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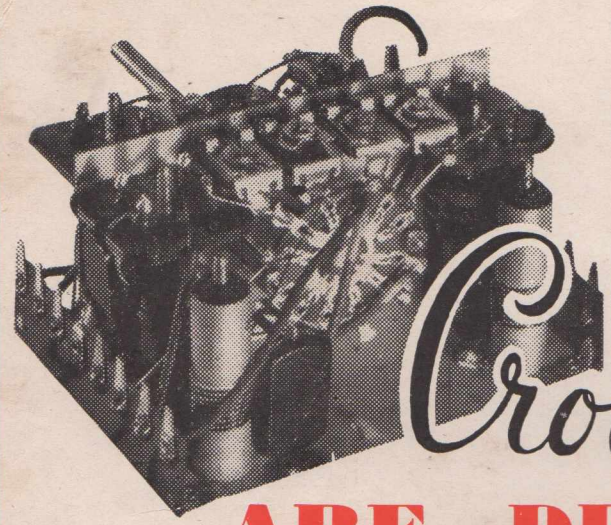

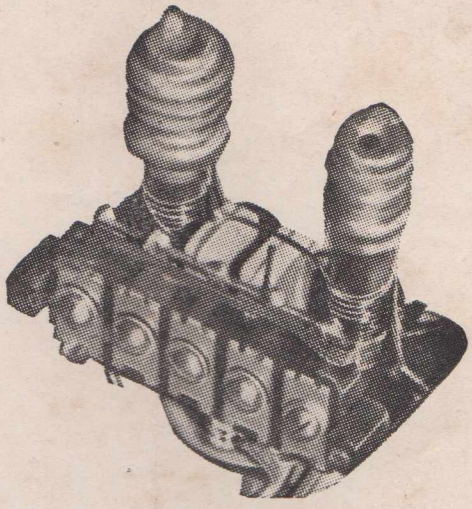

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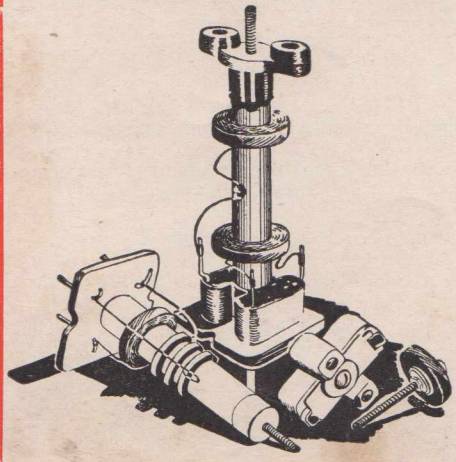

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EDITORIAL

Like most new things, the advent of the "personal" set, a baby version of a self-contained battery-operated portable, brings along its crop of worries.

Whilst waiting at a radio counter in town recently the customer ahead of me was trying to dispose of one of these sets. He told the man at the counter that he had only bought it a month ago, but already it had used up three sets of batteries. Having a few moments to spare, I suggested that we check the current drain, borrowed a meter and did so. The drain was still a shade over 12 milliamps, although the batteries were both down fairly low. This is a fairly normal drain for sets of the type and with it a 467 type battery will last about 15 hours. The running cost works out at well over a shilling per hour.

Unless buyers are acquainted with the true position about running costs these portables are likely to earn a smelly reputation, thereby spoiling what would be a further wide application of radio if handled properly.

Public reaction to the price of the minimax batteries is also easy to understand. They know that a small torch battery costs 8d. or 9d. The minimax is two or three times as big and as heavy. It is expected that the price will be, likewise, two or three times as much.

