ISSUED EVERY SECOND WEDNESDAY

SIXPENCE

RADIO IN AUSTRALIA & NEW ZEALAND

Registered at G.P.O., Sydney, for transmission by post as a newspaper.

VOL, II AUGUST 20, 1924 No. 37

"OLD KING COLE"---UP TO DATE

RADIO

IN AUSTRALIA & NEW ZEALAND

Incorporating "Sea, Land and Air".

Managing Editor: S. E. TATHAM.

Associate Editor: N. H. THOMPSON.

CONTENTS

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"While We Live, We Grow"

READERS of this magazine may remember that last issue's Radiotorial was entitled "Boom!" and that in it we pointed to, and gave several little instances of, how at last the wireless snowball is getting under way in this country.

PARTLY from a sense of natural modesty and partly from a desire to first substantiate our claims upon a solid foundation of indisputable fact, we refrained from giving one more instance just at that moment.

HOWEVER, the time has arrived and it is with pleasure that we now let a particularly healthy young cat out of the bag. . . .

THREE days after the publication of *Radio* No. 36 every copy was sold. This was despite the fact that as the same thing had occurred in the case of the four previous issues *the number printed had been increased by more than one hundred per centum.*

THE demand for *Radio* by the public is rapidly becoming phenomenal. We are still receiving applications for issues, 32, 33, 34, 35 and 36, which contained articles or information of considerable interest to the wireless beginner and expert. Unfortunately, copies are unprocurable at any price.

DEMANDS on our space by amateurs acquainting us of their noteworthy performances—which are always welcomed and given first preference over all other kinds of matter—have been so great and are continuing to arrive in such numbers that we have been compelled to enlarge the magazine to 32 pages commencing from the present issue.

THIS enlargement should prove welcome news to our many readers no less than it does to us, for it will mean henceforth that an even larger circle of subscribers will be catered for. At other times when space was "tight" it was often a knotty problem as to what to print and what not.

NOW, however, for the present, at least, this difficulty has been removed and, in the words of the late Rossetti there will be "room for all who come." It is our earnest hope that they will and will continue to do so in ever increasing numbers. As they do, so, too, will this magazine become bigger, better and brighter at every issue.

AS our circulation has soared during the recent numbers it has naturally followed, as a logical outcome, that the paid advertising has likewise increased, and since No. 34 it has more than doubled itself. Needless to say, this is the most important increase of all, as without advertisements no publication can long exist as more than one newspaper and magazine in this country has sadly demonstrated.

HERE we take a good opportunity of reminding our readers of a very important point.

WHEN an advertisement in *Radio* interests you and you are writing to the dealer, on no account omit to mention that you saw the announcement in this magazine. Most of our clients display particulars of their wares in several mediums and unless you state when making enquiries or ordering that you saw it in *Radio*, it is impossible for them to tell through what paper or periodical the appeal reached the prospective purchaser. If, on the other hand, they do know, it will unmistakeably show them that such a magazine as *Radio* is a good advertising medium and one that it will repay them in which to further particularise the stocks they have for sale. Thus, they will advertise again and more revenue will accrue to the proprietors which will enable them to make the publication larger and more interesting than ever.

READERS, by mentioning *Radio* as the publication in which they saw the dealer's advertisement, will indirectly be doing themselves a favour, for it is they who will eventually benefit through receiving regularly a magazine whose contents, "make-up" and general character are the best that money can buy.

NOW, please do not forget to do this next time !

IN conclusion, just a word of thanks to our many readers without whom, of course, *Radio* would not be enjoying the prestige it does to-day. We greatly appreciate the many letters we receive by every mail containing helpful suggestions, and in every instance strive to answer them personally and accede to all requests. We like our readers to write to us and, as we think we have rather excelled ourselves in the compilation of this latest number, we would be very glad if they would let us know what they think of it.

WILL you?

Highlights of Radio Broadcasting

The Wedding of Harp and Spark

By Dr. ALFRED N. GOLDSMITH, B.S., Phd., Fellow I.R.E.,
Chief Broadcast Engineer, Radio Corporation of America

(Special to "Radio.")

MUSIC, in all likelihood, originated in nature itself. The wind whistling through the trees, the crickets chirping their evening song, the musical splash of a small waterfall, and the deep boom of the thunder must have suggested to primitive man the beginnings of music. The first musical instruments were almost free from design—they were nearly untouched products of nature. The split reeds on which shepherds piped in pre-Athenian days, and the simple stringed instruments of the Orient must have spoken a language which was nearly akin to the sounds of forest and stream.

Sometimes the very wind was harnessed to breathe its own song. The air-strummed Aeolian harp hung among the trees sang its melody when the vagrant breeze passed over its strings. This simple instrument, played by no human fingers, is in a sense the most natural of musical instruments and may be taken as a symbol of the essence of music. The harp, or its cousin, the lyre, has been chosen for centuries as the emblem of music in general. The insignia of musicians in most armies and the design of music stands or musical instruments have very frequently included the lyre, tuba, or the harp.

The famous author once said that, "All arts tend toward music." The colour schemes of paintings suggest to many a musical theme, and the relation between pure music and the rhythm of poetry or the cadences of an oratorical effort is an obvious one. If music is indeed the ultimate art, broadcasting has an excellent chance of becoming its chosen medium, and thereby evolving into the greatest instrument of the arts.

There are many justifying circumstances for the bold claim of so exalted a future for broadcasting. For the first time in history the extraordinarily powerful agency of electricity has been successfully called to the aid of art. The voice of man can be heard only a little way, and even the greatest orchestra cannot reach more than a few thousand feet. And every local disturbance will go far toward spoiling the complete enjoyment of the auditor. A neighbour who coughs or a passing vehicle are enough to interrupt the flow of a composition and distract a portion of the audience. Electricity has already been able to overcome these hitherto inherent limitations of man-made

The Blended Harp and Spark.

music. Electrically we can amplify and reproduce music faithfully in such volume that multitudes can listen without fear of interruption, or we can carry a concert by radio all by wire into a million homes or across a continent and then re-create it in all its original perfection. Music has literally been lent the might of the lightning flash.

Electricity is the most powerful and the most subtle of modern physical agencies. Its powers, skilfully applied, seem so great that it is hardly possible to arouse public incredulity by any claim for a new electrical device, no matter how extreme or grotesque or bizarre the claim may be. The public has become so accustomed to a myriad of daily electrical marvels and engineering triumphs that the imagination of the people is unchained so far as further electrical possibilities are concerned. The wellnigh instantaneous transmission of the personality of an artist, expressed in music, to the homes of a continent has become a daily achievement, and we are in some danger of losing our perspective and belittling the meaning of such an achievement because of the apparent ease and simplicity with which it is accomplished. It is indeed important to remember that so basic and far-reaching an artistic and social agency can work for harm as well as for good, and that broadcasting, which is truly "the voice of the people" deserves their constant attention and appreciation.

Music from time immemorial has been transmitted through the air, by the medium of air sound waves travelling but little more than a thousand feet a second. To-day it is possible to transmit radio waves which carry music within them through the air (or through empty space, for that matter), and with the speed of light, thus circling the earth in a mere fraction of a second. Radio has also been fortunate in its choice of an appropriate symbol which indicates clearly the nature of this powerful agency. The spark or lightning flash has been used since the early days of radio as a sign of the art. It is an appropriate sign, since radio is after all tamed lightning, in a sense; and the spark itself—miniature lightning flash as it is—was originally used to start the radio waves on their long journeys.

Although to-day the spark no longer plays any part in the broadcasting transmitter, having been entirely superseded by the radiotron as an agency for the production of elec-

trical oscillations and radio waves, yet it retains its historical associations and its sentimental standing as a symbol of radio. No doubt the art will advance during the years to come into still more complicated and specialised directions, but the original birthplace of the electric oscillation—the flashing spark—will and should remain as the symbol of the radio art. It will always recall to those who understand its significance the early struggles, failures, and eventual triumphs of radio progress.

and spark was "music carried by radio," but the forms of the symbols were, to some extent, antagonistic. Fortunately, by using a conventionalised spark, and altering the harp into conventional and graceful form, the two were formed into a circular emblem which embodies within itself suggestions of all the charm of music and also the electric strength of radio.

This symbol faces the performers in the transmitter casings of stations WJY, WJZ, and WRC of the Radio

means of achieving this desire. A broadcasting transmitter is no more unnatural than a piano or than paint and canvas, and the receiver is as natural as marble and chisel. The arts come first, and science followed. For a while, these two seemed alien, but with the expansion in the mentality of man, it becomes clear that the emotional expression of the artist's nature is not chilled but, on the contrary, greatly encouraged by the wider scope which science can now afford it.

Addressing the Symbol of Broadcasting at Station WJZ, New York.

When a symbol was sought for the new art of broadcasting, the artistic difficulties were fairly discouraging. It remained for one of America's leading sculptors, Mr. Edward Field Sanford, Jr., to tear himself away from the design of several huge pediments for the new buildings of the State of California at Sacramento, and to attempt to blend harmoniously the symbols of music and of radio so as to have a suggestive and artistic symbol for broadcasting. The thought inspiring the combined harp

Corporation of America at New York and Washington, and is depicted in the accompanying photograph. Musicians are justly inspired when they face a symbol of the union of their art and the new science of radio.

No doubt there will be in the future still other means whereby electricity will come to the aid of the arts, enriching and expanding them. There is nothing unnatural about such a union of two natural things—the desire for beauty and the physical

RADIO INSPECTOR ISSUES WARNING.

WITH a view to reducing the present serious menace of howling valves, the Auckland Radio Inspector has issued warning notices to "listeners-in" so that the nuisance will be reduced to a minimum. It is very annoying when listening to distant stations and straining every nerve to log the call when some "ham" in the vicinity goes "whoop whoop" with his valve.

How to Make a Loose Coupler

A Popular Receiver

Simple and Efficient

ONE of the most popular types of wireless receiving sets with beginners is the Loose Coupler. It is easy to make, simple to operate, and gives good results.

A feature with the Loose Coupler is that either crystal or valve can be used as detector, or the coupler itself can be used as either a single or double circuit receiver. Also if a crystal is used as a detector, a valve can be added as an amplifier.

Radio dealers stock the necessary parts for a Loose Coupler and, after buying same, all that remains is to assemble the parts and make the necessary connections.

The parts required consist of:—

1 Base Board
2 Cardboard Tubes
1 Set of tube ends
1 Bar and Slider
7 Switch contact studs
1 Switch Arm
1 Piece of Ebonite for detector and terminals
1 Complete Crystal Detector
4 Terminals
2 Brass rods for Secondary Coil
1 'Phone Condenser
3 ft. Double Flexible Bell Wire
8 ozs. No. 26 D.C.C. Wire
6 ozs. No. 30 Enamel Wire

The various radio dealers have a complete set of parts similar to those above-mentioned. Maybe the actual parts listed do not agree exactly with those the dealer has. This does not matter very much but be sure that you wind the coils as directed in this article and also connect the set up as shown in the diagrams.

After having secured the component parts for the Loose Coupler, shellac and varnish the base and wooden coil ends and then proceed to wind the primary and secondary coils as follows:—

Primary: Use the largest tube and wind round it 200 turns of the No. 26 Gauge Double Cotton Covered Wire. When completed, give the whole tube and winding several coats of Shellac and allow to dry thoroughly.

Secondary: On the smaller tube, the No. 30 Gauge Enamel Wire, is wound in sections. First wind 25 turns, then pierce the tube with a hat-pin and push through to centre of tube about six inches of wire doubled over. Do not break the wire. That is called a tap.

Continue the winding and tap same at the 35th, 50th, 75th, 100th, 150th and the 200th turn.

The completed secondary coil should now also be given several coats of shellac and allowed to dry.

The windings on the Primary and Secondary will tune approximately between 200 and 2,000 metres.

When the two coils are thoroughly dry take the Primary and by means of a hot poker bare a track of wire as shown in the diagram. This track must be perfectly straight and the wire cleaned after the insulation is burned off. The track need not be more than ¼in. wide.

On the special wooden coil end that fits on to the secondary coil fix the contact studs and switch arm. This is also shown in diagram.

The taps from the secondary coil should now be soldered to the contact studs as shown in diagram. The first tap at the 25th turn should be taken to the first contact stud and so on.

Now, with the Flexible Bell Wire a connection should be made to the loose end of the secondary coil and another connection taken from the switch arm.

On the base board mount one end of the large wooden coil ends. The primary coil must now be fixed firmly in position by placing the second coil end in place and screwing to base also.

The rod and slider should next be placed in position. Great care must be taken with this operation to ensure perfect contact between slider and the bare wire track.

The two brass rods for secondary coil should now be fixed to the wooden coil end. The secondary coil should be put into position. The flexible leads from this coil should be led through and taken up and out through a small hole pierced in the top of primary coil tube. This is fully illustrated in diagrams.

Next firmly fix the wooden support for brass rods on which the secondary slides.

All that remains to be done is to mount the crystal detector, fixed 'phone condenser and various terminals on the ebonite and make connections.

The method of mounting the ebonite panel and connecting is clearly shown in illustration.

This completes the Loose Coupler. Connect Aerial, Earth and Telephone Receivers to terminals as marked.

One of these receivers recently assembled gives quite excellent results from broadcasting stations in Sydney at a distance of about 15 miles. Morse signals have been received from ship and shore stations over six hundred miles distant.

