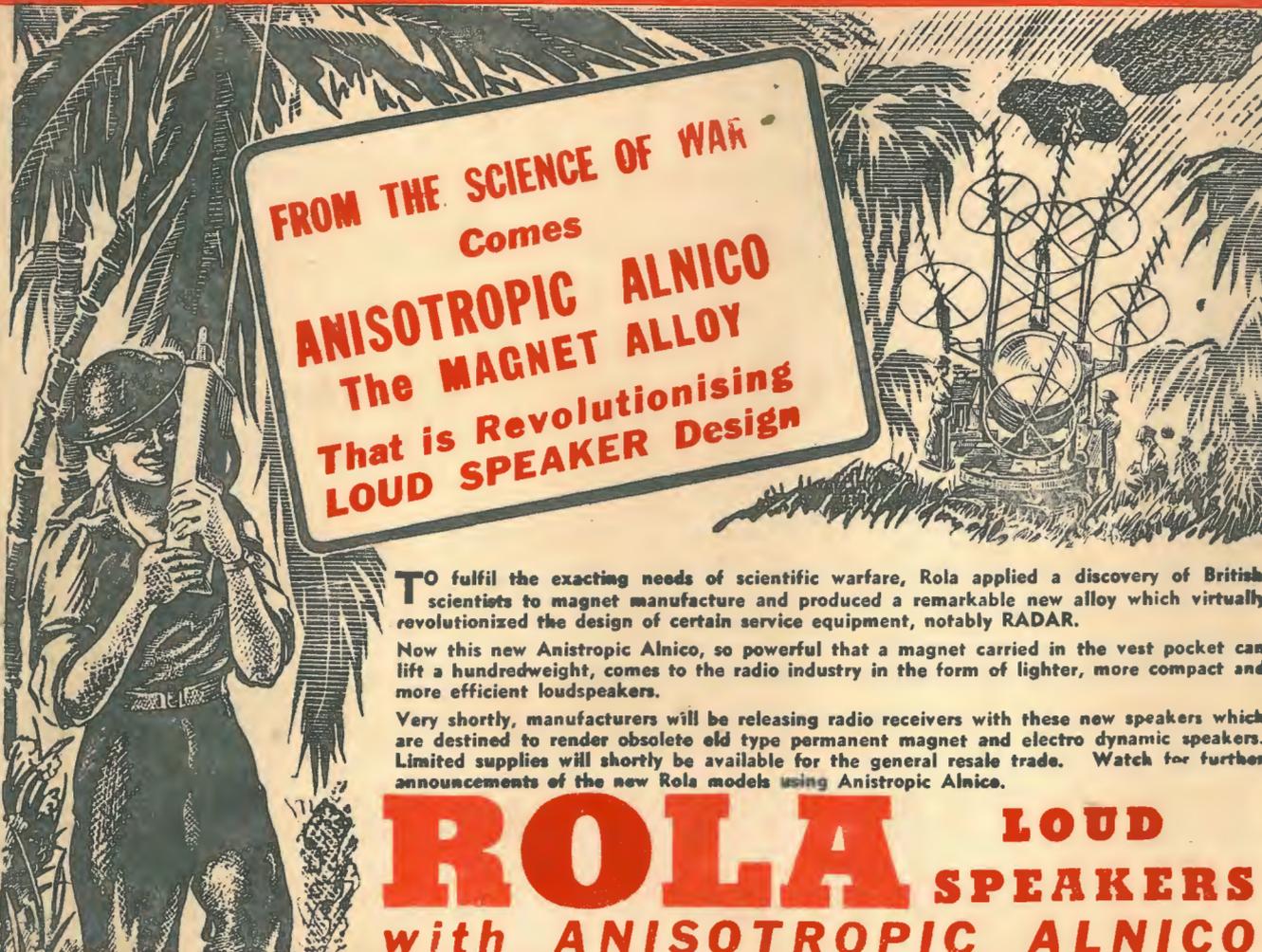


THE
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VOL. 11 NO. 4

1/-
SEPTEMBER 15, 1946



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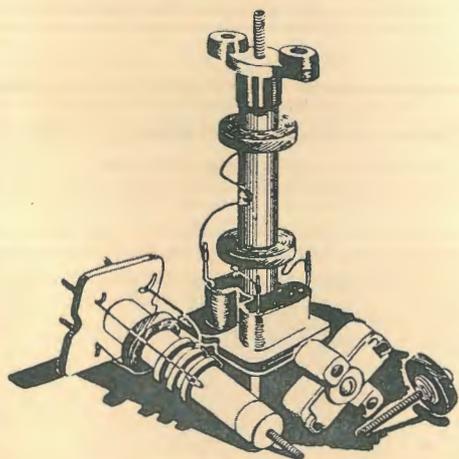
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VOL. 11 SEPTEMBER, 1946 No. 4

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EDITORIAL

Again and again crops up the matter of the application of the morse code test as a gauge of a person's suitability to be granted an operator's certificate.

In this morning's mail is a letter from a radio enthusiast who is undoubtedly a fellow of the type who would make the best possible use of a transmitting licence, and who has seen several years of service as a radio mechanic, with the R.A.A.F. But his doctor has given him strict orders that he is not to tax his nerves by attempting the strenuous concentration necessary to master the code.

To some people the morse code comes easily, to others it is a nightmare. Strangely enough, it is not the intelligently dumb or the reckless irresponsibles who have the most difficulty with the code.

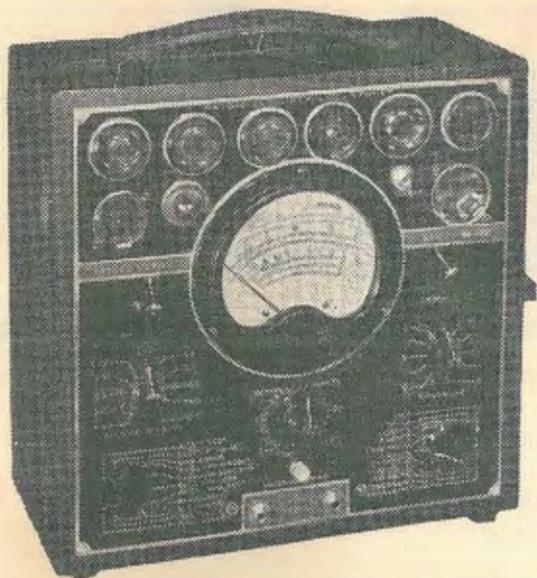
For fifteen years past I have battled on this particular subject without making any noticeable impression on anyone, except to offend several people with an editorial I wrote for "Wireless Weekly" about ten years ago, when I said something about the morse code test being proof that a person has the mentality of a parrot, rather than proof of his ability to handle a transmitter.

There may be justification for a knowledge of morse code by those who use the communication bands, but is there no chance of a relaxation of the Regulation for those who want a licence to operate radio-controlled models?

—A. G. HULL.

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Designed to cover the many and varied needs of the radio serviceman or technician, the “PALEC” VCT is a true multimeter. Housed in an attractive portable case, it measures 11 x 11 x 7 inches and weighs 16½ lbs. It is supplied for operation from 50 cycle A.C. mains with voltage from 200 to 250. A special battery operated model—the VCT/V—is also available. This is arranged for alternative A.C. mains operation or 6 volt accumulator.

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RESISTANCE: There are four ranges of resistance measurement: 0.2/30 Ohms, 10/20,000 Ohms, 100/200,000 Ohms, 5,000 Ohms/10 Megohms. The Megohms range operates at 225 volts D.C. and is, therefore, useful for measuring insulation resistance of conductors, condensers, etc.

O/PT VOLTS: This function covers those A.C. voltage ranges useful for output measurement, when carrying out radio alignment with an oscillator.

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IF IT'S ELECTRICAL — TRY HOMECRAFTS FIRST

A BAND CHECKER

Describing an easily constructed, but vitally important item of equipment for the modern Amateur radio station. It "spots" the limits of the various bands through the H.F. spectrum as high as 60 m/Cs. and provides 10 kcs. calibration points at will. This instrument comprises the amateur's own frequency standard at relatively low cost.

THOSE who have lived long with amateur radio are agreed that in the next few years there is likely to be a vast increase in the numbers of transmitting amateurs, proportionately in Australia, as elsewhere. That increase will follow naturally upon re-allocation of the "popular" bands. V-H-F work at frequencies of 28 m/Cs. and above is one thing,

By

DON B. KNOCK .
(VK2NO)

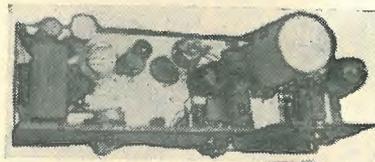
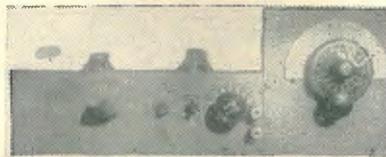
but the *general communication* bands are another. Despite the fact that here in Australia we are primarily "experimenters" at heart, the majority are plainly amateurs, who like to pull switches and converse with fellow enthusiasts far and wide. It is the "far and wide" aspect that appeals particularly to the younger generation. In other words — DX has the appeal; and in that I include such "DX" as working out of one's town or city to others — interstate and cross country — as well as overseas! As the DX bands became populated, congestion is inevitable. Pre-war allocation for Australians on "20" was the complete width of the band as made available by International Conference. The range was 14,000 to 14,400 kcs. and as such it was an extremely crowded region. Recently this band was made available partially, the present range (for VK's) being 14,100 to 14,300 kcs. Inside this region, half the pre-war allocation, there is now

plenty of congestion. "Forty" is in more dire straits, for there Australians are, at present, permitted only 50 kcs. in the centre of the previous 300 kcs. It is almost impossible to operate therein without continual inter-station QRM. What I am aiming at in introducing this "Band-Checker" is the need, more than at any time, for attention to band limits. Choice of quartz crystals to fall at the extreme edges is usually avoided by those who prefer to be on the safe side, but for stations using Variable Frequency Oscillator control — more than average care is imperative. Regulations decree that the licensee must have suitable frequency measuring equipment at his station, implying thereby well-made and reasonably accurate frequency metering gear of unpretentious but practical design. There's nothing to the making of a "Freqmeter," but calibrating it is another story for many. The piece of equipment described here provides a sub-standard from which a "Freqmeter" and/or receiver may be calibrated.

From the photographs and diagram you can see that there is nothing formidable about it — it is made up from parts that are easily obtainable. Since I made it up and put it to work it has proved to be an indispensable instrument. Construction is no more difficult than the building of a small receiver or power supply, and as such it is easy enough for the practical "ham" to undertake. If, however, you are not what I call "frequency conscious" then it may be better to leave it to the manufacturer to provide a commercial product.

THE CIRCUIT

Examination of the circuit diagram shows that the arrangement comprises three valves and a rectifier/power supply. Heart of the scheme is the 100 kcs. oscillator, an "electron-coupled" or Hartley oscillator employing a 6U7G with a screened coil unit. This is followed by a harmonic amplifier, for which purpose a 6J8G is particularly suitable. Mixing is also done by this valve by feeding the output of a 10 kcs. Multivibrator, a 6N7, to the Triode grid and anodes combined as an injection grid. Another valve suitable for this purpose is the 6L7, but which appears to be unobtainable. The Multivibrator being rich in harmonics, modulates each 100 kcs. signal at 10 kcs. as required, the effect then being that the output of the harmonic amplifier shows a series of carriers 10 kcs. apart, amplified at whatever part of the H.F. spectrum you require, by tuning the plate of the 6J8G to suit. With the Multivibrator "OFF," you have 100 kcs.



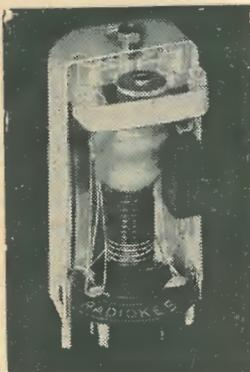
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CHECKER

(Continued)

signals across the range you require, or, by changing the oscillator coil, 1000 or 10,000 kcs. signals. The oscillator coils are made up in a screened plug-in assembly and are interchangeable in the way one changes shortwave receiver plug-in coils. A 4-pin valve socket is used for the mounting, and the coils are built on a 4-pin valve base, projecting through the cylindrical coil can.

It will be obvious to many that instead of using a self-excited oscillator, it may readily be replaced by a 100 kcs. crystal oscillator, if you are fortunate enough to possess such a crystal. Average reader is not likely to have such crystals, and it is for the man with access to the usual components that this article is written. So far as its plate is concerned, the 6J8G is applied as a normal R.F. amplifier, with untuned grid circuit coupled through a small capacity from the oscillator in the usual manner. Plug-in coils, wound on valve bases, are used to provide the desired tuning range. Reference is made to valve-base coils, but the pre-war plain and ribbed moulded plug-in formers are, of course, a better answer. These have been scarce, but are on their way back to the market again. When short of such coil formers, my own expedient is a valve base (Micanol for preference) and a length of suitable tubing fitted over it.

MULTIVIBRATOR

Even without this part of the instrument, the 100 kcs. oscillator and harmonic amplifier are useful enough, but inclusion of the 10 kcs. Multivibrator extends the use enormously. It means that you can calibrate your receiver bandspread dial quite accurately to divisions of 10 kcs. A 6N7 valve is used, but any other double triode such as the 79, 6A6, etc., can be applied. Or, if you don't mind extra space, you can use two triodes, such as 6J5, 6C5, 76, etc. The two grids and anodes are cross-connected to form

a resistance-capacity oscillator, the frequency of which depends primarily on the values of R and C applied. It is easily "locked" by another oscillator working at a frequency much higher than that of the Multivibrator. Values of R and C shown in the diagram put the MV fundamental frequency at around 10 kcs. This frequency is controlled by the 15,000 ohm variable resistance in the grid of one section of the 6N7 and by adjusting this control, with the E-C oscillator on 100 kcs., the MV can be made to "lock" on its 8th to 12th harmonics. As it happens, the 10th falls at mid-scale on the variable resistance. Some grid bias is provided by the 300 ohm cathode resistor and this is also used to provide coupling between MV and Oscillator, through the 20 mmf. condenser. The switch SW cuts out the MV when it is not required.

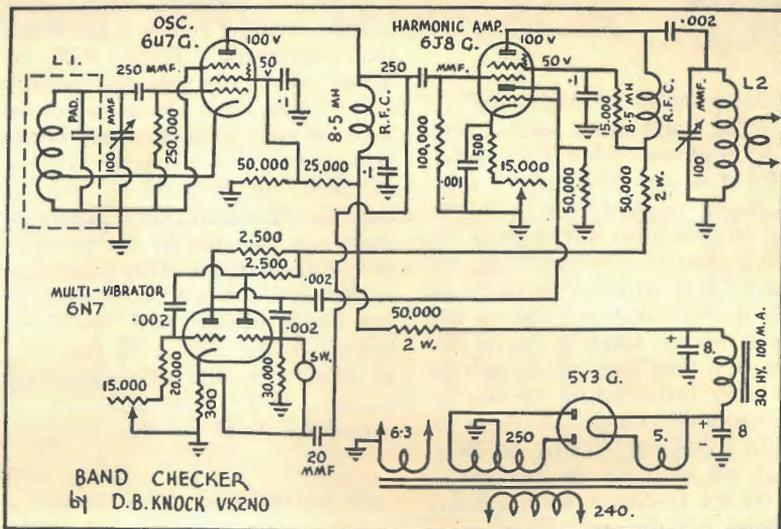
POWER SUPPLY

This is quite conventional and uses a small power transformer to give 250 volts with 5Y3G (or 80) rectifier, 30HY filter choke, and the usual 8 mfd. electrolytic filtering condensers. There is one item that could be included in connection with power supply and that is a voltage regulator tube of the VR150/30 type. This could be used to hold the oscillator anode and screen voltages constant. It is not essential, however, and the writer's "Band-Checker" functions quite nicely without it. The power supply is built on the same chassis as the rest of the instrument, but could be used in a separate unit with cable connector if desired.

CONSTRUCTION AND COIL DATA

The illustrations show how the writer's instrument is laid out, and I wish to emphasise that it is not necessary to follow this actual arrangement. You can make it up in any physical dimensions and shape that takes your fancy, but if you include the power supply on the same chassis, keep it well away from the oscillator portion. Heat generated by a power transformer and rectifier can affect oscillator stability. Looking at the plan view,

from left to right are the power section, and next, the 6N7 multi-vibrator valve. Necessary resistors and fixed condensers are underneath the chassis. At the rear centre is the 6J8G mixer/amplifier valve (which is not screened) with plug-in coil and tuning condenser. At the right, on a slightly raised platform, is the oscillator section, with the 6U7G valve at the extreme right. Incidentally, you don't *have* to use this type of valve, any other suitable pentode will serve equally well. Shielding of the oscillator coil is not just a fad; it is useful to avoid frequency changes caused by capacity effects to the user's hand, and it also serves as a baffle against temperature variations. *Solid construction is important in the oscillator wiring and assembly.* If you use flimsy wiring, or a tuning condenser with uncertain bearings, etc., you will experience trouble with frequency shift, or drift. Incidentally, the experienced constructor could make up an oscillator unit with *switched* screened coils, instead of the plug-in idea. The output coil (harmonic amplifier) is unshielded. All values of resistance and capacity are indicated on the circuit diagram, and inductance details are as follows:



OSCILLATOR ADJUSTMENT
 First step in making use of the instrument is to ensure that the oscillator is functioning at 100 kcs., and not at any plus or minus frequency. This is not a difficult matter in these days of broadcasting stations operating at accurately determined frequencies. The oscillator should be controlled from the front panel by a vernier dial, preferably one on which the posi-

tions for 100, 1000, and 10,000 kcs., can be marked once the setting has been determined. *A broadcast receiver is a necessary part of the procedure for setting the oscillator, which may be done without the harmonic amplifier in action.* Tune the receiver to a station which is at some harmonic of 100 kcs. — the writer uses 2NR (700 kcs.)

(Continued on next page)

OSCILLATOR —

L1 100 Kcs.

11 turns, 22 SWG enam. copper wire on 1 3/8-in. diameter form, tapped 1 turn from earth end for cathode. Shielded. Plug-in on 4 pin base.

L1 1000 Kcs.

8.5 Millihenry R.F. Choke (R.C.S.) tapped for cathode lead between 2nd and 3rd small honeycomb windings. Padder condenser .00035 mfd. mica. Shielded. Plug-in on 4 pin base.

L1 10,000 Kcs.

110 turns 22 SWG enam. copper wire on 1 1/2-in. diameter form, tapped at 20 turns from earth end for cathode. Shielded. Plug-in on 4 pin base.

HARMONIC AMPLIFIER:

| | | |
|-----------------------|----------------|--|
| 550— 1200...Kcs. | 130 turns | 30 enam copper* |
| 1200— 3300 Kcs. | 70 turns | 22 enam. copper. |
| 3300— 7500 Kcs. | 22 turns | 22 enam. copper. length 1-inch. |
| 6800—15000 Kcs. | 11 turns | 22 enam. copper length 1-inch. |
| 13500—32000 Kcs. | 5 turns | 22 enam. copper length 1-inch. |
| 40— 60 Mcs. | 3 spaced turns | 22 enam. copper 1-inch diameter, air-wound, inside 5 pin plug-in former. |

All coils except for 60 m/Cs. wound on 1 1/2-in. diameter forms with two turn coupling link for output. Plug-in on 5 pin base.

CHECKER

(Continued)

for the purpose — others suitable are 7ZL (600 kcs.) 4QG (800 kcs.), 2LM and 7AD (900 kcs.), 4MB, 4CA and 7EX (1000 kcs.) and so on — and arrange a wire from the amplifier output near the receiving aerial. The oscillator condenser C1 is adjusted to zero beat with the broadcasting station and then a check is taken to ensure that there is a zero beat condition with the other broadcasting stations on harmonics of 100 kcs. If these are within a reasonable value, 50 cycles or so, the oscillator is correctly set to 100 kcs. It should be unnecessary to point out that this procedure is undertaken only after the oscillator has been running for a fair "warm up" period.