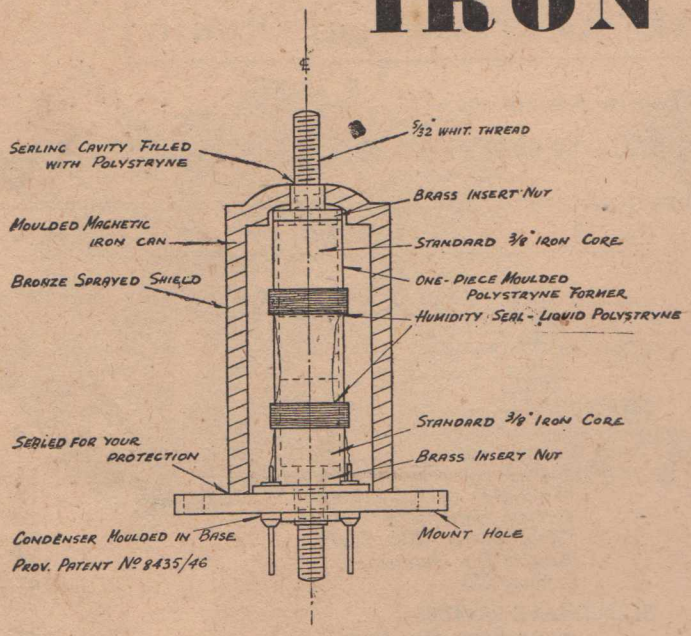
Unless the running costs of personal portables can be greatly reduced, they are going to go down in history as one of the worst flops in the radio business.

A. G. HULL.

R.C.S. — Radio's Cleanest Signal

—WITH THE MAGNASONIC

IRON CLAD COIL



The R.C.S. patented Magnasonic IRON CLAD I.F. is designed in conformity with the latest electronic developments and manufactured in one of the most modern factories of its size in Australia.

Outstanding of the super features of the R.C.S. intermediate are the high gain, wide range of selectivity, and total absence of frequency drift even under the extremities of operating conditions in Australia. One of the greatest causes of loss of gain—climatic conditions—is countered by a process of tropic-proofing and impregnating. The R.C.S. intermediate is fitted with a patented copper-sprayed iron can which has been so successful in maintaining peak operating efficiency on all R.C.S. coil units. The R.C.S. Intermediate is but one of the many high-quality radio components manufactured by R.C.S. Radio Pty. Ltd.

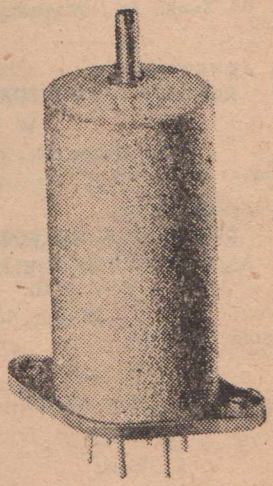
PERSONAL COIL KIT
TYPE K118

Consisting of—

1 Loop Aerial ..... Type F125
1 Midget Oscillator Coil for 6A8, 6J8-1R5 Valves) .... Type E354
2 Miniature Intermediate Transformers ..... Type IF168
1 Padding Condenser ..... Type P21

These kits are available from your local retailer. Contact them NOW for full particulars and specifications.

The miniature R.C.S. iron clad coil unit also produced in oscillator and short wave versions. Standard mounting holes, fit any chassis.



—R.C.S. RADIO PTY. LTD.

174 Canterbury Rd., CANTERBURY

"SALLY"

Powerful portable with drain of only 4 ma.

IN the construction of portable receivers, it is desirable always to keep size and weight to a minimum, but this is not always compatible with obtaining the maximum efficiency. Small size generally entails the use of a small speaker such as a 3-inch one. However such speakers are notoriously inefficient in that their magnets are too small to provide the necessary air-gap flux density for sufficient sensitivity.

By

H. L. HARVEY

University Union Hostel

Brisbane, Q.

This means that a comparatively large electrical input has to be applied to the speaker to give a sufficiently audible acoustic output. Thus we find most portables of the 5 valve variety operating at B current drains as high as 7 to 10 milliamps. With 67.5 volt Minimax batteries at their present exorbitant price, the very compact types of portable using small batteries and speaker, are not altogether an economical proposition as regards running cost.

