

The
Queensland

RADIO NEWS



A MAGAZINE *for the*
SET CONSTRUCTOR &
BROADCAST LISTENER

6

AUGUST 1st 1928

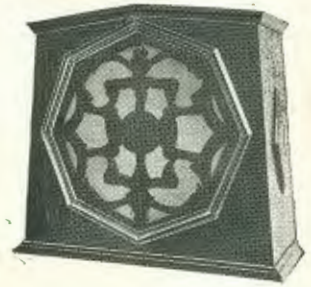
VOL. IV.

No. 7

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A.C.4, Oak	5 5 0
A.C.4, Mahogany ..	5 10 0
*A.C.3	6 0 0
*A.C.2	3 5 0
*A.C.2	4 0 0
*A.C.1	4 10 0

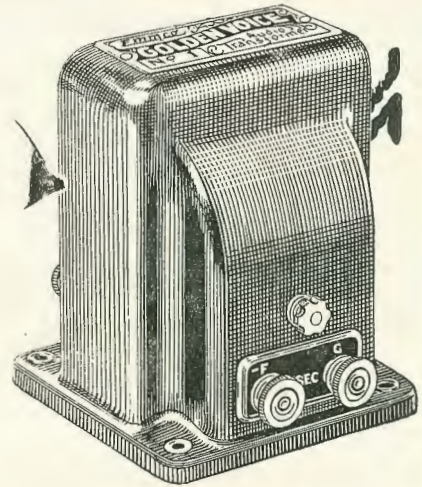
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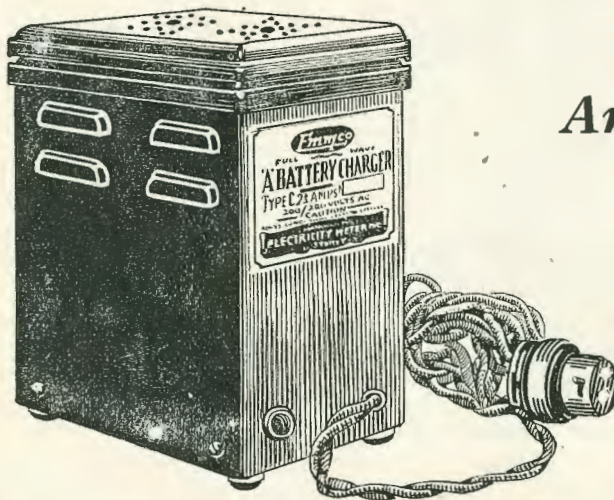
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The R.F. Choke

A Very Valuable Component

It is interesting to note that the same refinements which differentiate the work of a master painter from that of a dauber, or the melodies of a famous orchestra from the din produced by a backyard band, also serve to create a very marked difference between the reproduction obtained from a well designed radio receiver and that obtained from a poorly designed one.

In practically every case the difference lies in certain refinements which make all the difference in the world between a masterpiece and a mediocre effort.

One of the most important elements in receiver design, yet one which is rarely given due consideration, is the radio frequency choke coil.

When properly used, a good radio frequency choke coil will eliminate all distortion resulting from the coupling of separate circuits, reduce undesirable regeneration or oscillation, prevent the entry of radio-frequency currents into audio-frequency circuits and reduce to a considerable extent the necessity for shielding and the necessity for using extreme care in the placing of parts to avoid coupling effects.

To be of any practical value, however, it is very important to use R. F. chokes having extremely low values of distributed capacity. Merely winding a lot of turns of fine wire on a spool and using it as a radio frequency choke is next to useless because such a winding has such a high value of distributed capacity that it acts as a condenser rather than a choke coil and will allow the R. F. currents to pass freely.

In the most successful commercially-built chokes, this distributed capacity is reduced to a minimum by winding the coil in several small sections, each section being wound in a slot turned in a bobbin of insulating material. The slots are spaced some distance from one another, the idea being to keep the capacity between the sections of the winding at a minimum value.

A choke that has sufficient inductance (which is proportional to the number of turns) in conjunction with a low value of distributed capacity, will successfully perform its duty of blocking all radio-frequency currents, and forcing them to flow through the by-pass condenser, as they should.

Another very important point in the design of a choke is that it should have as much **inductance**, but as little **resistance**, as possible. High inductance is secured only by using a large number of turns. In order to conserve space, and reduce the physical dimensions of the coil to a minimum, there is a tendency to utilize excessively fine wire. As a result, such a choke, while its inductance will be satisfactorily high, also will offer a high resistance to direct currents, which is a defect. The ideal choke is one which is all inductance and no resistance. Such a state of affairs is, of course, as impossible as perpetual motion or a complete vacuum. Nevertheless, provided an intelligent compromise is made by the designers, a radio-frequency choke coil can be produced which will fulfil all requirements very successfully.



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Cell it will immediately be replaced. Remember, a Radio Set is no better than its battery, therefore it is most essential to choose a battery that will give long and honest service. Such are Diamond Dry Cells.

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A.F.3 -- 45/-

So much depends on your circuit, so much on your speaker—but even more on your transformers. To render sweet music and to get the full range of orchestral or instrumental performance, the transformer must faithfully reproduce all frequencies.

A.F.4 — 34/-

The Ferranti Transformer Meets Every Condition of Good Audio Reception

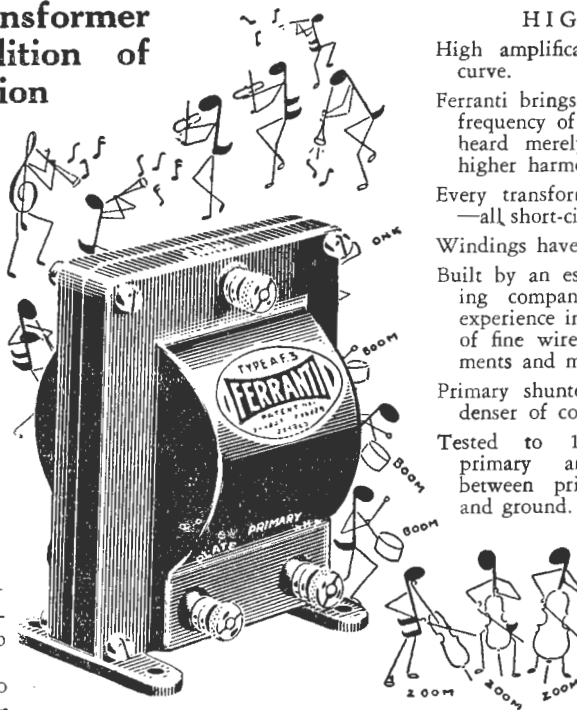
It takes two and a half miles of wire for the coils of the A.F.3, and one and a half for the A.F.4, plus the many refinements which the genius of Dr. Ferranti has made possible, to create transformers whose amplification curve is almost perfect—almost a straight line. By installing Ferranti's you can modernise your old set or perfect your new one. Ferranti will give you an uncensored message from the sending station.

If you want to make the best of the power valve, feeding the loud speaker, use Ferranti.

Ask your dealer for a Ferranti. Don't be satisfied until you have installed one. No better transformer is available at any price.

For the best available transformer results—Ferranti Audio Frequency Transformer A.F.3—ratio 3½ to 1—45/-.

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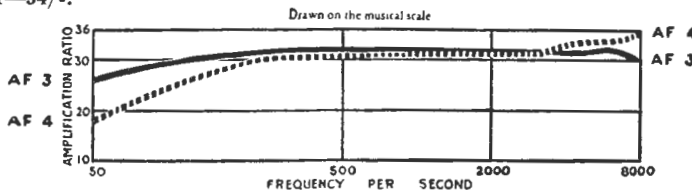
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Tested to 1000 volts between primary and secondary and between primary and secondary and ground.



This graph is drawn on a musical scale—the only accurate way of showing the full value of each tone which your set receives. Note that the evenness and fullness of amplification in both the Ferranti A.F.3. and the A.F.4. extends throughout the range of the organ, cello and the human voice.

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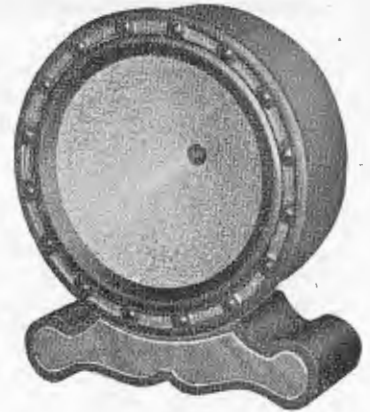
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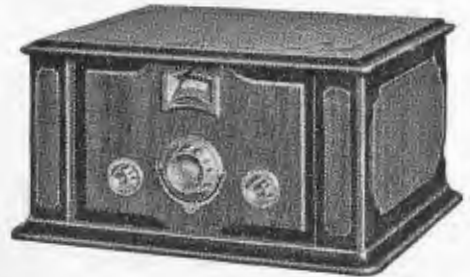
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ALFRED T. BARTLETT
Editor

LEIGHTON GIBSON
Technical Editor

The
QUEENSLAND
RADIO NEWS

WEDNESDAY, 1st AUGUST, 1928

Television ~ When?



MUCH has been said, and much has been written concerning the prospects of television and all it will mean to a wondering world. Fired by imagination, wireless contributors the whole world over have dipped their pens deep into the wells of eloquence, painting alluring word pictures and making absurd predictions as to when television in the home will be an actual reality.

Television is, as yet, in its very elementary stages. The technical difficulties that bar the progress of this wonderful science have not yet been surmounted by the inventors themselves, and until such time that a practical and proved system has been evolved, we cannot look forward with any certainty to the joys of "looking-in."

Mr. John L. Baird, the Scottish inventor, the Bell Telephone Laboratories in America, scientists of France, Germany, and elsewhere, have been carrying out intensive experimental work for some years. The best demonstrations to date have been given by the Bell Telephone Company, who, in describing the obstacles overcome and to be overcome, frankly admit that at least five years must elapse before any degree of perfection can be hoped for.

The conservative announcement of this company comes in striking contrast to the optimistic statements published by sections of the radio press and the exaggerated claims made by John L. Baird Company, who seek to prove that the era of television has actually arrived.

In the face of this, it is interesting to note that the friendly £1000 challenge made by "Popular Wireless" to Mr. Baird to televise images of three or four simple subjects to the satisfaction of a committee of competent observers and scientists, was not accepted.

The all-too-eager claims of sensationalists will do more harm than good to television. We must be patient. In 1912, radio telephony was in the same relative stage of development as television is in today. As a period of eight years elapsed before a regular broadcasting service was actually established, it would appear that some years must roll by before television is practicable. No doubt the time will come when television will be an accomplished fact; but that time is not yet.

QUEENSLAND RADIO NEWS

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Obtainable from all good radio dealers

SUPER SERVICE

45-Volt H.T. “B” Battery,
Old Price 26/-

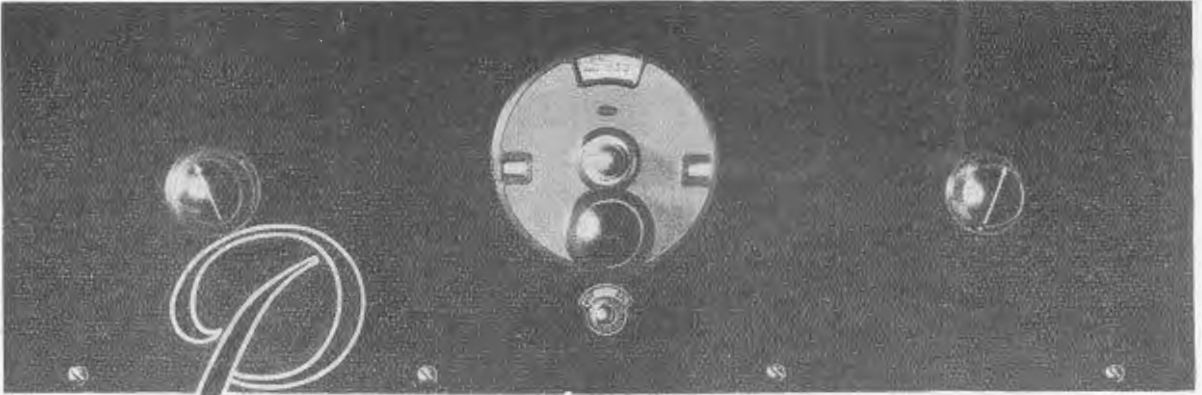
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The PERIDYNE Five

REGULATOR of many circuits, and inventor of several important contributions to the art, Hugo Gernsback, who developed the Peridyne principle of variable shield tuning, describes the Peridyne Five as the ideal uni-control receiver, and probably the most powerful five-valve circuit in existence. Not a pessimistic claim, this but one which is fully justified by a trial of the receiver itself. Using but five valves and a crystal detector, the Peridyne is, without a shadow of doubt, more than the equal of many eight-valve Super Heterodynes as far as range and volume are concerned. Contrary to what its remarkable performance would lead one to expect, it is neither an expensive nor a difficult set to construct, and it works "right from the word 'go'."

This month, we are going to depart from our usual custom of describing the results achieved by our own receiver at the end of the article. Our reason is a sound one—the results are much too good to keep as long as that, and we feel we must tell you about them right at the beginning. When first our Peridyne was constructed last month, we conformed to the standard design, and used two stages of transformer-coupled audio-frequency amplification. However, the volume was so terrific that it was thought that it could easily stand the small reduction in strength which would be occasioned by the use of resistance coupling. Accordingly, the first audio transformer was removed, and replaced by a Philips resistance-coupled unit. The

With Resistance Coupling

OF all the receivers which have been featured in "The Queensland Radio News," none has given us more pride and pleasure to present than this simplified Peridyne. Pride, because the set was designed in our own laboratory, and incorporates one or two new features not found in the original model; pleasure, because the receiver is such a remarkable performer, and will, doubtless, be built by many of our readers. We recommend this Peridyne whole-heartedly and without reservation.

by The
TECHNICAL EDITOR

results were startling, and whatever the reduction of volume **should** have been, it was wholly inappreciable in actual practice. The tone quality, as might have been expected, was a revelation, and we straight away decided that here, at least, was the ideal Peridyne.

The set has been in use for two months, and, in that time, we have listened to practically all the Australian stations—small and large, the New Zealand stations 1YA and 2YA, and JOAK and JOBK, both in Japan. **All these stations have been heard on the loudspeaker, and on a 35-foot-long indoor aerial.** As a matter of fact, we have reached the conclusion that an outdoor aerial is unnecessary with the Peridyne, as the volume appears to be almost as great, and the selectivity certainly much better, when operating on an indoor wire.

The Peridyne Principle.

An understanding of the principles underlying the Peridyne method of balancing the three tuned circuits, while not absolutely essential to good results, is nevertheless interesting and instructive, and for that reason we are reproducing a drawing of one of the Peridyne shielded coils (Fig. 3). The word "Peridyne" is not just a meaningless title, bestowed for the sake of euphony and convenience. It is derived from the Greek—**Peri**, on all sides, and **Dynamis**, power—and refers really to the design of the coils, in which the power is confined by the use of shielding on all sides.

In the older types of five-valve sets, where the three tuning condensers were operated by three indi-

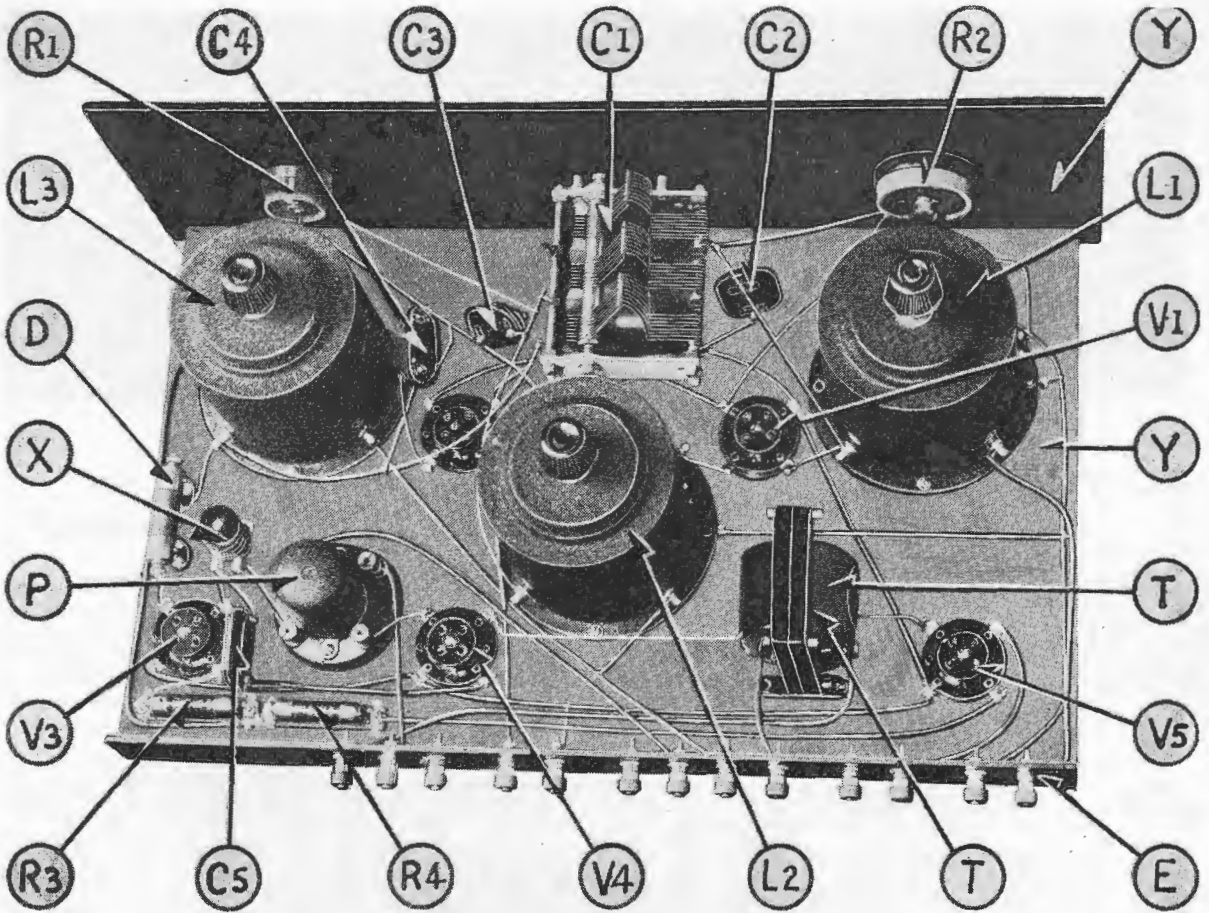


FIG. 2: A back-of-panel view, showing the three-gang condenser and Peridyne shielded coils. "D" indicates the crystal detector.

vidual dials, it is seldom found that the readings of the three dials coincide exactly for maximum response from a given station. Even though they may do this at one end of the tuning range, it is safe to say that only in very rare instances do they match at the other end. For example, suppose 2BL (350 metres) is received at 42 on all three dials. On 2FC (425 metres) we will almost surely find that the readings no longer agree. The discrepancy may not be great—perhaps the dials will read 57, 58 and 58½—and certainly forms no obstacle to accurate tuning. Nevertheless, it is there, and it becomes a force to be reckoned with when we attempt to tune those three circuits by means of three "ganged" condensers, rotated in unison by the same shaft and dial.

The single-control receiver is, naturally, the objective of all present-day set designers, for it is realised that the radio receiver of to-day is not the toy of yesterday, and has quite a different purpose to serve. A few years ago, the man who built a radio receiver for himself was perfectly content to sit before it for half-an-hour, patiently manipulating its numerous and complicated controls, and felt amply recompensed if, at the end of that time, a few snatches of "music" or per-

haps a morse station rewarded his straining ears. Let us not comment upon his sanity (some of us have vivid recollections of such performances), but reflect instead on the enormous advances that have been made between that time and this.

Nowadays, the ordinary radio receiver can be efficiently operated by any normally intelligent person after they once become familiar with the function of the few tuning controls. Usually, a single dial controls all the tuned circuits simultaneously, while some means is provided for controlling the sensitivity and volume.

Obviously, if we were to couple the three dials of the older type of receiver together in such a way that they would rotate in exact synchronism, maximum results would not be possible, for at least one tuned circuit would often be slightly out of resonance with the others. Tuning by this method would really amount to turning the three dials always to exactly corresponding readings, and, as we have already mentioned, the dial readings do **not** invariably agree for best reception. It is possible to produce variable condensers which are very close to being identical

electrically; that is, they will show very similar capacity measurements for different positions of the rotating plates. Up to the present, however, it has not been found practicable to manufacture coils having this same degree of uniformity. In actual fact, no two coils are quite alike in their electrical characteristics, and herein lies the chief reason for the non-agreement of our dial readings. We say "chief" reason because another factor which contributes to the same effect is the stray capacity incident to the wiring of the various parts. For all practical purposes, particularly on the "broadcast band" of wavelengths, this latter effect may be ignored. It is the coil variation which causes the bulk of the trouble, and it is with this that we have to deal in designing an efficient uni-control receiver.

In many single-control circuits, the variation between the tuned circuits is overcome to some extent by the inclusion of small balancing condensers shunted across the main tuning units. These may be either mounted on the front panel, or can be built into the interior of the set. If mounted on the panel, they constitute extra controls—minor ones, certainly, but important enough to add considerably to the complications of tuning. When mounted inside the cabinet, their initial adjustment is supposed to endure for all time. In actual practice it does **not**, because only the characteristics of the condenser have been altered; the coil, the real culprit, remains unchanged, and exerts the same effect upon the tuning as before. Thus, although they may be balanced at one end of the dial, the circuits are out of resonance at the other, and maximum efficiency is an impossibility.

In seeking a way out of the difficulty, Mr. Gernsback chose the obviously more direct way by going to the seat of the trouble instead of merely side-tracking it. He sought some means of correcting the variation in characteristics **within the coils themselves**, and hit upon the idea of employing a metal plate situated at a variable

distance from the high-potential (or grid) end of the secondary coils. This variable shield, as it is termed, is electrically connected with the metal shield surrounding the coils, and is secured to a finely-threaded rod in such a manner that it can be screwed either towards or away from the grid end of the coil. The Peridyne shield must not be confused with the "losser" method of suppressing oscillation, which utilises a metal plate in the field of the coil in order to absorb energy and so introduce sufficient loss to subdue oscillation.