H.F. CHECKING

Next move is to use the instrument against a receiver covering the shortwave ranges, including those standard frequencies used by the American Bureau of Standards, Station WWV. At almost any time of the 24 hours, one or more of these transmissions are audible in Australia. They are: 5,000, 10,000 and 15,000 kcs. The 2,500 kcs. signal is not normally audible, although I have frequently heard this at my location. Assume that you use the 10,000 kcs WWV signal for the purpose. The coil to place in the 6J8G anode circuit is the 11 turn one, covering from 6800 to 15,000 kcs. Connect the wire from the amplifier output to the shortwave receiver (two or three turns of this wrapped around the aerial lead is usually sufficient) and note if the 10 m/Cs. harmonic from the instrument shows zero beat with WWV. It may be a few cycles off, but a careful touch to the oscillator dial will restore this. With the 11 turn coil in place, you are then ready to check your 100 kcs. positions over the "20 metre" band. Assuming you know from receiver observation roughly where the band is on the band-spread dial, it is easy enough to determine the

14,000 kcs. position, where there will be a strong steady signal from the instrument. There will be others at 14,100, 14,200, 14,300 and 14,400. Once you are sure you have the right position of the 14000 kcs. marker, it is advisable to leave the aerial off the receiver, and use only the "Band-checker," otherwise confusion can arise by the presence of external signal. This procedure is the same for any points through the whole of the H.F. spectrum, but, of course, it is really necessary to have a means of establishing markers. WWV's transmissions are extremely useful for this.

MULTIVIBRATOR ADJUSTMENT

Assume that you have calibrated your receiver dial for 100 kcs. points over an amateur band, and the 10 kcs. sub-division is to be undertaken. The MV switch "SW" is opened and immediately a mass of signals should appear in the band. The number of these carriers must be counted between the 100 kcs. known spots and if 9 additional signals are heard, the MV is locking at its 10th harmonic. With the oscillator at 100 kcs. this means that the signals are 10 kcs. apart. If 7 additional carriers are heard, the MV is at the 8th harmonic and signals would then be 12.5 kcs. apart. Variation of the 15,000 ohm resistor will show a sudden jumping of these intermediate signals

RADIO CONTROL

A frequency has now been allocated in England for the radio remote control of models. It is 460.5 Mc/s. Five watts is the maximum permissible power and the regulation stipulates that there must be no radiation outside the limits of 460-461 Mc/s.

Notification of the intention to use radio control should be given to Radio Branch, G.P.O., London.

as the control passes from one harmonic to another. Usually, the 100 kcs. signals are much stronger and are easily identified. If there is any doubt about this, the MV switch can be closed momentarily, and the 100 kcs. signals will still remain.

UNKNOWN FREQUENCY CHECKS

For extension of measurements to the high frequency ranges, the 50-54 m/Cs. band for example, the extra oscillator coils are used, with, of course, a suitable receiver. First move is to locate 1000 kcs. which is easily done by checking against a B.C. station at that frequency. The harmonics will now be spaced at 1000 kcs. intervals and when the 3 turn coil is plugged into the amplifier and the output coupled to a 50 m/Cs. receiver, there should be no trouble in picking the correct points for 50,000, 51,000, 52,000, 53,000 and 54,000 kcs. Adjacent harmonics are far enough from the band edges so that no doubt will exist as to the correct points. 10,000 kcs. intervals may be checked by similar procedure.

The difference between this "Band-Checker" and the usual Amateur Band "Frequency Meter" is that measurements can be made anywhere in the H.F. spectrum. No calibration curves are needed. Possession of the two types of instruments is a distinct advantage for amateur band checking, and that is what we are concerned with primarily. Idea of this instrument is not new in any way — it appeared in "QST" some years ago, but it is in these congested days of amateur radio, something that the seriously disposed experimenter should not be without. The circuit diagram with all values marked, is sufficient guide, together with coil data, to make up a similar piece of equipment, and I know that if you do, you will wonder how you managed without it beforehand.

*M.I.R.E. (Aust.) Experimental Radio Equipment Department, Philips Electrical Industries of Aust. Pty. Ltd.

A REGENERATIVE PRE - SELECTOR UNIT

Much higher sensitivity and an improved signal-to-noise ratio can be obtained on the short waves from any 4/5 dual-wave superhet, by using this regenerative booster unit.

THE average 4/5 dual-wave superhet will normally bring in the main shortwave stations throughout the world at satisfactory volume, but the average DX enthusiast is rarely satisfied with the restricted amount of gain given by a set of this type.

The cheapest way of boosting up its DX capabilities is to use a regenerative pre-selector unit, which, except for the fact that regeneration is applied, is nothing more or less than a separate tuned R.F. stage. Regeneration is not essential, in fact, without it a noticeable improvement in gain is obtained, but with it sensitivity is increased considerably, and what is more important, the signal-to-noise ratio is also greatly improved, so that signals that normally are almost lost in the noise are lifted by the booster to provide fairly readable signals at good volume.

BOOSTER CAN BE SWITCHED IN OR OUT AT WILL

So that the unit can be cut in and out of circuit at will, a double-pole double-throw switch has been incorporated. One section of this transfers the aerial from the booster to the aerial input of the main receiver (see circuit), while the other breaks "B+."

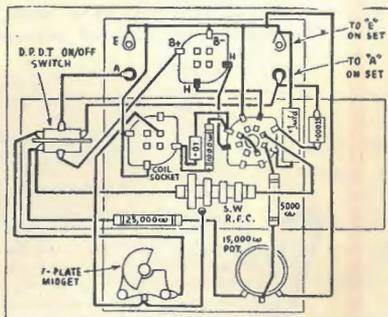
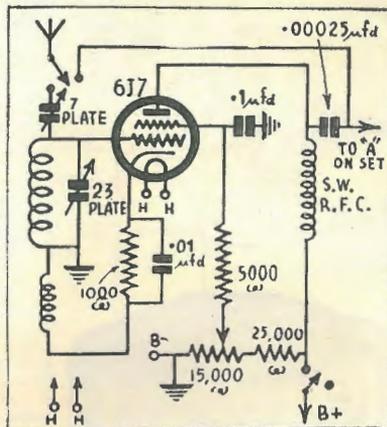
The 7-plate midget aerial condenser needs to be insulated from

the chassis with washers, and the same applies to the 15,000-ohm potentiometer.

Looking at the rear of the chassis, the two terminals on the left are for the aerial and earth leads and those on the right for the aerial and earth leads from the booster to the receiver.

ABOUT THE POWER SUPPLY

The power supply is obtained from the main receiver by means of a 4-wire cable carrying the two



as possible, run from the output terminals of the unit to the aerial and earth terminals of the main set.

OPERATION POINTERS

The regeneration control is affected slightly by the plate circuit

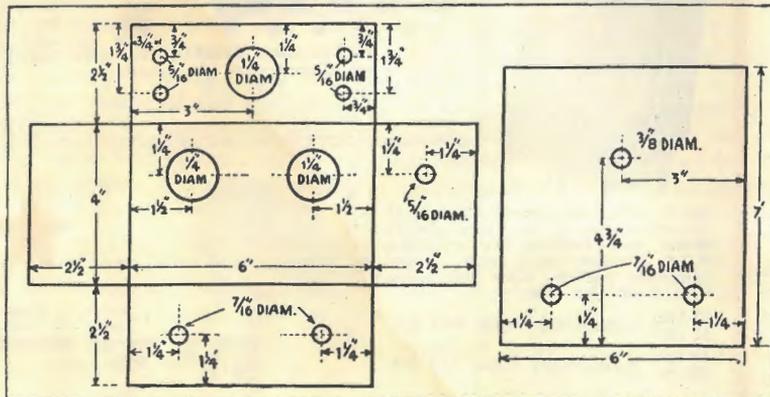
PRE-SELECTOR COIL WINDING DETAILS

| BAND | Grid | Reaction |
|--------------|------|----------|
| 17—30 metres | 7 | 2 |
| 28—51 metres | 15 | 3 |
| 48—90 metres | 22 | 4 |

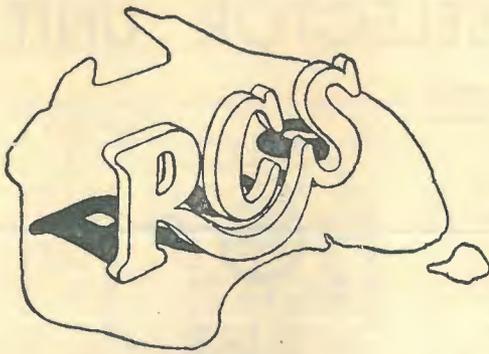
Use 24 gauge enamelled for all grid windings, and 28 enamelled for reaction. Space between windings, $\frac{1}{8}$ -in. Reaction windings should be put on in opposite direction to grid windings. Two smallest grid windings should be double space-wound, i.e., so that the turns are separated by a distance approximately equal to twice the diameter of the wire. The largest grid winding is close-wound.

heater leads (6.3v., .3 amp.), "B+250v." and "B-."

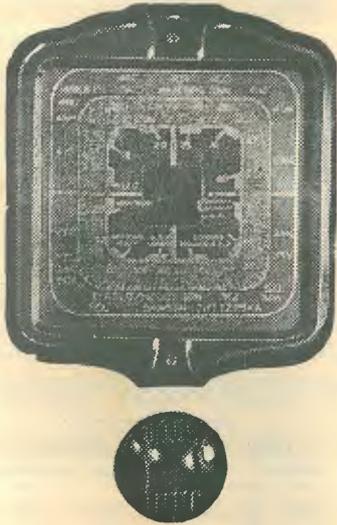
When the unit is completed it is placed alongside the main set, as close as possible to the aerial and earth terminals on the latter. The aerial and earth leads are then transferred from the main receiver to the corresponding terminals on the unit, and a pair of short leads, which should be as short and direct



load, requiring in some cases a little juggling with the reaction winding on each coil in order to obtain smoothest results. With the aerial coupling condenser set approximately half way in, the unit should slide smoothly into oscillation when the reaction control is full on. The point at which regeneration occurs can be controlled to a certain extent by moving the reaction winding closer to or further away from the grid winding.



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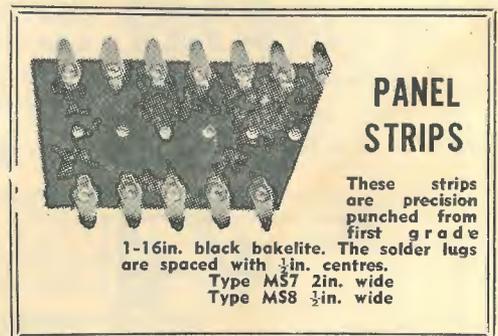


These R.C.S. quality components incorporate heavy copper wire wound on Trolitul bobbins. The use of Trolitul eliminates electrolysis, ensuring much longer effective life.

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TA4 Audio Chokes
TC58 L.T. Vibrator Chokes
TC70 H.T. Vibrator Chokes.



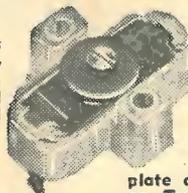
PANEL STRIPS

These strips are precision punched from first grade 1-16in. black bakelite. The solder lugs are spaced with 1/4 in. centres.
Type MS7 2in. wide
Type MS8 1/2 in. wide

R.C.S. I.F. Transformers are of registered design, are permeability tuned and feature the exclusive R.C.S. Trolitul base, with special condenser pockets. Coils are wound with 7/41 Litz wire.

IF 162 Permeability tuned. 460 K.C.
IF 163

IE 74 Permeability tuned 175 K.C.
IE 75

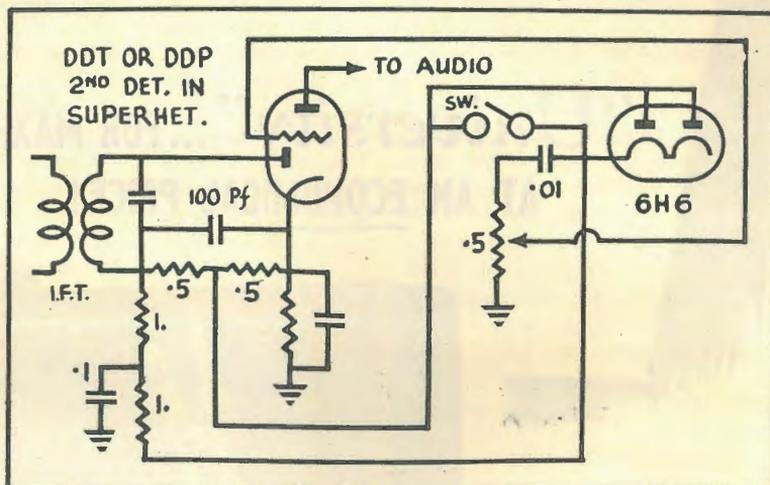


R.C.S. Trimmers — Two-plate coil trimmers mounted on Trolitul base.
CG 15.



An Effective Noise Limiter

Since the return to the air in January with the lowest permissible frequency at 28 mC/s., a much aired topic of conversation during the past few months has been the predominance of radio-inductive interference to which "Ten" is so prone. Pre-war users of "Twenty" could be heard sighing for that band (and now they've got it) and were emphatic that anybody "could have Ten if they wanted it." There is no doubt about it . . . the kind of din kicked up in receivers by car ignition systems, electric shavers, vacuum cleaners . . . is particularly aggressive on "Ten." However, in these days of technical advancement, the Ham who endures under such handicaps is not making the most of his opportunities. For many years now the various Handbooks have had lots of information about "Noise Silencers" in various forms, starting off with the elaborate Lamb type, also the Dickert, and Watzel versions. The Lamb Silencer does a remarkable job . . . we remember a demonstration by A.W. Valve Co. at our own station of a Radiotron Communications Senior Receiver embodying this Silencer . . . It was so effective that 20 metre W phones could be copied comfortably with a Ford spark coil buzzing away on the table next to the receiver! The design calls for a lot of gadgets . . . nearly as much as a small receiver . . . and, therefore, needs to be built into a receiver from the start. There are others — in the form of attachments — also bulky. What the average Ham wants is a simple affair that can be readily added to his present receiver. The circuit diagram shows one of the simplest Limiters . . . merely by addition of a 6H6 (or similar diode) and a few resistors and by-passes. This is the Limiter that many of the VK2's around Sydney's Western Suburbs have been praising. VK2-AGU in particular is enthusiastic about it's effect on cars and vacuum cleaners . . . says he doesn't even know that they are there. A point



about it is that the receiver needs a diode second-detector . . . as most receivers have . . . or if they have not the present arrangement can easily be altered. In effect this is a series Peak Limiter, and as such, results in a slight reduction in audio gain, but that is easily restored as

required. The switch SW is used to cut out the Limiter when not required. The circuit diagram is self-explanatory. No values are shown for the detector cathode biasing . . . as this depends on the valve in use in your receiver.

DON B. KNOCK.

MORE ABOUT THE "VKSNO-V6"

More about the "VK2NO V Six" ("A.R.W.", March, 1946). Since the return to "40" and "20," I have had opportunities to give this receiver a fair amount of use on these bands, and have taken the opportunity to try a few variations. That's what becomes of being a hardened experimenter! Most beneficial result has been the use of a high gain EF50 R.F. pentode in place of the EBF2 R.F. amplifier. Results are remarkable. Usually one is striving to get all the gain possible from an R.F. stage but this is the first time I have had to *hold it back*. With the original primary coupling specifications the signal voltage to the mixer grid was so heavy that with no Audio Volume control to the output stage, the I.F. gain control didn't have enough gradual action. It was either ON with a wallop — or OFF. First

move was to instal a .5 meg. pot. at the grid of the 6V6G output valve — and this brought signals down to *comfortable* speaker level. Some tendency to oscillation and introduction of spurious signals was noticed when peaking the manually controlled R.F. and mixer circuits. The cure for that was to reduce primary coupling by removing the interwound primary (L3) and re-winding it *below* L4. For "40" and "20" — only half the inductance value is needed with the EF50 as R.F. stage. Note that with this valve care must be taken to earth the metal shell of the valve. A sure way to do this is to put a clamp round the valve and to screw this to the metal chassis. Another point — the metal screen across the EF50 socket to isolate Grid and Plate circuits is imperative.

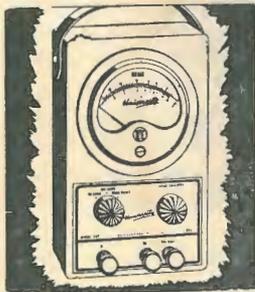
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16/764.

More About Ham Politics

Mr. Malcolm S. Urquhart (VK-6MU) writes from West Australia as follows:

"I have just read with great interest your 'Politics of Ham Radio' in which I receive a mention, and must say your remarks are very much to the point.

First of all I should make it clear that I am once again a member of the Wireless Institute, for the third time since 1921.

Secondly, I should like to say that any talk of "competition" in this State in so far as the WIA is concerned is not warranted.

A good deal has been made of a circular which was put out by Transix (a purely social organisation of Amateurs in that it never before engaged in politics). This organisation has now ceased to exist.

W.I.A.—HAMS ONLY

It is fair to say that since the WIA (W.A. Division) took the step of excluding from membership all but licensed Amateurs and ceasing to manufacture amateurs by the class method, relations with existing Radio Clubs have been and are likely to be more amicable than in the past.

I am one of a number of Amateurs who believe the present Federal set-up of the WIA leaves much to be desired.

We find a democratically elected Federal Council composed of representatives of each State co-ordinating its deliberations through another body, the Federal Executive, popularly known as F.H.Q. This group are charged with most important duties not the least of which is carrying out negotiations for the amateur as a whole in the matter of regulations and conditions.

F.H.Q. is usually described as being in close personal touch with the PMG's Dept. In their recent convention report they claim "cordial relations." It would give us more satisfaction if instead of honeyed words they would get down to business and tell us why the post war plans they submitted

to the Dept., for three grades of station licence and power with a limit of 250 watts were not acceded to. A clear statement naming the officials or persons holding out against us in the matter of frequencies would also be appreciated.

Over a matter of years has grown the habit of going to an official of the PMG's Dept. on the matter of Amateur conditions and regulations until it is now an accepted practice. This has led to an acknowledgment of government by regulation which at the moment is the route evil of the present Amateur situation.

SECURITY FOR HAMS

Has the Amateur any security of tenure at all? I ask you to read the station licence to satisfy yourself on this point. There is absolutely no security of tenure at all.

I am going to ask your readers to be with me in getting democracy to function in the passing by Parliament of an "Amateur Wireless Act." This Act will get for Amateur Radio its official recognition. It will be the Amateurs' "Magna Carta." It will stop once and for all any chance of bureaucratic control.

Its subject matter will contain clauses covering fundamental conditions of licensing such as: eligibility, examination requirements, power (after a referendum) rights

of traffic and free speech, wartime control, etc.

I cannot speak too highly of your remarks on prohibitive regulations. The growth of the regulations covering Amateur stations (and it is here worth pointing out that the booklet only contains those the PMG deems relevant) is, I think, a sorry story. No two amateurs are likely to agree on certain aspects of regulations and if we are to have a new regulation every time some erring ham trespasses we will soon be out of business.

I am still looking for the reason why the PMG's Dept. found it necessary to produce a new list of rules for post war amateur radio before a single station was on the air. There was certainly no changed condition that required them.

The Wireless Institute is primarily responsible for a lot of regulations we have, and if you study its post war plan, as submitted to the Dept., and its Convention deliberations you will find a marked inconsistency.

My idea is that operating rules and regulations should be made by the Amateur, they should be made only after a referendum of all licensed Amateurs and they should be kept to a minimum.

I want to see the Institute's Federal Council take charge of the Amateurs' affairs and govern as they are given mandate to do, not some of the time, but all of the time. So far as the F.H.Q. system is concerned it has been tried and found wanting. Post-war Amateur Radio as a result finds everything on the debit side and official statements characterised by an evasiveness which would not be tolerated if we were organised.

