THE AUSTRALASIAN

Radio World

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VOL. 12 ..... NO. 2

JULY 15, 1947

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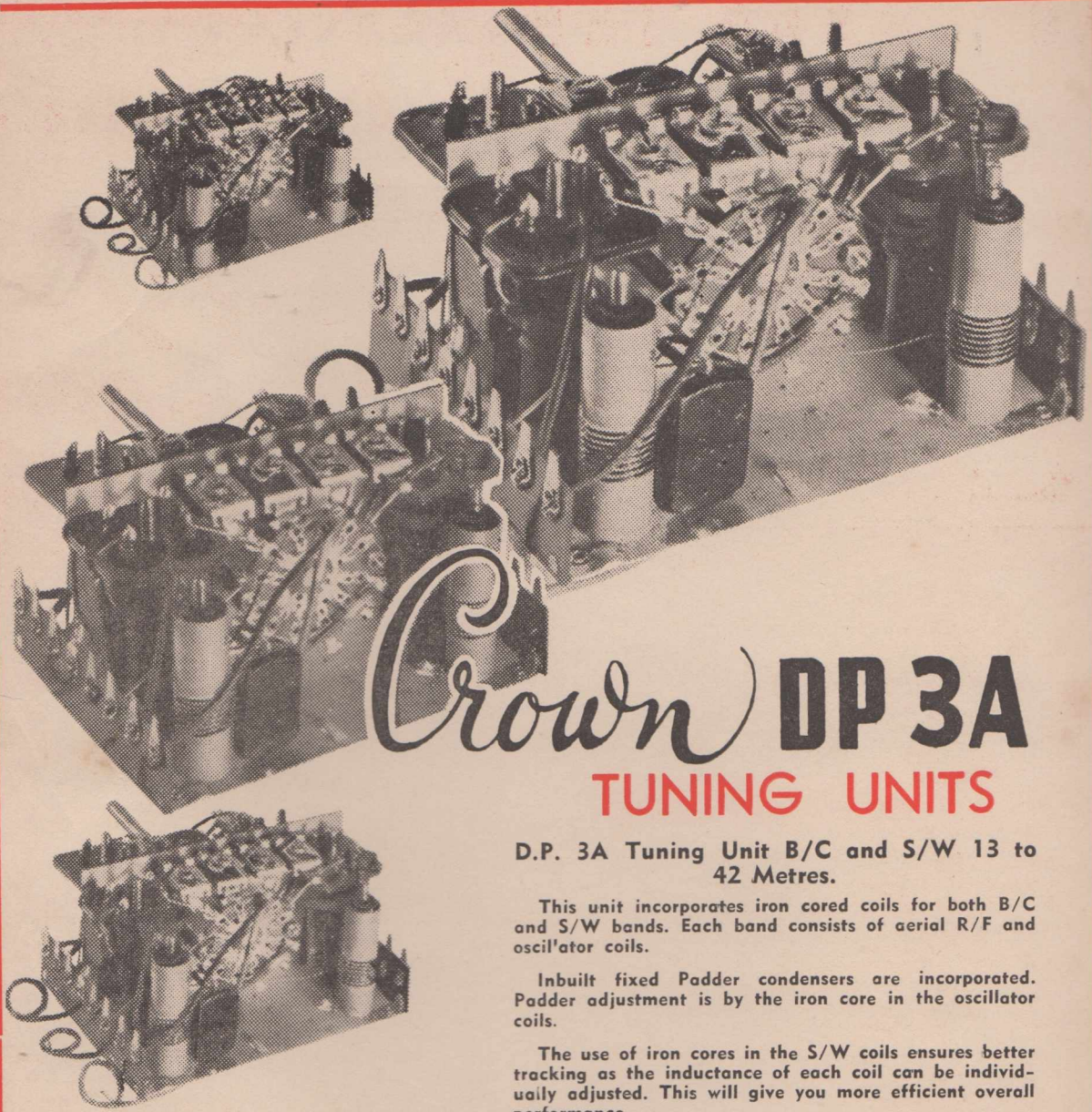

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VOL. 12. JULY, 1947. No. 2

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GUEST EDITORIAL

In New York recently the Chairman of the Federal Communications Commission warned amateurs, pointing out that the frequencies between 4 and 25 megacycles are very much in the spotlight. Following on this, "Radio News" (U.S.A. says "—that brings us to the topic at hand; the conduct of many amateurs who are abusing their privilege to operate. The QRM situation becomes worse each day, yet many 500 watt transmitters can be heard emitting strong DX signals when merely talking cross-town. Such operators are doing little to enhance the art of Amateur Radio. When the chips are down they will only have themselves to blame if they come out on the short end of the deal—Atlantic City is sure to show pressure from foreign representatives who want amateur frequencies reallocated—every amateur should take stock of his own operating practices and make sure he is not open to criticism—it is the personal responsibility of each amateur to look jealously upon the safety of his hobby—there are many interests seeking any type of ammunition which will destroy our hobby."

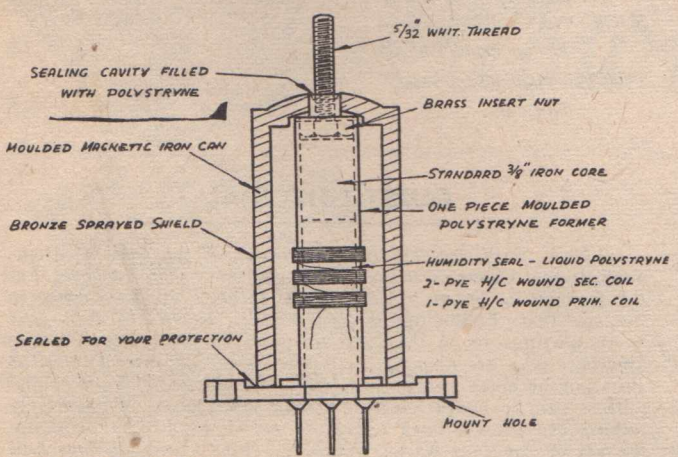
Those words of wisdom may well apply to this side of the Pacific, as those who listen know full well. In this part of the world there are loud-mouthed individuals who are endangering the whole future of amateur radio by spouting anything but the correct atmosphere into their microphones. There can be but one end to such malpractice. When shortwave listeners write in indignation to the Authorities it is more than obvious that the public takes note of the undesirable features of our valued hobby.

—D.B.K.

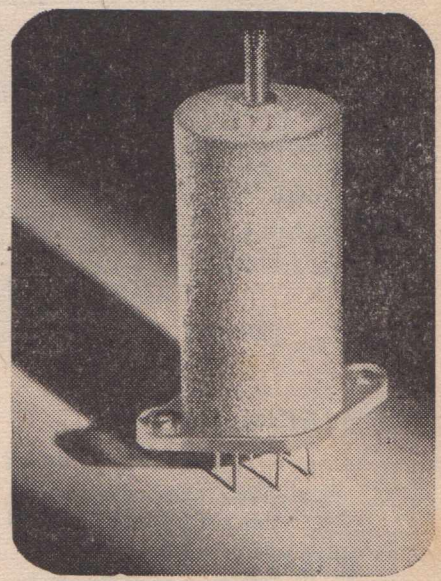
An Iron Clad Coil with a Higher "Q"

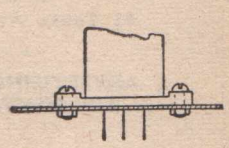
This new patented R.C.S. coil development offers radio technicians and set assemblers, a miniature coil which fits the restricted dimensions of the modern mantel receiver, yet with a "Q" rating that assures peak performance. Interchangeable with standard coils, it is nat a midget coil, but one that takes advantage of advanced designs.

The secret of the performance rating of this new R.C.S. development is the patented magnetic iron "can." The cross-section illustration below, clearly shows this and other evidence of the superiority of this R.C.S. coil.

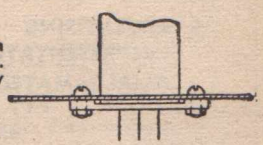


Patent No. 115484

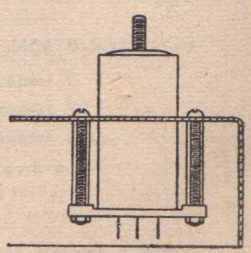




The new R.C.S. coil may be mounted on top of a chassis in the normal manner, the mounting holes being interchangeable.



This illustration shows the new R.C.S. unit mounted below the chassis.



Where space is a factor the coil unit may be mounted on spacers as shown.

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This new coil unit will shortly be available from your favourite retailer.

How to Obtain
NATURAL REPRODUCTION
At Low Volume Levels

THIS amplifier has been designed with the object in view of obtaining superlative quality at medium and low volume levels. It is a well known fact that at these levels the amplifier which has a flat frequency response sounds particularly dull, all the sparkle and fullness of the lower frequencies disappearing when the volume is lowered. Personally, I like to listen to recordings and radio programmes at a volume level that is in keeping with the average suburban home and only on rare occasions when the mood is right and the time opportune do I really turn up the wick and let the whole neighbourhood hear my personal taste in recordings. Frequency correction in small amounts is necessary at high levels, mainly to compensate for deficiencies in recordings, pick-up, and speakers, assuming the amplifier itself has a flat frequency response quite easily obtained with present day technique. Correction of this type is usually fixed at a certain degree and also at a certain position on the frequency scale, being required to compensate for definite known deficiencies and results in a flat frequency response from the record to the listener. Something more is necessary if natural tone is to be achieved at low volume owing to certain characteristics of the human ear tending to attenuate both the upper and lower ends of the frequency spectrum at these levels.

By
H. C. V. SMITH,
85 Rainbow Street,
Randwick, N.S.W.

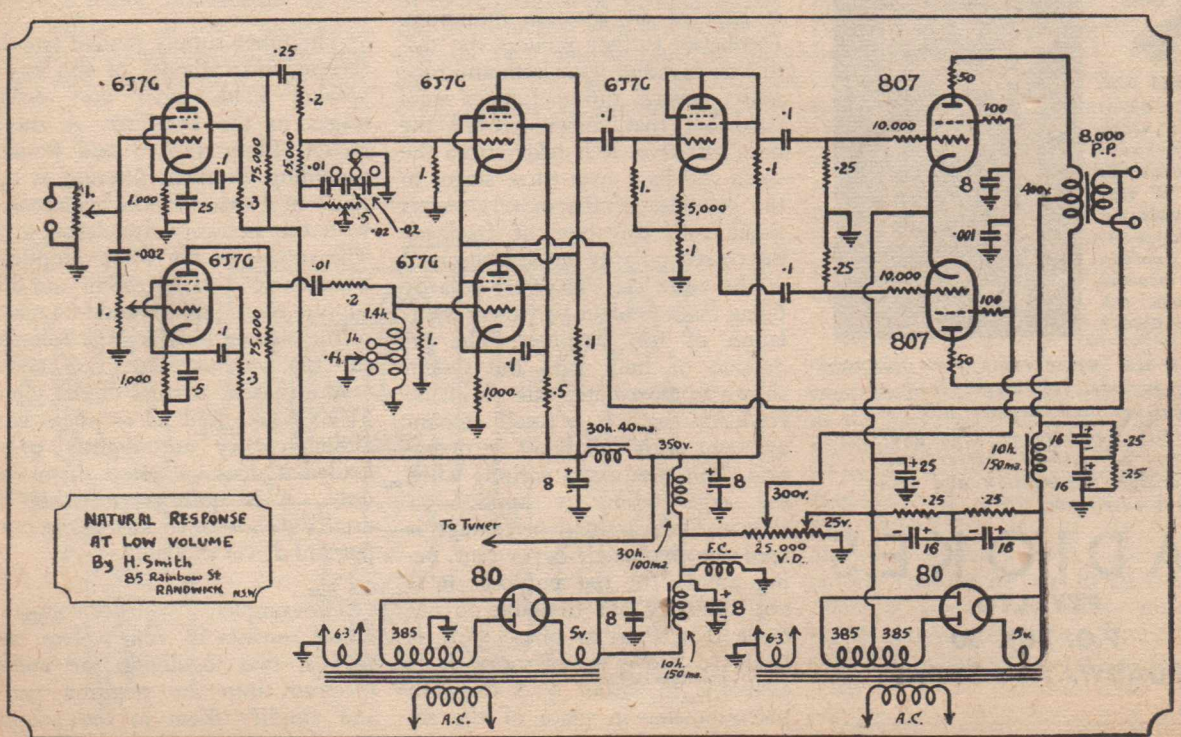
Conclusion reached after several years of experimenting with amplifiers and frequency compensation resolve themselves into four major requirements:

(1) At least 18 db of boost is required at both ends of the frequency scale.

(2) The boost applied must be capable of being moved up or down the frequency scale. This applies to both high and low frequencies.

(3) Any boost applied must be variable and have an apparent effect on the frequency response.

(*Continued on page 6*)



NATURAL REPRODUCTION

(Continued)

(4) The amplifier must be capable of at least 20 watts output with a frequency response as wide and as flat as possible.

To obtain the necessary output without recourse to special and expensive equipment it was apparent that triodes were out of the question, so the choice was limited to pentodes and beam tetrodes. By far the best values for this particular application were 807's and they proved in practice to be every bit as good as they appear on paper, turning out quality far above expectation, The complete amplifier is shown in the circuit diagram and is capable of 34 watts output at 5 per cent. total harmonic distortion, a peculiarity of these beam tetrodes is the fact that the harmonic distortion, which incidentally is predominantly 2nd and therefore concealed by push-pull operation, is very low until nearing full output, when it rises sharply, so by designing for greater power than is actually required, distortion is kept at an absolute minimum. Feedbacks further reduces the distortion together with hum and tube noise. Several different types were tried but that shown proved the most effective. It is taken from the voice coil back over three stages to the cathodes of the drivers. As is usual with this type of feedback the correct polarity must be observed at the voice coil, incorrect polarity being made evident by violent oscillation of the amplifier. The reduction of hum with the system shown is most noticeable. With no feedback there is a small amount apparent with full boost in operation. This disappears entirely when the regeneration is applied as shown. Only a small percentage is used, approximately 5 per cent. being ample for the purpose. It is not necessary nor desirable to use more than this, as phase shift is likely to prove troublesome. It is advisable to install a .5 megohm potentiometer in place of the resistor shown and gradually decrease the resistance until just before relaxation oscillation or not on boosting begins. The potentiometer can be left in circuit at the appropriate setting, or the resistance measured and a resistance of the same size installed.

Power Supply

Two separate power supplies are used for this amplifier to avoid the necessity for one large transformer and heavy duty rectifier valve and also to provide stabilised voltages for the screens and cathodes of the output valves. One supply feeds the plates of the output valves the centre tap of the high tension winding being returned to the cathodes, this gives a voltage of 415v., no snignal, with two 16 mfd. condensers in series and 398v., no signal, using two 8 mfd. The choke shown can also be eliminated with a slight increase in hum, for really quiet operation it should be included. Filter condensers are not necessary on the load side of this choke, but can be included if desired, they would need to be two 525v. in series with equalising resistors across them.

The other supply is used for the screens and cathodes of the 807's, speaker field, tuner and driver stages in the amplifier. A three-section filter is used and besides providing excellent filtering is applied in a manner which dispenses with the necessity for decoupling. The success of the whole amplifier depends to a large extent on this supply, special note should be taken of the manner in which the voltages for the various stages are taken from different sections of the filter. 5Y3G's are used as rectifiers and although they are slightly overloaded it does not affect them unduly., it is quite permissable to use 5V4G's with an increase in output and driver available.

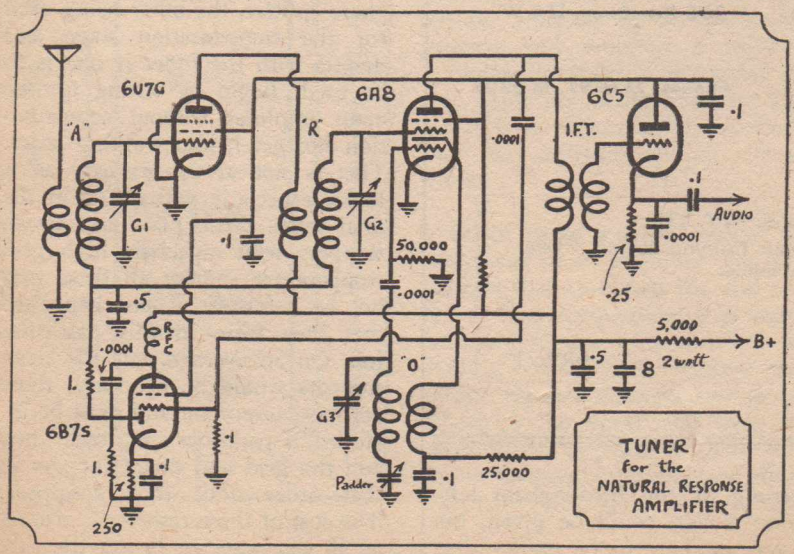
The complete frequency compensation consists of four valves, all 6J7G's, two to divide the audio spectrum into the required parts and amplify these in the proper proportions and two to finally am-

plify these separated frequencies and feed them into the grid of the phase splitter. Starting with the bass and middle section consisting of two 6J7's, all frequencies are attenuated an equal amount with the aid of a voltage divider across the output of the first 6J7G, consisting of a .2 megohm resistor in series with a 15,000 ohm resistor which returns to earth, the feed for the following valve being taken from the junction of these two resistors. Set frequencies are developed equally across the .2 megohm and 15,000 ohm resistors, however, as only the voltage which is developed by the 15,000 ohm resistor is supplied to the following valve it results in a greatly reduced output from the first 6J7G, the actual voltage available being approximately one-fifteenth that at the plate. If the smaller resistor is increased in value then the effect will be the same as moving the contact of a volume control towards the high end, resulting in more voltage becoming available for the following valve and increasing the gain in proportion. When some method can be found that will allow this increase to become effective at low frequencies without affecting the middle and highs, then bass boost will be realised.

Bass Boost

Fortunately, a condenser possesses the necessary characteristics to fulfil this requirement because capacative reactance increases with a decrease in frequency. Inserting this condenser between the 15,000 ohm resistor and earth, the lower frequencies only are allowed additional amplification, rising gradually from the middle to the lower frequencies down the frequency scale. To control the additional amplification allowed by this condenser it is necessary to shunt it with a .5 megohm potentiometer, the setting of which determines the degree of boost obtainable. The capacity of the condenser has a direct bearing on the position on the frequency scale, where the output starts to rise and the position where greatest boost obtains. The second control in the bass boost circuit makes use of this fact and by the addition of a simple single-pole three position switch the boost can be shifted up and down the frequency scale as desired.

Treble accentuation is obtained in exactly the same manner as the bass accentuation with exceptions of one or two modifications to the circuit. In this stage the 15,000 ohm resistor is omitted, so the only audio voltages available for the following valves are developed across the inductance, excluding all the low and most of the middle frequencies. Insertion of an inductance in the divider network in place of a condenser allows only the high frequencies to be developed because inductive reactance increases with an increase in frequency. By tapping the inductance and using a switch as shown, the accentuation can be shifted up and down the frequency scale in the same manner as the bass boost. Control for the degree of boost to be used is provided by the potentiometer in the grid of the first 6J7G.



The Mixing Stage

The output from both these valves is taken to the grids of two 6J7G's, which are connected in parallel, effectively mixing the two signals and passing them on to the phase splitter. These two valves are operated with low values of plate and screen resistors to obtain best possible operating conditions with lowest distortion, the cathode resistor, not being bypassed, provides limited current feedback and further improves the linearity of the stage. Bypass condensers are used at the cathodes of both the frequency dividing values, these can be omitted if desired, but additional amplification will be necessary unless a crystal pick-up is used, as with them there is just sufficient gain from a medium output magnetic to load the 807's to full capacity.