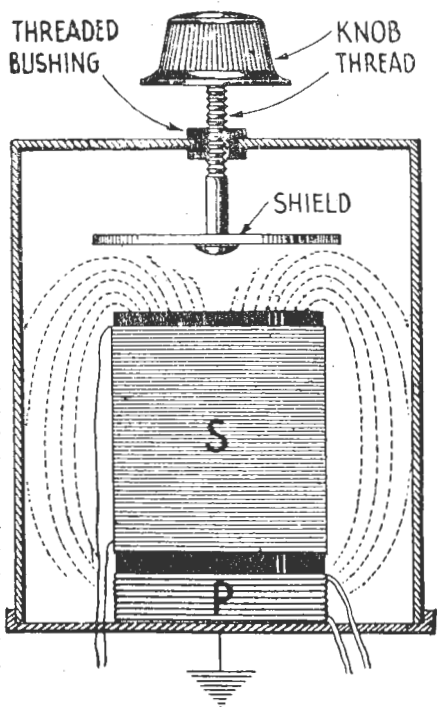


FIG. 3: One of the screened coils shown in section. Note the tuning shield, which can be screwed towards or away from the secondary coil "S."

It is not really an oscillation control at all, but is purely a means of so altering the characteristics of the coil that it may be made to tune accurately in synchronism with its neighbour. The fundamental design of the Peridyne shielded coil unit will be better understood by referring to the sectional drawing (Fig. 3), in which the outer shield, the coils, and the Peridyne tuning shield are clearly shown. Note that the tuning shield does not, as a rule, approach closer to the coil than about one inch. When it is closer than this it becomes a "losser," absorbing energy and broadening the tuning of the receiver.

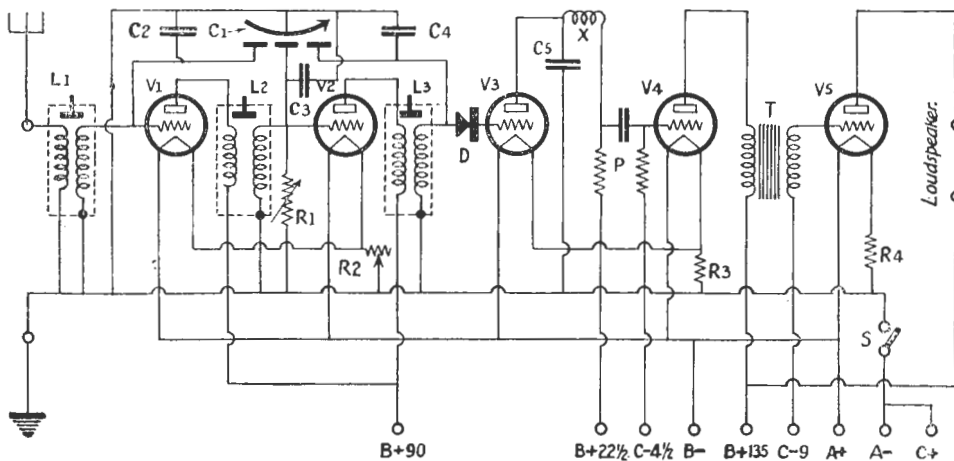


FIG. 4: The circuit diagram. Two stages of radio-frequency, a crystal detector, and three audio-frequency stages are incorporated.

A Crystal Detector is Used.

Fig. 4 shows the circuit, and it will be found very interesting by those who can follow the conventional diagram. The

first two valves are radio-frequency amplifiers, coupled by the Peridyne units, and tuned with the three-gang condenser C1. For controlling inter-stage oscillation an interesting method has been adopted. This consists of a variable high resistance shunted across the secondary of the second coil unit. This resistance is very effective in practise, and in addition to controlling oscillation, it is useful as a modulator or volume control.

Following the two r.f. stages, and connected directly in the grid lead to the first audio valve is a fixed Carborundum detector, which rectifies the energy which it receives from the preceding valves. While the valve V3 is nominally an audio amplifier, there is some evidence in support of the belief that it is partly a rectifier, the process of rectification or detection apparently being divided between the crystal and the valve. At any rate, the crystal detector certainly pulls its weight in the circuit, for a very definite reduction in signal strength is noticeable when it is removed. The fixed condenser C5 by-passes radio-frequency energy to the filament circuit, while the duty of the choke coil X is to prevent the entry of any r.f. energy into the audio amplifying system. The next valve (V4) is resistance-coupled to its predecessor, while the last valve is a transformer-coupled stage. Three stages of audio-frequency amplification are thus provided.

In the original Peridyne, three rheostats are specified—one for each r.f. valve, and one for the detector. Intensive experiment on our part failed to reveal any appreciable advantage which could be gained by their use, so a single rheostat was utilised for controlling both r.f. valves at the one time, and the detector and audio valves are placed in charge of Amperite automatic filament ballasts.

To ensure efficient transfer of energy between the first and second audio stages, a high- μ high impedance valve is employed at V3, because it is followed by a high resistance in its plate circuit. The remaining valves will be dealt with later in this article.

Few Parts—Simple Layout.

The appearance of the front panel is an accurate indication of the simplicity of the receiver as a whole. The number of parts is remarkably small, and the layout of both panel and baseboard simplicity itself.

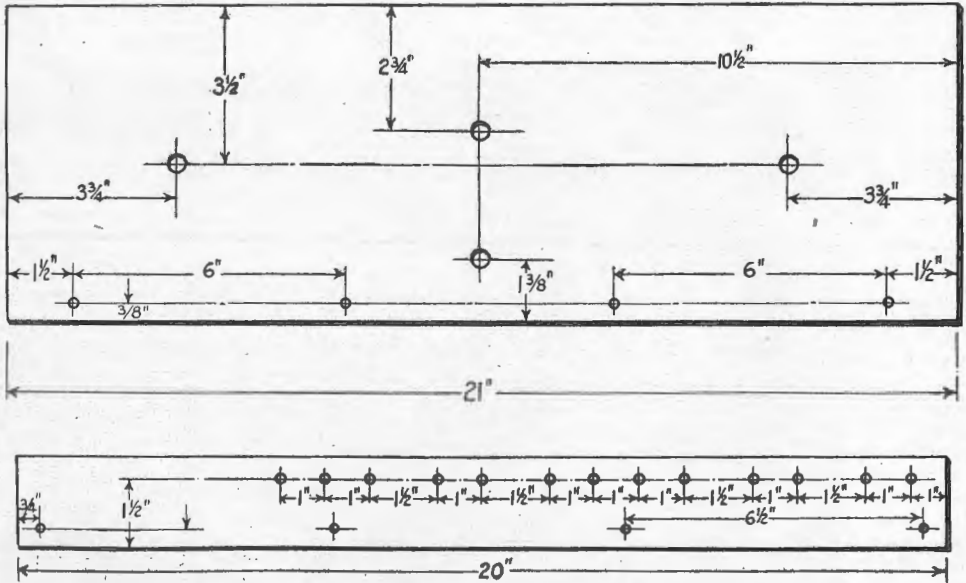


FIG. 5: Showing all dimensions for drilling the panel (above) and the terminal strip. The panel measures 21 x 7 inches, and the terminal strip 20 x 2.

No difficulty will be encountered in drilling the panel if the drilling diagram (Fig. 5) is followed closely. Only the position of the centre-hole of the three-gang condenser is indicated, as a template is furnished with the condenser; it should be used in conjunction with a centre-punch for marking the screw holes. Some care must be exercised in placing the catch-screw for securing the Emmco vernier dial. If the template supplied with the dial is used, the catch screw will foul the lower mounting-pillar of the three gang condenser. By drilling the hole a shade higher than the spot indicated by the template, it will just clear nicely. Another—and perhaps the best—way of overcoming the difficulty is to mount the condenser upside down.

As far as the construction of the Peridyne Five is concerned, little explanation is needed. The back-of-panel view (Fig. 2) gives a good idea of the location of all the parts, so we will content ourselves with mentioning several little points which may assist the constructor. After being drilled and cleaned up with methylated spirits, the panel is screwed securely to one edge of the baseboard, using heavy screws of good length—3/4 in. is about right. The battery switch, three-gang condenser, vernier dial, rheostat, and variable resistance R1 are next mounted on the panel in the order named. The Peridyne coil units C1, C2 and C3, are now screwed down in the positions shown, and it is quite essential that they be mounted with the markings on their terminals corresponding with the markings in the pictorial diagram (Fig. 6). Make very certain on this point. The five valve sockets (turned with the moulded arrow pointing in the correct direction), crystal detector (which is mounted in the Cyldon Tempryte clips), the Radiokes r.f. choke, two Amperites, Philips resistance-coupled unit, and Fer-

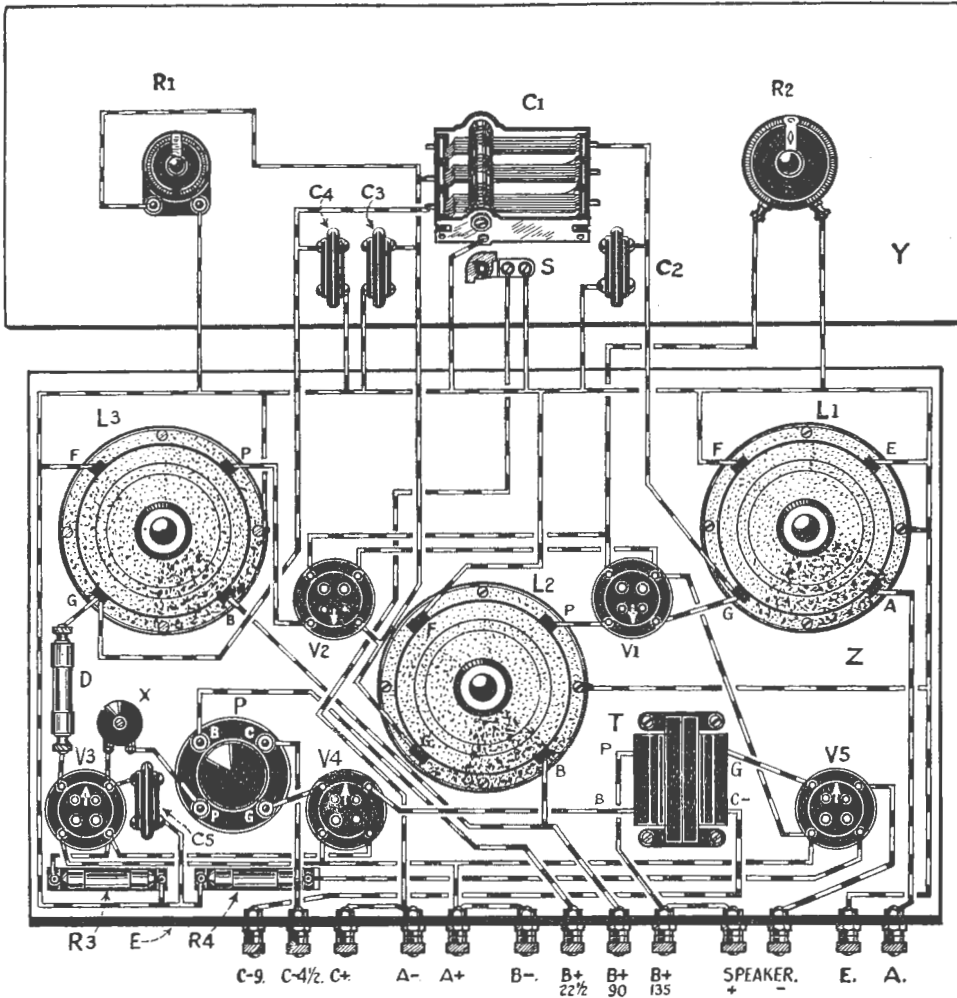


FIG. 6: A pictorial wiring diagram showing all the connections. The indicating letters and figures correspond with those on the other illustrations.

ranti transformer should be laid out on the baseboard until their proper relative positions are determined, then they are screwed down firmly. Attached to the back edge of the baseboard is the bakelite terminal strip, particulars of which are given in Fig. 4. This carries 13 terminals, but these are not to be mounted until the wiring is being carried out. The Sangamo fixed condensers are in all cases supported by the wiring itself, and are not screwed down.

Wiring the Parts.

Fig. 6 shows all the connections between the various components, and it will be noticed that comparatively few wires are used. Before starting to wire the set, we want you to be quite clear on this point: Many set-constructors are under the impression that, when following a pictorial diagram, each wire must be bent to the exact shape shown in the drawing, and must occupy precisely the same position in relation to other wires. This is not the case. As we have explained

previously, the artist has to draw each wire so that it will show clearly, and will not be confused with other adjacent connections. This is especially true where several wires run parallel with each other. In the actual set, it may happen that the wires are insulated, and are run so close together that they may touch. Again, two wires might run parallel, one above the other. Obviously, it is impossible to draw these wires in a flat plan. The artist must indicate them as running side by side, and well clear of one another.

So, when you wire up a receiver, proceed in this way: Using a pencil or some sharp instrument as a pointer, trace out a wire on the drawing, noting the different terminals which it connects together. Sometimes a wire simply runs from one terminal on one part to one terminal on another—a simple connection. Another wire may do the same thing, but may have several other wires joined on to it as it goes along. In any

case, just find out which terminals are connected together, and join them all together by the shortest route.

As far as running wires close together is concerned, just watch this point: Any wires connected with the grid terminals of the valve sockets or the stationary plates of the variable condensers, should be kept at least half-an-inch away from other wires. It is a good plan to follow the same procedure with any wires connected to the plate terminals, though this is not so important. Any wires connected to the filament terminals, or connecting ultimately with any of the batteries, may be bunched together without any harmful effects, provided, of course, they are suitably insulated from one another. Actually, it is an advantage to run these battery wires close together where convenient, as the capacity between the adjacent wires forms a small by-pass condenser, which is desirable.

In our own Peridyne, we used 18-gauge tinned copper wire, covered, where necessary, with spaghetti tubing. Reference to the photograph (Fig. 2) will show that sharp bends have been avoided, the wires instead running in gentle curves. All the wires in the battery circuits have been insulated with spaghetti, but some of the bare wires in the r.f. circuits show clearly. All joints are soldered. It is best to wire the filament circuits first, then the "B" and "C" battery circuits, finishing up with the radio-frequency portion of the circuit—that is, the wires connected to the plate and grid terminals, and the fixed plates of the variable condenser. Notice the .00015-mfd. Sangamo fixed condensers, C2, C3 and C4. The purpose of these condensers is to increase the maximum capacity of each .00035 section of the three-gang condenser up to .0005 mfd., as a .0005-mfd. three-gang unit was not obtainable when the set was built. As the coils demand a .0005-mfd., this means was chosen to provide the necessary maximum capacity to enable the higher wavelength stations to be tuned in. The fixed condensers are supported by their own connecting wires, as mentioned previously.

Notice that the connections to the primary of the Ferranti audio transformer "T" are reversed. This was done intentionally in order to eliminate a "motor-boating" tendency which was present when the receiver was used on a "B" battery eliminator. Reversing the primary connections had the desired effect, and no ill-effect was noticed with regard to either volume or tone. It may not be necessary to reverse these connections in every case.

Batteries and Valves.

All the connections should be gone over carefully, and checked with the diagram, before the valves are inserted, as it is an easy matter to make a wrong connection, and easier still to leave one out altogether.

The batteries are connected in the following way: The terminals marked "A—" and "A†" are connected to the negative and positive terminals of the "A" battery (4-volt accumulator), respectively. Three 45-volt "B" batteries furnish the 135 volts of "B" battery necessary. The "B—" terminal is connected to the "—" terminal of the first "B" battery, and the "B†22½" terminal to the "22½" terminal of the same battery. From the "45" terminal of this same battery, a wire goes to the "—" terminal of the second "B" battery. The "B†90" terminal is connected to the "45" terminal of the second battery, and from here a wire is run to the "—" terminal of the third "B" battery. The

"B†135" terminal is connected to the "45" terminal of the same battery. Now for the "C" battery: Two 4½-volt "C" batteries are necessary. The "C†" terminal is connected to the "†" terminal of the first "C" battery and the "C—4½" terminal to the "4½" terminal of the same battery. From the "4½" terminal of this battery, a connection is made to the "†" terminal of the second "C" battery, and, lastly, a wire is run from the "C—9" terminal to the "4½" terminal of the same battery. This completes the battery connections, which should be checked over minutely.

We are using 4-volt Mullard valves in the following combination: Sockets V1 and V2, PM.3; socket V3, PM.3A; socket V4, PM.4; socket V5, PM.254. This last is a power-valve, capable of handling the enormous output of the receiver without overloading and consequent distortion. The valves mentioned operate from a 4-volt accumulator, and consume little current.

The remaining connections to be made are those of the aerial and earth to terminals "A" and "E," and the loud-speaker to the terminals so marked. When this has been done, the set is ready for its initial test.

Adjusting the Peridyne Shields.

A bakelite knob will be noticed on top of each of the three Peridyne units. These knobs control the movement of the tuning shields, and should be turned as far as they will go towards the left, so that the shields are as far as possible from the coils. Turn on the battery switch, and turn the rheostat R2 about half-way round. Turn the oscillation control R1 as far as it will go towards the left—counter-clockwise. Rotate the tuning dial until a station is picked up, perhaps in the form of a whistle. If this whistle,

or carrier-wave, is present, move the oscillation control R1 back towards the right until the whistle ceases, when music should be heard. Adjust the tuning dial for maximum volume, after which the Peridyne shields are ready to be adjusted.

No very definite directions can be given for this, except that it is simply a process of "try and try again" until the best positions for each of the three shields is found. Half-an-hour used in playing with these shields will be well spent, as the adjustment of the shields means everything to the Peridyne. It may be said that the adjustment should be such that the set oscillates feebly on the highest end of the dial—say on 3AR, which means that it should be possible to receive the whistle or carrier-wave of that station

Parts for The Peridyne Five

C1—Pilot 3-gang .00035 variable condenser
 C2, C3, C4—Sangamo .00015 fixed condensers
 C5—Sangamo .001 fixed condenser
 D—Carborundum detector with Cyldon Temp-ryte mounting clips
 E—Bakelite terminal strip 20 x 2 x ½ inches
 L1, L2, L3—Radiokes Peridyne Kit
 P—Philips resistance-coupling unit
 R1—Electrad Royalty variable resistance, 1500 to 100,000 ohms
 R2—De Jur rheostat, 10 ohms
 R3—Amperite, type 150
 R4—Amperite, type 1A
 S—Emmco battery switch
 T—Ferranti AF.3 audio transformer
 V1, V2, V3, V4, V5—De Jur U.X. sockets
 X—Radiokes R.F. choke
 Y—Bakelite panel, 21 x 7 x 3/16 inches
 Z—Pine baseboard 20 x 12 x ¾ inches
 Emmco bakelite dial, CCW
 13 Pilot nickelled terminals
 Spaghetti tubing
 18-gauge tinned copper wire
 Screws

Accessories

Valves:
 2 Mullard PM.3's
 1 Mullard PM.3A
 1 Mullard PM.4
 1 Mullard PM.254

1 4v. accumulator
 3 45v. "B" batteries
 2 4½v. "C" batteries
 1 Loudspeaker

when the oscillation control is turned all the way to the left.

The adjustment cannot be carried out on a local station; it is best to do it while listening to a weak distant station. Remember that the adjustment of all the units will not be the same. Particularly is this so with the first one (L1), which is dependent upon the size of aerial used. The manner in which the crystal detector is inserted in the clips is most important. On distant stations, the volume will be very disappointing if the crystal detector happens to be connected the wrong way round. An inspection of the detector cartridge will reveal a letter "G" marked at one end. This end should be connected to the grid terminal of socket V3, but in case the marking is incorrect, try reversing the detector in its clips.

The size of the aerial is not very important, but for maximum selectivity, it is recommended that a wire not longer than fifty feet overall should be used. The Peridyne has such a tremendous reserve of power that satisfactory results usually are possible with an indoor aerial. Although the set is fairly selective, in certain localities it may be necessary to connect a wavetrap in the aerial lead in order to separate 3LO from 4QG.

Needless to say, valves of makes other than those specified will give satisfactory service, and either six-volt or four-volt types may be employed. Philips, Cosmor and Radiotron—all manufacture suitable types, the names of which can be ascertained from the dealer from whom the valves are purchased.

If it so happens that the constructor already is in possession of two good audio transformers, or if, for any other reason, it is desired to substitute a transformer-coupled stage for the resistance-coupled stage of audio-frequency amplification, it is perfectly feasible to do so. Other than the actual substitution, no alteration is necessary in the circuit, but it is important that, instead of the P.M.3A type of valve which we have used at V3, a PM.3 type be utilised.

On the previous page, a list of the parts required to build the Peridyne Five with resistance coupling is published. The components mentioned are the actual makes which have been used in the receiver described and illustrated in this article. While the experienced set-constructor may make some changes in his selection of parts, it is recommended that the list be closely adhered to in order to ensure duplication of the results obtained with our own model. This applies in particular to such items as coils and condensers; in the case of parts which perform a purely mechanical function, such as sockets, dials, and terminals, substitution may be made with safety—provided, of course, good quality parts are used.

A final word: We have heard quite a lot of adverse comment, mainly from those who have not tried it, concerning the Peridyne circuit. That is always the case with anything new, and is to be regretted. However, from the results which our own model has produced—and from the way it is working at the present time—we are convinced that there is no fallacy about the Peridyne principle. It is a noteworthy receiver, and one which will be popular for some time to come.



Better in Performance Better in Design

By virtue of its special plate and cell design the EXIDE High Tension Bat-

tery (illustrated below) is superior to any other High Tension accumulator.

It provides greater and sweeter reception than is obtained with battery eliminators or dry batteries, which become noisy after but little use.

Its initial cost is very little more than a good dry battery, and it will probably pay for itself within a year.

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EXIDE BATTERY Type WH

This battery has a capacity of 5000 milliampere hours with a voltage of 24 and a mid-point tapping at 12 volts.