Your slogan, "the only worthwhile policy for the WIA is to drop all pretence of appeasement, stand up on its legs and fight for better conditions and freedom for Ham Radio," finds echo on this side of the continent. We will be with you all the way."

M. S. URQUHART.

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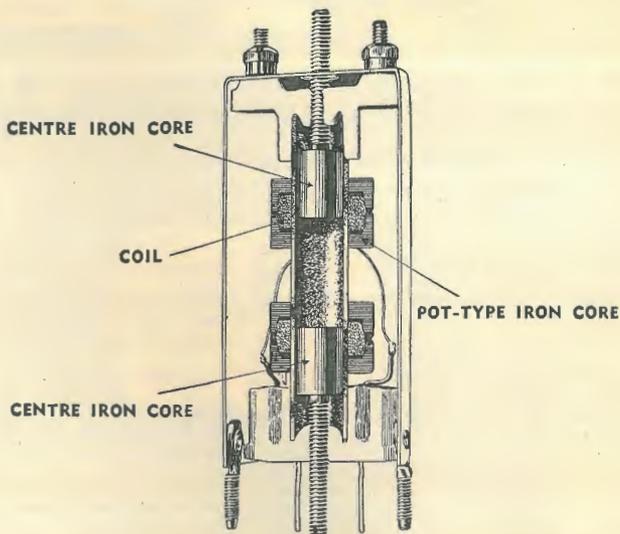
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LET'S GET TO THE CORE OF THINGS

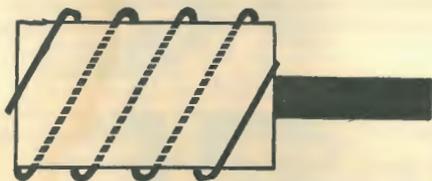
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GETTING STARTED AT SET-BUILDING

Some further valuable practical advice on receiver construction is given in this month's instalment of the series of articles commenced last month under the above title.

WHEN a kit of parts is being chosen for a receiver, the quality and type of each component are the two main points to bear in mind.

CHECKING CONDENSER VALUES

When the kit has been obtained the next step is to check all values.

In the case of fixed condensers, these are always clearly marked, though with the small capacities there are two popular ways of marking them. For example, a .0001 mfd. (microfarad) condenser has the same capacity as one marked 100 mmfd. (micro microfarad). The prefix "micro" means "millionth," so a micro microfarad is one-millionth of a microfarad (which incidentally is in turn one-millionth of a farad, the unit of capacity). Hence to convert .0001 mfd. to mmfd., the figure should be multiplied by one million, which gives 100 mmfd.

COLOUR-CODED RESISTORS

The values of fixed condensers are either marked directly in ohms or megohms (millions of ohms) or are indicated by a standard colour code. There are generally three colours on commonly-used resistors. The body is one colour, one end another, and a dot on the body still another.

For example, a resistor coloured green (body), black (end) and yellow (dot) has a value of 500,000 ohms. Conversely, if a .1 megohm (or 100,000-ohm) resistor is wanted, its colouring will be brown body, black end, and yellow dot.

Sometimes only two colours appear. For example, a 2000-ohm resistor will have a red body and

black end, but no dot. In this case a red dot should be allowed for; being the same colour as the body it cannot be shown.

CHECKING OTHER COMPONENTS

Strictly speaking, every component should be tested before being used, but without suitable equipment the process is a laborious one, and at the best is only a makeshift. Provided the parts recommended by the designer are used, the chances are a hundred to one against any trouble arising due to defects.

This is especially true if a simple continuity test is applied to all windings of coils and i.f. transformers. To do this, connect either a pair of phones or a low-range voltmeter in series with a 1½-volt dry cell. If phones are used, a click should be heard when the test prods are applied to the terminals of each winding. With a meter, a reading should be registered, and providing the contacts are firmly made, any needle flicker indicates a poor connection.

(Continued on next page)

ATTRACTIVE RACK AND PANEL



The above photographs show an attractive rack and panel assembly which has been made available by J. H. Magrath & Co., of 208 Little Lonsdale Street, Melbourne. It is ideal with "ham" transmitters, home recording enthusiasts and for extra large receivers. The price is quite reasonable.

STARTING

(Continued)

ABOUT THE CHASSIS

The best plan is to obtain the chassis ready stamped and drilled, but those who prefer to prepare their own will find some useful hints in last month's article of this series.

The layout given by the designer should always be closely followed, as a single departure from it could result in instability and indifferent performance. Long grid and plate leads particularly should be avoided.

A square and ruler are needed to mark out the blank chassis before drilling. A steel rule — either solid or flexible — is best. One side should be marked off into inches, with divisions of 1/32-in. over a portion of the scale; the other should be divided into centimetres and millimetres.

After a chassis has been prepared, some time should be spent giving it a thorough "clean up" to remove burrs and jagged edges. For large holes, either a knife or an old file can be used. If the latter,

its surface should first be rubbed over with chalk to prevent it clogging after a few strokes. Any aluminium that does become lodged in the interstices can then be easily removed with a stiff metal brush.

Small holes of 1/8-in. or so downward can be cleaned up by taking a drill several sizes larger, and rotating it a few times in the holes. This is particularly important for holes carrying leads passing through the chassis, as the drill will sometimes leave tiny needle-like pieces of metal which can pierce through insulation and cause a short-circuit.

ASSEMBLY POINTERS

When mounting the components, begin with the valve and speaker sockets, arranging them so that the terminals face in the right directions. Next, the parts of the front and rear of the chassis, such as volume and tone control potentiometers and "A" and "E" terminals, can be mounted.

Nowadays, the shaft of the average potentiometer is insulated from the resistance element, and so in

cases where the moving arm should not be in contact with the chassis, no further insulation is needed. Where an uninsulated potentiometer is used, however, and the moving arm should not be earthed, the shaft should be insulated from the chassis by means of washers, a bush, or rubber grommet.

The aerial terminal always requires insulating in the same way, though the earth terminal should be mounted directly on the chassis.

For the power supply, a mains socket can be mounted on the back of the chassis. Alternatively, the power cable can be taken direct to the power transformer panel through a rubber grommet or bush.

FITTING THE DIAL

The remainder of the components, which may include coils, condenser gang, power transformer, electrolytics, padder and voltage divider can then be mounted. It is best to leave the fitting of the dial till last, to avoid the risk of damaging it when the chassis is inverted.

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It is a good plan to slip a solder lug underneath the nut of each mounting bolt, to facilitate making earth connections. Incidentally, the ends of bolts should never be used for this purpose. Also, before mounting the gang, solder a lead to the stator terminal lug underneath each section. These pass through holes in the chassis to the "grid" terminals on the coils. The brass wipers can also be soldered together with a length of 18 or 20 gauge tinned copper wire, which passes through the chassis to earth.

ABOUT THE WIRING

A good grade of "push-back" is excellent for wiring purposes. Use the solid variety on all occasions except where flexibility is required, as with dial light leads, and then use the flexible kind. With push-back, there is no need to cut away the insulation in order to make a joint. The wire can be bared by sliding the outer covering between a finger and thumb.

Alternatively, 18 gauge tinned copper wire, covered with spaghetti sleeving, can be used to make a neat job.

Pig-tail components, such as r.f. chokes, fixed resistors, and fixed condensers can be connected directly between the points to which they run. Where these components are connected together without support, however, it is best to use an insulated lug bolted to the chassis as a support. The lug is mounted on a small strip of bakelite, which can be mounted on a handy 1-in. or 1½-in. bolt. This can be bolted through the chassis specially for the purpose, or can replace a nearby ⅜-in. bolt used for mounting a component such as a valve socket.

An earth line of tinned copper wire can be run round the chassis, soldered to solder lugs slipped under nuts of mounting bolts, and also to a lug underneath the earth terminal. Such a line ensures that a convenient, low resistance earth connection is always available during wiring operations.

Try and make all wiring as neat as possible, and where convenient, mount all pig-tail components so

that they are well-spaced, and either parallel or at right angles to each other. At the same time, do not materially lengthen leads to accomplish this.

CONNECTING CONDENSERS CORRECTLY

Most tubular condensers have a red ring round one end, or else the latter is marked "outside foil." Both mean that the pig-tail running from the end so marked connects to the outer one of the two strips of foil which form the plates of the condenser. If this end is earthed, the outer covering provides a shield for the condenser, reduc-

ing any tendency to instability.

Similarly, dry electrolytic condensers of the variety used for bypassing bias resistors have one end either painted red or marked "positive." This end should always be connected so that it is at a higher potential than the other. In cases where valves are self-biased, this means that the positive end should go to cathode.

In battery sets where automatic bias is provided by connecting a resistor of suitable value between "B—" and earth, the positive end of a dry electrolytic used to by-pass

(Continued on next page)

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STARTING

(Continued)

this resistor should go to earth, and the other end to "B—."

THE FINAL CHECK

After the main wiring has been completed, the dial light can be wired up, and the grid clips, if any, should be fitted.

Next comes the final check of the wiring, which should always be done before the set is switched on. Even experienced set-builders make mistakes, and a single wrong connection can cause several pounds' worth of damage, particularly in a battery set.

The surest way of checking the wiring is to put all diagrams away, and then to draw out the circuit from the wiring. A comparison between the resulting sketch and the original will soon reveal any mistakes.

Those who find it difficult to do this can check the wiring with that shown in the wiring diagram, marking off each connection on the latter as it is found to be correct.

FOR BATTERY SET BUILDERS

To safeguard the valves of battery sets not fitted with a fuse, it is a good idea to test the filament circuits with a torch bulb before the valves are plugged in, but with all batteries connected. This, of course, providing a voltmeter is not available.

To do this, solder one of a pair of flexible leads to the other side of the metal base on the bulb, and the other to the end. Attach a pair of test prods to the free ends, and then apply the prods to the filament lugs on every valve socket. If the wiring is in order, the bulb should light normally each time, but if any "B" voltage is accidentally present, the bulb will light brilliantly and burn out.

Instead of the test prods, a handy little device can be made by removing the glass envelope from a burnt-out valve, and soldering the torch bulb across the filament leads. The valve base is then plugged into each socket in turn. A valve that has lost its emission, but which still has a sound filament which

glows when "A" voltage is applied, is also a useful tester for filament circuits.

CHECKING A.C. RECEIVERS

An a.c. set should never be switched on if the rectifier valve is the only one in position as if there is little or no current drain, the voltage will rise to dangerously high limits, and the filter condensers may break down.

If the rectifier is of the glass-enveloped variety, such as the popular 80, watch it closely when turning on the power for the first time. Any sign of sparking or of a blue glow round the plates spells trouble, and the set should be switched on again until the cause is located and rectified.

If, on the other hand, the rectifier filament burns a dull red, the remaining filaments are alight, and a faint hum can be heard when an ear is placed close to the speaker, it can be taken that nothing is seriously amiss, and the set can then be tested and aligned in the ordinary way.

HAMS !!

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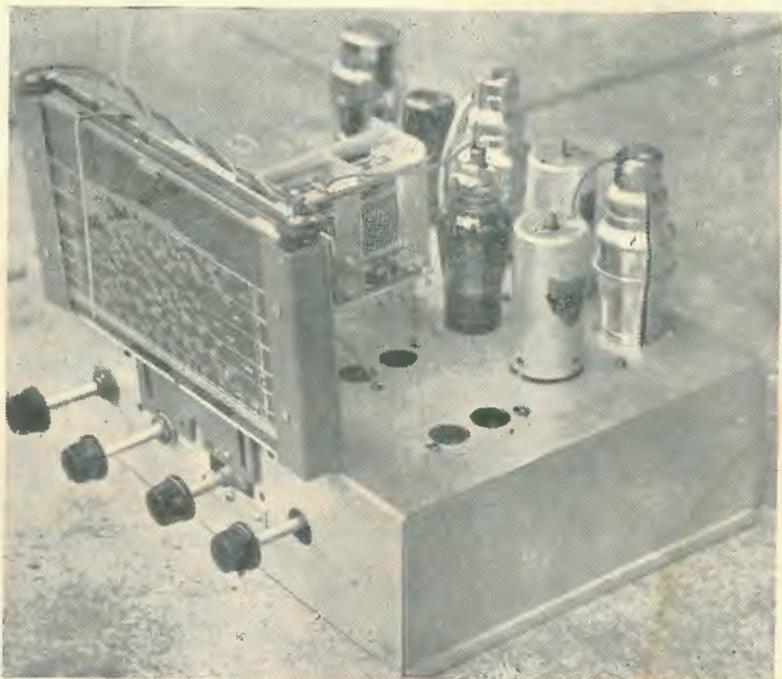
The CONNOISSEUR

“Critical Judge of the Fine Arts” — Dictionary

IN keeping with Aegis policy of being the first with the latest we have much pleasure in presenting some new features in receiver design. We have studied the

By

The Engineering Staff
Aegis Manufacturing Co.
MELBOURNE



popularity of the various types of receiver amongst our large and appreciative group of customers and have found that by far the most popular is the 5 valve variety in which there are no unnecessary complications to make it difficult to get going. With this in mind we have developed this new 5 valve receiver which, in conjunction with our latest designs in I.F.T.'s

Above—Front view of the chassis built from the "Connoisseur" kit.

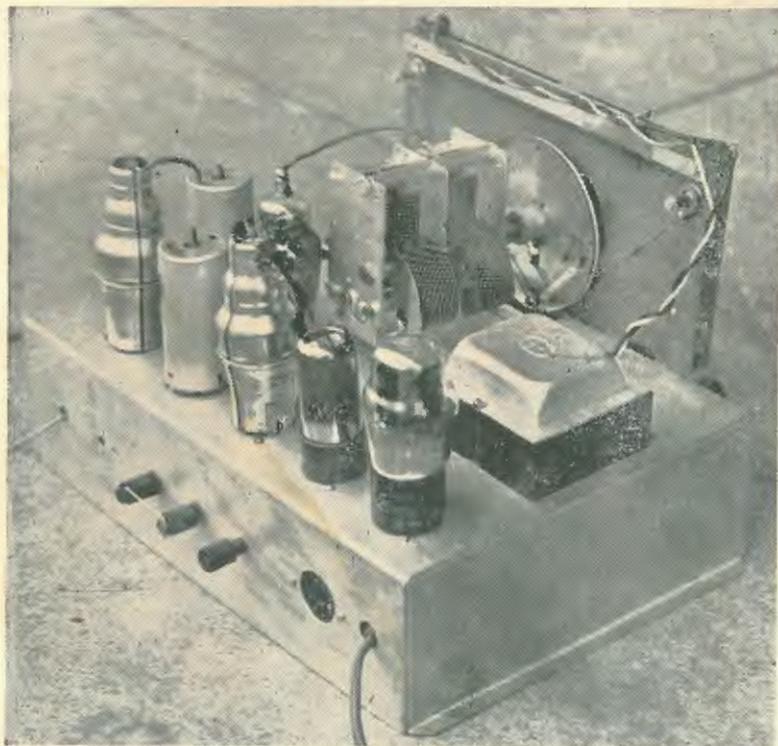
Below—Rear view of the chassis.

Aegis type J9 and J10 and coils type K1, will prove a worthy addition to the field of radio receiver design.

REQUIREMENTS OF A RECEIVER

The demand for a better than average receiver calls for good sensitivity, good selectivity, dual-wave operation, excellent tonal qualities and most of all be reasonably priced. From the point of view of sensitivity a 5 valve receiver using the modern developments in high performance coils and I.F.T.'s can produce sensitivities of better than 10 microvolts at signal-to-noise ratios of 15 DB. Practical tests have shown that receivers in this class,

(Continued on next page)



(Continued)

while not being "communication receivers" have a very high degree of performance and are a source of constant enjoyment from both "broadcast" and "shortwave" listening.

The selectivity and tonal qualities are somewhat dependent on each other as the shape of the I.F. selectivity curve affects the ability of the I.F. amplifier to pass the higher frequencies in the modulation. We have therefore developed a new 455 kc. I.F.T. which combine high gain with the ability to handle modulation frequencies up to 4000 cps. with no attenuation and yet have an adjacent channel selectivity of 26 DB at 10 ks. off resonance and 50 DB at 20 kc. This is sufficient to give reasonable rejection of even strong "locals"

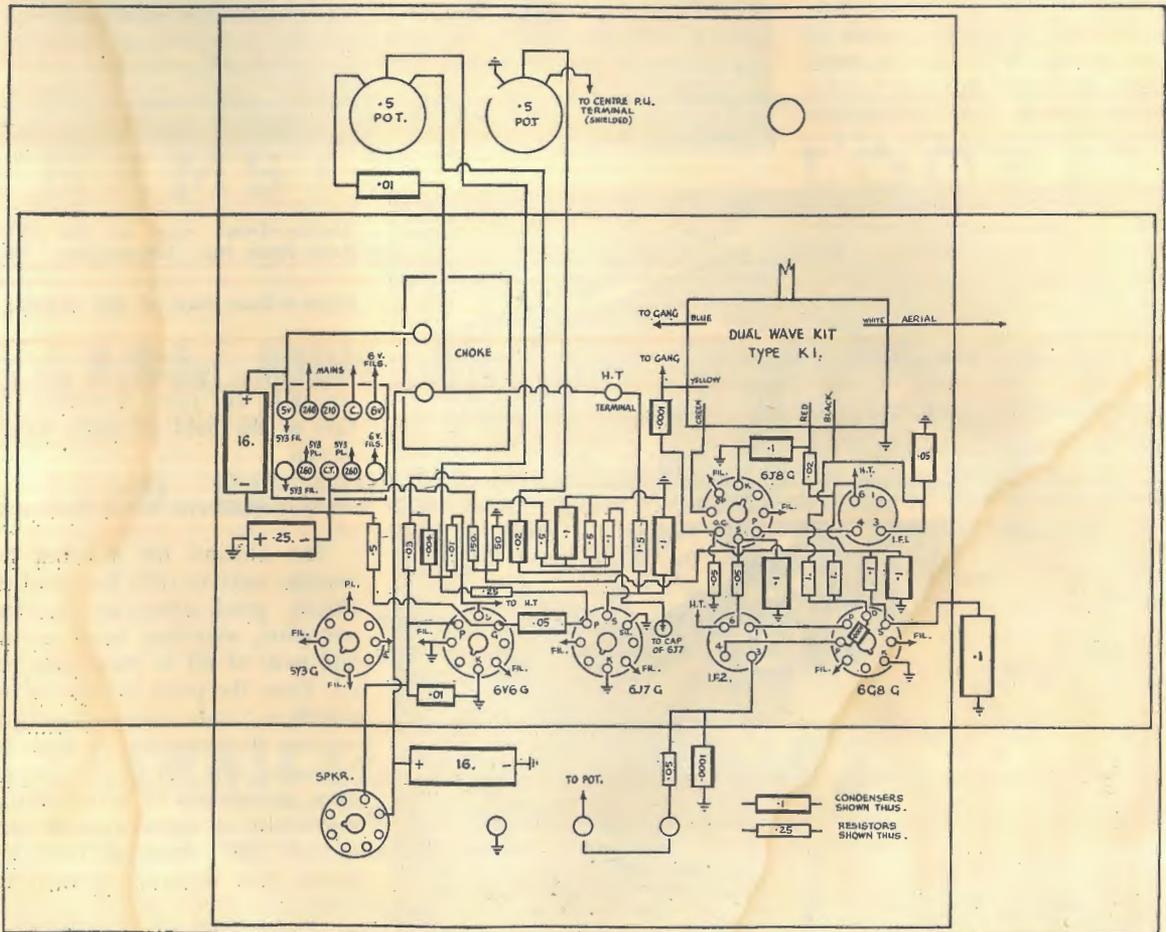
only 20 kc away from country and interstate stations and 10 kc separation of stations of similar signal strength. We therefore recommend these Aegis I.F.T.'s for their improved audio capabilities without sacrificing selectivity.