"Sally" in her original form was a set of this type. A 5 valve job built from walkie-talkie parts and fitted with a 2" speaker, her overall dimensions (including masonite cabinet) were 8½" by 5½" by 3¼". B+ voltage was 67½V and she drew 7.5 milliamps. However, it was found that when the B voltage dropped below about 50 volts, distortion became very noticeable, and volume weak, and the 67½ volt Minimax had to be renewed once every two months. It was therefore decided that something had to be done to reduce costs (quite apart from the difficulty of obtaining Minimax batteries).

One solution to the problem of

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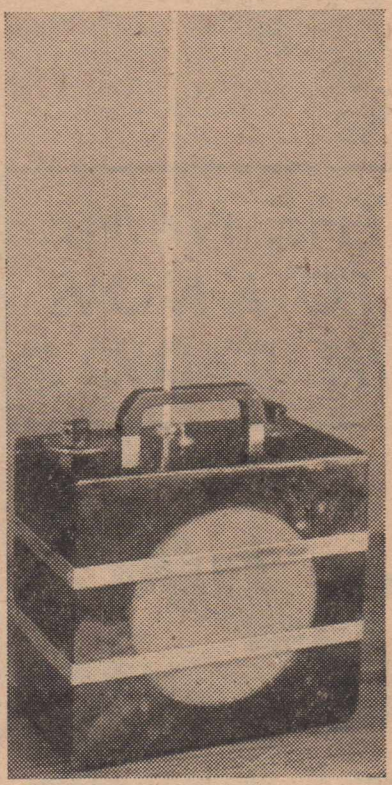

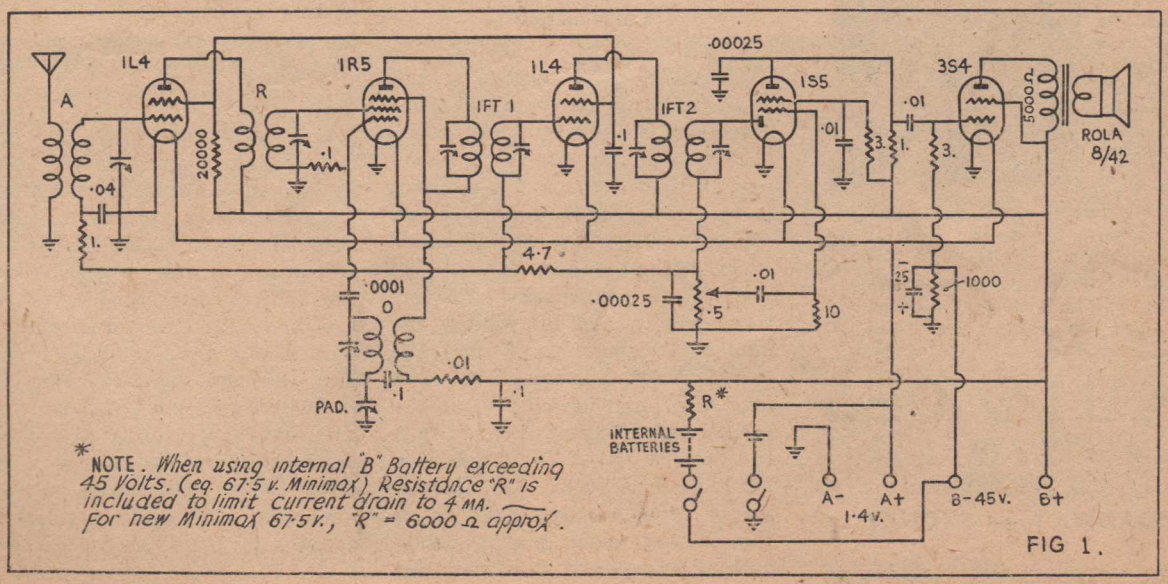

FIG 1.

