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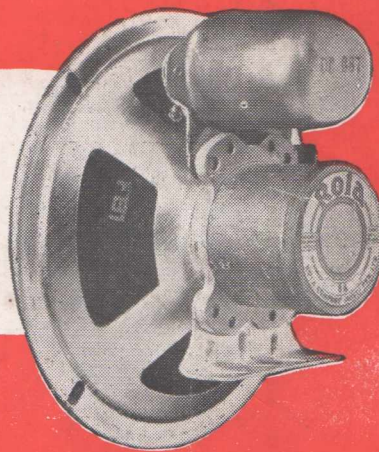
# Radio World

1/-

VOL. 12 . . . . . NO. 10

MARCH 15, 1948

**ROLA  
PRESENT THEIR  
NEWEST SPEAKER  
MODEL 6K**



The new Rola 6K Speaker is the most highly efficient 6" Speaker available in Australia. Specially designed to provide the extra speaker efficiency required by portable, battery, and vibrator operated receivers. Can be used in A.C. receivers if desired.

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*Rola 6K Speakers are now becoming available to the Trade.*

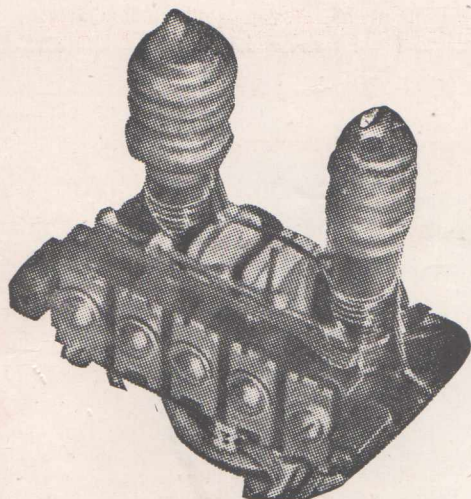
# Rola

**LOUD SPEAKERS WITH  
ANISOTROPIC ALNICO**

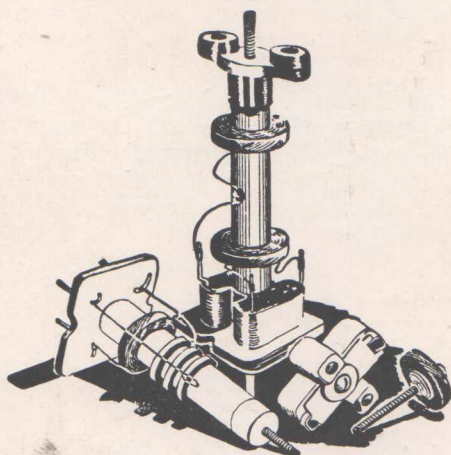
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No. 10

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## EDITORIAL

Ever since the earliest days of radio, most of us have been battling to get a wider and flatter frequency response from our amplifiers. Now things have advanced to such a stage that it is fairly easy to get a set-up of the flattest and widest response, such as a Lexington pick-up, Williamson amplifier circuit, and Goodmans speaker. I have such an outfit in operation and I can tell you that it is useless with the ordinary records as sold in the shops to-day. Using the amplifier and speaker with a wide-band tuner it is possible to get some brilliant results on radio from certain "live" broadcasts, but to enjoy the reproduction of gramophone recordings it is essential to lop off the highs.

Let me imagine that all is lost, I hasten to say that the latest wide-range pick-ups have more than mere wide range, their wave form on the normal frequencies is better than that of the old magnetic pick-ups; the amplifiers with triodes and inverse feedback have low distortion as well as wide range; the high-fidelity speakers can handle the middle register well.

It seems strange that we should have to strive so hard for wide-range reproduction and then turn around and lop off the highs, but that is the position at the moment with ordinary records. Later when full frequency range records become available things may be different.

In the meantime I can only recommend true wide-range equipment for radio work, and it has its drawbacks there, too. Static and noise are both reproduced with added brilliance in a manner which you won't appreciate.

—A. G. Hull.

# R.C.S. RADIO PTY. LTD.

# COMPONENTS



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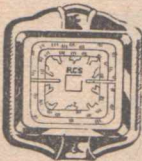
PT 40	6 ohm	25 amp	5 0
PT 38	10 ohm	25 amp	5 0
PT 39	20 ohm	25 amp	5 0
PT 34	30 ohm	25 amp	5 0
PT 46	400 ohm	50 M/A	5 0
PT 47	1000 ohm	35 M/A	5 0
PT 49	2500 ohm	30 M/A	5 0
PT 51	5000 ohm	30 M/A	5 0
PT 52	10,000 ohm	20 M/A	5 0



## PADDING CONDENSERS

R.C.S. padding condensers are complete on a clear polystyrene base with 6 B.A. insert moulded in a centre to ensure perfect finish. Available in four standard capacities. Variations from standard made to special order.

P21 Padding Condenser 460 K.C. 2 6  
 P22 Padding Condenser 262 K.C. 3 0  
 P23 Padding Condenser 175 K.C. 3 0



## DIALS

This portable D/W kit dial has all parts supplied ready to assemble and has a glass scale with B/C and S/W bands clearly marked, finished in white with green background. The special walnut escutcheon is easy to fit and requires an aperture of 3in. x 3in. This dial can be edge lit and is suitable for use with H gang condensers on 1600 and 550 K.C. and 13-7 to 40 metres.

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LF21 3 amp without condensers 1 17 6



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0 ohms to 1500 ohms, 100 M/A 1 0  
 1500 ohms to 2500 ohms 50 M/A 1 2  
 2500 ohms to 10,000 ohms 25 M/A 1 2



## TRIMMING CONDENSERS

This standard trimmer is small and compact, and ideal for trimming coils, etc., Type CG15. 2 plate 1 0

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CV34	10	3	2 .. 4 0
CV35	15	3	3 .. 4 3
CV36	25	3 5	4 .. 4 6
CV37	35	4	5 .. 4 9
CV38	50	4	7 .. 5 3
CV39	70	5	9 .. 5 10
CV40	100	6	14 .. 6 6

### M.C. TYPE WITH FACE AND BACK SUPPORTS AND SUITABLE FOR GANGING—

	Max. Cap MMFD	Min. Cap MMFD	Plates
CV41	10	3	2 .. 7 3
CV42	15	3	3 .. 7 9
CV43	25	3 5	4 .. 8 4
CV44	35	4	5 .. 9 0
CV45	50	4	7 .. 9 6
CV46	70	5	9 .. 10 0
CV47	100	6	14 .. 11 3



## R.C.S. VOLTAGE DIVIDERS

Wound with oxidised nichrome wire on round bakelite formers 3 1/2 in. x 3 1/2 in., complete with mounting legs.

VD25 15,000 ohms, 2 variable clips 5 6  
 VD 23 25,000 ohms, 2 variable clips 5 6



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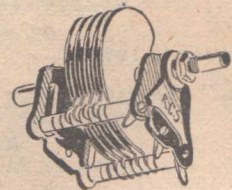
Type CG19 3 6



## 5 BAND TROLITUL SHORT WAVE COILS

These coils are the latest product of our factory, and the former after being moulded from polystyrene is grooved in a lath, thus keeping the winding accurately spaced and providing perfect tracking.

Metres	Aerial R.F.	Osc.	
10	H124	H125	H126 ... 4 6
20	H127	H128	H129 ... 4 6
40	H130	H131	H132 ... 4 6
80	H133	H134	H135 ... 4 6
B/C	H136	H137	H138 ... 5 6



# R.C.S. RADIO PTY. LTD.

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# IN SEARCH OF FIDELITY

*England Offers High-fidelity Pick-ups and Speakers*

**T**HE search for fidelity of reproduction from recordings is a long, hard but interesting struggle.

Once you get a fairly good speaker, a good crystal pick-up and a powerful push-pull amplifier you start to get impressive results. The louder you play it the better it sounds, until the neighbours intervene. But after a time you

By

**A. G. HULL**

notice the distortion and then your troubles really start, for every step you take makes you keener and keener, but the going gets tougher and tougher. By the time you have an amplifier capable of giving 15 watts with less than about 2 per cent. distortion, with a G12 speaker, you start looking around to find out which is the most likely step to get further im-

provement: a better speaker, better pick-up or better amplifier?

There are few better speakers than the old Rola G12, but there are one or two. Some of them are priced at such a figure that the economics of the position are out of all proportion. A tale is in circulation that one Melbourne fellow recently managed to land an Altec-Lansing speaker for around £200. Getting down a bit to the price range of £15 to £30 we find that there are a few to choose from, big Philips speakers of various types and one or two brands of English high-fidelity speakers, such as the Goodmans 12-inch job. Of the Philips jobs we have had little practical experience but have heard that some of them are more intended for high power use with speech frequencies, and do not claim to have anything brilliant in either extreme highs or lows.

About the Goodmans speaker we can say that it is good, with a wider range than the ordinary speakers, but to do its best it

needs two major items: an efficient baffle system and a really good input transformer. For the baffle we can't do better than recommend the vented enclosure detailed in last month's issue, but you will find that cabinet-makers do not regard it lightly when they read over the specifications. Making it yourself at home is a man-sized job. For the input transformer there is only one answer, the Red Line job which lists at £6. Adding £6 to the price of the speaker makes up a formidable total, but that's how it is. Dealing with better pick-ups, there is plenty of scope once you get over the fear of pre-amplifiers. Crystal pick-ups give fair frequency response with volts of output, so that you have little hum trouble and needle scratch is not a real problem. If you are content with a few millivolts of signal output you can get a more brilliant high-note response from several different types and brands of pick-ups, in fact you can

(Continued on next page)

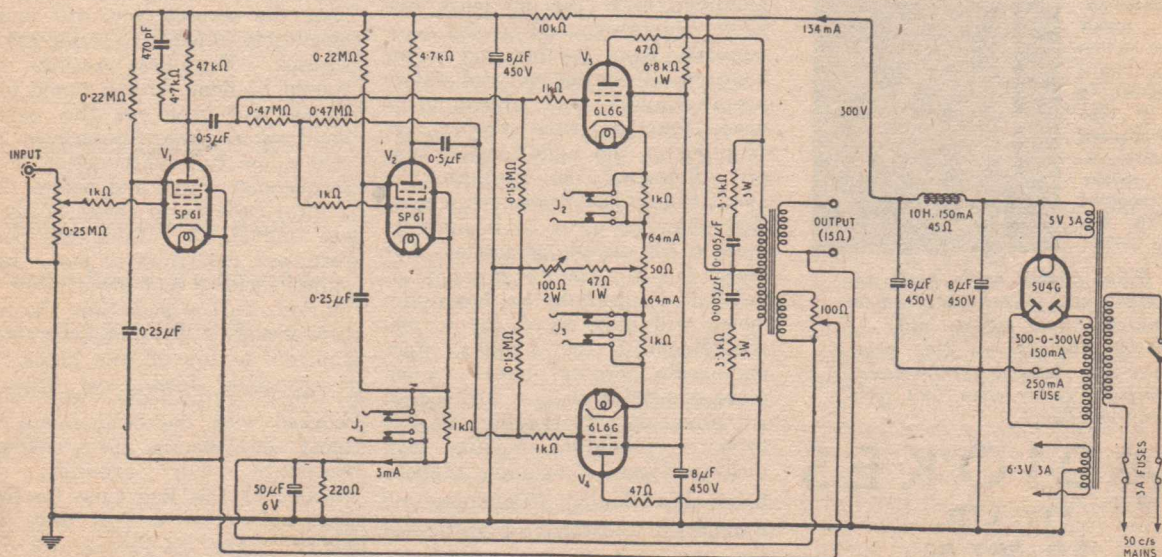


Fig. 3. Circuit diagram of amplifier. All resistors are  $\frac{1}{2}$ -watt,  $\pm 20$  per cent unless otherwise marked.

Latest English circuit for a high-fidelity amplifier using beam power valves, from *Wireless World*, London.

## FIDELITY

(Continued)

build them up yourself. Several local enthusiasts have turned out moving coil pick-ups of excellent characteristics and then there is the outstanding example of beautiful English workmanship, the Lexington. Under proper operating conditions this pick-up can give superb reproduction but there are several factors which must be faced up to. Firstly, the output is 1 millivolt from the head, so that a two-stage pre-amplifier is essential to build up the signal to a level suitable for driving the first stage of an amplifier of the type generally used with crystal pick-ups. Even with this pre-amplifier an input transformer with a step-up ratio of 50 to 1 is required. Such high gain brings its crop of problems; the turntable gives some electro-static effect showing up as sizzle and hiss in the speaker unless great care is taken with its earthing, shielding, etc. In England they have special turntable tops of heavy cast aluminium to help in this matter, also quarter-inch thick rubber mats to go under the records. The 50 to 1 input transformer picks up hum readily, even with special mu-metal shielding boxes and such like precautions. Its placement becomes vitally important. The pre-amplifier calls for at least one valve and twenty-odd sundry components. Hum trouble and motor boating will be encountered unless proper layout and shielding is used, together with proper decoupling of the high tension supply. Price of the Lexington is about £15 or £20, from memory, so that changing over to it involves quite a big layout of money. For about 25/- you can get a sapphire-pointed needle for the Lexington which will play about 400 to 500 recordings. It has a silky effect on needle scratch, but is much more expensive than steel needles. An alternative is the high-fidelity type of miniature moving iron pick-up, foremost example of these being the English "Connoisseur." Samples of these have been landed recently by J. H. Magrath & Co. and shipments are on the way out now. The "Connoisseur" has a flat response from 30 to 12,000 cycles,

like the Lexington but with an output of about one-tenth of a volt from the head without an input transformer. The two-stage pre-amplifier and tone compensator is still needed, but dodging the transformer also dodges a possible source of hum and distortion. Actually the "Connoisseur" is listed to run with an input transformer, then giving sufficient output to require only a single-stage tone compensator. But from what we have done in the way of experimenting it seems a far better proposition to use a two-stage pre-amplifier with a 6SN7GT and omit the input transformer. A point here to watch is the loading of the pick-up head. Feeding it directly into the grid of the first stage you need a grid-leak to return the grid to earth and to match impedances. If the value of this resistor is too high the tone is affected a lot. A resistor of about 100,000 ohms seems to be about right, lower values cutting the highs a bit which may not be a drawback with certain recordings.

### Needle Scratch

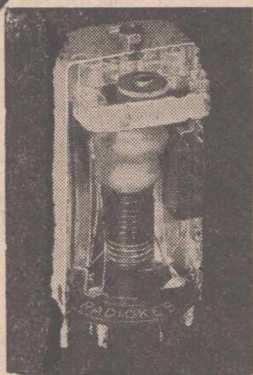
With both the Lexington and Connoisseur pick-ups the reproduction is brilliant in the extreme, but so is the needle scratch from even the best of available recordings. Unless you have the necessary mental make-up to allow you to concentrate on the music and not hear the scratch you will find it absolutely imperative to lop off the scratch. For best results this should be done with a tuned filter which will just cut the narrow band of scratch frequencies and still allow full reproduction of all frequencies above and below. Such a filter calls for a choke of accurate inductance. Doubtless some firm will find time to make up a suitable choke and place it on the market. In the meantime the next best thing is the old style "tone control" to lop off the highs.

Other enthusiasts who have worked with the Connoisseur are most enthusiastic about its performance. For example, Mr. Swales of the Red Line Co. in a personal letter a few days ago said:

"I have been doing some work on the Connoisseur pick-up in association with Williamson's circuit for a negative feedback amplifier.

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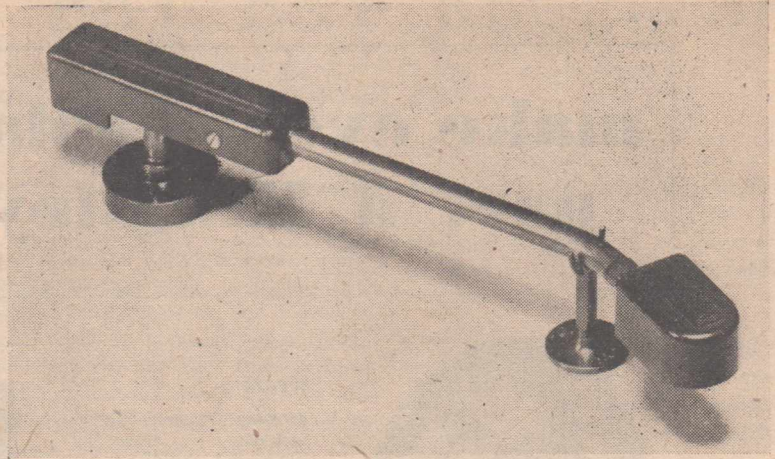
BROADWAY — SYDNEY

R-56

"Firstly I would like to say that a very critical test and examination of one of these pick-ups gave results substantially as claimed by the manufacturers. The frequency response curve taken in association with H.M.V. standard test records showed a deviation of not greater than 2.8db over the range of 50 c.p.s. to 8,500 c.p.s. At higher frequencies the tests were not very reliable, but I suspect a considerable attenuation at 10 kc/s.

"What in my opinion, however, is of a great deal more importance, the wave form showed a very close approximation to a sine wave at all frequencies over 250 c.p.s., and this was confirmed by listening tests which gave notably clean reproduction free from cross modulation. The wave form below this frequency shows progressive deterioration to 50 c.p.s. at which there is appreciable distortion, but, curiously enough, does not appear to be very marked in listening tests.

"The pick-up was used in conjunction with the amplifier described by D. T. N. Williamson with some 'FFRR' Decco recordings which reached me last week from England, and I can really say that the reproduction had a startling realism, attack and quality far ahead of anything else that I have had experience of. I doubt that these new recordings have



**The English "Connoisseur" pick-up which is now being imported by J. H. Magrath & Co. It is of the miniature moving iron type and capable of meeting all requirements for high fidelity.**

quite the virtues ascribed to them from time to time in the overseas press; nevertheless, the best of them are capable of a fidelity that is a very marked improvement on the best of recordings previously available. It is particularly noticeable in heavy orchestral reproduction where the definition of individual instruments is very apt to be blurred and indistinct with the older types of records.

"As the pick-up is a constant velocity type, it requires equalisation to compensate for the recorded characteristic, and after experimenting with different methods I find that a preamplifier in accordance with the enclosed circuit diagram gave optimum results. As the output from the unit is 0.1V. the transformer supplied was dispensed with and the pick-up fed directly into a 100,000 ohms load formed by the grid resistor of the initial tube. The total gain of this preamplifier is approximately 15 and the output voltage from the second half of the 6SN7 about 1.5 volts. This is more than ample to fully drive the negative feedback amplifier, which requires 0.9V. input if the gain reduction in the feedback loop is made 25 db.

"The elimination of the input transformer makes it possible to completely remove the last trace of hum background, and in the system under test was not accurately measurable, and thought to be 60 db below an average level

of -3 db from full output."

My own work has shown the need for some method of cutting scratch from ordinary records and so I have added a tone control to the pre-amplifier circuit, bringing it into line with the circuit which we gave in our issue of December, 1944. I don't think that this method of dealing with scratch is ideal but until someone offers to supply a 3 milli-henry air-cored choke it will have to do, as I hate winding 40-gauge wire by hand. The last thousand turns are always the hardest.

An attractive feature of the Connoisseur is the price, less than half that of the Lexington.

To sum up in a nutshell, I like these new things and have no hesitation in recommending them, but with a word of warning that they all call for further effort to get them into proper working condition, taking time and money.

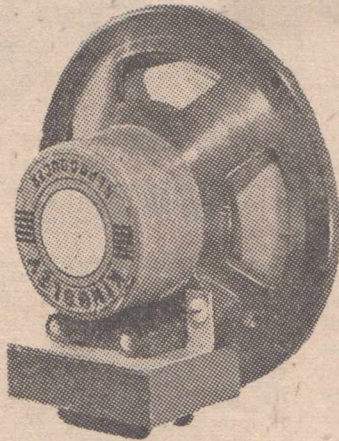
If you already have a good amplifier and want to improve it I suggest the following order for steps in that direction; put in the best of output transformers, use triodes with inverse feedback, install your speaker in an efficient baffle. If still keen to go further, then add the better speaker and a new style pick-up. If you want to be on the safe side, wait and see what the crystal pick-up people produce as the answer to the moving coil and moving iron pick-ups.

## NEW ZEALANDERS!

**Future issues of Australasian Radio World will be available in New Zealand only by direct subscription.**

**See notice on page 15.**

# make every replacement part a Kingsley part!



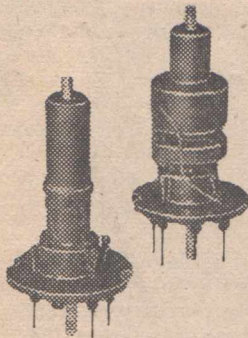
## SPEAKERS

Kingsley 3" and 6" Speakers — types K.R.3 and K.R.6 — are easily the best in the field. Radio engineers have been unstinting in their appraisal of these fine units, each one a piece of high-precision production. An extension to our Speaker range will be announced shortly.