Exide

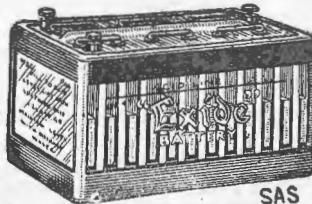
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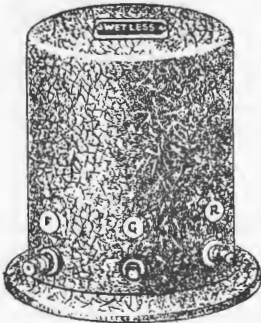
TELEPHONE CENTRAL 6111 (3 LINES)



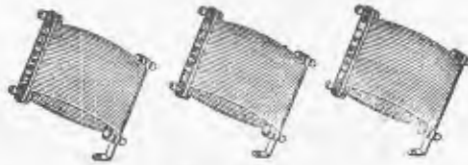
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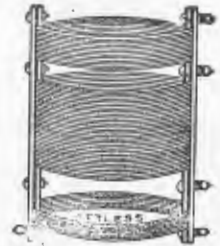
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 "Wetless" Solodyne Kit with two Neutralising Condensers.
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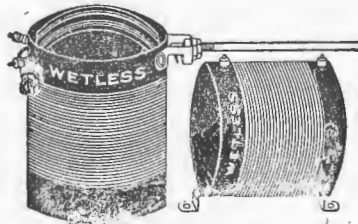
NEUT COIL KIT
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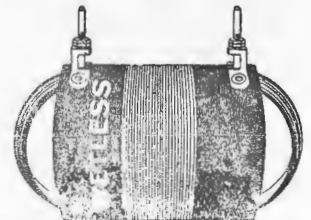
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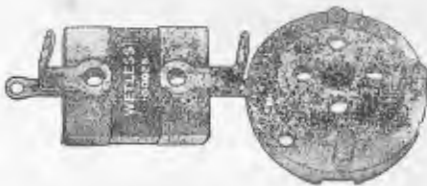
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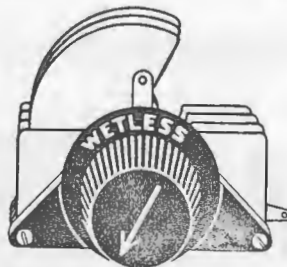
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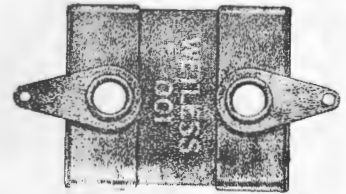
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"B" TYPE.
GRID CONDENSER is specially made for attaching directly to valve socket terminal



MIDGET CONDENSER
 "Wetless" Midget Condensers, 3-plate, 4/3; 5-plate, 4/9; 7-plate, 5/3; 9-plate 5/6; 11-plate, 5/9; 13-plate, 6/3 each.



"B" TYPE.

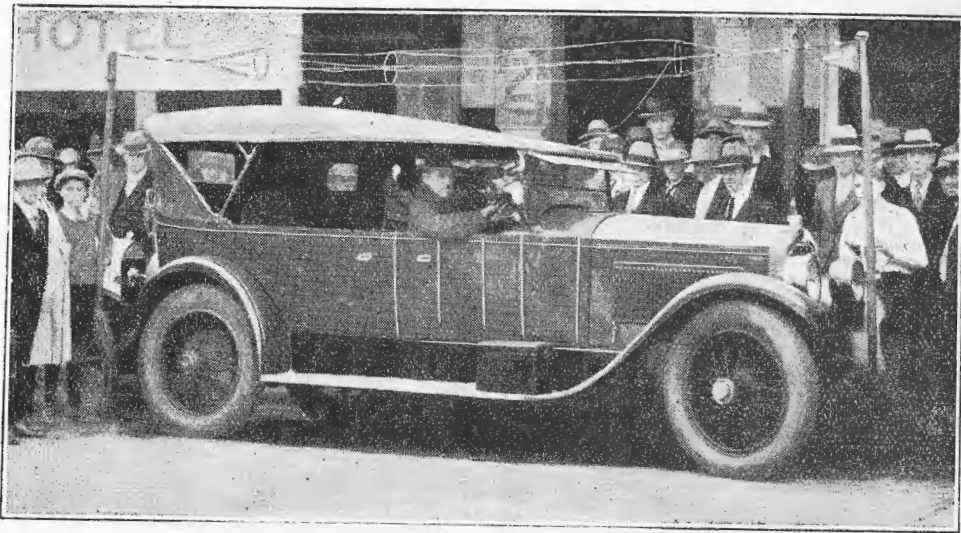
"WETLESS" MICA CONDENSERS

A. TYPE.		B. TYPE.		B. TYPE		Each
.0001	1/6 Each	.0001	2/- Each	.003	...	2/6
.00015		.00015		.004	...	2/6
.0002		.0002		.005	...	3/-
.00025		.00025		.006	...	3/6
.0003		.0003		.0075	...	3/9
.0004		.0004		.01	...	5/-
.0005		.0005		.02	...	5/6
.001		.001		.0025 (with clips),	2/6 each.	
.002		.002				
.00025 (with clips, 1/9 each.						

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Our photograph depicts the tourist car outside the Australian Hotel, Brisbane. Note the substantial arrangement of the aerial system.

Touring with Radio

WHILST to-day it may seem a far cry from Cobb's coach to a Packard Eight, it is, after all, not such a great number of years ago when overland passengers were obliged to sit bolt upright in a creaking, swaying coach, blinded by dust, overcome by heat, and weary with long days of slow travelling over very rough highways.

Then came the railways, offering travellers greater speed and more comfort on long journeys. The coach gradually fell into oblivion, as iron roadways extended to the more populated portions of the Commonwealth, until to-day, the coach—except in very remote places—is regarded as one of the relics connected with early pioneering days in Australia.

Of late years the motor vehicle has been making inroads upon the railway traffic. Because of improved roads, greater travelling comfort, more opportunities to view and enjoy the roadside scenery, motor travelling is becoming increasingly popular. At least one company—the Victorian Tourist Service—is making a bold bid for Interstate passenger support, by giving its passengers the added enjoyment of listening-in throughout the long trip.

The arrival of the first car of this line to reach Brisbane created quite a little stir among those who saw it. Canopied by a substantial four-wire aerial, the big Packard rolled slowly down Queen Street. Halting at the entrance of a leading hotel, a curious crowd quickly gathered to see what, to all appearances, looked like a portable broadcasting station.

The driver of the car (Mr. Bruce Newnham) told

a representative of this paper that the car was making its maiden tourist trip between Melbourne and Cairns with a full complement of passengers.

By the courtesy of Mr. Newnham, we were privileged to inspect the wireless outfit—which was remarkably well designed and compactly arranged.

Description of the Receiver.

Affixed rigidly to the chassis at each end of the car are two metal poles, which project a couple of feet above the hood. Between them is stretched a four-wire cage or "Navy type" aerial, about eight feet in length. An ingenious feature of this aerial is that, in addition to the four copper wires comprising the aerial proper, there are also four galvanised iron wires, the purpose of these being to relieve the copper wires of all strain, and so maintain an even tension on the aerial.

A down-lead is taken to the receiver, which is mounted on the back of the front seat, so that it can conveniently be operated either by the driver or by the occupants of the two "dickey" seats.

The receiver is a really fine piece of work. It is a five-valve set, and was built to Mr. Newnham's specifications by Mr. Osborne, of Howard Street, Hawkesburn (Vic.). Measuring only 15 x 7 x 7 inches, the cabinet contains two stages of untuned radio-frequency amplification coupled by A.W.A. "All wave" transformers, a valve detector, and two audio stages using All-American transformers. Philips A.409 and B.406 valves are in use, drawing their filament supply from a small Masse four-volt accumulator. Two 45-



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volt Columbia "B" batteries are housed under the front seat alongside a 4½-volt "C" battery. The volume control is a "Clarostat," and the output of the receiver is ably handled by a Philips "Baby Grand" loudspeaker mounted on the receiver and facing the back seat. The receiver is "earthed" simply to the rug-rail in the car, thus making an indirect connection with the chassis, which acts as a capacity earth or counterpoise.

As to results, Mr. Newnham mentioned that the party had had good reception of stations in one or more States (in daylight) throughout the entire trip from Melbourne to Brisbane. "We would not be without the radio for anything," he said. An amusing incident occurred when the car was crossing a ferry some distance this side of Lismore. 4QG's morning news session was picked up, and the party was informed that it had just left Lismore. The news had gone to Brisbane by land-line, and had then retraced its route—this time through the air!

Mr. Newnham is a great admirer of our own "A" class station. He endorsed the assertion of many Southern visitors, that 4QG is listened to "down South" with more appreciation than is accorded to the Melbourne and Sydney stations. 3LO, according to Mr. Newnham, is far from faultless.

"Truly," remarked the "Radio News" man, "is a prophet without honour in his own country!"—a sentiment with which Mr. Newnham laughingly agreed.



MISS EILEEN BOYD.

The distinguished Southern Artist who recently visited Brisbane with the film, "The Adorable Outcast," and appeared in the special prologue at the Tivoli Theatre.

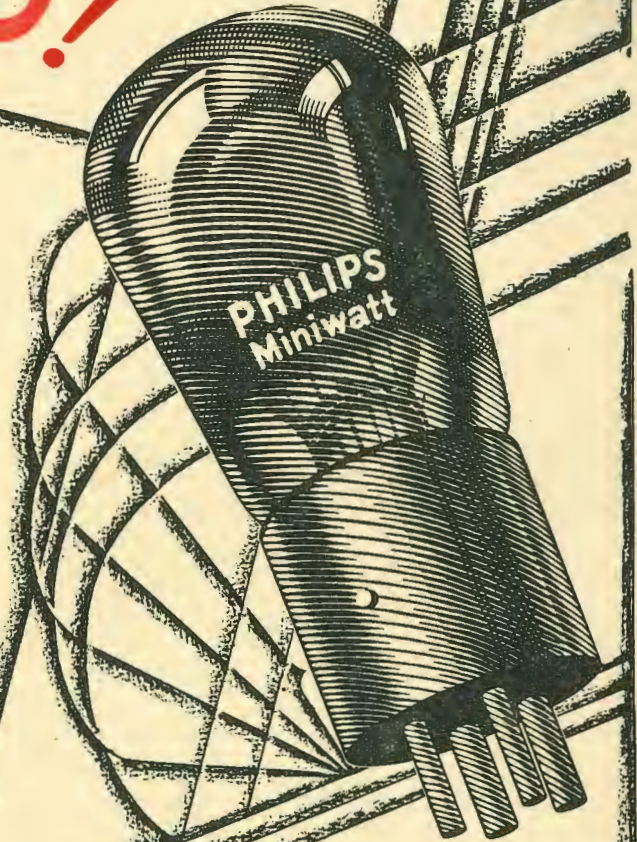
During her brief stay in Brisbane, Miss Boyd appeared at 4QG and delighted listeners with some beautifully rendered songs from her extensive repertoire.

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A409 (4-volt) 13/6	B406 (4-volt) 13/6	B409 (4-volt) 15/-	B605 (6-volt) 13/6
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<u>DETECTOR—</u>		<u>POWER</u>	
<u>FIRST AUDIO</u>		B405 (4-volt) 20/-	
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NOW more so than ever before does the use of YALE Radio Batteries cost you less per hour of radio reception. The reduction in YALE Radio "B" Batteries means no reduction in quality. They still give the same perfect performance for which every YALE Battery is noted.

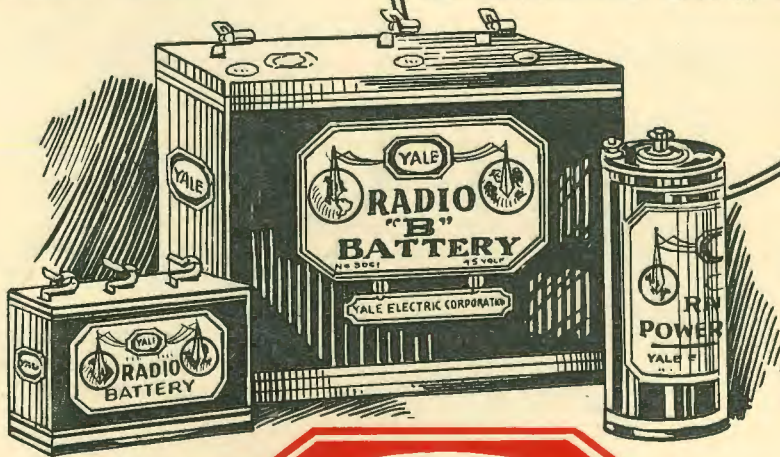
The same powerful pick-up of depleted energy during idle hours—greater recuperation;—the reason why YALE "B" Batteries live longer are still outstanding. And to this exceptional advantage of "Plus Power" is added a quietness and steadiness of energy-flow that transforms each radio hour into sixty minutes of uninterrupted delight.

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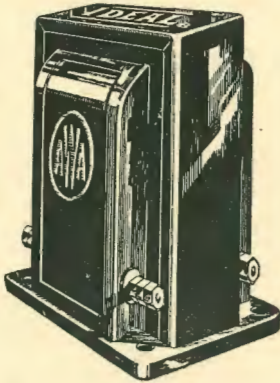
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Improved Features Give Improved Reproduction

THE beautiful, deep, full tone and faultless technique of a noted 'cellist, or the sweet, high notes of a lyric soprano—none of these qualities are lost when your set is equipped with the NEW A.W.A. "IDEAL" TRANSFORMERS. The outcome of long and patient research work by the Engineers of A.W.A., this new Transformer has many improved features which bring greater realism to radio reproduction. It has increased size of iron core, more copper used in windings, robust construction, and handsome phosphor-bronze enamel finish.

Best results are obtained by using two A.W.A. IDEAL Transformers (one in each stage).

Equip your set with them to-day, and results will astonish you. Supplied in ratios of 2-1, 3½-1, 5-1, 9-1.



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Price 18/-

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for use Singly or in Gang Operation

THE new A.W.A. Logarithmic (Centraline) Condensers have been designed especially for Australian conditions. They meet the demand for a variable condenser suitable for use either singly or in "gang" operation. These condensers have been designed with true logarithmic characteristics which eliminates bunching of stations, and makes tuning easy. The insulating material has been kept extremely low; minimum capacity is low; true alignment with contact bearings, and rigid construction ensure freedom from all troubles. Procurable in all standard capacities.

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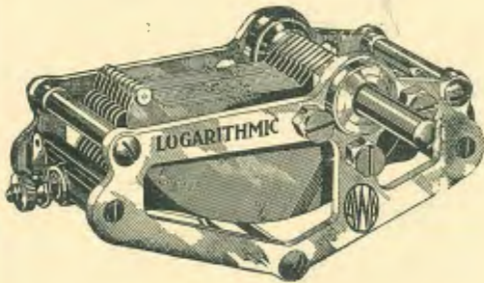
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Peerless Dual Rheostats, 10 and 30 ohms, 2/6 each.
 C. & H. Rheostats and Potentiometers — a few left, 1/- each.
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 Ormond Condensers, .00025 and .00035 capacity, 7/- each.
 Formo 3-Gang Condensers, a splendid line, 55/- each.
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 Series Parallel Switch complete with 10 studs, 2 stops and nuts. **ONLY 6d the lot** (not even the cost of the studs).
 Terminal Strips, 1/6 each.
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Large Comfortable Earpiece which positively excludes all extraneous noises.

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 Sample of 18 new model American Cone Speakers to be cleared at special Exhibition Sale Prices.
 Poly Claro Plugs (a Polymet Product —clarifies and harmonises loud-speaker reception), 4/- each.

.001, .002. To clear, 1/- each.
 W.R.C. Condensers, .0005, 9/- each; .00035, 9/6 each; .00025, 10/6 each.
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 Eclipse Radio-Frequency Chokes, 4/6 ea.
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 Midget Condensers, 3-plate, 3/ each; 5-plate, 3/3; 7-plate, 3/6; 11-plate, 3/9.
 U.X. Sockets, 1/6 each.
 Aerial and Earth Switch Arrestors, 1/6 each.

4in. Dials, 1/- each.
 0-50 Voltmeters, 3/- each.
 0-50 Voltmeters, 4/6 each.
 Combination Voltmeter 0 to 10 and 0 to 100, 6/6 each.
 W.R.C. Slow Motion Vernier Dials, 4/- each.
 Big Boy Transformers, 6/6 each.
 Telsen Ace Transformers, 8/6 each.
 Formo Transformers, 10/- each.
 W.R.C. Transformers, 12/6 each.
 Carborundum Detectors, Trackson's Price 9/6 each.
 New Formo 1928 Log Condensers, .00025, .00035, .0005. All One Price 8/6 each.

Regular Supplies of COLUMBIA "A," "B" and "C" BATTERIES. Headquarters for PHILIPS, CONDOR, RADIOTRON, MULLARD and OSRAM VALVES. ENQUIRIES INVITED. CLEAN NEW STOCK. PRICES RIGHT.
 Buy your Radio and Electrical Requirements from TRACKSON'S—the Radio Rendezvous—AND SAVE MONEY.

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The Electrical and Radio People

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BRISBANE

The Radio and Electrical Exhibition

HELD AT BOHEMIA THEATRE, SOUTH BRISBANE, JULY 16—30, 1928

Great Success Attends Well-Organised Effort

BRISBANE is not likely to forget the Radio and Electrical Exhibition of 1928 for a very long time to come. It will live in the memory of those connected with the running of it, and also those who visited it, as the most wonderful demonstration of public interest in wireless Brisbane has yet seen. Indeed, we might go further and say that the show just concluded was the biggest and most successful radio exhibition yet held in Australia.

Although planned to run for one week, it was found necessary to extend the season to two weeks—so great was the public interest displayed. In making the extension, the promoters fully expected a slight "falling-off" in attendance towards the end of the second week, but attendance figures proved the last two days of the show to be among the heaviest of the season.

The Exhibition assuredly deserved all the success that was bestowed upon it. The scheme was very well organised by Station 4QG, which did everything within its power to attract the crowds. No expense was spared to make the show the highly popular affair it proved to be, and it is a credit to all



The Premier (Hon. W. McCormack, M.L.A.) and the Director of 4QG photographed immediately after the official opening.

concerned to know that not a single hitch occurred in the running of the Exhibition or in the broadcasting arrangements throughout the entire fortnight.

People who visited the Radio and Electrical Exhibition received splendid value for their admission money. Not only were they able to see the many fine displays of modern radio and electrical apparatus, but they were also able to seat themselves in comfort and listen to the programmes being broadcast from the stage.

The bedtime storytellers provided a pantomime for the children nightly, and by 6.30 every night, it was well nigh impossible to get inside the theatre. It cannot be denied that the ever-

popular bedtimers from 4QG provided a very big "draw" to the Exhibition, and the professional manner in which they made their appearance, and in which their numbers were staged, reflects great credit upon the storytellers themselves, their producer (Mr. Billy Maloney), and their stage manager (Mr. Harry Humphreys).



Some idea of the huge crowds which attended the bedtime sessions may be gathered from this flashlight photograph.

Among the Radio Exhibitors at the Radio and Electrical Exhibition

It would have been a difficult task indeed to name the best exhibit at the show, should one have been called upon to do so. Without exception, each exhibitor, regardless of the size of the stall, made very effective use of the space. Some excellent displays were arranged, chief among which were the following:—

Stands No. 1, 2 and 3 comprised the Amateur Section, conducted and controlled by "The Queensland Radio News," a complete description of which appears elsewhere in this issue.

Stand No. 4.—An attractive display by Messrs W. T. Henley's Telegraph Works Co., Ltd., was arranged in this stand, comprising various types of wires, cables and accessories. So much depends upon the efficiency of wires, cables, and flexibles in radio and electrical work. Messrs. Henley's Ltd. have specialised for many years in the manufacture of all types of wires and cables, until to-day, they hold a large portion of the world's market in this particular direction.

Stands 5 and 6.—The mere fact that these two stands comprised a display of Philips Radio Products was enough to cause an unusual amount of attention to be centred around the most attractive display, portion of which is illustrated opposite (No. 7). A mammoth "PCJJ" speaker formed the centre-piece of this display, while a huge Philips valve (whose filament consumption, we should imagine, would not be in keeping with the economy of a regular Miniwatt!) was the subject of many wondering eyes. The complete range of Philips Products was tastefully arranged on the stands, in a manner that made inspection an easy task.

Philips valves (all types), PCJJ loudspeakers (three models), audio transformers, resistance capacity coupling units, battery chargers, trickle charger, and also those beautiful and highly efficient Philips "B" and "B-C" Eliminators, comprised what was altogether an interesting and representative showing.

Stands 7, 8 and 9 was essentially an Australian exhibit, being the display of A.W.A. Products, arranged by Messrs. J. B. Chandler & Co., their Queensland distributors. Here, surely was an object lesson in what Australia is doing in the field of radio manufacturing. Everything from the miniature broadcasting station right down to the A.W.A. valve sockets, was a product of Australian workmanship. In looking over the new line of Radiola receivers—particularly the Screened Six and the Straight Six—one was made to wonder why we should import such quantities of foreign radio material when here in our own country an organisation such as Amalgamated Wireless (A.Sia.) Ltd. are producing such a complete and splendid line of radio receivers and radio accessories.

Stands 10 and 11.—"The Radio Rendezvous," as Messrs Trackson Bros., Ltd. term their business in Elizabeth Street, was well represented at the Radio and Electrical Exhibition by a complete display of radio receivers and accessories handled by this popular radio store. As agent for many well-known electrical lines such as Heemaf motors, Condor lamps, Marelli fans, etc., etc., their stalls were given over to a display of electrical lines as well. Altogether a bright and attractive display of quality lines that represented wonderful value at the prices asked.

Stands 12 and 13.—There are some products which, by their inherent goodness are universally recognised as leaders in their field. Such are "Igranic" radio products, "Brown" loudspeakers, and "Oldham" accumulators. British built all three, and represented in Queensland by Messrs Noyes Bros. (Sydney) Ltd., Perry House, Albert Street, Brisbane. An attractive showing of the products of all three manufacturers drew many radio fans around Noyes Bros.' display. As agent for some big electrical concerns, it was to be expected that quite a large portion of the stands was given over to the display of such lines, which are far too numerous to mention here. The illustration opposite (No. 1) gives some idea of the appearance of the display.

Stand 14.—Messrs Edgar V. Hudson, as agent for two widely known names in radio—Mullard and Ferranti—arranged a very fine display of both of these British products in Stand No. 14. Mullard, in introducing the wonderful P.M. filament, has led the way in valve economy, and others have quickly emulated Mullard's excellent example. Ferranti, too, has won a great following in Australia. "Quality pays every time," and by following this policy, Ferranti products are gaining in public popularity all along the way.

Stand No. 15 featured a display of the many excellent lines carried by the progressive radio warehouses of Messrs Edgar V. Hudson. To detail a description of each is out of the question

here. Suffice it to mention a few of the many well-known lines for which this firm is agent: Mullard, Ferranti, Radiokes, De Jur, Amperite, Advance, Mayolian, Luxor, Audiola, Cydon, Emmco, Deal, Grodan, Racon, Simplex, Marinette, Sonochorde, Ormond, Majestic, Frost, B.T.H. Lotus, Kolster, Belling-Lee, Collett, Ultra Handy, H. & H., Fellows, Polar and Dayfan. Edgar V. Hudson claim theirs to be the most comprehensive radio stock in the Commonwealth, and we are inclined to agree with them!

Stand No. 19.—Harringtons display of their "Popular" and "Gilfillan" receivers, attracted a great amount of attention. In the Gilfillan line are offered several fine models, chief of which is the all-electric console, a wonderful receiver operating direct from the light socket. The "Popular" line—Australian made by Harringtons engineers—provides the choice of a good receiver at a moderate price.