Explanatory Diagrams of a Loose Coupler

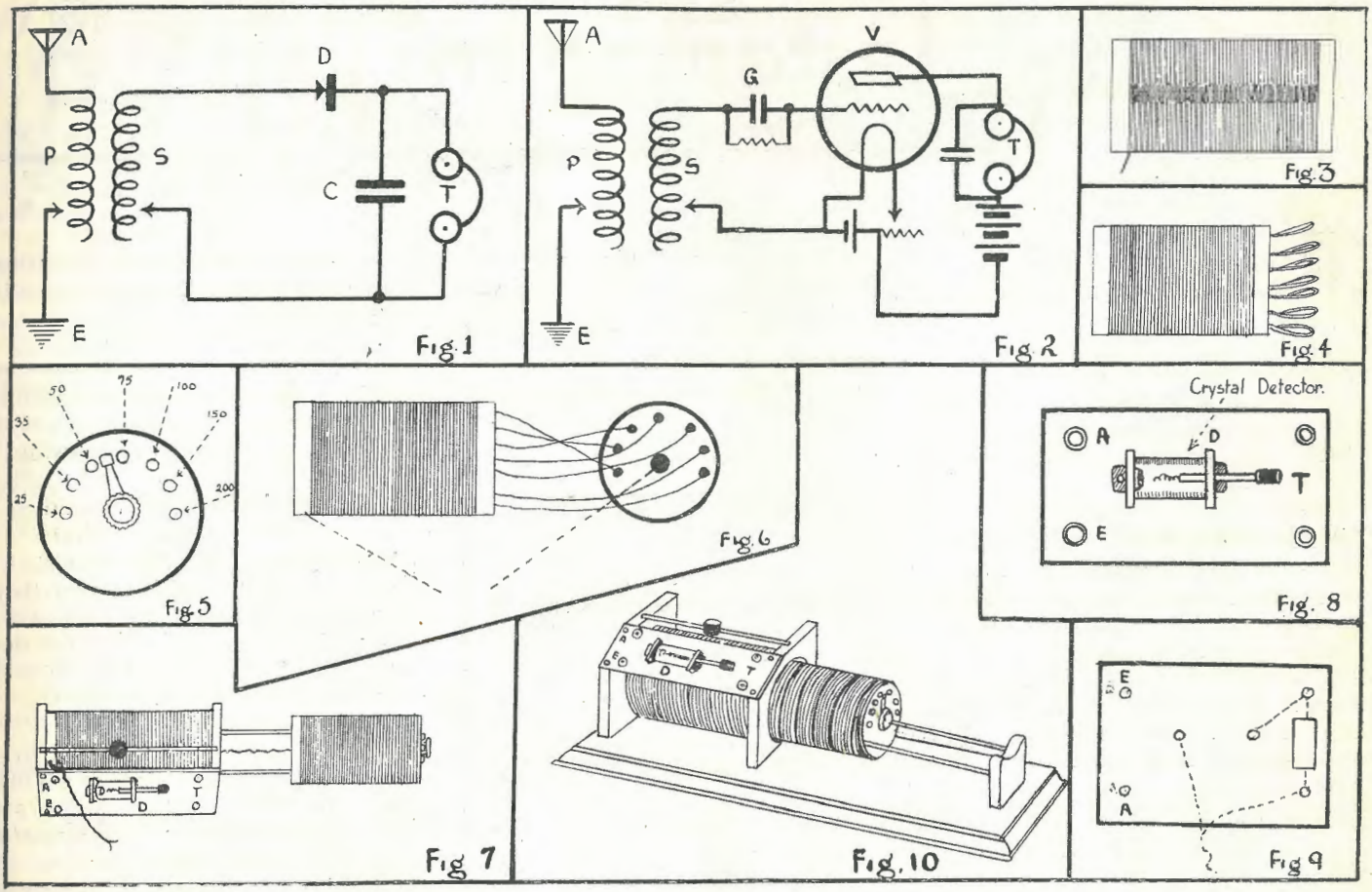


Figure 1: Schematic diagram of connections using Loose Coupler with Crystal Detector. Index:—A, Aerial; P, Primary winding of Loose Coupler; E, Earth connection; S, Secondary winding of Loose Coupler; D, Crystal Detector; C, .001 mfd. Fixed Condenser across 'phones; T, Telephone Receivers.

Figure 2: Schematic diagram of connections using Loose Coupler with Valve as Detector. Index:—A, Aerial; E, Earth; P, Primary winding of Loose Coupler; S, Secondary winding of Loose Coupler; G, Grid Condenser and Grid Leak; V, Valve; T, Telephone Receivers.

Figure 3: Primary winding of Loose Coupler, showing method of baring track of wire for sliding contact.

Figure 4: Secondary winding of Loose Coupler showing taps from winding.

Figure 5: Shows Switch Studs and Switch Arm mounted on coil end of Secondary. The numerals, 25, 35, etc., show where the various tappings are connected.

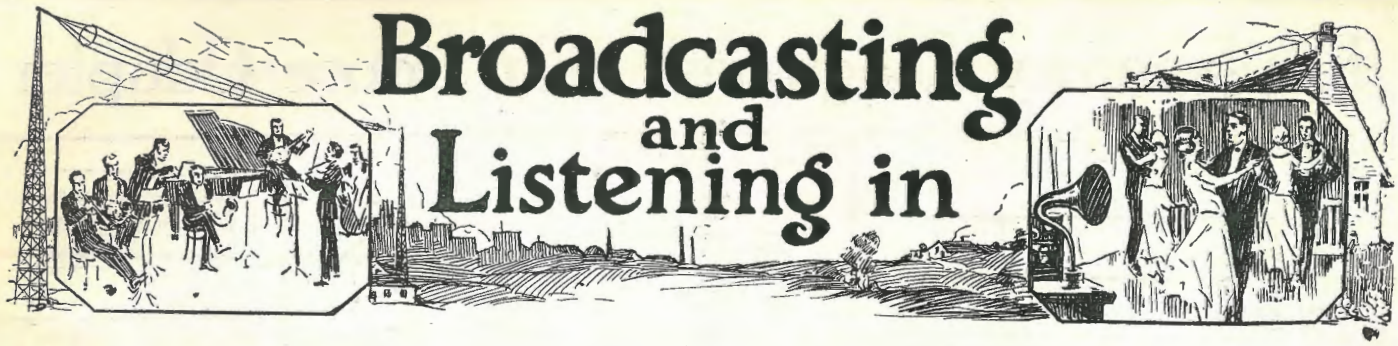
Figure 6: Method of connecting taps from Secondary Winding to Switch Studs. The two dotted lines indicate where the connections are taken off this winding to ebonite panel illustrated in Figs. 8 and 9.

Figure 7: The two leads from Secondary Winding are shown, led through from Secondary Coil, through Primary, and come out on extreme left top of Primary Coil and connected to Ebonite Panel.

Figure 8: Layout of Ebonite Panel showing position of Terminals and Crystal Detector. Index:—A, Aerial; E, Earth; D, Crystal Detector; T, Terminals for 'phones.

Figure 9: Back view of Ebonite Panel, showing wiring. The two leads, lower centre of sketch, are connected to Secondary Winding.

Figure 10: Sketch of completed Loose Coupler.



PROGRAMMES sent out by Westralian Farmers' broadcasting station have been picked up in Adelaide. Mr. J. Hale, radio manager of Messrs. Newton, Maclaren Ltd., has heard them clearly on a loud speaker installed at his home in North Adelaide. He used four valves.

* * *

"THE wireless beam opens ranges previously commercially impossible for the use of wireless, owing to the huge outlay required," states Mr. Godfrey Isaacs, chairman of directors of the Marconi company. "The beam is ideal for wireless telephony," he continued. "My company is not building any further high power stations and in future the power of our stations will not exceed 25 k.w. An era of immense magnitude is opening."

* * *

THE ingenious application of the current from a wireless set to a surgeon's knife which burns its way through the tissues of the body has been successfully carried out by Dr. L. E. Schmidt, of Chicago. This form of operation is practically bloodless, as the heat of the knife coagulates the blood as it cuts. The knife, which is about half the width of a lead pencil, and resembles a knitting needle, forms one terminal and the other is applied to the patient. The tissues offer resistance to the passing of the current when the knife is applied and this causes heat which enables the knife to burn its way through skin, fat and muscle quickly and with very little pressure.

* * *

IT has been suggested that Shakespeare knew more than a little about broadcasting. Anyway, judge for yourself from this portion of Caliban's speech: "Be not afeared: the isle is full of noises, sounds and sweet airs, that give delight and hurt not. Sometimes a thousand twangling instruments will hum about mine ears, and sometimes voices that if I then had waked after long sleep, will make me sleep again and then, in dreaming, clouds methought would open and show riches ready to drop upon me, that, when I wake, I cried to dream again." To which Stephano replies: "This will prove a brave kingdom, where I shall have my music for nothing."

2FC

BROADCASTING TIMES.

Sydney Mean Time.
Wave Length: 1100 metres.

Midday Session:

12.55 Tune in to the Studio Chimes.
12.58 Time Signals from Farmer's Master Clock (Sydney Observatory Time), Coastal Farmers' Market Reports, Stock Exchange Intelligence, Weather News, "Sydney Morning Herald" news and cable service, "Evening News" midday news bulletin.
1.15 Close down.

Afternoon Session:

3.30 Studio Chimes.
3.33 Musical programme by Farmer's Orchestra broadcast direct from Farmer's Oak Luncheon Hall. Numbers will be played at intervals to 4.45.
4.45 Stock Exchange, weather, afternoon news.

Early Evening Session:

6.30 Studio Chimes.
6.33 Children's Hour.
7.0 Dalgety's Market Reports, Fruit and Vegetable Markets, Stock Exchange, Late News.
7.15 Close down.

Night Session:

8.0 to 10.0 } Entertainment. See list hereunder.

EVENING ENTERTAINMENT.

As far as possible the following schedule is adhered to:—

Monday: Theatre Night.
Tuesday: Popular Concert
Wednesday: Jazz Night.
Thursday: Classical Night.
Friday: Popular Concert.
Saturday: Choral and popular numbers.

IT is reported that King Alphonso has agreed to a system of broadcasting in Spain.

* * *

HARRY TATE, the famous London comedian, complains in his sketch "Broadcasting" that when he gets Yarmouth on the wireless it doesn't smell like Yarmouth. There's no satisfying some people!

* * *

RADIO dealers in Adelaide look to a big increase in business now that the regulations have been completed. It is probable that a factory for the manufacture of wireless material will be erected outside the city.

* * *

ON last Empire Day, 2LO, the British Broadcasting Company's London station flung out over the air "Banjo" Patterson's "The Amateur Rider." Thousands of listeners in the British Isles were able to hear—how does it begin, now? Oh, yes . . . . "Him going to ride for us! Him with the pants and the eyeglass and all. Amateur! Don't he just look it—it's twenty to one on a fall!"

And while we're on the subject—why not let us have some readings of other Australian poets on the ether over here? Broadcast stations, please note.

* * *

THE South Australian Radio Company has received a Class A broadcasting license and, pending the arrival of permanent apparatus from England, a 500-watt station will be installed immediately.

* * *

WHAT are said to be the faintest sounds ever picked up by a radio microphone were heart-beats broadcast from the Westinghouse station in East Pittsburgh, U.S.A. The sounds were intensified so clearly as to be audible to all listeners.

Here and There

SIR ARTHUR RICKARD BROADCASTS.

WE happened to be listening-in the other evening upon the occasion of the broadcasting at 2BL of Sir Arthur Rickard's address on the objects of the Millions Club. We understand that this was Sir Arthur's "first offence" but we trust that it will be by no means his last, as he has an excellent radio voice. In the words of our American cousins—he "hands you the whole word with no fluff at the ends." The concert that followed was one of the very best that has so far been disseminated from this station, and all concerned are to be heartily congratulated on an evening of delightfully diversified aerial entertainment.

PERSONAL.

MR. E. GABRIEL has been elected president of the Radio Society of Queensland. Mr. Gabriel is one of the foundation members of the Society.

THE OLD AND THE NEW.

AN interesting visitor to Auckland recently was the Chinese steamer *Ling Nam*. She carries three Chinese operators who are certainly efficient at their job but she has on board, something of interest which stirred the memory of the old wireless experimenter and was an object of much curiosity to the younger amateurs who paid her a visit, for there were many who had never seen a fixed Gap Transmitter and its attendant tray of lime. The deficiency, however, was counter-balanced by the receiver which was a P1.

A WONDER OF WIRELESS.

IT is a strange fact that when speeches are broadcast from a large hall people listening hundreds of miles away can hear the words before those seated at the back of the building. An interesting example of this was when some people listening by wireless at Hampstead, England, to the chimes of Big Ben in London heard the actual ringing of the bell eighteen seconds after they had heard it by radio.

MOORE RELIEF FUND.

THE trustees of the Moore Relief Fund advise that the total amount subscribed was £134/10/- and wish to extend their best thanks to all subscribers through whose assistance Mrs. Moore will be able to commence a small business to support both herself and her two little children.

SINGLE WIRE AERIAL INSTALLED.

THE U.S.S. Co's. s.s. *Kurow*, which has just completed general overhaul, has followed the lead of the "Home" liners and has been fitted with a single wire aerial.

A Good One Valve Amplifier

MANY people who have been listening-in on crystal receivers and one-valve sets are now desirous of increasing the strength of the signals they are receiving.

An amplifier is necessary for this purpose. This instrument may consist of one, two, or more valves. As almost everyone commences with a one-valve amplifier, we will confine this article to just the one-stage of audio amplification.

This amplifier may be added to the crystal and valve receivers described in *"Radio"* No. 36. In fact, it can be added to practically any ordinary receiver.

The parts required to build this amplifier comprise:—

1 Audio Frequency Transformer
1 Ebonite Panel
1 Valve Holder
1 Valve (UV201A preferably)
1 Filament Rheostat
1 A Battery
1 B Battery

The two latter items, batteries, are only necessary if you are adding this amplifier to a crystal set. If adding it to a valve set, the batteries of same can be used, although it may be necessary to get an extra B battery.

The diagrams and illustrations show the method of connecting up the apparatus and also the way of adding it to a crystal or valve set.