There is some scope for experimentation with the values of the condensers in the divider circuit of the bass boost value. A word of warning on this subject will not go amiss, don't use a condenser smaller than .01 mfd., otherwise the boost will extend too far up the frequency scale. Even with a .01 the middle frequencies are lifted considerably around 400 cycles, making its presence felt by an objectionable rise in output on certain passages of a low baritone voice. In practice this condenser is very sel-

(*Continued on next page*)

"This Year, Next Year . . ."— The Postmaster-General recently stated in the House of Commons that no forecast of the date of the opening of the Birmingham television station could be given, but it was unlikely to be earlier than two years hence.

NATURAL REPRODUCTION

(Continued)

dom used except on recordings which are particularly lacking in bass response. Values of the other condensers can be varied to suit the individual, those shown suited my own particular requirements and gave a noticeable shift when in use. All other resistors and condensers should be as shown in the circuit diagram with the usual tolerances allowed. One point of importance is the coupling condensers from the plates of the frequency dividing values, these should be the very best obtainable as any leakage will cause the controls to be very noisy in operation.

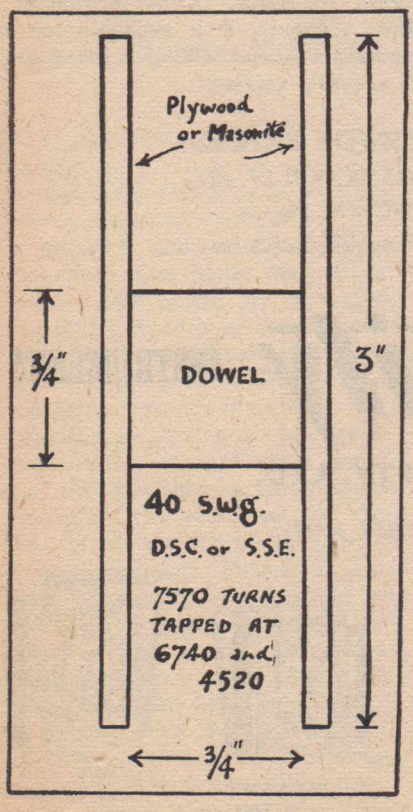
Constructional Details

Construction of the amplifier should not present any difficulties to the advanced constructor. I would not advise anyone who has not had any experience with amplifier construction to attempt to build this particular outfit. The use of two separate chassis is strongly recommended, otherwise, with an inductance in circuit in the first stage, hum will prove extremely hard to eradicate. One chassis should carry all power transformers and chokes with the output valves and phase splitter, the other being used for the compensation stage and drivers with the tuner if one is to be used. Begin by wiring up the main amplifier without compensation and get it into working order. This is not always as easy as it looks, especially with 807's in the final stage. Grid, plate and screen stoppers with especially high grid stoppers are shown; all these may not be necessary, it just happened that they were in this particular job. On an average only the sreen stoppers would be necessary; these are most important and must be included, if parasitics are present then add the grid and plate stoppers in that order until they disappear. The cost of these resistors is trifling so if you want to be on the safe side, include them.

Parasitics

Parasitic oscillations can be recognised by a whistling rattle in the speaker, although sometimes they are more obscure and only make their presence felt by the fact that the amplifier does not appear to have sufficient gain to drive the 807's to full output. Leave the feedback loop out until everything is in working order, as this is intended to iron out any minor discrepancies in the frequency response, etc., and is not intended to compensate for faulty resistors, condensers.

Make everything as symmetrical and all wiring as short as possible round the 807 sockets, return all earth leads for each stage to one earthing point near its own valve socket and everything should go into operation with a minimum of trouble. Do *not* connect all earthing points together with a bus bar unless the chassis is sprayed, then it will be necessary to insulate each earthing point from the chassis before connecting them together with an earth busbar, making sure it follows through the set in the same sequence as the valves. Make sure the output valves are getting their proper plate voltage before inserting the rectifier for the screen supply in its socket because if the plate supply is interrupted at all with the full screen voltage connected it will ruin the 807's in no time. The plate voltage will rise to somewhere in the vicinity of 475 volts with the screen and cathode supplies disconnected, this will automatically adjust itself with proper voltages on screen and cathode.



Voltage Setting

Set the clips on the voltage divider so that the bias will be high and the screen voltage low, this will protect the valves in the initial period of switching on. When the set has warmed up and the voltages become stable then the bias and screen voltages can be set at the correct values as shown in the diagram. The output transformer must be mounted on the chassis near the 807's so the plate leads can be made as short as possible, the transformer must also be a high fidelity types, those supplied with most speakers on the market being totally inadequate when it comes to supplying really good bass and high note response such as this amplifier is capable of giving. A good quality power transformer can be pressed into service here by using the high tension winding as the push-pull primary and winding a suitable secondary to match the speaker in use, while not being ideal for the job it is an immense improvement over an ordinary output transformer.

When using a large amount of bass boost in an amplifier it is my opinion that to obtain the full effect at low frequencies it is most necessary to use some method of baffling which will remove the natural speaker resonant frequency, otherwise the boost will give an exaggerated response at that particular frequency, spoiling the effect which is obtainable at low frequencies. The method used will be left to the individual constructor, there have been quite a number of suitable baffle boxes described in this journal from time to time. I am using one of these personally and have been for several years, the results being all that could be desired. It is not necessary to use two speakers with this amplifier providing care is taken in the handling of the controls; however, if large amounts of power are required it is advisable to use two heavy duty speakers, such as the G12's. When the amplifier is completed and operating properly it is capable of delivering good quality at high levels, what is more important it can deliver really excellent response at low and medium levels, bass being full, and smooth highs being crisp and clean with no signs of distortion. I have been a triode enthusiast for a great many years and have always maintained that tetrodes could not compare with triodes. After listening to this amplifier I am not so sure, sufficient to say that the quality is equal to any triode amplifier I have ever built and it will be hard to better it.

HIGHER FREQUENCIES USED

In America recently the national speedboat championships provided an opportunity for some radio enthusiasts to make good use of the higher frequencies. Four battery-operated transceivers were used, operating on 235 megacycles with 5 watts input.

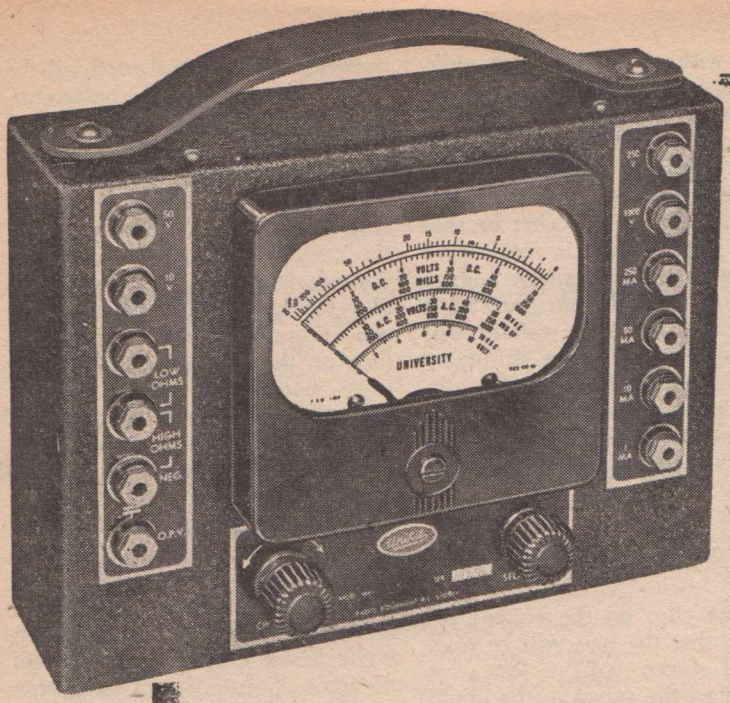
* * *

TELEVISION SETS

The English Board of Trade announced on March 7 that licenses had been issued to fourteen manufacturers to produce 78,300 television receivers.

Licenses have also been granted for the production of a total of 937,100 broadcast sets for the home market and 583,380 for export.

During the last five months of 1945 nearly 73,000 sets were manufactured. Of this number 12,000 were for export.



UNIVERSITY'S MULTIMETER KIT

(MODEL MKI)

Easily constructed with a few simple tools, the new MKI uses the popular four-inch square meter with clear multi-scale. Featuring extensive ranges, the finished instrument compares more than favorably with commercial models. Selected components insure a high order of accuracy.

It comes complete with full wiring and constructional details, circuit diagrams and photographs make assembly easy.

When the construction of the instrument is finished, no calibration is necesary because of the pre-determined resistors and shunts being made to accurate standards. If the instrument is wired correctly it is available for immediate use and will give many years of accurate service.

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DC volts: 0/10, 0/50, 0/250, 0/1000.
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Ohms: 0/1000, 0/100,000.

The 0/1000 ohm range is particularly helpful in checking open circuits and short circuits in coils and I.F.'s. The lowest division on the 0/1000 ohms scale is a quarter of an ohm. Only one standard type torch cell is used, and sensitivity of the instrument is 1,000 ohms per volt.

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AC/DC Kit: £7/12/-.
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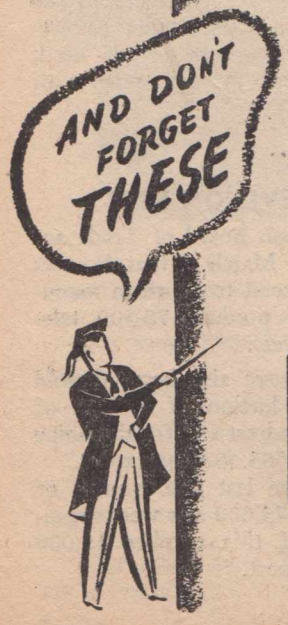
Plus 10% sales tax



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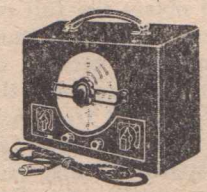

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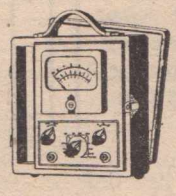
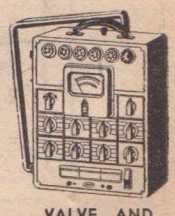


MULTIMETER
Model MVA
£11/2/- plus tax



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DESIGN FOR

WAVE TRAPS

FOR INCREASING R.F. GAIN

A WAVE TRAP can be defined as a circuit containing at least one condenser and one coil wired in series or parallel to form a tuned circuit. A most common form of wave trap is one utilising a parallel tuned circuit.

Examination of inductive and capacitive reactance tables will show that as the frequency of the current supplied to a condenser increases, the reactance of the condenser deacreases; and in the case of inductive components the opposite effect takes place. Now when the two components are connected in parallel, to form a tuned circuit, the inductive reactance predominates until the resonant frequency is reached. Beyond this point the capacitative reactance predominates. At the point of exact resonance the inductive reactance equals the capacitative reactance, and the flow of current around the circuit is at a minimum. Therefore, if a parallel tuned circuit, designed to tune to a certain frequency, is placed in series with the aerial and radio receiver, the circuit, or series wave trap as it is generally called, will tend to block the reception of that frequency because as the current flowing around the resonant circuit is at a minimum the current applied to the load is also at a minimum, the load in this case being the aerial coil unit of the receiver.

By

R. J. A. LITTLE, A.M.I.R.E.

10 Albert Road,

South Melbourne

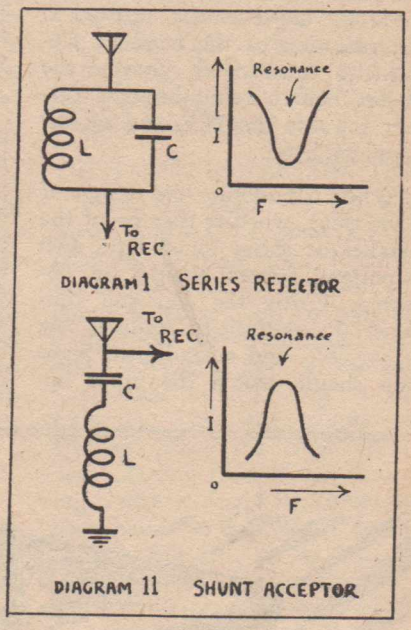
As shown by S. W. Amos, this type of wave trap can be designed to give a certain amount of signal gain to a frequency lower than that to which the wave trap is tuned, when used on the broadcast band of 550 K/cs. to 1600 K/cs. But at frequencies higher than that to which the wave trap is tuned a certain amount of loss occurs. This is a disadvantage of the type of circuit. He shows that it can be overcome, however, by the use of a series tuned circuit known as a shunt type wave trap.

In theory this kind of wave trap operates in the opposite way to the parellel tuned type. Instead of the current flowing through the circuit being at a minimum value, it is a maximum value at resonance (see diagram II). Thus, when the wave trap is placed in parallel with the aerial and earth terminal of a receiver it acts as a short circuit at the frequency to which it, the wave trap, is tuned.

Amos shows that this series tuned circuit gives a boost to frequencies above its resonant point and can be used to best advantage as a wave trap placed across the input terminals of a receiver and tuned to the I.F. or to some frequency near to, but lower than, the I.F. By this means it is possible to amplify frequencies in the low frequency end of the broadcast band.

Practical Experiments

For the purposes of experiment a shunt type wave trap was made, using an I.F. transformer coil in conjunction with a small preset condenser to facilitate the tuning of the coil. (The condenser wired across the coil must be disconnected). This arrangement worked well.



An experimental coil was wound to have a value of very approximately 1,000 millhenries, and was tuned by a condenser, variable from 100 mmfd to 250 mmfd. This gave a frequency coverage of from about 380 K/cs. to about 550 K/cs. With this set-up broadcast stations lying between 750 and 550 K/cs. approximately received a definite "boost." Actual details are shown below.

The tuning of the wave trap described above appeared to be rather broad until the point of maximum gain was reached. The gain fell rapidly to its normal level after the peak had been passed. A change

(*Continued on page* 12)

TRAPS

(*Continued*)

in capacity between 100 mmfd and 115 mmfd made only a small change in the signal intensity of the transmitter used in the experiment. Decreasing the capacity of the condenser below 100 mmfd made no improvement in gain to the reception of the band of frequencies mentioned above, the "boost" effect being brought further towards the H.F. end of the broadcast band.

When considering the design of wave traps, whether they be of the parallel or series tuned type, two important factors should be observed. Firstly the coil and condenser losses must be made as low as possible, and secondly the wave trap should match the input impedance across which it is to be connected.

The experimental coil mentioned previously was wound on a one inch diameter bakelite former and consisted of three "pies" of 80 turns each, wound with 36 S.W.G. silk-covered wire. Each winding, or pie, was jumble wound and was approximately 5/16-in. long, the spacing between each being also 5/16-in.

The results obtained, using the above coil tuned with the condenser set to 115 mmfd. showed an increase in signal strength at 620 K/cs. of approximately two and one half times, which corresponds to a rise, in the output power level, of approximately 8Dd. It should be possible to improve upon this result with a well designed coil.

The tuning unit used for the experiment was simply a leaky grid detector with a standard broadcast aerial coil unit tuned by a 750 mmfd max. variable condenser. The output from this set-up was fed to an amplifier with an output meter connected across the output.

The use of a unit as described above should be of use in increasing the gain of T.R.F. sets or even crystal sets, at the low frequency end of the broadcast band.

Reference: "Wave Traps," S. W. Amos, Wireless World, February, 1945.

* * *

(Our contributor refers to this device to "amplify," but perhaps it would be better to consider this as comparative, or as indicating less loss than usual.—Editor.)

The

GREAT CIRCLE GADGET

Tells You Where To Point Your Directional Aerial

AN ever-recurring problem is that of finding the Great Circle bearing of some part of the globe from your own locality. Methods used have been Great Circle maps or the solution of the appropriate spherical triangle by trigonometry. A Great Circle map is nice if you can get it and spherical trigonometry takes too long. This article describes a simple gadget which does the job and whose

By

A. K. HEAD

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Balwyn, Vic.

construction involves only drawing a circle and a few straight lines and no more than 30 minutes to do so. Once drawn, bearings can be read from it in a couple of seconds. Since (as far as the author knows) it is a new idea, a relatively full description of its construction will be given. Like a Great Circle map, the gadget is only accurate for bearings from the place for which it has been drawn. But, unlike the map (which has probably been drawn for the nearest capital city), you can draw the gadget for your own latitude and longitude and know that the bearings from it will be accurate. So the first thing to do is to go away and find out your own latitude and longitude and while you're there get a ruler, pair of compasses, protractor and a sheet of paper (which should be unruled and at least foolscap size). Then follow this construction point by point.

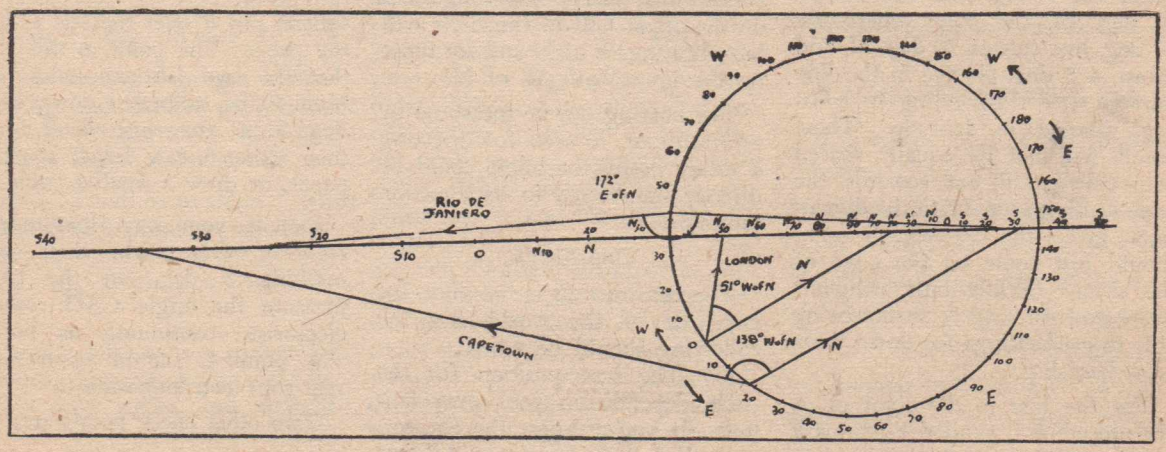
CONSTRUCTION

(a) Draw a straight line lengthways down the paper, about in the middle of the sheet. Mark a point on this straight line about 3 inches from the right-hand end and with this point as centre draw a circle of 2 ins. radius. When completed, the gadget will consist just of this straight line and circle; the straight line graduated in degrees of latitude and the circle in degrees of longitude. Call A the point which is the centre of the circle, and B, C the points where the circle cuts the straight line (Fig. 1).

(B) CALIBRATION OF THE CIRCLE

Mark the point on the circle which is as many degrees clockwise from C as your own longitude. Label this point 0 deg., since it is going to correspond to longitude 0 deg. So for Melbourne, longitude 145 deg. 2 min. E, the angle CAO will be 145 deg. 2 min. (Fig. 2). Then mark points every 10 deg. round the circle from 0 deg. Starting from 0 deg. and going clockwise round the circle, label these points 10 deg. W, 20 deg. W, 30 deg. W, etc., up to 180 deg., which will be directly opposite 0 deg. Similarly, going counterclockwise from 0 deg., label the points 10 deg. E, 20 deg. E, etc. This completes the graduation of the

(*Continued on next page*)



GREAT CIRCLE

(Continued)

circle which is now marked out in uniformly spaced degrees of longitude right round the circle (Fig. 3). As a check on your work, the point C should correspond to your own longitude.