"SALLY"

(Continued)

small batteries in short supply is to use larger batteries, but this does not necessarily reduce running costs. In the case of "Sally" it was decided to rebuild the set round a larger and more efficient speaker, operate the valves at subnormal B voltage, and considerably reduce B current drain without reducing acoustics output. The speaker chosen was nothing less than a Rola 8/42. Some readers may throw up their hands in horror at the idea of using a speaker of such size and weight in a portable, but subsequent tests have shown the choice to be a wise one. The most striking feature is the amount which B voltage and current can be reduced without adversely affecting the performance of the set, but more will be said of this in the section dealing with performance.

Circuit

It should be stated from the outset that the circuit contains no tricks. The circuit diagram is reproduced in Fig. 1 and is purely for reference purposes. As will be readily seen it is just the usual circuit with r.f. stage.

Construction

The use of an 8" speaker having a 42 oz. magnet entailed quite a problem in keeping the set reasonably small. By careful arrangement of parts round the speaker, it was found that the whole set could be fitted into a box which could normally just comfortably hold the 8 inch speaker. To further minimise size the cabinet was built of 20 gauge panel steel, the outside dimensions being 9¼ inches long, 8½ inches high, by 5½ inches deep. An illustration of the cabinet is shown in fig. 2. The finish is in black dynamel, with two chrome-plated bands running right round the cabinet, black plastic handle with chrome-plated steel mounting blocks and chrome-plated dial scales under the black pointer-type knobs. The aerial is the small telescopic walkie-talkie type chrome-plated and fitted with a telephone plug so that it simply plugs into the top of the cabinet and can be easily removed for portability (minimum length of aerial is 15 inches). It will be appreciated that a loop could not be used inside a steel cabinet, and the use of an external loop would mar the appearance. The speaker openings (the back of the cabinet is the same as the front) are 6 inches in diameter and covered with 100 mesh brass gauze. This provides better protection than cloth and leaves little to be desired in the matter of appearance.

Now it is one thing to squeeze a set into a small space, and another thing to do so and yet keep all parts readily accessible. In the case of "Sally", the set was built on to the speaker so that it could be removed from the cabinet merely by undoing the four speaker mounting screws. Batteries, consisting of a 67.5 volt Minimax and a cycle lamp battery with the two cells connected in parallel, are mounted in one corner of the cabinet and connected to the set by means of an octal plug and socket. There is another octal socket in the side of the cabinet for connecting external batteries and to provide external audio input and speaker connections. These are very handy for test purposes.

A general view of the set end cabinet taken apart is shown in fig. 3 and the method of building the set onto the speaker is readily seen. The walkie-takie chassis was left intact as far as possible and the RF converter, and IF valves and the two IF transformers can be seen along the front in fig. 3. The 1S5 and 3S4 are round the corner at the right-hand end. The batteries in their position in the cabinet, and the octal plug are also shown. The aerial with its telephone plug end-connection is shown lying across the back cover plate.

Fig. 4 shows the set mounted in the cabinet with the back cover plate removed. It will be seen that all wiring is accessible without removing the set from the cabinet. The only jobs requiring such removal are insertion of valves and alignment of IF transformers.

R.C.S. Coils

The tuning condenser is a miniature 3 gang while the coils are standard size R.C.S. (miniature coils being unobtainable at the time "Sally" was built.) It will be seen that aerial and RF coils are mounted right alongside the speaker magnet, and it was found necessary to insert a small piece of panel steel between the coils and the magnet to minimize the danger of core-saturation by the powerful magnetic field. The three trimmers are mounted directly on the gang condenser, and the padder can be seen to the right above the oscillator coil. The straight white wire running up across the speaker magnet is the aerial connection, and fits into a miniature plug in the phone jack. The two control knobs and switch are not shown in fig 4, but the volume control can be seen in the top right-hand corner and the extension shaft on the tuning condenser at the left.

It may appear from photos that the set could not be removed from the cabinet without first removing the batteries. However the latter are so positioned that the set can be "dived" out the opposite corner without disturbing the batteries. Likewise the batteries are a neat sliding fit in their clamps and can be replaced without disturbing the set.