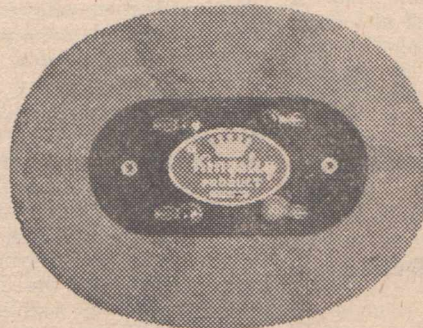
## I.F.'s

Kingsley makes over 27 different types of I.F.—455 k.c., 195 k.c., and 1.9 m.c.—each one a high-tested unit of guaranteed performance. Apart from the wide range of I.F.'s for the above frequencies, Kingsley has produced a superbly engineered miniature which has completely normal characteristics.



## COILS

The Kingsley coil-range includes 30 types of broadcast coils, 10 types of shortwave coils, and car radio coils. Whatever replacement is necessary—there is a coil to suit the exact specifications. All feature an exclusive iron-core technique—all are guaranteed for uniformity of purpose and long life.



## LOOP AERIALS

The new, and improved, Kingsley Loop Aerial, type K.L.2, is wound with special Litz-wire instead of solid wire. This change has greatly improved the performance, as is indicated by the following brief technical data supplied by Kingsley research-engineers. This data gives a comparison between the new Litz-wound product and the average competitive solid wound loop.

	"Q"	"Q"
	(Litz-wire)	(Solid wire)
Frequency	227	102
600 k.c.	166	118
1000 k.c.		

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# A MODERN BATTERY RECEIVER

## *Using Ferrotune Foundation Kit*

**A** WEEK or so ago, Mr. C. W. Harwood of Kyneton, in conversation with an executive of Kingsley, mentioned that he was building with great success the KFT1 Ferrotune Kit into a battery receiver with surprisingly good results.

So pleasing was this report that a movement was begun within Kingsley organisation to modify this kit to meet the conditions found in country centres more distant from broadcasting than Kyneton.

The results so far indicate that it is possible to modify the KFT1 Foundation Kit in such a manner that the chassis and the main tuning unit and the dial can be employed with very slight modifications to produce a really good battery receiver, with sufficient gain to make it useful for the

special conditions found in remote country districts.

While the KFT1 Ferrotune Kit as it stands was primarily designed as foundation for a 5-valve A.C. receiver, some allowance must be made for the fact that perhaps there is not as much gain in the battery tube if the receiver is to remain economical. To offset this, Kingsley engineers have designed an extremely good untuned radio frequency stage which is based on the principle of specially-designed coils arranged to peak at the correct portion of the tuning band to level out the curve and contribute considerable gain to the whole system without involving the complications of an additional mechanical piece of equipment to drive an additional core.

The principle employed in the design of this transformer is (a) the design of the coils at the right

frequency with sufficiently high Q to make them effective, (b) the winding is arranged so that the resistance of the coil is comparatively low.

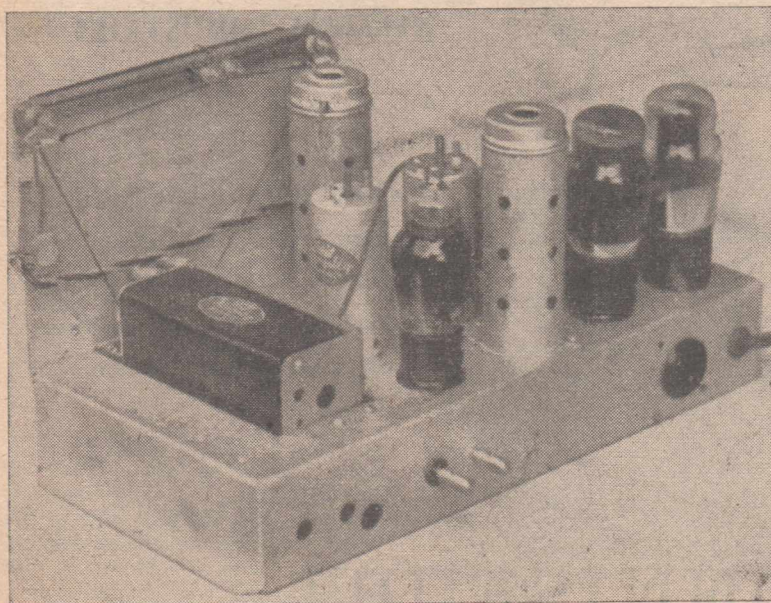
(c) They are totally enclosed in a special barrel core which is compacted of a super medium-frequency iron powder of a special grade

This really permits the construction of an untuned stage, the whole being housed in a miniature can similar to the Kingsley KIF14 or 15, but takes up surprisingly little room and is a handy addition to any type of receiver where additional gain is necessary to make its performance consistent under all conditions.

In order to add this radio frequency stage to the KFT1 Ferrotune Foundation Kit, Adaptor Plates are being manufactured and will be supplied with all new KFT1 Kits or can be supplied through our distributors for use with kits that are already in the distributors' hands.

This, together with complete written information as to how adaptations are to be made will provide simplicity of construction and will result in a greatly improved performance in remote areas where the received signal is, as a rule, below average. It is anticipated that the modifications of the KFT1 Ferrotune Kit for this new type of battery operation, together with its circuit and all information, will be made available to distributors at a very early date.

Taking a long-range view of the availability of the necessary tubes to employ this kit as a battery



Rear view of the full-size chassis built up from the KFT1 Ferrotune kit.

(Continued on page 14)

# "CONNISEUR" J10 DESIGNED FOR YOU

A moderately priced unit, 99/6, for general usage. Its unique **UNBREAKABLE** crystal cartridge has a response from 40 c/s to the top limit of commercial recordings, viz. 8.5 kc/s, in addition to low distortion, less than 1%, and a tracking error of 1 degree.

The **AUSTRALIAN RECORD COMPANY**, of Sydney, have again made a special needle available for this unit, a special type shadowgraphed needle.

The complete technical specifications are too numerous to mention, so that we have prepared a special brochure, which is available, free on request. Have you received **YOUR Copy??**



Wait for details on a startling new unit, designed for transcription records, and which will be available in June, when full details will be available. It is the **MICRO-LINE** series 3B.

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**CONNISEUR** pick-ups are the finest type crystal units available today, but are low priced to suit your purse. **REMEMBER**, the **BEST** after test is your choice.



## "CONNISEUR"

# RADIO WORLD REVIEW

## A Glance Through the Mail With Your Editor

In a report of the English Radiolympia I read that somebody displayed an amplifier for quality reproduction, with response flat to 20,000 cycles but "a filter is available for use with commercial recordings to exclude cross-modulation and other distortions. The filter leaves the response flat to 6,000 cycles but then cuts it down 15 db. at 7,000 and 40 db. down at 9,000 cycles." After playing around with a Lexington pick-up, Williamson amplifier and Goodman's speaker I fully appreciate the need for such a filter.

A telegram from friend Bristoe of Denham's, Maryborough, Q'd., tells the sad tale of premises and complete stock of radio parts totally destroyed by fire. This is indeed bad news. John is a great battler for the radio enthusiast, a keen contributor to Radio World, and he has built up a wonderful business in radio parts and equipment for radio testing and servicing. Knowing him, we feel sure that he won't be discouraged by this disaster, but will simply redouble his efforts until everything has been re-established.

Problems associated with coal production have driven English scientists to again consider electricity generation from tidal power. To watch the tide flowing in and out at places such as San Remo certainly gives you the impression that a lot of power is at present going to waste.

The latest (eleventh) edition of the Radio Handbook has been brought out on a larger format and printed by some sort of photogravure process which I'd like to know more about, as it seems to be quite a popular printing method with many modern American magazines. To get to the point,

the new Radio Handbook is an even better publication than ever before; in fact, I might even admit that it is now almost up to the standard of the A.R.R.L. Handbook!

Over 500 pages cover every aspect of Ham radio, from the simplest fundamentals to the fullest details on the building and adjustment of a 450-watt phone transmitter. The receivers detailed range from a four-tube job to a 12-valve double conversion super-het. I don't know when the local bookshops will have copies of this eleventh edition available or what the price will be, but I have no hesitation in advising every enthusiast to get a copy placed on order.

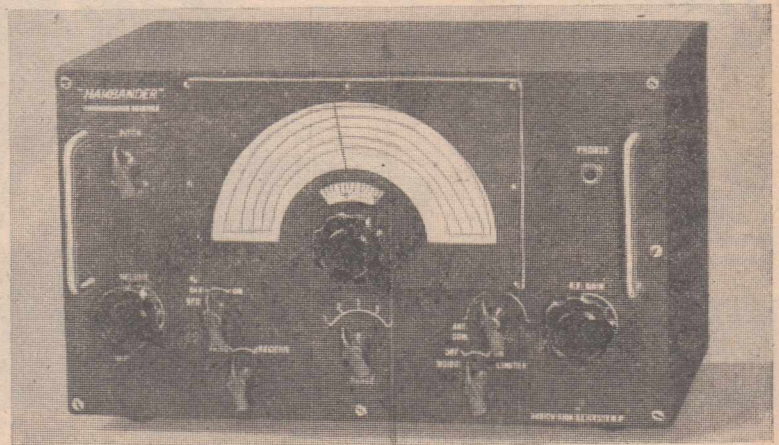
A complete answer to those who are so keen to build their own wire recorders is given in the December issue of "Electronic Engineering" from England. Of course that is not the title of their article but you can read it between the lines. There are a great many minor points to wire-recording which need specialised knowledge and components. It is not nearly so easy as you might imagine from

a glance at an "outline schematic of the arrangement."

A wonderful achievement for Australia is the latest publication by Angus & Robertson, "A Textbook of Radar," being a collective work by the staff of the Radio-physics Laboratory of the Council for Scientific and Industrial Research.

In every way this is a splendid book and, compared to overseas publications, offering exceptional value at its list price of £2/10/-. Frankly, I doubt if there are many hundred people in Australia who are able to appreciate the subject matter, amplifiers for frequencies of 3,000 megacycles, and that sort of thing. There seems to be a tendency at the moment to look on radar as just another unpleasantly connected with the late war, now to be forgotten as quickly as possible. Undoubtedly this attitude is to be deplored. The field of radar has only been scratched as yet and the bright young lads of today would be well advised not to overlook its possibilities. As a foundation of knowledge this text book

(Continued on next page)



The "Hambander," an English receiver for the enthusiast, which sells at a low figure. Read further details in this article.

## REVIEW

(Continued)

is invaluable. It is published by Angus & Robertson of Sydney and is available from all booksellers at 50/-.

\* \* \*  
From Chapman & Hall, London, comes a review copy of volume 1 of Radio Engineering by E. K. Sandeman of the B.B.C., listing at 45/-, English. It is an impressive text book, but was sadly misnamed. It should have been "Radio Broadcast Engineering" or something like that, as it is really a text-book of instruction for maintenance engineers at the B.B.C. transmitting stations. Nearly 800 pages are filled with sound principles, definitions, formulae and all the rest that goes to put furrows on the brow of the radio technicians.

\* \* \*  
In "Life" magazines a short time ago they had a story about a new design of radio with plug-in components and plug-in assemblies to assist in servicing. The idea is

a fine one, but "Life" went too far in their tale about how anyone would be able to fix his own radio if built in this way. The plug-in scheme would be a great help to the radio serviceman but it still wouldn't mean that he would be forced out of business. They could hardly fit plug-in dial cords, could they?

\* \* \*  
A few years ago a New York paper had a radio set "doctored" and then took it around to get quotes for its repair. Only one wire had been disconnected but the majority of servicemen claimed that a new set of valves was required, new speaker or other major components to get the bill up to several dollars. Out of twenty servicemen tried only two were found to be honest. Recently the same paper tried the stunt again and this time found that everyone of the twenty servicemen was completely dishonest. The same stunt was tried in Sydney about ten years ago, and results were just too awful to publish.

They go in for high-quality amplifiers in England. Vortexion is advertising an amplifier of 10 valves which is flat (plus or minus nothing) from 50 to 20,000 cycles and only .5 db down at 20 cycles. Distortion is given as a total of .01 per cent. Input needed for 15 watts is only .7 of a millivolt. The job is push-pull throughout with cathode-follower triodes in the output stage. In the advertisement they don't mention the price!

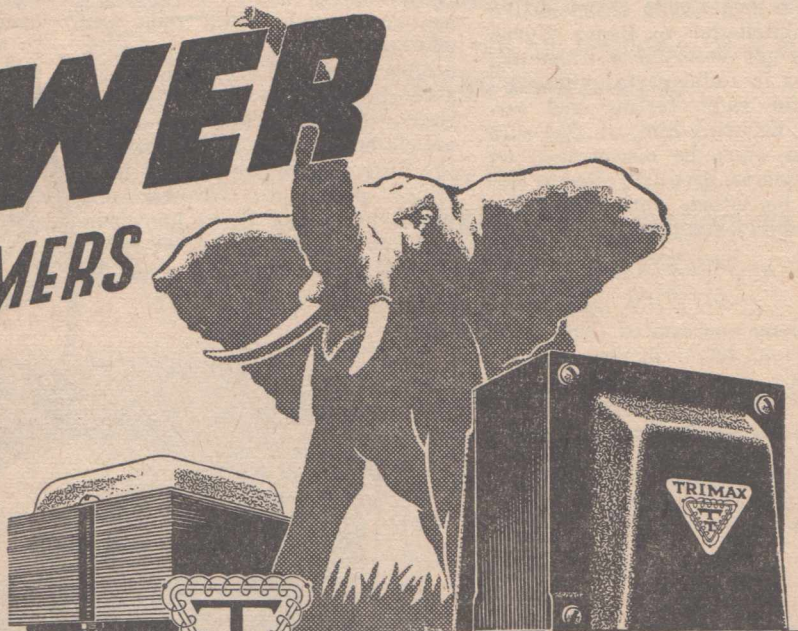
\* \* \*  
After the recent Radiolympia Show in London there were many cynics who said that the only important advance they had been able to find was in the prices.

\* \* \*  
Nearly as bad as in Australia? One English loud-speaker manufacturer is advertising that he is accepting orders for delivery five to six months hence.

\* \* \*  
Paton Electrical, Sydney manufacturers of radio test equipment,

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have gone into production of a photographic exposure meter, which is grand news to those who also make a hobby of photography.

In their advertising the old English firm of H. A. Hartley Co. says: "After twenty years we have come to the conclusion that more bolony is spilled over high-fidelity reproduction than any other subject under the sun, except politics."

As you all know, there are two main types of receivers: superhets and tuned radio frequency sets. But lately a new comet has appeared in the sky and also a new method of reception, known as the Synchronyne. So far it appears to have been mainly sponsored by the English "Electronic Engineering," with little comment by the several other English journals. The design is by Dr Tucker of the Post Office Research Department, so I can't quite understand why it should be a more or less "exclusive" story to one publication. If I can get time to get around to it I may be able to get together a summary of this design for publication in an early issue. At a glance it looks as though it would have more of an academic than practical interest.

Cutest thing in the valve line for many years is the Tungram UA55, which is a sort of twin-pentode which can be used in any socket in a receiver. A typical circuit is a four-valve superhet with the UA55 in every socket, including the rectifier. Other circuits show it in a regenerative two-valver and so on. So far as I know there is no Tungram representative in Australia and little likelihood of this type of valve finding its way out here for a long time yet. I found the best story about this valve in the Belgian "La Radio Revue," but it is written in French and it is only now that I realise that I could not have paid proper attention to the French teacher when I went to school.

On behalf of Capitalism it is claimed that only 7 per cent. of the world's population is in the United States, yet they have 85 per cent. of the world's radio, 80 per cent. of the motor cars, and 95 per cent. of the bath-tubs!

At a recent trade meeting in Melbourne, the Hon. A. G. Warner, M.L.C., said that it was expected that by the end of the first quarter of 1948 supplies of radio goods would be plentiful, and there would be need of keen selling campaigns.

Another Radiolympia sidelight which may mean a lot: An extended bass response is provided in the "Concert Labyrinth" loud-speaker by a combination of pipe resonances and phase shifts between back and front of the diaphragm, blended experimentally to give a smooth response curve in conjunction with the characteristics of the loud-speaker driving unit. The measured response curve in the open is not flat, but has been modified deliberately to give the best results when the loud-speaker is used in a living room of average dimensions and absorption co-efficient.

I don't know whether it is a mis-print or not, but in an article on wire recorders by the Chief-Engineer of the Columbia Broadcasting System, he gives the price of

the special wire as being about 10,000 dollars for sufficient wire for an hour's recording.


From the English company Radiovision (Leicester) Ltd., I have full details of their latest receiver, known as the Hambander. This is a modest set, selling at £22/10/- in England, yet in appearance and performance it is a real "Ham" receiver, covering the ten, twenty, forty and eighty metre bands with plenty of hand-spread. I'll bet there are plenty of Australian enthusiasts who would like to have a set like this on the bench if it could be obtained in this country at anywhere near the English price. Taking into account the exchange rate, customs tariff, primage, sales tax and all the rest of it, they would need to sell at nearer £50 in Australia, but they might be quite an attractive proposition at that.

Another interesting English receiver is an eight-valve t.r.f. job for high-quality reception, which you can have to give you flat re-

(Continued on next page)

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## REVIEW

(Continued)

sponse from 40 to 12,000 cycles, or with bass or treble boost or cut as required. The output stage is push-pull triodes.

From John F. Rider of New York I have a sample copy of his latest publication entitled "High Frequency Measuring Techniques Using Transmission Lines." To me it seems to be just a terrific example of algebraic headache, but possibly some of our readers would appreciate it. If you are interested in inverse-hyperbolic tangents and that sort of thing I'll be glad to let you have the loan of it.

I see that in America they now have a portable fluorescent lamp, like an over-grown hand torch but carrying two 45-volt "B" batteries. It can also be plugged straight into the mains or into a stationary unit containing a pair of heavier-type "B" batteries.

## BATTERY SET

(Continued)

set-up, it has been decided to plan it on a button type of tube. This occasions the use of an adaptor socket plate which will be produced and become available so that the plate can be placed over the existing octal holes in the chassis and miniature button tubes used with easy convenience.

Thus a first-class battery-operated mantel receiver will be available fitted with a connecting plug for the attachment of external heavy-duty batteries. The extra room thus provided will permit of the use of the Kingsley 6-inch speaker—type KR6-B—which, by the use of a decent-sized baffle, ensures excellent reproduction.

With the incorporation of a large easily-read dial, the modified "Ferrotune" KFT1 promises to be a very presentable receiver which will be described more fully in the April issue of this journal and should prove of immense interest not only to home-builders but to country radio dealers and servicemen who prefer to build up a few receivers in their own workshops.

# AMONG OUR READERS

## News and Views From Enthusiasts

**A**LTHOUGH this feature has been running only a few months it is already one of our most popular. When it got squeezed out of last month's issue there was a solid squeal of complaint from dozens of readers. So here are a fresh batch of comments from subscribers. It should be understood that not every comment received can be published, as space is limited, and we have several hundred subscription renewals each month and in nearly every case the subscriber has eagerly accepted our invitation to write a few lines. It is quite impossible to publish them all, even parts of them. The best we can do is to take and publish a representative cross-section of opinion in each issue.

"One of the best features of your magazine is that it is not cluttered up with misleading 'Popular Science' articles, such as one can read in any newspaper. I think I enjoy reading Paul Stevens best, as he writes with refreshing style and presents the other side of the picture. Although not an amateur I often listen in and look forward to Don Knock's articles. Unfortunately, owing to a heart ailment I have to spend a lot of time on my back, and am not able

to do as much practical work as I would like to. I am doing an A.R.C. course at present and am about two-thirds of the way through it."—G. Philipson, 43 College Road, Brighton, South Aust.

"I must write a few lines in praise of your excellent magazine. The articles by Paul Stevens, in particular, have special appeal. In 1945, while in Cairns, I built his circuit of the EK2, EBF2, EL3 set with which he won the 1944 Utility Set Contest, and after reflexing the EBF2 stage, logged KSL, Salt Lake City, on the broadcast band at 10 p.m. And now a question: Why must people misuse the ECH35? I have seen numerous instances where the oscillator-tuned circuit of this valve has been put in the oscillator grid, with the tickler in the plate. As for screen feed, well, anything goes. When this valve appeared it was recommended by Philips, in the interests of frequency drift, that the tuned circuit should be in the plate circuit of the triode, with the feedback coil in the grid circuit. Three sets of conditions for operation were given—but I've yet to see even one of these conditions met in a published circuit. I had better close before I start tearing my

hair out."—W. F. Cromarty, 28 Sharpe Street, Regent, N19, Vic.