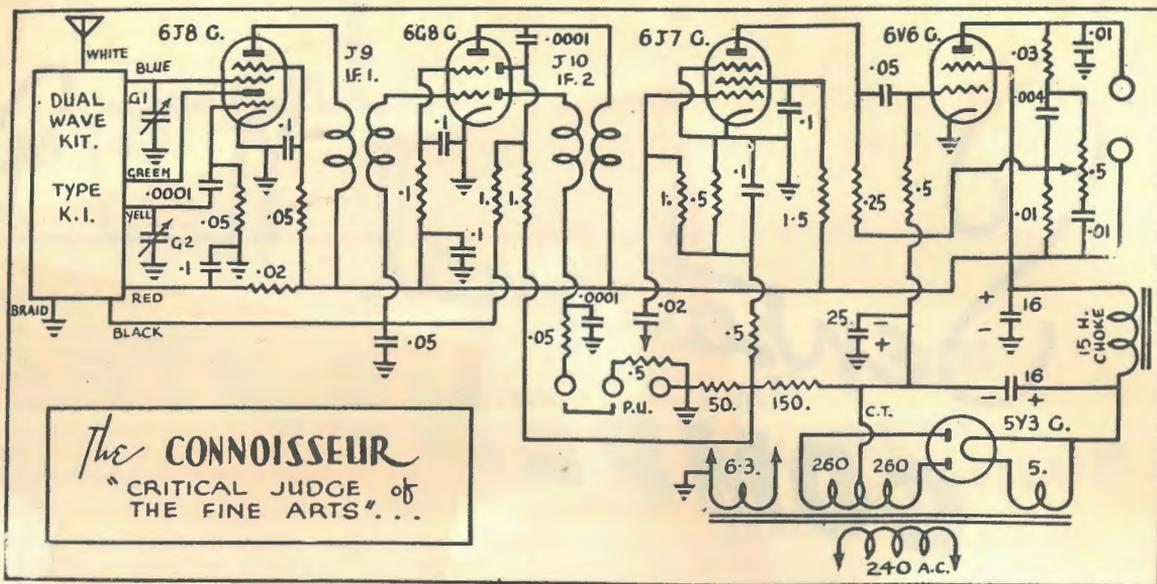
Having dealt with the aspect of the I.F. channel in regards to the audio response we now come to the audio amplifier itself. This section of a receiver possibly comes in for more comment and argument and a greater divergency of ideas than the rest. We have on the one hand the "hi-fi" experts who believe in the amplifier with a flat frequency response and on the other we have the person who likes to "jiggle" with the frequency response. Without wishing to enter the argument of the pros and cons of either we at least have found that individual listeners have widely divergent opinions of what to them is "good

tone." These fall into two broad groups, first those who like a set with a mellow tone — in other words increased bass response — and second those who like a set which is brilliant — increased high frequency response. We have also found that where pentodes and beam tetrodes are used as output tubes inverse feedback is essential. Therefore we have designed a tone control incorporated in the feedback circuit which will give a wide selection of audio response to suit the individual taste without sacrificing the quality, as often happens with tone control circuits.

THE TONE CONTROL CIRCUIT

What is required of the tone control is first to give various degrees of bass boost and second various degrees of treble boost. Experience has shown that the application of treble boost without in-





creased bass response is not very desirable so we have designed the tone control to give first bass boost and then also treble boost. Examination of Fig. 1 will show the normal series feedback, but with values giving somewhat higher percentage feedback than normally used — 25 per cent as against 17 per cent. Now the inclusion of an appropriate sized condenser in series with R1 will modify the feed-

back voltage at the lower frequencies. The voltage which will be reduced and changed in phase will cause the feedback at the lower frequencies to be less, thus giving an increase in amplification and output. This constitutes bass boost and is shown in Fig. 2.

By shunting capacity across R2 the feedback voltages at the high frequencies can be modified in the same way so giving treble boost—

Fig. 3. These features are now incorporated with a control to give the finished "Feedback Tone Control Circuit" as shown in Fig. 4. When the tone control is turned to the maximum position the condenser C1 is shorted out and the condenser C2 has sufficient resistance in series with it to eliminate its effect. This results in the standard series feedback circuit as shown in Fig. 1, and the response is "flat" within certain limits. As the tone control is turned down the effect of condenser C1 is brought to bear on the feedback circuit in varying amounts, thus giving various degrees of bass boost. As the amount of resistance across C1 becomes sufficiently large it ceases to have any further effect. This happens when the control is about half way down, i.e., in position not resistance with the usual tapered pot. — and from there to the low end of the control the condenser C2 is brought into effect in varying degrees, thus giving treble boost. Condenser C3 is the usual high frequency by-pass across the output to prevent overall feedback and this causes attenuation of the frequencies above 6000 cps. This is desirable in preventing excessive rise in noise level with treble boost. The audio characteris-

LIST OF PARTS

1—Dial.
 1—2 gang Tuning Condenser.
 1—Dual Wave Kit.
 1—I.F.T. No. 1.
 1—I.F.T. No. 2
 1—8-inch Permag. Rola Speaker
 5000 ohms.
 1—Chassis.
 1—Power Transformer 285-0-285 V
 at 60 mA. 6.3 v at 3 A. 5 v at
 2 A.
 1—15 H. at 60 mA. Filter Choke.
 1—6J8G Valve
 1—6G8G "
 1—6J7G "
 1—6V6G "
 1—5Y3G "
 2—Va've shields.
 6—Octal Sockets.
 1—Octal Speaker Plug.
 1—Power Flex and Plug.
 2—6.3 v. Pilot Lamps.
 4—Knobs. Marquis.
 3—Terminals. Red.
 2—Terminals. Black.
 3—Miniature Grid Clips.
 Resistor Strip 18 in.
 Bolts, Nuts, Solder Lugs, etc.

3—.0001 mfd. Mica Condensers.
 1—.004 mfd. Mica Condensers.
 2—.01 mfd. Mica Condensers
 1—.02 mfd. Mica Condensers.
 2—.05 mfd. Paper Condensers.
 6—.1 mfd. Paper Condensers.
 2—16. mfd. Electro Condensers,
 525 V.
 1—25 mfd. Electro Condenser, 40 V.
 1—50 ohm 1 W Carbon Resistor.
 1—150 ohm 1 W Carbon Resistor.
 1—.01 meg. .5 W Carbon Resistor.
 1—.02 meg 1 W Carbon Resistor.
 1—.03 meg.5 W Carbon Resistor.
 2—.05 meg. .5 W Carbon Resistors.
 1—.05 meg. 1 W Carbon Resistor.
 1—.1 meg. .5 W Carbon Resistor.
 1—.25 meg. 5. W Carbon Resistor.
 3—.5 meg. .5 W Carbon Resistors.
 3—1. meg. .5 W Carbon Resistors.
 1—1.5 meg. .5 W Carbon Resistor.
 2—.5 meg. Potentiometers.
 1—½-in. Rubber Grommet.
 9—¾-in. Spacers.
 Hook-up Wire, Several Colours.
 Shielded Hook-up Wire.
 Tinned Copper Wire 20 G.

(Continued on next page)

Sensational New Development

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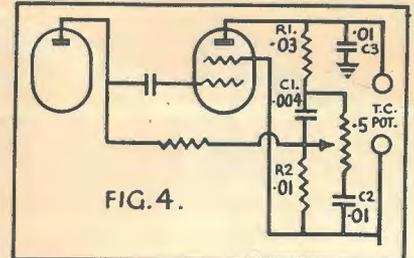
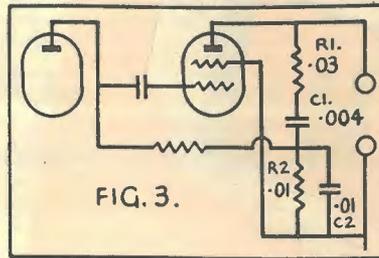
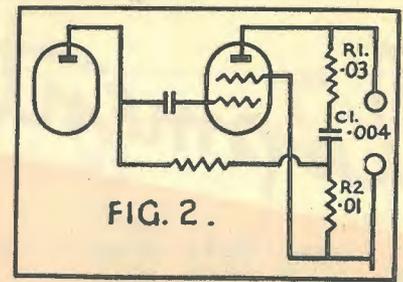
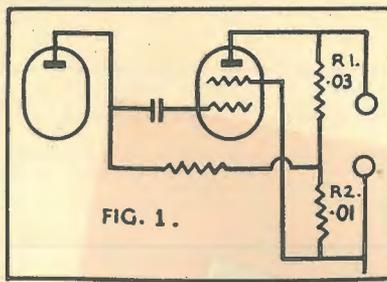
208 LT. LONSDALE STREET
MELBOURNE, VICTORIA

CONNOISSEUR

(Continued)

tics show a maximum bass boost of 9 DB at 150 cps and 9 DB at 5500 cps. when measured into a resistive load at the secondary of the output transformer. These characteristics are shown in Fig. 5 with resistive load and Fig. 6 with speaker load. It would be well to mention that these characteristics have been worked out to suit an 8-inch speaker with reasonable baffling — we used a 3-ft. 6-in. sq. baffle on initial tests, but have since used it on somewhat smaller baffles — but would recommend a baffle comparable to a console cabinet, otherwise the feedback circuit might require some variation in component sizes to suit other conditions.

As the boost in each case is true boost and not obtained by actually attenuating the other frequencies, the tone control can be used without requiring much adjustment of the volume control; in fact in most cases it does not require any adjusting, thus giving a very effective and desirable tone control and as at no time the negative feedback entirely eliminated, the quality of reproduction does not suffer at any stage.



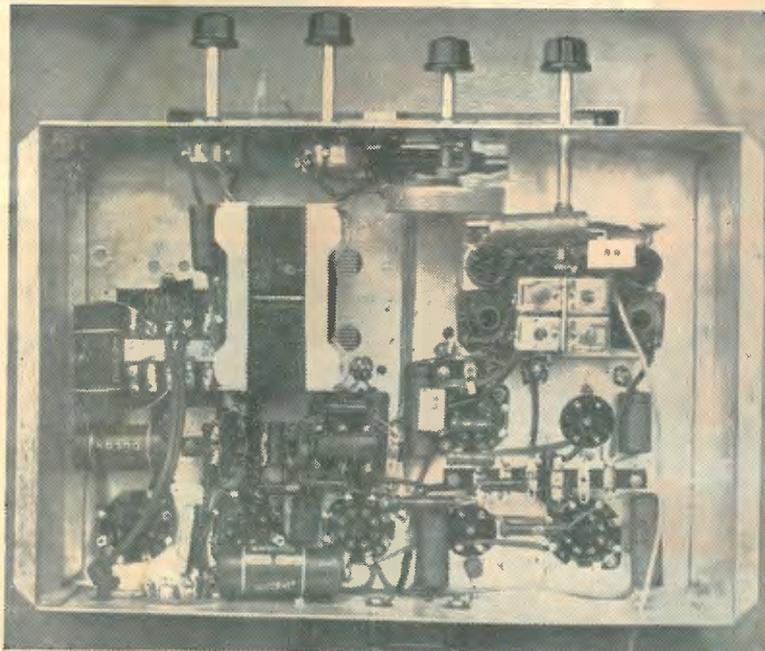
THE R.F. SECTION

The R.F. end of this receiver is more or less perfectly straight forward. The use of back-bias throughout, results in the elimination of the usual cathode resistors and condensers thus making the R.F. section cleaner and giving improved performance and greater stability. The mixer is the usual reliable 6J8G and is built round

our dual-wave coil kit Type K1 which has been improved in performance, while the I.F. channel uses a 6G8G as combined I.F. amplifier, second detector and delayed A.V.C. tube. This set-up is preferred to the 6U7G and combined detector and first audio as the diode leads which are at high R.F. potential can be kept short and compact and further improve the R.F. stability. This is preferable and outweighs any loss in gain due to the slightly lower "gm" of the 6G8G as compared with the 6U7G. Also this loss in gain—about 4DB—is made up by a similar increase in gain in the use of a 6J7G as the audio amplifier as against a 6G8G or 6B8G as detector-audio. The screens of the two R.F. tubes are fed separately from resistors to keep down modulation rise with increased A.V.C. voltage on strong signals from "locals" to further enhance the quality of reproduction.

AUDIO SECTION & POWER SUPPLY

The output stage has been dealt with to some length, there only remains the audio driver and power supply. The audio amplifier is a 6J7G resistance coupled and the bias is derived from a network across the back-bias resistor used



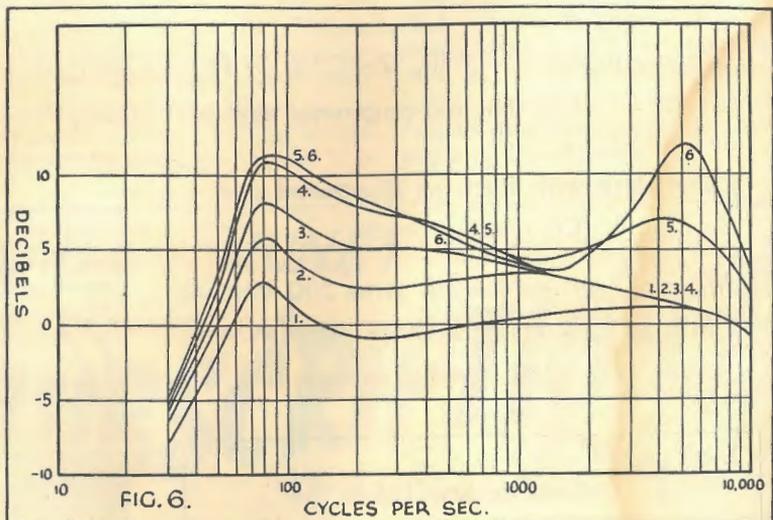
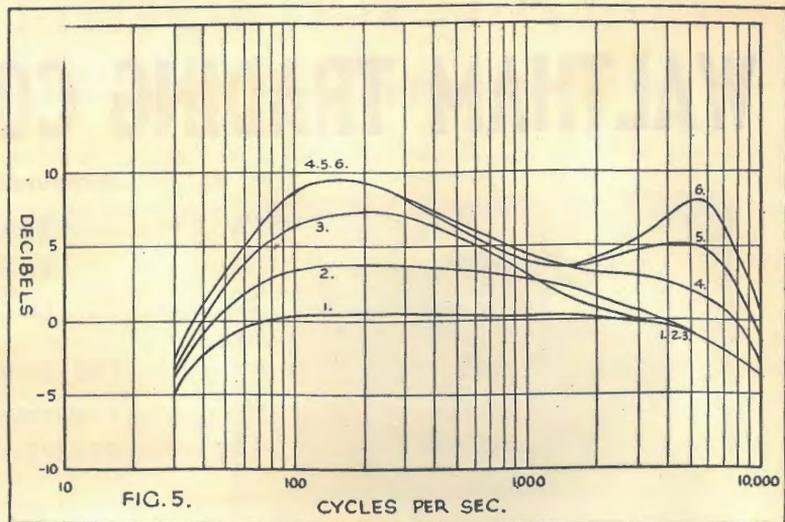
to supply the 3 volts for the R.F. tubes. This network serves to supply 1.5 volts to the grid of the 6J7G and also to decouple the bias source to prevent motor-boating.

As the speaker is a permag. the filter section of the power supply uses a 15 henry filter choke and 16mFD. electrolytics. Due to the use of bass boost in the audio amplifier the filtering of the power pack must be good and under certain conditions it might be found desirable to use a two section filter in the power supply.

LINING PROCEDURE

The lining of the receiver is quite straight-forward but for the sake of clarity we will repeat it. Due to the use of back-bias when using a test oscillator to line the I.F. channel leave the grid connections on the tubes and feed the oscillator through a condenser — about .01 mFD.—to the grid of each tube. Line the I.F.T.'s to 455 KCS. using as low an input level as possible. For those without the use of a test oscillator it is first necessary to get the receiver operating and then relying on the factory setting of the I.F.T.s to give the approximate frequency setting to adjust the cores to give maximum output using as weak a signal as possible. Having aligned the I.F. channel the R.F. section is lined as follows. For those with a test oscillator on the broadcast band, connect the oscillator to the aerial through a standard dummy antenna or a 100—200 pFD. condenser. Adjust the oscillator iron core to bring 600 KC. to its correct position on the dial, adjust the oscillator trimmer to bring 1400 K.C. to its correct position and repeat these two adjustments until both are correct finishing at 1400 KC. Adjust the aerial iron core to give maximum output at 600 KC. and the aerial trimmer to give maximum output at 1400 K.C. Repeat these two adjustments until both are correct making the final adjustment with the trimmer and making sure the input signal is as low as possible.

On the short-wave use a 400 ohm



Curves showing the variations in frequency response which can be obtained by the unique tone control circuit.

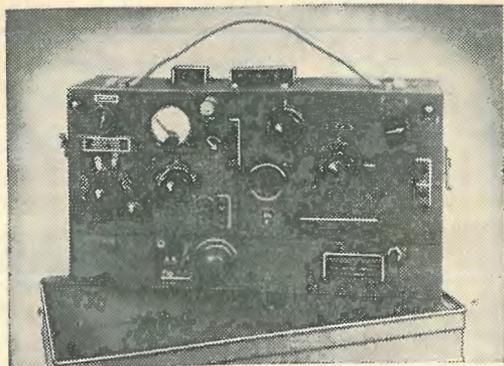
carbon resistor as a dummy antenna and a procedure similar to the broadcast band. The iron cores are used to adjust the low frequency end and the trimmers the high frequency between the actual signal and the image signal as they are close together at these frequencies. The image is the higher of the two, so use the lower frequency from the test oscillator.

For those without the use of an oscillator the procedure is as follows. On the broadcast band connect a long aerial to the set preferably the longest aerial which will

be used on it, and identify two stations—as weak as possible—one on or near 600 KC. and the other on or near 1400 KC. Adjust oscillator trimmer to bring the 1400 KC. station to its correct position on the dial and the adjustments until both are correct. Then adjust the aerial iron core for maximum output on the 1400 Kc. station and the aerial trimmer for maximum output on the 1400 KC. station. Repeat these two adjustments until both are correct. It might be found

(Continued on page 42)

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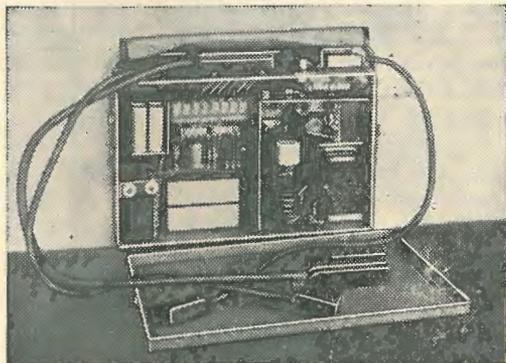
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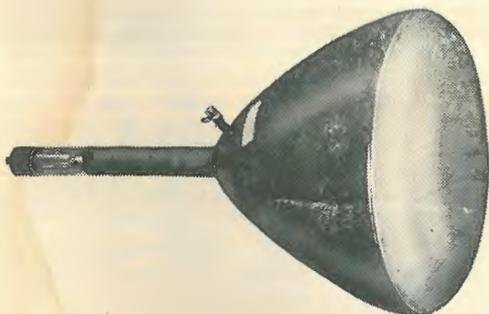
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TWO WOODEN PACKING CASES.

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THE IMPORTANCE OF LAYOUT

Some Golden Rules for All Types of Sets

IN the design of any receiver, layout is one of the main features to be considered, becoming more and more important as the number of valves, and hence the overall amplification, is increased. With a powerful receiver, it is quite possible that the changing of location of a single component could make a perfectly stable set hopelessly unstable.

In some cases, careless wiring alone is sufficient to cause instability, but generally speaking, layout is the main factor in ensuring good performance in this respect. For example, it would be possible to build up a five-valve superhet that would give great results with a well-planned layout, but with a poor one, would give nothing but howls and squeals, due to instability. The cause of the difference in performance would be solely in the layouts.