Do not expect too much from a one-valve amplifier. Some, according to receiver, location, height of aerial, etc., give quite good results. But remember, it is not every one stage amplifier that will operate a loud speaker.

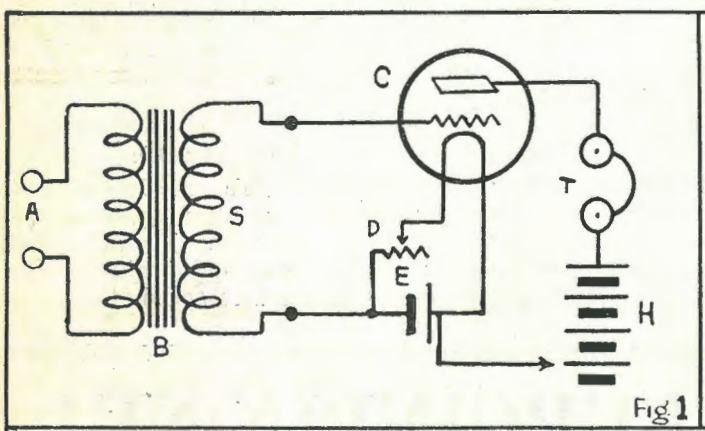


Fig 1

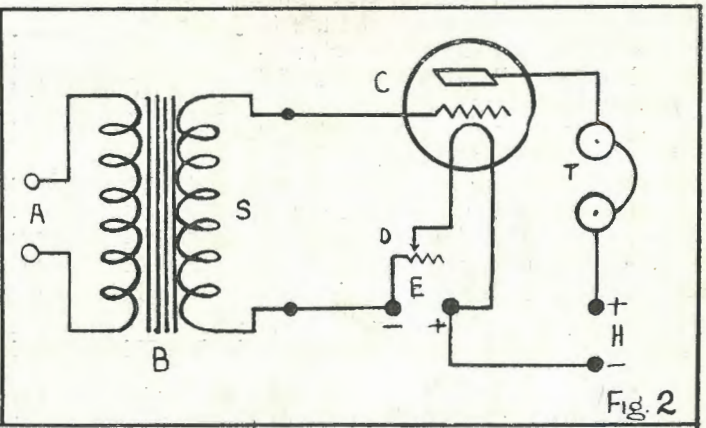


Fig. 2

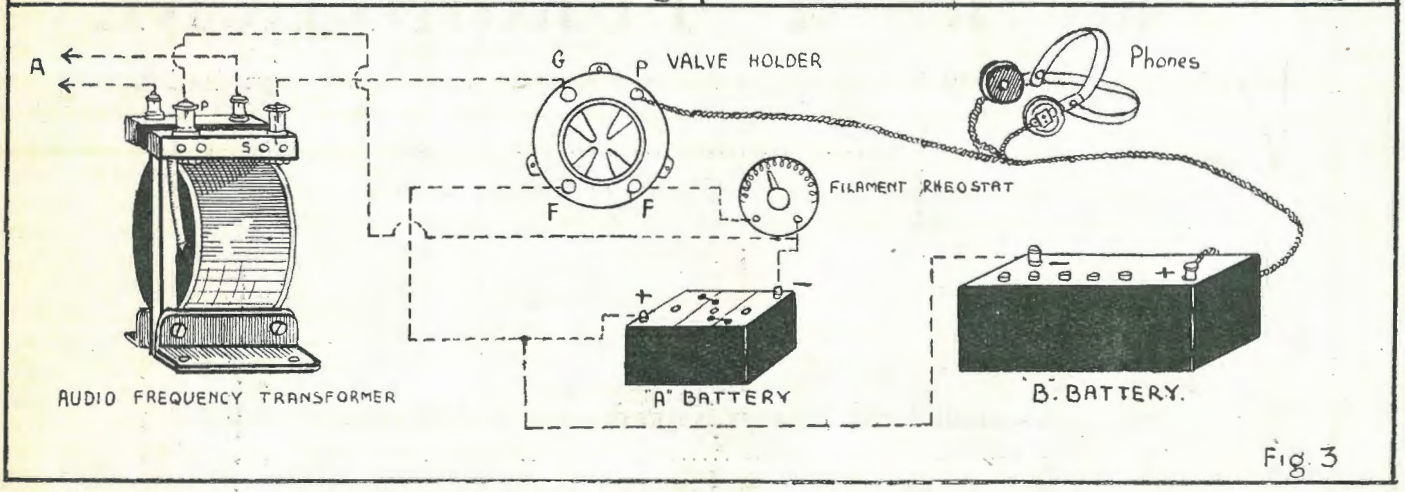


Fig. 3

Figure 1: Diagram of connections of One-valve Audio Frequency Amplifier. Index:—A, Primary Winding of Audio Frequency Transformer, which is connected to telephone terminals of your present receiver; B, Core of Audio Frequency Transformer; S, Secondary Winding of Audio Frequency Transformer; C, Valve; D, Filament Rheostat; E, Filament Battery; H, High Tension Battery; T, Telephone Receivers.

Figure 2: The same diagram as Fig. 1, with the exception of Batteries, which are only indicated as terminals. This diagram should be followed by those who at present have a valve receiver and wish to add a stage of Audio Frequency Amplification and utilise the same batteries. This is done by connecting the terminals E and H as follows: Connect E to Filament Battery, and H to High Tension Battery.

Figure 3: Illustrates the complete component parts of a One-valve Amplifier. This sketch is identical with the diagram of connections shown in Figure 1.

Note: To connect up this amplifying unit to either a Crystal or Valve receiver remove telephone receivers from receiver and connect leads shown at "A" to 'phone terminals on your present receiver.

Un-Tuned RF in a Regenerative Set

How to Secure It

By N. N. Bernstein.
(In the "Radio World," New York.)

THE single circuit regenerative set, when operated by the novice, is very often allowed to oscillate. That is, the operator tunes in by means of the broadcasting station's carrier wave, which can only be heard when the tube is so adjusted that a slight hiss and whistling noises are audible in the ear 'phones. When the circuit is in such a state, it is in effect a miniature transmitter of radio waves.

Radio users have often condemned the "squeal boxes" or single circuit sets, when, in the midst of a nice programme, some neighbour with such a set starts to tune in by first finding the carrier wave. The wave-length of the energy transmitted by the interfering set is the wave-length its operator is tuning on, therefore, should Mr. A. be listening in on WEAF on 492 metres, and Mr. B. next door tunes in on WEAF's carrier wave, Mr. A will hear all manner of squawks, howls, whistles, groans and scratchy noises until Mr. B gets off the wave.

There is a good method of stopping this interference, and at the same time improving the range and volume of the single circuit outfit. By the addition of one stage of radio frequency amplification, which can be done at comparatively small cost, a muffler action is placed on the oscillations emitting from the detector tube and the energy is prevented from getting out to the antenna. Fig. 1 shows the complete wiring diagram of a regenerative set with the addition of one stage of untuned radio-frequency amplification. The parts needed for the stage are:—

One tube, one socket, one 45-volt B. battery, one rheostat, one 50-turn honeycomb coil or 35 turns No. 22 wire on a 3in. tube, one 400 ohm potentiometer.

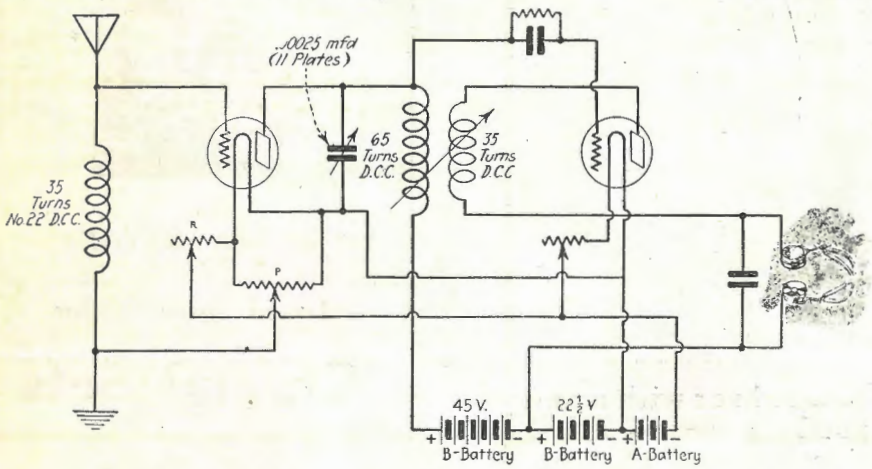


FIG. 1.

Adding a stage of RF to a single circuit regenerative set gives better signals and takes the set out of the radiation nuisance class. The diagram shows how to use a stage of untuned RF. This may be put in a separate little cabinet, or, if an entirely new set is being built, a 7in. x 21in. cabinet would suffice for the circuit and two stages of AF. There are only two controls—one for the vario-coupler, the other for the variable condenser.

These parts may be mounted on a baseboard or in a small cabinet 6in. x 6in. The only adjustment necessary on the RF stage is the potentiometer, which can be set where best results are obtained and left there for most stations.

In wiring the set, the antenna is connected to one side of the coil and to the grid of the first tube. No grid condenser or leak is used here. The ground is connected to the other side of the coil and to the centre or switch arm of the potentiometer. The end binding posts of the potentiometer are connected directly across the filament leads going to the first tube. This does not short-circuit the battery, as the resistance of the potentiometer is so high as to allow only a trifling amount of current to pass. The rheostat is connected into the negative A battery lead.

The variable condenser which is already in the original set is connected as follows:—One end of the primary of the coupler, which is connected to the grid condenser and leak, is wired to the rotor plates of the variable condenser and to the plate of the first tube. The stator plates of the condenser are connected to the positive A battery lead. The other end of the primary is connected to the 45-volt positive tap of the added B Battery. The minus of this new B battery is connected to the plus of the original 22½-volt battery. The secondary of the coupler, or tickler, is connected to the detector tube plate at one end and to the ear-'phone binding post at the other. The remaining ear-'phone binding post is wired to the 22½-volt tap on the 22½-volt B battery. A small fixed condenser of .001 mfd. may be connected across the 'phone posts for improving the tone of the music received.

INITIATIVE!

A COMMUNITY wireless set is installed at a Devonport (N.Z.) resident's house and his neighbours have become so keen on wireless concerts for their course of entertainment that they have installed a loudspeaker operated in conjunction with the speaker and set next door and connected by a few feet of flex. The set used is a Gloridio three-valve, a local product, which successfully tunes in KGO, 2BL and other DX stations.

UNITED SETS' GOOD WORK.

THERE have recently been brought to our notice details of splendid reception in Western Queensland. Using a standard five valve receiver, built by the United Distributing Co., Sydney, results were obtained which speak volumes for its efficiency and the skill employed in its design and construction.

Accompanied by a member of the technical staff of the United Distributing Co., the set with its accessories left for Middleton Station, Queensland, a distance of 650 miles airline from Sydney. Arriving at Brewarrina at 7 o'clock on Saturday night the set was loaded on a motor lorry in preparation for its 200 mile trip farther west, and left the same night, arriving at Middleton Station at 9 o'clock the next night.

The first station heard was Westralian Farmers Broadcasting, with good volume and very clear. Immediately they stopped, Farmer and Co's. Sydney station, was tuned in with great volume. They were just starting their one o'clock session and the chimes and voice could be heard all over the room without any audio amplification at all.

At 3 o'clock that afternoon KGO was tuned in, then at 3.30 p.m. Farmer's were again tuned in. 2BL was tuned in at 4.30 p.m., about two-thirds of 2FC's strength.

That evening before 8 p.m. two New Zealand amateurs and three Victorian amateurs were tuned in with good strength, besides numerous N.S.W. amateurs.

Later 2FC and 2BL were tuned in with very good strength. With 2FC the volume was so great as to necessitate detuning the set, in order not to overload the magnavox loudspeaker. When the aerial was removed entirely from the set, 2FC could still be heard on the speaker.

Earlier in the evening, whilst using an external heterodyne, 6XAD, U.S.A., was heard on detector, with head phones. 1YA, N.Z., was also heard with good volume. At 10 p.m., 2HM (500 miles away) could be heard all over the room on detector alone as could VIB, VIM and VIA. VKQ (together with his attendant harmonics) could be tuned in with very good volume.

Two Ways to Erect an Aerial

Hints for Beginners

NOW that so many people will be erecting aerials for broadcast reception we will run in several consecutive issues of "Radio" small articles illustrated with diagrams on the erection and insulation of aerials.

The illustrations hereunder show two methods of erecting an aerial in the average suburban residence.

Figure 1 shows an inverted "L" type aerial, so called because the lead-in wires are taken from one end.

Figure 2 shows a "T" type aerial, the lead-in wires being taken from the centre.

It is important to see that all connections in the aerial are soldered. It is equally important to have the aerial well insulated.