"I have followed wireless as a hobby for a bit over twenty years, ever since I was about twelve years old. I am a garage proprietor, and do a bit of car radio work. I always read the Radio World from cover to cover."—E. Blow, 8 Lymington Street, Bexley, N.S.W.

"I am a radio operator for the Department of Civil Aviation—read your paper mainly to keep track of current events in radio—was glad to see your editorial on miniature portables—only confirmed my own views. Am spending my fourth week in hospital—malaria and its complications."—W. Bruce, Port Moresby, Papua.

"I enjoy very much your recent innovation of letters from some of your subscribers, so am adding to the list. I first became interested in radio in 1922 when broadcasting was just beginning, graduating from crystal sets to supers. My greatest thrill came when my brother-in-law and I, using a one-valver with UV199, stripped of its base and the leads soldered direct, heard the McMillan expedition near the North Pole, sending a message through a Rose Bay ham to the editor of the old 'Wireless Weekly.' We heard the ham's reply expressing difficulty in copying the message, but we got it all and sent it to the editor. My interest now is in Hi-Fi amplifiers, born when I first heard a panatrope about 1927. I enjoy immensely your setup of Radio World, particularly articles by Paul Stevens. As to suggested improvements, well it seems impossible, but if it was twice the size, even at twice the price, I would await it still more eagerly."—Jno. G. Arkell, Ingleburn, N.S.W.

"Primarily I am essentially a strict amateur in that I can ap-

(Continued on next page)

### NOTICE TO NEW ZEALAND READERS

#### April Issue By Subscription Only

Owing to the shortage of paper and rises in printing and production costs, handling charges, freights and so on, it is no longer possible for us to continue sending issues to New Zealand for bulk distribution. Therefore, as from this issue, no further issues will be on sale at book-stalls or over the counters of newsagencies throughout the Dominion.

If you wish to continue to get Australasian Radio World you will need to place a subscription order (12/- for 12 issues, in advance) with your present supplier, through any branch of Gordon & Gotch, or through H. Barnes & Co., 4 Boulcott Terrace, Wellington. If you wish to maintain continuity of your issues you should place your subscription order immediately.

preciate radio simply for the sake of radio; that is, I enjoy the articles and schematics without necessarily building the jobs described. My big radio interest in life is the amplifier. I have built every sort of amplifier; the one I am using at present has been rebuilt about twelve times in the past two years, ending up with a 6N7 paraphase, resistance coupled to two 6C5 in push-pull driving two 2A3 with direct-coupling. At present I am on the verge of completing the amplifier to end all amplifiers (for me, I hope). It consists of a 6N7 in the standard Lexington pre-amplifier circuit, feeding into a 6J7 tone-control stage, then a 6C5 direct coupled to a 6C5 phase-splitter, driving the two triodes of a 6SN7 in push-pull, direct coupled to four 2A3 in parallel push-pull. The output transformer feeds into a 500-ohm line, and ends in a frequency dividing network, the bass being handled by two G12's and the high by a Goodmans 12-inch.

"Scratch is a bugbear. When I hear a record on my amplifier and then hear it played by the A.B.C. I wonder just what is their secret of eliminating scratch."—Dr. Frank Burke, 571 Sydney Road, Coburg, Vic.

(From Mr. Swales of Red Line, who knows all the secrets, I hear that the broadcasting stations use an elaborate Campbell filter with very steep cut at 5,500 cycles per second, which has to be incorporated in a transmission line and is fairly expensive, about £30.—A.G.H.)

"I am a fairly old-timer in radio, having started my interest about 1922 with a one-valve set using a French 'R' valve. A chance purchase of a copy of 'QST' in 1923, and hearing the first licensed hams started me in the ham game, and I got my call, ZL3CP, in 1928. We ZL's have no sort of admiration for the Australian regulations which allow new hams to start up on 20 metres, and operate phone anywhere in the band."—Charles

W. Parton, 78 Diamond Avenue, Spreydon, N.Z.

"I am working on the truck of the Deniliquin Municipal Council—ever since sixteen years have been interested in radio—served in the 2/8 Field Regiment as a poisoner and a nine-mile sniper, 3.5 version. After the war did a course with A.R.C.—can build a set to give as much noise, static included, as any professional set in the district and my opinions are valued by more experienced and intelligent men. After blowing the trumpet, I give my reasons for reading your publication. Because—Paul Stevens, the great de-bunker, gives the low-down. Good old Paul! Because—Don Knock carries weight by the ton with me. Your own standard of radio science is, by the way, a 'jewel of the first water.' I enjoy the articles and adverts by Kingsley and Aegis and find both products the finest in the field for consistency. I can't suggest any improvements as the ruddy paper satisfies me as it is, and that is



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about all that any paper can do. In the 1.4-volt line, I have sacked the 1A7 in favour of the 1P5.—A. C. Martyn, 11 Hunter Street, Deniliquin, N.S.W.

\* \* \*

"My interest in radio is purely a hobby, and it is a very fascinating one. I follow your magazine to keep in touch with the latest developments in the radio world, and try and learn the whys and wherefores of radio. A few years ago I managed to build myself an amplifier from a Radio World circuit using 2A3's in push-pull. As this was the first attempt to build anything of this kind I was quite pleased when the amplifier responded favourably without doing in a valve or two. The only thing that gave up the ghost was the bias resistor, it just couldn't stand up to it."—W. S. P. Creaser, Box 42, Salisbury, South Aust.

\* \* \*

"I read (and like) your whole journal to keep abreast of current developments, but am mainly interested in the sound amplification side. Therefore any articles on pick-ups, speakers, tone-controls, etc., claim first attention, and as a not-too-skilled amateur, appreciate theory, if neither too elementary, nor advanced. Types of microphones, their most suitable applications, and their pre-amplification requirements. Other suggestions would include: data on mixing circuits for mike and pick-up, output transformers and multi-speakers hook-ups."—P. A. Richmond, 14 East Parkway, Col. Light Gardens, S.A.

\* \* \*

"I have been a regular reader of your paper since 1937 and look forward to its arrival monthly. I enjoy all the articles, particularly the short-wave pages, and have built up a few of the circuits, although am not an expert at set-building by any means. My main interest is in S.W.L. and DX-ing, and have advanced from a one-valve battery set up through various commercial dual-wave jobs to my present set, a Kingsley K.C.R.-11."—A. G. Dix, 25 Tamar Grove, Oakleigh, Victoria.

\* \* \*

"I take a keen interest in your general receiver circuits and have played around with most of them. Have not seen a magazine of



The Aegis Personal Portable receiver which is detailed in this issue. The kit is available as a four-valve model, with an auxiliary kit to convert to a five-valve circuit at a small extra charge.

A.R.W. calibre anywhere, and think you are doing a good job in the field of receiver design generally. Being a W.O.A.G. by trade I have little interest in Amateur Radio as far as operating goes, but am a keen small receiver enthusiast. Your items of general interest are good."—441450, W/o Pashley, F., Sgts. Mess, Laverton, Vic.

\* \* \*

"I have been reading your publication for a couple of years now and find the articles on mantel models and portables quite interesting. The only improvement I can suggest is that maybe the circuits could be printed blueprint style. A black blueprint should look well, especially when used with the glossy paper, when it becomes available again."—E. Thomas, Real Avenue, Norman Park, Brisbane.

"I have not previously written to you, but as a reader of the A.R.W. for the last couple of years, feel I know a good deal about you through its columns. I appreciate the personal touch which you maintain and many of the articles published. Although not a Ham, training in more conventional fields of electrical engineering, I still have a live interest in the doings of electrons wherever they may appear, and a particular interest in the construction and designing of measuring and testing equipment."—R. L. Burns, 3 Kingsley Crescent, Mont Albert, Vic.

"The prospect of receiving another 24 issues is enough to part me from the humble quid. It is difficult to say which of the sections appeal to me most, for the generally lucid nature of the articles and their friendly tone

(Continued on next page)

## OUR READERS

(Continued)

seem to be a common characteristic. On second thoughts, I place the contributions by Don Knock and Paul Stevens slightly ahead of the rest for their hard-hitting, yet helpful style; it is refreshing to see horse-sense dispensed in such a manner these days. I am studying the I.C.S. on a radio servicing course, in an effort to learn a bit more about the hobby of hobbies, but am employed by the National Oil Co. The job itself is an assistant fireman in the boiler house. The one and only industry here is, needless to say, the production of gasoline from oil-bearing shale and it appears to be functioning quite as per schedule to date."—K. Lidden, National Guest House, Glen Davis, N.S.W.

"I thank you for your recent letter which served its purpose in reminding me that another year

has passed and the time has arrived to touch the XYL for the usual ten-and-six which constitutes my Xmas present, by purchasing a year's subscription to Radio World. About myself there is little to be said except that I have been interested in radio since turning 14, a matter of 15 years now. My interest led me into the R.A.N. reserve in 1936 and the term just sufficed to run me into seven years of active service with the R.A.N., during which time I struggled through from Ordinary Tel. to P.O. Tel., mostly on corvettes. I have built a wheatstone bridge operating a magic eye indicator, a multi-meter, A.C.-D.C., after the University style, and several reflex sets from your magazine at various times."—J. Hanan, Terrace Street, Toowong, Brisbane.

"I am apprenticed as an electrician to the Forbes Municipal Council and have just completed

my third year. I am doing an Electrical Trades Course from the Sydney Technical College and have to go to Sydney each year for training, and I also intend to do a Diploma course later on, and I may do a radio course after that. These courses all take time, but I am only 18 now and I won't be so very old when I finish. I started radio construction in January, 1944, and it and DX-ing have gone hand in hand. My first set was a one-valve, and I sent reports to every station I heard on it and received my QSL cards from same. As I added valves I used to send reports to the new stations logged and so there was always the urge to build a bigger set to get more stations and in turn more QSL cards. I haven't built a set now for about 18 months but I have been getting ready to sit for my Ham licence some time this year."—K. Jones, Box 104, P.O., Forbes, N.S.W.

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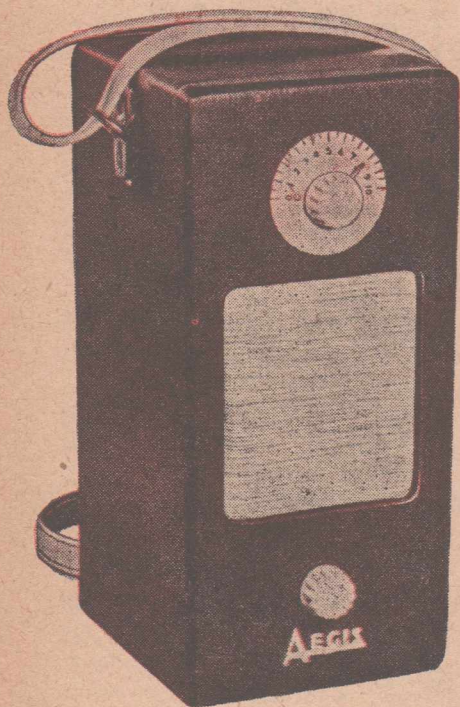
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6. All brackets and chassis cadmium plated.
7. Size 4" x 4½" x 9".
8. Special chassis for either 4 or 5 valves.
9. Eveready Mini-Max No. 467, 67.5V. type.
10. Two No. 2 torch cells, "Diamond" or "StanMor."
11. High quality parts—"Aegis" Coils, "Rola" Speaker, "A.W.A." Tuning Condenser, "Ducon" Condensers, "Ducon" or "I.R.C." Resistors.
12. "A" Battery drain: 200 mils. on 4 valves; 250 mils. on 5 valves.  
"B" Battery drain: Average 10-11 mils. on either 4 or 5 valves.
13. Fully "A.R.T.S. & P." Licensed.

HERE is a kit-set for a fine little portable, which can be made up either as a four- or a five-valve model. The kit comes to you complete with every screw and nut.

It is only a matter of a few hours pleasant work to build it up into a dandy little receiver. The finished receiver will give you splendid results, with truly exceptional long-range performance from the five-valve version.

## Assembly

FIRST of all, mount the button-valve sockets underneath the chassis, using the 3/32-inch screws and nuts. Follow the wiring diagram closely, making sure their position is correct. We have noticed a slight discrepancy in the manufacture of these sockets; the double space between pins 1 and 7

may lie either to the right or left of the nearest mounting hole, but this need not cause alarm. Should there be any excess length of screw beyond the nut at any of the sockets, nip it off with your cutting pliers, otherwise it may cause a short circuit on one or more of the valve socket terminals. The chassis has been made universal for either 4 or 5 valves, so in case you have purchased a 4-valve kit, some of the punched holes will not be used.

Now you are ready to mount the tuning condenser as shown in the pictures and diagrams. Using the four eyebolts, attach two on each end of the condenser gang on the narrow side nearest the rotor shaft. Please notice that one side of the eyebolts is flat, and it is this side which lays against the condenser end plates. Four special  $\frac{1}{8}$ -inch screws in the condenser carton are provided for fastening the eyebolts to the condenser.

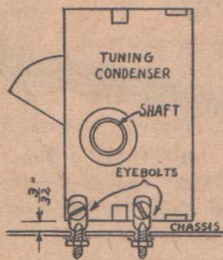
The next step is to insert the tips of the four eyebolts through the four holes around the 1-inch x 2-inch opening at one corner of the chassis. Having done this, a

- PARTS LIST**
- 1—Cabinet complete with built-in Loop Aerial.
  - 1—Wire Speaker Grill and Cloth.
  - 1—Plastic Strap complete with Buckle, "D's" and Saddles.
  - 1—Output Transformer Bracket.
  - 1—Volume Control Bracket.
  - 1—"A" Battery Bracket.
  - 1—Dial Plate.
  - 2—"Aegis" I.F. Transformers, Type J1 & J2.
  - 1—"Aegis" Oscillator Coil, Type M18B.
  - 1—"A.W.A." Midget 2-Gang Condenser.
  - 1—Chassis, Type P.P. 4/5.
  - 1—"Rola" 3C Speaker.
  - 1—"Rola" Output Transformer.
  - 1—1R5 Valve.
  - 1—1T4 Valve.
  - 1—1S5 Valve.
  - 1—3S4 Valve.
  - 4—Button Valve Sockets.
  - 2—Knobs (Aegis)
  - 1—Mini-Max "B" Battery 67.5V.
  - 2—Torch Batteries 1.5V. each.
  - Hook-up Wire.
  - Tinned Copper Wire.
  - Resin-cored Solder.

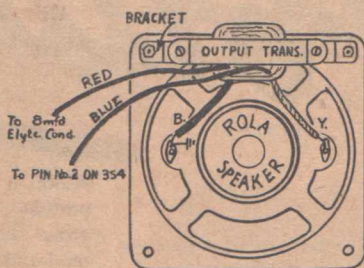
- Mounting Terminals.
- Assorted Screws, Washers, Nuts, etc.
- CONDENSERS**
- 1—8 mfd. 100V. Electrolytic.
- 1—.004 mfd. Tubular Paper.
- 2—.002 mfd. Tubular Paper.
- 2—.01 mfd. Tubular Paper.
- 1—.05 mfd. Tubular Paper.
- 1—.1 mfd. Tubular Paper.
- 1—100 mmf. Mica
- 2—250 mmf. Mica.
- 1—450 mmf. Mica.
- 2—Hy-Q Trimmers.
- CARBON RESISTORS:**
- 1—750 ohm 1W.
- 2—.1 megohm 1W.
- 1—.25 megohm 1W.
- 1—1 megohm 1W.
- 3—3 megohm 1W.
- 1—10 megohm 1W.
- 1—1 megohm Volume Control with D.P.S.T. Switch.
- KIT OF ADDITIONAL COMPONENTS**
- 1—"Aegis" I.F. Transformer, Type J1.
- 1—1T4 Valve.
- 1—Button Valve Socket.

shakeproof washer and  $\frac{1}{8}$ -inch nut is placed over each eyebolt and cautiously tightened. A space of  $\frac{3}{32}$ -inch should remain between

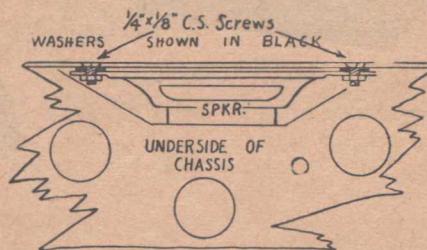
the tuning condenser end-plates and the chassis top, due to the shoulder on the eyebolts. This space is important!



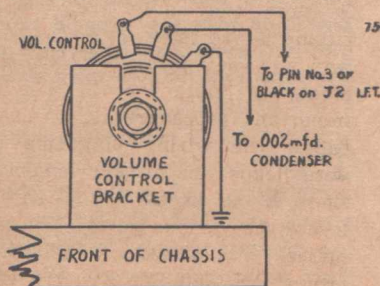
MOUNTING TUNING CONDENSER



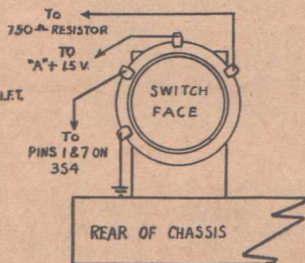
MOUNTING OUTPUT TRANSFORMER



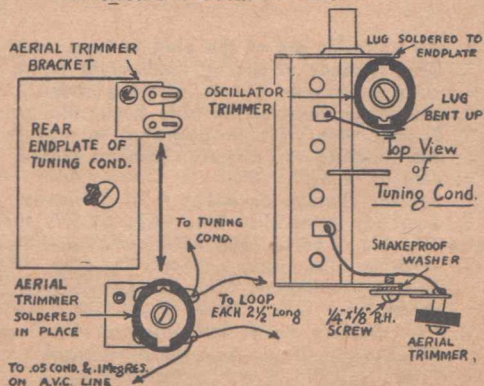
MOUNTING SPEAKER ON CHASSIS



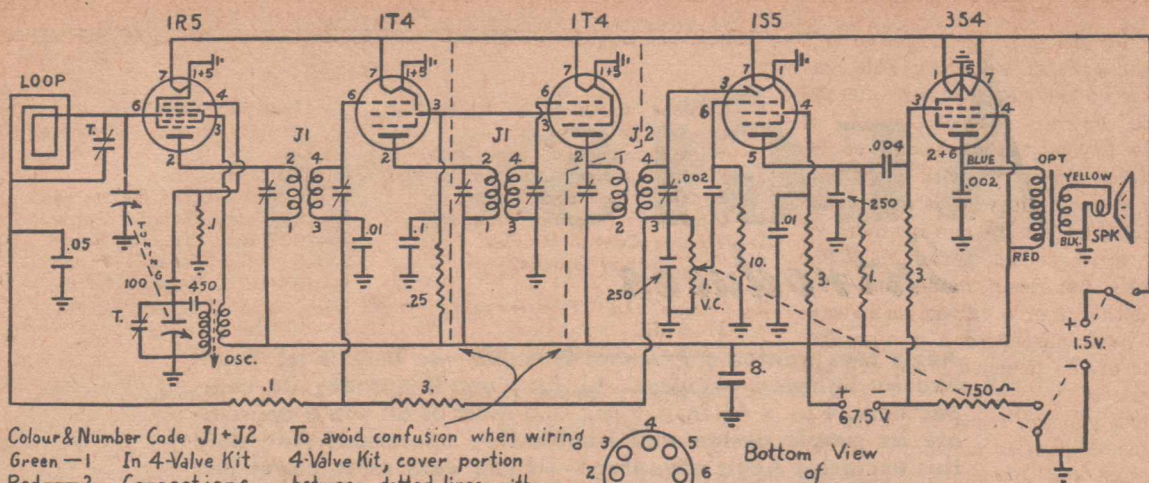
MOUNTING VOL. CONTROL & BRACKET



CONNECTIONS TO SWITCH



MOUNTING DETAILS OF AER. & OSC. TRIMMERS & BRACKET



Colour & Number Code J1+J2  
 Green—1 In 4-Valve Kit  
 Red—2 Connections  
 Black—3 1 & 2 on J1 are  
 Blue—4 Reversed.

To avoid confusion when wiring 4-Valve Kit, cover portion between dotted lines with paper, and draw line from No. 2 on IT4 to No. 1 on J2

Bottom View of Sockets

Mount the J1 and J2 I.F. transformers next, making certain that the colour codes on the base are at the proper holes in the chassis as shown on the picture diagram. Shakeproof washers and 1/8-inch nuts securely tightened ensure perfect earthing of the I.F.T. shield cans.