TWO RULES FOR SET DESIGNERS

The two golden rules to bear in mind when designing a set are, firstly to ensure that all leads are kept as short as possible, and secondly, to avoid doubling back so that the output from one stage runs close to the input to, or output from, an earlier one. If these precautions are not taken feedback will result, causing either poor sensitivity or oscillation.

The "short leads" rule applies particularly to leads carrying radio frequency (including intermediate frequency) currents. All plate and grid leads, particularly, should be short and well spaced, though if proximity is unavoidable, the leads should either be crossed at right angles or shielded. The latter should be avoided wherever possible, as, because of the by-passing effect of the small condenser formed by the metal shield and the wire it surrounds, some gain is lost. This loss varies directly with the frequency of the r.f. currents carried by the shielding lead, with the

amount of shielding used, and with the proximity of the outer shield casing to the wire within. For example, there will be far more loss if the lead is carrying signal currents from a station operating on 20 metres (15,000 k.c.) than there will be with a signal from a transmitter operating on the broadcast band. Similarly, there will be still less loss if the lead in question is carrying a signal of an intermediate frequency of 175 k.c. instead of one at a broadcast frequency.

The loss obviously varies with the amount of shielding and with its proximity to the lead within, as the by-pass capacity formed between the shield and lead depends directly upon both. Hence, if its use is unavoidable, shielding should be sparingly used, and where it is

employed it should be spaced from the wire within by slipping a length of spaghetti over the lead before the shielding is put on.

PRECAUTIONS AGAINST "DOUBLING BACK"

The necessity for avoiding "doubling back" becomes more important the higher the frequency at which tuner portion of the set operates. This explains why sensitive, stable shortwave receivers are more difficult to design than broadcast sets.

A well planned layout in itself does not ensure there will be no doubling back or long leads. Both coils and valve sockets need to be carefully arranged so that the lugs face in directions giving the shortest, most direct leads.

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FAULT FINDING BY SUBSTITUTIONS

Substitution of components is the last desperate resource of the experienced, and usually the only hope of the novice, when endeavouring to trace an obscure fault; it is also the obvious method of verifying a suspicion however founded. When the suspected fault takes the form of an open circuit it is normal practice to connect a temporary substitute in parallel without removing the suspect component. The most convenient method for tracing of open circuit condensers, for example, is by employing a condenser of suitable value connected to a pair of crocodile clips, which facilitate rapid connection. This method is generally advocated in service manuals and handbooks and the practice may be observed when visiting the service departments of famous radio manufacturers.

MOTOR BOATING

The writer's faith in this estab-

SALE OF USED COMPONENTS

VALVES CHECKED

KK2, KBC1, KF2, 34, PM22A, 32, 1F7, 15, KC3, 1L5G, 1A6, B217, 30, KF3, 1D5G, 1C6, 1B5, KDD1, 1K7G, KL4, KF4, KF1, 1K6, PM12, 19, 22, L410, B405, A409, B443, AK2, E454, AK1, E444N, E406, E443N, 1560, 47, 57, 24, 45, 55, 58, 35, 77, 42, 36, 78, 26, A609.

All 5/- Each

Battery Set Chassis (complete, less valves, e.g., Radiola 55B)

20/- Each

Semi-complete, 15/- Each

3 Gangs (approx. .00036) 4/6.

A.W.A. Ideal Audio Trans. 2/-

FREIGHT EXTRA

HARVEY IVERS
MANNING STREET,
TAREE, N.S.W.

lished practice recently had a severe set-back. A fault had developed in a well known make of radiogram and took the form of really violent motor-boating which was quickly isolated to the double-diode-triode circuit. All the de-coupling condensers, with the exception of the electrolytic cathode bypass condenser, were eliminated by the established method, using a .1 mFD. condenser and crocodile clips. It had already been noted that a reasonable value of grid bias existed; it followed, therefore, that the electrolytic condenser, if defective, must be open-circuited and not short-circuited. A suitable electrolytic condenser was selected and its short leads connected direct to the clamping screws of a pair of crocodile clips which, incidentally, were comparatively new and of clean appearance. The new condenser was clipped in place across the suspect and made no apparent difference to either the volume or frequency of motor-boating. This caused some surprise and a new reading was taken across the bias resistance which showed correct bias voltage (the motor-boating was stopped temporarily while taking this reading by the only effective method discovered, shorting the triode grid to chassis.) Wrong diagnosis was assumed and time was wasted endeavouring to trace the fault elsewhere; the electrolytic condenser still seemed by logical deduction to be the source of trouble, however, and notwithstanding that it was obviously not short-circuited it was removed and the new one (still connected to its crocodile clips) was clipped into place; new points of attachment were selected, since the previous ones, the leads of the old condenser, had been removed; the motor-boating, however, persisted with unchanged vigour. The old condenser having been removed, replacement had to be effected before investigations could be continued elsewhere. The original condenser being eight years old and still regarded with half-suspicion,

the substitute condenser was removed from the clips and soldered in position in the normal manner, whereupon the motor-boating immediately ceased. This turn of events was so surprising that it was decided to re-check; the condenser was accordingly removed, a similar one was fixed to the crocodile clips, which were clipped into position, and the motor-boating reappeared. The *new* substitute condenser was then soldered to the crocodile clips, which were again clipped into position, but the motor-boating persisted; the ends of the crocodile clips were cleaned with carbon tetrachloride, but the motor-boating persisted with unabated violence; the serrated edges were then filed bright, the clips again put into position, and the motor-boating ceased.

SOLDERED CONNECTIONS

This unusual experience is retold as a warning that substitution is not 100 per cent substitution unless a proper soldered connection is made. Ninety-nine times out of 100, or even 999 times out of 1,000, a clip connection is good enough, but it is necessary to be on the alert for the odd case. The general circumstances of the above experience also serve to show that the conclusions of systematic diagnosis should not lightly be thrown aside until *proved* incorrect.

Experiments with the coating elsewhere on the clips showed that the skin was an excellent D.C. conductor, but exhibited the properties of a rectifier to radio frequencies presumably due to oxidation of the metal with which the devices were plated or coated. This rectification phenomenon could be stopped by thoroughly cleaning the surface with a light abrasive, but rectification properties returned within 24 hours and reached a maximum in 72 hours; unfortunately, means were not available to measure the impedance of surface contact at R.F. frequencies.

—PRACTICAL WIRELESS.

THE "SKY HAWK FOUR"

FOUR valves in a simple t.r.f. circuit, with reaction, make this set a great little performer that is at the same time simple and cheap to build.

A 6K7 r.f. pentode provides plenty of gain, which is built up still further by the regenerative leaky-grid detector, long recognised by set builders the world over as the easiest and cheapest way of getting maximum sensitivity from a minimum number of valves.

GOOD SENSITIVITY AND SELECTIVITY

Not only sensitivity, but selectivity, too, is improved enormously by reaction. With it, local stations that spread over a great portion of the dial without it can be confined to a few degrees. The tuned r.f. stage helps considerably in this respect, too, while still better results can be obtained by those living in city areas if a short aerial is used.

If the set is to be used for local work only, then even in the suburban areas around Sydney there is plenty of selectivity to ensure complete separation of the eight locals.

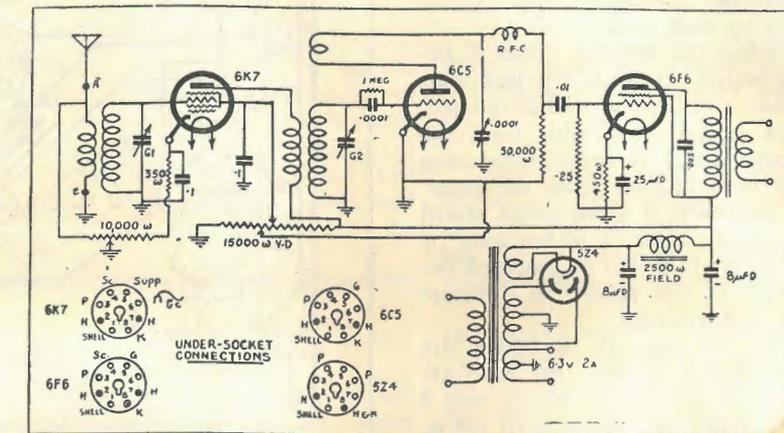
As regards sensitivity, a few feet of wire for an aerial will give far more volume from nearby stations than would be needed for any home. In good locations there will be no difficulty in bringing in all the main Australian and New Zealand stations at fine speaker volume, providing an efficient aerial and earth system is used.

Tone is natural, and a well-baffled speaker of good make will give reproduction that is crisp and clear, equal to that obtained from many sets costing several times as much.

THE COILS

A standard aerial coil, and an r.f. type with reaction, are required, together with a 2-gang condenser of approximately .00035 mfd. capacity per section for tuning purposes.

To ensure a good margin of



The circuit of the "Sky-Hawk," together with under-socket connections for all valves.

safety, the 450-ohm bias resistor for the 6F6 should be rated to carry 100 miles. Though theoretically a 1-watt carbon resistor should be quite satisfactory, it is exceedingly risky to run any type of resistor according to its rated dissipation. A 100 per cent margin of safety for the lower ratings, at least, should always be allowed.

MAKING A START

When the parts have all been obtained, a start can be made by mounting the power transformer, valve and speaker sockets, coils, condenser gang, volume control potentiometer, reaction condenser, aerial and earth terminals, voltage divider, and power cable grommet.

As there are many types of power transformers on the market, the terminal arrangement on the panel has not been shown on the wiring sketch.

The heater wiring should be put in first of all. To do this, solder a lead to each of the "6.3-volt, 2 amp." terminals on the power transformer panel, and take them to the terminals 2 and 7 of the 6F6 socket. Repeat the process, but take the second pair of leads to the same terminals on the 6C5 socket. Next, run a final pair of leads between

terminals 2 and 7 on the 6C5 and 6K7 sockets.

To avoid the risk of introducing hum, these leads should either be twisted or run side by side, close together.

Now the rectifier can be wired up. To do this, run a pair of leads from the "5-volt 2 amp." terminals on the power transformer panel to terminals 2 and 8 on the 5Z4 socket, and another pair from the "385v. 60 m.a." terminals to terminals 4 and 6. Both "C.T." terminals on the power transformer panel should be connected together and earthed to a soldering lug held down by the nut on a convenient mounting bolt.

The four leads to the rectifier should be bunched together and kept towards the back wall of the chassis.

The remainder of the wiring can now be put in as shown on the wiring diagram. All valve socket connections are clearly shown on the circuit diagram, the pins being numbered correspondingly on both diagrams.

Starting from the aerial terminal, wire up the aerial coil, then the 6K7, then the detector coil, and

(Continued on next page)

SKY-HAWK

(Continued)

so on until the wiring is complete. The lugs on the coils supplied will be either colour-coded or numbered, and the connections will be indicated on a slip of paper accompanying each coil.

When the detector socket is being wired up, keep the grid condenser and leak, as well as the grid lead, as far as possible from the rectifier leads, to avoid introducing any hum pick-up from the latter. If necessary, a small metal shield measuring about 2 inches long by 1½ inches high can be mounted between the two sockets to eliminate this risk entirely.

The polarity of the three dry electrolytics should be carefully watched. In the case of the two 8 mfd. types, the end painted red or marked positive should be connected to "B+", and in the case of the 25 mfd. condenser, this end should be connected to the 6F6 cathode.

When the wiring has been completed and checked, the power cable can be wired in — black lead to "C" on the power transformer panel, red to "220v., 240v., or

260v.," depending on the voltage of the supply mains, and, if a 3-pin plug is used, white or any other

colour to chassis.

MOUNTING THE DIAL

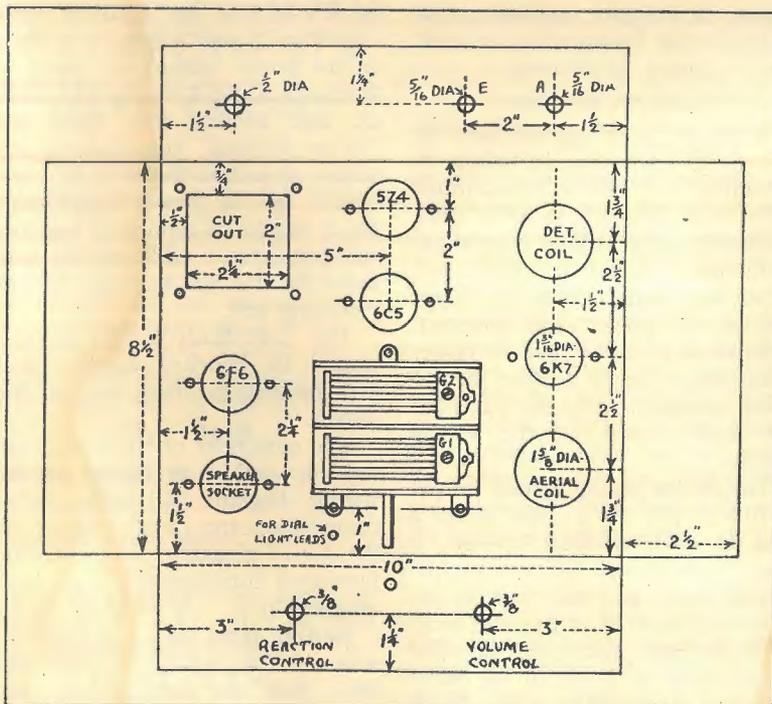
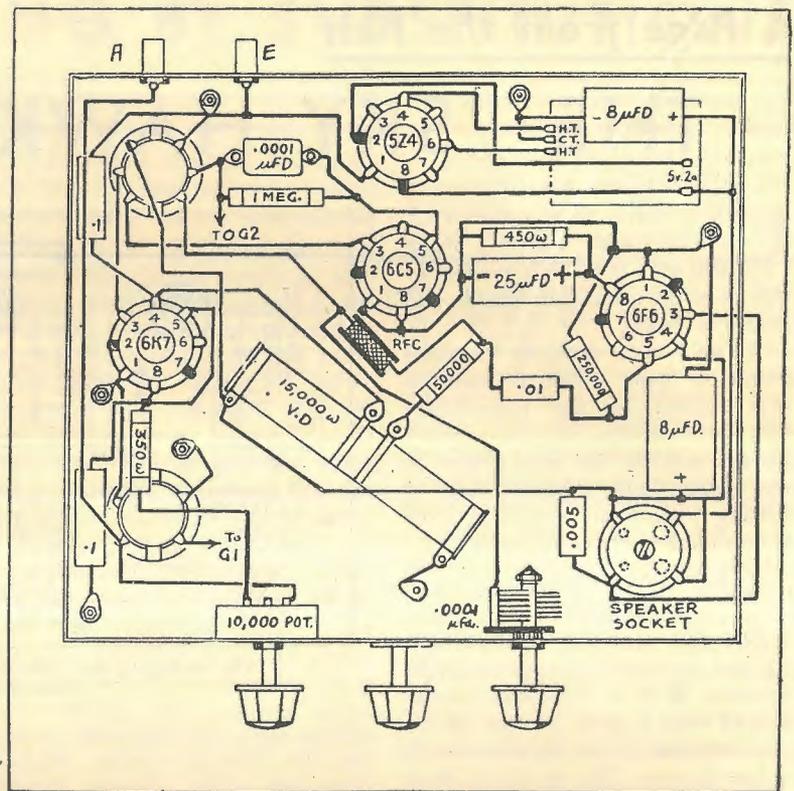
Lastly, the dial can be mounted and the dial lights wired up. To do this, run a pair of twisted leads from the heater lugs of the 6F6 socket to the lugs of the dial light sockets. A pair of leads is then run between the lugs on the two dial light sockets, and the wiring is complete.

READY FOR OPERATION

Take a final run over all connections, and then plug in the valves and speaker, and connect up the aerial and earth leads.

Invert the chassis and turn on the power, and at the same time watch and listen closely for any signs of sparking or power transformer overload. If a faint bubbling is heard from the transformer, for example, switch off immediately, as there is something radically wrong somewhere.

If everything seems O.K., however, and a faint hum is heard when an ear is placed close to the



Full dimensions for stamping and drilling the chassis are shown in this sketch

(Continued on page 42)

CALLING CQ!

By DON B. KNOCK

In the history of Amateur Radio, there is no doubt that the home of V-H-F development has been in U.S.A., from the time Ross Hull started "beaming" signals over hills and dales in 1934. When "Five" acquired a population, as was in-

evitable in a country of 60,000 Hams, QSO's of 2,000 miles or so became familiar occurrences. Since the war ended, activity in America on 50 m/Cs. and 144 mC/s. is reaching new levels, and the following information came by

air mail to the writer from "QST's" V.H.F. Editor, Ed. Tilton (WIH-DQ):

"Our Spring Season on 50 mC/s opened on April 23, but from that date on through the end of May the DX showing on 50 was a bit disappointing. It appears that, as far as Sporadic E skip is concerned, the sunspot maximum now just approaching is somewhat inferior to the years either side of the sunspot minimum. Though the month of June has produced many more openings than May, signals generally have been rather low, and most of the openings have been of short duration. Within the last two weeks (in June) DX conditions have improved markedly, and out of the first 28 days of June Sporadic E skip was worked in the United States on 50 mC/s. at some time during 25 different days. Outstanding dates were June 14, when the first Transcontinental contact was made between W6OVK in Redwood City, Calif., (a distance of 2,500 miles) and W2BYM of Lakehurst, New Jersey; and June 23, when the band was open for more than 14 hours continuously. On June 23, DX contacts were made in all W call areas, the outstanding work being a QSO between W7QAP in Tucson, Ariz., and W8CLS/1 at Waltham, Mass., (a distance of 2,200 miles). This occurred at 1 p.m. (12 noon E.S.T.) and was of very brief duration. At the same time, your present correspondent (WIHDQ) was heard in San Diego, Calif., a distance of 2,500 miles, but no contact was made, unfortunately! It appears that distribution of Sporadic E ionisation is quite general over most of

"ONE SIXTY-SIX" — (From a VK2 Viewpoint)

If you possess one or two of the "horned" variety of valves, plus a few "miniatures" or "acorns," you have the "Open Sesame" to 166-170 m/Cs. (or thereabouts). But if you try to make out with the old "Five Metre" super-regen. of the 76, 6C5, or 6J5 breed, with cut-down coils, etc., you are in for a headache or two. One or two VK2's around Sydney, now making good use of this VHF band, found that the old valves — even when de-based, are quite useless above 116 m/Cs. Activity and results obtained are both encouraging, with two-way communication between Sydney and the defatigable VK2LZ, in the Blue Mountains, 60 miles distant. Those actively engaged on this band are: VK's 2LZ, (Wentworth Falls), 2AFO (Katoomba), 2NP (Gladesville), 2-ABZ (Dundas), 2KI and 2YE (Strathfield), 2AGL (Summer Hill) 2AFH (Willoughby), and 2WJ (Maroubra). Location is much more of an obstacle than at lower frequencies, and in that respect your writer appears to be in a difficult position. Only station I can hear is VK2WJ who is R7/8 through four intervening hills 4 miles airline distance. Answer to the problem may be the use of high gain arrays which are compact enough at the frequency range to warrant extensive investigation. An interesting sidelight on receivers is

provided by resurrection of an old 56 m/Cs. type, namely the "Jones Resistance tuned I.F." Superhet. Con Bischoff (VK2LZ) gave the scheme a work-out, using a 6AG5 autodyne detector, and was so loud in praise thereof that John Peell (VK2WJ) scrapped his super-regen. in favour. He uses a 956 R.F. stage ahead of a 954 autodyne. Users of the "resistance I.F." method on "Five" will recall that it had snags:

(1) The 50 kcs. I.F. channel gave two signals close together on the dial.

(2) Local B.C. stations had a tendency to "ride in" on the I.F.