Stands 20, 21 and 22.—The largest stand at the Radio Exhibition was that of The Australian General Electric Co., who occupied practically the whole of an island pavilion in the centre of the theatre. Of course, the radio portion of the display interested us more than the electrical exhibits—excellent though they were. Here the public was given the opportunity of seeing (though unfortunately not of hearing) the much-discussed R.C.A. radio receivers. The electric instrument—the Model 17—attracted the most attention, and the company report satisfactory sales of this wonderful instrument during the running of the Exhibition. The Model 16—battery model—was also much inspected, and great surprise was manifested at the neat arrangement and compactness of this sensitive 6-valve receiver. Naturally, the R.C.A. Model 100A loudspeaker was featured in the display, and demonstrators were kept busy showing interested visitors just how the R.C.A. Model 100A could "unmuffle their radio receivers—and let them sing."

ROSENFELDS
TIMBER MERCHANTS (IMPORTERS)

Oregon Wireless Masts!

GOOD high wireless masts give your set its maximum range—they permit you to pick up signals much easier than if you had a low aerial. Decide now—put up a good set of masts. Oregon makes the best aerial masts, and you get the best Oregon from Rosenfelds—the Timber Merchants. Masts in one length from 30 to 80 feet lengths.

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Phone C5990-1 - BRISBANE
SPECIALISTS IN OREGON



Some of the Radio Exhibits at the Radio and Electrical Exhibition.



UNCLE PETE, who, with his parrot "Rastus," created much fun at the Radio Exhibition.

The

Bedtime Stories

at the Radio and Electrical Exhibition



"IKEY" was the victim of many a joke at the Radio Exhibition.

There were many surprises in store for those who visited the Radio and Electrical Exhibition, but the biggest surprise was provided by 4QG's Bedtime Storytellers, who appeared nightly in a well-produced miniature pantomime—to the keen delight and amusement of many thousands of children—and grown-up children as well.

It was something of an achievement for these popular bedtime storytellers to adapt themselves to the stage so readily. Practically every member of the party was strange to the footlights, yet to view the performance, one could never have guessed that such was the case, so excellently did the company acquit itself..

The nightly opening chorus was set to the tune of "How Do You Do." The curtain went up, revealing a huge microphone erected in the centre of the stage. Uncle Ben broke through the paper-covered aperture, and introduced the company one by one as they, too, thrust their heads through the microphone circles.

At every session throughout the whole fortnight the theatre was filled to overflowing. Crowds blocked every passage way, and although the sessions were timed to commence at 6.30 p.m., by 5.30 every available seat was filled.

The nightly productions were bright with good music, good humour, and beautiful costume and stage effects, and the fact that huge crowds were attracted to such a show was not to be wondered at.

The antics of Uncle Pete and "Ikey," were particularly funny, and proved great entertainers for the children.

"Sandy," Uncle Ben, Grandfather,

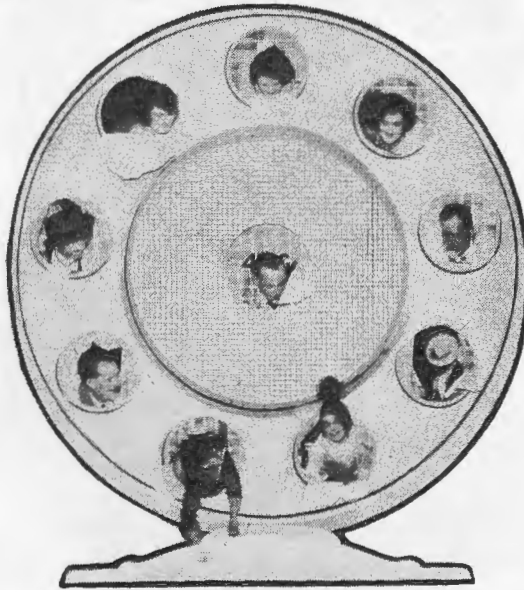
were well received by the huge audiences, while Little Miss Brisbane, Bebe and Bunty appeared in musical numbers looking very charming indeed.

Great credit is due to Mr. Billy Maloney for the excellent manner in which the entertainments were produced. To turn out a high-class company of artists from a group of pure amateurs with but a week's rehearsal is no mean feat, and congratulations are due to Mr. Maloney and, indeed, to every member of the company.

The Radio and Electrical Exhibition will live long in the memory of those children who were privileged to attend the show. They will listen in to their favourite bedtime storytellers with a better appreciation of their efforts—now that they have had the pleasure of seeing them "in the flesh."

Altogether 14 shows were staged by the bedtimers, comprised of 12 night performances and 2 Saturday matinees. Five distinct changes of programme were given, necessitating much rehearsing.

The Studio Orchestra, under the conductorship of Mr. Alf. Featherstone, rendered valuable assistance in the musical side of the performances, whilst the company was assisted in the vocal choruses by Miss Eileen McLennan, Dulcie Maloney, Mrs. T. Roberts.



The Bedtime Storytellers are introduced one by one by Uncle Ben.



"Jingle Bells" was a very pretty and highly popular number.

The Amateur Competitions

IN point of size, the Amateur Competition Section exceeded the most optimistic expectations of those responsible for its organisation. The large stall erected for displaying the exhibits was considered to be any amount large enough, and the shelving provided ample in area. Actually, however, the various sets and pieces of apparatus had to be crowded close together, and it was even necessary to place some of the larger receivers and transmitters outside the boundary of the stall, in an extra enclosure.

There was no doubt about the interest attached to the exhibit, as far as the public was concerned. Night after night the space surrounding the stall was crowded to suffocation, and a large number of people found that their only chance of examining the entries in detail was to visit the Exhibition during the daytime, when the crowds were not so dense.

Although the quality of much of the work in evidence reached a very high standard indeed, one has to admit frankly that it was rather disappointing to note that, with few exceptions, the receivers exhibited in Sections 5 and 6 (covering the 3, 4, 5 valves and over class) followed the same old run of Browning-Drakes, Neutrodyne, and even honeycomb-coil designs. Apart from one Strobodine (a recent modification of the Super Heterodyne), none of the newer circuits—such as the Solodyne and the Peridyne—was represented, and there was very little originality shown in this section.

The short wave section was much more encouraging. Here were found some very well-designed sets—nothing new, certainly, but several with sufficient merit to make the task of the judges in selecting the second and third prize-winners quite a difficult one. The set which carried off first prize—and incidentally the exhibit which gained the 4QG Silver Cup—was in a class by itself, and the decision of the judges admitted of no criticism. A point worthy of note is that the first prize winning set was a totally shielded job (it is illustrated on the following page), the second prize receiver had a nickel-plated brass panel, acting as a shield, and the set which was awarded the third prize had a metal shield behind the panel. This bears out our contention that a bakelite or hard-rubber panel has no place in the modern short-wave receiver, which demands either partial or complete shielding in order to eliminate troublesome body-capacity effects.

Section 1 (best Piece of home-made apparatus, juvenile, 15 years and under) was highly satisfactory from every aspect. There were six entries, and the quality of the work on exhibition was unexpectedly high. The young enthusiasts who entered in this section are deserving of great praise for their efforts.

With regard to Section 2 (most novel and original crystal set), it is interesting to note the judge's comments which appear on another page on the question of a true definition of a "novelty." Several of the efforts in this



THE 4QG CUP.
Won by Mr. K. Elliott at the Radio Exhibition.



The Amateur Competitions Stall, conducted by "The Queensland Radio News" and "The Broadcast Bulletin."

section, whilst interesting in themselves, were quite without merit when considered from the strictly novel point of view. There were 13 entries in this section.

Only four sets were exhibited in Section 3 (best made crystal set). No doubt the reason for the small support this section received was that the majority of amateur set constructors nowadays attempt something more ambitious than a crystal set, and again, it is true that there is not a very wide scope for originality in this branch.

In Section 4 (best 1 or 2 valve set), there were six entries. The 2-valve Reinartz receiver which was awarded first prize, merits special mention, and the constructor (W. Fullagar, Norman Park) is to be congratulated on the production of such a fine piece of work. This set, which was illustrated and described in detail in the July 30th issue of the "Broadcast Bulletin," undoubtedly was one of the best soldered receivers in the competitions.

Sections 5, 6, and 7 (covering sets with from 3 valves upwards) revealed nothing outstanding with the exception of some splendid examples of cabinet work (which were not taken into account for judging purposes). The entries in these sections totalled 27.

The section with the largest number of exhibits was, Section 8 (best home-made piece of apparatus), with 19 entries. Here the work submitted reached a really excellent standard, and the entries were representative of all branches of the art. Shielded wavemeters, meters, electric pick-ups, power transformers, "B" eliminators, battery chargers—all were featured. The first prize winning wavemeter was equal in appearance and in general design and construction to any factory-built instrument.

There were five entries in Section 9 (most novel loudspeaker), the speaker which gained first prize being very cleverly constructed from various odds and ends. A brief description of the entries is appended to the photograph which appears on another page.

Thanks to the co-operation of the Australian Radio Transmitters' League (Queensland Division), the number of entries in Section 10 (best low-power transmitter) was most satisfactory. Nine transmit-

ters were exhibited, all being well designed and constructed. Only one point separated the first and second prize winners; both were exceptionally fine examples of modern amateur short-wave transmitter design.

Organisation.

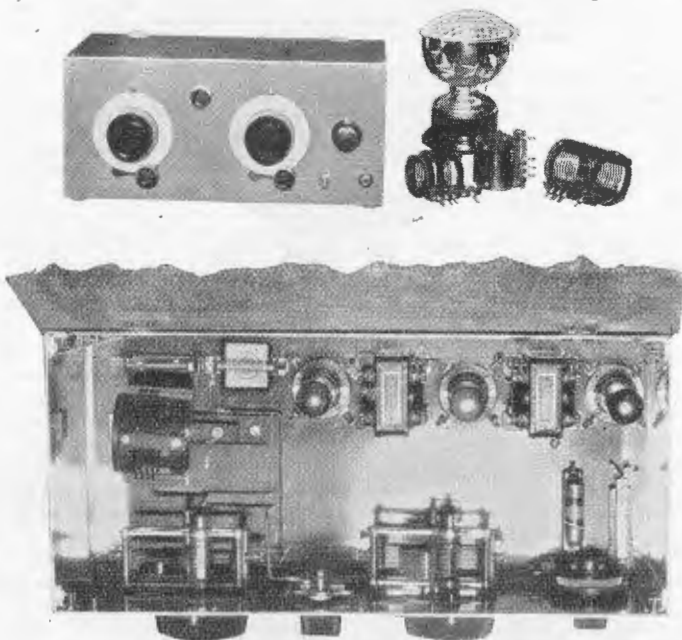
The organisation of the Amateur Competition Section was in the capable hands of Mr. Hubert Kington, of "The Queensland Radio News," who, assisted by members of the staff and by volunteers from the A.R.T.L. (Queensland Division) and the Woolloowin Radio Club, was responsible for the conducting of the

stall during the term of the Exhibition. During the entire period, Mr. Kington was on duty day and night, and to him is due in no small measure the credit for the great success which attended the display.

Due to the generosity of the radio traders, a very attractive prize list was offered, three prizes being allocated to practically every section. It is interesting to note that the total value of these prizes reached the astonishing sum of £64/5/—probably a record for Australian Radio Exhibitions.

In addition, a handsome trophy—the "4QG Silver Cup"—donated by Messrs. Hardy Bros. Ltd.,

was awarded outright for the best constructed exhibit in the competitions. A special prize was also awarded by "The Queensland Radio News" and "The Broadcast Bulletin" to any radio club whose members submitted twenty-five or more entries.



The Magic of MORSE

SOONER or later, and better sooner than later, YOU as a radio enthusiast will turn to the magic dots and dashes, because, after all, the radio telegraph still dominates the air as far as the volume of traffic is concerned.

While the music and the radio-phone talks may be most interesting to the laity, the fact remains that many things of very great importance are being missed if one does not understand that vital spirit of sound—the telegraph code.

Let me teach you how. Sounder or Buzzer method; speed and proficiency guaranteed; terms moderate.

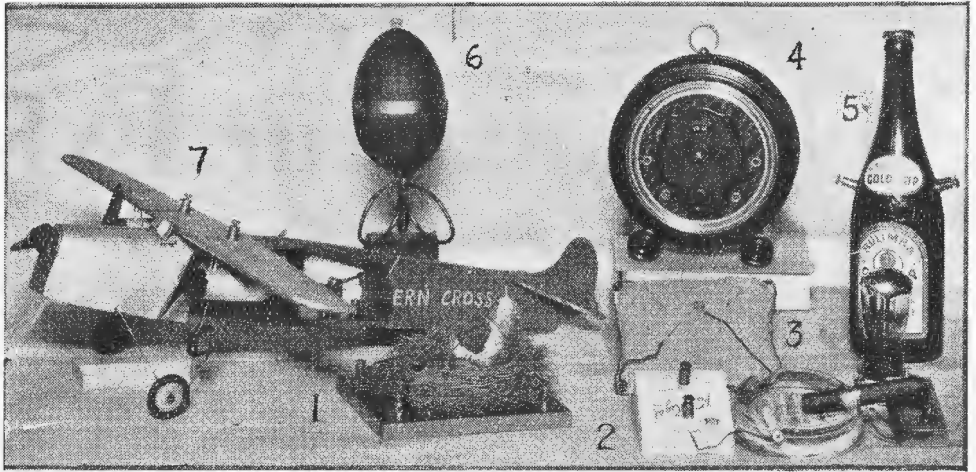
CHAS. RUNGE

(3 Years' Experience as a Morse Instructor; several years as a Commercial Operator.)

Address enquiries c/o "Queensland Radio News,"
Box 1095N, Brisbane.

Novel Crystal Sets

(1) First prize (Walter F. Scott) — a "bird's nest" receiver. The basket-weave coil forms the "nest." Master Scott has donated this set (which works well) to the Ambulance Brigade. (2) Second prize (H. A. Jiear)—a smoker's outfit; the coil is under the ash-tray; (5) Third prize (S. Fry) — a crystal set contained in a bottle.



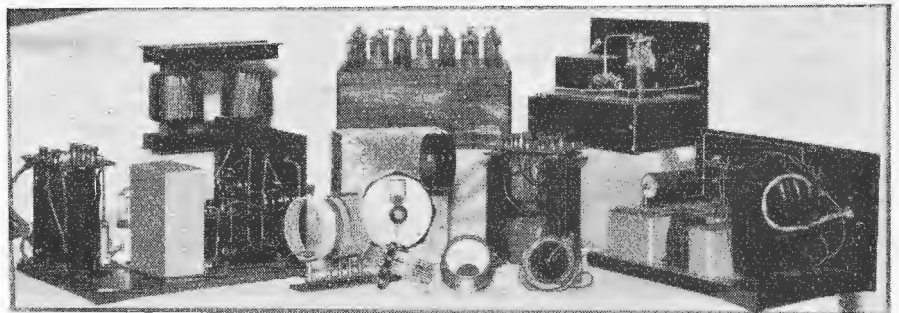
The Novel Loudspeakers

(1) First prize (M. H. Munro), a horn type loudspeaker composed of various odd parts; it is home-made, and comprises parts from a telephone magneto, a car-curettor, and a bullock's horn in conjunction with a home-made octagonal flare. (2) Second prize (E. J. Chilton), a large cone loudspeaker. The cone, which is made of linen, is mounted on a wooden bicycle rim, the actuating unit being adjustable. (3) Third prize (A. Kington), a celluloid "baby" mounted on a cigar-hox, which contains the phone unit. The body of the doll, which is perforated, forms the tone chamber.



Home-made Apparatus

Only a small portion of the exhibit is shown in the photograph. First prize (H. and C. Stephenson)—the power transformer just behind and slightly to the right of the meter (front centre). To the left of this transformer is the shielded wavemeter (J. P. Love), second prize. Third prize went to the meter already referred to (V. F. Kenna), a hot-wire ammeter, fitted with a zero-error adjuster, and calibrated by hand.



A Review of The Amateur Exhibits

The Judges' Comments

By W. T. MONKHOUSE, A.M.I.E.E., A.M.I.E., (Aust)

EDITOR'S NOTE:—On behalf of the Exhibition Committee, and of "The Queensland Radio News," we desire to express our sincere appreciation of the valuable assistance rendered by Messrs. T. W. Armstrong (Radio Inspector) and W. T. Monkhouse (President of the Queensland Division, W.I.A.). Both of these gentlemen gave a great deal of their time to the judging of the Amateur Competitions, and carried out their duties in a very exacting and conscientious manner.

Now that the Radio and Electrical Exhibition is over, it is thought that it might assist future exhibitors in the Amateur Section if they obtained some idea of the factors upon which the exhibits were judged, and also a general idea of the faults that tend to mar their workmanship. Before judging was proceeded with, it was thought that some common basis should be decided upon, and after a discussion, five sections for points were arrived at: 20 points or marks were allotted for each section, making a total of 100 for each exhibit. For certain exhibits the whole of the sectional points did not apply, and the marks were first arrived at pro rata, and then a percentage made. The sections for judging were as follows, and are dealt with in detail:—

1. Design.—Under this heading was taken the general layout of the set. Circuit arrangements being more or less standard, they were not particularly noted, other than for general correctness. Symmetrical arrangement of the dials, position of individual units of the set in the various stages, arrangement of terminal rack, accessibility of units, and the mounting of the panel and baseboard were all factors that were noted. These factors should be carefully thought out beforehand, so that the wiring in the radio stages will be well separated and supported, and individual leads will be as short as possible. The position of the coils should be carefully considered in their effect upon each other, due to their electromagnetic and electrostatic fields. Shielding of the various units should be considered so as to reduce hand capacity. By carefully considering these factors before beginning to build, the set will have the appearance of an efficient machine instead of looking as though the various parts have been simply thrown together.

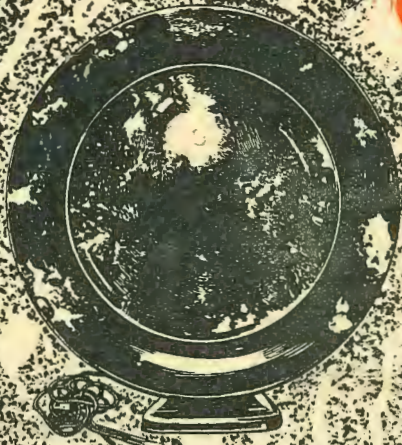
2. Control.—Proper control in a wireless set is essential and involves the following important factors: Simple control of tuning, so that the various stations can be quickly and easily tuned in; control of the detector filament temperature, of the capacity between the radio stages, and of the volume of sound from the loudspeaker. Although control of tuning these days is becoming centred in the one dial (and this seems necessary, due to the persons operating them knowing little or nothing of the radio art), such form of control, although taken into account, is not considered important in an amateur set. Simplicity is the main factor, but this must be combined with efficiency. The less gadgets one has to turn the better.

The various dials must be convenient to the hand and easy to adjust. An important adjusting device should never be placed inside the set where one has to partially dismantle to reach it.

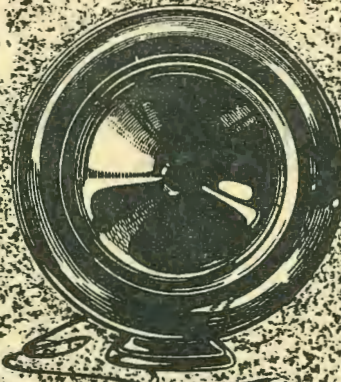
3. Components.—This section was included to give the builder who used expensive units credit for his selection of them. Good units are necessary, for it does not matter what work you do in the general design, if the effect is lost in leakage, capacity, and inductance where it is not wanted. I have seen some sets that look like junk heaps produce wonderful results, but they are exceptions to the rule, and for reliable results good units are essential. Judges expect to see exhibition sets fitted with good units, even if made by the builder, and the general value of the work expended in making the set is increased by their use.

4. Wiring.—This is one of the important sections of the work of building an exhibition set, as even with good design and components the set looks nothing if poorly wired. Point-to-point wiring seems to be coming into favour, and bare wire properly and carefully fitted is preferable to that covered with insulating material, as such coverings usually contain cotton and so are hygroscopic or moisture absorbing. All wiring should be stiff enough to remain in position and be so supported that it cannot vibrate. In the radio stages the fewer and shorter the wires the better; in fact this constitutes the art of wiring. All joints and terminal tabs should be well soldered in position. Soldering seems to be one of the operations that cause most builders trouble. Although apparently a simple operation, it is one that requires a fair amount of skill and care to do properly. The main factors to be considered to obtain a good job are to have the job clean, the surfaces to be joined well tinned, and to make the joint with a minimum of solder. To do this the soldering iron must be the right heat; if it is too hot the solder will run off the joint, and if too cold the solder will simply plaster on. Resin should always be used as a flux; a sixpenny cake of violin resin crushed to a powder and dusted on the joint will give a clean job. Better still, would be the use of resin-cored solder. Wires should not be bent at too sharp an angle, as this in the radio stages will lead to loss, and all grid leads should be as short as possible, well clear of other wires, and well insulated. Wires should not be allowed to touch the wooden baseboard. When terminating wires onto

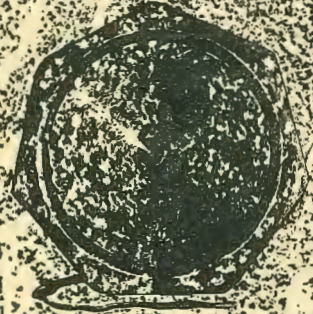
THE PHILIPS RANGE OF LOUDSPEAKERS



"PCJJ"
£6/10/-



"Junior"
£5/5/-



"Baby Grand"
£3/15/-

WOULD'N'T you like to hear better music from your radio—music which thrills you with its stark realism? Well, why not enjoy the benefit of a Philips Loud Speaker—and pay the price you want to—for there are three Philips models. Used with a GOOD Radio receiver they are revolutionary in their reproduction.

Comparison will carry conviction, so let your dealer demonstrate the Philips models to you

We have much pleasure in announcing the result of the Loud Speaker Poster Competition. Mr. H. Skinner of 9 River Road West, Lane Cove, Sydney, wins the prize of £25 for his caption "Pedigreed." We thank all competitors for their co-operation.

[Advt. of Philips Lamps (Australasia) Ltd., Head Office and Showrooms, corner Clarence and Margaret Streets, SYDNEY, N.S.W.]



PHILIPS LOUDSPEAKERS

Reception Magnified 2,500,000,000 Times!