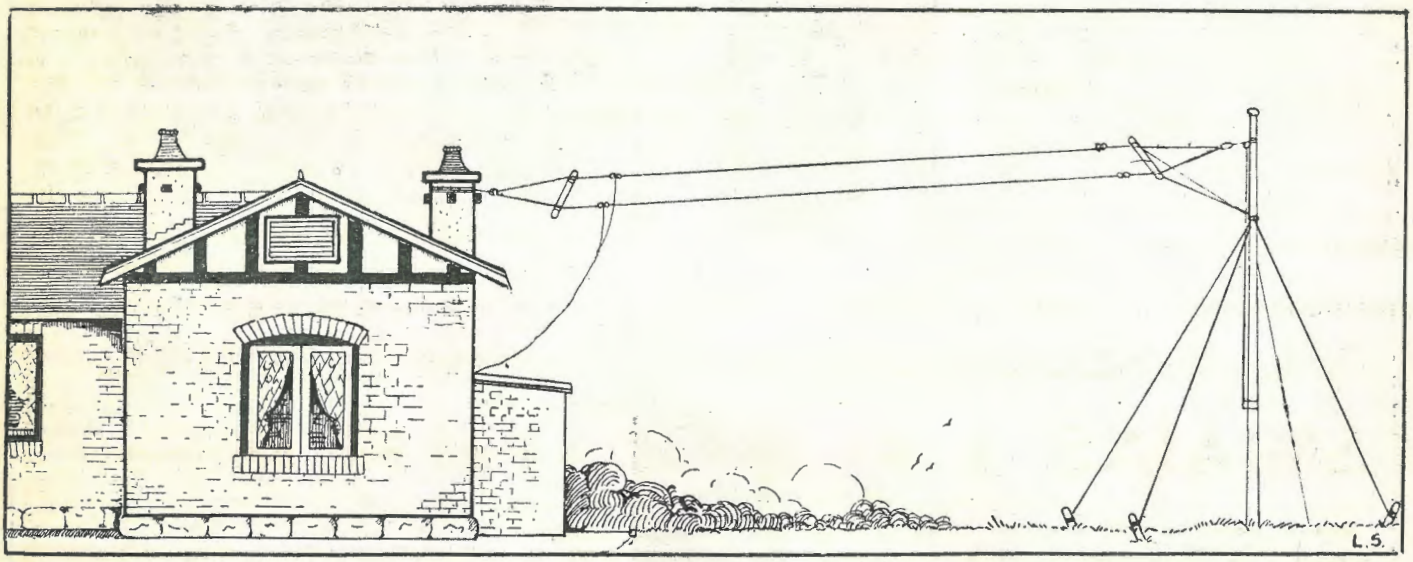


Figure 1.--This illustrates an inverted "L" type aerial, suitable for homes where the receiving instruments are situated in the house itself.

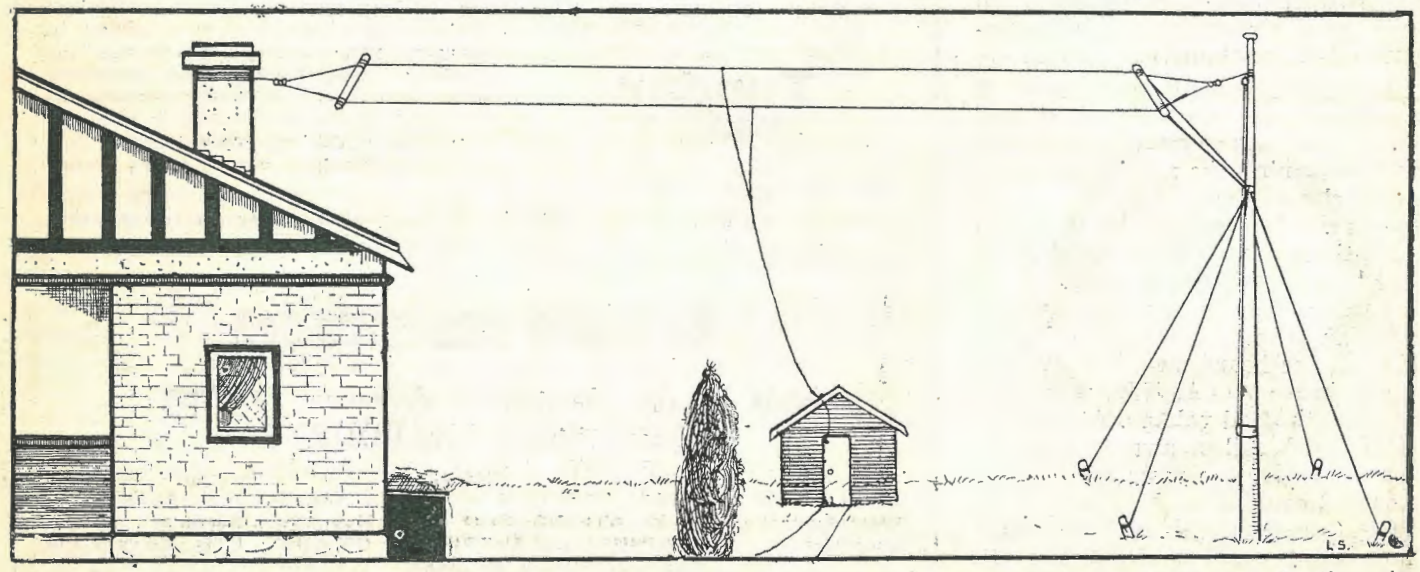


Figure 2.—Illustrating the "T" type aerial. This should always be used where the receiving equipment is situated directly under the aerial.

ST. KILDA (V.) HEARS 2FC.

BEGINNING his letter with several complimentary remarks concerning the assistance *Radio* has been to him in the building of his experimental sets, Mr. W. K. Davenport, of High Street, St. Kilda, Melbourne, writes that in the course of the last seven months in experimenting with valve sets he has tried out most of the circuits published, and finally constructed a five-valve receiver of 2 h.f., the first stage un-tuned aperiodic transformer coupled and the second stage tuned anode with reaction. He has two audio-frequency stages using UV201a. With this set and an in-door aerial he receives 2BL and 2FC with a loud speaker strong enough "to fill a room." An outside single-wire aerial brings in 2GQ. Armidale (N.S.W.), on the loud speaker on *telephony*. "Not bad for 800 miles, is it?" he asks. Mr. Davenport thinks the best reflex circuit is the "S.T.100" as on the two valves and a crystal 2FC comes in on the loud speaker. He finds, however, the reflex circuits rather unstable for DX reception but the "S.T.100" is an O.K. set if properly spaced, and it gives good loud speaker results on local amateurs up to 100 miles. In the case of Mr. Davenport's permanent five-valve set only three controls are necessary, the .0005 condenser across the secondary honeycomb, the .0002 condenser across the anode coil and the re-actance. Thus, it is easily handled and causes absolutely no radiation from the aerial—two very desirable features. The primary A.T.1. is not tuned, he finding it unnecessary. Mr. Davenport ouly uses a plate voltage of 40-50P for these results.

"VERY GOOD, INDEED!"

WITH his one-valve high frequency amplifier, using a crystal for detector, Mr. O. E. Alder, of Old Sandgate Road, Albion, Brisbane, writes us that he can pick up 2FC and 2BL very well every night, and sometimes in the afternoon. All local amateurs come in well and the majority of Australian commercial stations. The tuning unit consists of a loose-coupler with .0005 shunted across the secondary. The valve is an Ediswan "AR" and a .0005 variable condenser is used in the anode circuit. "After trying various crystals, including Galena, Bornite, Iron Pyrites, etc.," he writes, "I have come to the conclusion that Molybdenite is out on its own!" Living near VIB that station, of course, comes in very loudly and one has to keep the 'phones at a respectful distance from the ears to hear comfortably. 4CM, an amateur station, comes in loud enough to be heard with ease all over a fair-size room without even a loud speaker. In conclusion, Mr. Alder writes, "You will notice that I am not using reactance on this set, so under these circumstances I think it is not treating me too badly!"

Famous FROST Parts

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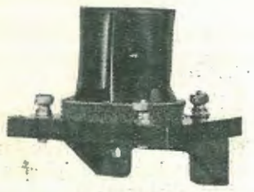

FROST RADIO.

No. 618, Bakelite Sponge Shock Absorber Socket, Standard base, panel or table mounting 6/3

For 199 Tube 6/3

For those who wish a compact gang of three Shock-Absorber Sockets. The construction is identical with our separate sockets, except for base. For panel or table mounting.

FROST RADIO.

No. 600.—Frost-Radio Metal Frame Rheostat or Potentiometer.

Equal in operation to the best moulded type, with precision, operation of all moving parts and guaranteed resistance wire. Frame is made of heavy sheet brass, nickel plated and formed so as to give a rigid construction both to the windings and the contact arm. Central mounting thimble with locating tip prevents turning when mounted on panel. Washers provided to fit panels of varying thickness. Fluted moulded knob and nickel plated pointer.

No. 600, Metal Frame Rheostat, 6 ohms 5/6

No. 602, Metal Frame Rheostat, 35 ohms 5/6

Same with Vernier 7/6

No. 603, Metal Frame Potentiometer, 0.400 ohms 5/6

No. 605, Metal Frame Potentiometer, 0.200 ohms 5/6

EACH OF THE ABOVE, WITH VERNIER, 7/6.

FROST SOCKETS.

618 **SINGLE SHOCK ABSORBER SOCKET,** for Standard Valves .. 6/3
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(All above sockets are made of Bakelite and have sponge rubber cushions.)
612 **BAKELITE SOCKET,** for C299 and UV199 Valves 5/-
100 **BAKELITE SOCKETS** for Standard Valves 5/-
619 **3 GANG SHOCK ABSORBER SOCKET,** for Standard Valves 24/6
616 **3 GANG SHOCK ABSORBER SOCKET,** for UV199, C299 .. .. 24/6

FROST RHEOSTATS AND POTENTIOMETERS

COMPLETE WITH TAPERED BLACK BAKELITE KNOBS, METAL PARTS HIGHLY NICKELLED, KNURLED TERMINALS, TECHNICALLY PERFECT.

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651 **RHEOSTAT,** 6 ohm Vernier (Maroon Bakelite) 9/6
652 **RHEOSTAT,** 35 ohm (Maroon Bakelite) 7/3
653 **RHEOSTAT,** 35 ohm Vernier (Maroon Bakelite) 9/6
600 **RHEOSTAT** 6 ohm Metal Frame 5/6
601 **RHEOSTAT,** 6 ohm Vernier, Metal Frame 7/6
602 **RHEOSTAT,** 35 ohm, Metal Frame 5/6
604 **RHEOSTAT,** 35 ohm Vernier, Metal Frame 7/6
654 **POTENTIOMETER,** 400 ohm (Maroon Bakelite) 9/6
605 **POTENTIOMETER,** 200 ohm, Metal Frame 5/6
603 **POTENTIOMETER,** 400 ohm, Metal Frame 5/6

FROST MISCELLANEOUS.

301 **EXTENSION CORD,** complete with Adapter and Plug, 20ft. 32/6
400 **LOOSE COUPLER** or Receiving Transformers 75/-
410 **CRYSTAL TUNING COIL SLIDER** (1100 metre range) 27/6
501 **RADIO JACK BOX** (for 4 plugs) 28/-
611 **ADAPTER,** for C299 or UV199 .. .. 5/6

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NICKEL-PLATED, FORMICA INSULATION, NICKELLED SILVER COMPACT SPRINGS, PURE SILVER CONTACT POINTS.

133 OPEN CIRCUIT JACK 4/6
134 CLOSED CIRCUIT 5/-
131 DOUBLE CIRCUIT JACK 5/-
135 FILAMENT SINGLE JACK 6/-
136 FILAMENT DOUBLE JACK 6/6
126 NEUTRODYNE CIRCUIT JACK 6/6
140 PLUG, DOUBLE (2 connections) 5/-
139 PLUG, SINGLE 4/6

FROST MISCELLANEOUS.

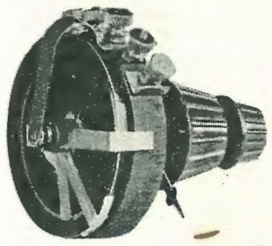
630 **RESISTANCE UNIT,** 35 ohm (to increase resistance) 3/6
631 **INDUCTANCE UNIT** (to increase wave length) 5/-
620 **POTENTIOMETER SWITCH** 5/-
621 **PARALLEL SWITCH** 5/-
608 **PUSH-PULL BATTERY SWITCH** 4/-

FROST HEAD FONES

STANDARD THE WORLD OVER.

161 **FONES** (Aluminium Head Pieces), 2000 ohm 32/6
171 **FONES** (Aluminium Head Pieces), 3000 ohm 37/6
172 **FONES** (Maroon Bakelite Head Pieces), 3200 ohm 45/-

THE MAGNETS IN FROST FONES ARE TREATED WITH COPPER TO PREVENT CORROSION BY MOISTURE AND SALT AIR.



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COMPLETE WITH KNOBS, ALL HAVE KNURLED BINDING POST CONNECTIONS, AND ARE TECHNICALLY PERFECT.

610 **TUBE CONTROL UNIT,** a combination of a 35 ohm Vernier Rheostat and 400 ohm Potentiometer 17/6

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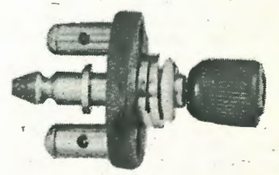
MANUFACTURERS OF **RADIOVOX SETS**

A FEW TERRITORIES OPEN FOR AGENTS.

MANUFACTURERS OF **HOME ASSEMBLY SETS**

SEE OTHER LINES, PAGE 242.

28 CLARENCE STREET, SYDNEY. — HOBART — PERTH — BRISBANE — ADELAIDE — 592 Bourke Street, MELBOURNE.



FROST RADIO.

608 PUSH PULL BATTERY SWITCH 4/-

Y.M.C.A. (AUCKLAND, N.Z.) WIRELESS CLUB.

AN experimental branch of the above club was formed at the last meeting held at Headquarters and it is intended to carry out Radio research work in general, and at a later date to install and operate an experimental transmitting station. A provisional committee has been formed to draw up the necessary syllabus in connection with the future activities of the club. Any amateurs who are desirous of joining up can receive full particulars by applying to Mr. W. Andrew, Y.M.C.A. Wireless Club, Auckland.

NEW AUCKLAND BODY.

A RADIO association has been formed at Kaitaia, North Auckland (N.Z.), with a membership of 35. Application has already been made to join up with the Auckland Association.

ESSENDON (V.) RADIO CLUB.

AT the last general meeting held in the Regent Street Hall, Ascot Vale, Melbourne, the evening was given over to a demonstration and social. Splendid musical and vocal items were contributed by friends of Mr. Kennedy, and radio items were received with great success on the loud-speaker from two club members' transmitters, Messrs. Busch (3LS) and Chaffer (3XF). The Radio music was so loud that it was used for two dances. Some very fine home-made sets were exhibited, the majority being four and five valve sets, which speaks well for the interest taken by club members. At the close of the evening, a hearty vote of thanks was accorded the artists who went out of their way to attend.