At 166 m/Cs. these troubles are non-existent. The two signals merge into one, and there appears to be no trouble from a local B.C. Transmitter. Most comprehensive receiver I have yet encountered for 166 m/Cs. work is a slightly modified A.W. MKIV model now on test by VK2NP. This has two 954 T.R.F. stages ahead of a 955 mixer, with 955 oscillator, followed by 6 stages of 30 m/Cs. I.F. using 1852's. Such a receiver is beyond the average ham, but is within the constructional ability of the experienced experimenter. What is needed to develop 166 m/Cs. is a spate those of earlier 56 m/Cs. days of mobile week-ends, similar to around Sydney in 1934-39.

—VK2NO.

(Continued on next page)

HAM NOTES

(Continued)

U.S.A. at this season of the year, and we anticipate that more work over such distances will be done within the next few weeks. Just yesterday (July 2) the writer had the good fortune to raise W5JGV/-

7 in Douglas, Ariz., a distance of 2,000 miles or more, for a brief contact. Such DX is a distinct rarity, however, and most of all work is being done over distances ranging from 700 to 1300 miles. The summer season is productive of very nice temperature inversion bending of V-H-F signals, and our present record for 144 m/Cs. has been ex-

tended to 280 miles, for two-way work. This contact was made in California recently by W6RBQ/6 and W4TZ/6, operating crystal controlled portable rigs with high gain antennas at high elevation. There have been numerous instances of work beyond 200 miles between

WITH THE VK3'S ON "SIX"

From Ken McTaggart (VK3-NW) of Kew, E.A., Victoria, comes a resume of what is happening around 50 mC/s. in Melbourne and environs. If any VK4, 5, 6 or 7 has anything similar up his sleeve, a few notes to VK2NO will be appreciated. Ken says, "The band has been pretty dead lately, with only 3MJ, 3QO, 3GG, 3AFQ, 3HK, 3VJ, and 3NW, on at all regularly. Others who have made some appearances, but 'faded out' during the last two months are: 3BW (Portarlinton, 35 miles), 3CO, 3TQ, 3FT, 3JD, 3LS, 3NB, 3OA and 3NU. In order to stimulate some interest and to show what can be done with low power, Dave Medley and myself have organised some portable work. Being the fortunate possessor of a car I have done the portable side, whilst 3MJ with his very good RX — ECH35, EF50's, acorns, etc. — and 50 watts to 100th plus rotatable 4 element beam — stays at home and does the listening. The portable rig consists of DET3 (6J5 with Plate and Grid out the top) 6L6G, M.O., with 807 P.A. Plate voltage is from 180 volts of H.D. "B" batteries, 90 volts on the DET3 at 3 m.a., and 180 volts on the 807 at 17 m.a. This outfit is modulated by a dynamic mike into a 6J5 and 6V6 using choke modulation. Transmitting antenna is a $\frac{1}{2}$ -wave doublet fed with co-ax. cable and is usually about 10 or 12 feet above the car. Receiver is 955 into the same 6J5-6V6 arrangement functioning as modulator. After trying the outfit at home and getting very satisfactory results, our first excursion was to Belgrave in the Dande-

nongs. This is 22 miles S.E. of 3MJ's location in the city and is about 600-700 feet above sea level.

Operation was not line of sight, however, because of an intervening spur of hill. Reports were: 3MJ Q5/R9 and 3NW's signal at 3MJ was Q5/R5. I also worked with 3QO who uses only 2.3 watts to a single tube in a linear oscillator, a 2-valve Super-regen.: RX and a rotary beam consisting of two stacked $\frac{1}{2}$ -wave dipoles. His signal at Belgrave was Q5/R5, distance being 21 miles. A trip is to be organised to Woodend, about 50 miles distant, also to Mount Macedon, followed by a run to Ballarat. We are endeavouring to interest country stations by demonstrating that signals will cover a range of 100 miles or so. With the return of portion of "40" it is found that many country stations are interested in "Six." Some have even attempted communication, but they are doubtful as to how far signals will travel. That is where the city man steps in to assist. The "Six metre" rig. at VK3NW comprises 807 crystal oscillator and doubler from 6314 kcs. followed by two 807 doublers driving an 800 final. Modulation is by Class AB1 807's and the antenna a single section W8JK rotary, horizontally polarised."

The foregoing is an interesting picture of enthusiasm and co-operation in developing the 50 mC/s. band in and around Victoria. A similar outlook is in vogue in and around Sydney, and country enthusiasts should note that VK2NO is only too pleased to co-operate with test schedules upon request. —D.B.K.

AN ENGLISH CONTEMPORARY

The English "Short Wave Magazine" is again blossoming with the re-introduction of ham radio in Great Britain. The latest issue to hand (June, 1946) is full of interesting circuits and odds and ends, such as a VFO Drive Unit, Transmitter for Five, Absorption wave meter, etc. General articles deal with ham calls heard, how to pass the amateur examination, a list of new QRA's and Club News. The Editor is Austin Forsyth, O.B.E. (G6FO) and the editorial offices are at 49 Victoria Street, London SW1. Subscription rate is 22/- (English) per annum.

stations operating from their home locations close to sea-level, however, and we look for contacts over distances up to perhaps 350 miles or more on our 2 metre band before the summer season is over.

Regarding the possibility of work between the United States and Australia on 50 m/Cs., we feel that there is a good possibility of signals covering this path during September and October and you may be sure that many stations here in U.S.A. will be watching the band most for DX opportunities. I suggest that W and VK stations operating on 28 or 14 m/Cs. make a point of discussing this matter with a view to arranging tests when conditions appear propitious. We will be more than pleased to do anything possible to further interest in W and VK work on 50 m/Cs."

* * *

The 50 mC/s. Exciter as used in my own station, and described in June, 1946, "A.R.W.", has aroused lots of interest among VHF men

HAM-STRINGING OF HAMS

in many States, judging by the mail queries I receive. VK's tell me about it over the air also — one VK3 I QSO'ed on "40" was using the scheme on that band and was enthusiastic about its performance. There seems to be some doubt in some minds about the degree of coupling between Oscillator and Quadrupler coils — so here's the answer. *Tight* coupling is obviously used to build up the harmonic as much as possible; the spacing between the coils — end to end — being about $\frac{1}{8}$ -inch. Connections are as would be for an R.F. coil with primary coupling to a preceding R.F. amplifier in a receiver, the plate end of the Quad. coil is adjacent to the H.T. end of the Osc. Coil. There is no snag either about crystals in the 8.5 m/Cs. region. To *Triple* instead of *Quadruple* the coil in the regenerative stage may need an extra turn — or may hit the 3rd harmonic simply by compressing the turns.

* * *

There is one bad aspect of that measly 5/ kcs. we irk in on "40" and that is the fact that so many are grinding perfectly good crystals of pre-war wide-band vintage in order to get into the Sardine-tin crush. What I mean to emphasise is: why not keep those other crystals until

NEW AEGIS AERIAL COIL

The Aegis Manufacturing Company announces that they have now redesigned their aerial coil unit and in future it will be known as type M9N. It has the same base and can, the alterations being purely of an electrical nature. These alterations have been brought about to reduce the difficulties previously experienced in alignment of these *Coils*, and also to eliminate the possibilities of the primary coil resonating inside the band. In this way, the overall performance of the coil will be considerably improved and much better results will be obtained due to better tracking.

The price remains the same, and cartons in future will be clearly marked with the code number M9N.

There is a story in the current issue of the well-known magazine, ERDA, about "hams" and their future Television activities; to say nothing of Facsimile. It says, among other things: "It appears inevitable that amateur activities will blossom into Television, and that the post-war "hams" will see as well as hear each other." A most encouraging picture . . . for *Americans!* It is an ironical fact that in U.S.A. the "ham" operates under an *amateur* license, and gets an excellent deal from his Federal Communications Commission, with plenty of frequency allocations, plus authority to use FM, Television, and Facsimile, also mobile-portable concessions of all times . . . whilst the Australian "ham" — what of him? The VK also lives in one of the Allied countries . . . under a supposedly Democratic mode of life . . . and he exists "on the air" by virtue of a strictly "experimental" license. Today such a de-

inition is a farce . . . and every VK knows it. He is banned from Television, FM, and all that kind of thing; and to make his "ham-stringing" more complete, some ogre of an unsympathetic authority in a uniformed Service chops his meagre pre-war frequency allocations to an almost intolerable degree. It is high time that those who like to preen themselves as "leaders" in VK affairs got on to their hind legs and did a bit of fighting for rights . . . Those rights were fought for in a different manner not so long ago . . . by humble fellows who mostly wore crossed flags on the arm or something similar. Those are the people who will swell amateur ranks in the future in this country as elsewhere. In short, the VK is entitled to a lot more consideration than is being grudgingly doled out to him just now, but he won't get that consolation by running round in circles admiring himself.

we get more of our rightful territory back? Better to get a new crystal pro tem for the 50 kcs. than to regret at a future date the shifting of frequency of crystals that may be of use. If you haven't a suitable crystal for the present narrow-chested allocation — you can't do much harm therein on E.C.O. — the QRM is already fierce at week-ends — but woe betide you if you get *outside* the 50 kcs. from what I'm told. It's a hard world for struggling "40 metre" VK's.

* * *

Although in many respects the G's have been more leniently treated with regard to the return of the popular bands than have VK's, things are still far from rosy there, according to friend Arthur Milne, G2MI, Editor of RSGB Bulletin. On "40" the allocation is between 7150 and 7300 kcs. (100 kcs. more than VK's get), but in Europe the region is almost completely occu-

ped by 50 kw. broadcasting stations. (Yes OM, we know . . . we hear 'em down here!) On 1800 kcs. (a band the VK's probably wouldn't use much if they had it) the band is from 1800 to 2000 kcs. and "the last 80 kcs. of this is occupied by Loran, which has to be heard to be believed! Now we have 'Gee' experiments on 28 m/Cs., and there are plenty of raucous Italians and others helping out the general din. We are doing our best with the authorities to get things sorted out, but with so many administrations and departments involved, it is quite a job. We still have no 80 metre band (neither have VK's), although the Yanks, ZL's and Neutrals are back on it. We are at least fortunate in having quite a lot of Hams in the various Service Committees (much more fortunate than VK's in that respect!), but as it is only a year

(Continued on next page)

HAM NOTES

(Continued)

from VJ Day I suppose we must not be unduly worried. After all we were not *likely* to be back on the air one year after 1918." Bracketed comments are mine.

* * *

Old-timer VK3ML, Bob Cunningham, well-known in pre-war days for his organising ability in connection with DX contests, also the birth of R.A.A.F.W.R., is back on the job again with lots of plans for his amateur radio activities. He is Contest Manager for a world-wide W.I.A. Contest, planned to take place toward the end of this year. My guess is that Bob will be prominent in future VHF activities in VK3, having picked himself a first-rate residential location down the Bay. Also, he is the distributor in this part of the world for the famous Eddystone products, which will be seen again soon on the market. In addition to having most of his time well occupied, the W.I.A.

has roped him in as Federal Treasurer.

Laurie Sinclair (VK2MH), one of the lads to whom the DX always seems to reply to on 28, and now 14 mC/s., sends along some information about G6CU/ZC2. That station was, between January and May, 1946, located on Cocos Island, in the Indian Ocean, and most active VK phones on "Ten" hooked up with him. To VK2MH, G6CU/ZC2 sent a batch of QSL cards and these have been handed over to the W.I.A., QSL Bureau in Sydney. Those who have not yet received cards note that the home address of G6CU, where he is now located, is 5 St. Lukes Rd., Maidenhead, England.

* * *

"Forty" might well be called "The Friendly Band," for thereupon old friendships are being renewed, and new ones established, despite the hamstringing confines of 50 kcs. During the week ending July 20-21, 1946, there was a virtual parade of "oldtimers." A

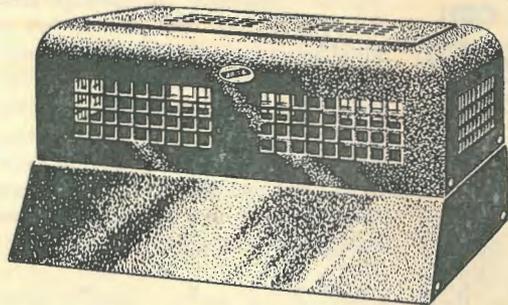
T-SECTION BRASS

That reference to the use of section brass for constructing ground-plane and other arrays ("A.R.W." July, 1946), was guilty of a slight omission. The whole story was written around the use of T section brass, but unfortunately the T went missing in print. The kind I refer to is the smooth finish T section brass that sliding doors move on in some architectural designs. Idea of using originated with friend VK-2CL, who pointed out the strength of an array constructed of such material.

CW QSO with a Victorian signing VK3MH turned out to be the old original Mart Chaffer — well-known through pioneer years as "3XF Moonee Ponds." Next heard on the band and promptly contacted was VK2NS — Trev. Evans of Bathurst — using a "temporary rig and the wire clothes line for an antenna." VK2NS was famous as

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B
A
C**

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AROUND THE MARKET

a B.E.R.U. Trophy winner and also as the inaugurator of the Australian R.C.C." For the benefit of new hands, that means "Rag Chewer's Club," and Trev. was the "Old Sock," so work it out for yourselves. He has lost none of his key style, and like many others, yearns for "80."

* * *

Heard later in QSO with 2NS was VK2RF, "Bill" Felton, also an old-time resurrection. VK2RF was the first N.S.W. member of the R.A.A.F.W.R. in the 1929 era; was a pilot in World War I, but like your correspondent, went through the second fracas in khaki instead of blue. The other O.T. I noticed, back at his old CW DX form, was VK2HZ, "Bill" Moore. Three years ago, when a P.O.W. in J. hands, Bill didn't think he'd be "calling CQ DX" for a long time; but time passes and Ham Radio emerges exultant.

* * *

This is an appeal to you Ham readers of "A.R.W." It is evident

Having been the recipient of numerous phone calls asking me where items of transmitting gear can be obtained, in particular, high voltage filter condensers, I am herewith passing on such information as may be of immediate help to many "Hams."

There has been a shortage of filter condensers with a reasonable working margin of safety; that is, at prices within the ham pocket. If you seek something good in the nature of 4 mfd. 2000 Volt filter condensers, I suggest that you contact Jim Loneragan, radio parts manager, at Philips Head Office, Clarence Street, Sydney. From the same source of supply I note that one can obtain 300 mmfd. 3000 Volt tuning condensers, 1½-inch ceramic stand-off insulators, sockets for 813's and X, Y, AT and BT cut crystals, with or without holders, between 2 and 10 mC/s. Those who wonder what can be had in the way of transmitting valves will

find, in the range of Philips valves applicable to amateur needs, such types as: 800, 807, 809, 813, 866A, 802, HF100 and ZB120.

There is a formidable list of types of powers well beyond the amateur 100 watt rating.

One of the Australian Army's most comprehensive mobile radio installations was Wireless Set No. 19, designed for Tank and armoured vehicle communications. Occasionally I run across "bits and pieces" of this equipment on Disposals Dealers' counters — 2/- for this, and 6d. for that. There are excellent plug and cable connectors from such sets as the 19 — but the snag is that usually it's one without t'other! One finds a plug — but no socket — or vice versa. These things don't usually show up together through some perverse fate, but sometimes it pays to get the one — you may run across the other in a week or so and if you don't, you may only be down 6d.

NEW BARRETTTER AVAILABLE

Philips Electrical Industries of Australia announce that a new barretter type C8 is now available for replacement purposes. The C8 may be used as a direct replacement for C1 in existing AC/DC receivers fitted with "00 in A" valves. The C8 is electrically identical to the C1. In the new version, however, pins 1 and 2 are internally linked. This has no bearing on the operation, as in both types the resistance element is connected to pins 3 and 6.

C8 is designed for operation in receivers in which the total heater voltage (series connected) is not less than 52 volts. The maximum voltage applied to the heater circuit must not exceed 250 volts when switching on. Regulating range is 80-200 volts for a heater current of 200 in A.

The C8 barretter can only be substituted for the C1 and other substitutions must not be attempted.

that this publication is booming in popularity, and that, I aver, is a natural result of giving the "gang" the kind of reading they can understand. Our publisher-editor makes a goodly number of pages available solely for Amateur Radio in all its phases and those pages are well catered for. But — *you* can help to make them even more interesting, and in a simple manner. The boys like to see what the other fellow looks like and what he uses in his shack. If you have any photographs or snaps suitable for "Calling CQ" — send them along to me at VK2NO.

* * *

Listening on "20" (I haven't yet added to the din) there is no doubt that this is the popular band with the majority, the world over. The DX is easier to snag (QRM permitting) than on "Ten," where the antenna is of prime importance. But don't get the idea that it *isn't* of importance on "20" — it's just that one can work the world there more consistently with an average

antenna. Having received air mail requests from old G friends, I suppose I shall have to grit my teeth and join the maelstrom!

* * *

Talking further of Wireless Set No. 19 — American "Radio News" for May, 1946, carries a full page advt. showing brand new Zenith (U.S.A.) 19's "as made for the British and Russians" *complete*, with all spares and accessories — straight out of the Munitions Stores in the three large packing cases — for 78 dollars 50 cents F.O.B. Los Angeles! That is around £20 in our money. For this the American gets:

Set No. 1: W/T—R/T. Includes 6 valve Superhet and 6 valve MOPA TX with 807 final. Grid modulation. Range 2 to 8 mC/s.

Set No. 2: 235 mC/s. Transceiver (can be shifted easily to amateur bands).

Set No. 3: A complete inter-Com. System using 3 control boxes

(Continued on next page)

HAM NOTES

(Continued)

and headphones — push to talk mike.

Power Supply: Dynamotor from 12 volt battery and A.C. as alternative.

Antenna Systems: These include 235 mC/s. half-wave and a 12 foot unit with variometer loading for resonance between 2 and 8 mC/s.

Spare: Valves, Connectors, etc. Antenna Masts.

No, I'm not trying to advertise for an American firm, I'm just emphasising how easy it is for Uncle Sam's boys to purchase ex-Service gear cheaply, and in complete working order.

* * *

The Philips organisation is moving its industries to South Australia, which means, among other things, vacation of the present Apparatus Factory in Sydney. As a result of this move there is a large quantity of material of all kinds available for sale to amateurs and

manufacturers. If you are short of plated chassis, angle brackets, screws nuts, bolts, wire, power transformers, resistors, mica condensers, switches, lacquer, adhesives, lighting fixtures, ceramic parts, dials, knobs, in fact — almost anything in the radio parts line. You may benefit by a visit to the factory at Glenmore Road, Paddington, Sydney, where officials of the "Liquidation Section" will show you what is available. This source of materials supply will exist until depleted. My advice is: Get in early.

SUBIACO RADIO SOCIETY, W.A.

Reference to this progressive Westralian Radio Club by our Editor ("A.R.W.", July, 1946), prompts me to enlarge upon its activities and partial history.

Club call sign is VK6KR, and prime mover is Mr. B. Congdon (VK6BC), 75 Gloster St., Subiaco, W.A., to whom all correspondence should be addressed. Members re-

ceive a monthly magazine styled "The Wavetrap," and this is replete with Club Topicalities, personal pars, and brief technical tips. Editorials of this lively little Ham mag have a way of being forthright and outspoken! VB6BC tells me that in Westralia, quite a few are making every Post a winner on DX, and 50 m/Cs. is not neglected, either. Active there are VK's 6LW, 6FL, and 6HM. There are no doubt others at this time of writing. VK-6BC himself is so snowed under with Club activities and correspondence that his own rig. is silent, but not for long. His experiences run parallel to my own — i.e., "You can guess what time I have — my Den is the home of radio hams — anyone wanting information or a check on equipment just drives in to see 6BC. Oft-times I am hard put to it — but it's all for a good cause." Yes — the days when sight of an antenna over a roof was enough for a ham passerby to punch the doorbell, are still with us, but now the antennas may be rotaries!

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They "Only Fade Away"!

The lure of amateur radio is proving too strong for a few Old-Timers who ostensibly "gave it away" years ago. Met no less an old friend than Chas Maclurcan (old A2CM) t'other day, and he yet cherishes ideas of putting a rig back on the air. In fact, he is so serious about it that, despite his pre-occupation as the driving force behind one of Sydney's most important hotels, he holds his A.O.C.P. and renews his "Ham" licence yearly. Chas., like many of us older "Hams," is a bit grey at the temples, but says "when he retires some day, 2CM will be heard again."