(C) Calibration of the Straight Line

This is done in two parts, that to the right of A and that to the left of A. We'll take first the part to the left of A. Draw a construction line (i.e., a faint line which can be easily rubbed out later) down from A at right angles to the line BAC. Now calculate your own CO-latitude. This is simply the number of degrees of latitude you are from the North Pole; e.g., for Melbourne latitude 37 deg. 48 min. S, its co-latitude equals 90 deg. from the North Pole to the equator plus 37 deg. 48 min. from the equator to Melbourne, i.e. = 127 deg. 48 min. Having done this for your own latitude, mark a point P on the construction line such that the angle ABP is equal to *half* your own co-latitude (i.e., for Melbourne the angle ABP would be 63 deg. 54 min.), Fig. 4. Now draw a series of lines through P at angles 5 deg., 10 deg., 15 deg., 20 deg., etc., counter clockwise from AP (Fig. 5). The points where these lines cut AB are the latitude graduations, so mark the point as latitude 90 deg. N, the points where the 5 deg. line cuts AB as 80 deg. N, the point where the 10 deg. line cuts as 70 deg. N, and so on, a 5 deg. change in the line through P corresponding to a 10 deg. change in latitude. These points will not be equally spaced but will spread out towards the edge of the paper. With the dimensions given the 50 deg. S point should just come on the edge of the sheet. Luckily only penguins live below 50 deg. S, so not being able to get bearings for down there is no hardship.

For the line to the right of A the procedure is similar. First, mark a point Q on the construction line such that the angle ACQ is equal to 90 deg. minus half your own co-latitude (i.e., for Melbourne ACQ = 90 deg. minus 63 deg. 54 min. = 26 deg. 06 min.). Fig. 6. Now draw lines through Q every 5 deg. clockwise from AQ and mark the points where they cut the line AC. The point A is marked 90 deg. N, the next point to the right 80 deg. N, and so on, again running off the edge of the paper at about 50 deg. S. These points are closer together than the corresponding graduations on the left of A.

The gadget is now complete, so rub out all construction lines, leaving only the circle with its longitude graduations and the straight line with its two sets of latitude graduations.

Operation

Using the gadget is as easy as falling off the traditional log. Suppose we desire the Great Circle bearing of Timbuktu, latitude 17 deg., 48 mins. N, longitude 03 deg., 09 mins. W. Then locate the two points on the straight line corresponding to latitude 17 deg. 48 min. N, and join them to the point on the circle corresponding to longitude 03 deg. 09 min. W. The Great Circle bearing of Timbuktu is then simply the angle between these two lines. As to whether the bearing is this angle E of N or W of N is always given by the simple rule that North is in the direction of the right hand line and the left-hand line is the direction of the Great Circle. From this it follows that places with longitudes on the upper half of the circle will have bearings E of N and for those on the lower half, W of N.

The bearing can be measured by protractor or, if used for directing a rotary beam, the angle could be directly transferred to its direction indicator.

Odd Notes

The construction is the same for any part of the world, but the following should be noted:

(i) The best position for the circle depends on your own latitude. If you are near the equator, draw the circle in the middle of the sheet; if in the northern hemisphere, put it over the left side of the paper. The point in this is so that the two latitude scales have room to be calibrated down to 50 deg. S. If they just won't fit in, then either use a larger sheet of paper, or draw a smaller circle.

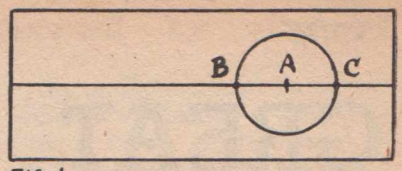


FIG. 1.

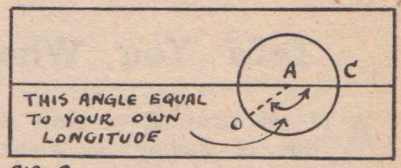


FIG. 2.

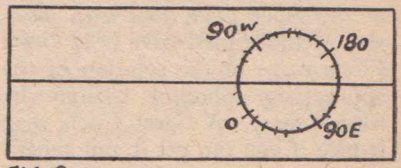


FIG. 3.

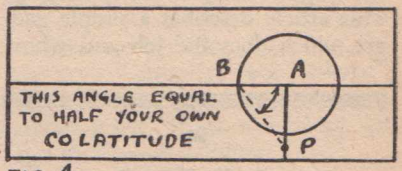


FIG. 4.

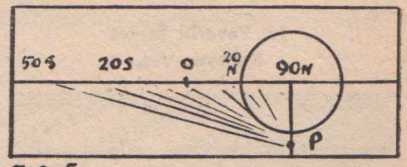


FIG. 5.

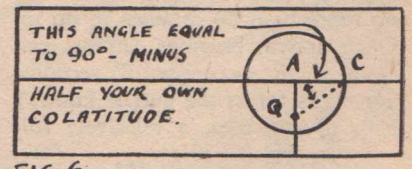


FIG. 6.

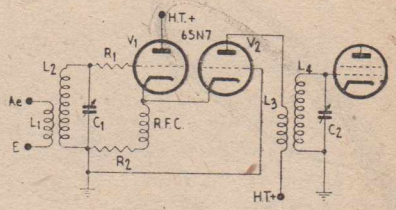
(ii) If your own longitude is *west* of Greenwich, then when marking 0 deg. on the circle, measure the angle CAO *counter*-clockwise, continuing as before. The point C should again represent your own longitude.

Two other check points are: that

(Continued on page 15)

Grounded-Grid R.F. Stages

In the near future you are going to hear lots more about grounded-grid r.f. amplifiers of various kinds. They are especially effective on wavelengths below 20 metres, but can be used for the broadcast band, too. Grounded-grid amplifiers were used extensively in radar work during the war.



One circuit for a grounded-grid amplifier, using a twin triode. The values for R1 and R2 are 1,000 and 500 ohms respectively.

Reference has been made in "Calling CQ" to a new scheme for receiver RF amplification wherein a double triode valve is used in a manner that opens up possibilities for better performance in RF amplification. First we saw of the scheme was in the NZART magazine "Break-In," in a receiver description using the arrangement ahead of a somewhat similar mixer of the "infinite impedance" type. Whereas the latter has one or two features that present a snag by reason of difficulties in connection with the following IF channel, the RF amplifier scheme is something well-worth immediate investigation. The idea is given in the circuit diagram, which is reproduced from "Radio and Electronics", a New Zealand magazine. R.C.A. engineers (U.S.A.) are responsible for the development which they term the "cathode coupled twin triode amplifier" circuit. In the diagram the two triode sections of a 6SN7G valve have been drawn separately to illustrate the point more clearly. The first section VI acts as a cathode follower with input applied to the grid in the usual manner. RFC acts as the cathode load and here a standard 2.5 mh. type is suitable for HF's. For the broadcast range one of the RCS 8.5 mh. types would be suitable. The signal appears at the cathode of VI. The second half of the circuit, V2, is connected as a grounded grid amplifier. The grid is earthed and signal voltage is applied to the cathode, with output from the anode circuit. This grounded grid amplifier can be considered as a self-neutralised stage . . . it gives normal amplification and provides output through an RF transformer in the usual way. Result of this twin triode application is a circuit with plenty of gain, plus stability and the big advantage of the inherently low noise level of any triode amplifier. In the cathode follower input section, there is a large inselectivity. The effect on image ratio is considerable. The 6SN7G is shown as a suitable valve for the purpose, and if one possesses a 6J6 miniature so much the better by reason of the high Mu. In an experimental set-up by the editors of "Radio and Electronics" measured gain over the broadcast band with a 6SN7G was between 50 and 60. In the diagram, R1 should be 1000 ohms and may possibly be unnecessary if the input stage is stable with regard to external screening. R2, with the 6SN7G is 500 ohms. The idea seems simple and well worth a trial in Amateur Band receivers.

—D.B.K.

GREAT CIRCLE

(*Continued*)

the point C should represent your own latitude; and that the point B should represent numerically your own latitude but in the other hemisphere (i.e., for a gadget drawn for Melbourne the point B should represent 37 deg. 48 min. N).

When finding bearings, instead of ruling lines on the gadget, use a pair of strips of, say, film base with hair lines ruled thereon.

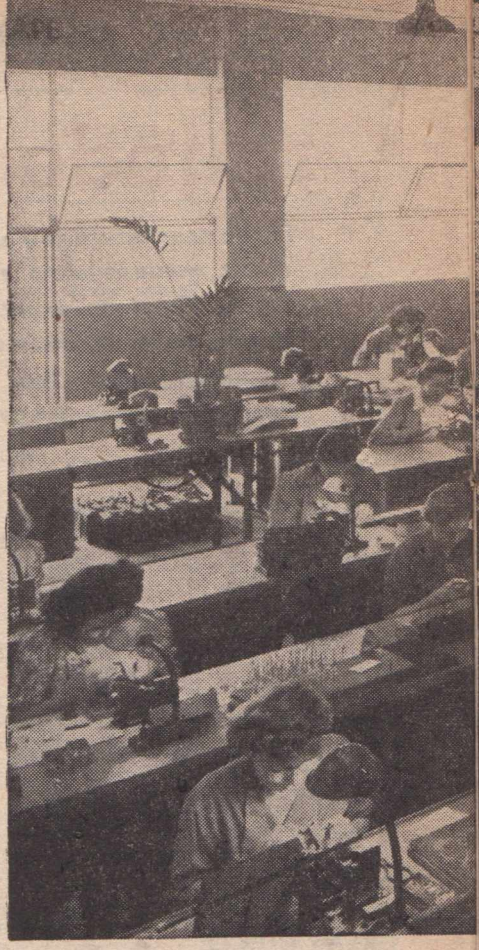
Accuracy will be to about 1 deg. if drawn with ordinary school instruments, while with a little bit of care ¼ deg. accuracy is easily obtained.

A search for a similar gadget for calculating great circle distances involving only circles and straight lines has not been successful. Any ideas in this direction would be welcome.

A MIKE ENERGISING TIP

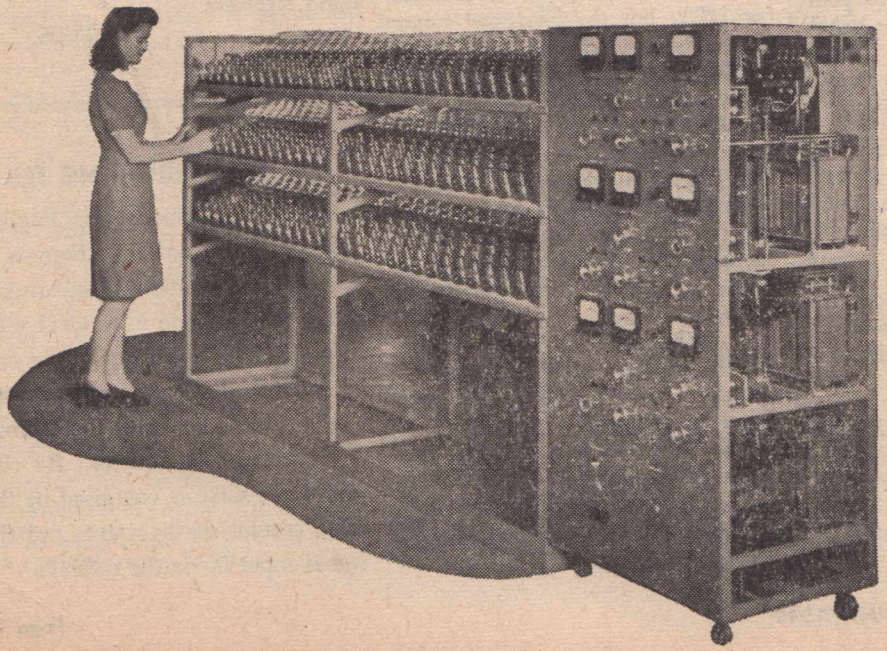
In a recent issue of the English "Shortwave Magazine" there is a description of a modulator, using a carbon microphone in a novel way. The grid and suppressor of the first 6J7G are both directly earthed, with the mike in series with the cathode and normal bias resistor. By this means the mike is energised by the plate current of the valve, and the signal input is via the cathode.

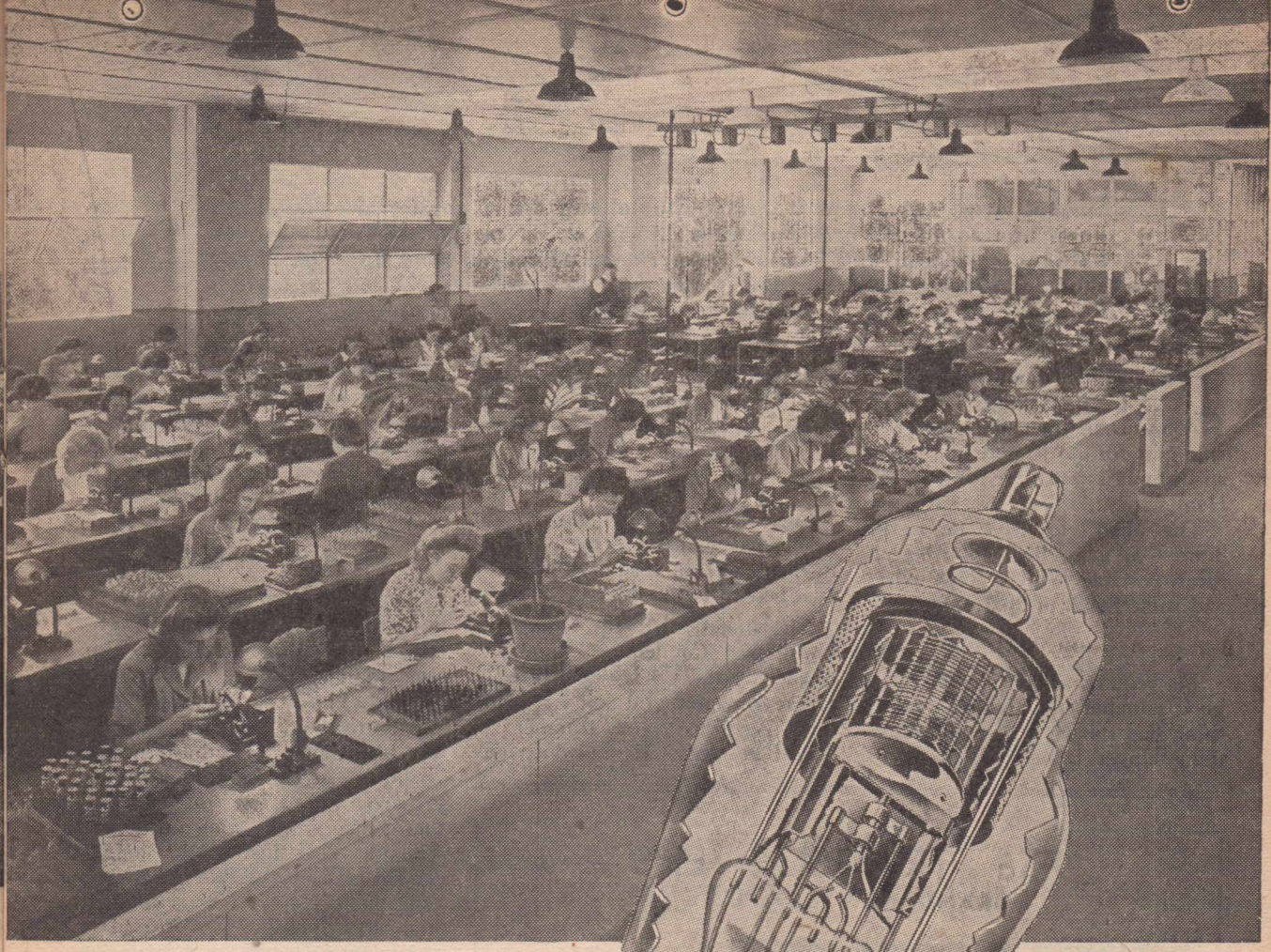
Concentration



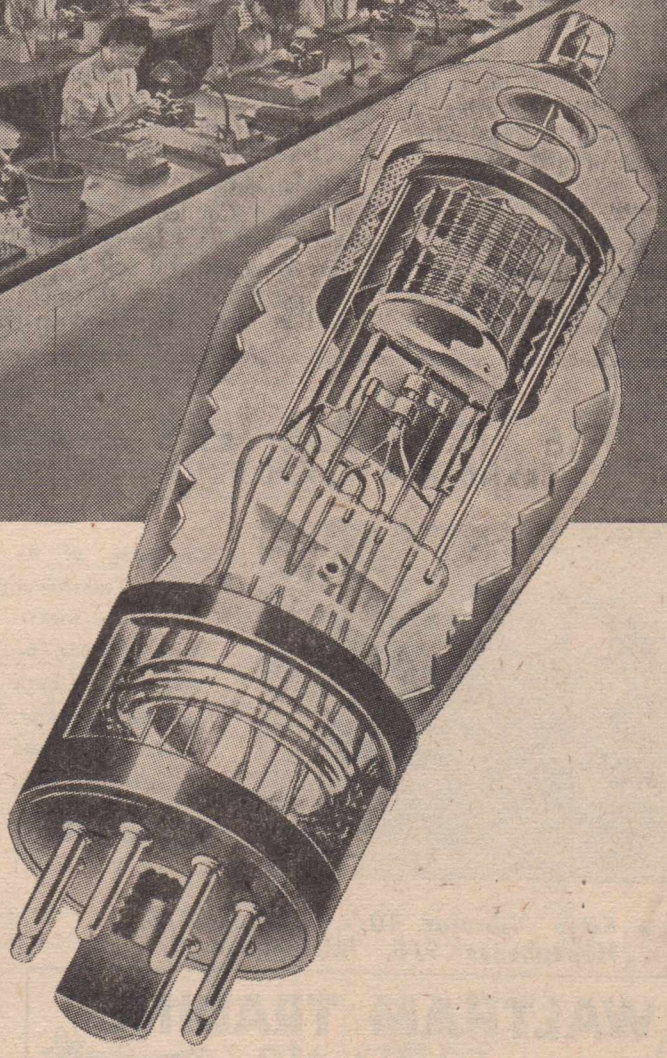
Under the guidance of skilled hands, Australia's requirements of radio valves daily take shape at the Ashfield (N.S.W.) Works of Amalgamated Wireless Valve Company Pty. Limited.

Deft fingers and delicate machines ensure efficient construction whilst critical eyes constantly scrutinize each progressive step in their assembly.





Assembling Australian-made receiving valves at the works of Amalgamated Wireless Valve Company, Ashfield.



adiotron
A L V E S
DE IN AUSTRALIA

AMALGAMATED WIRELESS VALVE COMPANY PTY. LIMITED

Administration: 47 York Street, Sydney — Manufacture: Parramatta Road, Ashfield

THE "FS6" — PLUS

Surplus Army equipment is now available, and offers wonderful value if you know how to handle it and what to do with it. In the February issue we ran a few notes on the "FS6" and the reception given to that story shows us clearly that our readers are interested in this type of article. Watch out for further articles on disposals gear.

THE winter months present a good opportunity to the Amateur for making up portable gear for use later on, or purely and simply as auxiliary gear for the Ham station.

The "FS6" leaves a lot to be desired as it is, but can make an ideal portable with a few extras and some hours of spare time.

A Good Portable

My requirements were, firstly, a good portable and, secondly, something that can be used while something bigger is being built up. I intended to use only one band for the present. I decided to leave the tuning coils in and make alterations suitable for 7 Mc/s, also incorporating plenty of band-spread.

Since all the components are designated, it makes it easy to refer to them without fear of confusion. It is best to tackle the receiver first.

The alterations to the tuning are as follows: Condenser, "Tune Receiver Aerial," C3 is wired directly across converter grid coil L2. This now performs as a trimmer or "band-set" across L2, but once it is set requires no further attention. The plunger type trimmer condenser C5 is next removed from across oscillator section of gang and wired directly across oscillator coil L3 and padder C6; this then also acts as a "band-set" condenser.

Band Spread

An excellent and simple method of obtaining band-spread is obtained by wiring, in series with each section of gang condenser a 3-30 Pf. Philips air trimmer.

The method used for locating the band and for adjusting the "band-spread" is as follows: Forget about the aerial coil, etc., for the moment, and commence on the oscillator coil first. Set plunger condenser C5 to within ½ inch of "all out." Now screw in Philips trimmer to approx. ¾ in. With gang at minimum capacity, next screw out core of oscillator coil L3-4, until the high frequency and the band is located. Rotate gang to maximum capacity and note frequency. If frequency is too low, screw out trimmer slightly. Now return gang to minimum capacity and note if high frequency end of band has shifted. If it has, bring back by adjusting core. Check low frequency end again and make any adjustment necessary with Philips trimmer. Screwing out core brings frequency setting to higher frequency and vice versa.