Performance

Now we come to the crux of the matter, and the real advantages of using such a large speaker. The minimax shown in the photographs does not deliver 67½ volts, but is merely one of "Sally's" previous cast-offs and measured 45 volts when put back into service. By increasing the bias resistor on the 3S4 from 750 ohms to 1,000 ohms, and using IL4's in place of IT4's, and operating the set at a B voltage of 45 instead of the usual 67½ or 90, it was found that the total B current drain for the five valves was 4 milliamps. And from the very small amout of electrified power which the 3S4 was delivering under these sub-normal conditions, the Rola 8/42 speaker was giving quite a respectable acoustic output—plenty of volume for an ordinary-sized room was obtained with the volume control set at less than half-way for local stations.

The internal Minimax battery has not had much use, so the writer is unable to give any information as to how long the partly depleted Minimax could last. Practically all of "Sally's" running for the past 5 months has been on an external 45 volt light duty battery. She runs on an average about 2 to 3 hours a day and all day on Sundays. Of course the B battery no longer measures 45 volts, in fact it is now down to 36 volts, but with this reduction in voltage there occurs a reduction in current, the total drain at the latter voltage being 3 milliamps.

No Distortion

One may well wonder what sort of performance a 5 valve set would give under these conditions. The first and most objectional symptom of low voltage in battery sets is distortion. However, this generally arises from the need to turn the volume control up almost to overload point to get sufficient acoustic output from the set. The use of a more efficient speaker enables considerably greater latitude in battery voltages before distortion becomes objectional. For example "Sally" is operating quite satis-

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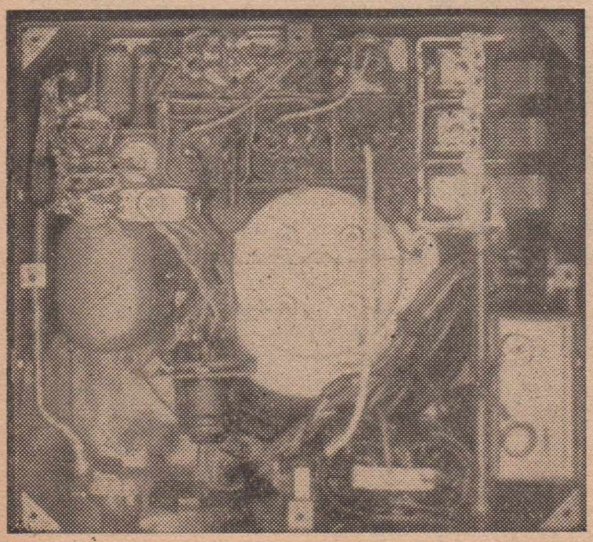
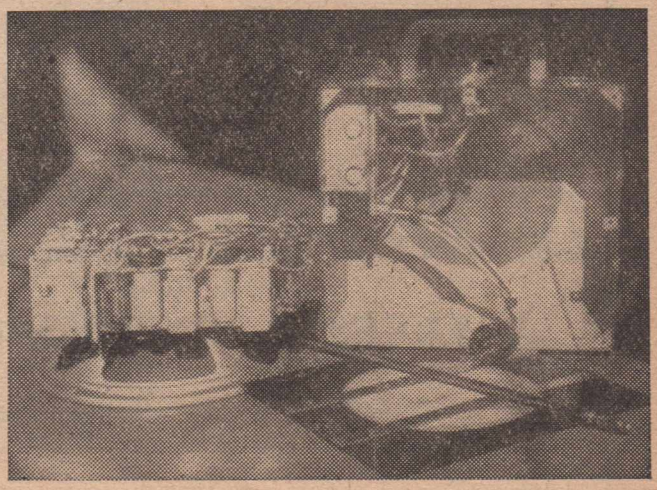




Two views of the original set.

"SALLY" (Continued)

factorily on 36 volts B, but if the A voltage is reduced below about 0.9 volts, distortion becomes objectionable.