Not all the old callsigns heard these days on "ten" are re-issues to successors, as witness VK2GQ. This station, heard battling out CW at a nice clip, has the original hand at the key-knob. It is that of Ted Barlow, a veteran of both wars. In the first he was an A.F.C. pilot, hurtling around the Somme skies in Sopwith "Camels," etc.; and in the second an A.M.F. Sigs. officer. He commanded Eastern Command Area Sigs., which Unit had lots of applications for radio from the word go. If he had the "Ham" bug before 1939, it has bitten a lot harder during his Sigs. career.

Another Sig. heard with familiar style, and always on the key, is that of Charles Luckman, VK2JT. His is one of those stations which, with unassuming modesty, gets in

"ATTRACTIVE DX"

Talking of DX on "Ten," we notice that lots of stations, both here and overseas, don't waste any time answering the "CQ DX" calls of a W8 station at present so active in Shanghai, China. Reason isn't far to seek—the YL (or is it XYL?) there has a pleasing voice, and we never knew the Ham who could quite ignore a feminine voice virtually pleading for DX! have you yet had a QSO with "Susu"? We heard of one W who (on C.W.) called "SUSU de BOZO" !!!

DX—on "Six" ?

The eleven year sun spot cycle theory is now accepted as a governing factor in the behaviour of HF's and VHF's with regard to ionosphere layer reflections, and current issues of overseas publications, both in U.S.A. and Britain, deal at length with predictions for the present year. Emphasis is laid upon the direct possibility of cross-Pacific working in the amateur 50-54 mC/s band, with the limit falling around 52 mC/s. With VHF conditions approaching a maximum, it is interesting to look back to 1936. It was in that year that my station, VK2NO, operating in the old 56-60 mC/s band, was reported heard at a mountain location in North Wales by a Mr. Mellanby. This report caused a fluttering in VHF amateur circles in Britain, and there were attempts to discredit the listener report. Fact remained that the report checked up with the log of the station operation. About a year later, the American Bureau of Standards reported upon ionosphere conditions

at the time, and stated that the reception would have been possible because of the extraordinary conditions prevailing.

In 1937, VK2NO was heard strongly in Wellington, New Zealand, by Mr. P. A. Morrison, of Karori, no less than five times over a period of four months. I mention these incidents in order to hammer home the obviously better chances of DX at the slightly lower frequency available in the new "Six" metre band.

ZL2UG informed me on "Ten" that Mr. Morrison is ready to conduct observations on signals from Australia, so the 6 metre gang should not be surprised to receive reports from across the Tasman.

It was in 1938 that VK5ZU, of Prospect, S.A., was logged on 56 mC/s phone by ZL4DQ of Dunedin, with the bad luck of no two-way hook-up.

Also, it was in August, 1939, that G's began working Italian under-cover "Ham" stations on "Five."

on the DX and makes WAC without fuss. Yes, the OT's are like the Old Soldiers!

* * *

Two embryo G's who have been doing the rounds of Sydney "Ham" stations lack nothing in enthusiasm—if in years. These two Lancashire lads—one, G2FMu, a W/T op., and the other a Radar mechanic R.N.—only need to spot an antenna over a roof—and that's enough. It started with VK2AKR's beam array!—a train from H.M.S. "Golden Hind" passing Lidcombe; the array seen from the train—the two G's hopping off and presenting themselves at the shack. Since then they have been heard at the "mikes" of various stations, and say they can't get home to G-land quickly enough to get their own rigs into action.

* * *

Radar men will forgive the suggestion—but it is refreshing to meet up with a Radar engineer who is also a practical key-punching "Ham" to boot. Perhaps I've been unfortunate, but most of the (over-

seas) Radar men I have met have been callow youths with no pre-Service experience of radio—who have adopted a know-all attitude of posture as high priests of Black Magic. When tried out on "ham" matters—my finding was that experience in the simplest of radio fundamentals was sketchy, and wide of the mark. Reason is obvious—youths called into the Service—mustered willy nilly as "Radar mechanics"—and stuffed with a lot of detail on one or two Service equipments. One such lad I encountered (and endured) confessed that back home he was a graduate in languages at a prominent University. Better he should return to his books instead of hoping to get a "laboratory job" with an unsuspecting Australian radio manufacturer. At the other end of the scale—I met up with a first-class Radio and Radar engineer from one of Britain's most famous electrical and radio concerns—he is a G "Ham" of long experience—and came to Sydney as operator aboard a Blue Funnel vessel, for a change,

Shortwave Review

CONDUCTED BY

L. J. KEAST

NOTES FROM MY DIARY—

DENMARK DESIRES DATA

I have received a letter from Lund-Johansen, Editor of the Danish journals "Radiolytteren" and "Popular, Radio" asking for information concerning shortwave stations in Australia and also the name and address of shortwave listeners interested in corresponding with Danish shortwave listeners. The first portion of his request I have attended to, but the latter I am leaving to individual readers of these pages, and for those who would care to write Mr. Lund-Johansen, here is the address: "Radiolytteren," Pilestraede 35, Copenhagen, Denmark.

UP SHE GOES

Now that rocket flights to the moon are no longer considered fantastic, what the Crosley comics, Bud Abbott and Lou Costello did the other day may turn out to be history-making. They walked into the Hollywood Post Office and actually posted a letter "To the man in the moon."

Superintendent Leo D. Collette, finding that there were no previously established rates to moon, set a figure of 70 cents a half ounce. The letter weighed one and a half ounces, so the boys paid 2 dollars 10 cents—for the privilege of mailing the first letter to the earth's satellite. (Collette did not set a delivery date.) —WLW Radio News.

NOW THEY WILL GROW FISH

Read where my two favourites,

"Fibber McGee and Molly" (Jim and Marian Jordan) will build a five-acre lake on their ranch in California. They plan to stock it with Bass, as well as use the water for irrigation purposes. Well, I guess Fibber will have a grand story to tell about "the one that got away."

RAY RETURNS FROM RADAR

Saw Ray Simpson threading his way gingerly through Sydney's crowded streets the other day. He was in mufti and I figure he finds it a little strange to "watch" for sounds after "listening" for so long. But now he is to write again for "R. & H." he will, I am sure, be spending many hours at the receiver, and I can see him measuring the air miles from Concord West to various towns in South America. Here's welcoming you back Ray, but I want to go on record in saying "Thanks to Ted Whiting for his great help with many doubtful stations and his almost regular listenings of the BBC transmitters." Ted did a fine job through the jolly hard war years and I trust that with the wealth of information he has amassed he will continue to follow this grand hobby and still give listeners the benefit of his loggings.

SAYS WHO?

"Find your log in the June issue of 'A.R.W.' most interesting. I am enclosing some notes for the next issue of your magazine and you will note I have been concentrating on the South Americans. I remember

you once referring to me as a 'tiger' for the South Americans, but as I have given you the signing-off times checked through July they should be useful." — Arthur Cushen.

They certainly are useful and I trust space will be found to print them all in this issue. Arthur Cushen, with the receipt of a verification from Luxembourg, can now proudly claim he has received 1,000 verifications, 594 on shortwave and 406 on Broadcast band. It represents 86 countries and the proportion of "Ham" stations is only 2 per cent. That is a very fine record. It is not surprising that he won the award offered by the New Zealand DX Club for 1945-46, for the best shortwave verification, and this turned out to be a South American, OAX2A, Trujillo City, Peru, 200 watts on 5.625 mc., Good business Arthur.—L.J.K.

I listened to the "Radio Australia" broadcast to North America and Canada over VLC-9, 17.84 mc, 16.82 m., but very bad interference from strong morse just on the edge made copying a little difficult around 10.45 a.m.—L.J.K.

The Canadian Broadcasting Corporation carried out a series of tests from July 22 to 26, on CHOL, 11.72 mc., 25.60 m. from 4.55—5.39 p.m. and on CKLO, 9.63 mc., 31.15 m., from 7.55—8.39 p.m. Actually the Australian-African antennae was used and various angles, 240, 250, 264 and 277 degrees were tried. Signals were generally good and doubtless we will later benefit from the trials. I have for ages hollered for a regular service from our Canadian cousins and look forward

to this now being consummated.—L.J.K.

Ern Suffolk, of Lobethal, South Australia reports hearing HP5A, Panama City, on 11.696 mc., 25.65 m. at 10.30 p.m.—L.J.K.

Roy Hallett who has been conducting the Broadcast Band DX pages of our contemporary, writes: "Pleased to see the 10th Birthday issue of A.R.W.; although I have not a copy of each issue, I have 84, and if they continue to prove as interesting (and no doubt they will, as peace-time conditions progress) the century will be registered in 16 months. I am now able to give an increased amount of time to listening as I have given up my daytime work with a Radio firm, and as you have doubtless noticed, the Broadcast band pages in 'R. & H.' has been cut out."

Received a nice verie from CHOL plus schedules and letter, also booklets containing the story of Canada's Radio Voice. TAP sent their attractive new card. Was quite pleased when the American West coasters had to put on a transcribed programme of music instead of their regular baseball rebroadcast the other night, as it proved quite enjoyable, and brought to my no-

tice the change of studio equipment from San Francisco to Los Angeles. Land-lines failed right in the middle of a "King" Cole trio record, during one of Jill's request programmes one night last week, but otherwise to my knowledge, despite the move South, programmes have been interrupted. A photo of Jill appears in one of several interesting books to arrive here recently from NBC, New York; her real name is Martha Wilkerson." — Jill will be remembered as that bright little lassie who conducts "GI Jive."—L.J.K.

Bill Howe of "Universalite" and Roger Legge report verifications from Radio Club De Cabo-Verde, Praia, Cape Verde Islands. This station is heard on 6.40 mc. 46.84 m., from 7.30—8.30 a.m. This is not audible at that hour at my little shack, but for those lucky ones, the address is Oldgard B. Lisboa Santos, Servicos de Fazenda, Praia. The language you may hear will be Portuguese.—L.J.K.

Rex Gillett advises his latest veries are from: "Radio Luxembourg," "Radio Tananarive," PLY Bandoeng, 10.060 kc., HER-5 (first report from Pacific area), OIX-2 and OIX-4, LRX, COKG, KGOY (25.2 and 31.10 m.) SUX, FZI

(49.81), and FCJ (49.79, 31.28, 25.57 m).

JODK is the key station of the Korean Broadcasting System, studios are in Seoul, the capital (formerly known under Japs as Keija). Staffed by Koreans under supervision of civilian American technicians of Military Government.

Transmitters are on the outskirts of the city. There are three, but only one is a s.w. channel, this being on 2510 kc.; it uses 5000 watts. Broadcast day runs from about 7.30 a.m. till midnight. It is not a continuous sked, however, Korean is used, but news in English is broadcast in Korea's early afternoon (exact time is not known). Sign off is in Korean and English.—Gillett.

Mr. Frank W. Brockbank, of Auburn, after making some very nice references to these pages, states he has been DX-ing for seven years and with a 5-valve dual-wave set connected to an inverted "L" aerial 70 feet long and 40 feet high he is very pleased with his results. He considers from 5.30—6.30 a.m. offers the greatest selection of stations. As a qualified radio mechanic and studying for the M.I.R.E. exam, hopes to be on the air in 1947.

ULTIMATE

Champion Radio

Sole Australian Concessionaires:

GEORGE BROWN & CO. PTY. LTD.
267 Clarence Street, Sydney

Victorian Distributors: J. H. MAGRATH PTY. LTD., 208 Little Lonsdale Street
Melbourne

The Ultimate factory has made the changeover from wartime production. Designs for the new models are now completed and production is about to commence.

These models should be available soon — they will be worth waiting for. Watch for further announcements.

SERVICE: Servicing of all kinds of radio sets, amplifiers and Rola speakers will continue to be available.

COMMONWEALTH OF AUSTRALIA

"RADIO AUSTRALIA"

OVERSEAS SHORTWAVE SERVICE OF DEPARTMENT OF INFORMATION

VLA (Shepparton): 100 KW. VLC (Shepparton): 50 KW

| | m. | mcs. | VLC2 | .m. | mcs. |
|------|-------|-------|-------|-------|-------|
| VLA | 41.21 | 7.28 | VLC4 | 30.99 | 9.68 |
| VLA3 | 30.99 | 9.68 | VLC4 | 19.59 | 15.32 |
| VLA4 | 25.49 | 11.77 | VLC5 | 31.45 | 9.54 |
| VLA6 | 19.74 | 15.20 | VLC6 | 31.2 | 9.615 |
| VLA7 | 16.85 | 17.80 | VLC7 | 25.35 | 11.84 |
| VLA8 | 25.51 | 11.76 | VLC8 | 41.21 | 7.28 |
| VLA9 | 13.89 | 21.60 | VLC9 | 16.82 | 17.84 |
| | | | VLC10 | 13.84 | 21.68 |
| | | | VLC11 | 19.72 | 15.21 |

VLB (Shepparton): 100 KW. VLG (Lyndhurst): 10 KW.

| | .m. | mcs. | VLG | .m. | mcs. |
|------|-------|-------|-------|-------|-------|
| VLB | 31.45 | 9.54 | VLG3 | 31.32 | 9.58 |
| VLB2 | 30.99 | 9.68 | VLG3 | 25.62 | 11.71 |
| VLB3 | 25.49 | 11.77 | VLK4 | 25.35 | 11.84 |
| VLB6 | 19.74 | 15.20 | VLG5 | 25.25 | 11.88 |
| VLB7 | 16.85 | 17.80 | VLG6 | 19.69 | 15.23 |
| VLB8 | 13.89 | 21.60 | VLG7 | 19.79 | 15.16 |
| VLB9 | 31.2 | 9.615 | VLG9 | 25.21 | 11.90 |
| | | | VLG10 | 25.51 | 11.76 |

Times: Aust. East. Stand. 10 hours ahead of G.M.T.

| | | |
|---------------------|--------|---|
| 6.30—9.30 am—VLA3 | 30.99: | To British Isles and Europe. |
| 7.15—9.30 am—VLA3 | 30.99: | To Forces in Pacific, Japan and Asia. |
| | VLB6 | 19.74: To Forces in Pacific, Japan and Asia. |
| | VLC4 | 19.59: To Forces in Pacific, Japan, and Asia. |
| 10.30—11.45 am—VLA9 | 13.89: | To Nth America (East) and Canada (till 11.30). |
| | VLC9 | 16.82: To Nth America (East) and Canada (till 11.30). |
| 12.00—2.00 pm—VLA9 | 13.89: | To Forces in Pacific, Japan and Asia. |
| | VLB6 | 19.74: To Forces in Pacific, Japan and Asia. |
| | VLC4 | 19.59: To Forces in Pacific, Japan and Asia. |
| | VLG6 | 19.69: To Forces in Pacific, Japan and Asia. |
| 1.15—5.30 pm—VLB6 | 19.74: | To Forces on Saturdays only |
| 2.45—3.45 pm—VLA4 | 25.49: | North America (West) |
| | VLB8 | 13.89: (Not on Saturday) |
| | VLC4 | 19.59: (Not on Saturday) |
| | VLG7 | 19.79: (Not on Saturday) |
| 4.00—4.45 pm—VLC4 | 19.59: | Tahiti in French |
| | VLG3 | 25.62: To Tahiti in French |
| 5.00—6.15 pm—VLA9 | 13.89: | To British Isles (till 6.00 pm). Not used on Sat. |
| | VLB3 | 25.49: To British Isles (till 6.00 pm). Not used on Sat. |
| 5.30—6.45 pm—VLC4 | 19.59: | To New Caledonia in French |
| | VLG3 | 25.62: To New Caledonia in French |
| 6.30—11.00 pm—VLA8 | 25.51: | To Forces in Pacific, Japan and Asia. |
| 12.—1.00 am— | | |
| 6.58—8.00 pm—VLB9 | 31.2: | To Forces in Pacific, Japan and Asia. |
| | VLC4 | 19.59: To Forces in Pacific, Japan and Asia. |
| | VLG5 | 25.25: To Forces in Pacific, Japan and Asia. |
| 8.00—10.00 pm—VLB9 | 31.2: | To Asia (VLB9 till 9.30) In Chinese, Japanese, Dutch and Malay |
| | VLC4 | 19.59: To Asia (VLC4 till 9.45) In Chinese, Japanese, Dutch and Malay |
| | VLG5 | 25.25: To Asia (VLG5 till 9.45) In Chinese, Japanese, Dutch and Malay |
| 10.00—11.00 pm—VLA8 | 25.51: | To Asia and Forces. |
| | VLG5 | 25.25: To Asia and Forces |
| 10.00—11.15 pm—VLB | 31.45: | To Nth America (East) and Canada |
| | VLC7 | 25.35: To Nth America (East) and Canada |
| 11.00—11.35 pm—VLA8 | 25.51: | To Indo China in French |
| | VLG5 | 25.25: To Indo China in French |
| 11.35—12.00 pm—VLA8 | 25.51: | To Siam in Siamese |
| | VLC6 | 31.2: To Siam in Siamese. |
| | VLG5 | 25.25: To Siam in Siamese. |
| 12.00—1.00 am—VLA8 | 25.51: | To Pacific and India |
| | VLB2 | 30.99: To Pacific and India |
| | VLC6 | 31.2: To Pacific and India |

| | | |
|-------------------|--------|--|
| 1.00—2.00 am—VLA8 | 25.21: | (from 12.15 a.m.) |
| | 25.51: | To British Isles (VLA8 till 1.30 am). |
| | VLB2 | 30.99: To British Isles (VLA8 till 1.30 am). |
| | VLC6 | 31.2: To British Isles (VLA8 till 1.30 am). |
| | VLG9 | 25.21: To British Isles (VLG9 till 1.45 am). |
| 2.00—3.00 am—VLA4 | 25.49: | To Nth America (West) |
| | VLC6 | 31.2: To Nth America (West) |
| | VLG | 31.32: To Nth America (West) |

AUSTRALIAN BROADCASTING COMMISSION

NATIONAL SHORTWAVE STATIONS

VLR, Melbourne, 2 Kilowatts; VLH, Lyndhurst, 10 kilowatts; VLG, Lyndhurst, 10 kilowatts.

VLR Call-signs.

SUNDAYS. - - All Times East. Aust. Standard.

| | | | |
|-------|------------------|--------|--------|
| VLR-2 | 6.45 am—9.15 am | 48.78m | 6.15mc |
| VLR | 9.30 am—6.30 pm | 31.45m | 9.54mc |
| VLR-2 | 6.58 pm—11.30 pm | 48.78m | 6.15mc |

WEEK-DAYS

| | | | |
|-------|------------------------------------|--------|--------|
| VLR2 | 6.00 am—7.10 am | 48.78m | 6.15mc |
| VLR | 7.20 am—10.00 am | 31.45m | 9.54mc |
| VLR | 11.45 am—5.00 pm | 31.45m | 9.54mc |
| | (Saturdays, 11.45—6 pm). | | |
| VLR-2 | 5.15 pm—11.30 pm | 48.78m | 6.15mc |
| | (Saturdays 6.15 pm to 12 midnight) | | |

VLH Call-signs

SUNDAYS

| | | | |
|-------|------------------|--------|---------|
| VLH-4 | 6.45 am—8.30 am | 25.25m | 11.88mc |
| VLH-5 | 9.00 am—3.00 pm | 19.69m | 15.24mc |
| VLH-4 | 3.30 pm—6.00 pm | 25.25m | 11.88mc |
| VLH-3 | 6.30 pm—11.30 pm | 31.32m | 9.58mc |

WEEK-DAYS

| | | | |
|-------|------------------|--------|---------|
| VLH-4 | 6.00 am—8.15 am | 25.25m | 11.88mc |
| VLH-5 | 10.00 am—4.00 pm | 19.69m | 15.24mc |
| VLH-4 | 4.30 pm—6.30 pm | 25.25m | 11.88mc |
| VLH-3 | 6.45 pm—11.30 pm | 31.32m | 9.58mc |

SATURDAYS

| | | | |
|-------|------------------|--------|---------|
| VLH-4 | 6.00 am—8.15 am | 25.25m | 11.88mc |
| VLH-5 | 10.00 am—5.30 pm | 19.69m | 15.24mc |
| VLH-3 | 5.45 pm—M/night | 31.32m | 9.58mc |

VLG Call-sign

| | | | |
|-------|-----------------------------|--------|---------|
| VLG-7 | 6.00 am—8.00 am | 19.79m | 15.16mc |
| | (Sundays: 6.45 am—8.15 am). | | |

CHANGES IN "RADIO AUSTRALIA"

In addition to these shown under New Stations:

VLA-4 11.77 mc 25.49m: Joins VLA-4, 15.32mc to North America from 3—3.45 pm.
VLC-10, 21.68mc, 13.84m: Joins VLA-4, 11.77 mc and replaces VLC-11, 15.21mc to British Isles from 5—6.15 pm
VLA-8, 11.76mc, 25.51m: replaces VLA-4, 11.77mc, to Forces in Pacific from 6.35 pm—12.29 am
VLG-9, 11.98mc, 25.21m: has replaced VLG, 9.58mc, and joins VLA-3, 9.68mc, and VLC-6, 9.615mc from 12.15—1.45 am.