Screwing out Philips trimmer narrows band and vice versa.

If the Philips trimmer on L1-2 is now adjusted to the same position of that on L3-4, the gang will track perfectly, and the condenser, "Tune Receiver Aerial" can be locked in position.

Setting the Band

A Signal Generator is very use-

ful for these adjustments to oscillator coil and I set the "bandspread" to a little beyond each end of the old 7-7.3 Mc/s band; this gives nearly 180 deg. coverage. No great difficulty should be experienced, though, if adjustments are made some time the band is well filled and it usually overflows every night.

By
H. R. FITZSIMMONS
(VK3FI)
Technician, 3WV Regional.
Horsham, Vic.

Having recovered from this job, next thing is to tackle the sensitivity and selectivity. Obviously this can be done by removing the resistors R5, R7, R13 across the I.F. coils. But there is a snag—there usually is! Instability takes over with plenty of howls, etc. But here is a ray of hope—all but R7 can be removed, if decoupling is used; R7 is very difficult to get at, anyway, being behind the front panel. Undoubtedly it is due to the layout, wiring, etc., but of course it could not be avoided. To restore stability, 1K7G (V4) "Audio out" is decoupled by connecting a .01 resistor in H.T. to output transformer lead, and by-passing on the transformer side with a 8 mf condenser to earth.

It is a good scheme to check I.F. alignment at this stage. 460 Kc.

Improved A.V.C.

The AVC system is not the best; an improvement in converter frequency stability can be made by operating the converter V1 at zero grid potential, which is normal practice.

The AVC lead is disconnected from L2, and earth end of L2 connected to earth.

This limits the AVC to V2 only, but its action can be improved by disconnecting the 2 megohm AVC diode load resistor R9 from earth and connecting it to filament positive of 1K7G, V3 socket.

The receiver really performs now and certainly is a pleasure to handle.

The Transmitter

If there is still any of the fighting spirit left! look out for a further article continuing with improvements to the transmitter section, at a not-too-distant date.

USING AN "FS6"

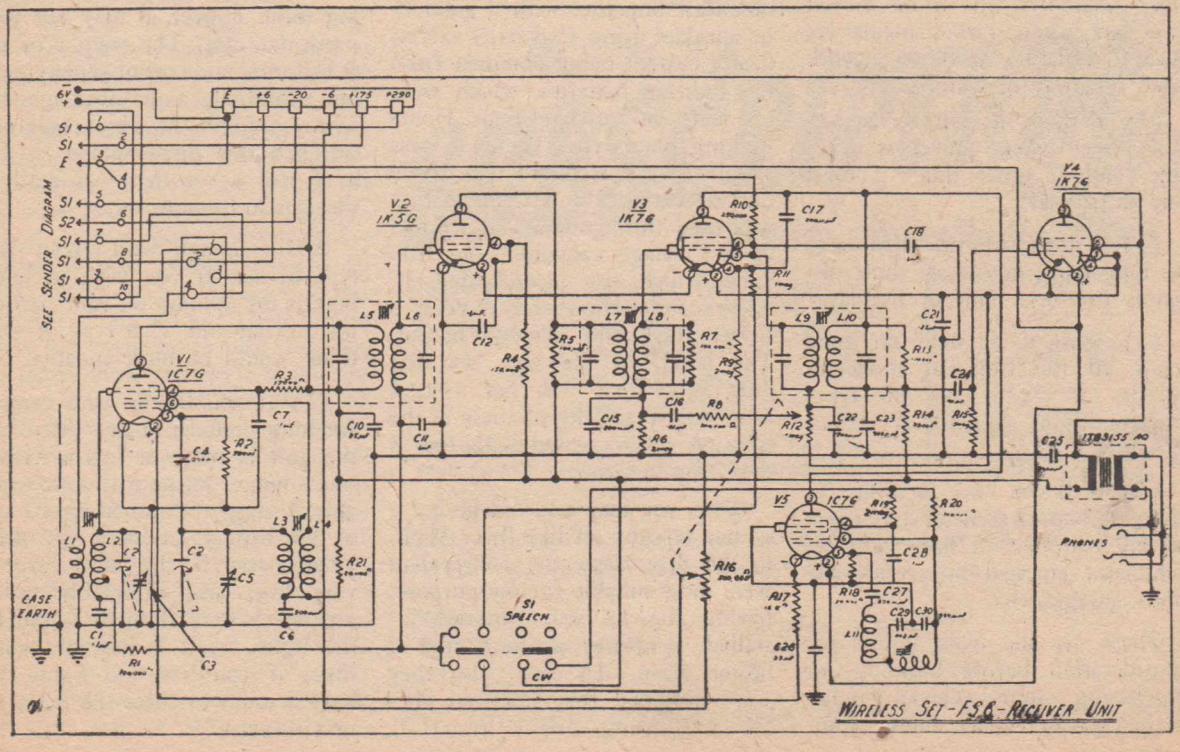
As you will read in full on page 36, that fine pioneer of Australian "ham" radio, Charles Maclurcan, recently did a cruise of the Barrier Reef, taking with him an ex-Army type FS6 equipment.

Reports indicate that the FS6 did a splendid job, healthy signals on both phone and telegraphy being heard over a range of a thousand miles and more.

A word of warning: don't use a transmitter unless you have a licence to do so.

THE VR65A

In the diagram of the socket of this valve given in the May issue we made a slight error. The cap is the grid connection and the "G" on the diagram should read "C" for cathode.



Some Thoughts on

CARAVAN RADIO

By

JOHN BRISTOE

Radio Manager,

Denham's (M'boro) Pty. Ltd.

Maryborough, Queensland

IN order to arrive at a suitable design for a radio for a caravan, a number of factors must be taken into consideration. The writer has travelled thousands of miles in caravans in Australia, and feels that he is fully qualified to give a first hand opinion on the various problems involved in a radio receiver for this specific purpose.

The first consideration is the manner in which the caravan will be used. Will it be used continuously, or moved only at rare intervals? Secondly, will it be moved to a site where power mains are always available, or must it work from a battery or batteries always?

(3) Perhaps it will be at certain places where power is available, and at other times it must rely on batteries.

(4) Will the van be called on to do long trips, or merely short distances for week-ends or holidays?

(5) Will it be used on good roads all the time, at moderate speeds, or travel over all types and conditions of roads at various speeds?

(6) Will you have facilities for charging batteries, or must you rely on dry batteries; or have your accumulator charged by service stations, garages, etc.

These are the main points for consideration before building, or purchasing your caravan radio. Many caravan owners, due to ignorance on the subject, are not very satisfied radio owners, mostly because they have not the right set for the particular purpose, with the result they either blame the maker or the circuit, or the designer, but very rarely themselves and they are the ones usually at fault.

Valve Types

Portable sets with 1.4 valves are used by many, and others use a conventional 2 volt set, either as a vibrator job or with B batteries. Another type used is the standard car radio. These are the usual types, but there are many others. Some of these are quite satisfactory and the owners are well pleased with their particular sets.

The design of a set used in a caravan that I owned was changed many times before I was satisfied with the results obtained. The final version was as follows: a five valve broadcast Superhet with a good 8-in. speaker, using 12.6 series valves, heater current being obtained from the lighting batteries, which were 12 volt 250 ampere hour Home lighting plant type. The H.T. was supplied by 3 standard type triple duty B batteries and Cathode bias was used throughout. The set had an R.F. stage converter, one I.F. valve which also incorporated diodes for detection and A.V.C., a driver stage and pentode output. The latter, by the way, was the only valve that was not a 12.6 type, due to scarcity of these at the time. A 38 was used with the .3 dial lamp in series.

Why, you may ask, did he use a screwy type of set like that? Well, in the first place, the 12.6 valves were most suitable for my purpose, having the 12 volt batteries installed; also these are fairly low in heater drain, .15 each; also they were designed for American AC-DC sets, using only a low H.T. voltage. But why, you may ask, use the B batteries for H.T.? Well, this again was partially due to the fact that 12 volt synchronous vibrators were in short supply at the time. The main reason was to avoid hum or hash, and with all the arguments that the vibrator or genemotor fans like to bring forth, I still maintain that the purest and quietest source of H.T. can only be obtained from batteries. Please bear in mind that any caravan, not even the largest of them, is not as big as an average room in a house, with the result that being in such a small room the hum and hash, even if very slight, is much more pronounced than in a home.

Battery Life

As my caravan was not in use all the time, the B batteries were usually good for quite a lengthy period. This type of set certainly would not suit every caravan owner, but think it over, it may suit your particular case. The weight of the B batteries, and cost of replacement, are admittedly a disadvantage, but in my opinion the advantages outweighed this disadvantage by far, as I had a set that was really a pleasure to listen to.

Well, enough said about that type of set. If you wish to know here is my opinion on your particular caravan and what type of set I think would be most suitable.

(1) If you live in your caravan for long periods, in one place, and the unit is more or less a fixture, like a house, yet no mains are available, I suggest a normal type 2 volt or 1.4 battery set, or a low drain vibrator set if the hum level is very low, and preferably use a separate battery from that used for the lights, as it is bearable sometimes if you have no lights, but have a radio to cheer the place up, or vice versa.

(2) If your caravan is to be used where power mains are available all the time, use a small AC set, or AC-DC if you go where both types are used.

(3) If you go to places where power is available, and at other times where no power is available, I would suggest you either build a special power pack that will work from your batteries with a vibrator unit, or can be switched alternately to AC mains. If it is DC mains the problem is more complex, but it can be done. Or alternately, instal a small battery charger in your caravan that will charge the batteries when power is available.

(4) If you only use your caravan for short trips over good roads at intervals, such as week-ends, etc., a good 1.4 portable type set is probably most suitable.

(5) If your caravan is used for long trips, over all types of roads, I suggest you use a set something after the style of the one I used.

You know where and how your caravan will be used, so try to instal the set that is going to suit your particular purpose. Bear in mind these points, if you have no easy charging facilities, don't use an ordinary car radio, as these use a fair amount of current, but they have this advantage in as much as they are designed to stand a lot of vibration and knocking about, and if your caravan is moving fairly often a generator to charge the battery operated from the wheels or by wind makes them a good proposition. Don't use 2 volt or 1.4 valves if your caravan is used on bad roads, or has to sand a fair amount of travelling. These valves were not designed to take this type of punishment so keep to the heater type valves. If the set is being built into the caravan, a normal type circuit is usually good enough as quite a reasonable aerial can be installed in the roof of most caravans, particularly as most of them are built of wood, plys or masonite, and if an R.F. stage is included, the set should give quite good results. A metal caravan is not so good for radio reception with a self-contained aerial, but a length of wire can be strung out to a tree or neighbouring building for an aerial when the caravan is at rest.

If sufficient interest is shown in special designs for caravan radios please write either to me or to the editor and between us I am sure we can give you full details at a later date, on how to build some sets for this purpose.

NEW R.C.S. COILS

Samples are just to hand of the new R.C.S. miniature coils.

Mr. Ron Bell, Managing Director of R.C.S. Radio Pty. Ltd., has been specialising in coil design for the past twenty years or so, and the new coils certainly reflect the amount of practical experience and scientific development which has gone into their design. The new aerial coil is known as Type E349, and the oscillator coil as Type E351.

Both are not only iron-cored, but enclosed in heavy "cans" of moulded iron-core material. This iron-clad arrangement ensures that the field around the coils is kept at a minimum, giving the coils maximum efficiency. Another factor contributing to their remarkable efficiency is the use of a Trolitul moulding for the mounting base and terminal strip.

The new R.C.S. coils are ideal for the construction of compact receivers, as the outside dimensions of the iron-clad casings are one inch diameter by two inches long. The E351 oscillator coil has been designed to operate with the 6J8 type converter valve and after aligning at 1300 Kcs. and padding at 600 Kcs. the cores are set for maximum sensitivity over the band, namely ½-microvolt from 1500 to 550 Kcs.

The No. 5 connection on the base of the coils should be earthed. The correct padder is the R.C.S. Type P21.

Photographs and further details of the new R.C.S. coils will appear in next month's issue.

KINGSLEY

has killed two birds with the one speaker

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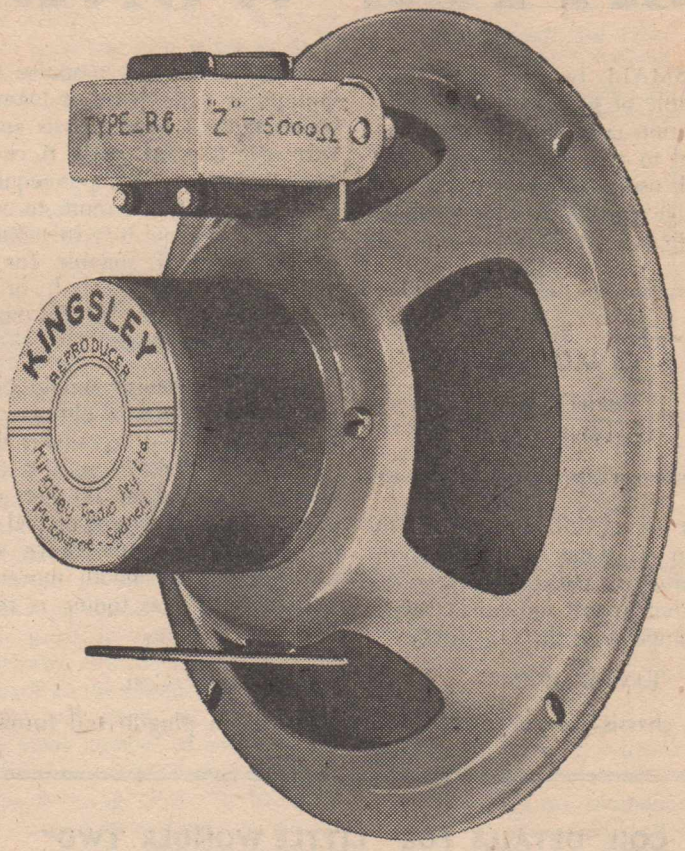
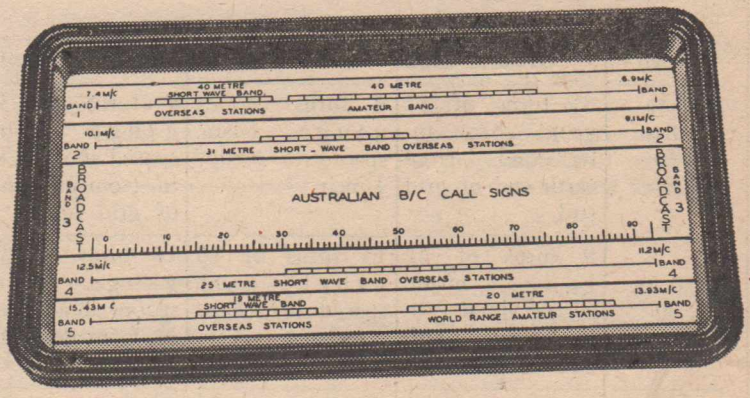


KINGSLEY KF/5CR BC/SW UNIT

INCORPORATING THE NEW CATHODE FOLLOWER AND GROUNDED GRID R.F. AMPLIFIER

Here is Kingsley's second big presentation—a BC/SW Ferrotune 5 Band tuner. It features a projection of the important shortwave-bands up to a size when each range can be covered comprehensively with perfect tuning, and with the elimination of unwanted "rubbish" (morse and interference.) The days when you had to tune in Short Wave Broadcast Bands in a dial-space of a quarter-inch are gone for good. The dial is clearly calibrated and permits split-accuracy in tuning. (In the illustration the main Australian Station Call Signs have been deleted to give you a slightly clearer picture of the main dial features.) This tuner allows accurate tuning of the amateur bands.



MODEL

w, compact, and simplified Broadcast Band Tuner—a Ferrotune surprise packet for the straightforward set with no frills but excellent superhet. performance. This unit is the d from "Ferrotune Fans."

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"LITTLE WONDER TWO"

A SMALL two valve set, capable of giving all-wave operation and being most economical to run. A home-made coil is used, using 32 gauge enam. and 25 gauge enamelled wire throughout different bands, as in the coil

By
G. MUNRO,
Hunter's Road,
Warragul, Victoria

data at the end of this article. The reaction windings given are only approximate. These will have to be altered to suit individual valves and components that are used.

Review of Parts

The chassis may be made from aluminium, wood or masonite. Aluminium is preferred, but masonite makes quite a good chassis and is very easy to work with. A chassis sized 8-ins. x 2-ins deep is required, allowing plenty of room to work with. A sub-panel may be mounted on the front if suitable for the type of dial being used; or the chassis may be left plain for mounting in a small cabinet.

Tuning condenser should be in good order. A new or old type may be used so long as its value is about .0004 mfd. Make sure it is clean and that the plates do not short when rotated. Any type of dial may be used, but for shortwave work one that has a smooth movement will be needed as tuning is rather fine.

Coil

A six-pin plug-in coil former is used when home-making the coil. This suits a 6 pin valve socket. Directions of wiring are given in a sketch which accompanies this article. If you do not feel like winding up a coil at home, commercial coils are available, but for the broadcast band only. They are known as Reinartz coils.

Reaction Condenser

This is simply a small tuning condenser having a value of .0001 mfd. which controls the amount of regeneration.

Grid Leak

This is a 2 megohm carbon resistor of a ½-watt type. On shortwaves better results may be had if a 1 megohm resistor is used.

Audio Transformer

A new or old type of transformer may be used here. One having a ratio of 3 to 1 is preferred. If buying an old type one, make sure it is in good order.

Automatic Bias

Instead of using a "C" battery in this set we have what is known as "automatic bias". This is the 500 ohm wire wound resistor which you see connected to B— and thence to earth. A 25 volt electrolytic condenser is also connected across B— to earth. The use of automatic bias has given this the most economical running costs.

Earphones

These should be of 2000 ohm variety, and in good order. A small set of this type is not suited to a loud speaker.

Batteries

For an "A" battery a 1½-volt buzzer type battery is used. If you are using "30" type valves this battery will last a good 6 months. The "B" battery is a standard 45 volt type. This will last over 12 months use. Remember to always turn the set off when you have finished listening.

COIL DETAILS FOR "LITTLE WONDER TWO"

Band	Aerial Coil	Grid Coil	Reaction Coil
10 to 30 Metres	2¼ turns of 32 gauge enam. interwound from earth end of grid coil.	4 turns of 25 gauge enam. spaced to occupy ½-inch.	7 turns of 32 gauge enam. spaced about 1/8-in. from grid end of grid coil.
30 to 90 Metres	8 turns of 32 gauge enam. spaced about 1/8-in. from earth end of grid coil.	15 turns of 25 gauge enam. spaced to occupy ½-inch.	16 turns of 32 gauge enam. spaced about 1/8-in. from grid end of grid coil.
90 to 220 Metres	12 turns of 32 gauge enam. spaced about 1/8-in. from earth end of grid coil.	40 turns of 25 gauge enam. close wound.	30 turns of 32 gauge enam. spaced about 1/8-in. from grid end of grid coil.
Broadcast Band	16 turns of 32 gauge enam. spaced about 1/8-in. from earth end of grid coil.	112 turns of 25 gauge enam. close wound.	60 turns of 32 gauge enam. spaced about 1/8-in. from grid end of grid coil.

Valves

In the circuit shown two triodes are used. These can be of any type as long as they have a low filament drain. "30" type valves are preferred.

Aerial and Earth

Use a good aerial about 60 feet long, and as high as possible. When on shortwave better results may be had if no earth is used.