On the matter of station-getting under sub-normal voltage conditions "Sally's" performance is highly satisfactory. With the telescopic aerial fully extended, a quick run round the dial the other night brought to light about 20 different southern stations including 3AR (incidentally reception of this station has been very reliable lately). Very good reception is also obtained from 2NA and 2GB. Recently I listened to an excellent reproduction of Mozart's Clarinet Quintet from 2NA and was impressed by the clarity of the higher audio frequencies. (It is very pleasing to hear good music from the A.B.C. without land-line obligato.)

Battery Life

In the matter of A batteries little can be done to effect economy. A light duty portable A battery used as an external battery on "Sally" lasts about 3 months. However, these are considerably less expensive than B batteries and there is less need to attempt economy measures.

The saving in B batteries is entirely due to the use of an efficient speaker, and at the fairly solid use to which the set is subjected, it is reasonable to expect a light duty 45 volt battery to last 6 months.

The use of really efficient speakers in battery receivers should be of particular interest to country listeners, and it is this writer's contention that speaker manufacturers should endeavour to produce a line of high-sensitivity speakers specifically for battery receivers. Anisotropic alnico should enable production of something even better than the 8/42.

Another advantage of operating at subnormal voltages with high-sensitivity speakers is that valve life can be increased, and in general the design of the whole set can entail a much higher factor of safety than normal.

A RECORD ON SIX METRES

Details of Dutch ham station at Eindhoven

ANYONE at all familiar with the world of short-wave radio amateurs, knows how keen these people are on their hobby. This is not surprising, for even the uninitiated can well imagine how fascinating it must be to be

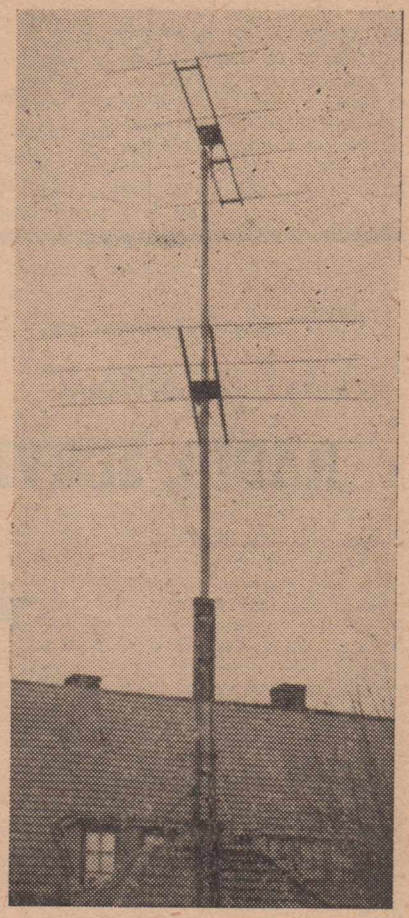
By
A Dutch Journalist
(Exclusive to Australasian Radio World)

able to speak with someone thousands of miles away with no other means than a receiver and small transmitting apparatus of minimum power. The astonishing development in radio technique is due to no small degree to these amateurs, who are rightly recognised to be the pioneers in the radio world.

Tradition is being Maintained

As soon as we heard that one of the many amateur transmitters among the Philips personnel, Mr. Zaayer, had established a link with Capetown on the 6-meter band—a unique performance in the annals of amateur transmission—we went and looked him up at his house. Mr. Zaayer was pleased to be able to tell us something about his achievement, assisted by his "better half," who shows a no less keen interest in her husband's hobby; this is all the more remarkable considering that the wives of most radio amateurs do not speak very favourably about their husband's mysterious gadgets somewhere up in the attic.

We first went into the room where the transmitter was installed. "That's it," said Mr. Zaayer as he nodded his head in the direction of a long table on which his radio equipment was very neatly set up. We nodded, putting an expression on our face as if we had summed up the situation at once and murmured "Aha" and



The beam aerials at PAOUN, Eindhoven, the six-metre record-breaking station of David Zaayer. The upper beam is for 6 and the lower for 10.

David Zaayer, of PAOUN, Eindhoven, Holland, rotates his 4-element beam whilst Mrs. Zaayer (Puck) tunes the receiver. Is that a "DX Hound" in the picture also, David?

