radio will have secured a start in Mexico from which there will spread rapidly, enlightenment and progress throughout the entire Republic.

For Sale or Exchange

COMPLETE LOOSE-COUPLED RECEIVING SET, 2000 mc. Maple, French Polished Nickel-plated Parts. £3/10/-, or reasonable offer. Miniature LOUD SPEAKER, 2000 ohms. Apply—F. ADAMS, 150 Birrell Street, Waverley.

FOR SALE.

EXPANSE TUNING UNIT, No. 1, in Perfect Working Order, £3. Also New Pair Murdoch Phones, £1. O. SANDEL, 14 James Street, Manly.

FOR SALE.

VALVE SET, Maple Cabinet, H. Coils, 6001 Concerts. Well Finished. Bargain, £7/10/- Ring Y1833.

Published by W. J. MacLardy, "Truro," Powell Street, Neutral Bay at the offices of W. M. MacLardy, 248 Castlereagh Street, Sydney.

March 30, 1923.

## WIRELESS WEEKLY

### Amplifying Transformers

The Amplifying Transformer is one of the important integral parts of the Radio Receiving Set. Probably no other part is more subject to quality than the Transformer. Its functions are so delicately performed that satisfactory results are most dependent on the performance of this little instrument.

The Jefferson Electric Manufacturing Company were quite logically attracted to this field. As originators, pioneers and manufacturing specialists of Transformers for a period of twenty years, they are in a good position to develop an Amplifying Transformer of the highest quality.

1. Ratio of secondary to primary turns, 3.75 to 1.
2. Useful tone frequency range, 60/5000 cycles.
3. Allowable current on



each winding 10 milliamperes.

4. Test voltage between primary and secondary, between primary, secondary, and ground, 300 volts.

5. Terminal voltage tests on open circuit, 500 volts.

6. D.C. resistance of windings: Primary, 1000 ohms (approx.); Secondary, 5000 ohms (approx.).

7. Primary and secondary wound with No. 40 enamel-covered copper wire.

The core iron is so designed and assembled as to get an even distribution of flux through the entire circuit. Competing Transformers operate above saturation point at some sections on account of poorly designed core. The number of turns in the Jefferson Transformers is anywhere from 50 per cent. to three times as many as are used on Transformers which sell for approximately the same money. Jefferson Transformers will operate with tubes having impedance from plate to filament of 20,000 to 30,000 ohms, and grid to filament 200,000 to 300,000 ohms.

40/-

## The Colville-Moore Wireless Supplies

10 ROWE STREET, SYDNEY.



Just a Real Good Car  
**AUTOMOBILES LIMITED**  
207 Castlereagh Street, Sydney.

### QUALITY RADIO

Winter Seasons are the best for Radio Reception. Secure your Set before the season arrives.

WE STOCK COMPLETE SETS OR PARTS TO BUILD YOUR OWN.

B.T.H. English Detecting, 35/-; Amplifying, 35/-; and Transmitting Valves, 40/-; Head Sets 2000 to 8000 ohms; Crystal Sets complete with 4000 ohms; Head Set, £5.

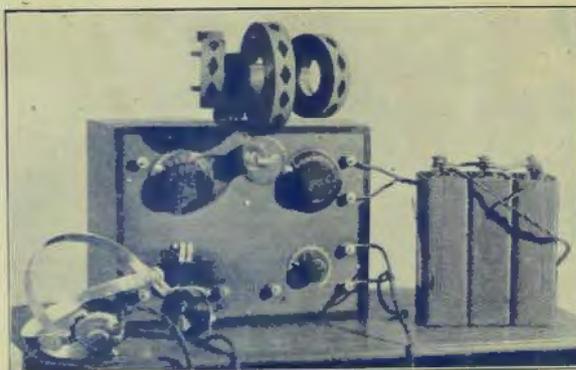
SEND FOR PRICE LIST TO

**W. HARRY WILES,**  
Radio Department,  
**60-62 GOULBURN STREET,**  
One door from Pitt Street.  
**SYDNEY.**

WIRELESS WEEKLY

March 30, 1923.

## 3 Coil Valve Set Complete



*with "A" & "B" Batteries, Phones, Etc., Ready to "Listen-in" on.*

To Our Country Visitors,

Don't go back home without hearing Wireless Music.

We are arranging Wireless Telephone Demonstrations to show what our sets will do.

You can instal a complete Wireless Receiving Set in your home for £14/14 0.

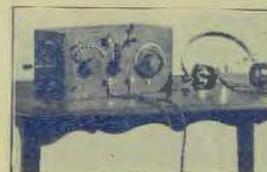
Consult us for advice and all particulars in Wireless Matters.

## Radio Company

18 Elizabeth Street

(4 doors from Hunter Street)

B 5586



*Crystal Set Complete with Phones Ready to "Listen-in" on.*