Mounting of Components

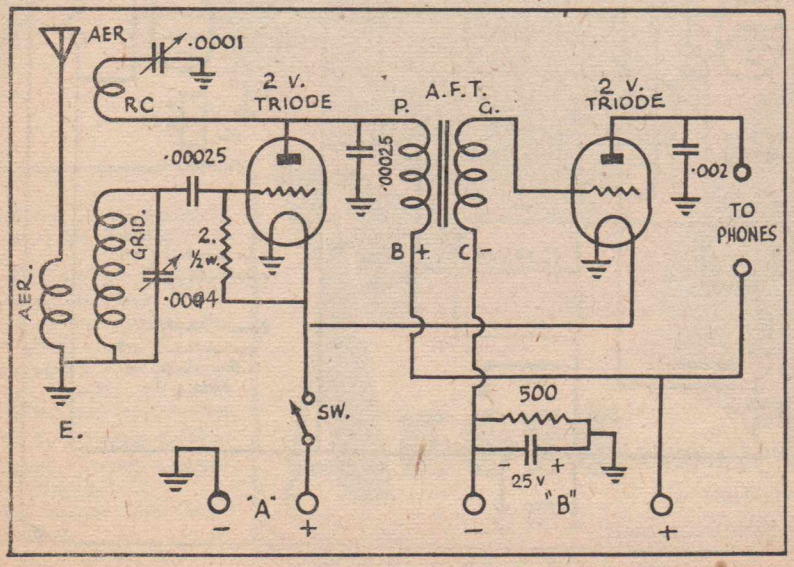
The tuning condenser is mounted in the centre of the chassis on the top side, with the reaction condenser on the left hand side and battery on-off switch on the right. Immediately behind the switch and alongside the tuning condenser the coil socket is mounted. Behind this in the right hand bottom corner is mounted the first valve socket. The bottom centre behind the tuning condenser is the space for the audio transformer, and in the left hand corner the second valve socket is mounted. The earphone terminals are mounted behind the reaction condenser.

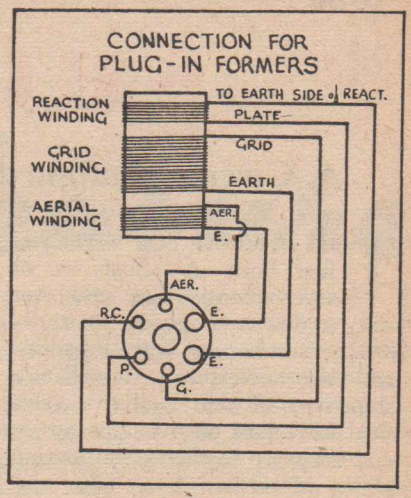
Wiring

First of all make a tinned earth network connecting reaction condenser, tuning condenser, coil earth points, and "A—" lead to the earth terminals. This earth wiring serves as an earth connection for any of the components, such as the .00025 and .002 condensers too. Then the other wiring can be done. Remember to keep the grid wires as short as possible, and well away from plate wires. All the parts should mount in without any difficulty. Make all joints secure. Use only resin cored solder and keep the iron tinned. Check the wiring over two or three times before testing.

Testing

Once you have finished the wiring and made sure all connections are correct, plug the two valves in, connect the phones and batteries, and aerial and earth wires. Switch on and rotate dial. A station may, or may not, be heard. If you hear a loud squeal, back off the reaction until you hear the station properly. This type of set should never be allowed to squeal (or oscillate) as it is heard in nearby radios. On shortwave, adjustments will have to be made to the number of windings on the coil. Every set will require a different number of turns. If the set fails to oscillate move the reaction winding closer to the grid coil, or add more turns to the reaction coil. If it misses out the high or lower frequencies on shortwave, remove or add two turns to the grid coil. This set should, and will give good results if made and handled properly.





PARTS REQUIRED TO BUILD THE SET

1 Chassis 8-ins. x 7-ins. x 2-ins. (See text.)
1 Reel 32 gauge enamelled wire.
1 Reel 25 gauge enamelled wire.
4 6-pin ribbed coil formers (plug-in.
1 .0004 mfd. tuning condenser.
1 Dial to suit above.
1 .0001 mfd. reaction condenser.
2 .00025 mfd. mica condenser.
1 2 megohm carbon resistor.
1 Audio transformer (ratio 3 to 1).
1 .002 mfd. tubular condenser.
2 "30" type valves.
1 25 volt electrolytic condenser.
1 500 ohm wire wound resistor.
1 On-Off switch.
4 Terminals.
1 Pair earphones.
1 1½-volt buzzer battery.
1 45 volt "B" battery.
Wire for battery cable.
2 4-pin valve sockets (or sockets to suit valves you may use).
1 6-pin valve socket (for coil).
Bolts and nuts, solder lugs, hook wire, etc., 3 knobs.

The

"EUROPA 5"

A Circuit Designed to Use the Latest European-Type Valves

THIS five valve dual waver was first built up about six or seven months ago, and ever since it has been giving most excellent service on both broadcast and short wave bands. It will outshine any of the usual five valve dual wave jobs on the short waves, and keeps up to the station getting ability of six and seven tube jobs.

By

S. H. DALEY

It will cost a little more than the usual five tube job, but is less costly than the larger set of comparable performance.

The line up consists of an EF-50, RF amp., ECH35 converter EF35, IF amp. detector, AVC and reflex audio amp., EL3-G output tube, 5Y3-GT rectifier. These tubes are all made in Australia with the exception of the EF50, which is readily available. This set-up is, of course, based on the high gain type of four tube dual waver with the addition of a high gain R.F. stage.

Some readers may not be keen on the reflexing used in this set, this particular circuit has been used quite widely of late with good results. I have used it on both four and five tube sets without any trouble at all.

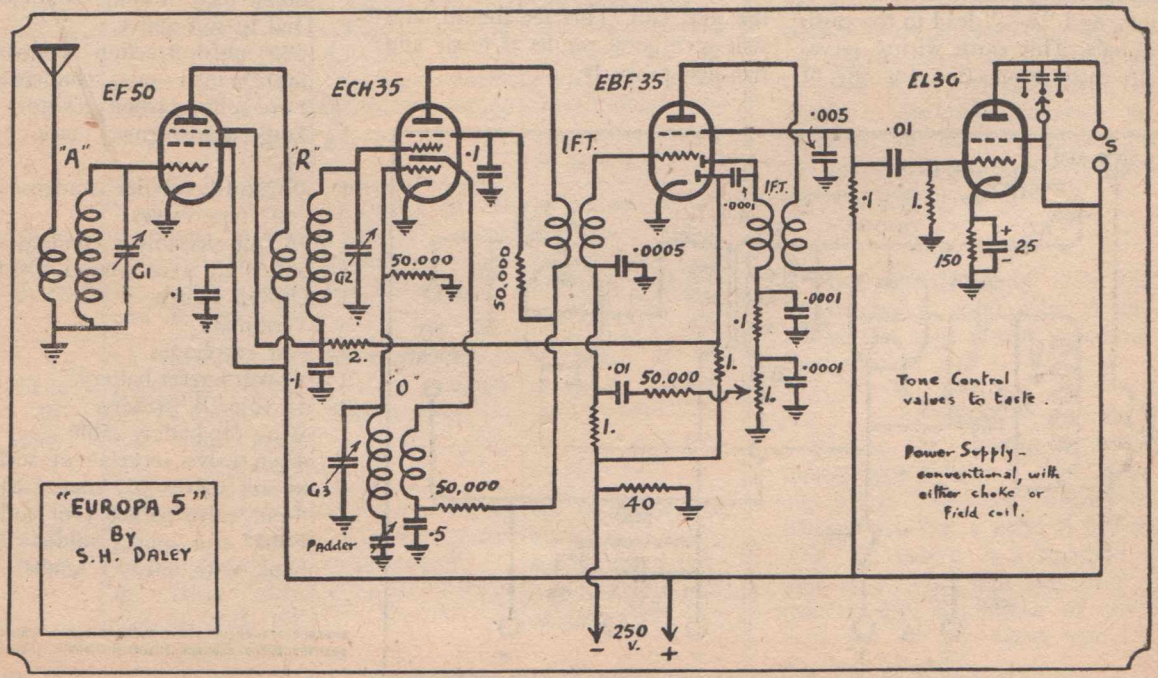
An EF50 is used for RF amp. to give high gain with a simple AVC and screen feed. These tubes are designed for 250 volts on both plate and screen, with the AVC feed on to the suppressor grid. The only point to note is that a .1 mfd. condenser should be wired from the screen at the socket to earth. This not only serves to prevent any instability in this stage, but acts as a H.T. bypass.

Converter Stage

The converter is an ECH35 (or ECH3, ECH3-G) which is now to be manufactured locally. This tube gives an extra high gain with low noise level and performance down to about twelve metres. I prefer it to American style tubes for most purposes. The circuit here is quite normal and uses grid tuning for the oscillator section. The coil bracket that I used was an old R.C.S. unit of pre-war vintage, there was no trouble in obtaining satisfactory oscillation performance over the whole 13½ to 42 metre shortwave band.

The EBF35 (EBF2-G) is a high gain tube when used as an I.F.

(*Continued on page* 28)



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amp., and in this circuit the full gain is realised. The .005 screen by-pass is adequate for I.F. of 455 K/cs., yet it does not shunt too much of the high audio end. I think that this circuit or a similar one has been described in a previous issue; it is not by any means new. There does not seem to be any special precautions for this stage. I used "Kingsley" permaclad I.F. transformers for their high gain and selectivity, though there is no reason why any other make of 455 K/cs. transformer shouldn't be used.

The well-known EL3-G (EL33) was used in the output stage because of its high sensitivity and low cathode current compared to other types in the American series. There is, of course, the 6AG6-G, which could be used here, but the heater current of 1.25 amps is rather heavy for a small transformer, in addition to the fact that it seems to be hard to obtain. A 6V6-GT could also be used by changing the bias resistor to 250 or 300 ohms, but there would be a slight loss of gain. No inverse feedback is used because the loss of gain is not justified in this type of set. This does not mean that the quality is poor, however, with an eight inch permag. speaker the set sounds very clear. But no claim of "hi-fi" or wide band reception can be claimed.

The power pack is quite conventional with a 5Y3-GT rectifier. A 6X5-GT could also be used if one is on hand. I used a 60 ma. power transformer which does the job quite nicely, though an 80 ma. size is preferred.

There are the voltage measurements with 20,000 ohms-voltmeter. Variations of 10 per cent. should make little difference. (Aerial shorted to earth.)

	plate	screen	osc. plate	control grid supply
EF50 ...	252	252	—	0
ECH35 ...	252	100	110	—2.5
EBF35 ...	252	108	—	—2.5
EL3-G ...	235	252	—	—6.5

Osc. grid current B.C. .14 to 2.3 ma. S.W. .13 to 2.1 ma. (These figures will vary with other osc. coils.)

Suppressor grid of EF50, —2.5v.

There is little more to say about this set. I have it built up as a table model in a home-made cabinet and chassis. The performance of this line-up on the shortwave band is really remarkable for only five tubes. A shortwave fan who is a friend of mine has the set in use at the moment beside a well known commercial seven tube set. He states that below 20 metres the "Europa 5" romps in, whilst at high wave lengths there is little to choose between the two.

In conclusion let me say that for first class distance listening this set is hard to beat.

TECHNICAL TOPICS

When the "VK2NO V Six" receiver was introduced early in 1946 the use of 1600 K/cs. IF was considered to be a workable proposition as a compromise. Selectivity was fair enough to get by with on the band VK's were making the most of at that time, namely, 28 M/cs., and it was stressed that selectivity wouldn't be of any high order on the more popular DX bands when they became available for use again.

The way things are now on 80, 40 and 20 metres, a single stage of IF around 1600 K/cs. just isn't good enough, despite the fact that images are "off the dial." Perhaps with two stages of IF suitably applied, plus back-to-back transformer coupling for narrowed band-pass, matters are a lot better. Nevertheless a shadow looms on the horizon so far as the use of IF from 1500 to 1600 K/cs. is concerned, and that is the advent some time in the near future, of broadcasters. In February, 1946, the A.M. broadcasting band from 550 K/cs. to 1500 K/cs. was extended to 1600 K/cs. There aren't stations working in the extension yet, but it stands to reason that some time there will be. Unless a receiver is very completely screened in an IF channel of that range, there is likely to be severe QRM where the receiver is used in the vicinity of a local broadcaster. Better to avoid the possibility by making use of a slightly higher frequency IF, such as 1900 K/cs. The Kingsley people turn out some excellent IFT's in that range, and when applied in a receiver with a crystal filter using a special VK3BQ (Max Howden) low capacity holder, an amateur band job with a most interesting performance is possible. Because of the wider band-pass the IF range at 1900 K/cs. can be applied with the crystal "In" all the time. There is enough width for good speech and the selectivity can be increased very simply by the series resistance scheme. The writer has been testing a receiver on these lines and more will be heard about the results in the near future.

* * *

Many VK's have asked me

(*Continued on page* 30)

Latest photograph of our worthy contributor, Don B. Knock, VK2NO, as he sits at the bench of his radio den at Waverley, N.S.W. Note the firm grip which Don has on the microphone!

TECHNICAL TOPICS

(*Continued*)

where type 811 can be obtained, and the answer has always been, until recently, "nowhere that I know of." As this is written there is a spot of good news for those seeking such "bottles." They are now obtainable from Philips' Transmission Dept, Head Office, Sydney, and the price . . . less than that of the 809. That is an anomaly for some reason undefined, but the 811 is priced at £1/14/9 . . . a very reasonable figure. 812 is available also at the same price and for those who are interested in the Gammatron series of valves, there is the 24G on hand. Latter is priced at £3/5/-. Quantities of the three types are limited.

* * *

The inductively coupled dipole scheme has "caught on" with several VK2's and 4's since one was installed at KK2NO for 7 M/cs working. Results are most satisfactory. On the morning of May 21, 1947, VK2NO worked ZD-6DT, Royal Signals, Zomba, Nyasaland, Central Africa on "Forty phone" at 0730 hrs. EAT. The ZD was S7 and was very surprised to hear a VK on the band. That is how good the inductive dipole scheme proves to be. VK2AEY, Bill Eagling, of Taree, finds that he reaches out on 40 as never before and VK4TY, in Brisbane, has raised his signal from an indifferently distant one to one with a forceful wallop . . . and it comes from no more than 24 watts. In effect, of course, the inductive method is that link-coupling is used between the final stage and the actual radiating system up in the sky (or wherever you put it). It is a "pipeline" that seems to pour all the RF just where one wants it, without spilling it en route. Originator of the scheme was W9NLP. —"QST", January, 1947.

* * *

Ray Boyle, of 256 Denison St., Rockhampton, Queensland, seeks assistance from any "A.R.W." reader who may be able to oblige with the circuit diagram and/or particulars of the AR14 receiver. Any offers?

* * *

In a forthcoming issue it is proposed to run a description with illustrations of what your scribe considers to be the most outstanding amateur antenna creation on this planet . . . namely the multi-beam-cum-tower-radiator of Howard Love, VK3KU. Only runner-up I can recall to this affair of Howard's was that Bryan Groom's . . . pre-war GM6RG . . . a massive girder-like construction for his 28 M/cs. stacked elements. VK3KU's is something to make a lasting impression and a big dent in the ether, as it surely does, and there must have been quite a gang of the lads out Mt. Waverley way on the day this colossus reared its head into the unsuspecting Victorian sky. Incidentally, as this is written, in mid-May, H.K.L. mentions to me per 7 M/cs. phone that it is almost 25 years to the day since he and the late Ross Hull heard the first American amateur in Australia. The station was old 6KA, Los Angeles, and the frequency . . . believe it or not, laddies . . . around 1.7 M/cs. . . . in the parlance of those times: 200 metres. As Howard says, the occasion is one calling for a celebration of some kind. 25 years after, H.K.L. is even keener than ever on the old hobby (and profession) or he wouldn't have gone to all the trouble over this target-hitter of a multiple "squisher."

* * *

Current issue (April) "QST" has a story on a snappy little gadget described as the Micromatch. This little box of tricks, inserted in your feedline in the shack, will show you on a calibrated meter scale just what is your ratio of standing waves. It will do lots of other things also, but there is a catch in it for us VK's. It includes in the make-up two 1N34 Sylvania crystal rectifiers. Such things don't exist in this country and the catswhisker variety from Uncle Joe's on the corner just won't do.

(*Continued on page* 37)

A LOYAL SUPPORTER

For solid support we must pay tribute to Mr. P. M. Hoare, of Pierce Hoare Pty. Ltd., of Lismore, N.S.W., who recently sent along his cheque for five years' subscription in advance, to expire 1952.

Mr. Hoare is making sure he is not going to miss anything in technical radio developments.

NEW BOOK ATTRACTS FAVOURABLE COMMENT

Advance copies of "Philip's Manual of Radio Practice" brought many appreciative messages to the author, Mr. E. G. Beard, M.I.R.E. (Aust.). Sir Ernest Fisk cabled that he considered it "an excellent compendium of fundamental and up to date information covering all radio subjects . . ."

In Australia, Mr. J. Malone, of the Overseas Telecommunications Commission (Australia) wrote: "I cordially agree that Mr. Beard and the Company have done a valuable service for servicemen, particularly the new men coming along, in making available to them such a valuable work of reference."

The Strand Press commented that: "The publication breaks new ground as far as Australia is concerned . . .," while Mr. L. B. Graham, Principal of the Australian Radio College Pty. Ltd., says: "It is concisely written and well illustrated. I thoroughly recommend it to all radio men with the surety that they will find it of value."

"The grouping of so much useful information in the form of tables, graphs and formulas in the latter half of the book makes it a handy reference source for radio engineers who might otherwise be obliged to refer to a number of standard works for these data," writes Mr. P. H. Adams, of Eveready (Australia) Pty. Ltd.

CALLING CQ!

By Don Knock, VK2NO

Recent election of officers for WIA's N.S.W. Division brought to light new blood, which is all to the good. The list includes Messrs. Adams (VK2JX), Anthony (VK-2TR), Corbin (VK2YC), Dukes (VK2WD), Hutchison (VK2YP), Meyers (VK2VN), and Moyle (VK2JU). Peter Adams is well enough known to all and sundry . . . he has been a Ham since he went to Prep. school and that's a while back. Always co-operative, Peter has a pleasant personality and takes his amateur radio seriously. Like others who have lived a lifetime in the hobby, he gets a bit steamed up when people say really silly things, such as "I find I have standing waves on my 'Zepp' feed-line." For some years prior to September, '39, he was on the Lab. staff of Radio Corporation of N.Z., and meanwhile did a good job as Editor of "Break-In." With the war he returned to VK, and tried to get into the RAAF, but a faulty eye decreed otherwise. He was a designing engineer with Kriesler Radio, and has since taken up an appointment with Eveready Battery Co. Reg Anthony previously held a three letter callsign, but when Ray Conrad planted himself in the Apple Isle, Reg eacquired the vacant 2TR call. His activities in amateur radio include operation of an excellent 50 M/cs. phone outfit, a spot of 14 M/cs. DX, and the Presidency of the flourishing Ex-Experimental Society of N.S.W. Those who know 10 metre history in Eastern Australia don't think of that without memories of the steady plodding work put in on that once empty band by Jim Corbin, VK2YC. Jim still works exclusively on that band, but has never been heard on phone. CW is his pigeon and he makes out very nicely at it, too. G's are his specialty and when WIA Conventions come around, logical N.S.W. choice for a delegate who knows the ins and outs is Jim. In his spare (?) time he is a Pharmacist. Bill Dukes is one of the early birds in the doings on the pre-war 5 metre band and was present on the momentous occasion when a 5 metre transmission from Sydney was first heard well outside the Sydney area, i.e., the Blue Mountains. His

(*Continued on next page*)

A LETTER FROM BRITAIN

From Eric Sherlock, ex VK-2ANE, Mobile Marine, to VK2NO:

"12 Downs Road, St. Helens, Lancs., May 23, 1947. After calling at the ports of Savona, La Goulette, Oran, and Gibraltar we made our last port of call at Grangemouth, Scotland. There we began to yearn for the good weather of the Australian coast. During the passage home, the GPO granted my 'G' call, which is G3BQH. I expect to be on the air in a week or two, using the small rig at first, and then with a bigger job. A high voltage power pack is under way but there is difficulty in obtaining rectifiers. All types of valves are scarce. Band will be 14 M/cs. at first and then 28 M/cs. later.