As for mounting the speaker, little can be said to help you. Just follow the individual diagram on that subject, omitting nothing. After you have attached the output transformer, the speaker is fastened in place with two 1/4-inch x 1/8-inch counter-sunk screws, shakeproof washers, and nuts, plus two small brass washers used as spacers between chassis and speaker.

Following this, the electrolytic condenser, volume control bracket, and "A" battery-holder are all mounted in their respective places, using 1/8-inch round-head screws and nuts which must be securely tightened. Now remove one nut

from the volume control, slip on the 3/8-inch shake-proof washer and replace the nut, but before tightening it, slip the unit down in the slot of the bracket, rotate to its correct position and tighten.

The oscillator coil can only be mounted in the correct position, but care must be taken in handling it as the fine wires might become broken. When you have tightened the mounting nut, carefully open the tuning condenser rotor plates and observe if they pass the oscillator coil wires and soldering lugs without touching. If they do touch, either bend the coil bracket or bush up the mounting base so there is no chance of contact. A short circuit here would discharge your very precious "B" battery very quickly.

The last step before wiring is mounting the aerial-trimmer bracket. This consists of a small, soldering lugs. Referring to the descriptive diagram on this subject, insert a 1/4-inch x 1/8-inch

round-head screw through the hole in the bakelite, then, before screwing into the upper right corner of the tuning condenser backplate, place a 1/8-inch shakeproof washer over the screw. When tightened, this washer prevents the trimmer bracket from ever rotating, which is important because neither of these two terminals, or soldering lugs, must touch the metal backplate.

#### Circuit and Wiring

This circuit is quite a simple one, yet no essential part has been omitted. It is a straight-forward superhet with no trick circuits; essentially the same as the "Voyager" and "Rural 4," except with a slightly reduced power output resulting from the miniature 67.5-volt "B" battery. However, to the ear one can hardly notice the difference.

#### Follow Diagrams

The wiring of this little receiver is quite easy and, even though standard-size resistors and condensers are used throughout, there is plenty of space for all. The all-important procedure is to closely follow the wiring diagrams, cut wire leads to proper length so there is no excess, and carefully locate the various parts. You may notice a difference in wiring around the 750-ohm resistor when comparing the wiring photograph with the wiring diagram. Do not

#### COLOUR CODE

(Value)	(Body)	(End)	(Dot)
750 ohms	Violet	Green	Brown
.1 meg.	Brown	Black	Yellow
.25 meg.	Red	Green	Yellow
1 meg.	Brown	Black	Green
3 meg.	Orange	Black	Green
10 meg.	Brown	Black	Blue

# AEGIS

## Introduces

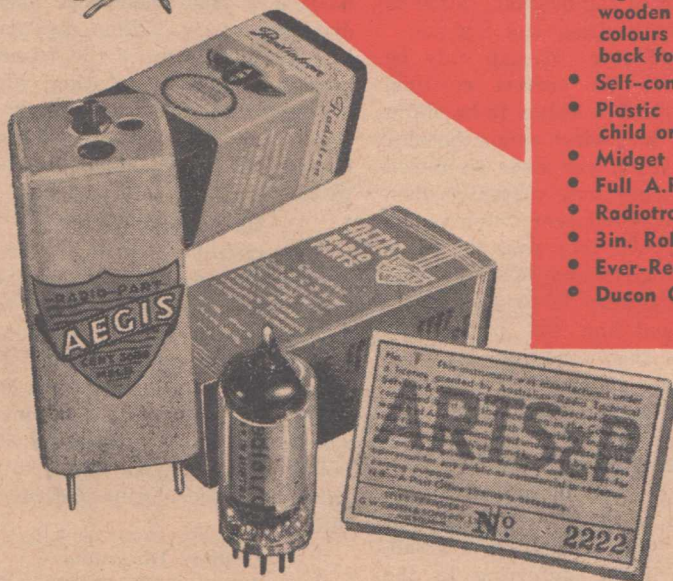
# The Baby

Aegis fans wanted a Personal Portable—so here it is! You'll like its lightness—approx. 4½ lbs.; you'll approve its compactness, 4 in. x 4½ in. x 9 in.; and most of all you'll appreciate its simple design and trouble-free operation! And note this exclusive Aegis advantage—if you want more power just get an Auxiliary Kit (PP5) and you can have it in a few minutes.

Price of the complete Kit (PP4) for broadcast band,

**£16/17/6**

(slightly variable Interstate)



### MORE FEATURES

- Lightweight, leatherette-covered wooden case in choice of colours with "pencil-case" slide back for easy battery changing.
- Self-contained Loop Aerial.
- Plastic strap, adjustable for child or grown-up.
- Midget 2-gang by A.W.A.
- Full A.R.T.S. & P. Licence.
- Radiotron Valves.
- 3in. Rola Speaker
- Ever-Ready Minimax Batteries.
- Ducon Condensers, etc.

ATTRACTIVE  
DISCOUNT  
TO AMATEURS  
AND THE  
TRADE

### AUXILIARY KIT—A Plus Feature . . .

You'd like the most powerful Personal Portable yet? Well, it's easy to make the "Baby" into a 5-valve for the chassis is already drilled for the extra components—and so this Aegis Auxiliary Kit does the rest—in double quick time! The complete additional Kit includes A.R.T.S. & P. Licence for only **47/6**

#### MELBOURNE:

Lawrence & Hanson Electrical Pty. Ltd.  
Replacement Parts Pty. Ltd.  
Vealls Electrical & Radio Pty. Ltd.  
Homecrafts Pty. Ltd.  
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#### PERTH:

Nicholsons Ltd.

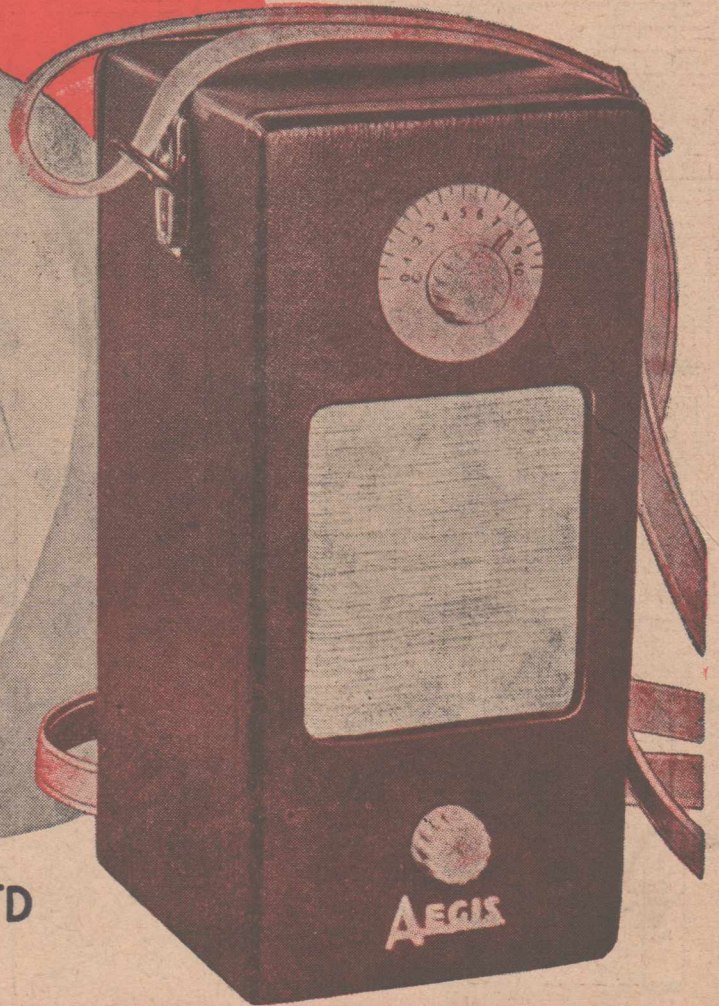
#### SYDNEY:

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Pty. Ltd.  
Australian General Electric Pty. Ltd.  
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# Baby of the Family

★ If you prefer it, your distributor will be pleased to arrange wiring and assembly of this Kit for a nominal fee.



**AEGIS**  
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8 LIT. LONSDALE STREET, MELBOURNE

#### ADELAIDE:

George Proctor (Factory Representative).  
Newton, McLaren Ltd.  
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Oliver J. Nilsen & Co. Ltd.  
Gerard & Goodman Ltd.  
Unbehau & Johnstone Ltd.

#### BRISBANE:

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(Hobart).  
Lawrence & Hanson Electrical Pty. Ltd.  
(Launceston).  
Replacement Parts Pty. Ltd.

let this confuse you as a last-minute change was made; just make the connections as they are shown in the diagrams and everything will be correct. A resistor colour code is given in the parts list. Condensers have their values marked directly on them. Whenever a tubular condenser has one end earthed, make certain it is the end on which the black band appears. Number 20G. tinned copper wire is used for earthing the valve

socket terminals and for short, direct connections, where nothing else touches. Form the wires running to the volume control so that they lie in the chassis bend well away from the 3S4 valve socket. It may be necessary to anchor them there with a short piece of stiff wire soldered to the chassis. To avoid confusion when soldering the snap fasteners to the "B" positive and negative leads, refer directly to the "B" battery itself.

### Important

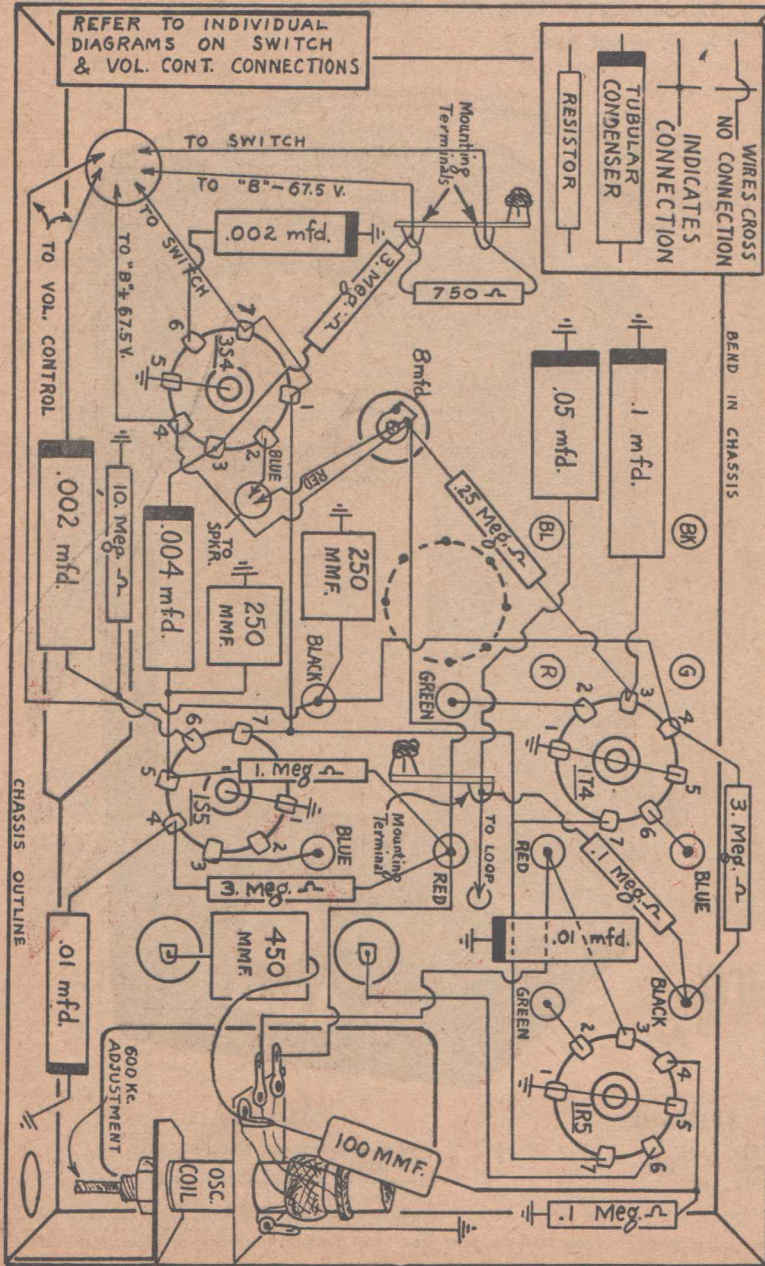
Earthing the centre pins of the valve sockets is very important as they are provided as shields to prevent feed-back between valve pins, namely, plates and grids.

### First Test

Having finished the wiring, it is desirable to check this, as battery valves are susceptible to being blown if the wrong volts get around. Make certain that no part of any resistor, condenser, or wire touches any other part except to which it is soldered. If you have a voltmeter, leave the valves out and connect in the batteries. Check the volts on the various points to see if they are correct. If you do not have a voltmeter, switch off the batteries and insert the valves except the 1R5 and remove the "B" battery. In some dark place, switch on and see if the valve filaments light up. The filament in the 1S5 will show up the best. After establishing that everything is in order, switch off and take up assembly of the cabinet.

### Cabinet Assembly

On the inside of the cabinet near one end you will find two counter-sunk holes on each side. With some pointed instrument, pierce the covering through these holes, and using the 3/8-inch x 1/8-inch C.S. screws and nuts, fasten the "D's" and "saddles" to the sides. One set will already be assembled at one end of the strap, but you must assemble the other yourself. Firmly tighten the screws so that the nuts pull up into the wood on the inside of the cabinet and if any of the screws protrude, file them off, otherwise you will have difficulty inserting the chassis. Now thread the strap through the buckle, down and back under the "D" and once again through the buckle under the first layer of strap. This makes the strap readily adjustable but non-slipping. Next insert the grill and cloth in the speaker hole, and while holding the back of the cabinet facing you and with the loop connections on your right, insert the two thumb tacks in the top corner of the grill screen. You are now ready





to insert the chassis and observe if the two spindles rotate freely in the front panel holes. If they do not, either carve the sides of the holes slightly, or adjust the components on the chassis until they do. When you are satisfied that the fit is proper, carefully nail on the dial plate with the two long brass tacks. Refer to the photographs to determine its position. It is important not to have the tuning condenser spindle touching the deal plate, otherwise a scratching noise will result when tuning the receiver.

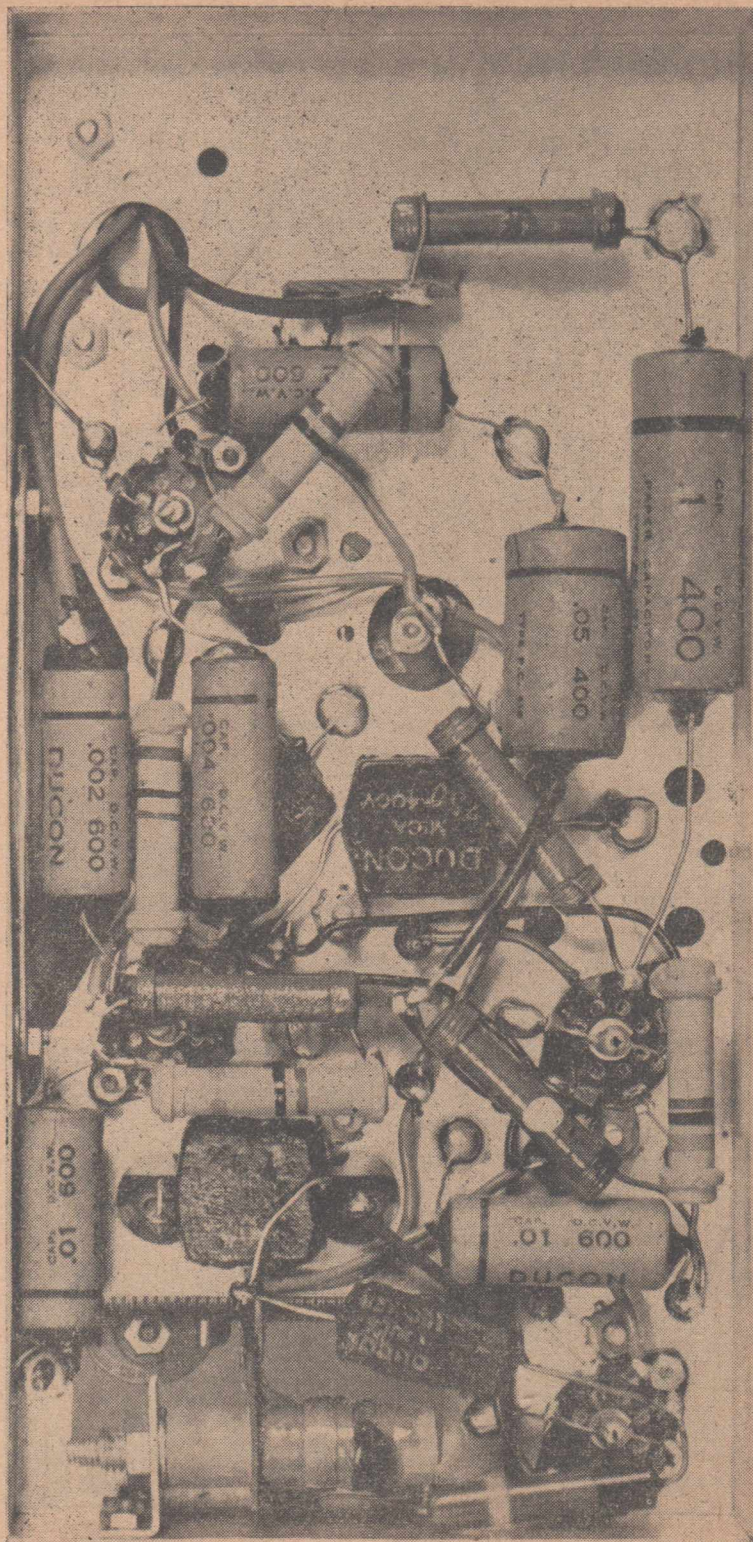
#### Alignment

In preparing for alignment, make sure switch is off, have all valves inserted, and batteries connected. With the chassis outside the cabinet, solder the wires from the aerial trimmer bracket to the loop terminals on the inside of the cabinet.

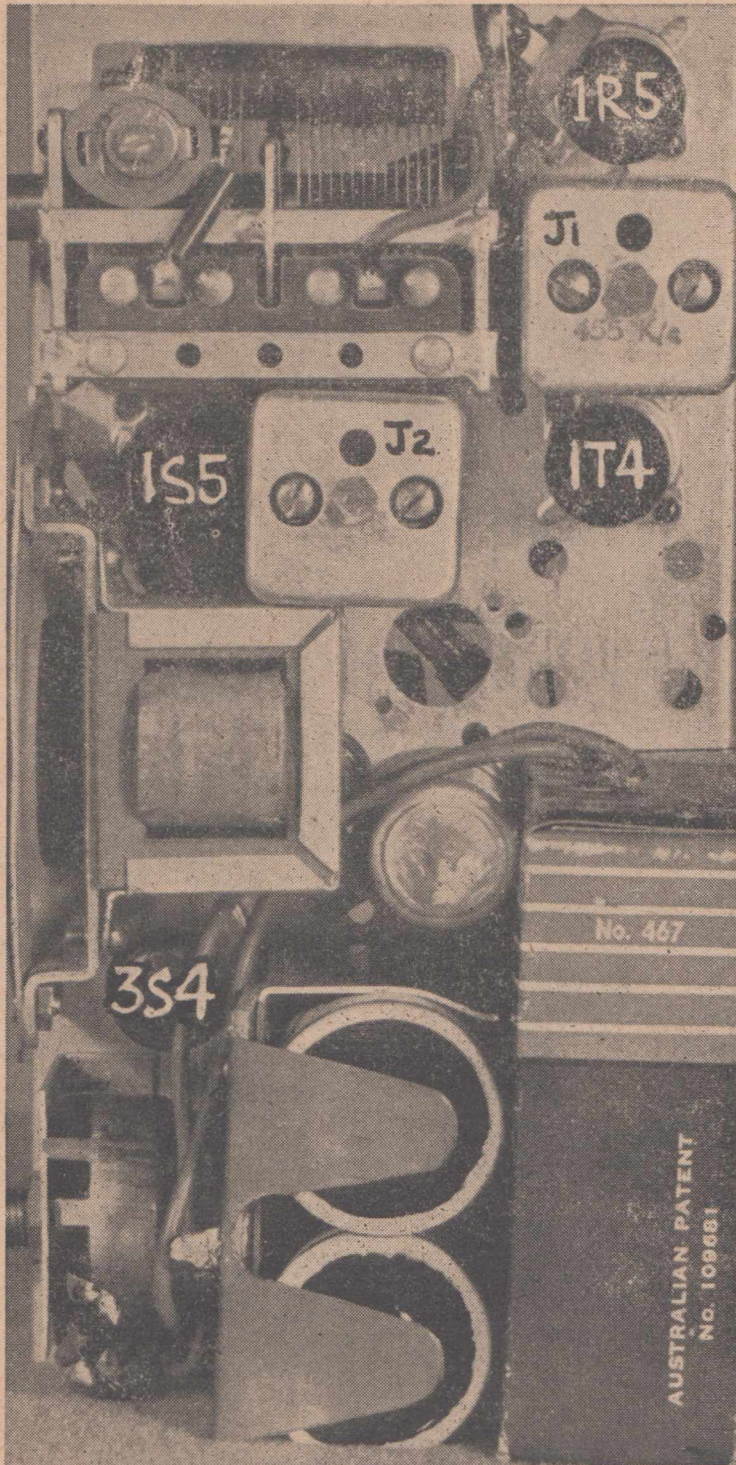
A test oscillator is a great help to ensure perfect alignment, but don't be discouraged if you do not have one on hand. Excellent results can be obtained after alignment on the broadcast stations if you do the job carefully. The I1 and J2 I.F. coils are the most difficult to adjust and require only a slight misadjustment of the trimmer screws to throw their frequency way off. They have been adjusted to the proper frequency in the same circuit at our laboratory but variations in circuit wiring and valve electrode capacities necessitate a bit of readjustment after the set is built. An ordinary screwdriver will not do the job of adjusting. You will need to file to a screwdriver point the end of an old toothbrush handle, and to use this when tuning the I.F. trimmer screws.