"Grand," before venturing to ask how he had succeeded in effecting contact with Capetown on the 6-meter band.

"That," said Mr. Zaayer, "is a long story," as he drew out some closely written sheets from a pile of papers and began to read out to us the report on his work. We gathered that this had been no mere chance, for on the contrary a great deal of care had been taken in preparing for this possibility, based on the knowledge that certain times this year were favourable for the experiment. It should be mentioned here that in the pres-

(Continued on next page)

DUTCH HAM

(Continued)

ent stage of developments DX radio communication on the 6-metre band is only possible about every eleventh year. This was the time for it and a report of the American National Bureau of Standards showed that as a result of measurements taken in the ionosphere it was to be expected that the month of March and also the period October/November of this year would offer a favourable opportunity to try to establish contact on this frequency range with other parts of the world and in particular with South Africa.

Or else wait till 1958

When we asked how this was to be accounted for Mr. Zaayer gave a very interesting explanation of conditions in the ionosphere and the presence of sun spots, which also influence the power of the transmission, so that at a certain moment it may be desirable to work on higher frequencies; he spoke about the behaviour of short-waves in general, special aerial systems and directional effects, and about a number of other technicalities which, unfortunately, we cannot enter into within the scope of this report. Mr. Zaayer told us of his resolve to take advantage of the present opportunity and to apply all his practical knowledge to this experiment. He immediately applied to the P.T.T. at the Hague for a special permit to operate on the 6-metre band, and this was granted although, as it subsequently appeared, the P.T.T. had little expectation of success. Mr. Zaayer, however, did not feel like waiting until 1958 and within a week he built a special transmitter to explore this new field, readjustment his aerial and also constructed an apparatus with which his call-letters PAOUN could be sent out into the ether while he was away from home. He made his intentions known to amateur transmitters all over the world and arranged for his wife to watched over things in his forced absence.

Days of Tension

After days of tense waiting the first signs of success came in the shape of a report that PAOUN had been picked up quite clearly on the 6-meter band by the amateur ZSIP (Mr. Henry Rieder) in Capetown. This was in the afternoon of 26th of March. Unfortunately Mr. Zaayer could not get away in time to effect a cross talk the same afternoon, but he remarked that there were many amateurs talking on the 10-meter band about the contact he had made on 6 meters. The so anxiously awaited cross talk was brought about on Saturday 29th March and continued without interruption for half an hour, thus proving incontestably the possibility of a 6-metre link.

An unfortunate coincidence

As fate would have it, Mr. A. Bles of Rotterdam, who also wanted to try his luck on the 6-meter band and with whom Mr. Zaayer had cooperated in the initial exploration of this field, had the call-letters PAUM, which led to some confusion and as a result some press reports gave the name of Mr. Bles as being the Dutch 6-meter pioneer. That this was not the actual fact was made quite clear to us when we looked up Mr. Zaayer again the next day in connection with one of these reports.

Positive Proof

When we called he had just got into touch with Capetown on the 10-meter band and in our presence he told his colleague in South Africa about the false press reports and asked him to speak to us directly to remove any mis-

(Continued on page 39)

THE "DENRADIO"

SIGNAL TRACER

MODEL JB7

It is now some years since John Bristoe first told us of the many advantages of signal tracing for speedy service work. Mr. Bristoe has described several signal tracers in our columns, but all these issues are out of print. Using the knowledge gained in years of practical signal tracing, Mr. Bristoe has now contributed this exclusive story of his latest design, a signal tracer embodying the best possible features of this type of equipment.