"It seems that I arrived home just at the right time, as there is a lot of Government gear going cheap for RSGB members. For £12 I got: one aircraft TX Type 1154, two complete American transceivers, one with a lot of VHF valves . . . a HF transceiver and some other gear. In London I saw Radar Units containing 3 and 5 inch CRO's, plus 10 other valves including VHF types, and all power accessories for £7/10/-. There are lots of 1¼ metre sets going cheaply and I suppose this will make your mouth water (No, Eric . . . we are doing better for price in VK for similar gear). At the moment England seems to be a Ham's paradise, but only so far as gear is concerned. I didn't do any working on the trip home excepting on one day when I made contact with a G who was on a ship moving in the same direction as we were. At times we suffered from QRM from G's. I was surprised to find that VK's went out after about 1000 miles from Perth and didn't come in again until we reached Italy. Africans were the only ones I could receive at any strength for the whole voyage. I may give up the sea, but from what I can see of conditions here, the sea is the best life. It is unfortunate that our GPO will not permit us to work mobile-marine, then I would certainly stay at sea for a few years more. I was in London for the British Industries Fair and noted with interest the types of marine gear by Marconi. They have three 807's in parallel for the TX's and the RX's are splendid affairs.

"Now I had better start sorting out my gear. The Customs were very good and I didn't have any trouble in that direction. The gear was in wooden cases and as the crew said when they gave me a hand with it ashore: 'there's not much mobile about this outfit.' All the best to you in that land of sunshine. . . ."

station VK2WD was very active on 56 M/cs. around 1934-5, but so far has not made any move toward 50 M/cs. Of VK2YP this writer has little personal knowledge, other than a measure of boundless enthusiasm for the job to which he has been elected.

Morrie Meyers, VK2VN, is known to all and sundry as a first rate amateur, with a war service background second to none. He went as a reservist into RAAF in the grim days . . a humble erk, and finished up as a W/C with an O.B.E. to boot. Morrie is a keyman in more ways than one . . . he wields a snappy vibroplex, and is the key radio executive in Qantas Empire Airways. Recently visited W and G on business and was heard from stations in those parts. Of John Moyle one can say, here is a full measure of enthusiasm for things radio, and a liking for writing about them. Holds the office of Editor-in-Chief to "R and H" and is frequently heard on 50.45 M/cs. with a nice phone, originating from a mightily elevated QTH atop the Sun building in Sydney. Served as Officer i/c RAAF Radar publications during the war. Is keen on VHF mobile operation and thoroughly enjoys tootling out per car with a natty vibrator-powered 6 metre phone TX and RX aboard. Is known to Hams everywhere in VK as VK-2JU.

* * *

At the Annual General Meeting of N.S.W. Division of WIA, it was anticipated a few W's might be in evidence from the visiting Task Force 38 of the U.S. Navy. Nary a W Ham showed up and its understood that a reply to an issued invitation was along the lines that "whilst the invitation was much appreciated, it was necessary to pay attention to prior engagements and all the time available ashore would be fully occupied." To which one comments understandingly in Americanese: "You're telling us!"

* * *

How that "Victor King" jargon has caught on and snowballed! Heard a laddie t'other night describing the humble 6V6G valve in his VFO as a "Six Victor Six George"!! Which is all very well in its way . . . but wouldn't it? The Services certainly started something when they got together and established this phoneticism business. Necessary and all that, of course, but one remembers the phonetical alphabet of that earlier war more fondly. Then it was a matter of plain Ack Ack, and B was Beer . . . not Able Baker. Which remind me . . . during the Big Disturbance recently I don't recall hearing any order given to Artillery AWAS to "WoMAN the Able Able Guns!!"

* * *

A recent Sunday morn broadcast from a WIA station was a bit unfortunate in that it was practically an apologia for activities of a 7 M/cs. pirate. Theme appeared to be that maybe it was but the misguided doing of a boy who didn't know what he was about. Stern words would really have been appropriate, but the widespread impression was that piracy was something that couldn't be avoided. An amusing sequence was an irate country Ham who exploded, "Why don't you tell the so-and-so the facts . . . that he is liable for a heavy fine, etc.?" Case of spare the rod and spoil the child?

* * *

Another old hand back on the air, on 14 and 7 Mc/s, is Harry Chinner, VK2CG. Harry figured prominently in Australian 56 Mc/s

GROUNDED GRIDS

Noticed a description in G6FO's "Short-Wave Magazine" of a VHF Converter employing a grounded-grid RM amplifier stage with the type RL37 valve. These valves have not been readily available in Australia, but in the lists of surplus war stocks now put out by the valve concerns, the RL37 is featured (CV66) at 12/-. Licensed amateurs get a special discount. It is intended to try out this type of RF amplifier in the near future and the results will be passed on for the benefit of VHF readers.

Kingsford District Amateur Radio Club (N.S.W.)

This recently formed Club is getting into its stride in catering for all amateurs and those interested in radio in the Kingsford, Coogee, Randwick and surrounding suburban districts of Sydney. This Club seems destined to shine in VHF activity by reason of the fact that many members are interested in that phase of radio. About six members' stations are active at present in the 166-170 M/cs. band. Meetings are held at Griffith Hall, 48 Rainbow Street, Kingsford, on alternate Tuesday evenings and are characterised by demonstrations of equipment and technical lectures. Plans are in hand for the inauguration of morse code classes. The executives elected at a recent meeting hold office until June 30, 1947, when increase in membership will justify re-election for a larger representation.

Present office bearers are:

President: W. G. Ryan, VK-2TI.

Vice-President: J. Peell, VK-2WJ.

Hon. Secretary: V. H. Wilson, VK2VW.

Treasurer: Cec. Horne, VK-2AIK.

Publicity Officer: R. W. Snyder-Lyons, VK2UL.

Invitation is extended to all amateurs to be present at meetings and visitors have already included some from Canada and Westralia.

—D.B.K.

history when he first heard 5 metre sigs from VK2NO up in the Blue Mountains during a car trip one Saturday in 1934. It was the first time that 5 metre signals had been heard outside the Sydney area and from then on the regular Sydney-Blue Mountains circuit was established with VK2BP, Hazelbrook. Harry has the VHF virus still in the blood and plans to get going on both 50 and 166 Mc/s.

* * *

On Sunday, May 11, 1947, VK-2AJU, the mobile outfit of John Moyle, VK2JU, went tootling down the NSW South Coast, taking an 18-watt crystal controlled telephony TX on 51 Mc/s. Results were excellent, both between the car and home station, but the inevitable happened when John left the upper levels and ducked down Bulli Pass. The signal ducked with him and wasn't heard until he emerged from the depths later on.

* * *

Back on the air on 7 Mc/s is Geoff Partridge, VK2VU, Singleton, who is as ever keen on VHF stuff. He plans to get going on Six very soon. It will be recalled that VK2VU and VK2LZ worked two-way over the 100 miles stretch on 56 Mc/s pre-war. Also back on the air in Singleton is Alex Mather of VK2JZ, who has a nice phone on 7 Mc/s, but the BCL's are getting it just now. As Alex runs the local broadcasting station, that would never do from two viewpoints, would it, OM?

* * *

There was a big gathering of clans at VK2NS, Bathurst, during the week-end, May 17-18, as evidenced by visitors at the mike there. Heard were VK's 2NS, 2II, 2OF, 2WH, 2ALG, 2ACU, 2DO, and 2AGA. Occasion was a miniature ham-feast and it seemed that by the efforts taken to induce 2DO to leave Yass, mileage and petrol were secondary considerations. . . which is as things should be. A feminine voice at the mike at 2NS needed no coaching in Ham verbiage, and indicated more than a working knowledge of Ham Radio.

Special Wireless Reserves

It is noted with interest that RAAF and WIA have been negotiating regarding the reconstitution of the RAAFWR and that the WIA has been asked to prepare a plan for discussion. One could hardly imagine the RAAF doing it with its Reserve of Operators and the suggestion that something on the lines of the pre-war set-up should be started again is logical. In 1939-40 it was that handful of Reservists—Amateurs—who made RAAF communications something other than a mere travesty. As the war years progressed those Reservists, called up from homes and Ham stations, emerged as the leaders of RAAF Signals. Others shone in the sphere of Radar as the need for specialists there became acute. Not so the Army. The AMF had no pre-war Reservist scheme, a fact that this writer, then a pre-war Militia Signals Officer, had tried to hammer home in print. The Army started off the war with a handicap so far as the services of amateur operators were concerned. There were a few experienced amateurs in the Militia . . . both commissioned and otherwise, but in those times their natural inclination to emphasise the importance of radio in Signals was frowned up by Unit commanders . . . men whose vision didn't go further than cable, flags and helios. But those men had the say then . . . and they gathered around them others with equal lack of vision and gave them authority. To be a Ham with the know-how of radio just didn't get one far in the pre-war and early-war Army set-up. Time told, however, and the natural flair for getting results with radio put the Army amateur in a better light. As Radio became more and more important in Army Signals so did the services of the Amateur. The war finished with Army Signals in a very different world of communications to that of 1939 with technical ability and proficiency in radio well to the forefront as attributes of vital importance. Despite the world of teleprinters and multiplex VHF channels there will always be a need for the key-pounder . . . the operator who, with ingrained procedure, gets his traffic through from the forward areas to GHQ and vice versa. The Army cannot afford to ignore a Reserve of such operators, but to secure their services, conditions of operation and possible call-up under National emergency will need to be just as attractive as Reserve conditions in the Navy or Air Force. Present S.O. in C. would do well to give the matter due consideration.

—D.B.K.

HOME RECORDINGS

SURPRISING that more Hams don't go in for home recording. Facility to record transmissions on the various bands can be most useful. In the first place it permits the other fellow to know what his own transmission (and voice) really sounds like. I noticed VK2AII on 7 Mc/s phone making very good cuts and shooting them back to VK2ALD. First noticed the stunt because I heard what appeared to be VK2ALD on a frequency quite different to his usual spot around 7200 Kc/s. It turned out to be a recording through VK-2AII. Now . . . if there had been some of those FB steel wire recorders as used in the AAF during the war offering through Disposals, they would have been rushed. Only place they are seen is in the ad pages of the W magazines.

HAM NOTES
(Continued)

Do you recall the gentlemen's agreement in pre-war times about "No phone on 40 after dark"? The suggestion was made to me during a QSO on the band that perhaps the same arrangement could be re-established. Wishful thinking, I am afraid, in these times, with things the way they are. CW on the 7 Mc/s band is in the minority. Reason for the aforesaid "gentlemen's agreement" was merely because it was the transition period. Amateur phone hadn't really got into its stride, and at that stage the loop modulation technique was not defunct. No harm in W.I.A. making the suggestion, but whether it would work is another matter.

—VK2NO.

THE SAFETY VALVE

Westralian magazine, "Wavetrap," of Subiaco Radio Society, lets off steam in May issue about remarks by "Gremlin" in "Amateur Radio." In April issue of the latter, he digs at W.A. to the effect that newcomers to the hobby were unwelcome in the West, and fraternisation is lacking. Naturally Westralia rose to the defence and indulged in a little sparring. That is good for the cause providing it doesn't get to the stage of antagonism, then to ill-feeling. How easy it is to have the purport of one's remarks misconstrued the writer of these Notes knows full well. A chance reference to even an unquoted instance of careless operating will bring from a minority a burst of protest, and even offensive remarks over the air. Criticism under a pen-name is far more likely to arouse protest than open signature, but any criticism considered necessary in "Calling CQ" is signed by the writer. Responsibility, therefore, is accepted by the author of the remarks, who is pleased to receive objections under signature. Any of the anonymous variety are at once consigned to the WPB.

Opinion of the writer is that "Gremlin's paragraphs in "Amateur Radio" are not menat in offensive form and that probably Westralia takes them a little too seriously. The style of both writers in both publications is refreshing and it is to be hoped that both take them in good part. The time is not one for ill-feeling between Amateurs, neither in this country nor elsewhere—there are vastly important events looming, events that may have profound effect on our future. Following on the Atlantic City Conference, we may be beset by problems of frequency usage. It is to be hoped that delegates at that Conference have been favourably disposed toward the amateur, and not people inclined to judgment coloured by the bad taste of a few. In the main the radio amateur is a good fellow—he follows a clean and serviceable hobby, and he has, or should have, a measure of tolerance and respect for his fellow-amateur's ideas. There are those without whom the hobby would be better off—such as those who cause deliberate interference with other stations on crowded popular channels. The latter is a vicious and growing practice that all decent Australian radio amateurs should stamp out by co-operation in running the offenders to earth. The Amateur Code, quoted by A.R.R.L., says that "the Amateur is gentlemanly, loyal, progressive, friendly, balanced, and patriotic." The actions of some who, in any case, could not be classed as radio amateurs by reason of piracy and non-license—are a travesty of that Code. Caustic comment is oft-times necessary to help keep this hobby of ours free of abuses, and when such comment is made, it will always be without regard for the ruffled feelings of trouble-makers. This writer signs himself . . .

—DON. B. KNOCK
VK2NO.

There are key clicks on Forty, and they don't arise from any Ham station. No . . . they emanate from VKS4, operating on 6980 K/cs., and they spread well into our territory. Bet your life that if a Ham station clicked thus outside the band he would very smartly receive a "please explain" from the PMG.

* * *

As this is written 'tis a rainy day . . . a drizzling uncomfortable cold Sydney winter's day. Despite that, the writer has been roof-climbing. Doing what? Surveying an antenna situation with Chas. D. Maclurcan, VK2CM. If proof were needed that amateur radio may remain dormant for 20 years, but still remain very much in evidence in the blood, this is it. More will be heard of VK2CM in the near future. Another old hand staging a reincarnation is Jack Pike, VK2JP; for 'tis known that Jack is busy altering an ex-U.S.A. Signal Corps outfit to get it tootling on the 28M /cs. band.

* * *

A friend who long ago sailed the sea-lanes as W/T operator and is now a prominent business executive recently moved his home to another locale. A suggestion from him that "a few odds and ends" of old radio gear might have some use resulted in his dropping a veritable truck load at the writer's QTH. Old equipment? There came to light a complete Marconi Multiple Tuner, V24 valve holders, several UV202's, French "R" valves, and type UV200 gaseous detectors . . . real museum pieces.

—D.B.K.

* * *

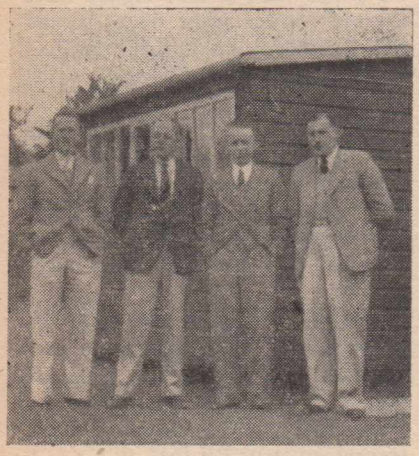
Latest valve lore from Philips is of considerable interest to the TX man. Now in tock are small quantities of the 4E27 Beam Power amplifier valves made by North American Philips. As HF amplifier this type fills the same positions as type 813 with the ad-

vantage that it can be used at much higher frequencies. 4E27 operates at full ratings to 75 M/cs. with 75 per cent. for anode modulation and 90 for telegraphy at 120 M/cs. 813 has full ratings to 30 M/cs. only. Another feature of 4E27 is that it can be suppressor-modulated where economy of audio power is needed, a method that is less critical than grid modulation used with other valves. 4E27 fits the same giant 7 pin socket as the 813. It is recommended for VHF work, either FM or AM, and for amateurs wanting the best performance on 10 and 6 metres.

* * *

Many amateurs are building small mobile-portable transmitters, and it is remarkable how many appear to consider that preamplification is necessary when using a carbon microphone of the neophone style. With a transformer of 1:20 such a microphone will drive fully a 6V6G or 807. An EL3 can be very much over-driven. Quite a gain in modulation level can be obtained in these small transmitters by reversing primary or secondary connections of the microphone transformer. Waveform of speech currents is unsymmetrical and by so arranging the connections that the higher amplitude side deals with the positive peak modulation, considerable improvement can be effected. Deeper average modulation is obtained thus since the positive peaks merely cause positive carrier shift but do not cause interference as they would if on the negative side.

—D.B.K.



A group of English DX men outside the shack of G8LP, Wolverhampton, England. They are, left to right, G6PC (who visited VK in 1935), G5WH, G6UI and G8LP (Geoff Hanley). G8LP is well known to VK's on the 20 and 10 metre bands these days.

BELOW THE BELT

THE week ended Saturday, May 17, 1947, was one of annoyance for VK2's using the 8 Mc/s band by reason of the depredations of a miscreant armed with what is most likely ex-Service equipment. Procedure has been reminiscent of interference tactics undertaken by the Allies to clutter up enemy ether lanes. Difference up enemy æther lanes. Difference is that in this amateur business, the enemy is within the camp and one wonders just what lies behind it. Technique of this outlaw has been to settle an interfering signal on station after station; swishing from side to side of the carrier, and occasionally shouting abuse into a microphone. If ever there has been an argument for the absolute condemnation of variable frequency oscillators, this has been one. My theory is that the equipment used is of the Number 11 set variety—equipment that Disposals dealers have been and are selling to anybody that passes the price over the counter. If the interference campaign continues, the matter should be taken up at once by W.I.A., working in conjunction with the P.M.G. It would not be a very difficult matter to organise, employing methods well-known to the Services in war-time. Careful observation and collation of reports will produce preliminary results, enabling a closer cordon. From then on, the procedure is obvious. Given enough rope the "joey" will hang himself. If he doesn't have enough gumption to know that the amateur fraternity is a resourceful one, no doubt his apparent immunity will be rudely dispelled ere long. Stations observed to have been deliberately interfered with on 18/5/47 were VK's 2ZX, 2NS, 2GS, 2ALZ, 2AIK, 2TC, 2CI and 3QG. There were undoubtedly others, including the writer's station. He laughs longest who laughs last!

* * *

Mal Urquhart (VK6ML) says, among a lot of other characteristically to the point remarks, a few things in Subiaco Radio Society's "Wavetrap" for May, '47, about overseas high grade receivers as advertised in "QST", etc. Stress is laid on the advt. "plugging" . . . page after page of it, with each and every dealer advising all and sundry to "get your XX49 at Joe's Radio Parlour" or somewhere. It's all fine business . . . for the W Ham (and QST) but it is enough to make overseas lads like ourselves weep. As Mal says, first tot up the valves and work out the Duty, and don't forget the Dollar exchange.

* * *

Then, even if you are a Croesus, have a crack at the Department of Indefinite Prohibitment, after which it will be better to contemplate some other hobby! Anyway, it is more appropriate and pleasurable to turn the other way for your high grade RX's, etc. The Mother Country produces radio goods par excellence, as witness the advent of a very FB Communications job with all that a Ham could wish for, under a very well-known and respected name. If anybody thinks that British radio engineers lag behind our Yankee friends, they should take a look over the workmanship in some of the war-produced, air-borne and other military gear. Take a look at the advts. in British magazines.

RANDOM RADIATIONS

Choice of the heading to discuss generalities among VK2's reminds me of the bloomer that Dr. Goebbels made early in the Blitz on Britain's south coast. Said his microphone mouthpiece: "Our Luftwaffe today made several raids and dropped bombs at random. This important military centre was very heavily damaged . . ." Englishmen still haven't located the place referred to as Random. All of which is by the way . . . looking over the dials at random one gleans quite a bit of chit-chat among the gang, particularly on 20 and 40.

At present the latter band is noteworthy for the advent of mobile marine VK2CM, operated on board H.V. "Bilkely," at present in bad WX around the Barrier Reef. This station is none other than the G.O.M. of Australian Amateur Radio himself, Charles D. Maclurcan, and the signal emanates from an ex-Army FS6. At times his CW is S9 during skeds with VK2NO and phone is around the S6 mark. It is well over 20 years since Charles last punched a key, but it proves nicely that a good fist never deteriorates . . . his sending is excellently spaced and legible.

* * *

The other morning a trio of stations in QSO were VK2CM, 3KU, and 2NO. Aggregate of years these operators have been actively interested in Amateur Radio totals 90 odd. VK2CM's first station was in 1910 on top of Sydney's old Wentworth Hotel . . . VK3KU (once 3BM) kicked off around the same period, and VK2NO was a pop-eyed English schoolboy who heard his first sigs from Eiffel Tower in 1911.