Switch on the set. With a test oscillator, align the I.F. coils to 455 kc/s or, if you do not have an oscillator, align them for maximum output on a station, starting with the J2 near the 1S5 and working back toward the 1R5. Repeat this operation.

Then with the test oscillator on 600 kc/s or a station as near as possible to 600 kc/s, open the



The wiring job is easy when you use this photograph in conjunction with the wiring diagram on the opposite page.



Top view of the finished chassis with batteries fitted. The valve and transformer type numbers are shown, and in the centre you can see the holes for the extra valve and transformer used in the 5-valve model.

tuning condenser to a position that would be about No. 9 on the dial, and adjust the receiver oscillator iron core to bring in this signal or station. An ordinary screwdriver can be used for this last adjustment.

Next, with a signal at 1400 kc/s or a station near this frequency, and the receiver tuning condenser opened to a position which would be about No. 2 on the dial, adjust the receiver oscillator trimmer to bring in the signal.

Repeat these last two adjustments until both are correct, always making the final adjustment with the trimmer.

To align the loop aerial, insert the chassis in the cabinet and be sure the tuning condenser is closed when doing this, otherwise you may damage the plates. Fasten on the knobs and adjust the pointer knob so it reads 0-10 when the tuning condenser is opened and closed. Now, turn the receiver on and set the dial to a weak station near No. 2 or 3. Adjust the aerial trimmer for maximum output.

#### Battery Life

The receiver is now ready for operation, so attach the lid and you'll be all set for real enjoyment when you go on those hikes to the hills, picnics, or a day at the beach. Many people find them an excellent companion at the races or at a ball game. If you're going out for the day, it's best you have two extra torch cells along. In event you have the receiver playing flat out, these cells may discharge in seven to nine hours, but with intermittent playing they will give longer service. The "B" battery, of course, will last many weeks, depending on how much you use them. It is not advisable to use this receiver unnecessarily around the house, because, after all, the batteries are quite expensive.

#### Conclusion

Certainly you will be very proud of this little personal receiver since you built it yourself. The fact that you can carry it with you anywhere makes it your own personal friend, so treat it like one and you will be well repaid.

# 3-VALVE TRIPLE-WAVE RECEIVER

Every now and then we like to give an article which goes into the finest details of building a set. Here is just such an article, written by a staff which has had infinite experience in guiding newcomers so that they can build a successful receiver at their first attempt.

The finished receiver in the cabinet supplied with the kit.



**A**LTHOUGH this triple wave three-valve receiver is designed expressly to represent the simplest possible practical receiver for operation in tropical areas, it is also admirably suited to Australian conditions. Particularly is this so where reception not only from the ordinary broadcasting stations operating in the broadcast band is required, but where, on account of tropical conditions and atmospheric, reception is desired from overseas short-wave stations to augment listening on the ordinary broadcast band.

The above requirements have been met by a design covering three-wave bands, the first extending from 550 to 1,800 kilocycles and embracing the ordinary broadcast band, the second extending from 3 to 9.5 megacycles and covering short-wave broadcasting stations operating in the South Eastern Asiatic area, also high-powered long range short-wave stations operating from Australia and the third band covering the

seas short-wave stations, terminals are provided for the connection of headphones (not that headphones are not supplied), but normally reception is obtained by means of the 5-inch loudspeaker supplied with the kit. The complete receiver is housed in an attractive moulded plastic cabinet and portion of the more intricate wiring is completed so that any radio enthusiast can complete construction of the kit with an absolute assurance of success.

### Unpacking

In order to facilitate transport, the kit is supplied in two parcels. One comprises the receiver chassis, with most of the components already mounted in their correct positions, screwed into the moulded plastic cabinet.

The second parcel comprises the loudspeaker, valves, power flex and other small components needed to complete the construction of the receiver.

To facilitate checking parts contained in this second parcel, a detailed list is set out below:

- 1 only 5-inch loudspeaker with transformer.
- 3 yards of power flex.
- 1 6SJ7GT valve.
- 1 6V6GT valve.
- 1 5Y3GT valve.
- 1 8 mfd. tubular electrolytic con-

denser.

- 2 .0001 mfd. mica condensers.
- 2 1 megohm 1 watt resistors.
- 1 50,000 ohm 1 watt resistor.
- 1 .05 mfd. tubular condenser.
- 1 .1 megohm 1 watt resistor.
- 1 .02 mfd. tubular condenser.
- 1 500 ohm 1 watt resistor.
- 1 soldering iron.
- 1 coil of solder.

To complete the construction of the receiver it will be necessary to remove the chassis from its moulded chassis. To do this the four screws attaching the feet to the bottom of the cabinet should be removed and also the two small screws recessed in small holes in the control knobs should be loosened by means of a fine screwdriver. These knobs, after the screws have been loosened, may be pulled forward, off the control shafts, and the receiver chassis is then free to be removed from the rear of the moulded cabinet.

### Principle of Operation of the Receiver

Before proceeding with the actual constructional work you should carefully examine the various parts mounted on the receiver chassis, and endeavour to associ-

(Continued on next page)

Designed and described by

The Staff of the  
Australian Radio College

more conventional short-wave range from 7.5 to 23.5 megacycles. The receiver is designed to operate from alternating power mains at frequencies between 40 and 60 cycles and at voltages between 200 and 260 volts.

To facilitate reception of over-

## TRIPLE-WAVER

(Continued)

ate them with the components shown in the photographs and on the circuit diagram.

To facilitate the association of the various parts on the receiver with their position on the circuit diagram and with their performance during the operation of the receiver, we will outline the function of the various parts comprising the set, and indicate not only their position in the actual receiver, but their position on the circuit diagram shown in Figure 1.

Signals transmitted from a broadcasting station comprise a high frequency carrier wave, the strength of which is varied in accordance with the pulsations of sound being broadcast. The sounds in the broadcasting station studio are converted by a microphone into electric pulsations, which extend over a range of frequencies corresponding to the pitch of the original sound. Bass notes represent a low frequency of relatively few cycles per second, and treble notes represent high frequencies extending up to several thousand cycles per second. These frequencies are known as "audio" frequencies. In the transmitter, the audio frequencies are made to control the strength of the carrier wave, which is a much higher frequency signal employed because of its ability to travel through many miles of space. The carrier frequency, modulated by the program, is applied to the transmitting aerial and produces electromagnetic waves in the air surrounding the transmitting aerial, these waves travelling out into space at a speed of 186,000 miles per second.

The waves from the radio transmitter are intercepted by a receiving aerial and earth system and generate a very small voltage difference between the receiving aerial and earth. The strength of this voltage is normally only a few thousandths of a volt and may even only be a few millionths of a volt from stations at a great distance. These voltages from the receiving aerial and earth system are applied to the aerial and earth terminals of the receiver, and so are brought to the three-position switch which guides the current into the appropriate tuning coil for the frequency of the station to be received.

It is impossible to design one tuning coil which will cover the full range of broadcasting station frequencies likely to be experi-

enced and consequently, three separate coils are provided. The appropriate one may be selected by means of the three position switch mounted on the back of the chassis.

Each of the coils in turn comprises three separate windings. One winding is connected by the switch to the aerial and earth terminals to receive the incoming current from the aerial system. The second winding, which comprises a larger number of turns, is tuned by means of the tuning condenser to respond to the required transmitter frequency, and to reject unwanted stations. The third winding is known as a reaction coil and helps considerably in increasing the sensitivity of the receiver to weak signals. The function of this winding will be explained in more detail later.

Although three separate tuning coils are provided, only one is indicated on the circuit diagram of Figure 1. To attempt to show the complex action of the switch, together with the three coils, would make the circuit too involved, and consequently, we have simply indicated the one coil with its three separate windings in the circuit. The dots and arrows on the wires extending from the coil in Figure 1 indicate the points at which the switch sections operate and change the wiring of the set from one coil to another.

### Tuning

The tuning condenser which operates in conjunction with the coils, to select the required station, is mounted on top of the receiver. Its action is controlled by means of the tuning dial.

With the switch on the rear of the set turned to position A and the tuning condenser plates fully engaged the receiver will tune to broadcasting stations transmitting with a frequency of 550 kilocycles. As the tuning condenser plates are gradually moved out of mesh, by rotation of the tuning control knob, the receiver will respond to stations of higher and higher frequency until, with the tuning condenser plates fully out of mesh it will respond to stations with a frequency of 1,800 kilocycles.

To receive stations with still higher carrier frequencies, it is necessary to turn the switch to position B or C to substitute the high frequency coils for the one normally used.

The wiring of the coils to the switch, and to the tuning condenser, is already completed when you receive your kit, to prevent any possibility of an error occurring in

the wiring of the coils or switch. You will observe that the coil wires are in some cases extremely thin, and consequently, care must be exercised to avoid breaking these fine wires in completing construction of the receiver.

Signals selected by the tuning coil and condenser are fed out from the switch by means of the long wire connecting the switch to the upper right-hand lug on the long panel to which you are to attach the resistors and condensers.

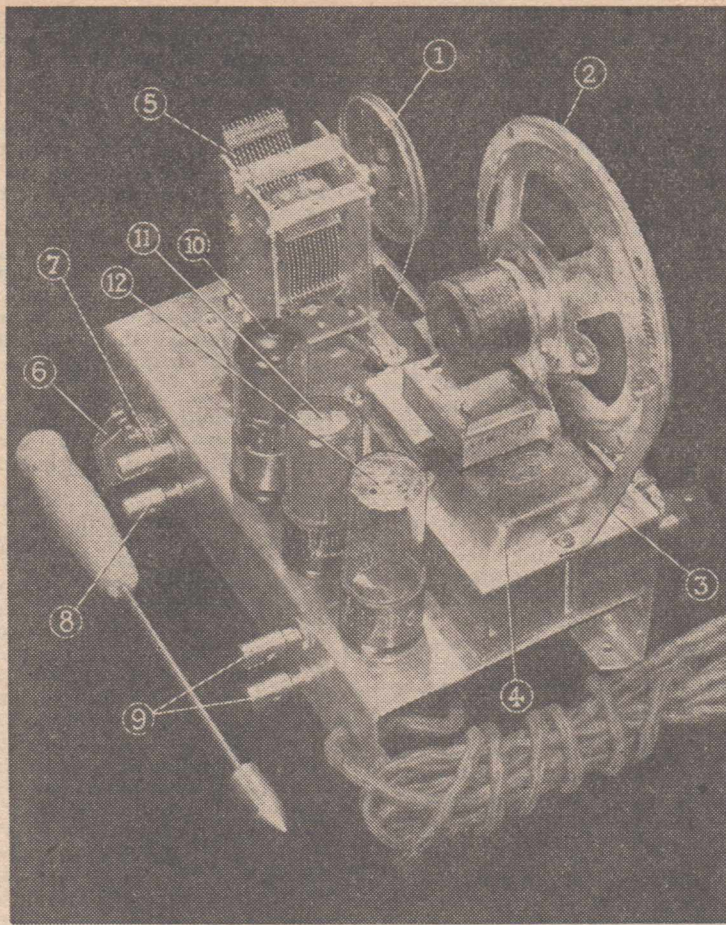
The first two parts to be fitted in place on the resistor panel are a small condenser marked .0001 and a resistor with a brown body, green band and black coloured end. This resistor has a value of one megohm and is used in conjunction with the condenser to feed signals from the tuning coil to the grid of the first valve in the receiver. This valve, a type 6SJ7GT, fits in the valve socket nearest to the tuning condenser, and receives its signals after they have passed through the condenser and resistor just mentioned, by means of the wire connecting its socket to the lower right-hand lug on the resistor panel.

### Soldering Instructions

The only practical method of attaching the resistor and condenser to the resistor panel is by means of soldering them in place. For this reason a soldering iron and some solder is included with the kit of parts.

Prior to using the soldering iron it must be heated in a flame until it is almost red-hot. The pointed end should then be cleaned with a file or a piece of sandpaper or similar abrasive material until it is bright and shining, and then immediately, while the iron is still hot, solder should be applied to it until it runs and forms a silvery coating over the pointed end. This process is known as "tinning" the iron and must be undertaken before the iron can be used for making any soldered joints.

Before attempting to solder the resistor and condenser into position, you should hold them in place with your fingers and then cut off any excess lengths of wire extending from them. Next, carefully examine the wires and see that they are bright and shining. If they are not perfectly clean it is necessary to clean them until they do shine brightly by means of sandpaper or by scraping them with some sharp object, such as the blade of a knife. They may then be held in position, the heated soldering iron touched on the



- (1) Dial Drum and Cord.
- (2) Speaker.
- (3) Speaker mounting bracket.
- (4) Power Transformer.
- (5) Tuning Condenser.
- (6) Wave-change Switch.
- (7) Aerial Terminal.
- (8) Earth Terminal
- (9) Headphone Terminals.
- (10) 6SJ7GT—Valve.
- (11) 6V6GT—Valve.
- (12) 5Y3GT—Valve.

undertaking any soldering, it is important that the iron be made hot enough for the solder adhering to it to be quite molten, yet the iron must on no account be made red-hot or it will become dirty and black at its pointed end, and then will fail to solder satisfactorily. If by any chance the iron is accidentally overheated, so that it becomes blackened, it will be necessary to file the surface bright and clean again, and then to quickly apply some of the solder to again complete the tin coating.

If you have had no previous experience in the use of a soldering iron, it would be quite a good idea to have some practice by soldering together the extreme ends of the wires from some of the resistors and condensers prior to cutting them to the right length. In all cases you will find that there is more wire protruding from the ends of the components than you will actually need, therefore, it does not matter to practise, by soldering together the ends of some of these component parts. After you have finished your prac-

tice you may easily melt the soldered joints with the hot iron and proceed to fit the parts into their place in the receiver.

There are two most important rules which must always be observed when soldering. One is that both parts to be joined must be thoroughly clean and shining. The slightest film of grease, tarnish or corrosion will prevent the solder from "wetting" the wires, and will result in an unsatisfactory joint. The second rule is that the hot iron must be left in contact with the joint long enough for the drop of molten solder, which is picked up on the point of the iron, to flow from the iron down over both surfaces to be soldered together and to spread over both before the iron is removed. If you remove the iron too quickly the solder will not stick to the surface, and consequently will peel off at a later date.

#### Detector Valve

Having now soldered in the first parts so that the signal may pass through them to the grid of the first valve, we may follow the signals a little further through the receiver.

The action of the 6SJ7GT valve is to take in the high frequency carrier wave from the broadcasting station, and act upon this carrier wave in such a way that it gives out, from its plate, shown at the top of the valve symbol in the circuit diagram, not the radio frequency carrier wave, but the audio

In order that the 6SJ7GT may operate, it is necessary for the plate of the valve and also for its screen grid, to receive some voltage from the power supply unit which is drawn at the bottom of the circuit diagram. This voltage passes through the resistor marked 100,000 to the plate of the valve, and also through another resistor marked 50,000 to a volume control also marked 50,000, and then from this volume control to the screen grid of the valve. The purpose of the volume control, which is fitted to the front of the chassis, so that the control shaft protrudes through a hole in the cabinet, is to regulate the degree of amplification provided by the first valve, and consequently the loudness of sounds from the loudspeaker. As the volume control knob is rotated an arm moves along the resistor unit and varies the amount of voltage applied to the screen grid of the valve. The sliding arm is indicated on the circuit diagram by an arrow-head.

solder until a small drop of solder adheres to the iron. This drop of solder may then be lifted on the hot iron to the radio set and deposited on the wire and solder lug. The soldering iron should be left in contact with the wire long enough for the wire to become hot and for the drop of molten solder to flow freely from the iron on to the wire and thence from the wire on to the solder lug.

In heating the iron prior to un-

The 50,000-ohm volume control is already mounted in position and wired when you receive the chassis. It is necessary, however, for you to fit the 50,000-ohm resistor across the second pair of lugs from the right-hand end of the resistor panel. When fitting this resistor in place and soldering it to the two lugs, be careful not to dislodge any of the other wires already joining on to the solder lugs.

The 50,000-ohm resistor has a green-coloured body, an orange-coloured band encircling it and a black-coloured end.

When you have fitted the resistor into the circuit it will be possible for current from the power unit to pass through this resistor to the volume control, and then from the volume control to the screen grid of the valve. However, before the valve will work properly it is necessary also to connect a condenser with a value of .05 mf. to the screen grid to allow any signals in the screen grid circuit, where they are not desired, to pass through the condenser to the metal chassis. This condenser will be easily recognised amongst the other parts and is soldered across the third pair of solder lugs from the right-hand end of the resistor panel.

In order that the signal current changes in the plate circuit of the first valve may be converted into signals voltages ready for the grid of the second valve, a 100,000-ohm resistor must be included in the line between the plate of the first valve and the power unit. This 100,000-ohm resistor has a brown-coloured body with a yellow-coloured band encircling it and a black-coloured end. It should be soldered across the fourth pair of lugs from the right-hand end of the resistor panel.

### Regeneration

Although the main purpose of the first valve is to take in the modulated carrier wave and give out the audio frequency programme alone, quite a lot of carrier wave voltage is present at the plate of this first valve. Some of this radio frequency energy is sent from the plate connection of the valve socket back through the switch to the "reaction" or "regeneration" winding on the particular coil in use. The purpose of this coil is to take some of the carrier frequency from the plate of the valve and feed it back into the grid circuit again. The energy

is sent back from the reaction coil to the grid coil by means of magnetic lines of force which couple the two, and this energy fed back into the grid circuit adds to that of the signal being received, thus making the signal a little stronger than it would otherwise be.

The extent of this regeneration has been carefully controlled by selecting for each of the three coils a separate condenser which is soldered immediately above the coil when you receive the set. These condensers, in conjunction with the setting of the volume control on the front panel, permit the actual amount of regeneration to be controlled until the receiver sensitivity is at a maximum, and this is normally just before the set starts "squealing" when tuning in stations.

The amount of radio frequency energy present at the plate of the 6SJ7GT is a little more than is required for regeneration purposes, and, consequently, a second .0001 mfd. condenser is to be connected from the plate of this valve across to the chassis to allow the excess energy to pass through it to the chassis. This condenser has to be soldered across the fifth pair of solder lugs from the right-hand end of the resistor panel.

### Audio Frequency Amplifier

The audio frequency signals developed at the plate of the first valve are applied to the grid of the second valve through a .02 mf. condenser. This condenser is to be soldered in position across the next pair of lugs on the resistor panel. The grid of the second valve also has to receive a negative bias voltage from the power supply unit, and this voltage is applied through a 1 megohm resistor, which has a brown body, a green band and a black end, this resistor to be soldered across the next vacant pair of solder lugs on the resistor panel.

The negative grid bias voltage is generated in the power supply unit by means of a 500-ohm resistor drawn near the bottom of the circuit diagram. This resistor will have a green body, brown coloured band a black coloured end. It should be mounted on the last pair of solder lugs at the extreme left-hand end of the resistor panel.