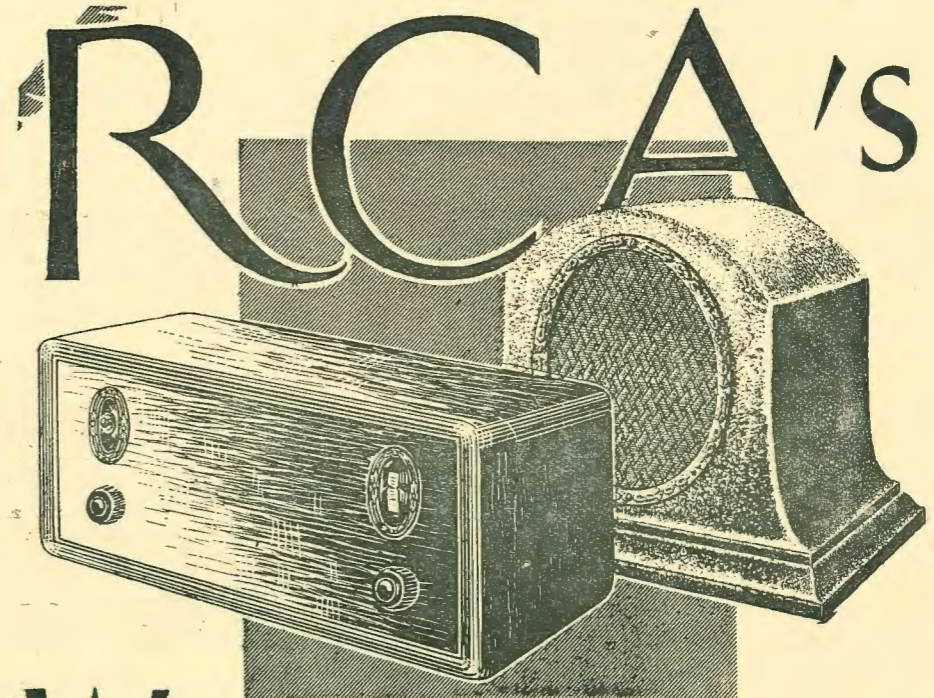
AMPLIFICATION

Amazing Volume
on long distance
Reception with
Rich, Clear Tone

RECEPTION amplified 2,500,000,000 times! Almost incredible, yet true—as you can believe when you reflect that the Model 16 is the joint achievement of such organisations as the Radio Corporation of America, General Electric Company, and others. Their combined genius has conceived unmatched refinements that depend on wire windings finer than a hair, and adjustments closer than a thousandth of an inch. Take a peep inside the Model 16. What a miracle of compactness and precise engineering it is—and what results it gives! Blindfolded you'd pick out this R.C.A. Receiver for its reproduction as instinctively as you would select a fine piano from its tone. And yet it is controlled by a single dial.

See it—hear it to-day—you will find its appearance worthy of its performance. The Model 16's cabinet is made of solid polished mahogany, while its speaker is the handsome dull bronze R.C.A. Model 100A.

AUSTRALIAN
GENERAL ELECTRIC
Australian General Electric Company, Ltd.
ATCHERLEY HOUSE
Corner Queen and Adelaide Streets
BRISBANE
And at FLINDERS STREET EAST, TOWNSVILLE



Wonder-Box

the New 6 Valve RCA Receiver Model 16
With R.C.A. Loudspeaker 100A

The companion Loudspeaker to the Model 16 R.C.A. Loudspeaker 100A has eight refinements found combined in no other Loudspeaker. The 100A handles amazing volume without trace of distortion. It has a clarity of tone hitherto never before achieved in a Loudspeaker. It reproduces every note of voice and instrument with flawless precision.

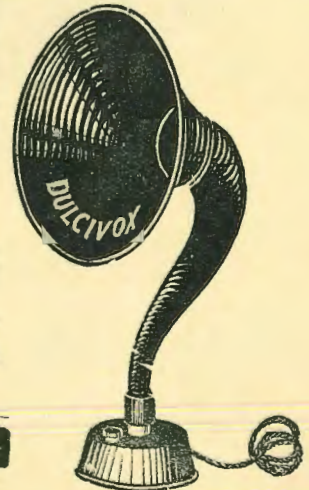
JOINT ACHIEVEMENT OF THE RADIO CORPORATION OF AMERICA, GENERAL ELECTRIC AND OTHERS

Ediswan Announce Huge Reduction In Price Of Their Famous Dulcivox Loudspeaker

THE great and ever-growing popularity of the little Dulcivox Loudspeaker has enabled Ediswan to make a substantial reduction in the price of this wonderful little instrument. The Dulcivox has ALWAYS stood out as the utmost value among loudspeakers, and now, with this reduction in price, it represents a value quite unrivalled in the wireless world.

EDISWAN

The Dulcivox is a product of the Edison Swan Electric Co. Ltd., and like all the products of this famous company, it is a typical example of thorough British workmanship and design. Its control is simple. The turning of a small knob adjusts the speaker to your particular set and brings out that full, rich, vibrationless tone for which Dulcivox is noted. COME AND SEE THE DULCIVOX.



New Dulcivox Prices

Black Finish. Price 37/6

Brown or Black and Gold, Mahogany, or Walnut finish. Price 42/6

DULCIVOX

The EDISON SWAN ELECTRIC Co. Ltd.

156 CREEK STREET, BRISBANE.

Ediswan are makers also of the Televox Loudspeaker. This is a full-size speaker, and like Dulcivox, is the "Master of Its Class"

Ask to See It

Please send me full particulars of your complete R.C. Threesome offer.

Name

Address

.....

terminals be careful not to cross the wires, as this will knick the lead and cause it to break if bent slightly.

5. Finish.—Under this heading comes the general finish of the set. The squareness of the front panel, and the way its edges are finished; the neatness of fitting the condenser spindles and the holding screws; the way the terminals are mounted, the straightness of the coils, the fit of the coil jacks, and the mounting of the filament resistances are all factors that are considered. When building your set, always handle your units and parts carefully, so that marks and scratches do not appear on the finished work. Use suitable clamps when holding in the vice, and chalk when marking out, so that you can locate your holes correctly. There should be no need to "draw" a hole to make a unit fit. Judges expect to find exhibition sets clean and free from dust, parts polished, and each unit complete. Don't forget to finish the hidden parts the same as those in sight, and don't use round headed screws where countersunk should be used, or use one screw where four holding holes are provided.

The above remarks cover in a general way the factors that have to be considered, but there are many others that are noted of a minor nature as the set is examined and tested. Good workmanship can only

be done by careful attention to detail, and a little less rush, and a little more care will, I am sure, put most of the builders of the low-marked sets in the winning class next time.

Before closing, I would like to write a word or two upon a feature that does not seem quite clear to those exhibiting in the novel sections, and that is what constitutes a novel set. Let us turn to Webster for a definition: "Novel" is given as "new; of recent origin or introduction; not ancient; hence, unusual." When applied to a wireless set, we must bring in two other factors—simplicity and utility—not a copy, but an original idea. Every part should be useful. It is no good making an ordinary arrangement and putting it on or with some other quite foreign part and calling it novel. It must be some new application or method of use of the usual parts of a wireless set, so as to constitute an unusual arrangement that will work.

In closing, I would express my appreciation of the exhibits as a whole, and commend the spirit shown by the various amateurs in putting forward such great specimens of their workmanship. I feel that we owe a great debt to "The Queensland Radio News" for promoting and organising the competitions, and heartily congratulate all concerned on the success that attended the whole show.

The Amateur Exhibits

LIST OF PRIZE-WINNERS:

SECTION 1:—Best Piece Home-made Apparatus (juvenile, 15 years and under):—

- (1) George H. M. Birkbeck, c/o Wooloowin Radio Club
- (2) George H. M. Birkbeck, c/o Wooloowin Radio Club

SECTION 2:—Most Novel and Original Crystal Set:—

- (1) Walter F. Scott, Boundary Street, West End.
- (2) H. A. Jiear, Wooloowin Radio Club.
- (3) S. Fry, Fairfield.

SECTION 3:—Best Made Crystal Set:—

- (1) Cecil O'Mara, Bellevue Avenue, Gaythorne.
- (2) F. M. Nolan, c/o Wooloowin Radio Club.
- (3) F. Clarkson, Valley.

SECTION 4:—Best 1 or 2 Valve Set (any circuit—may include crystal):—

- (1) W. Fullagar, Kingsby Street, Norman Park.
- (2) G. Payne, Wooloowin Radio Club.
- (3) Wm. Jonsen, Burlington St., E. Brisbane,

SECTION 5:—Best 3 or 4 Valve Set:—

- (1) W. Rhode, Wooloowin Radio Club.
- (2) G. Payne, Wooloowin Radio Club.
- (3) F. M. Nolan, Wooloowin Radio Club.

SECTION 6:—Best 5 Valve (or over) Set:—

- (1) P. Golden, Wynnum.
- (2) C. J. Grant, Wooloowin Radio Club.
- (3) Fred Brazier, Old Cleveland Road, Camp Hill.

SECTION 7:—Best Short-Wave Receiver (tuning down to 20 metres or below):—

- (1) Keith L. Elliott, Scott Street, Hawthorne.
- (2) A. T. Bauer, Rose Street, Annerley.
- (3) C. J. Grant, Wooloowin Radio Club.

SECTION 8:—Best Home-made Piece of Apparatus (points allotted according to amount of work entailed):—

- (1) H. and C. Stephenson, Wooloowin Radio Club.
- (2) J. P. Love, Wooloowin Radio Club.
- (3) V. F. Kenna, Wooloowin Radio Club.

SECTION 9:—Most Novel Loudspeaker:—

- (1) M. H. Munro, Loch Street, West End.
- (2) E. J. Chilton, Windsor Avenue, Wooloowin.
- (3) A. Kington, Normanby.

SECTION 10:—Best Low-power Transmitter:—

- (1) Walter Scott, Boundary St., West End.
- (2) V. F. Kenna, Wooloowin Radio Club.
- (3) T. W. Starkie, Sandgate Road, Nundah.

SPECIAL PRIZES:—

4QG Silver Cup (donated by 4QG for the best made exhibit in the competitions):—

Keith L. Elliott, Scott St., Hawthorne.

Mick Simmons' Special Prize (best-constructed set in sections 5, 6 and 7—4QG Cup winner not eligible):—

P. J. Golden, Wynnum.

TISIT

Aliquid Solder

**No Heat Required
No Soldering Iron Needed**

TISIT is a liquid solder that is applied cold with a stick. No heat or soldering iron required. It is heat-proof and acid-proof. Easy to use and always ready. Dries in 20 minutes.

TISIT is the only known solder for aluminium, and is used successfully on radios, steam pipes, cracked radiators, cracked cylinder heads, petrol tanks, leaky milk cans, pans, pails, kitchen utensils—in fact, any place where solder can be used.

PRICE: 2/11 per bottle, sold by all hardware stores and radio Dealers.



Queensland Distributors:

Canada Cycle & Motor Agency (Q) Ltd.

Adelaide and Creek Sts., RIS ANE

The
Ever Popular
"Q.R.N."

WAVETRAP

OLD readers of "The Queensland Radio News" no doubt will recall that, on two previous occasions, we have published an article describing the "Q.R.N." Wavetrap. So popular is this little instrument, and so high is its reputation, that both issues are now completely out of print. The demand for issues containing the wavetrap article still is as heavy as ever, therefore we make no apology for once more presenting full constructional details of the "Q.R.N." Wavetrap.



WHEN a high-powered broadcasting station such as 4QG is operating in the very heart of the Metropolis—in the centre of a very thickly populated residential area—it becomes practically impossible for owners of receivers having less than five or six valves to listen-in to distant Southern stations without at least a "background" of the local station's programme.

It has been said with truth that "variety is the spice of life," and few people appreciate the doubtful privilege of listening to two programmes at the one time, no matter how desirable either may be individually. For those reasons, some instrument must be devised to be attached to the ordinary receiving set, so making it possible for the operator to tune out the local station when the spirit moves in favour of a more distant one.

Such a device is known as a wave-trap, or, more correctly speaking, a wave-filter. The wavetrap described in this article has stood the test of time, and it would be no small task to calculate the number in use at the present day. It is so simple in design, and so easy to construct, that it can be built by anyone with average intelligence, even though they have had had no previous experience of set-construction.

Fig. 1 is a photograph of the working parts of the trap. It will at once be apparent that they are very few in number, and there is no complicated wiring attached to them. After procuring the components specified in the list of parts, the first item that claims attention is the coil. This job is quickly disposed of by winding 70 turns of the 20-gauge double-cotton-covered wire on the cardboard tube, leaving about nine inches of wire at each end for subsequent connections. The wire is, of course, anchored at the beginning and end of the winding in the usual way—that is, by threading it through two small holes punched in the tube about half an inch apart. The best method of winding such a coil, and one which ensures a neat, tight winding, is to unwind about 30 feet of wire from the reel,

and then secure the latter to a door-knob or some such object so that it cannot unwind any further. The wire is then stretched taut, the free end anchored to the cardboard tube, and the winding commenced. Holding the tube in both hands, and keeping rather a strong tension on the wire, rotate the tube towards you, at the same time walking towards the reel of wire. When the 30 feet of wire has been wound on, unroll another 30 feet or so, and repeat the process. The coil under discussion will take approximately 70 feet of wire, assuming that it is wound tightly. Do not paint the finished coil with varnish or "dope" of any kind.

Now the panel is to be drilled, using the template supplied with the condenser to locate the screw holes. The condenser is mounted in the centre of the panel, a terminal in each top corner, and the panel screwed to the baseboard. After that, the coil is mounted on the baseboard by means of two small angle brackets, such as those which come in "Meccano" outfits. Do not jamb the coil right up against the condenser—mount it as far away from the back of the condenser as possible, so that the magnetic "field" surrounding the coil will not be interfered with by the metal condenser plates.

The coil is now tapped in the middle in the following manner: The 35th turn is lifted up with a screw-driver, and a small piece of bakelite placed underneath it, as shown in Fig. 1. At this point the wire is bared of insulation, and a six-inch length of wire soldered to it.

There is literally nothing in the wiring. Refer to Fig. 3 and you will see just how it is done. First connect the wire from the centre-tap on the coil to one terminal. Now connect one end of the coil to one condenser terminal. The other end of the coil goes to the remaining condenser terminal, and from here a connection is made to the remaining terminal on the panel. See that all connections are tight, and mount an ordinary dial—it need not be a vernier dial—on the condenser spindle. In order to protect it from dust and

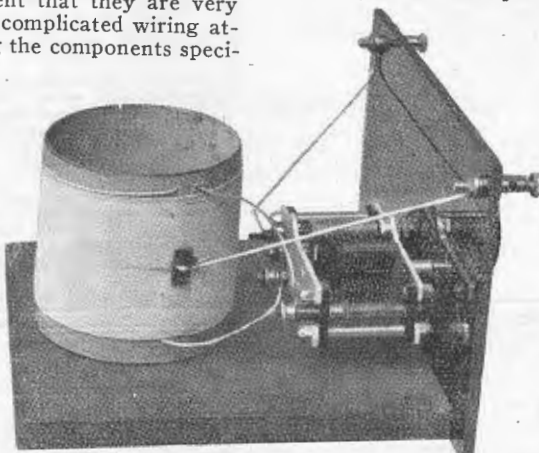


Fig. 1.—The efficiency of the Wavetrap must not be judged by its simplicity. Note the centre-tap in the coil.

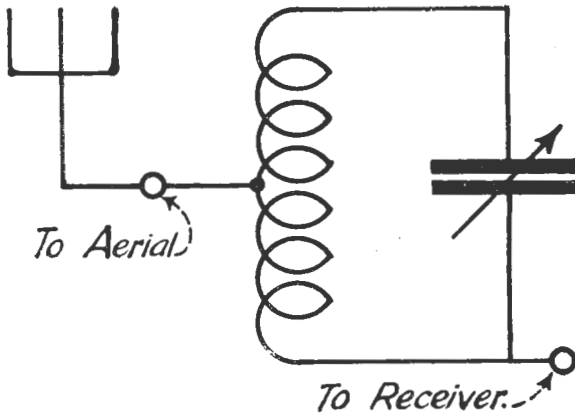


Fig. 2:—A diagrammatic version of the circuit used in the trap.

moisture, and to give it a good appearance, the finished instrument should be fitted into a cabinet of suitable size. The design and dimensions of such a cabinet are details which can safely be left to the constructor.

Operating the Trap.

In order to connect the wavetrap to your set, disconnect the aerial wire from your receiving set, and attach it instead to one terminal of the wavetrap—preferably the left-hand one, looking from the front. A length of wire is then run from the other wavetrap terminal to the aerial terminal of your set. That's all there is to it.

To place the trap in operation, first set the dial to zero, turn on your set in the usual way, and tune in the local station to comfortable volume. Now slowly rotate the wavetrap dial until a point is reached at which the volume is at minimum. Turning the dial past this point will result in the signals becoming loud again. It will be found that the precise point at which the local station is eliminated or reduced in volume is very critical indeed, so the wavetrap should be adjusted with great care.

It should be possible now to tune in the Southern stations without trouble. If there is still a background of the local station super-imposed on the distant music, try a further slight adjustment of the wavetrap dial.

One hears a great deal of comment to the effect that the use of a wavetrap results in a serious reduction in volume of the distant station, even if it does eliminate local interference. While this assertion—generally made with a lack of knowledge of the subject—no doubt is true of a badly designed trap, it is a fact that any weakening effect for which the "Q.R.N." Wavetrap may be responsible is practically inappreciable in practise, and is abundantly compensated for by the usually complete freedom from interference which its use permits. Indeed, we have had many reports from readers which stated quite definitely that **an actual improvement in volume** was noticeable on distant stations when the trap was in use.

At first sight, this would appear to be an impossibility—a figment of an over-enthusiastic imagination. Investigation has, however, proved conclusively that increased volume was an actual fact—on some sta-

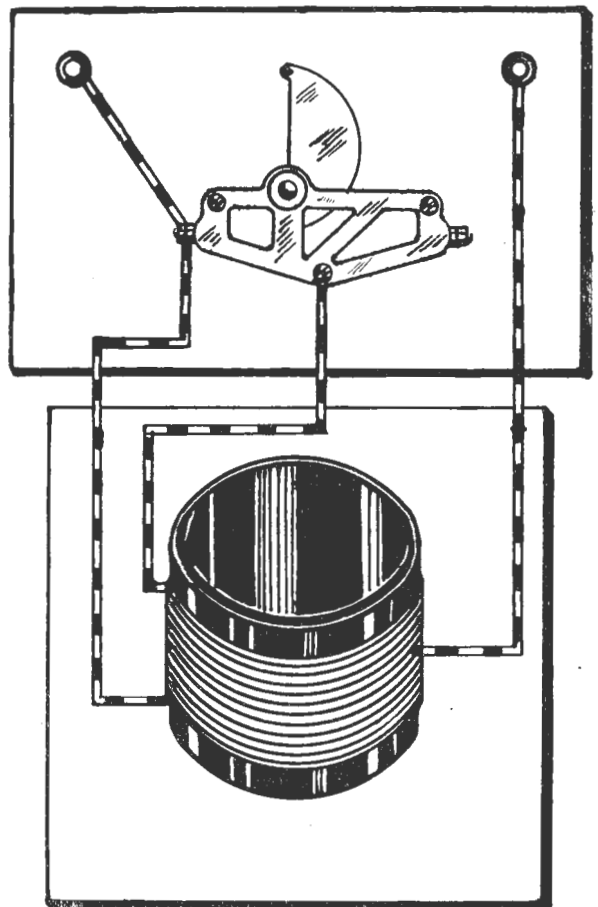
Fig. 3:—This pictorial diagram will assist you to wire up the instrument.

tions. There is a perfectly sound technical reason for this phenomena. As is well known, the efficiency of many types of receiver is considerably reduced on the higher wavelengths owing to the circuit being much further from oscillation point than it is on the lower waves. The introduction of the wavetrap, by a "choke" action, loosens the coupling between the aerial and the receiver, thus reducing the "damping" effect on the circuit, and allowing it to operate closer to the oscillating point.

So don't let any unfavourable reports you may have heard prejudice you against the use of a wavetrap. If you are troubled with inter-station interference, first build the "Q.R.N." Wavetrap, and then drop us a line to tell us about your success!

List of Parts:

- 1 Bakelite panel, 8 x 5 x 1/8 inches.
- 1 Wood baseboard, 7 x 7 x 3/4 inches.
- 1 .0005-mfd. variable condenser (Pilot shown).
- 1 Cardboard tube, 3 1/2 in. diameter.
- 1/2 lb. 20-gauge D.C.C. wire.
- 2 Nickelled phone terminals.
- 1 4 in. bakelite dial.
- 5 Screws.
- 2 Small angle brackets.



"This is Experimental Station 4RM"

Have you heard this announcement over the air? Here is a description of the station from which it comes.



In recent months a great deal of interest has been centred around Experimental Station 4RM Hawthorne, Brisbane. Many people who have listened to the excellent experimental broadcasts have shown a natural curiosity regarding the origin of the transmissions, and the fact that the voice of the announcer is easily recognisable as belonging to Mr. C. V. Woodland, formerly official announcer at 4QG, has served to intensify the interest aroused.

Whatever the future may bring forth, 4RM at the present time is purely an experimental station, and is being operated as such. It is owned and operated by Mr. Ray McIntosh (one of the engineers at 4QG), and is situated at Uhlman Street, Hawthorne.

Some time ago, an application was lodged with the Wireless Branch of the P.M.G.'s Department for a Class "B" Broadcast Station License. This has not as yet been granted, the reason given being that no new licenses are being issued until after the revision of the Wireless Regulations suggested by the recent Royal Commission, has been effected. However, there is every reason to hope that the arrival of the license will not be long delayed, and Mr. McIntosh has made arrangements to commence a regular service of a very high standard immediately the necessary authority is received.

Just now, the test transmissions are being effected on a power of only 15 watts, but the transmitter is designed to operate normally on a power of 1½ kilowatts—approximately one hundred times the present power.

That the 250-metre transmissions are being widely listened to is attested to by the tremendous pile of letters which Mr. McIntosh showed to a representative of "The Queensland Radio News." These letters come from points as far apart as Longreach and Hobart (Tas.), Bathurst and Wellington (N.Z.), and, without exception, refer in glowing terms to the writers' reception of 4RM.

Although regular programmes cannot be arranged until the license is received, 4RM has on several occasions secured the services of well-known artists in tests which were being carried out. Due to the fact that adjustments have been made at frequent in-

tervals, the transmission has varied a little from time to time, but recently the quality and volume have been amazing, and 4RM can count on a large and very appreciative army of listeners—both in this and other States—whenever the station goes on the air. The transmission of phonograph records—very well chosen, by the way—is particularly fine, and one is sometimes left in doubt as to whether the item being broadcast is a record or "the real thing." The voice of "Uncle Jim" Woodland, of course, needs no introduction to listeners. It is one which is particularly suited to broadcasting, and no doubt will do much towards enhancing the popularity of the new station.

The Station.