BALMAIN (N.S.W.) DISTRICT RADIO SOCIETY.

DURING the past fortnight much important business was discussed and finalised. The new lecture series is instilling into members much useful knowledge, and the great interest aroused is as was expected.

Commencing from August 1, 1924, a continuous receiving watch is to be maintained by various members of the Society at the residence of the Hon. Secretary every evening, in order that the lectures already delivered may be practically demonstrated.

It is also anticipated that the Society will be heard testing again within the next two or three weeks. (Call signal, 2ZB. Wave-length, 230 metres.) Members and those who intend to join are specially requested to note that the next meeting of the Society will be held at "Riverina," 18 Clifton Street, East Balmain, near Nicholson Street Public School. In order that members who were absent from the last meeting may be given a further opportunity to hear the lecture on the "Electronic Valve—Its Action and Application to Radio," it is intended to repeat this address at the next meeting. Members contemplating building a valve receiver should not fail to hear this lecture, which is illustrated with diagrams. The Hon. Secretary has a fresh supply of membership forms, which can be obtained either by writing or personally any evening after 7.30 p.m.

"IF AT FIRST YOU DON'T SUCCEED—"

FOR six weeks prior to his letter, "A Radio Reader," of Nana Glen (V.) had been trying to log KGO on one tube till on the night of July 20 success crowned his efforts. He picked up the carrier at 6.15 p.m. and, after very fine tuning, he could hear orchestral items followed by announcements of which, in the latter case only a few words were intelligible. At times the music was very loud but it continued fading. Mr. Gerard who lives some 300 miles from Sydney, can hear both 2FC and 2BL all over the room on one tube and these stations even come in very well on a loose-coupler crystal set. The tuning apparatus of the set on which this Victorian experimenter heard KGO consists of a vario-coupler (Primary, 20 turns; Secondary, 31 turns.) Tuning is accomplished by a .001 variable condenser connected in series. The valve is a WD12 and has been working for over 300 hours off two Columbia dry cells in parallel, and the cells still have enough "juice" left to receive KGO. Thirty-one and a half volts are used on the plate. The aerial is 60ft. high each end and consists of two wires 150 ft. long on 6 ft. spreaders. "I do not claim that my set is better than any other," he concludes, "but there are many other amateurs who could hear KGO if they tried patiently."

AUSTRALIAN RADIO NEWS FOR ORIENT LINERS.

IT is announced that an arrangement has been completed by the Wireless Press, whereby there will be immediately inaugurated an ocean news service on ships of the Orient Royal Mail line. Press messages will be transmitted nightly from Australia and will be received on board from the time the vessel leaves Sydney until in the vicinity of Colombo, and likewise on the return trip. The news service will provide not only a chronicle of world happenings, but also a large proportion of Australian events and progress.

S.S. "RAMA" NOW EQUIPPED.

THE s.s *Rama*, which has recently been trading to Nuie Island, has been fitted with an emergency spark transmitter and a single valve, three-coil receiver. Mr. Guerin, late of the Post Office, is in charge. This little ship is only 610 tons and is registered at Wellington, the call sign being VMF.

"THE ALLADIN'S LAMP OF WIRELESS."

THE progress of wireless during the last twenty years finds no better illustration than in the multiplicity of different types of valve designs now in operation. The invention of the two-electrode valve in 1904 was the work of Dr. J. A. Fleming. This was immeasurably improved by the addition of a third-electrode, viz., the grid, by Lee de Forest in 1907. The effect of valve operation upon the technique of wireless has been revolutionary. So great, indeed, has been its development, that it is to-day a specialised division of wireless manufacture and design. Just to hand from Amalgamated Wireless (A/sia.) Limited is one of the most comprehensive valve leaflets published in Australia, there being illustrated and described, no less than 19 types of valves for the transmission, detection and amplification of wireless signals.

"THE RADIO TELEPHONE."

WE have received from W. Harry Wiles, of 60-62 Goulburn Street, Sydney, a copy of *The Radio Telephone,* by Bertram W. Downs, B.Sc., Assoc. A.I.E.E.

Many new and so-called simple text books have made their appearance on the Australian market recently but hardly any have been so simple, lucid and concise as *The Radio Telephone.*

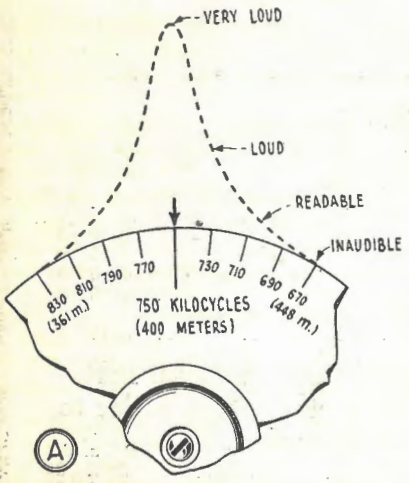
The author has presented in non-technical language a general discussion and explanation of wireless and how it works. The book is well illustrated throughout and we have no hesitation in recommending every beginner to read it. The price is 2/- per copy, plus postage. When ordering, kindly mention *Radio.*

MORSE STUDENTS, NOTE.

MR. R. WHITE, 1AO (Auckland, N.Z.), is transmitting slow Morse every evening from 7 o'clock for about an hour so as to enable any listener-in, who wishes to do so, to learn the code.

Why Some Sets are Not Selective

THERE are quite a number who have used the single circuit in the past but discarded it for a two or three circuit set and still found their set was not selective. This, no doubt, created the impression that interference would not be



eliminated on any set, but it can and very easily.

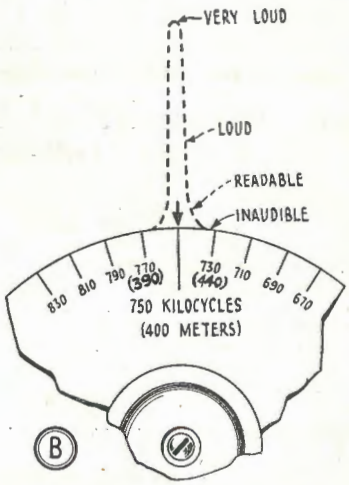
Even a single circuit set can be constructed so as to tune quite sharply on anything but strong local stations. If you are under the "nose" of a powerful station, there is no set that will eliminate them as their signals are "forced," and you can hear them on an ordinary set without aerial or ground. The inductances in the set pick up the energy. Therefore, if you happen to be one of those in the immediate vicinity of such a station, just sit still and try to enjoy their programmes.

The biggest factor in making a set "broad" is resistance in the aerial, or grid circuits. A poorly designed condenser in the aerial offers resistance to the incoming signals and, in many cases, absorbs energy and broadens out the tuning. If a variable condenser is used across the coil, tuning of it will be broad and in the case of where it is used in shunt to the secondary coil, the losses in this condenser will absorb an otherwise good signal and it will be noticed that the condenser may be varied several degrees without affecting the strength of the signal to any extent.

The drawings show the curves of two variable condensers. The left one is a high loss condenser, while the right is of the low loss type. Which way does yours tune? To be sure they will both pick up stations, but the one with the sharp peak will be able to differentiate between stations on nearly the same wave-length, while the flat curve will bring them both in with equal strength, which means interference. More sets are handicapped with inferior condensers than any other part.

High resistance coils, taps and switches are another draw-back to your set and taps and switches should be done away with if you are to have an efficient receiving set.

Where you have a two circuit set (loosely coupled) and it is not selective, the trouble may be due to too close coupling between primary and secondary coils. This can be corrected by taking some of the turns off the rotor of the vario-coupler and putting the same amount of wire in the secondary circuit as a loading coil. The loading coil to be connected be-



tween the rotor and where one side of the variable condenser connects to the rotor.

If you find this is not practicable in your set, but there is not reason why it should not be, then you can loosen the coupling at the primary by having about 20 turns of that coil in close relation to the rotor, removing the rest of the wire and using it as a tuning coil but not in inductive relation to the rotor.

The Crystal Rectifier

FOR retaining truthful tone reproduction, it is difficult to find anything more satisfactory than the crystal as a means of rectification. The crystal is largely used in Europe in valve circuits, and in such combinations the crystal attains importance as a reliable unit.

Most of us appreciate tonal subtleties in speech and music and for these the amplified crystal is unapproachable. It certainly cannot be used in a regenerative circuit, but the loss caused through not using regeneration is easily taken care of at a little extra expense.

Some superior persons—who have never tried one—often maintain that the day of the crystal is done. It might confound them to know that many and many a big boat that berths in Australian ports employs the crystal detector in its receiving circuit.

Cheap radio frequency transformers on the market are within the reach of all purses and all of them function exceedingly well with a crystal. Many hold that good piece of galena, combined with one step of radio amplification is a better long distance receiver than a single valve. Be that as it may, the quality in the case of beauty of reproduction in a combination like this is absolutely unbeatable.

Home Charging of Radio Batteries

THE TUNGAR BATTERY CHARGER, so long in popular use for charging automobile starting and lighting batteries for any alternating current lamp sockets, is particularly suitable for charging storage batteries used on radio receiving sets with vacuum tube. In fact, the bulb used in the Tungar is quite similar in action to the Radiotron used in the receiver: the difference is that there is a very appreciable amount of gas in the Tungar and little or none in the Radiotron. Obviously, the bulbs are not interchangeable, as the one is designed for two or six amperes, while the other is for about 1000th. of that amount.

There are three sizes of Tungar Chargers available, but the two most suitable for radio battery charging are the two ampere and the five ampere. The storage battery used with the radio set should be quite frequently charged for these reasons:—

1. Frequent charging keeps the voltage of the battery near its maximum—something over six volts, giving better results on the receiving tube.
2. Frequent charging keeps a reserve capacity always available which would not be the case if a battery were allowed to reach the discharge point before charging.

As to just what "frequent charging" means, this depends upon the ampere hour capacity of the battery and the number of receiving tubes used. Assuming that the Receiving Set uses three Radiotron tubes a detector and two amplifiers, this set will take three amperes, one ampere per tube. If it is used for three hours per day the ampere hours drawn from the battery are 3 x 3, or nine ampere hours per day, or 9 x 7, equalling 63 ampere hours a week. To replace the nine ampere hours would take about six hours with a two ampere or 2.3 hours with a five ampere Tungar.

There are limits in current at which a battery should be charged. A 40 to 60 ampere hour battery should not be charged at much over two amperes, while an 80 ampere hour or larger battery may be charged with a five amp. Tungar.

Frequent charging at a low rate is good for any sized battery and the two ampere Tungar is, therefore, a very popular size. The five ampere Tungar is employed where larger batteries are used, and also a greater number of receiving tubes.

Frequent charging prevents the weakening of the batteries and low rate charging keeps the battery clean and cool by preventing excessive gassing.

Whichever Tungar is used it should be located near the battery to make it easy to charge. Instructions for installing and use accompany each Tungar.

The owner of a radio outfit does not care to have an inactive station. He may miss some long awaited concert, or a talk by some famous speaker, yet he loses these pleasures if his battery is too weak to give full strength to the receiving. Without a Tungar he is obliged to disconnect the battery, which must be brought to some service station. Most batteries are too heavy to be easily carried about. Under these circumstances it is often several days before the charging is done. All this time he is missing many programmes which are daily becoming more popular and of higher grade.

This situation arises frequently and more often in proportion to his activities in radio. A Tungar battery does away with all these troubles at a very slight expense. Very often the concerts received by the radio operator are not sufficiently clear. This is due to the declining strength of the battery. It may often mean an evening of disappointment, for it frequently happens when least expected, and company invited to hear some artists go away without the promised entertainment. The Tungar prevents such disappointment, and by frequent charging saves the radio battery from becoming run-down.

KGO News

ALTHOUGH situated on opposite sides of the earth from each other, groups of radio listeners now sway, step and glide in unison to dance music played at KGO. This is shown by letters lately received at the General Electric Pacific Coast Station. From Waimate, South Island, New Zealand, almost four thousand miles south of the Equator, comes a letter of appreciation. "Every Sunday evening," writes F. D. Blackwood, "the family dances on the front lawn to KGO music reproduced by our loud speaker. We always look forward to hearing KGO, and there is a disappointed household when the atmospheres are bad." Owing to 19 hours difference in time between New Zealand and the United States, music received by the Blackwood family Sunday evening is played at KGO Saturday night. From the Far North within fifty miles of the Arctic Circle another letter has been received. "We have danced to music from KGO on several occasions," writes G. H. Hillman, of Candle, Alaska. "It is certainly great to have dance music carried into the Arctic." Mr. Hillman is the operator of the Candle Radio Station. "The wireless station installed here this summer," he continued, "is a new thing to people in this section. Most of them have not been outside for 25 years and it is hard for them to realize that KGO voices and music come from a distance of over four thousand miles."

TAKE WARNING!

THE last four consecutive issues of "RADIO" have been entirely sold out a few days after publication. Those readers who were not able to secure their copies are advised to place a standing order with their newsagent, or to send 10/- to The Wireless Press, 97 Clarence Street, Sydney, for 12 months' subscription (26 issues), and thus avoid the possibility of further disappointments.

DO not wait to buy a Postal Note—send a 10/- Bank Note.

Changing Single Circuit to Two Circuit

THE single circuit set, while it has the advantages of ease in tuning in the various stations, is not good for city work or where you have interference from other stations. There are single circuit sets that will eliminate interference from stations just as well as a two circuit set, but as a rule they have enough controls to make their operation more difficult than the two or three circuit set.