CROSLY CHANGES

WLWS, Cincinnati, 15.13mc, 19.83m is now on the air from 9.45 pm till 7.30 am directed to Europe. This frequency has replaced 15.13mc.
 WLWS, Cincinnati, 21.65mc, 13.85m: First heard around February of this year for a little while has again returned to the air and directed to North Africa is heard from 9.45 pm till 7.30 am.

RADIO TANANARIVE MADAGASCAR

Here are the latest schedules received in a verification by Rex Giffet:
Week-days: 2.30—3.30 pm 10.615 mc, 28.26m, 9.693mc, 30.95 and 6.138mc 48.88m.
 6.30—8.00 pm same as above.
 1.00—2.00 am: 28.26m, 48.88m and 4.37mc, 68.82m.
Sundays: 6.30—8.00 pm, 28.26m, 30.95 and 48.88m.
 Midnight—2.00 am: 28.26m, 48.88 and 68.82m.
 Verie was in French from Le Chef du Service General de l'Information, Tananarive, Madagascar.

NEW STATIONS

"RADIO AUSTRALIA," the Overseas Shortwave Service of Department of Information has added some more transmitters at Shepparton, Victoria and with a power of 100kw. have commenced to broadcast.

Here is the complete list:

| | | |
|------|-----------|----------|
| VLB | 9.54 mc. | 31.45 m. |
| VLB2 | 9.68 mc. | 30.99 m. |
| VLB3 | 11.77 mc. | 25.49 m. |
| VLB6 | 15.20 mc. | 19.74 m. |
| VLB7 | 17.80 mc. | 16.85 m. |
| VLB8 | 21.60 mc. | 13.89 m. |
| VLB9 | 9.615mc. | 31.2 m. |

As at August 26 schedules are as follows:

VLB-6, 15.20 mc, 19.74 m.: 7.15—9.30 am to Forces in Pacific, Japan and Asia. Noon—2.00 pm, to Forces in Pacific, Japan and Asia.

VLB-8, 21.60 mc, 13.89 m.: 2.45—3.45 p.m. daily except Saturdays to N. America (West).

VLB-3, 11.77 mc, 25.49 m.: 5.00—6.15 pm to British Isles.

VLB-9, 9.615 mc, 31.2 m.: 6.58—8.00 pm to Forces in Pacific, Japan and Asia; 8.00—10.00 pm to Asia in Chinese, Japanese, Dutch and Malay.

VLB, 9.54 mc, 31.45 m.: 10.00—11.15 pm to North America (East) and Canada.

VLB2, 9.68 mc, 30.99 m.: Midnight—1.00 am to Pacific and India; 1.00—2.00 am to British Isles.

U.S. GOVERNMENT—DEPARTMENT OF STATE (OIC) INTERNATIONAL BROADCASTING DIVISION

SAN FRANCISCO STATIONS AND FREQUENCIES

Time: East. Aust. Standard

| | mc | m | |
|-------|-------|--------|--|
| KNBA | 21.61 | 13.88: | 7.00 am—8.15 am beamed to Sth. America |
| KNBA | 17.78 | 16.87: | 10.00 am—11.15 am beamed to Japan, S. China—NEI |
| KNBI | 15.34 | 19.56: | 7.00 am—8.15 am beamed to South America. |
| KNBX | 15.34 | 19.56: | 8.30 am—1.00 pm beamed to South America |
| *KCBA | 15.27 | 19.64: | 7.00 am—1.00 pm beamed to South America |
| KCBF | 17.85 | 16.81: | 7.00 am—1.00 pm beamed to South America |
| KCBR | 15.33 | 19.57: | 8.30 am—11.15 am beamed to China-S.E.A. |
| KCBR | 11.77 | 25.49: | 11.30 am—1.00 pm beamed to South America |
| KWID | 17.76 | 16.89: | 7.00 am—10.15 am beamed to South America |
| KWID | 9.57 | 31.35: | 10.30 am—1.00 pm beamed to Sth America |
| KWIX | 17.77 | 16.88: | 10.30 am—11.15 am beamed to Japan-S. China-NEI |
| *KHRO | 17.80 | 16.85: | 8.30 am—11.15 am beamed to Philippine-NEI |
| KNBA | 9.49 | 31.61: | 7.00 pm—1.00 am beamed to Japan-S. China-NEI |
| KNBX | 11.79 | 25.45: | 7.00 pm—7.30 pm beamed to N.Z. |
| KNBX | 11.79 | 25.45: | 7.45 pm—2.00 am beamed to China-S.E.A. |
| KCBA | 15.15 | 19.81: | 7.00 pm—1.00 am beamed to Philippine-NEI |
| KCBF | 11.77 | 25.49: | 7.00 pm—1.00 am beamed to Japan-S. China-NEI |
| KCBR | 9.70 | 30.93: | 8.00 pm—1.00 am beamed to Philippine-NEI |
| KGEX | 11.73 | 25.59: | 8.00 pm—1.00 am beamed to NEI-Philippine |
| KWID | 9.57 | 31.35: | 10.00 pm—2.00 am beamed to China-S.E.A. |
| *KRHO | 9.65 | 31.09: | 7.00 pm—1.00 am beamed to Japan-China-S.E.A.-India |

*Honolulu.

LET'S LISTEN TO THE LATIN AMERICANS

TIMES ALL E.A.S.T.

Latest sign off times of the Latin Americans as received during July at the listening post of Arthur T. Cushen, 212 Earn St., Invercargill, N.Z.

SIGN OFF TIME:

- 12.50 pm—ZYB7, 6095 kc, Sao Paulo, Brazil, signs at this time, veri by letter.
- 1.00 pm—HH3W, 10130 kcs., signs at this time, opens 9.30 pm, non-verifier.
- 1.00 pm—CXA-19 "El Spectador," Montevideo, veri by new card, also booklet on network, signs at good strength at this time.
- 1.15 pm—HC2AN, "Radio Cenit," Guayaquil, Ecuador, signs at fair strength, verifies.
- 1.30 pm—HCJB, "The Voice of the Andes," Quito, 6285 kcs., verifies by card, 1000 w.
- 2.00 pm—HC2ET, "Radio El Tralegrafo," 4751 kcs., fair strength when closing.
- 2.00 pm—HJDE, 61.45 kcs., signs at this time. Eng. announcement heard at 1.30 pm.
- 2.00 pm—HJCD, 6160 kcs., closes with National Anthem.
- 2.00 pm—HJCQ, 4960 kcs., "Radiodifusora Nacional," heard to 2.30 pm at times also.
- 2.00 pm—COBQ "La Voz de Cuba," Havana, sometimes later than this, good signal.
- 2.00 pm—HRN, "La Voz de Honduras," fair signal when closing, 5875 kcs.
- 2.00 pm—HP5A, 11705 kcs., Panma City, sports relay to sign off. Verifies with card.
- 2.00 pm—CE970, 9720 kcs., and CE1190, 11900 kcs., both fair when closing, have Eng. sign-off; also heard opening 9.00 pm. Veri by card.
- 2.30 pm—OAX4Z, "Radio Nacional de Peru," Lima, 5895 kcs., one of the best, signs 2.30 pm with organ, verified with bright card.
- 2.30 pm—OAX4P, "Radio Huancayo," Huancayo, Peru, closes at fair strength.
- 2.30 pm—PRI-3, 6005 kcs., heard closing at this time once, signs usually at 1 pm.
- 2.50 pm—COCD, Havana, Cuba, signs with good-night melody, good signal, verifies.
- 2.50 pm—CE782 7820 kcs., new station, closes with "Goodnight Melody," relays CB97 "Radio Prat," Santiago, Chile.
- 3.00 pm—HI1Z, Trujillo City, heard to this time, but usual sign off is 1.40 pm, on 6310 kcs., slogan: "Broadcasting Nacional."
- 3.00 pm—YSR, San Salvador, 6270 kcs., new channel, signs at this time, but not regular, "La Voz de El Salvador."
- 3.00 pm—OAX6B, "Radio Landa," Arequipa, Peru, little heard station, 200w. now signs with organ "Rosalie" selection, fair signal.
- 3.00 pm—OAX6E, "Radio Continental," the best Latin here, great signal, signs with organ, veri by card; also located in Arequipa, Peru.
- 3.00 pm—OAX4J, "Radio Colonial," Lima, 9340 kcs., signs at good strength.
- 3.00 pm—OAX4V, 5946 kcs., now relayed by old-timer, OAX4W, back on 9375 kcs., good strength. "Radio America", Lima, location; signs with "Minuet in G."
- 3.00 pm—OAX4M, "Radio Miraflores," Lima, Peru, new station, signs with "Lover Come Back to Me," often on to 3.05 pm, on 6310 kcs., mixed with "Baden Baden," new French station in Germany, which opens at 2.45 pm.
- 3.00 pm—COBC, "Radio Progreso," Havana, signs at fair strength, 9365 kcs.
- 3.00 pm—HI2T, "La Voz del Yuna," Mensenor Nouel, Dominican Rep., signs with "Dominican March," at this time.
- 3.00 pm—YNOW (6750) and YNPS (6850) and YNQ (6910) all heard signing at this time.
- 4.00 pm—LRM, 5905 kcs., heard here with sign off Sundays, 4.00 pm, weekdays 3.00 pm. Transmitter still being heard on 6180 kcs., also.
- 4.00 pm—HI1G (6150) and YSPB (6150) both mixed here to sign-off at 4 pm. HJAG (4975) and HC2AK (4650) best 60 metre stations, sign 4 pm also.

Others from the Americans include LRS-LRS1 and LRX, also heard to 1 pm, and CFVP (6030) signs 4.45 pm Sundays, CBRX to 5.30 pm, on 6160 kcs.

Speedy Query Service

N.E.S. (Toowoomba) enquires about a circuit for a one-vave signal tracer?

A.—Yes, a circuit of the kind you describe appeared in our issue for February last. Back numbers are available direct from this office at 1/- each, post free.

* * *

T.C. (Drouin, Vic.) enquires about loudspeaker matching to a 500 ohm line.

A.—The turns ratio should be according to the square root of the impedance ratios. Since the voice coil is rated 3.7 ohms, the impedance ratio will be 500 divided by 3.7, which is about 13½, and the turns ratio you need is the square root of this number, which is about 3.6.

* * *

P.C.S. (Adelaide) asks about the 6SJ7G valves, now being offered in place of 6J7G.

A.—The 6SJ7G is the new single-ended style of valve and is similar to the 6J7 as regards characteristics, but the socket connections are entirely different. Provided that you take these into consideration the valve is equally suitable for all audio purposes. The socket pins run: (1) metal screen to be earthed; (2) Heater; (3) Suppressor grid; (4) Control grid; (5) Cathode; (6) Screen grid; (7) Heater; (8) Plate. There is no cap to the valve.

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'Phone: BW 7687

D.M. (Inverloch) asks whether it is now necessary to get a permit in order to set up in business as a radio serviceman.

A.—So far as we can find out, the regulations covering this matter were scrapped some time ago and all you have to do is hang out the shingle and wait for the customers to pour in the door.

Time and time again there has been talk of the licensing of radio mechanics, radio dealers and so on, but there does not appear to be any restrictive regulations actually in force at present.

P.E.D. (Vaucluse) is worried about speaker field energising.

A.—If you are out after maximum performance the only rule is to put as many watts into the field as it can take without getting overheated. The more watts in the field the better will be its performance up to the stage where the heat warps the voice coil so that it fouls the pole piece or something like that. A happy medium is to have the field coil housing comfortably hot after a couple of hours running. It is quite useless to feed more audio watts into the voice coil than you have watts of power in the field.

P.L. (Western Australia) complains about slow delivery.

A.—Sorry, but there is no easy way of speeding up delivery and distribution except by placing your subscription order direct with us. We will then see that your issue is posted the same day that it comes off the press.

W.A.S. (Cooma) is having trouble in cutting valve socket holes in an aluminium base.

A.—To avoid the ragged edges it is only necessary to use a suitable lubricant on the cutting bit. Turpentine is one of the best, but even light oil, such as sewing machine oil is better than nothing at all.

M.P.L. (Ballarat) asks about cathode ray tubes.

A.—We would strongly recommend the 902 or the 906 type. The 913 is quite O.K., too, but a bit on the small side. The other type you mention was specially developed for one of the radar applications and is entirely unsuitable for use in an oscilloscope for ordinary radio use.

N.K. (Essendon) enquires about a folded horn with twin channels.

A.—The article would be in the December, 1943 issue, and covers a folded horn type of acoustic labyrinth with separate openings for lows and highs. As detailed it was suitable for the Rola 10" range of speakers. A few copies of this issue are still available at 1/-, post free, direct from this office.

CONNOISSEUR

(Continued)

necessary to do the dial setting and preliminary adjustment of the aerial circuit using the more powerful "locals" but for best results the final aerial alignment should be made using a weak station as there is less error from "Miller Effect" detuning and it is on weak stations that correct alignment is required.

On the short-waves screw the oscillator trimmer right out and adjust the aerial trimmer for maximum output on a station on the 16 metre band—or align for maximum noise level on this band. The aerial iron core can be adjusted in a similar manner somewhere between the 31 and 42 metre bands.

SKY-HAWK

(Continued)

speaker, the volume control can be advanced and the tuning dial slowly rotated. A station should soon be picked up.

To align the receiver, set the two trimmers on top of the gang about half-way out, and tune in a station near the middle of the band—preferably one that requires a fair amount of reaction to bring it up to quiet room volume. Then adjust the trimmer on aerial section of the gang until volume is loudest.

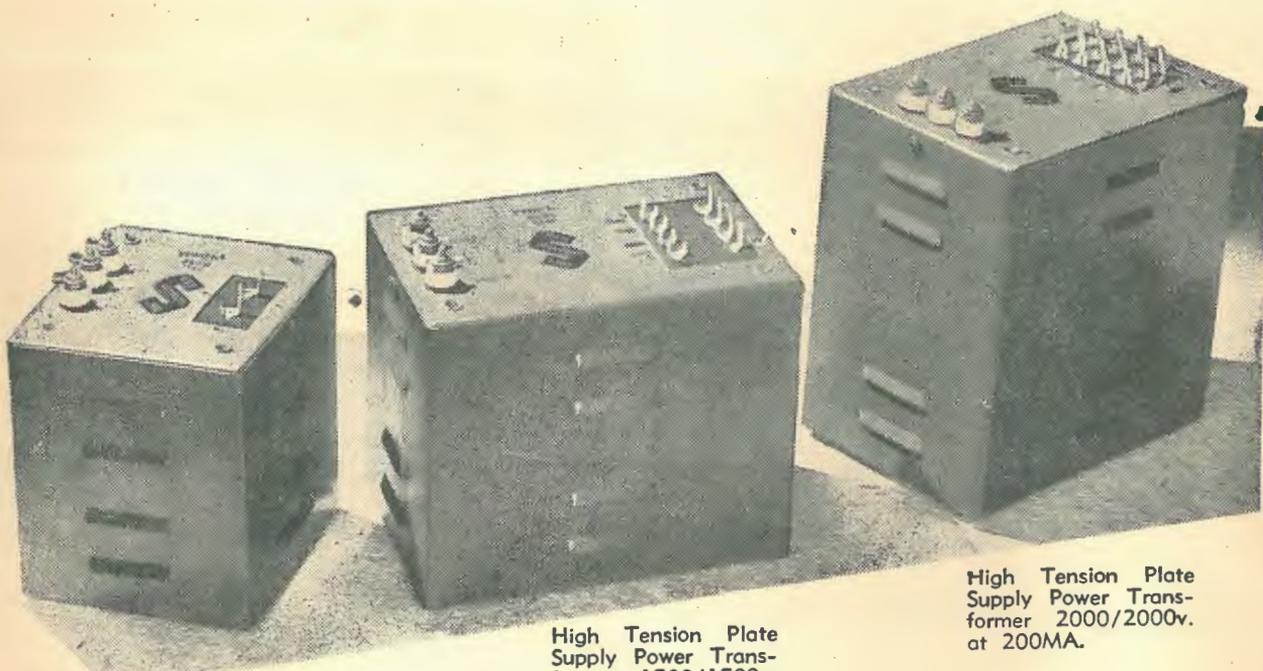
UNIT SHOULD NOT OSCILLATE

When the unit is switched in or out of circuit, it may be necessary with some receivers to make a slight adjustment to the main tuning control.

It will be found that the booster operates best, giving greatest gain and selectivity, with the regeneration control set just *below* the oscillation point.

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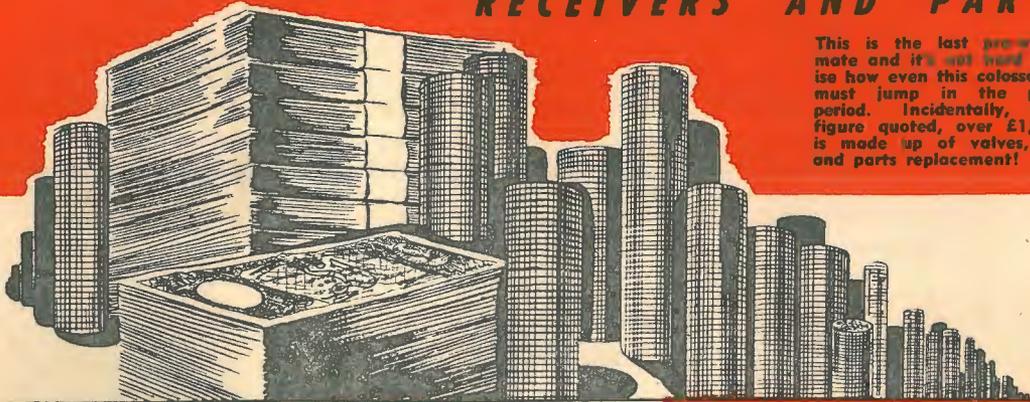
THE MONOGRAM

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AUSTRALIA SPENDS MO

£ 8,000,000

ANNUALLY ON RADIO RECEIVERS AND PARTS



This is the last pre-war estimate and it's not hard to realise how even this colossal figure must jump in the post-war period. Incidentally, in the figure quoted, over £1,000,000 is made up of valves, service and parts replacement!

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Pre-war Radio Set output reached an estimated 280,000. All records are expected to be broken in near future.

Even a 25 per cent increase in set sales will mean openings for perhaps 1,000 more Radio dealers—

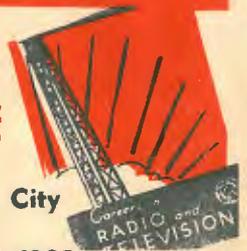
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10/463

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Dear Sir,—I am interested in Radio. Please send me, without obligation on my part, the free book, "Careers in Radio and Television."

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ADDRESS

27 APR 2010