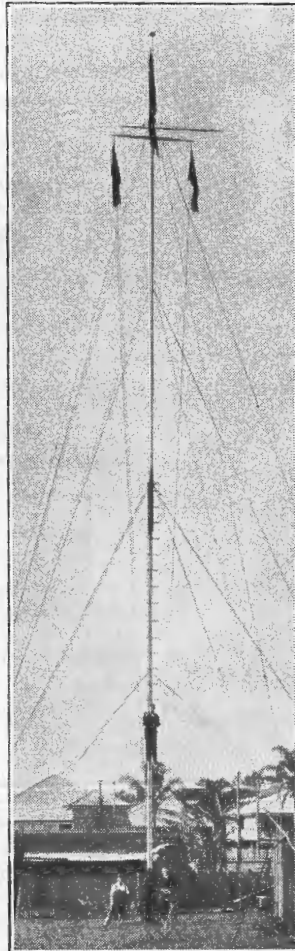
4RM's white-painted Oregon aerial mast forms a landmark for some miles around Hawthorne. Towering 95 feet into the sky, the mast and its complicated rigging present an imposing spectacle. Another 50-foot section is to be added to the mast in the near future, making a total height of close on 150 feet. The aerial is of the three-wire ship type, 80 feet long, and insulated with Pyrex glass.

At present the complete station is situated in the house itself, but all the apparatus will shortly be moved into a special room which is being erected immediately underneath the aerial. The lead-in will then drop directly from the aerial through a bushing in the roof of the station building, and the earth lead will go through the floor to the very complete earthing system which has been installed. This earth connection consists of a copper plate measuring 18 by 6 feet, buried in permanently moist earth, three feet below ground level; feeders radiate from the plate to different points underground. Thus, an ideal radiating system is assured, and the efficiency should be very high indeed.

The Transmitting Equipment.

In the meantime, the transmitting equipment at 4RM is located in a room adjoining the studio. All of the apparatus has been constructed by Mr. McIntosh, and the splendid workmanship is at once apparent.

There are two separate transmitters—the main 250 metre set, and a small 32-metre set. The main transmitter at



4RM's Fine Aerial Mast—95ft. high.

present consists of two UX.210 "7½-watt" valves connected in parallel in a Meissner circuit. With these valves the power input to the plate circuit may be increased as high as 50 watts, but in the meantime the power is maintained in the vicinity of 15 to 20 watts. An interesting feature of the main transmitter is the very complete system of shielding employed, the whole unit being covered on all sides by a sheet brass screen.

The problem of filtering out generator or A.C. hum from the power supply is one which does not exist at 4RM. A bank of storage batteries totalling 360 volts supplies plate current to all the valves—this being kept charged by a Tungar charger operating from the A.C. lighting mains.

For 32-Metre Operation.

For 32-metre operation a beautiful little short-wave transmitter has been built. Behind the silver-plated brass panel is a 7½-watt valve with its associated apparatus, arranged in a "Split Colpitts" circuit. At a later date, when the "B" class broadcasting license which is expected shortly is an established fact, it is intended to utilise this transmitter for conveying programmes to the transmitting station, where they will be received on 32 metres, and placed on the air in the regular 250-metre channel. This will eliminate much expense, and will make it possible to relay programmes from points to which the provision of land lines is difficult or where lines do not exist. Preliminary tests which already have been carried out within the suburbs of Brisbane indicate that extremely reliable communication can be maintained with 4RM when the power input to this "baby" transmitter is as low as one or two watts.

Both of these transmitters are oscillators only, their purpose being to generate the "carrier wave" upon which the music and speech is impressed. As they stand, they are each capable of sending out Morse signals—at 4RM a transmitting key is pro-



The Upper Photograph shows the Transmitting Apparatus at 4RM. From left to right may be seen the main 250-metre transmitter, the "baby" 32-metre transmitter, modulator and speech amplifier with the control panel, and the phonograph with its electric pick-up. The batteries are housed under the main transmitter.

Left—A view of the Temporary Studio.



vided for the purpose—but they cannot transmit music or speech.

The unit which impresses the voice currents from the microphone on the carrier wave is termed the "modulator," and at 4RM this is combined in one unit with the speech amplifier, the duty of which is to amplify or magnify the weak impulses from the microphone before they reach the modulator. Two stages of choke-coupled amplification using power-valves are employed, drawing power at 160 volts from the same bank of batteries that supplies the oscillators. In conjunction with the speech amplifier, a specially-designed volume control is used, the knob being mounted on the control panel alongside the switches, jacks, etc., which are provid-



RADIO CLUBS OF QUEENSLAND.

- AUCHENFLOWER AND DISTRICT.—Secretary, L. Gibb, "Frampton," Ridley Street, Auchenflower.
- CAIRNS AND DISTRICT.—Secretary, Mr. Tarbit, c/o. Mr. Les. Fitzsimmons, Cairns.
- EASTERN SUBURBS.—Secretary, J. Burns, Longland Street, East Brisbane.
- GRACEVILLE.—Secretary, H. Carter, Cr. Molonga Terrace and Wylie Streets, Graceville.
- IPSWICH.—Secretary, S. J. Aspinall, Brisbane Street, Ipswich.
- SOUTH BRISBANE.—Secretary, W. R. Gilbert, Gordon Street, Coorparoo.
- TOOMBUL.—Secretary, T. Starkie, Sandgate Road, Nundah.
- TOWNSVILLE.—Secretary, E. J. Jefferies, Fletcher Street, West End, Townsville.
- WIRELESS INSTITUTE (Queensland Division).—Postal address Box 689K, G.P.O., Brisbane.
- WOOLLOOWIN.—Secretary, H. A. Jiear, Lisson Grove, Woolloowin.
- WYNNUM AND MANLY.—Secretary, P. J. Golden, c/o Trackson Bros., Ltd., Elizabeth Street, Brisbane.

* * * *

Toombul Radio Club

Many reports have come to hand from listeners in most of the Brisbane suburbs, reporting reception of 4TC, the club's transmitter, on 240 metres, the majority reporting fair speaker strength. The transmitter will be on the air as follows: Sundays 6.30 p.m. to 8.30 p.m., Wednesday, 10 p.m. onwards; and Fridays 7 p.m. to 9 p.m., to carry out telephony tests.

On Saturday, July 14th, a display of apparatus was given by the club at the annual show of the Nundah District A.H. and I. Association. The awards in the competitive sections were as follows—Crystal set, T. Clark 1, A. E. Walz 2; valve sets, N. Skyring 1, E. H. Coulter 2; Accessories, A. E. Walz. During the afternoon items were received from 4TC and 4NW who were testing on 200 metres.

Meetings of the club are held every Wednesday evening at the club-room, Eton Street and Sandgate Road, Nundah. Anyone interested in wireless is cordially invited to attend at any time.

* * * *

Indooroopilly Radio Club

The I.R.C. has been very fortunate. It sorely needed a shed in which to hold meetings. Accordingly, our secretary approached a Mr. Hemming, solicitor, with the object of renting an outhouse from him. Now, Mr. Hemming kindly informed the secretary that the I.R.C. could make use of the outhouse and that they need not pay any rent. You can guess how the members felt when this was announced. By his most generous action Mr. Hemming has launched the club on the ocean of success. Therefore, Mr. Hemming, we thank you from the bottom of our hearts. There are several rooms in this outhouse. The one chosen for meetings is about 24ft. x 18ft. The floors throughout the shed are concrete.

Some members gave us a pleasant surprise by ceiling the room with calico. In time it is hoped to have the walls draped with the same material; a car-

pet on the concrete floor, and a bright electric light should make a snug little room.

But club-rooms are not all that is required; no club can succeed without funds. To accomplish this we are holding a radio night on Friday, August 3rd. This function should be successful, as it is the first of its kind to be held in the district. It will consist of "Electrical Mysteries," radio demonstrations, a talk by the Director of 4QG, a musical programme supplied by leading artists, and will conclude with a radio dance. The admission charge will be 2/- for adults, and 1/- for children. Radio enthusiasts, up and support us!

Some of the members of the I.R.C. contributed home-made apparatus to the Radio and Electrical Exhibition. As the club has just been formed, few entries were sent in this time, nevertheless, we hope in the future to be as well represented as any other radio club.

The I.R.C. heartily congratulates those members of the Woolloowin Radio Club who were so successful at the recent Electrical Exhibition.

Radio Clubs of Brisbane! The I.R.C. would be very grateful for any assistance your members could give—particularly in respect to technical matter. We require someone to guide us through the transmitting course. Can any ham among you take us through?

* * * *

WIRELESS "LAID ON"

Added to its many noteworthy improvements during the past twelve months, Hotel Carlton, Queen Street, Brisbane, is now able to claim a further exclusive feature for the entertainment of its guests. The hotel has just completed the installation of a powerful wireless receiver. This receiver is housed in the wireless room and is connected, by an intricate system of wiring, to the hotel lounges, and many of the bedrooms. Loudspeakers have been erected at the various wiring terminal points in the lounges and bedrooms, and each speaker has been fitted with its own individual switch. Guests who desire to listen to the programmes will merely have to turn the switch in their room. No tuning will be necessary, and the radio programmes will be available at call, just as is the electric light. The main receiver will regularly be under the supervision of a wireless operator. We understand that Hotel Carlton is the first hotel in Australia to equip its bedrooms with wireless.

* * * *

Experimental Station 4RM

Continued from Page 37

ed in order to link up the station with a maximum of ten outside points by land line.

Mr. McIntosh has developed a system of modulation which he claims possesses several important advantages over existing methods. Any doubts as to the efficiency of the system are dispelled when one listens in to 4RM's transmission, which has admirable depth and quality.

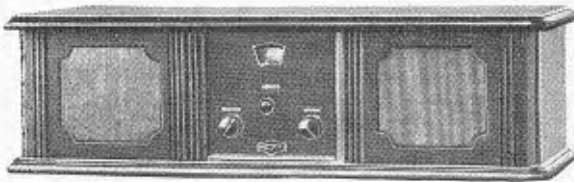
The "Mikes."

For transmission of phonograph music, an electric pick-up is used. This is identical with the pick-up designed and supplied by Mr. McIntosh to 4QG, and used by that station for all gramophone work.

A new microphone of original design handles studio music and speech. This instrument, for which patents are pending, is a wonderful piece of work, and a great tribute to the skill of the designer and constructor.

NEW RECEIVERS REVIEWED

In response to many requests from our readers, we have inaugurated this department. It is our intention to test each new receiver as it appears upon the market, and to offer candid criticism upon its performance.



The Udisco L5

The well-known Udisco L-5, manufactured and marketed by Messrs United Distributors Ltd., is a five-valve tuned radio-frequency receiver of advanced design. It embodies two stages of radio-frequency, a regenerative detector, and two stages of transformer-coupled audio-frequency amplification. The "Super-Neut" circuit employed is a development of the famous "Capacidyne" arrangement, with which the manufacturers have had great success. High quality components are used throughout, and the receiver certainly is a credit to Australian enterprise and engineering skill.

Outstanding features of the Udisco L-5 are its extreme simplicity of operation, great distance-getting ability, and high order of selectivity—a splendid combination. Our tests were carried out on a stock model (submitted by Messrs United Distributors Ltd., Queen Street, Brisbane) at a distance of approximately three miles from 4QG. Using an indoor aerial, it was merely necessary to set the single selector dial to the readings shown on the tuning chart, when all the principal Australian broadcasting stations were received at good loudspeaker strength. Two New Zealand stations also were tuned in, just loudly enough to be heard on the loudspeaker. On the main Southern stations, the volume was terrific—much too great at times for ordinary home requirements. As can be imagined, this great reserve of power is a tremendous asset when signals fade badly, as happens sometimes with all distant reception.

The tone quality is very good, a power valve being used in the last audio-stage, so that adequate volume may be handled without distortion. To the same end, two "C" batteries are built into the receiver, thus simplifying the exterior battery connections.

A two-tone cabinet is pleasingly set off by the bakelite panel, with its three tuning knobs. The centre knob controls the three tuning condensers simultaneously, the drive being by means of a gut belt running on cast aluminium pulleys, with an effective device for maintaining an even tension. The dial indicator is of the back-of-panel illuminated type; as

long as the receiver is switched on, the indicating window glows brightly, thus illuminating the scale and serving as a pilot light at the same time. On the left-hand side is the regeneration control—very smooth in action—and on the right an auxiliary volume control in the shape of a variable resistance in the "B" battery lead to the R.F. valves. This last control is useful for promoting stability when a very short aerial is used.

The selectivity of the L-5 is such that no difficulty is experienced in eliminating the local station and tuning in Southern transmissions in any of the suburbs of Brisbane. Philips Miniwatt valves are supplied as standard equipment, with the result that the receiver is remarkably economical as far as current consumption is concerned—a feature of very real value to country residents. Provision is made for the use of headphones, if desired.

The "Q" Signals

Several times recently we have been asked to make the position clear with regard to the conventional abbreviations, or, as they are commonly referred to, the "Q" signals, used in telegraphic communication by the International Code.

In the 1928 "A.W.A. Radio Guide" is published a list of "Q" signals which differs radically from previously-published lists. Many of our readers who intend to sit for the Amateur Operator's Proficiency Certificate, preparatory to joining the ranks of the amateur transmitters, are anxious to learn these signals, as a knowledge of the more important ones is essential. Naturally, there is considerable doubt as to which list to abide by—the new list which appears in the 1928 Guide, or one of the old lists which have been published from time to time in this and other radio journals.

In order to be quite clear upon the matter, we referred the question to the Commonwealth Radio Inspector for Queensland (Mr. T. Armstrong).

We were advised that the new and revised list, which was formulated by the recent Washington Conference, will not come into force until the first day of 1929. Prior to that the old lists will be adhered to.

In our next issue we shall print a list of the "Q" signals, and this may be regarded as being strictly accurate, **up to and including the last day of the current year.**

New Wireless Catalogue

Last month we reported on the acquisition of enlarged and improved premises by the well-known wholesale wireless house of Edgar V. Hudson. This month we have to comment on the new catalogue of wireless sets and components issued this past month by the same firm.

We must congratulate Messrs Hudson on the production of probably the finest and most comprehensive radio list yet printed in Australia. Thirty-six full pages with something over one thousand individual items, and over one hundred and thirty illustrations, bound in an art printed cover depicting the new warehouse "right under the shadow of 4QG," make a list that will not only be of the utmost assistance to the trade, but also of the greatest interest to radio fans and broadcast listeners generally, since the matter contained is right up to the minute. This catalogue show definitely that some Queensland radio traders at least are well aware of the possibilities of radio, are

carrying the requisite stocks, and are even in advance of their Southern States confreres.

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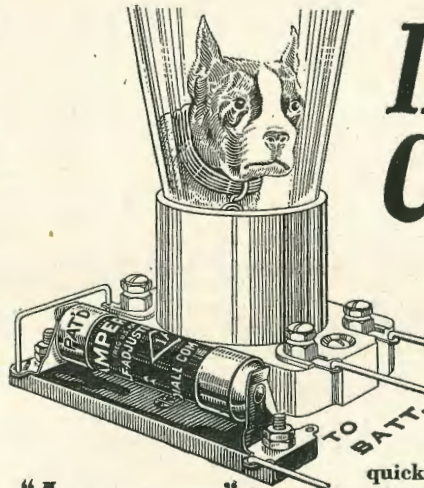
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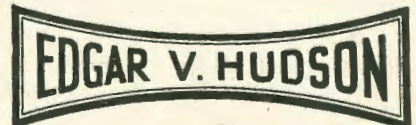
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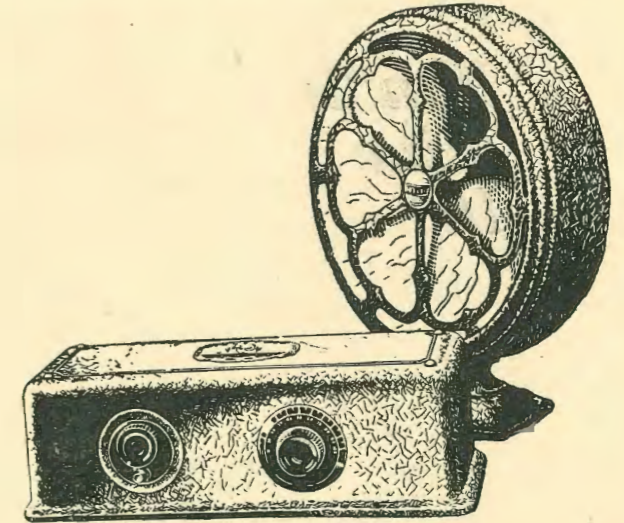
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Germany's Super Spy

A Thrilling Tale of German Intrigue and Cunning

by
ROBERT WARE

Under the heading of "Unrecorded Incidents in the Great War," Mr. Robert Ware has, during past months, contributed a very fine series of complete stories to this magazine. In this issue we publish the opening chapters of a new serial by the same author, which, we feel certain, will be well received by our readers.—Editor.

I.

A tall, white-haired man halted on his way across the big, dimly-lit room, slowly folded his arms, and smiled grimly. For a few moments he thoughtfully contemplated the man who was seated at a desk which had been placed in the mathematical centre of the huge apartment. The desk was littered with charts and ordnance maps, while the worker, unaware of the presence of a visitor, continued to write with almost feverish haste.

"What an opportunity to eliminate the brainiest man in the British Navy." At the first quietly-spoken clearly-enunciated word the figure at the table swung round in the chair, rose to his feet, and backed to the desk, as though he would hide its secret from the world by the strength of his own massive frame.

For an instant the two men faced each other without moving. Each was tall above the average, both had clean-cut, bronzed faces; but while he whose studies had been so abruptly interrupted, wore a faded naval uniform with three rings of gold braid at each cuff, his visitor, who was dressed in civilian attire, and bore a quiet air of authority and command.

Suddenly the younger man laughed, and his hand went to the salute automatically as he stepped forward to greet the other.

"By jove, Sir, you made me jump for once in my life."

"Jump be damned!" burst out Lord X (Prime Minister of England). "If you don't take more care of yourself I'll detail a guard to look after you."

"I'm alright, Sir, you needn't worry—I can take care of myself. But what brought you round here at this hour of the night? You know you've only to ring me and I'd come round to Downing Street at the double."

"I know that, my boy," replied the older man in a gentle voice, "I did ring Morris at your rooms, and he told me you were still here, so I couldn't resist the chance of catching you unawares. Exactly as I had expected, you had foolishly dismissed your man and were alone in this practically deserted building. However," he continued, "I shall now insist on a guard being at that door whilst you are in the building—

the Navy can't afford to run risks with its executive officers at a time like this, and I want you to promise me that you'll have another Petty Officer to act as relieving guard to Morris."

Commander Robert Hilton, R.N., D.S.O., Chief of the British Naval Intelligence Service, looked keenly at the grave face of the man who had filled the place of his father ever since the Naval disaster of 1905, when Rear Admiral Hilton had lost his ship and life.

There was a strong bond of affection between the two men, and Hilton was loath to treat the statesmen's demand from a cold reasoning aspect; moreover, the need of the Empire for every available man caused him to shrink from the thought of withdrawing another N.C.O. from active service merely to become a body-guard.

"But, Sir, I don't think I really need—" began the young Naval Officer hesitatingly.

"But I know that you do," broke in the Prime Minister in a quiet, decisive voice, "Hague Embassy advised me that Von Hagen and at least three of his friends were known to leave Antwerp in a submarine. After his escapades in America, there can't be much doubt that he intends to land somewhere on our coast—and I'm not running risks were you are concerned."

"Von Hagen!" echoed Hilton, "I'd be delighted to meet that gentleman—in the open," he added with a laugh. "I don't think he'd have the nerve to attempt to pass the outer guards of the British Admiralty, though, Sir. Still, if it will allay your anxiety, I'll agree to 'man' the door every minute I'm here."

"That's settled then," sighed the nobleman as he leaned back in his chair and took a cigar from the box which Hilton produced from the depths of a capacious steel cabinet which stood by his desk.

"You didn't come here to-night merely to tell me about Von Hagen, though, Sir."

"Not exactly, my boy. Er—the fact is—I want you to come down to Templecombe for the week-end."

"I'm very sorry, Sir, but it's absolutely impossible for me to get away during the next few weeks. I'm right in the middle of charting the new German mine-fields in the North Sea."

"Dear, dear," sighed Lord X, "what a perverse young man you are. I suppose I shall have to insist once more," he added with a gleam of humour lighting his eyes.

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Hilton knew by the quiet, even tones that he would have to again give way to this impelling man who sat before him.

"Can't I possibly 'beg to be excused,' Sir?"

"You haven't a hope, Robert. I've decided that you must come down with me."

"Very well, Sir," surrendered Hilton. "I expect you have already made arrangements regarding when and how I shall go?"

"Yes," responded the Prime Minister with a smile, "we shall go down to Exeter in the mid-day train tomorrow and then drive to Templecombe."

Knowing well that Lord X had a particular end in view, and that he would communicate his desires exactly when it pleased himself to do so, Hilton bowed deeply with mock humility and gave assent in the stereotyped monotone, "Aye, aye, Sir."

"That's really what I came for," remarked the politician as he rose. "You had better come with me and I'll drop you at your rooms."

Even such a trivial remark carried the command to obey when uttered by this magnetic personality, and Hilton, now feeling the weariness of a long, hard day, cheerfully crammed maps and charts into a draw and followed the Prime Minister along the wide Admiralty corridor.

The following morning saw Hilton working like a Trojan. Enemy wireless messages—intercepted by his group of shore wireless stations—and decoded by his staff of experts—came in flocks; every patrol boat seemed to have something of vital importance to be considered and acted upon; special reports from the Chancellors of Allied and neutral Europe betokened renewed enemy activities. Enemy submarine commanders were becoming animated with a boldness which indicated either increasing confidence in their diabolical methods, or the recklessness of despair, and the untimely loss of an auxiliary cruiser disclosed the existence of a German minefield in a location entirely unsuspected by the British Naval Authorities.

Petty Officer Morris's intimation that there were barely ten minutes left in which to issue final instructions and reach Paddington Station, made Hilton swear, a further wild burst of energy enabled him to arrive in time to sprint down the platform and jump into the reserved coach just as the train was set in motion.

II.

"You young devil!" reprimanded Lord X with severity. "One of these days you'll break your neck."

"Oh, I generally manage to scramble home, Sir," replied the panting Hilton as he looked questioningly at the Prime Minister's companion.

"Robert," proceeded the Prime Minister, "this is the gentleman who is entirely responsible for to-day's journey—Lieutenant Ivan Vorensky, of the Russian Engineers."

Turning to the Russian, his Lordship, with a thrill of pride in his quiet, even tones, said:

"Lieutenant Vorensky, this young man who nearly failed to keep an appointment with the Prime Minister of England is Commander Robert Hilton, Chief of our Naval Intelligence Service."

The young Russian engineer leaned forward with alacrity, extending his hand, with a frank smile of pleasure.

"I am indeed happy to meet so distinguished a member of the British Navy."

"Rats!" was Hilton cheerful retort, which was accompanied by a broad grin, "But you'd better clear up the mystery so that I can get my bearings."

Vorensky turned to Lord X. "I think, Sir, you had better tell Commander Hilton the necessary details."

"Very well, Robert," went on his Lordship in his customary, quiet, even voice, as he turned to Hilton, "it would seem that we are on the verge of events of a far-reaching nature. Lieutenant Vorensky is, like yourself, an experimental scientist, and has, it appears, brought a remarkable machine with him, details of which he will explain to us both later on."