After current has passed through each of the valves in the receiver it will flow from their cathode to the chassis, then from the chassis from right to left through the 500-

ohm resistor, as shown in Figure 1, on its way back to the power transformer. Passing through this resistor it will produce a negative voltage at the left-hand end of this resistor, and this is the negative bias voltage applied from the 500-ohm resistor up through the 1-megohm resistor to the grid of the second valve.

The purpose of the second valve is to amplify the signals in order that they may be strong enough to drive the loudspeaker. The second valve will multiply the signals applied to its grid approximately 18 times.

Before mounting the loudspeaker in position we will complete the underneath wiring of the chassis.

The only other component you have not yet mounted in place is the tubular electrolytic condenser marked 8 mfd. This condenser is shown in dotted lines in the photograph so that it does not obscure the position of the 500-ohm resistor at the left-hand end of the resistor panel. After mounting all the other parts in place on the panel, you can then lay the 8 mfd. condenser in the position indicated by the dotted lines. A most important point to consider, however, is that one end of this condenser is coloured red and the other is a shiny metal colour. It is absolutely essential that the red-coloured end is towards the left-hand end of the chassis. The wire from the red-coloured end of the condenser is simply bent underneath it, and connects to the second lug from the left-hand end at the top edge of the resistor panel. This is the upper lug to which the 1-megohm resistor is soldered.

### Power Cord

The power cord should be passed through the hole provided near the left-hand end of the chassis and a knot tied in the cord, about 5-inch from one end, to prevent the cord pulling back through the hole. The two halves of the flex should be split apart from one another for about an inch or two from the end and a small amount of the insulation material carefully removed from the wires by means of a sharp knife or razor blade. Only about ¼-inch of each wire should be bared. Before attempting to solder the flex to the power transformer you should transfer a blob of molten solder, by means of the hot soldering iron to the ends of the stranded wire. Leave the soldering iron in contact with the wire for five or ten seconds until

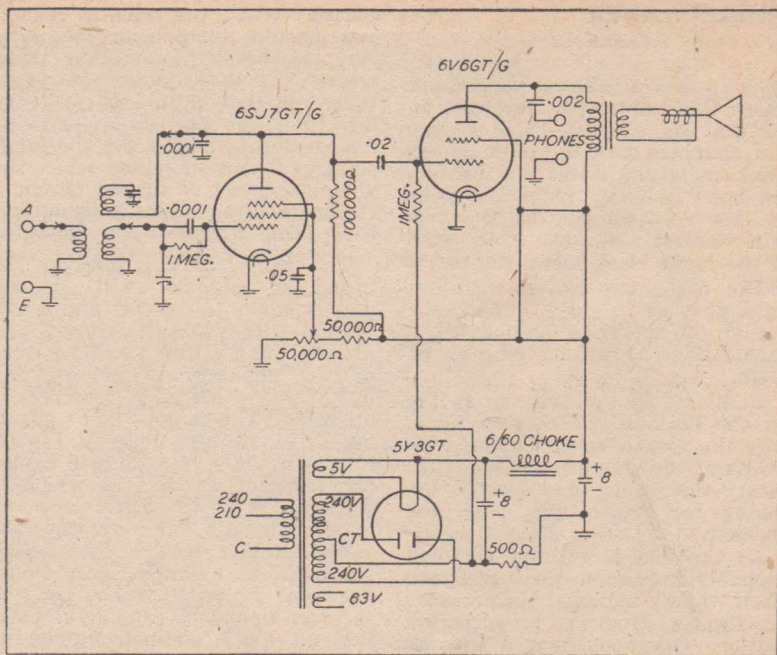
the molten solder has run freely on to the strands. This should be done to each of the wires comprising the flex. You may now solder one of the wires from the flex on to the second bottom solder lug on the right-hand side of the power transformer. This solder lug has a red nought beside it.

In districts where the power mains voltage is between 225 and 260 volts, the other wire from the flex should be soldered on to the third solder lug from the bottom on the left-hand side of the power transformer board. This lug is marked with a red 240. In districts where the power mains voltage is between 190 and 225 volts, the second wire from the flex should instead connect to the second lug from the bottom on the left-hand side of the board, i.e., the one marked 210 in red. Be very careful to see that the solder covers all strands of the flex and that no strands are extending outwards and touching any of the solder lugs other than the one to which they should be attached. If even one strand of flex joins across two of the solder lugs it may damage the power transformer or apply a dangerous voltage to the frame of the receiver.

#### Loudspeaker

The loudspeaker may now be mounted into position by bolting it to the two brackets protruding up from on top of the power transformer. The two wires from the loud-speaker transformer are passed down through the hole provided near the front edge of the chassis, and then pass underneath the left-hand end of the resistor panel to the centre valve socket. These two wires connect to the two solder lugs marked with an X on the photograph. These two lugs are not altogether clear in the photograph, but may be easily located because one of them has a wire from the red end of the 8 mfd. condenser near the back of the receiver, connecting to it whilst the other has one end of a small .005 mfd. condenser connecting to it.

All that now remains to complete the construction of the receiver itself is to fit the valves in their sockets. Be careful to see that the valves are inserted in the correct position, i.e., the 6SJ7GT near the tuning condenser, the 6V6GT in the centre and the 5Y3GT near the power transformer.



Schematic circuit of the Triple-wave Receiver.

#### Aerial and Earth

A simple receiver such as this, which contains only three valves, naturally requires a fairly efficient aerial and earth system if it is to give entirely satisfactory results. For the aerial, it is desirable to use a length of wire about 50 feet long mounted as high as possible above the earth's surface. For the best results this wire should be strung between two poles, or two trees, or perhaps a portion of a house and a tree or pole, so that it is about 15 to 20 feet high. An even greater height will result in still better reception, but you should certainly endeavour to have the aerial at least 10 feet high. The aerial wire itself should be carefully insulated from the supports to which it is attached by means of porcelain insulators. It is desirable to use two of these at each end as one may easily be rendered ineffective in tropical areas due to moisture condensation.

A good quality insulated wire should be soldered to the aerial and used to carry the signals down to the receiver's aerial terminal. A second length of insulated wire should be used to connect the earth terminal on the receiver chassis to an effective earth connection. This earth connection may be a metal water pipe extending down into the ground or a length of metal piping or rod

driven three or four feet down into the ground. It will be almost impossible to solder the earth wire to the metal pipe or rod and consequently the most practical form of connection will be a strip of metal to which the wire is soldered, the metal strip in turn formed in the shape of a clamp around the pipe, the two ends being held together by a bolt and nut. The pipe should be filed or scraped clean at the point where the earth wire or metal clip is fastened around it.

#### Tuning

We are now ready to test the receiver, but before inserting the power flex in a power outlet, make certain that the power supply is at a voltage between 190 and 260 volts, and that it is alternating power (A.C.) and not direct current (D.C.). If the receiver is plugged into a direct current power point the power transformer will be burnt out and ruined.

The frequency of an alternating current power supply must be between 40 and 60 cycles per second. In most areas the power supply has a frequency of 50 cycles, and this is quite satisfactory.

Having ascertained that the power is alternating voltage you may switch on and watch to see that the valve heaters light up. The filaments in the 5Y3GT will

# TRIPLE-WAYER

(Continued)

light up first of all and you should watch this valve very carefully to see that there are no blue sparks and that the two large pieces of black metal in it do not become red hot. The only red hot objects in this valve should be the two thin filament wires, one inside each of the large black metal plates.

The other two valves will not light up very brightly, but after a period of about 15 seconds they should have a distinct red glow in them.

If all seems well set the switch on the back of the chassis to A, turn the volume control about two-thirds of the way around, and then rotate the tuning dial slowly, listening for any sounds from the speaker.

As the dial is rotated you will probably hear some shrill whistles. Each whistle indicates the presence of signals from a broadcasting station. Once you hear a whistle, you should gradually turn back the volume control, in an anti-clockwise direction, until the whistle

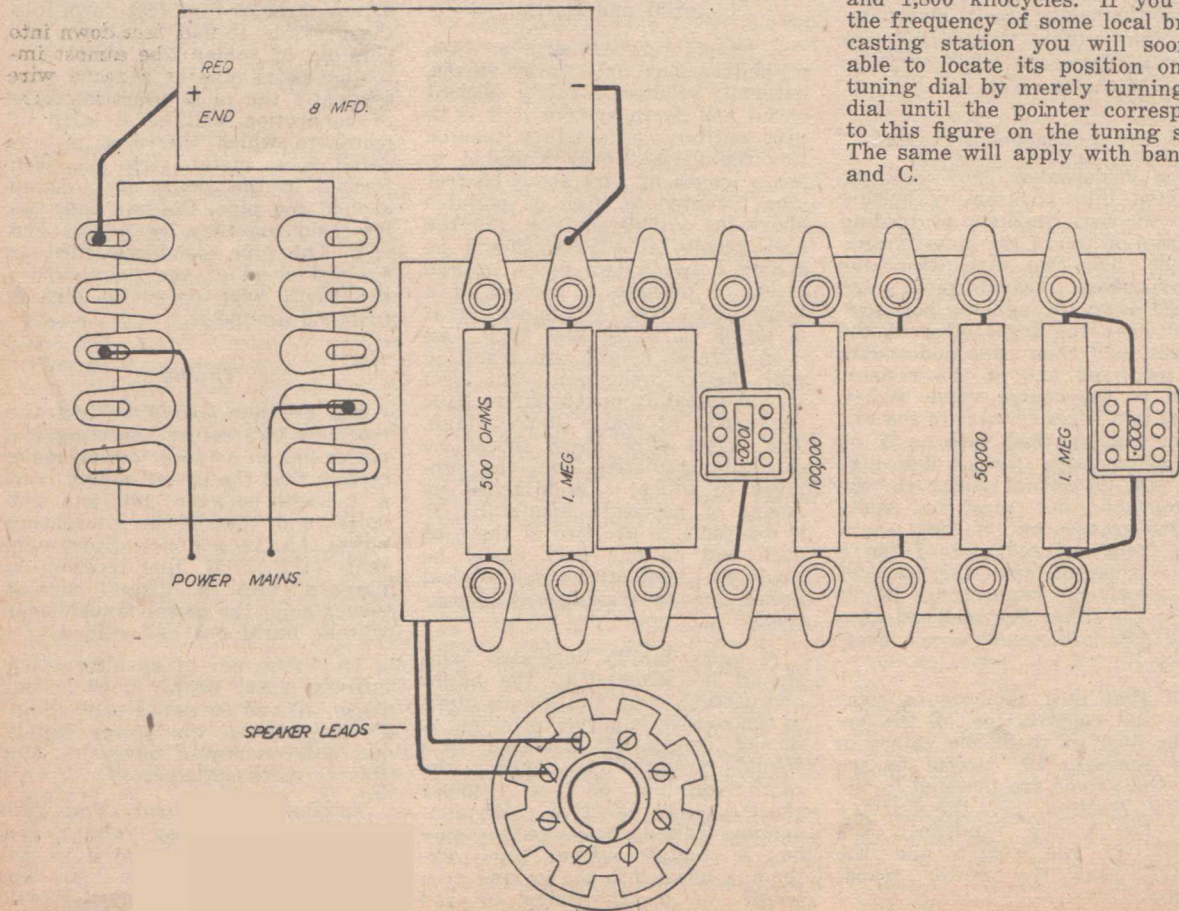
ceases. When the whistle ceases, you should then hear the programme from the station quite clearly. If the volume control is turned further in an anti-clockwise direction, the loudness of the signals will be diminished. The loudest signals are obtained when the volume control is turned on, in a clockwise direction to a point just before the whistle commences.

The range of the receiver for broadcast signals will depend mainly upon the aerial and earth system with which it is used, and also to some degree on the nature of the country surrounding the point at which the receiver is operated. The range will be greatest in fairly open country, especially near the coast. Rugged mountain country or country which is thickly covered with trees or undergrowth, will reduce the range of the receiver somewhat. However, an average figure would be about 20 or 30 miles, i.e., the receiver should be capable of picking up quite distinct signals at loud-speaker strength from broadcasting stations situated less than about 20 miles away.

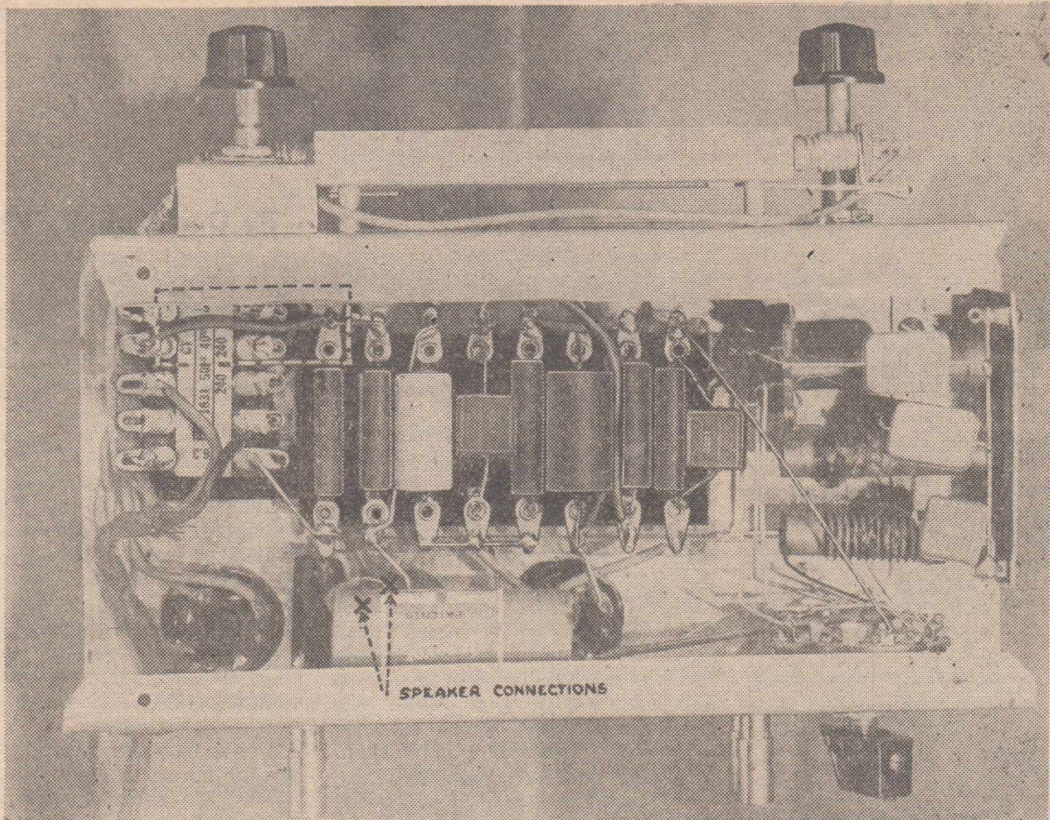
When the switch is turned to position B or C, for the reception of short-wave stations, the actual loudness of sounds from the loud-speaker may not be as great as is the case with the switch set at position A. However, the range of the receiver will be much greater, and it may be possible, at certain times of the day or night, to receive stations hundreds or even thousands of miles away.

Because of the fact that the volume may not be as great when using coils B or C, a pair of terminals is fitted to the back of the chassis to which headphones may be connected. If you find that the loudness of sound is not sufficiently great from the loud-speaker then you can connect a pair of headphones to the terminals marked "phones" and this will materially increase the range of your receiver.

The dial is marked with three bands of numbers, which indicate the frequency to which the receiver will respond. For instance, with the switch turned to position A, the receiver will respond to frequencies between 550 kilocycles and 1,800 kilocycles. If you now the frequency of some local broadcasting station you will soon be able to locate its position on the tuning dial by merely turning the dial until the pointer corresponds to this figure on the tuning scale. The same will apply with bands B and C.







A false strip is provided along the bottom of the tuning dial upon which you may scratch the call signs of any station to enable you to tune them in readily at any time. You will find that if you scratch the surface of the dial on this false strip the light from the lamp will show through and indicate any call sign markings you may scratch on the surface.

Before despatch to you, the receiver is partially wired and tested in such a way that provided you fit the component parts correctly into their positions the receiver should work without any trouble. If by any chance you find, when you have completed constructing the receiver that you cannot obtain any reception from it then the first step is to carefully check over the wiring and compare the work you have done with the photographs to see that all the parts are fitted in their correct positions.

If after carefully checking it over, you have still been unable to locate anything wrong, then we recommend that you take the receiver and these building instruc-

tions to some radio serviceman in your district. He will, for a small fee, no doubt, rectify the trouble.

#### Further Installation Hints

Although the need for an efficient aerial and earth installation has already been stated, it is felt that a few additional hints in regard to the former would not be amiss, because so much of one's ultimate success with the set depends upon this important item.

The wire used for the aerial should have adequate mechanical strength, preferably being hard-drawn copper of the type known as "seven-twenty-two"; this means that it comprises seven strands of twenty-two gauge wire. The wire may be either bare, or insulated with enamel or fabric material. Soft copper wire may be used, although it is not quite as satisfactory as the hard-drawn variety. The principal objection to soft copper wire is its tendency to stretch and sag. This is especially the case with fairly long aerals, as the weight of the wire is then quite

considerable. Electrically, of course, one type of copper wire is the same as any other of equivalent gauge, consequently, as long as the wire is about the size just mentioned there is no need to worry unduly whether it is hard or soft.

There is some advantage in using insulated aerial wire in districts situated close to the sea, as corrosion of bare copper wire, due to the chemical action set up by the salt air, may materially affect results, especially on short-waves. If enamel-covered wire is used, great care should be taken to scrape off all the enamel around the area to which the lead-in wire is to be soldered.

The down lead should always be insulated. A good type of wire for this lead is the kind used by electricians in house wiring. The insulation is usually coloured red or black and consists of rubber, with an outside covering of tough cotton braid.

Although the insulated covering

(Continued on page 42)

## CALLING CQ!

By Don Knock, VK2NO

FROM Lloyd Williams, VK4OW, of Mackay, Queensland, comes a detailed report of 50 mc/s observations: "Switched on the receiver on 27/12/48 at 9.53 a.m. and heard VK2OC briefly on MCW at S4. He signed K to somebody and was not heard again. The band opened here on January 2, 1948, at 11 a.m. and the following were heard: VK5KO at RST 539; VK2JX at RST 549, and VK5QR at RST 229. The latter signal was audible long enough only for identification but VK5KO held until noon and then faded. The weather has been cool and rainy and VK4KW brought along a type DR106 with which calls have been made using a folded dipole 32 feet high, but with no

replies. (You will need to crystal control that DR106, OM, before it will be copiable on the superhet receivers most people are now using.—D.B.K.) On January 11 I heard VK's 5KO, 5MP, 5LC, 3RR, 3PG and 5QR at strength varying from S2 to 9, and that day the weather was warmer and the temperature on the rise. Stations heard prior to New Year were VK's 5LJ (calling ZL3LB on CW), 3HZ, 3QR, 3PG, 3HK and 3KX. On December 29 at 2200 hrs. a CW signal keyed at about 18 w.p.m. was just audible on 50.51 mc/s and appeared to sign ZL3 something. That night also two stations were heard working each other and the call signs appeared to be VK2HO and 21G . . ."

G5UB/P, who is well-known on

DX channels, may, by the time these words reach print, be providing DX 50 mc/s contacts from somewhere out in the Pacific. He intends taking advantage of the favourable conditions to give the band a good work-out. Frequency will be around 51 mc/s and communication will be by CW only. He has a natty little crystal controlled rig and a converter ahead of a communications receiver. Jim was a visitor to the W.I.A. N.S.W. Division, VHF section, meeting last December, along with Bert Hay, ex-GW3BHG, and Ted Ironmonger, G8PO.