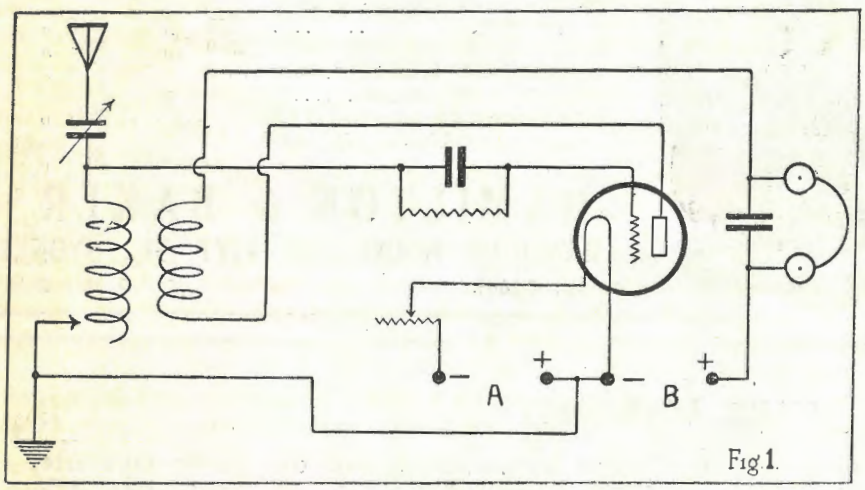


Fig 1.

The drawings show the regular single circuit regenerative set using a vario-coupler and a variable condenser, the variable condenser being in series with the stator coil, while the rotor of the vario-coupler is connected in the plate circuit. There are, no doubt, more of this type of set than all others. Figure 2 shows the same equipment converted to a two circuit set. You will note the same parts are used. The primary of the vario-coupler is connected between the aerial and ground but no condenser is used. The condenser is connected across the rotor coil, which is now used as the secondary instead of the tickler coil in the plate circuit as it was in Figure 1. One side of the rotor coil is connected to the grid connection of the socket and the other to the filament connection. The rotor plates of the condenser are connected to that part of the coil that is connected to the filament. This is done to get away from hand capacity effects. That is all there is to the change.

Tuning of this set will be somewhat different than when arranged as a single circuit set. The primary needs only approximate tuning with the switch taps, but the secondary will either require careful adjustment, or, not depending whether close or loose coupling is used, between the stator and rotor coils. Close coupling is had when the coils are parallel, that is, with the turns running in the same direction, while loose coupling is obtained when the coils are at right angles. In other words, the stator coil will be horizontal and the rotor will be vertical. Any setting between these two points will give various degrees of coupling. You seldom use a coupling where the coils are at right angles to each other unless it might be on local stations where interference was bad. A 45 degree coupling will be found to be sufficient for all stations.

Where coupling is loose, the variable condenser will have to be turned slowly in order to pick up stations unless they are very strong. If the condenser is quickly moved, you may not hear any except the loud stations. A small condenser will allow closer tuning as it can be moved several degrees without losing any but distant stations, while a large condenser of .001 microfarad capacity may only be moved one degree and lose the same station. A condenser should be used that will cover all the broadcasting stations you wish to hear. The larger the condenser the broader wavelength band it will have. A variometer at point X makes it a regenerative set.

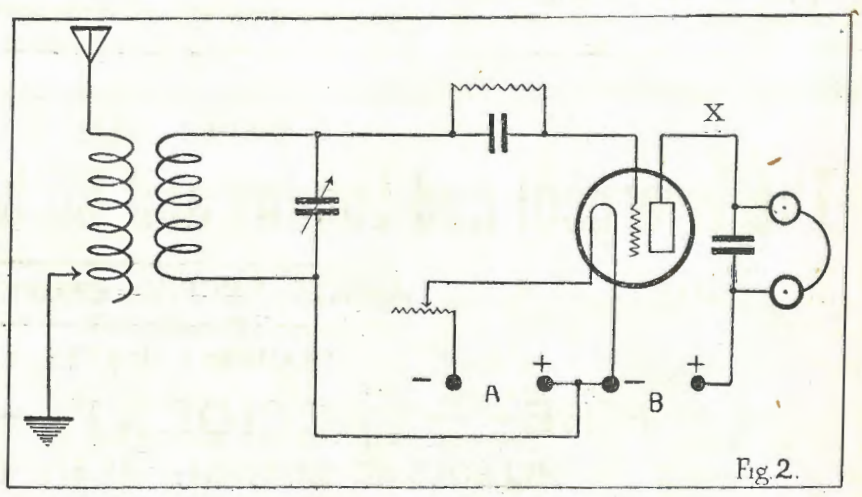


Fig 2.

DUNEDIN (N.Z.) HEARD ON ONE "WECOVALVE!"

ON Saturday night, July 5, using one peanut dull emitter Wecovalve, in a standard Western Electric receiving set, Mr. H. F. Pearce with two friends, Messrs. Smith Brothers, Master Builders of Stanmore, heard 4YA, Dunedin, New Zealand, broadcasting the result of the big Rugby match played between N.S.W. and the "All Blacks." The result was given as New South Wales 20 points, "All Blacks" 15. This was repeated. All were surprised to hear Sydney Broadcasters, Limited, announcing the result of the same match, some time later, but giving the "All Blacks,. score as "16 points," which, of course, was the correct one. Another item heard from New Zealand was the Dunedin Post Office clock striking nine o'clock; the chiming and striking of the hour being heard with remarkable clearness. The watches of the listeners gave the Sydney time as 7.30 p.m. A song "Tit Willow" and a musical item "The Rosary" were also clearly heard.

KGO CONFIRMS RECEPTION.

USING a four-valve portable set and "a very temporary aerial" on two 25ft. poles with two benzine tins buried a foot underground, Mr. J. G. Onus still continues to hear KGO—although on these occasions he is not listening in at Windsor (N.S.W.) but at Denman. Some time ago he wrote to the General Electric Company at Oakland, California, U.S.A., for confirmation of reception and received the following letter: Dear Mr. Onus,—Your good letter of May 5 has been received and as usual we are glad to hear from anyone situated in far-off Australia. There is no doubt in our minds but that you have been receiving KGO consistently. We do keep an accurate account of every concert and report broadcast from our station, and we are glad to inform you that the reception of May 4 exactly agrees with our log of Saturday night, May 3, and again your reception of May 7 agrees with our log of May 6. These are the late programmes broadcast from the Hotel St. Francis dance orchestra which you have been hearing. We broadcast these late programmes Tuesday and Saturday nights of each week, from 10 p.m. to 1 a.m. Our signing-off time is always around 1 o'clock. We hope this detail will help you convince your friends that you have been receiving KGO and to correct certain wrong impressions in regard to our broadcasting. Yours very truly, etc. P.S.: Thanks for the picture of your set which you enclosed, as we are interested in seeing the outfits of our radio friends.

EXCELLENT CRYSTAL RECEPTION.

MR. JOHN KILLEN, of South Singleton (N.S.W.), receives 2BL on a silicon crystal nearly every night. "I do not think there is one inch of wire on the primary going to waste," he writes. "This is the same old crystal on which I received VIT during the daytime, and VIN, VID, VLD, VLW, VLA and others at night."

STATIONS HEARD.

FOLLOWING is a list of stations heard by Mr. C. A. Cullinan, of Diggers Rest (V.), between July 1 and 15:—2AG, 2AY, 2CI, 2CM, 2DH, 2DM, 2DS, 2GQ, 2HM, 2JM, 2XX, 2YI, 2ZZ, 2BK, 5AC, 2AE, 2AP, 4AA, 4AD, 6CGW, 2ARI, 6TIA—all on a single D1 valve.

ONE-VALVE RECEPTION.

The Editor,
"Radio."

Dear Sir,—

Since writing you last, I have done some more interesting receiving on the one-valve set. The other night Farmer's (2FC) was heard very clearly, but the static was very Q R.N. Several items came in very well, one was: "Take a Pair of Sparkling Eyes," which was very interesting. We closed down early owing to static. I can pick up Farmer's concerts quite well now, but some nights it is very faint. The voice of the announcer can always be heard saying, "Hullo! Hullo!! Farmer's broadcasting. The next item will be," etc., etc. I also have picked up 2BL (Broadcasters' Limited), and Preston House—both very faintly. One night a station called 2YI was heard very faintly but readable.

Yours faithfully,
(Sgd.) WM. E. HAGARTY.

Kingfisher Street, Longreach,
Central Queensland.

TWENTY-TWO STATIONS IN THIRTY MINUTES.

MR. J. BASSETT, of Stroud (N.S.W.), has used several kinds of valves but on a recent Sunday evening he tried dull emitters. Searching the short waves between 5 p.m. and 5.30 p.m. on July 20 he logged the following stations (this list serving as QSL).—N.S.W.: 2HM, 2GQ, 2CR, 2GR, 2KC, 2YI, 2LO, 2ZZ, 2AY, 2YA, 2DS, Vic.: 3XO, 3HL, 3BD, 3ZR, 3BK. Qld.: 4EG, 4AN. S.A.: 5BF, 5WJ. Tas.: 7BK. N.Z.: 4AA. Listening in on July 21 he heard 5DO.

QUITE RIGHT, TOO!

IN another letter from him, Mr. S. McCarthy, of East Kempsey (N.S.W.), states that on a recent evening when he came home he found that Mrs. McCarthy had taken a hand in the reception of KGO. At one period when the music momentarily ceased, even clapping and the voices of the dancers could be heard at the St. Francis Hotel.

HEARD SERMON BROADCAST.

MR. T. EVANS, of Blayney (N.S.W.), writes that he recently heard a sermon broadcast from 4YA, using a loop aerial, detector and two stages of audio. Mr. Evans has also heard KGO faintly and also 2GR.

MORE ONE-VALVE RECEPTION OF KGO.

WRITING from the police station, Bulli (N.S.W.), Mr. Desereaux states that he has again heard KGO on one-valve and includes a detailed list of the transmission.

A BOUQUET FOR 2BL.

MR. A. L. PERREY, proprietor of the Star Engineering Works, Strathalbyn (N.S.W.), and an enthusiastic radio experimenter has heard Dunedin on a loud speaker and also Auckland. "Please give 2BL a 'boost' for the excellent transmission they give. Their modulation is by far the best of any heard here." The following is a list of stations lately logged by Mr. Perrey:—2HM, 2GR, 2CR, 2YA, 2YL, 2GQ, 2CM. 2LO, 2KC, 2RJ, 2BK, 3JU, 3BM, 3AR, 3ZE, 3BF, 3BD, 3CO, 3RY, 3BQ, 3FH, 3HL, 3ES, 4EG, 4YA, as well as nearly all South Australian stations. Amateur stations were logged on two valves regenerative.

AN EXCELLENT RECORD.

THE following stations received on one tube with no earth and a 60 ft. aerial and honeycomb coils constitute a splendid record. It has been put up by Mr. W. F. Sievers, of East Richmond (V.). The stations read as follows:—N.S.W.: (C.W.), 2HM ('phone), 2ZG, 2JN, 2BC, 2ZN, 2ZZ, 2AY, 2GY, 2CR, 2YI, 2ZY, 2CM ('phone), 2CI, 2BK, 2LO (very QSA), 2QG, 2GN, 2GF, 2DS ('phone), 2JM, 2YG, 2KC, 2YD, 2IX. Vic.: (C.W.), All third district, 'phone. Q.: (C.W.); 4EG, 4GE, 4CK, 4AA. S.A.: (C.W.), 5KA, 5AY, 5AC, 5HI, 5DO, 5AD, 5BQ ('phone), 5BD, 5BF. Tas.:

(Continued on page 26

TO THE PUBLIC

KILBOURNE & CLARK MFG. CO. radio parts are presented you as quality merchandise, backed up by this firm with a full guarantee. They are in no way competitive with low-priced, inefficient apparatus that is at present glutting the radio market. K & C parts are designed by engineers who have followed the progress and development of radio for many years, even before many companies now manufacturing radio equipment were heard of. From the beginning, K & C has given attention to correct design and efficiency of its radio apparatus rather than to quantity manufacture of lower-priced and less efficient parts. K & C equipment is in the main handled and recommended by dealers who are competent radio men, or who have real radio men in their employ. These men know radio, and that is why you find K & C parts chosen here. It is this class of trade that the Kilbourne & Clark Mfg. Co. desires, this, and that of the experimenter and radio fan who places positive quality and performance above uncertain performance and indifferent quality. Without correctly designed apparatus, with strictest consideration for low capacities, lowest possible losses, proper inductance as well as high-class construction, the user finds that he does not obtain all from his circuit that he had anticipated. This is gradually coming to be realised more and more as less efficient equipment is being substituted with K & C.

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COLUMBIA "B" Batteries are made in 22½ and 45-volt sizes. They are equipped with Fahnestock Spring Clip Connectors to insure easy, secure connections. They are thoroughly insulated and waterproofed. They are portable, powerful and long lasting.

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COLUMBIA "Three" Batteries are designed so that under certain conditions they can be used as an "A," "B" or "C" Battery. They are made of extra large sized cells, and are used as an "A" Battery for light, portable sets using UV-199 tubes; as a "B" Battery for obtaining additional plate voltage; as a "C" Battery for grid biasing.

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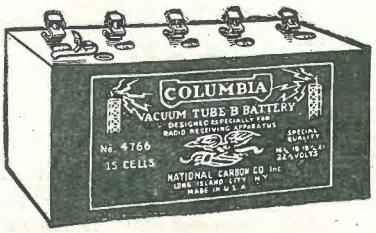


(C.W.), 7BK, 7BN, 7AB. N.Z.: 2AP, and also Australian ship and land stations and Nauru Radio. Mr. Sievers has received 2CM on C.W. working 2CDM without aerial or earth for four nights consecutively and upon writing to Mr. Basil Cooke, who was in charge of the latter station at the time he received full confirmation. This was done with one valve. (We regret that neither XYZ nor HAAG are included in the latest lists to our hand. —Ed. *R.*

AN INTERESTING LETTER.