"He disembarked from the Russian cruiser 'Irkutsk' which is now in the Thames, and reported to me yesterday morning in obedience to order from Poltich, the Russian Premier. His papers have been carefully examined and are all in order—and his letter of introduction was signed Poltich himself. In that innocent-looking black bok," his Lordship continued, nodding his head towards the overhead rack, "is the reason of his journey to England."

"I expect it would be the height of rashness to enquire about the contents of the innocent-looking black box, of course?" said Hilton quietly with a smile. "Suppose you tell me as near as you can what the real position in Russia is at the present moment."

Lieutenant Vorensky smiled at the undisguised inquisitiveness of the speaker.

Young and good looking as he was, the flashing white teeth beneath his small, carefully-tended black moustache, made his smile unusually charming. Hilton, like most other he-men, positively loathed a "pretty man"—but the fascination and charm of the young Russian engineer-scientist, dispelled all feelings of animosity and soon the two men were animatedly discussing the most intimate details of the World War as it affected the Eastern front. Grand Duke Nicholas and Poltich, as Hilton knew, were again at variance, and, rather to Hilton's disappointment, Vorensky seemed to consider the Grand Duke a lesser man than the Russian Premier.

"I did hear, once, that Poltich was enmeshed in the maze of German intrigue in St. Petersburg—even to the extent of being on the accepted list of the Council of Nobles," ventured Hilton in a non-committal, hesitating way.

The Russian's eyes blazed for a moment with anger—"Never, Sir. To couple the name of Count Poltich with such an infamous band of traitors is an insult to the strongest man Russia has yet produced. My poor, distracted country is being harassed and undermined by many of its leading men—and the Council of Nobles embraces the blackest-hearted traitors in Europe—men of high position who are determined to sell Russia to the Triple Alliance, hoping for political preferment in the event of their diabolical efforts being successful."

"Sorry if I unwittingly trod on a tender spot," placated Hilton with a laugh. "It was only an idle rumour I heard a long time ago."

"I trust you will pardon me if I seemed a little excited," replied Vorensky contritely. "In Russia one does not say a word one way or the other, so all-pervading is the influence of either the Council of Nobles or General Lipowski and his Secret Police, but



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we have strong feelings, nevertheless. Here in England, you can't realise that even one's own brother or sister may be a secret member of an enemy organisation, and that one indiscreet word to even them might quite easily sign one's death warrant."

Vorensky was again working himself up to a pitch of intense excitement, and Hilton deemed it wise to slightly change the course of the conversation.

"I must compliment you on your mastery of the English language, lieutenant, anyway. How did you acquire it?—if the question is permissible."

"Why, English is almost my native language," laughed Vorensky. "My father was a timber merchant in Riga, and my mother was the daughter of the owner-captain of a vessel which traded between Riga and the Tyne. I spent two years in Newcastle myself, acting as my father's agent in this country. I therefore speak English as well as, if not better, than Russian."

Knowing well the large number of people from Scandinavia and Baltic Russia, who had become absorbed in the timber trade on the Tyne, Hilton could well believe the latter part of Vorensky's statement.

Lord X, who had been silent during the conversation between the two younger men, now assumed his function as host, and, having entered country which he knew, and loved, best of any in England, began pointing out the numerous points of interest and beauty to the Russian, while Hilton relapsed into day dreaming and vague wonderings regarding the contents of the innocent-looking black box on the rack.

III.

A car from Templecombe awaited Lord X and his guests and, as they drove along the glorious English country roads, sometimes flanked by well-trimmed hedges, and at other times flung into deep shadow where the tall sycamores on the roadsides mingled their leafy branches overhead—thoughts of the legalised massacre of their fellow men, which each one of them prosecuted with so much vigour, were banished from their minds. All memories of the Great World War, with all its horrors and miseries, were momentarily cast away as though they were parts of a terrible dream which had better be forgotten. Dead, dying, maimed and sick countrymen were scattered in thousands over the maze of muddy trenches in France, on the sun-scorched plains and deserts of Palestine and Mesopotamia, in the malaria-infested jungles and swamps of East and West Africa, about the appalling death-trap in Poland known as the Masurian Lakes, and even on practically every ocean where British ships sailed—yet, the simple beauty of nature in this English country side brought forgetfulness.

Suddenly the car leapt from a leaf-carpeted, shaded woodland road, and sped to the top of a steep hill, where Hilton, who was driving, brought the car to a standstill. Turning to Vorensky, he nodded to the next range of hills and exclaimed:

"Templecombe."

Hilton never tired of presenting Lord X's beautiful Tudor mansion in this dramatic way—and for this reason alone would never allow anyone else to drive, if he were present.

Built at the top of a rolling upland, surrounded by dark, heavily-timbered woods and thickets, the adjacent country side dotted with old-fashioned farm-

houses and methodically planted hedgerows—"Templecombe," glinting rose-hued and purple-shadowed in the mellow evening sun, was indeed an unforgettable picture of the beauty and peacefulness of rural England.

The young Russian engineer gazed at the panorama in silence for several minutes and then, turning to Lord X, said: "No wonder you Englishmen love your country."

The sincerity of his simply-worded tribute was evident, and without further comment, Hilton re-started the car.

Less than half an hour later they were gliding between the well-kept lawns and glorious flower beds of "Templecombe," finally stopping in front of the flight of weather-beaten stone steps which led to the main entrance. Before the travellers could alight the big doors opened and, with a cry of happiness, an exultant young woman ran down the steps to give them a tumultuous welcome.

Her whirlwind career, however, abruptly ceased when she noticed that, in the rear of the car, her father had unexpected company.

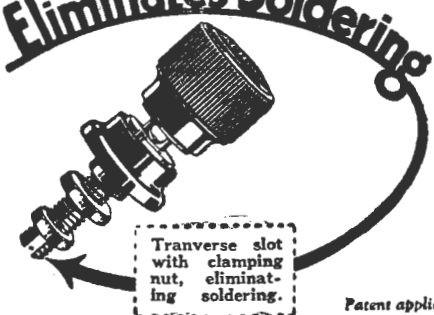
The damping of her gaiety was but momentary, and she greeted Vorensky with a charming frankness which gave no indication of her disappointment.

She allowed Lord X to take Vorensky up to the steps and then turned to Hilton. "Why the fascinating young Russian, Roberty?"

"Haven't the faintest, Sparkles. That innocent-looking etcetera black he is carrying is the *raison d'etre*."

"What's in it?"

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"I don't know yet, little inquisitive—but Dad won't let me remain in the dark very long. Tell you to-morrow morning—if you're good."

Between the tall, handsome naval officer and the beautiful, vivacious young woman, was a complete mateship which had dawned when they were children, and, although Hilton never departed from the strict code of officialdom when addressing the Prime Minister—from their early youth, both Hilton and the nobleman's only daughter had, between themselves, spoken of Lord X as "Dad." Although no word of sentiment had ever passed between the two, the perfect understanding which existed, decreed, inevitably, that they should go through life together.

It was not, therefore, remarkable that Hilton's work at the Admiralty was her dominating interest in life; and many of his successes, he frankly owned, were attributable to her marvellous intuition.

At dinner that evening she deliberately turned the conversation to the Russian situation, and Vorensky was astounded at her intimate knowledge of even the most complicated details of military, naval and diplomatic operations. Notwithstanding the undoubted mental powers of the three men, she dominated the group at the dinner table for, not only was the Hon. Cynthia X a keen thinker and a brilliant conversationalist, she was also superbly beautiful. Doubly dowered, she was the reincarnation of her beautiful, noble, yet sweet-natured mother, and had inherited her father's steadfast courage, loyalty and vigorous mentality.

Lord X and Hilton, in common with almost every other Britisher, never for one moment doubted the ultimate issue of the war—that Britain would be vanquished was a thought which, literally, never became formulated.

Vorensky, enthralled by the ardent patriotism, wisdom and charm of the Prime Minister's beautiful daughter, mentally asked himself, "Can Germany defeat a nation which has women such as this?"

IV.

"The scientific dream which once hoaxed the French Government and made France the 'laughing stock' of the world, is now an accomplished fact—I refer to the infamous Signor Ulivi and his 'F' rays."

This calm assertion by Ivan Vorensky was followed by complete silence. Lord X, Hilton and the Russian scientist-engineer were seated in the library of "Templecombe," and Vorensky, having made his dramatic announcement, leaned back in his chair and surveyed his dumbfounded listeners with a highly amused smile playing on his handsome face.

Doubt and incredulity were plainly visible in the faces of the other two, and both forebore to speak.

"Yes, gentlemen," continued Vorensky, "my innocent-looking black box, as you termed it, contains the result of many years' labour, and can, when properly adjusted, explode by a 'wireless wave' any known explosive compound, even though it is buried feet deep in the ground, or protected by the thickest armour-plate which can be made."

"You remember, Sir," he said, speaking to the Prime Minister, "that when I requested the honour of your hospitality and asked that one member of the Naval Higher Control be also included, I refused to

give you any details regarding my mission until I was under your roof.

"Naturally I knew my credentials would guarantee my authority from the Russian Government and ensure your acceptance of my proposals as far as the present moment.

"From now on I am the official emissary of my country, and must explain the full significance of my visit. The revelation of my secret has caused grave doubts in your minds regarding the possibility of another hoax, but I assure you, I am not attempting to emulate Signor Ulivi in any way—I can actually do what I say. To-morrow morning I shall be pleased to demonstrate my invention to you, but to-night I shall place my proposals regarding its disposal before you.

"Knowing that your heads are full of questions," Vorensky continued, smiling, "I shall proceed to anticipate some of them—any I fail to enlighten you upon, please ask with perfect frankness."

Lord X and Hilton lit their cigars and settled comfortably in their chairs to hear the Russian's explanation of the events which would appear to have placed on British soil the means to end the Great War in almost a few hours.

"The idea of detonating explosives by means of aetheric waves has been the dream of every military and naval power ever since the days when Branley's coherer was evolved, and used to operate a small electric bell by means of a wireless wave.

Ulivi, as you know, claimed to have stumbled upon the secret so strenuously sought, and 'admitted' that he had 'accidentally' blown up a French warship in Toulon Harbour whilst he was engaged in his experiments. The terrible fiasco of his Channel demonstration and the discovery of his trickery is also 'naval history.'

"There will not be a repetition of that to-morrow, for you shall collect your own explosives, and place them where you will in your own grounds.

"However, to resume my own story: I felt certain, as Ulivi did, that one had but to propagate a wave which corresponded to the fundamental frequency of the most unstable element in the explosive compound in order to create a violent vibration which would very quickly cause the whole lot to explode.

"Working on that theory, I progressed a little way, and then had to discontinue my experiments owing to my country becoming involved in the war. Out in the marshes of Poland, and in the snow clad Carpathians, the desire to complete my experiments grew to be a consuming passion. One night I worked out by mathematics what I might call the germ of my machine. Immediately I pressed for a transfer to the Military Laboratory at St. Petersburg. To my delight my request was granted straight away, and Count Poltich commanded me to report to him as soon as I could. You can easily imagine my amazement when the Premier informed me that he had made arrangements for me to experiment privately—and instructed me that whatever I did must be reported to him direct, and that I was not to communicate with the Military Laboratory in any way.

"Knowing how intensely patriotic he was, I consented, and, after almost a year of incessant work, I proved my theory correct, built my model, and reported to the Premier.

"That was less than a month ago and, to my consternation, he commanded me to sell my invention to the British Government.

"The Count believed that the moment I commenced building machines for my own country I would be a marked man by the Wilhelmstrasse and my life and secret would both be lost to Russia in a very short time.

"In England the machines can be built in perfect safety, and Russia will be able to obtain the measures of relief she so urgently needs.

"First of all, you must satisfy yourselves that the 'innocent-looking' black box will do what I claim it will—within the confines of your own estate. Then you must test it over a stretch of open sea at a place which you shall name and of which I shall approve as being suitable.

"If you are then satisfied that my invention is worth securing for your country and Empire, you must pay Russia twenty millions and replace, approximately, her Baltic Fleet, which has been sunk by German submarines or otherwise lost."

Lord X gazed at the ceiling, and gently murmured, "Twenty millions what—pounds or roubles?"

"Pounds sterling," my Lord! was the quiet answer of the Russian, as he stood up and bowed to the statesman.

Hilton contented himself with smoking furiously at his cigar and regarding Vorensky with a concentrated stare, but Lord X, with a dry smile, asked quietly: "Suppose we refuse to buy your machine?"

"You won't," countered Vorensky.

"What if we decided to have nothing whatever to do with it?" persisted his Lordship.

"Then Germany would win the war in six weeks."

The Russian's reply was delivered in a slow, almost menacing, voice.

"However," he went on pleasantly, "I'm not worrying over that in the slightest. Certain victory for the Allied forces would be a bargain for the British Empire at ten times the prices."

The cheerfulness with which he took "for granted" the acceptance of his proposal sounded like a piece of colossal cheek, but before either of the others could decide upon a method of meeting his challenge, Vorensky proceeded, with apparently unimpaired delight in the situation:

"Gentlemen, don't bother yourselves over the question to-night. All I ask you to do is to gather up every available sample of ammunition—the more varied the explosives the better, and wit for to-morrow's demonstration."

"A very good suggestion," broke in Lord X. "We will therefore adjourn and be entertained by my daughter and a few of her friends."

V.

Early the next morning the search for "targets" was instituted. All manner of explosives were located, and the collection was heterogenous in the extreme.

Mills bombs, hand grenades, "cricket-ball" bombs, flares, "jam-tin" bombs, Verey's lights and rockets, as well as small land mines, clips of cartridges, and even household vessels and tins—packed with dynamite, T.N.T., cordite and gunpowder—were laid on the closely-trimmed lawn of "Templecombe."

"Is this enough, do you think?" queried Lord X with a laugh.

"Enough to prove me a liar or otherwise, your Lordship," replied Vorensky, grinning.

"Now, I want you to please dispose these various items in different parts of the park," went on the Russian. "Make a rough plan, and mark on it, approximately, the spots in which you place them, so that you can nominate the shot so to speak."

A plan of the grounds was quickly sketched, showing the position of the balcony room from which Vorensky was to operate his machine.

Gathering up the queer assortment of explosive devices, Lord X and Hilton proceeded to plant them in various places—all in view of the window, so that results could be observed.

The Hon. Cynthia was allowed to accompany them in order to jot down on the map the various positions and type of target.

Some were just placed on the ground, other were buried—a few were dropped behind bushes and tree trunks. Yet others were hidden in the forks between heavy limbs of oak trees, or lodged in the topmost branches of towering elms and firs.

It was therefore some time before this work was completed, but, by early forenoon, a most comprehensive test had been prepared for Ivan Vorensky's "F" ray apparatus. When all, including Lord X's daughter, had assembled beside the machine, Vorensky turned and bowed deeply. "Lady, you shall have the honour of nominating the first target to be blown up," he said with his characteristic charm.

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For a second the Hon. Cynthia seemed non-plussed, but, with a smile, turned to the map and pointed to a spot which was only about two hundred yards away from the house.

"That one, please. Commander Hilton dug a hole about two feet deep and dropped a Mill's bomb in it."

"You are extending your pity and making it easy for the start," responded the Russian gallantly, as he bent down and "sighted" the position through a double telescope which was mounted on the top of the machine. Closing the double-pole switch on the base-board, Vorensky turned the handle of a large driving wheel at the side of a semi-circular arrangement of electro-magnets. A vertical spindle slowly picked up speed, and in a few seconds was spinning at an incredible rate.

Suddenly, with his left hand, he pressed a contact key, and, almost on the instant, the watchers heard a sharp explosion and saw the earth fly from the spot which the Hon. Cynthia had selected.

"Number 1," laughed Vorensky, still turning the large driving wheel. "Your Lordship, your nomination, please."

"There's a small land-mine just behind that old oak near the hedge. Try that."

Obediently, Vorensky spun his apparatus in the direction indicated, sighted the tree, and pressed the key.

A dull roar and an ominous swaying of branches announced that the mine had been "fired."

"Commander Hilton!" crisply ordered Vorensky, still keeping the spindle spinning at top speed.

"In the far corner of the orchard you will see a tall fir tree. I climbed that and hung a few odd bombs and things near the top."

Again the stereo-telescope was "sighted" and the detonating key pressed. A series of reports came from several spots and, about twenty feet of the fir tree suddenly leaped into the air and came crashing to the ground.

"There must have been a few 'targets' in the line of fire that time," Vorensky casually announced, as he leaned toward the sketch map.

It proved to be as he said. Four targets were almost within line—a beam only a foot wide would have easily covered them.

The performance continued with such accuracy and speed that within twenty minutes every "target" had been located and exploded, and Lord X, turning to Vorensky, said solemnly: "Sir, your invention seems to be a weapon which will give its possessor an unbelievable superiority in war time. Whoever uses it will assuredly win the present struggle, and I think you can safely advise Count Poltich that Britain will accept his terms. Before you do so, however, I must consult the Cabinet and obtain the ratification of Parliament to the purchase of your machine.

"No; you need not worry over the affair becoming public," he assured Vorensky as the latter seemed about to speak.

"Thank you, Sir," replied the Russian, "but, you remember, I must insist upon a further demonstration before handing the machine over to you."

"I don't think it is really necessary to do so," ventured the Prime Minister.

"Those are my orders, Sir. You two, and a military official, must accompany me to some island where we can test the full range of my invention on swiftly moving 'targets.' Failure to comply with this request will necessitate my returning to Russia immediately—and commencing the manufacture of machines under the very eyes of German agents. Count Poltich has insisted upon this final test before the three responsible men I have mentioned, and I dare not disobey his instructions."

"Very well, then," decided his Lordship. "We will leave for London this afternoon, and settle the time and place of the final demonstration."

This thrilling story will be continued in next month's issue of the "Q.R.N." Be sure to order your copy NOW.

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AMONG THE AMATEURS

(By "Lambda.")

The Radio and Electrical Exhibition seems to have claimed the attention of a large number of the gang during the month of July, with the result that there has been very little activity in other directions, and gathering information of an interesting nature is about as easy as squeezing blood from a stone. Still, it's all in a good cause (according to our bold Knights of the Key)—poor comfort, 'tis true, when a page must be filled, and Ye Hon. Ed. grows impatient.

In the ultra-short wave regions a few enthusiasts have been on the job, notably 4AW, 4CG, 4PN, 4RB and 4WA. The first-mentioned gentleman (the appellation is used advisedly—he calls in sometimes) has climbed down as low as two metres, and has listened to his own signals some distance down the street. No, he didn't send a few dashes, close down, and chase down to the corner per motor-bike in time to intercept the sigs as they passed that way. Arthur, who really is not as dull as he looks (how could he be?) doesn't do things that way at all. As no one was handy to sit on the key, it was screwed down, while the observer adjourned to his receiver, which had previously been taken a couple of hundreds yards down the road. The signals were quite strong and steady, according to AW.

CG, PN, RB and WA are well on to something new. Fixing the wave at ten metres, they have been trying phone at that wavelength, and so far have achieved a fair measure of success. No great distance has been covered as yet, but if any one has a coil which will let their short-wave receiver tune down to 10 metres, a little time spent in exploring in that direction might be well worth while. 4PN is wanting to know just how accurate—or, alternatively, how inaccurate—are Leicher wires for measuring the length of ultra-short waves. He has calibrated a meter by the harmonic method, but this system is open to serious error if one happens to miss a harmonic, as it is very easy to do, or if the original wave from which the calibration is being done is ever so slightly incorrect.

While on the subject, it is interesting to note the splendid 10-metre record put up by the American station 2JN and the French station 8CT. These two amateurs communicated across the Atlantic for half-an-hour on ten metres, both reporting good signal strength in spite of the fact that comparatively low power was used at each end. The writer still holds the opinion that, when the problem of ensuring that both stations are transmitting and listening on exactly the correct wavelength has been solved, seventy-five per cent. of the difficulties associated with ultra-short wave work will have been overcome. If you are attempting to get results by operating at **approximately** the right wavelength, there is no dodging the issue—you are merely working in the dark, and wasting valuable time.

A New Four.

4RA, whom some of you no doubt have heard, is a new one, and lives somewhere in the many-miles-long Ipswich Road. The location has been narrowed down to South Brisbane, but even that isn't very helpful. However, any cards for 4RA—or for any other station, for that matter—may be sent to the Q.R.T.L., c/o Main Roads Commission, Brisbane, where they will be dealt with by the ever-active QSR section and forwarded on to their destination.

4MM is looking forward to the arrival of his 900-cycle alternator, which is now on the water. He intended to instal a petrol engine to drive the alternator, but I believe he's now looking out for a motor instead.

A QSO with Portuguese 1AE gladdened the heart of 4NW last week. A long confab. was held, both ends reporting good signals. Tom is still as keen as ever on 240-metre phone, on which excellent reports are being received from all over Australia. On 32 metres he was QSO recently with the French station oc-8NZ, of New Caledonia. The Frenchman reported 4NW's C.W. R-8, and phone R-6, although he could not understand the latter, as he speaks very little French.

The old "BH" Raytheon at 4NW is still giving yeoman service. It has been in use for over a year, and walks away apparently quite comfortably with a mere 600 volts! The R.A.C. output of something like 520 volts is filtered, and yields a pure D.C. note. 4LJ has been heard working a few Yanks from time to time, but, as can be imagined, he gets very little time to be on the air these days. His steady "ripply" R.A.C. sigs. make a tremendous noise in these parts, and evidently are not by any means feeble some thousands of miles distant.

The Master Oscillator set owned by 4WS, which was awarded first prize in its section at the recent Radio and Electrical Exhibition, attracted a great deal of attention, and was the subject of much favourable comment. Have ye heard, though, that young Walter also carried off the Blue Ribbon in the Novel Crystal Set Section, with a cleverly designed "bird's nest" receiver. Can't help wondering if the dicky-bird is responsible for some of those heart-rending trills which make the B.C.L. gnash his hair and tear his teeth sometimes.

Quite a number of the Fours are looking into the matter of a screen-grid receiver, weighing up the pros and cons, particularly with regard to the exchequer. It certainly looks as if the old faithful three-coil set, which has been the standard equipment in nearly all ham stations for so long, will have to take second place before many months have passed.

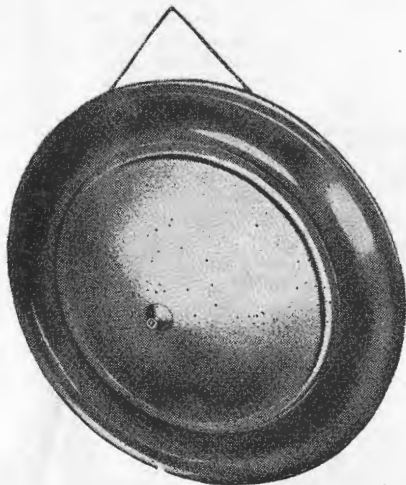


TESTED AND RECOMMENDED

A Department of Investigation, conducted for the benefit of our readers. Every piece of material featured on these pages is subjected to a rigorous and searching test before publication. No remuneration is received for the publication of these paragraphs.