Slowly but surely many of the Sydney 50 mc/s men are showing favour for horizontal polarisation instead of vertical for antennae; and the logical answer to any individual problem seems to be provision for both methods. A simple vertical dipole a dozen feet or so above ground is a handy adjunct to the horizontal system. For purely local working the vertical system has much to commend it; mainly the fact that as such it is an omni-directional affair. Oft-times surprising results can be obtained with a plain dipole. Recently a test with a remodelled DR106 (Philips) with 25 watts on a single 807 at VK2NO produced reports from as distant as the Blue Mountains region, of S8 telephony, and the radiator consisted of an "inductively coupled" rod, fed with "Nylex," and actually resting on the concrete floor of a garage. The 100-watt rig with ground-plane radiator 56 feet high seems, after that, to be quite the extreme. The DR106 referred to, by the way, is now to be heard on 52.74 mc/s as VK2ZU, located at Mosman. VK2ZU is an old radio identity, Norman Gilmour, who is general secretary of the Institution of Radio Engineers, Australia. Other recent additions to the 6-metre habituees

### IS IT STRANGULATION ?

A letter in the English "Wireless World" by a correspondent using the nom-de-plume "Etheris" paints a rather grim picture for the future of amateur radio. Extracts are given here with due acknowledgment to "Wireless World":

"We hear a lot about vicious spirals in economic affairs. May I, as an old amateur, venture to suggest that amateur radio is at present in the throes of a vicious spiral of a rather different type; and it tooks to me rather like this. Every month between 100 and 150 new licences are issued in this country (Britain), which means that by 1950 there will probably be about 10,000 amateur transmitters in the small area . . . and there will be fewer channels for them. More amateurs, fewer frequencies; and that is by no means the whole story. British amateurs are now allowed inputs up to 150 watts. Increasing congestion sorely tempts every amateur to go to the

limit of the power (and some) in order to make himself heard. The temptation to 'pile on the watts' is aggravated by the present crazy Gadarene rush to work DX; a procedure which seems quite purposeless, since any individual with a good aerial, a good receiver, and a few hundred watts can work any part of the world to order; there is little cleverness and no merit in doing so . . . another abuse of amateur bands . . . is the selfish employment of high-power telephony for local or semi-local communication . . . I suggested some years ago that if action were not taken among amateurs themselves to rationalise their operation, then amateur radio would choke itself to death by sheer weight of numbers. Today, that is more true than ever. What it will be like by 1950 I shudder to think. Can British amateur's discipline themselves in time? Or is amateur radio as a pleasant scientific hobby, doomed to extinction? That, flatly, is the choice before us . . ."

in Sydney are: VK's 2ALU, 2AXB, 2AWC and 2VW.

Overseas publications dealing with VHF design and theory are always of more than passing interest to the Australian amateur with a yen for frequencies higher than 28 mC/s. For good practical information on a variety of receivers and transmitters for 50 mC/s, one of the most useful is the "Short-wave Manual" put out by the British Eddystone concern. It is, when to hand, available through their Australian agents, headed by Bob Cunningham (VK3ML). Copies don't remain in stock long, which isn't surprising. Another typically British publication which is of particular value to the amateur from every angle is the "Short-Wave Magazine." This is not a manufacturer's manual, but a regular monthly devoted entirely to all phases of Amateur Radio, and that includes a vast amount of practical and topical information on VHF's. "Short-Wave Magazine" is edited by Austin Forsyth, O.B.E. (G6FO), and a very able staff. They publish also a sister magazine for the SWL called "Short-Wave Listener," very much on the same lines, and for the SWL who likes "rolling his own" or trying all

kinds of gadgets to aid better reception, it would be hard to find more interesting reading material.

In these times receiver design is invariably based upon some form of superhet principle, usually, for 50 mC/s, utilising the double conversion principle. It was decided to take a step in the other direction, and to try a modernised version of a receiver constructed in 1936, and known as the "Ultra-Searcher." This, a tuned RF job, had 956 RF amplifier, 76 detector, and 41 head-phone audio, with miniature plug-in coils for "5 and 10." That original was owned by world-famed SWL Eric Trebilcock, known as BERS195. Eric was at Rabaul in Civil Aviation at the time the Japanese struck, and the little receiver fell into their hands. A simple little affair, it totted up a vast number of stations heard on 10 metres, and all by use of a smoothly functioning regen: detector, etc. It was decided to make up another similar arrangement using appropriate valves, and this time the line up is VR65 (Mazda SP41) as tuned RF stage, 954 regenerative detector, and 6U7G high gain audio for phones. Success with such a receiver depends very much upon solidarity of mechanical construction in the detector portion, plus a positive action non-slip or backlash tuning dial. Those considerations, together with really smooth detector action, can result in a pleasing type of receiver that will pull in all the stations you can hear with a much more comprehensive affair. It is possible to make such a receiver with excellent signal to noise ratio by applying valves such as the Philips EF54 (RL7) as RF amplifier, with EF50 at detector; and probably an EF50 as head-phone audio stage.

For the benefit of those who may have purchased ex-Disposals DR-106 transmitter/receivers . . . a little general information on changing to crystal control for the transmitter will be of interest. Basis of the original design is a MOPA covering 60 to 80 mC/s with 6V6G Colpitts oscillator capacity-coupled to push-pull 807's. Modulator is via a carbon microphone, with 6V6G sub-modulator driving Class AB1 6V6G's. The receiver is a super-regen: with 954 TRF stage, 955 detector, 6J7G quench oscillator and 6V6G audio

to panel speaker or phones. Not much can be done about the receiver except to get it to cover 50-54 mC/s and this is easily done by squeezing in the grid coils and increasing the concentric-type padder capacities. The transmitter calls for more comprehensive treatment. By using a crystal in the 8 mC/s range, with a tritret oscillator, doubler, and P.A., the 50 mC/s band can be reached with a minimum of trouble. A 6V6G for the crystal oscillator can be arranged horizontally in the space underneath the chassis (with the metal grille removed) with a 25 mmfd. midget variable condenser to tune, with appropriate inductance, to the third harmonic. The 6V6G formerly used as the Colpitts oscillator is now applied as doubler to 50 mC/s and thence to drive one of the 807's as a single-ended P.A. The two 807's may be used as before, in push-pull, but it is found that with more drive

## RADIOMAC NAME PLATES

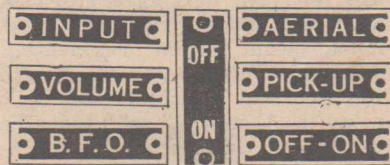


Plate size 1 1/4" x 1/4". Brass lettering on black. The following titles are available:—

A BATTERY	LOW MICROPHONE SPEAKER	RECEIVE RECTIFIER
B BATTERY	MILLIAMPS	REGENERATION
C BATTERY	MIXER	SHORT WAVE SELECTIVITY
AERIAL ATTENUATOR	MONITOR	SELECTOR
BAND SET	MODULATOR	SWEEP
BAND SPREAD	NEUTRALISER	SYNC
B.F.O.	OFF-ON	STONE
BROADCAST	OHMS	TUNER
CRYSTAL BUFFER	OSCILLATOR	TRANSMIT
CURRENT	OUTPUT	VOLTS
C.W.	PRE AMP	VERNIER
DOUBLER	PHONE	VOLUME
EARTH	PHONES	WAVE
FILAMENT	PICK-UP	CHANGE
FOCUS	PLATE	X SHIFT
GRID	PLAY BACK	X AMP
INPUT	POWER	Y AMP
INTENSITY	POWER-AMP	Y SHIFT
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	RADIATION	SPEAKER

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### PREFIXES FOR RUSSIA

The following is a complete list of post-war prefixes for USSR, which is comprised of 16 Republics. R.S.F.S.R. means "Central Federation of Autonomous Republics and Provinces."

#### Europe

R.S.F.S.R., Moscow, UA-1-4-6.  
Belorussia (White Russia), Minsk, UC2.  
Ukraine: Kiev, UB5.  
Armenia, Erivan, UG6.  
Azerbaijan, Baku, UD6.  
Georgia, Tbilisi, UF6.  
Karelo-Finnish S.S.R., Petrozavodsk, UN1.  
Moldavia, Kishinev, UO5.  
Lithuania, Vilnius, UP2.  
Latvia, Riga, UQ2.  
Estonia, Tallinn, UR2.

#### Asia

Siberia, Yakutsk, etc., UAD-0.  
Kazakhstan, Alma Ata, UL7.  
Turkmenistan, Ashkhabad, UH8.  
Uzbekistan, Tashkent, UI8.  
Kirgizhstan, Frunze, UM8.  
Tajikstan, Stalinbad, UJ8.

## HAM NOTES

(Continued)

available for a single-ended stage, modulation characteristic is normal. "Downward" modulation is likely with PP 807's if there is not sufficient drive. The heaters for the two 807's are arranged in series from a 12-volt transformer winding. Simplest way to use one 807 is to fit an appropriate resistor to a 5-pin valve base and plug this into the unused socket.

—D.B.K.

\* \* \*

"Querex": That was a 100 per cent. amateur gesture on the part of Bert Hay, ex-GW3BHG, when he arrived on this side of the world to settle finally with his family in the Australia he had known as a seafaring brass-pounder. A prominent industrialist, he was pounced upon by a commercial broadcasting outfit to unburden a few words before the mike. Bert agreed, but didn't agree with the questions the pretty boy "compere" wanted him to answer . . . leading and contentious items about international politics, Britain's industrial outlook, etc. All Bert agreed to talk about was amateur radio, and what it had meant to him in cementing friendships around the world. He was told that "amateur radio isn't news in Australia," and that the roundsman "had been a Ham himself and knew that nobody is interested much in the subject." Bert stuck to his guns and they recorded what he had to say. But when the session due to include the talk was scheduled, the broadcasters concerned had their own way . . . they substituted another feature. Bert may get the call-sign VK2AGW.

\* \* \*

"Exgee": Prefixes can be confusing. Don't ask me what I was doing up at the time, but I heard a VK2 on phone, gleefully hailing a ZM6 as "my first South African." I could almost see the look of disappointment on his face as the Samoan disillusioned him. There is a vast difference between ZM and ZS for VK's.

\* \* \*

"J. McB": The idea of N.S.W. Div. station of W.I.A. looking for

country QSO's after the Sunday morn 7 mC/s BC session is a good one. It is interesting also as demonstrative of the tactics of Veefo artists in crazily setting up a kind of marathon race to grab the first QSO with VK2WI. How the operator of VK2WI has managed to sort out the ensuing din at times only he knows, but he presumably picks the loudest; about all he can do. The scramble has been intense enough without further complication but when other Veefo's take to jumping the gun and actually calling VK2WI before the broadcast has completed, no comment can be expressed acidly enough. On a recent Sunday the broadcast included a very definite warning from the P.M.G. about misuse of VFO's and calling attention to a clause in regulations. Came the end of the broadcast and, instead of the usual marathon . . . utter silence! Later, a few "bush lawyers" could be heard "interpreting" the regulations!

\* \* \*

"La Mouche": It's easy to fall in when chasing RF and audio parasites in modulators and speech input gear. Heard a country VK2 with transmission affected at intervals by a variable buzzing sound that was difficult to track down. Eventually it turned out to be a persistent blow-fly zooming past the microphone between times.

\* \* \*

"Worm-warmer": Had a 14 mC/s phone yarn with W2ZJ with the usual R5 S8 reports both way, and was considerably surprised to learn that the New Yorker was using an underground folded dipole radiator buried 2 feet below the ground surface. There is nothing new about the idea of an underground antenna; the method was publicised in the 1920's as the "Rogers' Buried Antenna." That was in the "200-metre" era. W2ZJ assured me that it was the only possible way he could minimise the car ignition problem, his home being at the junction of two main highways. His receiving set-up is an "R Niner" ahead of an HRO, and his transmitted signal lacked nothing in punch from that interred wire at this end.

"Questa": Listening around the police and point-to-point services in the 35 mC/s region, I ran across a somewhat familiar feminine voice handling fire traffic. It turned out to be the Central Fire station of New York City, and the voice was that of Dot Hall . . . known to Hams and SWL's the world over as W2IXY. It seems that Dot isn't much away from microphones, what with amateur and fire brigade radio.

\* \* \*

"Exit BCI": One thing the WIA should push for is permission for VK's to use Narrow Band FM on the 3.5 mC/s band. There should be ample room for such operation there and with correct application, interference with broadcast receivers in the vicinity of the amateur station can be expected to disappear. Many VK's in the suburban city areas who would like to make use of "80," balk at the idea because of the ever-present snag of the BCL. NBFM is considered to be a progressive step in the right direction technically, so one fails to see what objection there could be to tests being made thus on "80."

\* \* \*

"Watts-plus": 100 watts? The rating must have been stretched a bit in the instance of a suburban VK3 station who "thought he might have a standing wave or so as the coaxial feedline gets hot to the touch!"

\* \* \*

J. T. Alphington writes: "The W.I.A. has announced Advisory Committee appointments of nominees selected by the P.M.G. for the current year. Vigorous action is needed from these people to curb regulation flaunters on our 7 mC/s band in particular. Apart from the fact that there are individuals at large who seem to indulge in campaigns of deliberate transmission interference with amateurs who have reached a more-than-resentful stage; there are also glaring instances of selfishness that call for departmental action. When a group of "blah-merchants" that appears to assume monopoly occupancy of a channel deliberately antagonises a crystal-controlled station that happens to start up on

'their' VFO-established stamping-ground, then it is time for them to exercise their alleged 'Spirit of Amateur Radio.' With any sense at all of give-and-take, such people should do the right thing and move frequency . . . they boast enough about being able to do so! Some of these glib-tongued people foster an idea that any amateur using anything else other than a 'swisher' is backward and non-progressive. The regulations are quite clear enough . . . the trouble is that Advisory Committees haven't been doing a real job of work. Variable Frequency Control is permissible if it meets with requirements, but the very fact that it has been emphasised by some people so much has been the means of attracting larrikins armed with a variable condenser and a knob. Then the aggrieved ones directly responsible for the advent of the miscreants talk loud and long about a gospel of DF hunting; the while they know full well that the chances of success in that direction are quite remote. There is more than enough reason why crystal-controlled gear, especially in the hands of beginners, is a most desirable feature of amateur transmitting practice.- If the kind of thing that persists in the mode and character of radio-phone operation on the 7 mC/s band is intensified, there won't be any of that band left after the next international hand-out. Advisory Committees need to be comprised of members who are something other than mere phone DX-hounds . . . people who can and will keep an eye on things for the good of the majority. Otherwise the few responsible for complaint and general ill-feeling between amateurs will undermine the whole structure . . ." (We publish this extract from our contributor's letter with mixed feelings. Comment is invited.)

"Steerbeam": At present in Australia is G8PO, otherwise Ted Ironmonger, Lieut. Comdr.. R.N., and his breezy personality is confirmation of a pleasant voice known to many VK 14 mC/s phone men for the last 12 months or so. He is the originator of a neat scheme for switching the directivity of a simple fixed beam of the W8JK variety, and describes it in

R.S.G.B. Bulletin for November, 1947. Briefly, it consists of two dipoles, spaced an eighth wave, with feedlines connected in phase, and paralleled. An additional length of feedline is looped to the lines from the dipoles, and this acts as a delay section. By changing the transmitter input from one socket to another at the junction of either line and the delay length, the directivity is changed over. It means that the hitherto bi-directional single section 8JK array becomes a much more useful affair. Radiation can be "fired" either way at will, with a back-to-front ratio of 20 to 30 db. G8PO's signal from England has always been one of the most outstanding under all conditions, and his "G8PO Special" is the reason why.

"Aref": Herewith a practical man's finding for VHF RF chokes. For 50-54 mC/s, use a length of wire 56.6 inches, and wind on a former of diameter less than half an inch. For 144-148 mC/s, the length of wire needed is 20 inches. For all other bands divide 2953 by the frequency in mC/s. The winding diameter must be about quarter-inch or less.

"Brader": If you are using that polythene insulated 300-ohm twin-lead of "Telcon" make to fashion a folded-dipole with feedline of the same material, don't imagine that you are seeing things as you approach your station some dark night. After a sunny day, the material stores a certain amount of light, and is actually luminous for a few hours following. And don't fall for the idea either that the RF in your antenna system is producing the glow . . . not with 100 watts in the shack anyway!

"Mervac": The 82 rectifier has gone into the discard of late, for the type has been obsolescent for some time. Nevertheless, it is a handy kind of tube to have around if one possesses a few transformers with 2.5 volt heater windings thereon. Those who may still have use for the 82 will be interested to know that the Philips

people say they can supply from stock.

"Powerdin": What lies in store for the future world of domestic VHF radio is evident unless far-seeing legislation takes a hand now. Radio-inductive interference from house appliances such as vacuum cleaners, sewing machines, mixers, washing machines, etc., is rising to a crescendo. Not so apparent on M/F, but annoying at H/F, the din becomes unbearable at VHF channels. "Universal" type fractional h.p. motors are the chief offenders, and the irony of it is that most of the noise, arising from sparking at commutators, is easily suppressed at the source by capacitor-filters. The P.M.G. takes notice only where M/F broadcasting suffers interference, but it is not particularly interested where H/F and VHF are concerned. The folly of permitting the manufacture of any appliance minus noise suppression will be obvious in time to come. VHF channels will be increasingly in use, and not all will use FM, which discriminates against such noise. There will be much AM used at VHF. About the most aggressive form of interference is from car ignition systems. During the recent war, the Services "suppressed" all vehicles used anywhere near radio receiving equipment and in these times no vehicles should roll off a production line minus suppressed ignition.

"Hi-Q": Seems to me the best way out of the receiver design problem for the various amateur bands is to base things around a double conversion I.F. amplifier unit. This can start off, say, with 3 mC/s input to a mixer/oscillator, changing thence to a lower frequency IF channel of 175 kC/s. Crystal filter and noise limiter can be incorporated, with S meter and any other useful items considered worth-while. A VHF and an HF converter with band-switching can then be applied to the front end as required. As the amateur bands only are wanted, a high measure of efficiency can be built into the front end converters, taking advantage of cathode-follower/grounded grid RF stages and infinite impedance mixer/oscillator combinations.

# Shortwave Review

CONDUCTED BY

L. J. KEAST

## NOTES FROM MY DIARY

### VACATION TIME

A letter from Arthur Cushen tells me he will be on vacation from February 14. "Not so much DX will be done this month." But I venture to suggest that, like myself—when I do get a few days away from the metropolis—he will take a portable s/w set. A man like Arthur, who has sent out his 2300th report and has verifications from 104 countries, is hardly likely to let up even when away on holidays. As a great booster for this little magazine, I wager he has arranged for his copy to be forwarded to whatever part of the Shaky Isles he has chosen to take his wife for a brief respite from his daily avocation.

### WOPPERS TODAY, LADY

Rex Gillett of Adelaide, who by the way is a philatelist, received a letter from XRRRA, Peiping, and on the envelope which brought news regarding the station were stamps of a face value of 39,000 dollars.

Thinking of stamps reminds me it is a long long while since we heard any news from another South Australian who finds stamp collecting a good and additional hobby to Dx-ing . . . I refer to Ern. Suffolk of Lobethal.

### ANOTHER TAIL-WAGGER

From WLW Radio News I learn my old favourite, Bob Hope, has a new pet at his North Hollywood home. It's a Great Dane pup answering to the name of Redson Jr. It takes the place of Hope's old pal, Redson, who passed on to dog heaven last summer.

### VERIFICATIONS

Alfred Henry Gosbells of Caulfield, Victoria, a newcomer to the

hobby of DX-ing, is naturally proud of his first verifications which are: HER-5 on 25.28m in their broadcast to America; CHOL on 25.6m, and several from amateurs on the 20-metre band. Reports are out to quite a number.

Alfred is anxious to join a Listeners' League and I am writing to him regarding this. His letter would suggest he is a keen listener and the fact that he has veries from a good many amateurs shows that he is listening as my experience when running over the amateur bands is that they are not the least bit concerned about anyone other than he to whom they are talking having any idea who they are—the slurring of their speech being, in my opinion, almost a breach of the regulations.

And in a hurried note just prior to packing the grips for a brief respite, Arthur Cushen reports having received verifications from the following: Radio Batavia (PLO, PLY, PLU, PLS, YDD2); PCJ, 9.59mc; PHI, 11.73mc; PGD, 6.025mc; XMPA, 12.20mc; Brazzaville, 11.97, 17.845 and 9.44mc; Jaffa, 6.135, 6.790, 11.735mc; OAX4V, OAX4W and OAX4J; LRA1 and LRX1; Wein 11.785mc; Voice of America (Manila), 11.84 mc.

Here is another fine list from the South Australian champion, Rex Gillett: "One of the best pieces of news I have had for some time came from the Philippines. It was in regard to the controversial KZBU reported from varying sources with different calls and locations to that which I originally quoted. Gerino M. Pancito, chief technician of KZBU, in verifying my report said: 'We are very glad to hear from the first one to send reception report outside the Republic of the Philippines.' KZBU's slogan is given as 'Cebu Calling' and it is a sister station of KZPI

and KZOK. The letter of verification is to be followed by a proper card as soon as these are printed. My first Peruvian commercial verified was OAX4J, which came to hand this week. Veri was by letter in Spanish. Slogan is 'Radio Colonial.' Address, P.O. Box 1166, Lima, Peru.

"Best of latest veries are KRRA (the Peiping broadcasting station), 3 Hsi Chang An Chick, Peiping); Paris, 7.24 and 7.28mc; XEQQ; Radio Trinidad (lemon shade card with outline Trinidad indicating location of station at Port of Spain); CKNC; CKCS; PRE-9; OIX-7 (formerly OIX-1) and Jaffa, 6.135, 6.79 and 11.73mc." (A very nice list, Rex.—L.J.K.)