WE received an interesting letter from a Gilgandra experimenter the other day. "Last night I was successful in getting hold of KGO," writes Mr. G. W. Anderson, "on my home-made set consisting of H.F. WD12 dry-cell valve, galena detector, 2 L.F. WD12 valves. At 5.40 I came in but did not expect to hear much as the sun had only just set, but nearly as soon as I tuned in about the 300 metre mark I got a very strong carrier wave and after a little adjustment of filaments, etc., I heard an announcement but it was not clear enough to be altogether understood. Immediately after an orchestra struck up and two or three items followed quite distinctly." Then, "Owing to the girls singing out for about the tenth time," explains Mr. Anderson, "that it was tea-time, I shut down." At 6.50 he tuned in again and "clicked" immediately hearing the Californian station till 7.3 local time when the usual announcement was made and they closed down. Most of the music was of the jazz variety, although one item was accompanied by the cornet and came in beautifully. Mr. Anderson noticed that the music seemed to come in in waves of about half a minute. On the peak of this it was very clear and strong and in the trough, clear but faint. This experimenter has lately heard 4YA, Dunedin, and 3BG, Melbourne. "I often wonder," concludes Mr. Anderson, "why wireless listening-in has not spread more than it has, as it is worth it, especially to us away in the bush when we can sit beside a nice, warm fire and hear the news of the day with market and weather reports together with the beautiful concerts. I met a person a while ago who would not believe it was possible to hear concerts from Sydney through the air. I was sorry that there was not any broadcasting on at the time or he might have believed it! When I explained the aerial to him as picking up the message from the ether, he said, 'Yes, but the Blue Mountains are between here and Sydney.' (!!!)"

2RK HEARD AT SOUTH SINGLETON.

MR. JOHN KILLEN, South Singleton (N.S.W.), writes that using a crystal set on the night of August 3 he heard the words, "Hullo, hullo, hullo!" and the call sign 2RK repeated. Static was troublesome but he could hear this station thanking someone for "sport" or "support."

FINE TWO-VALVE RECEPTION.

THE following is a list of stations recently logged by Mr. A. L. Clancy, of Stony Point, Leeton (N.S.W.). It is a praiseworthy record of two-valve reception and reads as follows:—U.S.A.: KGO, N.Z.: 1YA, 4YA. S.A.: 5BQ, 5BG, 5AI, 5FT, 5BF, 5WJ, 5LO, 5BN, 5BM. Qld.: 4AC, 4CM, 4EG. Vic.: 3ZL, 3GI, 3BD, 3BU, 3SM, 3BQ, 3LM, 3JP, 3UZ, 3RB, 3FH, 3AR. N.S.W.: 2ZE, 2BL, 2GQ, 2GR, 2UW, 2ZX, 2SO, 2CM, 2YG, 2RA, 2WV, 2YI, 2CR, 2BM, 2YA, 2ZH, 2DS, 2IJ, 2RJ, 2JM—all these stations have been heard by telephony. Mr. Clancy has also received 2BL, 2WV, 2ZE, 3AR in the daytime at fair strength.

SOMETHING LIKE A LOG!

A COPY of the stations logged by Mr. W. M. Henry, of Rhodes (N.S.W.) forms a list of DX work that warms the very cockles of our heart. All stations are picked up on one valve and the set is a home-constructed one. A two-valve audio-frequency amplifier is sometimes used for loud-speaker work. Following are the results that have recently been obtained:—N.S.W. (country): 2GQ, 2YA, 2HM, 2CR. Queensland: 4CK, 4CM, 4AK, Victoria: 3BM, 3EF, 3JU, 3BU, 3BH, 3BD, 3DD, 3BL, 3JP, 3BQ, 3QW, 3JH, 3OT, 3BK. South Australia: 5BG, 5BQ, Tasmania: 7BK. New Zealand: 4AA, 3AA, 3AF. The following have been heard on 'phone:—N.S.W.: 2HM, 2GQ. Victoria: 3BH, 3BD, 3JH. New Zealand: 3AA. South Australia: 5BQ, 5BG. Mr. Henry's list of Commercial Stations includes all New Zealand and Australian Coast Stations, and also the following long-wave stations: JAA, KIE, WQK, LY, HZA, PKX, NPO, NPN, NPG. To the date of his letter, the Victorian broadcasting station 3AR had been heard every night for three weeks and with the addition of the two stages of audio were heard on the loud-speaker at a distance of fifty yards. Mr. Henry informs us that a large number of the above stations have been logged on numerous occasions.

THE BEST TIMES FOR KGO.

ACCORDING to the latest advices received from KGO, the popular broadcast station at Oakland, California, U.S.A., the best times to listen-in every Sunday and Wednesday evenings for programmes from this station in the various Australian and New Zealand capital cities are as follow:—

New Zealand.

Auckland, Wellington, Christchurch, Dunedin	Between 5.30. p.m. and 8.30 p.m.

Australia.

Brisbane, Sydney, Melbourne, Hobart	Between 4 p.m. and 7 p.m.
Adelaide, Port Darwin	3.30 p.m. and 6.30 p.m.
Perth and all W.A.	2 p.m. and 5 p.m.

The above times are standard times for the various capitals shown. Actually, the time at KGO is hours ahead of the time in Australia and New Zealand.

KGO broadcasts on a wavelength of 312 metres.

All experimenters and Broadcast Listeners who hear KGO are asked to advise the Editor of "Radio." Address all letters to the Editor, "Radio." 97 Clarence Street, Sydney.

GOOD!

MR. N. L. McKENZIE, of Newfield (V.), finds that between the hours of 6 and 7 p.m. is the best time in which to pick up KGO. "It is hard to realise," he says, "at times, that the station is so far away as the music comes in with great clearness and the quality is the best I have heard. There is no mistaking the American accent; particularly with regard to the word 'Garden' which is pronounced, as near as I can spell it, 'Gearden.'" Using a home-made loud-speaker of thin cardboard, on favourable nights the music can be heard clearly in adjoining rooms. Mr. McKenzie's set is a four-valve one—one radio detector and two audio, tuned anode. The first three valves are 301A and the fourth a UV199. He can hear this station very well on three valves and intends to try them on two.

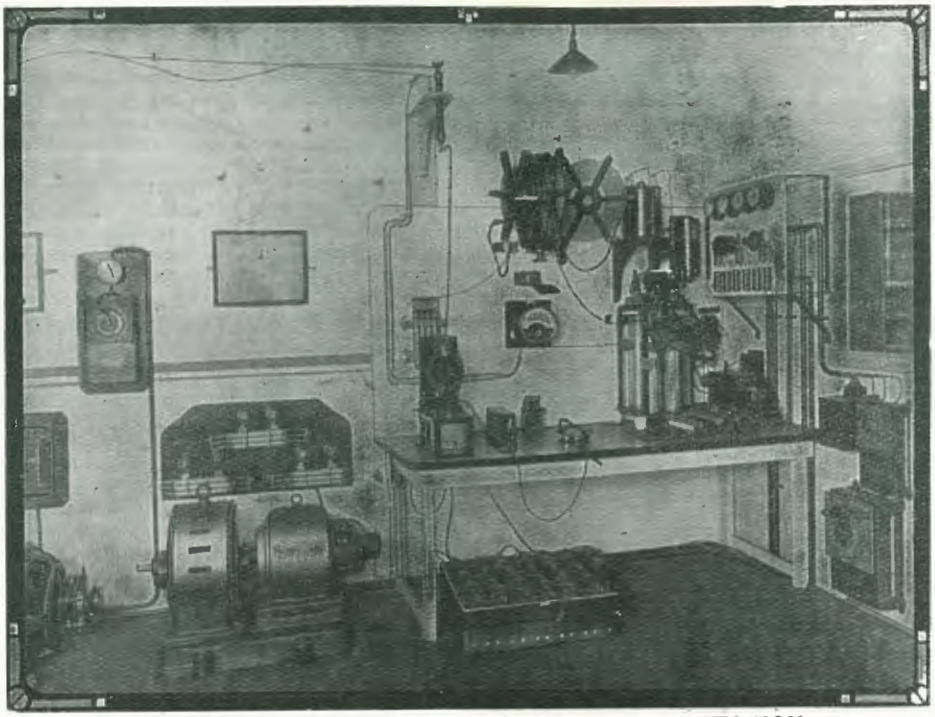
OF INTEREST TO MR. J. SCOTT-TAGGART.

"I HAVE read in your interesting journal from time to time," writes Mr. Val Seymour, of East Malvern (Vic.), "reports from several amateurs who have been receiving KGO for the last few months. I have been experimenting with two and three valve circuits for some time with varying success, but just recently have given much time to a single valve and crystal reflex circuit accredited to Mr. John Scott-Taggart. Results I have obtained with this little circuit are really remarkable. At first I considered it a splendid achievement to bring in 2FC on an aerial (inverted L) 100 feet long and only 30 feet high. I get that station now regularly whenever I like to tune in, audible on a small loud speaker. Since first receiving Farmer's I have been successful in bringing in 2BL, 2HM, 2YI, 2JM, 2CM, 2UW, 2GQ, 2BK, 2LO, 2RJ, and have also frequently tuned 2HM and 2JM and listened to them working together. 2RJ was particularly strong one Sunday evening last month. Realising that these receptions were credible performances with a single valve and crystal, I determined to try my luck with KGO last Sunday evening. I was rewarded by picking up a distant carrier wave at 5.50 p.m. and a few minutes later it bore fruit in the unmistakeable strains of orchestral jazz music. I held this until after seven o'clock, broken here and there by announcements which were unintelligible, Only once did I hear distinctly, "KGO, California—." I tried again this evening (Wednesday, July 30) and from 6 p.m. to 7 p.m. I listened to KGO's music and had no difficulty in hearing the station call announced several times at the end of various items. The American nasal drawl was very pronounced."

(*Continued on page* 270.)

FREE Practice Set

Service



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WRITE URGENTLY TO-DAY TO

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AND

Gloucester House, 44 Market Street, MELBOURNE.

NOW ON ONE VALVE.

MR. A. E. WRIGHT, of Scarborough, South Coast (N.S.W.), who requires no introduction to these columns states that he now receives KGO on one valve—an Audiotron.

HEARD KGO FOUR TIMES.

IN receiving KGO so well on one valve, Mr. G. S. Aplin, of Bulli (N.S.W.), may be considered an experimenter of the first-class. On a recent Sunday evening, despite considerable static, howling valves and a nearby leak in the electric lighting system which caused much crackling, the speech and music were very clear and at times each instrument in the orchestra could be distinguished. To date, Mr. Aplin has heard the Californian station four times—all on one valve. The set is entirely of his own construction and is based on a well-known regenerative circuit. The valve is a WD11 and the 'phones, Brown's (2000 ohms). This experimenter works in conjunction with a Mr. Hedley, a local resident, whose aerial he uses and also holds a First-class Operator's Certificate No. 558. He has had much experience with valve sets. Mr. Aplin's letter in which he tells us of his success is signed as a matter of good faith by four members of the Bulli-Wonoona School of Arts Wireless Club, of which he is a member.

GOOD TWO-VALVE WORK.

USING two dry cell valves—DV3 as Detector and UV199 as Audio Amplifier—Mr. A. L. Clancy, of Leeton (N.S.W.), writes to say that he has been successful in receiving KGO. His aerial is 50 feet high at both ends, and has a span of 120 feet, total length, 174 feet. It is one of the inverted L twin-wire type. On one occasion when the music stopped during the broadcasting the shouts and clapping of the audience were very clear. Mr. Clancy's DX work on two valves includes America, N.Z., Victoria, S.A., Q. and N.S.W.

CASTLEMAINE (V.) EXPERIMENTER HEARS 4YA.

"CONCERTS transmitted by wireless from Sydney have frequently been heard in Castlemaine (V.) by Mr. W. Macafee, but whilst experimenting with his instrument on a recent Saturday evening be tuned in to a concert which was being transmitted from Dunedin (N.Z.), about 1300 miles distant," states **The Castlemaine Mail.** The concert was first heard at 7 p.m. and a programme of instrumental and vocal items continued until 8 o'clock, each number being heard quite clearly and distinctly. The broadcasting station was 4YA. Later in the evening, Mr. Macafee picked up 2BL and several of the items were so clear that they could be heard in any part of his business premises in Barker Street. The set used to obtain these excellent results was a four-valve one.

1AO, N.Z.

SOME interesting particulars in regard to the working of his station, 1AO, are supplied by Mr. Russell White, of Grafton Road, Auckland. This very proficient amateur operator is becoming well-known among Australians and he has kindly supplied a log of the Commonwealth stations with which he has carried out two-way communication. The most prominent of these are:—2LO, 2DS, 2AY, 2BK, 3B2, 3JH and 3BD. Most of Mr. White's work is done on a wave-length of from 100 to 140 metres and he advises those Australian transmitters who can, to get down on to the lower wave-lengths as he claims that far better work is done round about 100 metres. In the station a type UV201A Radiotron is used for transmitting with 400-volts on the plate, and when working on 100 metres, a radiation of 1.1 amps is obtained with a plate current of 85 milliamps. On 140 metres 1.4 amps is radiated with a consumption of 68 mils. With DX reception Mr. White is also very successful, having received every test message complete sent on from 6CGW since June 1. Anyone who wishes, may call 1AO and the operator will be pleased to carry out tests with any of the five districts of Australia.

IS HE THE FIRST?