VK2HZ . . . Bill Moore, has been interested in 166 M/cs. from his Mountains QTH of Springwood, but other than the signal from Con, VK2LZ, at Wentworth Falls, his luck in pulling in Sydney stations has been completely negative. Seems as if a high gain beam is needed.

VK2WJ . . . John Peell, of Kingsford, is also up against a 166 M/cs. problem since he moved from his old QTH at Maroubra. It now takes John all his time to reach the Mountaineers on that band.

VK2AGU . . . Harry Hatton, the well-known DX exponent of 14 M/cs., recently completed his ninetieth QSO with G6XR on sked, and to celebrate put a rig on the 166 M/cs. band. So far Harry says his DX is fine . . . 2 miles.

* * *

VK2JU-2AJU . . . John Moyle . . . editor of our contemporary "R and H" is having a fine old time with mobile gear on 50 M/cs. Went down the South Coast on May 11 last, with excellent results from his car-borne 18 watts.

VK2AZ . . . Les Day . . . once of Brighton-le-Sands—off the air indefinitely, and a loss to the 50 M/cs. band around Sydney. The trouble? Ask the Minister for Housing!

VK2APW . . . Dick Rees, of Albury . . . back punching a key on 40 and threatens to go on speech to hold his own with the medley on the band. Has a receiver with 1900 K/cs. IF channel . . . back-to-back IFT's . . . and is now planning to pop a 3BQ crystal in for a gate.

VK2TI . . . Wal Ryan, of Kingsford . . . knocking the DX over in fine style on his number one favourite band, ten metres. G's and ZS's are easy pie since Wal installed a rotary for the band. Once a staunch supporter of the long wire, he reckons it really isn't in the race on Ten now.

VK2CI . . . Merewether . . . appears at week-ends on 40 and 20 and puts out excellent quality speech. Gordon has plans for a 60 feet high vertical antenna with phasing coils operated from ground by switches . . . but is taking good care to include a lightning switch system. Always a refreshing station to listen to . . . doesn't camouflage his remarks when annoyed! VK2ABD . . . Col Galbraith . . . back from USA and W6NY's shack. Had a grim kind of return sea voyage by all accounts.

VK2NP . . . Chas. Fryer, Gladesville . . . most reliable man in the VHF field around Sydney . . . right on the job with the WIA VHF section and as keen as it is possible to be. Sometimes heard on 40 CW . . . not phone.

VK2JZ . . . Alex Mather, Singleton . . . staged a comeback after years of absence and has a nice phone on 40. Alex doesn't think much of the drive that goes on oft-times, and says so.

VK2VU . . . Geoff. Partridge, Singleton . . . also back on 40 with a good phone signal but planning for Six metres. Geoff was a keen 56 M/cs. man pre-war, and made the epic two-way QSO with VK2LZ over 100 miles just before September, '39.

VK2WH . . . Hugh Stitt, Forbes . . . now has a nice signal since the AC power went on . . . and has discarded the faithful No. 11 . . . or is it in reserve, Hugh?

VK2DO . . . Roy Rayner, Yass . . . always has a wallop in Sydney with fine phone. Sounds like 5 Kw. instead of 50W. Says Roy: It's the antenna which is a centre-fed 100 foot top a la Handbook.

VK2JR . . . Joe Reed, the old-timer himself . . . as keen as ever on Ham radio, but has been on the sick list and holidaying in Yass. Too much industrial and not enough amateur RF Joe!

VK2FB . . . Frank Dickson, Croydon . . . not active on Ham bands, but goes mobile marine with the VCP around the harbour on 2810 K/cs. and 70 M/cs. Threatens to put phone on 40.

VK2ZN . . . Bill Cotterell, Dundas . . . has phone on 50 M/cs. dead and sticks to that band . . . another OT who never died, but only faded away for a while.

VK2KQ . . . Jack Early, Toronto . . . has had several QSO's on 50 M/cs. with VK2OC, Wyong . . . was heard in Sydney a few times . . . and is now active on 40 phone.

VK2KR . . . Cecil (Deener) Hardman, Woy Woy . . . heard with good phone on 40 and is one of a local group planning for 50 M/cs. Has lost none of his interest since the old 80 metre days in Gunnedah.

VK2LS . . . Lional Todd, Denistone . . . in between radio inspectoring is heard with nice speech and a strong signal on 50 and 7 M/cs. . . . as keen now as when he was 2CR, Tamworth, 20 years ago. Son Jim also a keen Ham with his own call sign, VK2UT.

VK2AX . . . Andy Kerr, Bronte . . . mostly heard on 40 phone and with Mac of VK2ML reminiscent of the Sunday morning harbour-table chats in the 1933 days.

VK2AIK . . . Cec. Horne, Matraville . . . has a great liking for his folded dipole on 20 which certainly justifies results on DX. Is active also on 40 when the going is too tough on 20 . . . (when is it otherwise?)

That's all for the present.

—VK2NO.

YOUNG LADY

QST reports that the youngest lady operator of a Ham transmitting station is Miss Georgette Ottney, 13 years of age, who actively operates VE3AMC, on c.w. with 35 watts to an 807. The youngest His is said to be W5LVZ, who is eleven years old. Contrast the attitude of the local authorities who won't even examine a candidate for the Amateur Certificate until he is 18 years of age.

TECHNICAL TOPICS

(Continued)

Want to find out if you *have* standing waves on that coax line? Lower the aerial so that it is possible to run your hand anywhere along the length of coaxial line; get somebody to watch the feedline ammeter in the shack; switch on the TX and run the hand along the line, grasping it firmly at various points. If the RF meter shows considerable change at some points there is plenty of unwanted voltage there. There will be normally some *slight* variation in reading as the line is grasped, but the "hot spots" will be at once evident. Yes, I know its a five-eighths mechanic's way of chasing standing waves, but it serves as a preliminary check!

Re that idea from N.Z. of using a twin-triode RF amplifier minus neutralisation in a cathode-follower/grounded-grid arrangement . . . I notice that one of U.S.A.'s most prominent FM and Television concerns has a receiver on the market applying the principle. If you have a 6SN7, 6J6 or other suitable twin-triode, the idea should be well worth investigation. With a receiver already using an octal-based RF stage, such as the 6U7G, 6K7, etc., very little wiring and additional alteration is needed to apply the 6SN7. Coil specifications remain unchanged. When possible an article will be run in "A.R.W." dealing fully with the development.

What to do with the excellent types of genemotors of the 18 and 24 volt D.C. input varieties one acquires in some forms of Disposals bargains, such as I.F.F. gear? These genemotors are beautifully made and will stand up to really hard work. Snag for the A.C. man is that they mostly do not have laminated fields, and therefore cannot be used on A.C. without heating. One answer is, of course, a dry rectifier outfit to supply a few D.C. amps, but cost thereof would be more than that of a ¼ h.p. A.C. motor. Country men with 30 volt D.C. home plants would have excellent use for these genemotors. Some take about 4 amps and give 400 volts for HT at 100 Ma. Years ago one paid out quite a lot of money for much less efficiently engineered outfits. These war-produced genemotors are superb jobs . . . they had to be to deal out the juice in aircraft, etc., under all conditions and for lengthy periods.

* * *

One of the neatest bits of humour I've yet heard from a Ham had something to do with coaxial cable and parabolic reflectors. It must have drawn a gale of laughter, especially when the intent to camouflage the "gen" was dispelled by a YL in the background. Which impels us to use something we NEVER do normally . . . thus . . . HI!

—D.B.K.

(*Continued on page* 41)

Shortwave Review

CONDUCTED BY
L. J. KEAST

NOTES FROM MY DIARY—

WHO DUNNIT?

According to the Sydney "Sun" of June 17, a bogus station in New Zealand startled radio listeners in Wellington on Sunday June 15 by announcing a declaration of war on Russia by Britain. New Zealand Post and Telegraph officials are on the warpath looking for some amateur broadcaster that may have "dunnit," most probably on a set sold by the War Assets Realisation Board.

OUR CANADIAN COUSINS

This issue will not be out in time to notify readers of the opening broadcast of the CBC special weekly transmission to New Zealand, but the channels selected, 11.72 and 9.61 mc.s. are the result of a check made by Arthur Cushen for the Canadian Broadcasting Corporation, and Sundays from 6—7 p.m. is the hour alloted. Mr. Cushen says they may get slight side interference from VLG-3 and JKE (9.605 mcs.) but this should not be much.

QUICK AS A FLASH

I have often moaned at the speed at which call signs and frequencies are given—I would say, in my opinion, one of the worst is one of the announcers who gives the particulars of the NBC stations, WNRI, etc., but talking of speed, here is a stunner.

According the "Daily Mirror," Sydney, the president of the National Broadcasting Company (Mr. Niles Trammel) said, a new radio communications system had been developed which could send 1,000,000 words a minute. The new system, which is called Ultrafax could transmit 50,000-word novels from New York to San Francisco in 60 seconds.

The workings were explained as follows: "Each printed page is treated as a picture and the pages are flashed in rapid success. At the receiving end, the pages are reproduced by high speed photographic processes."

Mr. Trammel said that the process may mean that the newspaper of the future will be delivered by radio.

* * *

SAYS WHO?

Arthur Cushen writes: "OAX4M, Radio Miraflores, Lima, Peru, signs in English at 2.55 p.m. and asks for reports and promises a nice veri. COBZ, Havana, 9.03 mc, 33.22 m, asks for reports when signing at 4 p.m. TG-2, Guatemala, 6.63 mc, 45.25 m, signs at 2.40 p.m. with fair signal."

* * *

Mr. H. Stevenson (Jr.) of New Farm, Brisbane writes: "This is my first report to you on shortwave stations. I have been a reader of your columns for about two years now, but this is the first time I have put pen to paper to write to you. I have only been DX-ing for about 3 weeks and one verification to offer. This was VLA-6, which was heard broadcasting a Requests for Forces programme. This station came in at very good strength with hardly any trace of fading and no static.

"I also heard KWID at 8.45 p.m. on 11.90 mc when giving a description of a baseball game, and KCBR on 17.78 mc, at 4.20 p.m. with a musical programme conducted by Lionel Barrymore. Both these stations came in at good signal strength. Hoping this report meets with your approval." (Yes, it is always nice to hear from newcomers and do not hesitate to ask for any information you think will help you in this grand hobby.—L.J.K.)

* * *

Rex Gillet reports that ADDIS ABABA on 9.62 mc, 31.19 m, can be heard well around 1 a.m. At 1.30 "Highlights and News Commentary of the Week" in English. Station closes at 2 a.m. with "This is Radio Addis Ababa saying Good Night."

Rex also says Johannesburg on 9.875 mc, 30.38 m is good at 12.45 a.m The station can be heard relaying the BBC news at 2 a.m.

NEW STATIONS

XENN, Mexico City, 11.78 mc, 25.47 m: This new Mexican, using the slogan "Radio Mundial" is reported by Arthur Cushen as heard well till 4 p.m. (This is a very fortunate logging as the station is, according to my American statistics only using 500 watts.—L.J.K.)

HCJB, Quito, 6.359 mc, 47.19 m.: And this new one from Ecuador is reported by Arthur Cushen. He says the signal is good till closing at 3 p.m. (I doubt if this would be audible in Sydney at that hour.—L.J.K.)

The BBC advise the following changes:

"Wavelength change operative June 1 onwards G.O. Service directed Norwest Pacific delete GRU 2—3 p.m."

"Wavelength changes operative June 15 onwards G.O. Service directed Southwest Pacific GST retimed 3.30—7 p.m."

WLWK, Cincinnati, 21.69 mc, 13.83 m.: This appears to me to be a new frequency for The Crosley Station and is beamed to Europe from 9.45 p.m. till 5 a.m.

XGOY, Chungking, 15.17 mc, 19.78 m: This Chinese station has wandered around on the 19 metre band, but this looks like a new spot. They are heard opening with Cantonese at 10.45 p.m. whilst at 11 o'clock news in English is given. Signal would be better if Moscow was not on the same frequency.

VP4RD, Port of Spain (Trinidad) 9.63 mc, 31.15 m: Here is a new station reported by Roger Legge of Binghampton, New York. Roger sent me an air mail letter advising that they are being heard with a twenty minute transmisson at 10 a.m., 11 a.m. and Noon. They ask for reports to be sent to Broadcasting House, Port of Spain, Trinidad. (At time of typing these notes I have not heard this station, but providing their power is fairly good we may hear them during the remaining few weeks of "Daylight" reception.—L.J.K.)

* * *

Here are ADDITIONAL calls and frequencies assigned to Berne, Switzerland:

HEU2	9.52mc	31.93m
HEU3	9.665	31.04m
HEU4	11.718	25.60m
HEU5	11.815	25.30m
HEU6	15.315	19.58m
HEU8	17.775	16.87m
HEU9	21.705	13.82m

I am indebted to Roger Legge for this information also.—L.J.K.

Radio Batavia, 6.175 mc, 48.58 m: This is a new frequency for Java, reported by Rex Gillet. It is heard at 8.30 p.m. giving news in English, but reception is only fair.

(This would appear to make 5 frequencies through which Radio Batavia can be heard at this hour. They are: 4.97, 9.557, 10.365, 15.145 and 6.175 mc.—L.J.K.)

Radio Batavia, 15.145 mc, 19.80 m: This new frequency is directed to Australia and Malaya and comes through at great strength. Its time on the air varies from 15 to 30 minutes. Rex Gillet also sent particulars of the above.

* * *

The following were, owing to pressure on space, omitted from June issue:

KNBA, San Francisco, 21.63 mc, 13.87m: This new frequency is used from 7 a.m.—8.15 a.m. directed to South America and from 8.30 a.m. —5 p.m. directed to Japan/China.

KNBI, San Francisco, 17.85 mc, 16.81 m: 8.30 a.m.—5 p.m. directed to Hawaii/Sth. Pacific and from 5.30 p.m.—6.45 p.m. except Mondays to China.

* * *

AUSTRALIAN BROADCASTING COMMISSION

VLH radiates the Interstate programme (3AR) and VLR the National programme (3LO).

The hours of operation are:

VLH—

Sundays:

6.45 a.m.—9 a.m., VLH-4, 11.88 mc, 25.25m.

9.15 a.m.—6.15 p.m., VLH-5, 15.23 mc, 19.69 m.

6.28 p.m.—12 M/n., VLH-3, 9.58 mc, 31.32 m.

Weekdays:

6 a.m.—9 a.m., VLH-4, 11.88 mc, 25.25 m.

9.15 a.m.—6.15 a.m., VLH-5, 15.23 mc, 19.69 m.

6.28 p.m.—12 M/n., VLH-3, 9.58 mc, 31.32 m.

VLR—

Sundays:

6.45 a.m.—8.15 a.m., VLR-2, 6.15 mc, 48.78 m.

8.30 a.m.—5.15 p.m., VLR, 9.54 mc, 31.45 m.

5.30 p.m.—12 M/n., VLR-2, 6.15 mc, 48.78 m.

Weekdays:

6 a.m.—8.15 a.m., VLR-2, 6.15 mc, 48.78 m.

8.30 a.m.—6.30 p.m., VLR, 9.54 mc, 31.45 m.

6.45 p.m.—12 M/n., VLR-2, 6.15 mc, 48.78 m.

VLG—

6 a.m.—8 a.m., VLG, 15.16 mc, 19.79 m.

(Sundays: 6.45—8.15.)

HERE ARE THE LATEST CROSLEY CORPORATION SCHEDULES

WLWK,	Cincinnati	15.25mc	19.67m	80.0	am—4.00	pm to	Latino-Americanas
WLWL	,,	15.13mc	19.83m	12.15	pm—1.15	pm To	Latino-Americanas (Except Mondays)
WLWO,	,,	11.79mc	25.45m	8.00	am—Noon	To	Latino-Americanas
				12.15	pm—1.15	pm To	Latino-Americanas (Except Mondays)
		6.08mc	49.34m	2.00	pm—4.00	pm To	Latino-Americanas
WLWR	,,	9.70mc	30.93m	8.00	am—4.00	pm To	Latino-Americanas
WLWS	,,	21.65mc	13.85m	7.45	am—4.00	pm To	Latino-Americanas
		11.71mc	25.62m	7.45	am—4.00	pm To	Latino-Americanas
*WLWK	,,	21.69mc	13.8 m	9.45	pm—5.00	am To	Europe
		15.25mc	19.67m	5.30	am—7.30	am To	Europe
WLWO,	,,	17.80mc	16.85m	9.45	pm—7.30	am To	Europe
WLWR,	,,	15.13mc	19.83m	9.45	pm—6.00	am To	Europe
				6.15	am—7.30	am To	North Africa
WLWS,	,,	21.65mc	13.85m	9.45	pm—7.30	am To	Europe
		21.65mc	13.85m	9.45	pm—7.30	am To	North Africa
WLWL,	,,	17.955mc	16.70m	9.45	pm—6.45	am To	Europe
		17.955mc	16.70m	9.45	pm—6.45	am To	North Africa

* Note new frequency.

HERE IS A HANDY CHART PREPARED IN A NEW FASHION THAT SHOULD BE USEFUL TO DX-LISTENERS WORKING ON A PARTICULAR BAND

It Comprises U.S. International Broadcasting Stations and Overseas Relay Stations in Frequency Order.

This is the latest information from the United States, and although schedules are subject to alteration without notice, it is expected they will obtain for some time.