### SIX YEARS OLD

The Short Wave League of W.A. is now six years old and congratulations go to that body and particularly to their energetic secretary, Roy Matthews. I know how thoroughly he enters into things as the help he gave me when I was conducting the shortwave listening post for the United States Office of War Information is still fresh in my memory.

---

## New Stations

OQ2RC, Leopoldville, 6.01mc, 49.92m: "Radio Congolia" is reported as being on the air from 3-4.30 a.m. with regional programmes. They request reports to P.O. Box 63, Leopoldville, Belgian Congo. (This is not actually a new station, but I cannot find any reference to it being logged in Australia. My attention was drawn to it in the February issue of DX Bulletin, N.Z., they having referred to

"Radio Australia" mentioning it as "Radio Congolia." The call-sign I obtained from my own records.—L.J.K.)

OQ2RC, Leopoldville, 15.325mc, 19.59m: The same remarks as above apply to this one.

WRUS, Boston, 17.75mc, 16.90 m: This old-timer, from the World Radio University, is being heard well around 7 a.m.

Here is a list from my very good friend, Roger Legge of New York, received by air mail:

Ecuador: MC4FS, 4.56mc, 65.78 m: La Voz de Esmeraldas, Ciudad Esmeraldas, a new station heard from 11 a.m.-2 p.m.

El Salvador: YSCP, 5.20mc, 57.69: A new station heard 11 a.m.-noon.

Honduras: HRQ, 6.125mc, 48.98m: San Pedro Sula, a new station heard from 10 a.m.-noon.

Venezuela: YV1RG, Cabimas, 6.15mc, 48.78m: Radio Cabimas is a new one and is on the air from 10 a.m. till 12.30 p.m.

YV6RK, El Tigre, 3.33mc, 60.91m: La Voz del Tigre, 10 a.m.-12.30 p.m.

YV9RK, San Fernando, 4.82mc,

62.24m: La Voz de Apura is heard from 10 a.m. till 12.30 p.m.

I am just afraid the schedules will be difficult for us but they may suit N.Z.—L.J.K.

## SAYS WHO?

At January 24, operating hours of KZBP, Cebu, were: 7-8.30 a.m. and 2 p.m.-2 a.m. due to power shortage. My March 24, KZBU will be on the air 18½ hours daily. Address is: Philippine Broadcasting Corporation, Gotiasco Building, Comercio St., Cebu City, Philippines.—Gillett.

XLKA, 7.93mc, Korean Broadcasting System, 1 Chung Dong Jung, Seoul, Korea, heard on 7.93 and 2.51mc from 6 p.m.-11.34 p.m. Gives English network call each quarter-hour.—Cushen.

COCH, Havana, 9.437mc, 31.80 m, according to the latest issue of "Radio Guia," now uses the slogan "Union Radio." I think their previous slogan was "Radio O'Shea."—L.J.K.

YDD2, Radio Batavia, Koning-splein, Z 17, Batavia, Java, verified by airmail letter from Mr. P. R. Hill of the English section. Also sent veri card as used by Macassar, and English language schedule which is: 8.30 p.m. on 15.145, 10.36, 9.55, 4.865 and 3.024mc;

12.30 a.m. to U.S.A. on 11.44 and 15.145mc; 3 a.m. to British Isles on 15.145 and 19.34mc; 3 a.m. to Middle East on 17.63mc. Plans are under way for extensive alterations to the short-wave broadcasts.—Cushen.

YV5RY, Caracas, Venezuela, "Radio Continente," has moved from 3.38mc to 4.725mc. They open at 9 p.m. with a march, then news in Spanish. Signal is fair.—Cushen.

Radio Espania Independencia, Russia, heard hourly on 6.84mc at 4.30-4.50 a.m., etc., with "Freedom" broadcasts at good strength.—DX Bulletin, N.Z.

Radio Macassar, Celebes, back on its former channel of 9.375mc from 8 p.m.-12.30 a.m. Listeners will remember they have been on 9.357 mc.—L.J.K.

Prague Radio since December 8 has been conducting all its broadcasts via OLR2A on 6.01mc. English transmissions are scheduled for 4.45, 6.45 and 8.45 a.m.—Gillett.

British Far East B/C Service, Singapore, is on the following schedule as from 18/1/48: 7 p.m.-2.35 a.m., 6.77mc. Power is 7½kw. 8.30 p.m.-2.35 a.m., 9.69mc, 7½kw. 7 p.m.-2.35 a.m., 11.77mc, 7½kw. 7 p.m.-2.35 a.m., 15.30mc, 7½kw., and 7 p.m.-8.30 p.m., 21.72mc, on which transmitter power is 5½kw.—Gillett.

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From "Short Wave Listener" I take the schedules of Canadian Broadcasting Corporation:

CKNC, 17.82mc: 12.15-5 a.m., Tuesday-Sunday; 12.15-5.45 a.m., Mondays.

CKCX, 15.19mc: 12.15-2 a.m., Tues.-Sun.; 12.15-2.30 a.m., Mon.

CKCS, 15.32mc: 2-7.30 a.m., Tues.-Sun.; 2-7.30 a.m., Mon.

CHOL, 11.72: 5.15-9 a.m. Tues.-Sun.; 6-9 a.m., Mon.

CKLO, 9.63mc: 7.45-9 a.m., Tues.-Sun.; 7.45-9 a.m., Mon.

ZBW-3, Hongkong, is reported to be verifying in the form of a letter. They are to be heard from 11 p.m. till 1 a.m. in their English session but are not easily tuned in.—L.J.K.

Radio Australia gives a special session for shortwave listeners at 3.25 p.m. on Sundays.—L.J.K.

A note from Harold J. Barr, Hon. Nat. Secty., N.Z. DX Club Inc., says the now permanent address for all communications is 10

Koraha St., Remuera, Auckland, S.E.2.—L.J.K.

Radio France, Hanoi, Indo-China, is now in the clear, having moved to 6.05mc, and is well received at 11 p.m.—DX Bulletin, N.Z.

Have noticed KZRC opening on 6.135mc with fair to good signals at 7 a.m. This one is operated from Cebu City by Manila Broadcasting Co.—Gillett.

KWU, heard on 15.35mc, one day recently contacting ZLT-7, Wellington, at 3.15 a.m. Could not hear ZLT-7 here.—Gillett.

HED-6, Switzerland, 9.655mc, 31.08m. Good signal at 7.45 a.m.—Radio Listening Post.

Subscribers to "Universalite" will be sorry to hear Walter E. Welch is unable to continue as Shortwave Editor of this popular American Radio Club paper. His company now requires him to do a lot of travelling, thus making it impossible for him to give the same time

to Universal Radio Club as previously.

Veri hunters should try their luck with XECC, Peubla, 6.185mc, 48.47m, as I am told by Ray Simpson they verified his report and in pretty quick time. The address is: Radiodifusora, XECC, c/- Estacion XECD, Apartado No. 60, 2 Norte No. 803, Ciudad de Peubla, Mexico.—L.J.K.

### AUSTRALASIAN RADIO WORLD

Australasian Radio World is again in short supply, due to the necessity for paper conservation under economic measures applied by the Federal Government in its effort to assist Britain.

It is, therefore, suggested that you ask your newsagent to reserve your copy.

## SPECIAL PURCHASE

### All Brand New Stock

Midget Dual Wave Coil Brackets .....	17/6
8 mfd. 525 volt Electrolytics .....	2/6
Torpedo Microphones .....	£3/10/-
Heavy Duty 8" Perm. Speakers with Transformers .....	£1/19/6

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## NOTICE

# BACK NUMBER CLEARANCE

Owing to the heavy demand for back numbers following our recent offer we have decided to change our policy in regard to these. In future our Back Dates department will stock only the six or eight previous issues. All earlier issues will be 6d. each or 5/- per dozen until stocks have been cleared. We will not make any effort to retain stocks of back numbers older than six months. If you want to complete your files, don't hesitate. The following issues are now available at 6d. each or 5/- per dozen, post free to any part of the Commonwealth.

These issues contain a wealth of technical data and information. Only small stocks of some issues are available, so don't hesitate.

- December, 1939.—Loop portable 3, Junior class B battery amplifier, "Air-scout" communications six, multi-meter circuit.
- November, 1940.—Transport a.c. portable, T.r.f. mantel 4, "Criterion Crystal," Two champion amplifier circuits, 8-valve battery superhet.
- December, 1940.—"Tip-top" 3/4 superhet (one of our most popular circuits), tone-corrector for magnetic pick-ups.
- February, 1941.—The Club Special, Local-tone Four (a.c), First article on tone compensation by inverse feedback.
- March, 1941.—Second article on compensated acoustics, also the "Acoustic Compensated Superhet."
- June, 1941.—Super-seven dual-waver, Paraphase amplifier, extension speakers.
- December, 1943.—Design of folded horns, five-way tone control, High efficiency aerial for short-wave listening.
- January, 1944.—Simple v.t.v.m. with magic eye, home-made high-fidelity pick-up head, all-wave two-valver.
- February, 1944.—How to make a soldering iron, 12-valve super-quality amplifier.
- March, 1944.—Making electric musical instruments. The Three-Two battery special.
- April, 1944.—How to make an electric guitar, simple volume expander circuits, Mystery crystal set.
- May, 1944.—Multi-vibrators, an amplifier beyond reproach, wide tone-control unit.
- June, 1944.—Utility battery set, Direct-coupled t,r,f, 4, How to wind your own output transformer, etc.
- July, 1944.—Simple v.t.v.m., Three circuits by Stevens, Home-built communications 13, scratch filters.
- August, 1944.—Home-made hi-fi pick-up, wide-range audio oscillator, useful a.c. bridge, bass booster amplifier.
- September, 1944.—How to design direct-coupled amplifiers, crystal circuit which receives N.Z., Eclipse champion amplifier, simple valve tester, R.f. heating.
- December, 1944.—Victorian champion amplifier circuits, pick-up equalizers, English fidelity radiogram circuit.
- May, 1945.—Reflex circuit with cathode follower, one-valve test oscillator using 6A8G, Audio oscillator circuit.
- June, 1945.—Well-trying reflex circuit, Theory of microphones.
- July, 1945.—Resistance and capacity meter, Tone compensation amplifier.
- August, 1945.—The Decibel, Theory behind proper amplifier design.
- September, 1945.—Camera-case portable, An answer to the cathode follower, Getting the best from a pick-up, Probe adaptor for v.t.v.m.
- October, 1945.—Transitron oscillator, Vibratory power supplies.
- December, 1945.—The "Hammond" electric organ, Noise suppressors.
- January, 1946.—Champion amplifier, Simple service oscillator, Home-made filter chokes.
- February, 1946.—The "Antitheorist," Improving DX performance, Signal tracer in miniature.
- June, 1946.—Signal tracer for battery operation, Receiving aerial for ten metres, exciter unit for mC/s, deaf aid amplifier, single-gang superhet, etc.
- July, 1946.—Latest in direct-coupling, Absorption - type wave meter, powerful 8-valve circuit, ideal single-ender amplifier, servicing a.c. receivers, etc.
- August, 1946.—Handy multi-meter, All-wave band-spread 2 for battery operation, with coil data, Stroboscope speed indicator for turntable, "Ferrotune Reinartz," T.R.F. four-valver for battery operation, "Fidelity Broadcast 5," etc.
- September, 1946.—Band checker for hams, Pre-selector unit, Effective noise limiter, "Connoisseur" a.c. five with tone compensation, "Sky - hawk" t.r.f. 4 for a.c., etc.
- October, 1946.—"Max-Plus" by Paul Stevens. A.C. Bridge using magic eye, How to suppress man-made static.
- November, 1946.—Circuit for a.c. or battery operation, Ferro-tune mantel model, intro. to the F.F.R. amplifier.
- December, 1946. How to build a multi-meter, the F.F.R. amplifier, to deliver 45 watts of super-quality.
- January, 1947. Battery circuit design, the control of tone, list of Australian broadcasting stations in order of frequency.
- February, 1947.—Simple super from the past, Inputs for the F.F.R., Two more "Connoisseur" circuits. Re-vamping the FS6.
- March, 1947.—How to get the best fidelity from ordinary speakers, sensitive four-valve reflex circuit, Servicing the vibrator, how to make r.f. chokes.

Put a cross alongside the numbers you require and post this page, or make out a list of dates you want. Remit the amount in 1½d. stamps or postal notes and address your letters to

**AUSTRALASIAN RADIO WORLD**  
Balcombe Street, Mornington, Victoria

R.S. (Colac) wants a modern circuit to which to build a portable set, but with a number of old-fashioned valves which he has on hand.

A.—No, we couldn't have any part in the suggested plan as we feel certain that it would amount to nothing but a waste of time and money. The new miniature valves are certainly expensive but in the long run they would be cheapest. The old valves you mention not only draw a hopelessly heavy amount of filament current but they are of unsuitable type in every way.

## TRIPLE-WAVER

(Continued)

of this wire is quite tough it is not proof against a prolonged rubbing or chaffing. As a consequence, care should be taken to keep the wire at least six inches away from the sides of a wall, the edge of a roof, etc. If this is not done, the swaying of the wire causes the insulation to wear away, eventually exposing the bare wire. The result may be reduced signal strength or severe crackling noises from the loudspeaker.

Finally, a word about soldering connections to the aerial. Make sure that the two wires to be soldered are perfectly clean and bright, that the soldering iron is very hot and that a non-corrosive flux is used. The latter is especially important. Spirits of salts and other acid fluxes may be all right for plumbing jobs and the like, but these can cause endless trouble when used for radio or electrical work. Plain powdered resin is probably the best type of flux to use.

## ACOS PICK-UPS

May we correct a slight inaccuracy? On the top right-hand of page 15 appears:

"It is interesting to note that Acos (usually known as Cosmocord) . . . ."

This is not exactly correct, as the pick-ups imported into Australia from Cosmocord Limited prior to August, 1947 were all known as Cosmocord. An entirely new series incorporating the unbreakable crystal was then introduced coincident with our taking over Cosmocord rights in Australia, and these new products are known as Acos products, manufactured by Cosmocord Ltd. We do not want any confusion to rise between Acos products and previous Cosmocord products, which were not marketed under that brand.

The fact that you have mentioned Acos GP12 is rather embarrassing because we are informed by our principals in England that this pick-up is not yet in production and it will possibly be June or July before samples are airfreighted to us. To prevent disappointment, and a flood of correspondence, you may think fit to announce in your next issue that the announcement of the type GP12 is premature, and that your journal will advise its readers when Amplion (A'sia) Pty. Ltd. receive the first samples from the manufacturers.

—Amplion (A'sia) Pty Ltd.  
Maxwell Cutts  
Manager—Radio Division.

## RESISTOR COLOUR CODE

Value	Body	Dot	End
1 Meg	Brown	Green	Black
50,000	Green	Orange	Black
100,000	Brown	Yellow	Black
500	Green	Brown	Black

WILL SELL accumulation valves many years. AC types, 4, 12, 2.5 volts. Battery types 2 volt. Your replacement may be available. VK2NO, Don. B. Knock, 43 Yanko Ave., Waverley, N.S.W.

BACK Numbers of A.R.W. wanted: Sept., Oct., Nov., 1939; Feb., May, 1940; April, 1941; Nov., 1945. Write H. A. Tootell, Civic Theatre, Coramandel, New Zealand.

FOR SALE: 1 IR5, 2-3S4 type valves, all new, bought in error. 50/-. Write to J. Wilson, c/- Box 595J, G.P.O., Brisbane.

WANTED to Sell or Exchange: Quantity of valves, 1C7G, 1K7, 1D5, etc. Exchange for 6.3 volt types. Douglas Markwell, Telemo Road, Beaudesert, Queensland.

FOR SALE: Voigt twin-cone speaker (latest type cone) and Senior Tetrax labyrinth. £25. Hear it on an FFR amplifier. Write F. Young, Box 2286, G.P.O., Sydney.

FOR SALE: Brand-new boxed moving coil meter, 0-10 ma., 3½" diam., uncalibrated, 14/-. A.R.R.L. "Radio Amateurs' Handbook," 1945 edition, as new, 7/6. M. Herman, 6 Nicholson Street, South Yarra, Vic. Phone Windsor 3665.

FOR SALE: 3-valve t.r.f. set, 1.4-volt valves, 1P5GT, 1Q5GT, 1C5GT, less speaker, batteries and cabinet. £10. Rail, 5/- extra. H. Hearne, Victoria Flat, Binda via Crookwell, N.S.W.

FOR SALE: University T.S.T. Super-tester. Condition new, £22. A.R.7 Kingsley Communication Receiver, £35. C. W. Everdell, Gleneagle, Beaudesert Line, Q'ld.

FOR SALE: Kingsley AR7, 140 kc/s to 25 mc/s. Complete receiver and power pack, good order. £40. Hardinge Bros., Box 201, Horsham, Vic.

WANTED: Back numbers of October, 1944 (Vol. 9, No. 5) and November, 1944 (Vol. 9, No. 6). Henry McLeod, Onslow, North West Aust.

WANTED TO KNOW where I can have copies bound into book form containing year's issues, at a reasonable price. J. E. George, 73 Wentworth Street, Port Kembla, N.S.W.

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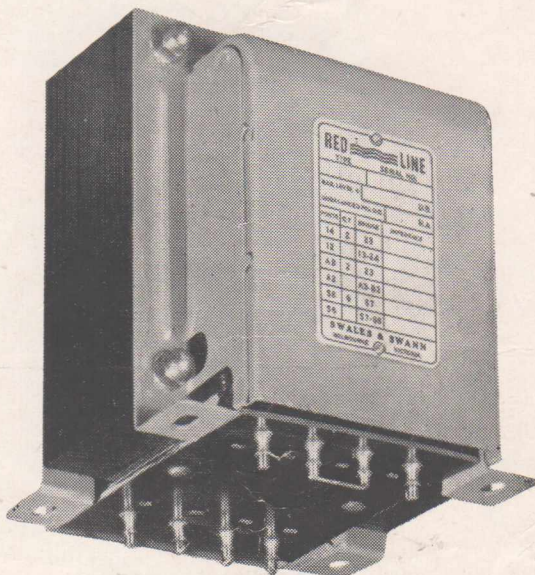
**Primary Inductance** (at low ac flux) not less than  
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**Leakage Inductance:** 17 Millihenries.

**Insertion Loss:** 0.4 Decibels

This transformer may be used to obtain a gain reduction of up to 25 db. across 4 Stages in a suitable negative feedback circuit.★

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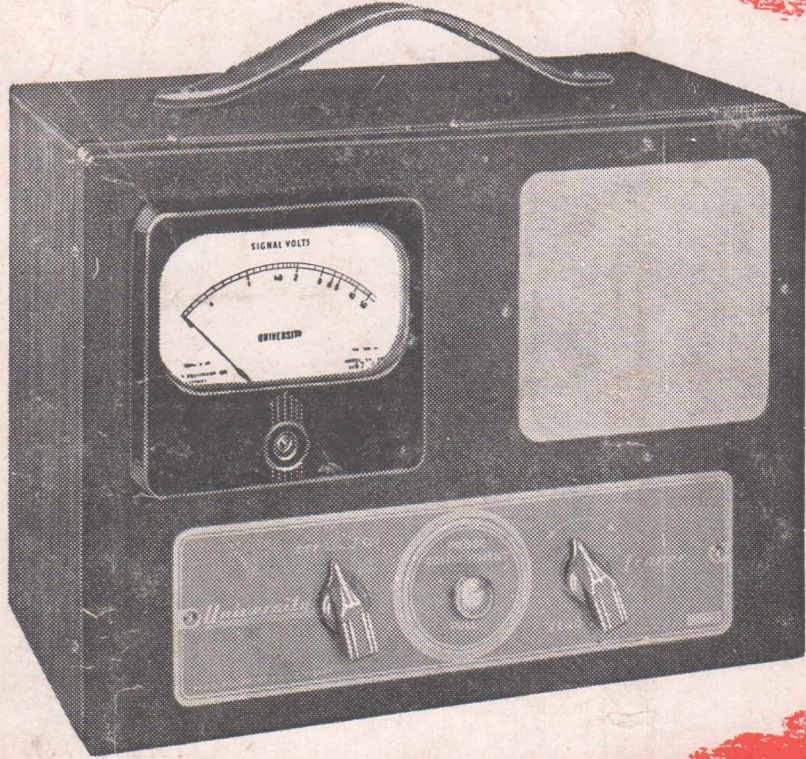
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