"IT may interest your readers to know," writes Mr. A. L. Perrey, of Strathalbyn (S.A.), "that I have been successful in logging KGO and I think I am the first S.A. amateur to do so." One evening recently Mr. Perrey was hunting for a N.Z. broadcasting station when he tuned in music between 5.50 p.m. and 6.1 p.m. (S.A. time). Then followed a ten-minute interval and at 6.11 p.m. he heard the usual announcement from KGO very indistinctly, "but the words 'San Francisco' made me sit up," and he returned and enjoyed the music till 6.28 local time, at which moment this station closed down. The above results were secured with an Armstrong three-coil circuit, Phillips D1 as detector and Cossor valves for amplifiers. Mr. Perrey also writes that he has succeeded in receiving a large number of N.S.W. amateurs and has worked 2HM on 'phone several times, as well as 2YI, both being two-way conversations.

KGO HEARD AT BACCHUS MARSH.

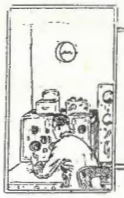
"I WISH to add my name to the list of those who have heard KGO," writes Mr. James K. Herd, L.D.S., B.D., Sc., of Bacchus Marsh (V.). July 27 was the second occasion on which he heard the above station, but on the prior night it was not sufficiently clear to warrant announcement to *Radio*. (SOME experimenters, please note!—Ed.,*R.*) He picked up the carrier at 5.10 p.m. and heard music and speech, which was somewhat blurred by inaccurate tuning. Most of the music was of the "jazz" variety and was succeeded by an announcement. "At last," he writes, "after much care and patience, I finally heard the orchestra beautifully clear at 6.34 p.m. and at 6.37 the usual announcement. The pronunciation was decidedly 'Yank'," he continues, "and 'Garden' may have been 'Dining' but I felt sure it was the former. Owing to the arrival of a patient at 6.37 he had to close down. When KGO was correctly tuned it was as strong as 2BL. Local reception conditions are very bad, as the station is situated in a valley and surrounded by trees and roofs. The set is a five-valve one of home construction and consists of 2RF, 1Det., 2AF and tuned primary transformer couplings in R. F. stages. Although Mr. Herd has only been an experimenter for six months, he has logged amateur stations in all States and N.Z., although his only W.A. amateur to date is 6AG on C.W. "Having achieved KGO," he concludes, "I hope, by dint of patience, to hear some other 'Yanks.'" (Australasian experimenters who have now heard KGO—"go thou and do likewise and stand not upon the order of your going but go at once!"—Ed. *R.*)

AN UP-TO-DATE TOWN.

A GOSFORD (N.S.W.) correspondent writes:—"Three months ago the word 'wireless' was about the most unpopular word that you could expect to hear in this district. To-day there is a Radio club whose members number about twelve, six of whom have installed sets. Messrs. Canning and Company have installed a four-valve set with loud speaker in one of their departments, and one can hear the word 'wireless' at nearly every corner. When I first erected my four-wire bird-cage type aerial which is fifty feet high, many were the enquiries as to 'What's the joke!' Some of the more interested people made enquiries to such an effect that a club was formed last month and called the Gosford District Radio Club. Full particulars were reported in the local paper and later a two-column article written by one of the members appeared. The editor has considerately promised to publish matter each week concerning wireless, so it is hoped that Gosford will be able to hold up its head like any other self-respecting Radio township. Application for a transmitting license on behalf of the club has been made and the members would be glad to hear from anyone not more than a thousand miles away who is about to start transmitting also, in order to work with him."

GOULBURN EXPERIMENTER LOGS KGO.

ONE recent Sunday afternoon, between 5.30 and 7 o'clock, Mr. Laurie R. Nichols, the well-known local radio experimenter, was turning the controls of his receiving set at his home in Victoria Street, reports *The Goulburn Evening Penny Post*, when a voice which thrilled every fibre of his body, came through the head-'phones. It was the announcer at KGO, the big broadcasting station at Oakland, California, U.S.A. Mr. Nichols held the station for an hour and a half and, during that time, heard a varied programme including a vocal solo in which the lady's voice came in very clearly, orchestral items, mixed choruses, a saxaphone solo and, on several occasions, even the hum of the generators in the transmitting station could be heard. The set on which these splendid results were secured was a two-valve one of home construction with only a single wire aerial, poorly insulated, 100ft. long, 25ft high at one end and 4ft. at the other.



MOVEMENTS OF MARINE WIRELESS OFFICERS

JULY.

MR. J. R. HAIN relieved Mr. H. A. Stickpwich on s.s. *Waiotapu* at Sydney, 21st.

Mr. V. J. Foreman relieved Mr. H. M. Watson on s.s. *Wear* at Melbourne, 17th.

Mr. H. M. Watson relieved Mr. A. W. Hodge on s.s. *Moira* at Melbourne, 18th.

Mr. A. W Hodge relieved Mr. I. R. Hodder on s.s. *Goulburn* at Melbourne, 21st.

Mr. H. Taylor relieved Mr. J. W. McKay on s.s. *Macedon* at Sydney, 25th.

Mr. A. H. Jeremy relieved Mr. J. E. Cleary on s.s. *Melbourne* at Sydney, 25th

Mr. T. V. Tressler relieved Mr. W. S. Ringrose on s.s. *Cooma* at Sydney, 28th.

Mr. G. H. Tracey relieved Mr. M. A. Macgoun on s.s. *Arcoona* at Sydney, 28th.

Mr. J. E. Cleary relieved Mr. H. J. Byrne on s.s. *Kanna* at Sydney, 29th.

Mr. J. H. Bennett signed off s.s. *Manuka* at Sydney, 30th, and relieved Mr. H. W. Barnfield as senior operator on s.s. *Makura*, same date.

Mr. R. G. Wright signed on s.s. *Macumba* at Brisbane, 25th.

Mr. R. T. Murray relieved Mr. J. Doggett on s.s. *Melusia* at Sydney, 28th.

Mr. G. H. Tracey signed off s.s. *Iron Crown* at Newcastle, 21st, and signed on s.s. *Iron Chief* at Newcastle. same date.

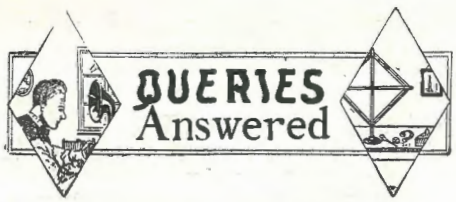
Mr. A. S. Dening signed off s.s. *Iron Chief* at Newcastle, 19th, and signed on s.s. *Iron Crown* at Newcastle. 21st.

AUGUST.

Mr. C. C. Ullman relieved Mr. A. G. Ross on s.s. *Zealandia* at Sydney, 1st.

QUEENSLANDERS SUCCEED.

TO the already swelling list of amateurs who have been logging KGO, California, must now be added three more Queenslanders, who lately have successfully received musical programmes from the well-known station. They are:—Mr. Squire Winten, of Clayfield, Brisbane; Les Downing, of Cross Street, Gympie; and Mr. Harold Hobler, of Rockhampton. Les Downing, who is only 16 years of age, with 18 months' experience of radio, states that on one evening at 6.15 o'clock, he heard orchestral music, followed by an announcement: "———— California, St. Francis Hotel, San Francisco." Static was very bad. At 7 o'clock 2BL was jamming him, and he closed down. On the following Wednesday, at 6.4 p.m., he picked up orchestral music, clear, and fairly strong. On Sunday, KGO was again picked up, but carriers were switching about, and tuning was difficult. On Wednesday, at 25 minutes to six, music was picked up from KGO, and shortly before 7 o'clock the station was distinctly heard signing off at 1 a.m. Les Downing's set is of three valves, with re-action on tuned transformer.



G. (Macksville). Q.: Do other experimenters hear harmonics of 600 metres on 2FC's wavelength?

A.: Yes.

Q.: What type of static eliminator would you advise me to experiment with?

A.: We do not know of any method that satisfactorily eliminates static interference.

H. R. B. (Yanac) proposes to use two "L" aerials, a short one for amateur work and transmitting, and a longer one for the waves.

Q.: Would efficiency of either be reduced if placed at right angles to each other with lead-in wires not closer than 10 feet apart?

A.: No.

Q.: Would two leads-in about two feet apart to a switch near receiver be satisfactory?

A.: Yes.

Q.: Would two stages of R.F. amplification, using Federal transformers and plain detector be more efficient than a three coil regenerative receiver?

A.: Yes, for telephony, but not worth the trouble for C.W. reception.

Q.: Would 1 stage of R.F. amplification with tuned anode coupling and reactance on the plate be more efficient than the two foregoing?

A.: The difference would be inappreciable.

W. A. G. (Kurri Kurri). Q.: Why is it when plate voltage on V24 valves is increased over 30, strength of telephony decreases in volume (circuit submitted)?

A.: Using negative bias of about three volts on valve grids should overcome your trouble.

"An Experimenter" (Chatswood). Q.: Would directly coupled aerial be better for long distance reception than one inductively coupled?

A.: The use of inductive coupling would give you greater selectivity and consequently greater range due to less interference from local stations.

Q.: Do you advise series-parallel switch for aerial condenser?

A.: Yes, this being a quick means of changing the wave-length of your aerial circuit.

Q.: Which would be more satisfactory, basket coils or honycomb coils?

A.: Basket coils for short waves and honeycomb coils for waves above 600 metres.

L. R. M. (Hornsby). Q.: What is wavelength of variometer 26 turns No. 22 wire on 3¾in. diameter stator, and 32 turns on 2½in. rotor?

A.: About 300-700 metres with average experimenter's aerial.

Q.: What loading coil is necessary to receive 2FC?

A.: Use 100 turn honeycomb coil.

"Reflex" (Rockhampton). Referring to article on "Radio and Reflex Amplification," published in *Radio* No. 5, Vol. 1. Q.: What should be the value of the variable resistances connected in series with the primaries of the H.F. transformers?

A.: About 1000 ohms.

Q.: What is capacity of variable condensers across the primary of the transformers?

A.: .0003 m.f.

Q.: Should potentiometer be dispensed with if crystal such as galena were used, or has it other functions to perform in the circuit?

A.: You can dispense with the potentiometer if crystals other than carborundum are used.

E. G. W. M. (Hordern Vale). Q.: Can you recommend me a good book explaining Inductance and Capacity?

A.: *The Elementary Principles of Wireless Telegraphy,* by Bangay.

Q.: Can you give me a list of N.S.W. transmitting stations and their wavelengths?

A.: A complete list of N.S.W. amateur transmitting licences was published in issue *Radio* No. 29. Supplementary lists appeared in subsequent issues.

Q.: How many turns of No. 36 d.s.c. wire would be required for R.F. transformer for 350 metres using 2in. former?

A.: 50 turns.

"Avondale" (Avondale, Qld.). Q.: How should an "Advance" L.F. transformer be connected for the first stage (sketch submitted)?

A.: Connect P1 to plate.

Q.: Why is it necessary to use the full six volts on filaments of three V24 valves as amplifiers, to cut out internal noises?

A.: Unless the valves are burnt at the correct brilliancy they will be operating on the wrong portion of the characteristic curve.

Q.: What is cause of 2BL's signals fading? Is it in the adjustment of detector valve?

A.: Fading is due to atmospheric conditions and the nature of the country over which signals have to travel and is not controllable at the receiver.

F. H. M. (Browns Plains). Q.: What size coils are necessary to tune in 2FC on a three-valve receiver?

A.: You should use a 200-turn coil in aerial and anode circuits, with a 100-turn reaction coil. Please furnish circuit diagram when we will be pleased to give you further information.

Q.: Does KGO transmit every day about six o'clock?

A.: Sunday and Wednesday are the best nights to listen for this station.

Q.: What is the best way of connecting a Series Parallel switch with only six studs?

A.: Diagram being posted.

W. G. T. (East Coburg). Following are particulars for constructing transformer for 5 or 10 watt transmitter, using electrolytic rectifier 230 volts A.C. 50 cycles:—Core 2in. x 2in. cross section. Internal dimensions, 4in. x 4in. External, 8in. x 8in. Primary, 800 turns No. 20 d.c.c. Wind filament secondary with 3.5 turns No. 16 d.c.c. per volt required. For Secondary use two sections of 1800 turns No. 36 d.c.c. with taps at 600 and 1200 turns. These two sections when joined in series will give a centre tapped winding giving 175, 350 and 525 volts. Assuming you require 10 volts on the filament, use two sections of 18 turns No. 16 connected in series. We are unable to give any data regarding radiation from a loop aerial as so much depends upon local absorption and sensitivity of the receiver.

F. E. (Dunedin, N.Z.). A transformer can only be used to change the potential of an alternating current. To obtain direct current some form of rectifier must be used. Write again and give the following particulars when we will be able to design a suitable transformer for you. (1) Current required from Secondary in 6, 90 and 300 volt windings; (2) whether for continuous duty, for battery charging, or for valve filaments.

O. J. J. (Ascot Vale), referring to article on "Low Loss Tuners," published in *Radio* No. 32. Q.: How can body capacity effects be eliminated?

A.: Employ metallic shields at back of panel.

Q.: What causes howling in the 'phones when tuning in?

A.: Possibly grid leak resistance too high.

Q.: Does howling energise the aerial?

A.: Yes.

Q.: Are connections correct (diagram submitted)?

A.: Yes, with the exception that no grid leak is shown.

Q.: What is wave-length of KGO?

A.: 312 metres.

Q.: What time in Melbourne corresponds to KGO transmitting time?

A.: 6 p.m. to 7 p.m.

Q.: What is wave-length of 6WF (Perth)?

A.: 1250 metres.

S. F. D. (Paddington). Q.: Will efficiency of a three-valve set be reduced if ordinary valves requiring accumulators are replaced with UV199 and dry cells?

A.: No.

Q.: Would you recommend using UV199 valves with combined crystal set?

A.: These valves are suitable for all work except exceptionally loud speaker work.

Q.: Would a crystal and UV199 valve work a loud speaker?

A.: This will not give very satisfactory results.

A.: What make of loud speaker can you recommend?

A.: The "Amplion" is very good.

"Tungar" (Rockdale). Data for this special transformer is being prepared and will appear shortly.

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