Kcs.	*A.E.S.T.*	*Station Beam*
6080	2.00 p.m.- 4.00 p.m.	WLWO—Central America
6170	6.30 a.m.- 7.15 a.m.	Munich II—E. Europe
7290	2.00 a.m.- 7.15 a.m.	Munich I—Balkans
9490	7.00 p.m.- 2.00 a.m.	KNBI—Japan/China
9530	8.00 a.m.- 2.00 p.m.	WGEO—E. So. America
9540	2.00 a.m.- 7.15 a.m.	Munich IV—E. Europe
9570	10.00 p.m.- 2.00 a.m.	KWID—China/S.E. Asia
	9.00 a.m.- 1.00 p.m.	WRUW—E. So. America
	1.15 p.m.- 4.45 p.m.	KWID—Alaska (AFRS)
9610	4.00 a.m.- 8.45 a.m.	Algiers I—W. Europe
9650	5.30 p.m.- 6.45 p.m.	KNBA—Hawaii/Aust. (UN)
	(Exc. Mon.)	
	7.00 p.m.- 2.00 a.m.	KNBA—Hawaii/Aust.
	8.15 a.m.- 8.45 a.m.	WCDA—Caribbean
9670	10.00 a.m.-12.00 a.m.	WRCA—Brazil
	(Mon. from 10.15 a.m.)	
	12.15 p.m.- 1.15 p.m.	WRCA—E. So. America (UN)
	(Exc. Mon.)	
9700	7.00 p.m.-12.00 p.m.	KCBF—Japan/China (AFRS)
	8.00 a.m.- 4.00 p.m.	WLWR1—W. So. Amer./ Cent. Amer.
9750	7.00 p.m.-12.00 p.m.	KCBA—Phil./Guam (AFRS)
11710	7.45 a.m.- 4.00 p.m.	WLWS2—W. So. Amer./ Cent. Amer.
11730	7.00 p.m.- 2.00 a.m.	KGEX—Phil./E. Indies
	6.00 a.m.- 8.00 a.m.	WRUW—Europe (W.W.)
	8.15 a.m.- 8.45 a.m.	WRUL—Caribbean
	9.30 a.m.- 4.00 p.m.	WRUL—Central America
11765	4.00 a.m.- 8.45 a.m.	Algiers III—Balkans
11770	7.00 a.m.- 1.00 p.m.	KCBR—So. America
11790	7.00 p.m.- 2.00 a.m.	KNBX—China/S.E. Asia
	8.00 a.m.-12.00 a.m.	WLWO—E. So. America
	12.15 p.m.- 1.15 p.m.	WLWO—E. So. America (UN)
	(Exc. Mon.)	
11810	3.00 p.m.- 6.15 p.m.	KCBF—Alaska (AFRS)
	8.00 p.m.-10.15 p.m.	WOOW—Europe
	8.00 a.m.-12.00 a.m.	WGEA—Brazil
11830	8.15 a.m.- 8.45 a.m.	WCBN—Caribbean
	9.00 a.m.- 4.00 p.m.	WCBN—Mexico
11870	8.00 p.m.-10.15 p.m.	WBOS—Europe
	2.00 a.m.- 6.00 a.m.	Munich II—Europe
	9.30 a.m.-12.00 a.m.	WNRA—Europe (UN)
11890	7.00 p.m.-12.00 p.m.	KWIX—Japan/China (AFRS)
11900	5.00 p.m.- 9.30 p.m.	KWID—So. Pacific (AFRS)
15130	4.15 p.m.- 6.45 p.m.	KGEI—S.W. Pacific (AFRS)
	9.45 p.m.- 6.00 a.m.	WLWR1—Europe
	6.15 a.m.- 7.30 a.m.	WLWR1—No. Europe
	8.00 p.m.-10.45 a.m.	KGEI—Alaska/China (AFRS)
	12.15 p.m.- 1.15 p.m.	WLWL1—So. America (UN)
	(Exc. Mon.)	
15150	3.00 p.m.- 6.15 p.m.	KCBA—Alaska/China (AFRS)
	7.00 p.m.- 2.00 a.m.	KCBR—Phil./E. Indies
	2.15 a.m.- 7.30 a.m.	WRCA—Europe
	8.00 a.m.- 9.45 a.m.	WRCA—Brazil
	(Sun. to 10 a.m.)	
15200	12.00 p.m.- 9.15 a.m.	WOOC—Europe (UN)
	9.15 a.m.-12.00 a.m.	WOOC—Europe (UN)
15210	7.00 p.m.-12.00 p.m.	KGEI—Guam/Phil. (AFRS)
	12.15 a.m.- 3.45 a.m.	WBOS—No. Europe
	4.00 a.m.- 6.45 a.m.	WBOS—No. Europe (AFRS)
	7.00 a.m.- 1.00 p.m.	WBOS—So. America
15250	7.00 p.m.- 2.00 a.m.	KRHO—Phil./S.E. Asia
	5.30 a.m.- 7.30 a.m.	WLWK—Europe
	8.00 a.m.- 4.00 p.m.	WLWK—W. So. Amer./ Cent Amer.
15270	9.00 p.m.- 7.45 a.m.	WCBN—Europe
	8.00 a.m.-12.00 a.m.	WCRC—So. America.
15280	8.00 p.m.- 9.15 a.m.	WNRE—Europe
15290	9.00 p.m.- 5.00 a.m.	WRUL—Europe
	6.00 a.m.- 8.00 a.m.	WRUL—Europe (W.W.)
	8.30 a.m.- 1.00 p.m.	KWIX—Japan/China
15330	9.00 p.m.- 7.45 a.m.	WGEO—Europe
	8.00 a.m.- 1.00 p.m.	KNBX—So. America
	1.15 p.m.- 6.45 p.m.	KNBX—Japan/China (AFRS)
15350	8.00 p.m.-10.45 p.m.	WRUA/WRUS—No. Africa/Europe
	1.30 a.m.- 9.15 a.m.	WRUA/WRUS—No. Africa/Europe
	9.30 a.m.- 4.00 p.m.	WRUA/WRUS—Cent. Amer./Mexico
17750	9.00 p.m.- 3.15 a.m.	WRUW—Europe
	3.30 a.m.- 5.00 a.m.	WRUW—No. Europe
	8.15 a.m.- 8.45 a.m.	WRUW—Caribbean
17760	7.00 a.m.- 1.00 p.m.	KWID—So. America
	1.15 p.m.- 6.45 p.m.	KWIX—Japan/China (AFRS)
17770	8.00 a.m.- 9.15 a.m.	WOOW—Europe
17780	2.30 p.m.- 6.45 p.m.	KCBR—Japan/China (AFRS)
	8.00 p.m.- 7.30 a.m.	WNBI—Europe
	7.45 a.m.- 2.00 p.m.	WNBI—So. America
17800	5.30 p.m.- 6.45 p.m.	KRHO—China (UN)
	(Exc. Mon.)	
	9.45 p.m.- 7.30 a.m.	WLWO—Europe
	8.00 a.m.-11.15 a.m.	KRHO—Phil./S.E. Asia
	12.00 a.m.- 4.00 p.m.	KRHO—Japan/China/Phil. (AFRS)
17830	9.00 p.m.- 7.45 a.m.	WCBX—Europe
	8.00 a.m.-12.00 a.m.	WCBX—Brazil
	12.15 p.m.- 1.15 p.m.	WCBX—So. America
	(Exc. Mon.)	(UN)
17850	5.30 p.m.- 6.45 p.m.	KNBI—China (UN)
	(Exc. Mon.)	
	8.30 a.m.- 5.00 p.m.	KNBI—Hawaii/So. Pacific
17880	12.00 p.m.- 7.00 a.m.	WGEX—Europe
	7.00 a.m.- 1.00 p.m.	KGEX—So. America
	1.15 p.m.- 6.45 p.m.	KGEX—Guam/Phil. (AFRS)
17955	9.45 p.m.- 6.45 a.m.	WLWL1/2—Europe/No. Africa
18160	8.00 p.m.- 9.15 a.m.	WNRA—Europe (UN)
	9.15 a.m.-12.00 a.m.	WNRA—Europe (UN)
21460	8.00 a.m.- 2.30 p.m.	KCBA—Phil./Guam (AFRS)

(Continued)

21490	11.00 a.m.- 4.00 p.m.	KGEI—S.W. Pacific (AFRS)
21500	10.30 p.m.- 7.30 a.m.	WOOW—Europe
21570	9.00 p.m.- 7.45 a.m.	WCRC—Europe
	9.00 a.m.- 1.00 p.m.	WCDA—So. America
21590	9.00 p.m.- 7.45 a.m.	WGEA—Europe
21610	12.00 p.m.- 9.15 a.m.	WNRA—Europe (UN)
21630	7.00 a.m.- 8.15 a.m.	KNBA—So. America
	8.30 a.m.- 5.00 p.m.	KNBA—Japan/China
21650	9.45 p.m.- 7.30 a.m.	WLWS1/2—Europe/ No. Africa
	7.45 a.m.- 4.00 p.m.	WLWS1—W. So. America
21690	9.45 p.m.- 5.00 a.m.	WLWK—Europe
21730	8.00 p.m.- 9.15 a.m.	WNRX—Europe
21740	8.00 a.m.- 2.30 p.m.	KCBF—Japan/China (AFRS)

CANADIAN BROADCASTS TO AUSTRALIA AND NEW ZEALAND

These have now commenced and I was able to hear the first broadcast on Monday, June 30, thanks to a 'phone ring from Mr. Hepburn, of Croydon. The two channels were CHOL, 11.72 mc, 25.6 m, and CHLS, 9. 61 mc. 31.22 m. The signals from 6—7 p.m. were EXCELLENT. It may interest the engineers of the CBC to hear that the speech given by both the Rt. Hon. Francis Forde and Rt. Hon. James Thorne came through clearer than the musical records.

The June 30 broadcast was given again on Tuesday, July 1, and we were informed the next would be on Sunday, July 6. It is intended to broadcast each Sunday night. The announcer is Tim Crowe and all correct reports to International Service of CBS, Box 7000, Montreal, Canada, will be verified.

The signals were absolutely in the clear and compare favourably with any of the West Coast of America transmissions. The CBC are particularly anxious to receive reports from Western Australia and any of the Islands in the Pacific.

TECHNICAL TOPICS

(Continued)

Your scribe has for disposal an excellent receiver either for the Ham or SWL. It is a remodelled "Reception Set No. 4" made by Philips during the war for armoured vehicle applications. As No. 4 stood, it was a pretty good performer, but this one is streets ahead. It now uses 1851 RF stage with ECH35 mixer-oscillator. Speaker output with full volume is provided for by an alternative audio channel to the original using a 6V6G. Range of No. 4 is 1.2 to 20 M/cs. in four switched bands with BFO, AVC, and Crash Limiter. Antenna switching provides for doublet or plain aerial from the front panel. By a throw of a multiple switch the receiver functions on 230-260 volts, AC, or from a 6 volt accumulator. A sturdy vibrator pack is built in for the DC purpose . . . a very handy point for the country user. Sole reason for offering this receiver for sale is that because of developmental and experimental work with individually designed equipment at VK-2NO, there is just not the use for this No. 4 that some Ham or SWL could put it to. There is one stipulation. Whoever acquires it will have to come and get it.

Speedy Query Service

A.W. (Kingsford) asks about disposal gear.

A.—Unless distinctly advertised as "brand new" it is fairly safe to assume that the gear is second hand, in fact in many cases, just junk which has been lying around under a bag in a tropic jungle for a couple of years after having been declared useless. If you can go along and inspect, you may be able to pick out second hand stuff which is still in good condition, but otherwise we advise you to go after sets which are new.

* * *

P.E.S. (Geelong) wants characteristics of the VT90 "Micropup" valve which he has obtained from salvage gear.

A.—The filament is rated 8.25 volts at 7 amperes. Plate takes up to 1,000 volts at 100 milliamps with 20 volts negative bias. They are O.K. for use on frequencies up to 300 megacycles. Internal capacities are rated 4.45 mmfd. from plate to grid and 2.85 mmfd. grid to heater.

* * *

R.A.D. (Echuca) wants to know where he can get a set of coils to suit the 6SA7GT converter valve.

A.—We haven't seen any about the trade so far, but we have heard that R.C.S. have a miniature iron-clad unit scheduled for early production which has been designed to make the most of the 6SA7. Probably these new R.C.S. coils will be on the market by the time this appears in print.

* * *

R.L.G. (Marrickville) has an Air Force transceiver, type T1138, R1139, and wants to know something of the valves fitted.

A.—These are mostly standard type of English valves of the two-volt battery-operated style, with English sockets and socket connections. The VT50 is equal to the HL2K, the VT51 is equivalent to the Pen 220A, VR18 is the same as the 215SG, and the VR22 is like the 220PA, power triode. The VR35 is a twin pentode similar to the Osram QP21, designed for quiescent push-pull, but used as a pre-amplifier in this outfit.

* * *

B.C.G. (Bendigo) enquires about circuit for the Kinglsey "Ferrotune" units.

A.—Yes, we have described several sets using the Ferrotune units. The first was the Ferrotune 5-valve set in the May, 1946, issue. A direct-coupled circuit with Ferrotune appeared in the July, 1946 issue. A modern version of the Reinartz appeared in the August, 1946, issue and a four-valve mantel model was described in the November, 1946, issue. All used Kingsley "Ferrotune." These back numbers are available at 1/- each, post free direct from this office, or from the Technical Book & Magazine Co. of 297 Swanston Street, Melbourne, if you are in town.

BACK NUMBERS

Back numbers of all 1946 and 1947 issues, *except March*, 1946, are available at 1/- each, post free from Australasian Radio World, Mornington, Victoria, or direct from the Technical Book and Magazine Co., 297 Swanston Street, Melbourne.

BARGAIN CORNER

Advertisements for insertion in this column are accepted free of charge from readers who are direct subscribers or who have a regular order placed with a newsagent. Only one advertisement per issue is allowed to any subscriber. Maximum 16 words. When sending in your advertisement be sure to mention the name of the agent with whom you have your order placed, or your receipt number if you are a direct subscriber

FOR SALE.—7-valve portable amplifier, 2 turntables, crystal p.u., crystal microphone, G12, PM speaker, large collapsable baffle. Ring LF 6038 (Melbourne).

WANTED TO SELL.—12-watt Amplifier, P.P. 2A3's, and 12" Alnico permag. speaker, good tone. £16. "Alnico," c/o Radio World, Mornington, Vic.

WANTED.—Someone to build or sell me a small receiver for DX work, battery-operated. Write to D. Ardis c/o H. Baalman, Private Bag, Boolarra, South Gippsland, Vic.

WANTED TO BUY.—Camera, Super Ikonta, or similar with coupled range-finder, not 35 mm. Will trade Popular Pressman Reflex if desired. "Optic," c/o Radio World, Mornington, Vic.

WANTED TO BUY.—Palec VCT or similar valve and circuit tester, for a.c. operation. "No. 1111," c/o Radio World, Mornington, Vic.

FOR SALE.—Back numbers of "Q.S.T.," 1943 to 1946. 1/- each. Write to "Hammer," c/o Radio World, Mornington, Vic.

FOR SALE.—Philips No. 4 reception set, perfect order, £30. M. Darwen, William Street, Rosewood, Queensland.

SLIPS

The value of the resistor in the bass boost circuit on page 12 of the may issue is 3,000 ohms.

In the May issue the socket connections of the VR65A showed G in mistake for C. The cap is the grid connection.

In the June issue the photographs of the converter were of a version using a rotary turret.

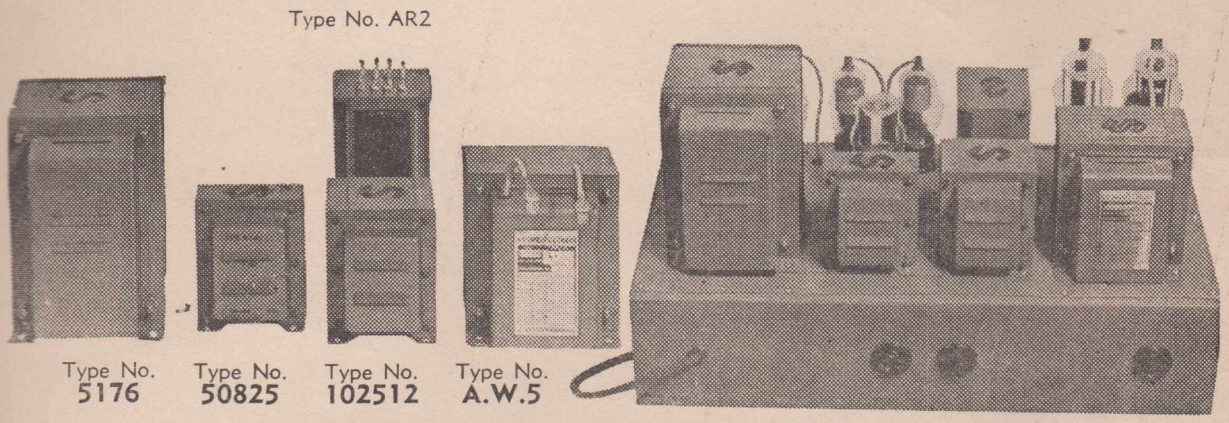
On page 10 of the June issue the coil data is slightly confused by the "For 28-30 Mcs. line being placed above, instead of below, the 7-turn oscillator coil data.

RED LINE

EQUIPMENT

TRANSFORMERS and CHOKES

For the F.F.R. Amplifier



Type No. AR2

Type No. 5176 | Type No. 50825 | Type No. 102512 | Type No. A.W.5

PRECISION IN DESIGN AND CONSTRUCTION

Your Transformer problem will be transformed from a headache to that craftsman-built component which you desire but cannot quite figure out. Swales and Swann specialise in Audio Frequency Transformers up to Frequency Modulation Standards; Power Transformers up to 2 K.W. rating.

BUT

See Swales and Swann for Transformers of ANY specification, whether they are required for Industrial Applications, Electronic Controls, Broadcasting, Amateur Transmitting or Public Address Systems.

★ **Pamphlet describing design and construction of the Full Frequency Range Amplifier available from**

SWALES & SWANN

Technical Service, Wholesale and Manufacturers

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MU 6895 (3 Lines)

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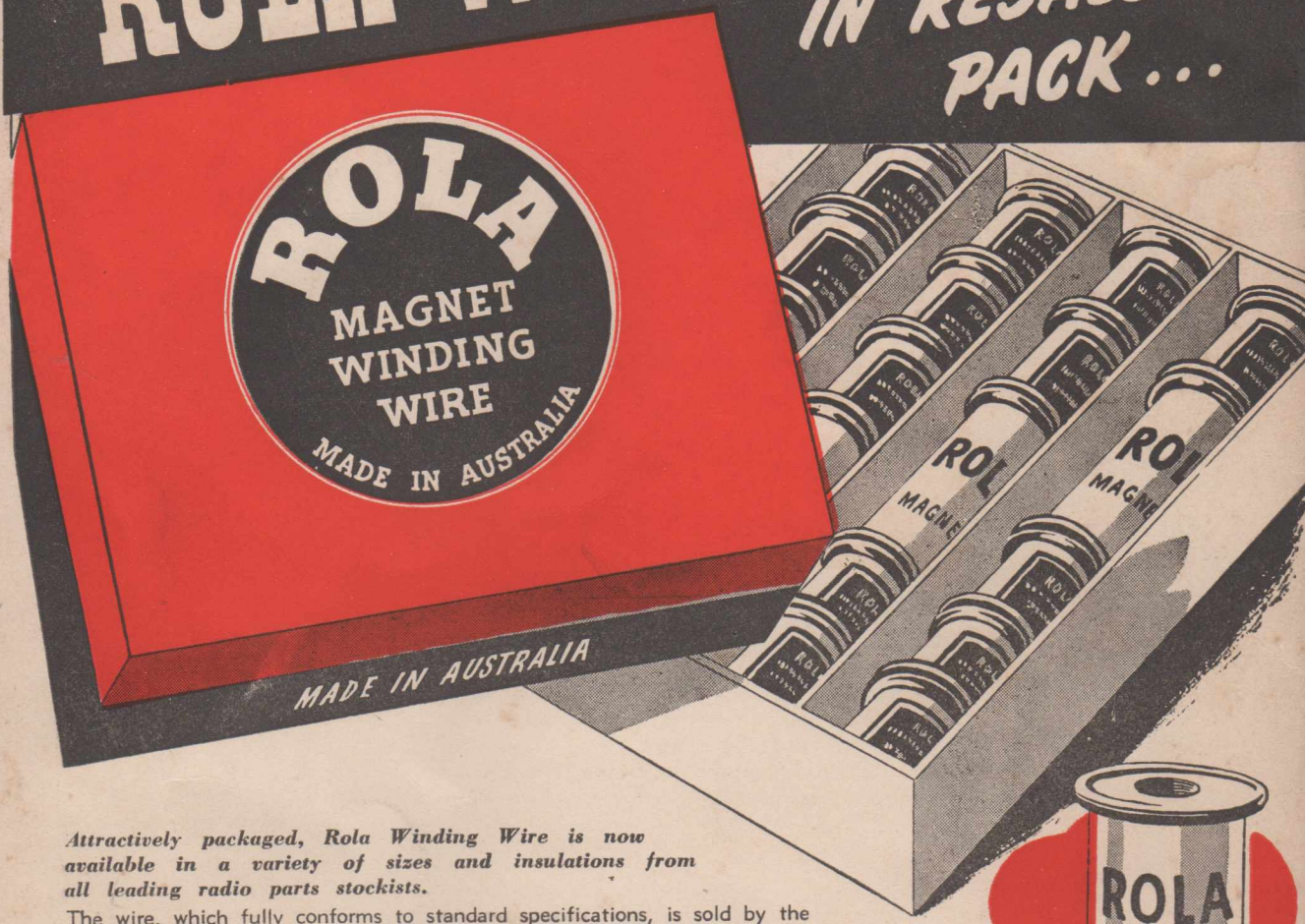
A GUARANTEE OF DEPENDABILITY

ROLA WIRE

NOW AVAILABLE IN RESALE PACK . . .



Attractively packaged, Rola Winding Wire is now available in a variety of sizes and insulations from all leading radio parts stockists.

The wire, which fully conforms to standard specifications, is sold by the ounce on two sizes of spools which contain from ½ oz. to 8 oz. and from 9 oz. to 15 oz. respectively.

The range of gauges is from 21 to 39 B & S and insulations include enamel, enamel and cotton, enamel and paper, enamel and artificial silk.

Rola wire is ideal for all forms of coil and armature winding . . . place your order NOW!

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