THE AMPLION JUNIOR HANGING CONE LOUDSPEAKER.

The Amplion Junior Hanging Cone, Model A.C.-2, is intended to hang from the picture-rail, or from any other point, so that it will rest against the wall in such a position that the latter acts as a sounding board. Used in this position, we found the reproduction to be very good indeed—remarkably good for such a low-priced speaker. On the lower notes the difference between the A.C.-2 cone and a good horn-type loudspeaker was most marked, while the “muffling”

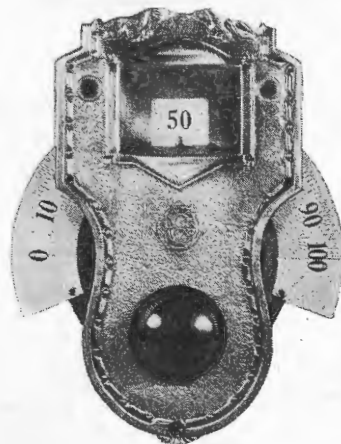


effect so noticeable on some notes with many cones, was entirely absent. Speech is clear and natural, and the A.C.-2 will handle any amount of volume for the requirements of the average home. It is a very attractive instrument, and takes its place on the wall without being too obtrusive. The decorative scheme is tastefully chosen—a dark brown frame, and a gold-finished diaphragm. It is supplied with a hanging cord of adequate length, and is available also adapted to hang from the ceiling, for those who prefer that method of suspension.

Our sample of the Amplion A.C.-2 Cone came from Messrs J. B. Chandler & Co., Adelaide St., Brisbane.

THE DE JUR ILLUMINATED VERNIER DIAL.

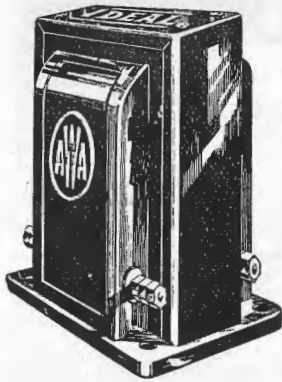
A beautiful example of artistic design and precision manufacturing methods is afforded by the De Jur Illuminated Vernier Dial, a sample of which we have received from the agents, Messrs. Edgar V. Hudson, 53 Charlotte St., Brisbane.



The dial is of the back-of-panel mounting type, only an embossed escutcheon plate with bakelite control knob being visible from the front of the panel. Of extremely rugged construction, the metal frame supports a 1 to 10 reduction friction drive vernier mechanism, the driving spindle being equipped with a self-adjusting device for taking up wear. Heavy semi-transparent celluloid is used to carry the large, easily-read scale, which reads from 0 to 100 in a counter-clockwise direction. Immediately behind the window in the escutcheon plate, and behind the dial itself, is a small lamp; this is to be connected to the filament battery, and serves the dual purpose of illuminating the scale from behind, and acting as a pilot light which will be alight whenever the set is in operation. This is a handy feature—a safeguard against the possibility of leaving the switch in the “on” position inadvertently.

Mounted on the front panel, the exterior of the dial cannot fail to add a touch of beauty and distinction to any receiver. The shape, ornamental embossing, and the finish are obviously the work of an artist, and form a most pleasing ensemble. Antique bronze has been chosen as a finish to the metal plate—a finish which harmonises perfectly with the mahogany-bakelite control knob. The De Jur Illuminated Vernier Dial is well boxed, and supplied complete with all necessary hardware for mounting any type of condenser. A heavy paper drilling template is also included.

THE A.W.A. "IDEAL" AUDIO TRANSFORMER.

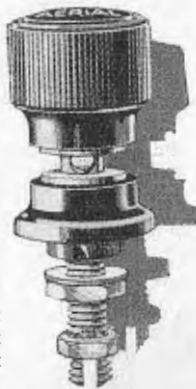


Two of the new A.W.A. "Ideal" audio transformers have been submitted to us for testing purposes by the Queensland distributors for A.W.A. products, Messrs. J. B. Chandler & Co., Adelaide St., Brisbane. They were connected up in an ordinary audio amplifier, using Marconi valves with 90 volts on the plate, and, with a good cone loud-speaker, used to amplify the output of a valve detector. As regards tone quality, the result was flawless, even the very low

notes of the string bass being fully amplified and standing out with splendid definition. And this fine performance in the lower register is not secured at the expense of the higher end of the musical scale—far from it. The high artificial harmonics of the violin were not missing, and the results bear out the assertion of the manufacturers that the amplification-frequency curve of the transformer is practically a straight line over the entire musical and harmonic scale. In appearance, the A.W.A. "Ideal" transformer is radically different from the older model; it is a good deal larger, and is finished in an attractive phosphor branze enamel. The terminals are conveniently placed and plainly marked, and the transformer is produced in ratios of 2-1, 3½-1, 5-1, and 9-1, in addition to an output transformer having a 1-1 ratio.

BELLING-LEE TERMINALS.

The range of radio terminals or binding-posts manufactured by the English firm of Belling-Lee is undoubtedly the finest that has ever come under our notice. Two distinct types are produced—the all-bakelite terminal, and the lower-priced nickel-finished terminal. Both types are supplied with about 15 different engraved names, and follow the same general design.



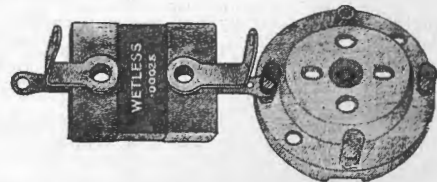
So many fine points are combined in the bakelite type "B" that it is difficult to enumerate them. First of all, the engraved head does not rotate with the clamping-head; it stays stationary, thus permitting the engraving to be easily read at all times. The clamping head itself will only unscrew a certain distance, and no further—it cannot be removed and mislaid. A hole is drilled through the stem, so that the wire to be held may either be threaded through this, or clamped between the two metal faces. There is no thread on the stem at the point at which the wire is clamped, thus eliminating the tendency to cut the wire which is always present with ordinary terminals. Moulded into the under side of the terminal is a projecting tooth, which may be fitted into a notch in the ter-

minal strip. This is probably the most important feature of all, as it absolutely prevents the possibility of the whole terminal turning should the nut become loose, which often happens when the material of which the terminal strip is composed shrinks or "flows." A bakelite shoulder is also provided, which allows the terminal to be mounted on a metal panel with no additional insulation except a single washer. In the lower end of the stem is a milled slot, and in this the connecting wire may be securely fastened by means of the second nut furnished. The beautiful proportions and high finish of the type "B" certainly make it an aristocrat among terminals.

Type "M" is the popular model, finished in nickel, and supplied with the same markings as type "B." It incorporates many of the features of the type "B"—non-rotating head, non-removable clamping-head, metal faces, plain stem, slot and extra nut. Instead of the projecting tooth, however, the bottom of this terminal is milled so that a roughened surface is presented to the terminal strip, thus providing a firm grip. Our samples of both types were received from the factory representatives for Australia, Messrs. W. G. Watson & Co., 53 Charlotte St., Brisbane.

WETLESS FIXED MICA CONDENSERS.

The Wetless line of fixed condensers needs no introduction to Queensland set-constructors. For some considerable time, they have been widely used, and the name of this Sydney manufacturer is well and favourably known. Recently, however, new types have been produced, and we have received a complete set of these condensers from Messrs J. Wetless, Rockdale, Sydney, for test.



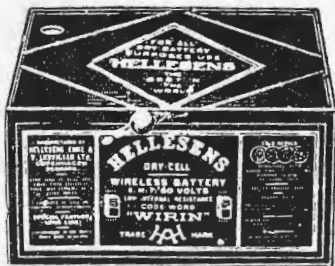
After using them in every position in a receiving set in which a condenser of small capacity is called for, we have no hesitation in recommending them. Two types are manufactured—the first quality, type "B," and a lower-priced line, type "A." The capacitor unit itself is composed of thin sheet copper (not foil), separated by the highest-grade of Indian ruby mica. The unit is clamped rigidly between two Continental-bakelite outside plates, which are held in compression by heavy nickelled brass bands secured by eyelets. Tinned soldering lugs are provided, and the grid condenser is fitted with suitable clips for holding the grid leak, as well as extra long mounting lugs.

In the "A" type the metal clamping bands have been dispensed with, the outside bakelite plates being held in compression only by eyelets. Otherwise, the construction is similar to the type "B," the same high quality of material being used. Type "A" is marketed in capacities ranging from .0001 in easy stages up to .002 mfd., while the higher grade type "B" is available in capacities as high as .02 mfd. Our illustration shows a type "B" grid condenser attached directly to the grid terminal of an ordinary valve socket, no wiring being needed between the two.

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BRISBANE.



Constitution Road, Windsor, Brisbane,
July 16th, 1928.

(The Editor, "Queensland Radio News.")

Dear Sir,—I am sending you a schedule of the transmissions of the short-wave stations 2XAF and 2XAD, Schenectady, N.Y., recently received from a friend in America, and which should be of interest to short-wave enthusiasts.

Last Saturday, 14th inst., I heard 2XAD at good strength from 12.10 p.m. to 2 p.m. From 1 p.m. to 2 p.m., it was on the speaker. The schedule, in Brisbane time, is as follows:—

2XAF, 31.4 Metres.

Tuesday	9.0 a.m. to 1.0 p.m.
Wednesday	9.0 a.m. to 4.0 p.m.
Friday	9.0 a.m. to 3.30 p.m.
Sunday	9.25 a.m. to 3.0 p.m.

2XAD, 22 Metres.

Monday	9.0 a.m. to 2.0 p.m.
Tuesday	5.0 a.m. to 7.0 a.m.
Wednesday	3.0 a.m. to 5.0 a.m.
Thursday	9.0 a.m. to 2.0 p.m.
Friday	5.0 a.m. to 7.0 a.m.
Saturday	9.0 a.m. to 2.0 p.m.

On Thursday and Saturdays 2XAD relays WGY (New York).—Yours faithfully,

L. S. CUFFE.

* * * *

Postal Staff, Narrogin, West Australia,

July 16th, 1928.

(The Technical Editor, Qld. Radio News.)

Dear Sir,—Please accept my many thanks for the copies of "Queensland Radio News" received here some weeks ago, containing dope for A.O.P.C. I might inform you that I was successful in passing the exam. the end of June, for which great credit is due to yourself and 4MM for your valuable assistance. With my kindest regards and 73's,—Yours very sincerely,

NORM TURNBULL.



DOWN IN PRICE.

One of the most efficient of horn type speakers, the Amplion Model A.R.38, which formerly sold at £4, is now offered at £3. At this figure it would be difficult to imagine a better bargain. The instrument is all metal, and is therefore well suited to withstand rough usage and climatic changes. It is as large as many so called "Senior" loudspeakers, and will give more volume than most, whilst the quality is excellent. It is an ideal speaker for the manufacturer to sell with his sets.

The "Senior" Swan Neck Model A.R.88 (metal) and A.R.88O (oak flare) have also been reduced to £4/10/- and £5/10/- respectively.

These speakers, like all Amplions, are backed by the Amplion guarantee of performance and service.

This department is conducted for the benefit of our readers. We cannot answer queries by mail, but if a special diagram is required, we will supply it at a cost of 1/-.

Questions Answered

By the TECHNICAL EDITOR

Questions received before the 20th of the month will be answered in the following month's issue. Queries arriving after this date are deferred until the next issue.

J.H.A., Springsure.—“Re the short-wave adapter (April ‘Q.R.N.’), the condensers I have have the following number of plates: The .00025 has 7 moving vanes and the .00015 4 moving vanes. I would like to know if these are correct. (2) Could you give me particulars of the ingredients, and the quantity of each, to use in making up acid to replenish the cells of a storage battery, 6 volts?”

Answer.—The sizes of the condensers you have are quite correct. Unfortunately, an artist's error occurred in the pictorial diagram (Fig. 4). The wires running to the second and third terminals (from the left) of the coil mounting are transposed. That is, the wire from the plate terminal of the valve socket should go to the third terminal, and the wire from reaction condenser “B” to the second terminal, whereas the opposite is shown. (2) When you say “replenish,” I assume you mean the solution is required to renew the solution of the battery after the old solution has been poured out. To make up for evaporation from a battery, only pure water must be added—no acid. However, to renew the solution, or to replace solution which has been split, you should purchase a sufficient quantity of commercial sulphuric acid, which comes in approximately the correct density for battery use. For warm climates such as ours, a density of 1.250 (always expressed as “twelve-fifty”) is used, this being what is termed a “low” acid. Therefore, you should test the gravity or density of the acid (always using an earthenware vessel), and, if above 1.250, add distilled water to it until the correct density is reached. The solution may then be poured into the cells of the battery until the plates are covered to a depth of a quarter of an inch or so. As a matter of interest, it may be mentioned that, in cold climates, a “high” acid is used—acid with a high density, usually about 1.300 or slightly higher. The reason is that a “high” acid does not freeze as readily as a “low” acid. This is why most American hydrometers are marked “fully charged” at the 1.300 point. Only the figures should be noted in this case, the battery being regarded as fully charged when the liquid rests at the 1.250 level.

E.K., Sarina, near Mackay.—“In your June ‘Questions Answered’ I see you mentioning the August 1926, and July 1926 issue of your ‘Q.R.N.’ regarding a short-wave receiver and a wavetrapp. I would like to receive these, and am enclosing 1/- in stamps. I would like your opinion on the following: I have a Reinartz set, and would like to know if it is possible to receive any of the European stations on it, or what set would be required to do so. I am interested in Prague (Bohemia) station, which is using 348.8 wavelength. I get JOAK (Japan) quite easily with my set, especially on Sunday nights after 4QG shuts down.”

Answer.—A copy of the August 1926 issue was mailed to you on July 4th last. We cannot supply copies of the July 1926 issue, containing the wavetrapp article, as the demand has been so heavy that this issue is now out of print. However, in response to many requests, we are reprinting the article in this issue. We have refunded 6d. to you. With regard to reception of European stations, it would not be possible for you to hear Prague on your present set, or indeed on any set at the present time, as there is no short-wave station in that city, so far as I am aware. With a two or three-valve short-wave receiver, however, you should be able to listen to Dutch, French, Italian, German, English, and American stations at different times. The receiver described in the issue which has been sent to you is suitable for this purpose.

S.A.G., Annerley.—“Please give me some information about the enclosed ‘B’ eliminator circuit. It appears to me to be extremely simple, and as I require about 150-volts ‘B’ supply, I should like to know about what voltage it would deliver. I have a three-valve set, one H.F., detector, and one stage of audio. A suggestion as to how to split up the voltage to 45, 80, 120, and 150 volts would also be appreciated. If necessary, I could dispense with the last-named voltage, and only use the 45, 80 and 120.”

Answer.—The circuit you submit is not suitable for operation on 240 volts, as one jar is not sufficient. We are mailing you an amended circuit, showing the method of connecting various resistances in order to secure various voltages. The maximum voltage delivered by such a unit would be in the vicinity of 130 or 140 volts, and it can be made to operate successfully if a sufficient number of chokes and condensers are used to entirely smooth out the strong A.C. ripple which is present after rectification. At the same time, I don't like the idea of connecting the receiver directly to the electric light mains (which is what this sort of thing amounts to), as it would be an easy matter to get quite a nasty shock if some parts (for instance, the loud-speaker jack) were touched while some part of the body was in contact with earth.

C.K., South Brisbane.—“Would you kindly forward me a good circuit of a two-valve short-wave set, and list of components, which would amount to £5 or less.”

Answer.—We shall be glad to forward you a copy of the August 1927 issue, containing full constructional details of the “Q.R.N.” short-wave Receiver on receipt of 6d. in stamps.

C.W.M., Maryborough.—See reply to J.H.A., Springsure, re error in the Short-wave Adapter pictorial diagram, which we regret. This should put you right, as the adapter should work perfectly with the receiver you mention.

W.G.R., Maryborough.—“In reference to the 1928 Browning-Drake wireless set described in ‘Q.R.N.’ June number, kindly advise me if the set could be worked by electricity supplied by the local power house from a light socket. If so, would you also advise what adjustments would be necessary and the approximate cost of same?”

Answer.—Yes, it is possible to electrify the 1928 Browning-Drake, but it is rather too comprehensive a subject to be dealt with in this department. In an early issue, we intend to publish full constructional details for such a receiver. At present suitable transformers are not available in Queensland, and the job of building them at home is a little beyond the capabilities of the average set-constructor. It is expected that a commercially-built transformer will be on the market shortly. Sorry we cannot answer queries by mail.

A.G., Moregatta, via Cairns.—“Will you kindly answer the following through your valuable paper: How to make the coils for the Short-wave Adapter (April 1928 ‘Q.R.N.’). The diameter, number of turns, gauge and kind of wire?”

Answer.—The diameter is approximately 3 inches, and 20-gauge D.S.C. wire (green) is used for the grid coils, and 32-gauge D.S.C. for the tickler or reaction coils. The tickler coil is in each case wound at the filament end of the grid coil. To cover the wavelength range of 15 to 133 metres, 3 separate coils are



required, each consisting actually of a grid coil with its tickler or reaction coil. Coil 1, covering 15 to 33.5 metres with a .00015 mfd. tuning condenser, has 3 turns grid, and 3 or 4 turns tickler. Coil 2, 31.5 to 68 metres, has 8 and 6 turns, respectively. Coil 3, 57 to 133 metres, has 19 and 12 turns. The variable primary coil has 5 turns, and is O.K. for all waves. In the circuit diagram the primary is marked "1," grid coil "2," and tickler coil "3." If building the adapter, see reply to J.H.A., Springsure.

W.F.T., Valley.—"In your issue of November, 1926, there is a list of the 'Q' signals, and you assure readers that that list is the only correct one, and the only one which will be accepted. On looking through the 1928 A.W.A. Radio Guide, I see that their list is different from yours, some signals having their meanings modified, while others have different meanings altogether. Would you kindly tell me which is the correct list, as I am anxious to learn these signals?"

Answer.—The list published in "Q.R.N." November 1926 issue is correct, and the Radio Inspector advises that the A.O.P.C. ex-

amination will be based upon this list up to and including December 31st of this year. After that date, the list of "Q" signals compiled by the Washington Conference, and published in the A.W.A. Guide will come into force. A notice making this point clear appears in another part of this issue.

H.J.B., Belli, via Eumundi.—"Would you kindly forward to me a circuit of Browning-Drake Four, using a 1928 B.-D. Kit. Kindly let me know the cost of such information, and I will remit by return."

Answer.—We are mailing you a copy of our June issue, in which were published full instructions for building this excellent receiver. The cost of the single copy is 6d., post paid.

C.H., Bowen.—The information published in this issue re the Peridyne should settle your trouble. You may have a faulty valve in the third socket (first audio). The screen grid valves cannot be used for the Peridyne in its present form. Sorry we cannot reply by mail.

New Wireless Device Which Calls Operator

For some years radio research engineers have been engaged in experimenting with various radio devices, having for their object the automatic reception of a pre-arranged signal from a ship or other station, the reception of such signal actuating a call bell apparatus to ring in the wireless operating room or at various locations on a ship or at a wireless station.

The chief difficulty encountered during these trials was the failure of the apparatus to respond, due to interference caused by atmospheric or other signals, and the danger of false calls. Both these difficulties have now been overcome by the Marconi Auto Alarm, a wonderfully efficient unit of wireless equipment which operates with certainty on receipt of a pre-arranged signal, and practically eliminates chance of false calls. Many of these Auto Alarms have been installed on British ships, and bid fair to become a necessary part of the wireless equipment of every wireless-equipped ship. Their use, however, is not confined to ship stations, an Auto Alarm having been recently installed by Amalgamated Wireless (A'sia.) Ltd. at the A.W.A. Radio Station at Suva, Fiji—the first to be installed in Australasia or the Pacific Islands.

The Auto Alarm at Suva Radio Station comes into operation on the closing of the station at mid-night. The pre-arranged signal is strictly confined to use as a preliminary to the well-known S.O.S. signal, and has the effect of attracting the attention of the telegraphists—who, though off duty, are on the premises—and in calling them to the operating room by means of the automatic ringing of bells.

One of the bells is located in the operating room, and the others are placed in the bedrooms of the telegraphists, and all continue to ring until attended to and switched off in the wireless room by the operator who then takes up a watch for the vessel calling. The best pre-arranged signal has been found to be a series of dashes each of four seconds' duration, separated by intervals of one second, and to this combination the name of "Alarm Signal" has been given.

The Auto-Alarm equipment, which is intended to be connected directly to the station aerial, when the

telegraphist goes off watch, in place of the ordinary receiver, consists of two chief units, the receiver and the selector.

The receiver consists of a three-valve amplifier and tuning circuits arranged so as to cut out as much as possible signals on wavelengths other than 600 metres, and at the same time to be fully sensitive to any wave within 2½ per cent of 600 metres, the limits of error which are now allowed in the tuning of ship's transmitting instruments.

Signals from the receiver are passed on to the selector, whose duty it is to pick out the alarm signals from all other signals or mixture of signals which may be received.

The peculiar arrangement of the selector, combined with the nature of the alarm signal, enables the apparatus to pick out the alarm signal even when two ships are sending Morse messages at the same time and on the same wavelength, however close they may be. Such a degree of interference does not hamper the working of the instrument, and trial has shown that if the alarm signal is continued for one minute the apparatus will almost always get hold of it even when three ships are working ordinary Morse on the same wavelength in the vicinity.

If one of the valves in the receiver unit burns out or the battery runs down, the mechanism in the selector unit will act and set the alarm bells ringing, thus bringing the operator to the wireless office where indicating instruments will show the cause of the ringing.

What's on To-night ?

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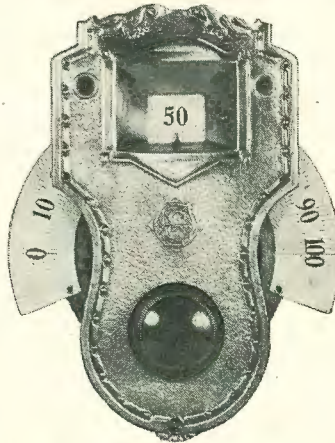
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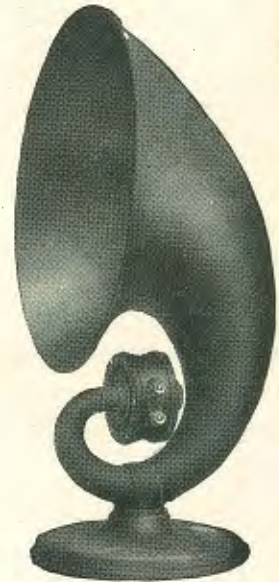
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