SIGNAL tracing is now recognised and definitely established as one of the easiest and quickest methods of servicing and generally finding faults in all types of radio equipment. Since my first article appeared on this subject, and after the full details of a practical Signal Tracer appeared in the Australian Radio World in 1941, Signal tracing has become an interesting subject for thousands of Radio men throughout this country. I still receive letters from many people who have decided to build Signal Tracers. Some of them have come across old copies of the Radio World and strange as it may seem, most of them build the original unit that appeared as mentioned previously in 1941. Why this is, I cannot understand, as in April 1942, details of a much improved model were published. This Signal Tracer was much more efficient from every point of view and also contained a very handy Vacuum tube Voltmeter. However, I am now giving you the details of an entirely new model that uses modern valves and is more efficient than any of the previous models, as well as being very simple in design, easy to build and to operate. Another big factor is that this model is available in Kit form, complete with chassis and panel, drilled and correctly scribed for all controls. In fact everything is supplied to make it easy for you to build.

by
JOHN BRISTOE
RADIO MANAGER
DENHAM'S (M'bro.) Pty. Ltd.
Maryborough
Queensland

This instrument is one of the most versatile of all test instruments. Its function is simply to trace the fault, no matter what or where it may be, in any type of radio receiver, transmitter, amplifier or similar apparatus.

Unlike most test instruments the Signal Tracer does not rely on voltage or current readings, but follows the signal from where it comes in at the aerial of the set, and right through the set to the speaker where it goes out. Or, in the case of a set not working correctly, it will trace the signal until the faulty part or parts which are stopping the correct operation of the set are located, with the result that the fault is located quickly and easily.

The Signal Tracer works equally well on RF, IF, Osc., Audio and power supply, and automatically checks all valves and components as you go along. Hum, crackles,

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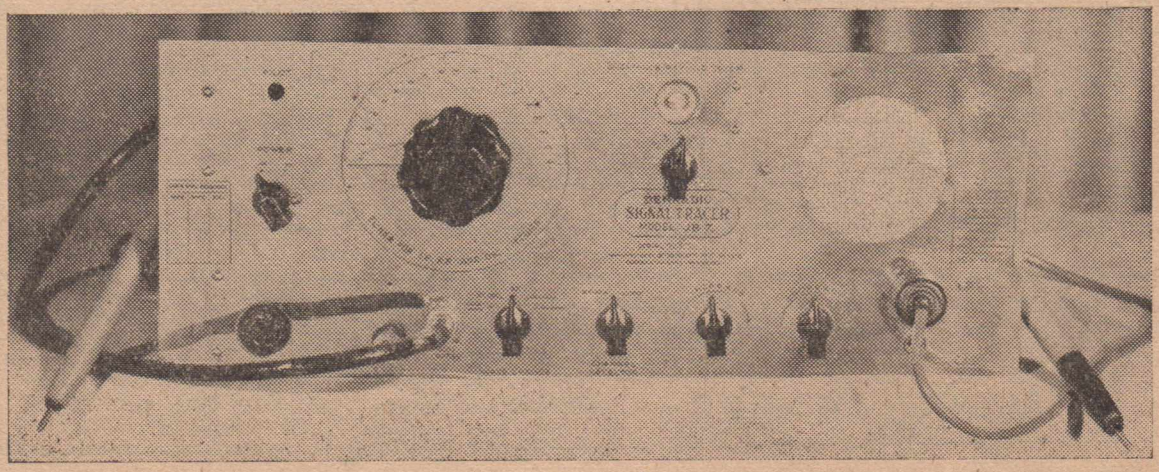


Front panel of the finest signal tracer yet described in Australia.

TRACER

(Continued)

noise, intermittents, oscillation, whistles and all other faults are easily located at their source.

SPECIFICATIONS:—Size 17¼" long, 6½" deep, 7¾" high. Front panel. Chromium plated brass with black engraved markings and lettering.

CONTROLS AND INDICATORS ON PANEL:—Main tuning dial for IF, OS and RF section approximately five inches diameter tuned by large black knob approximately 2¼" diameter.

Pilot light on panel indicating tracer is in operation.

Main power switch marked off-on operated by black instrument knob.

Large plated earth terminal. Detachable RF, OSC, IF probe.

Main wave change switch covering short wave, broadcast, oscillator, and IF frequencies.

Channel selector switch which changes tracer from IF and RF to oscillator.

RF gain control. Audio Volume control.

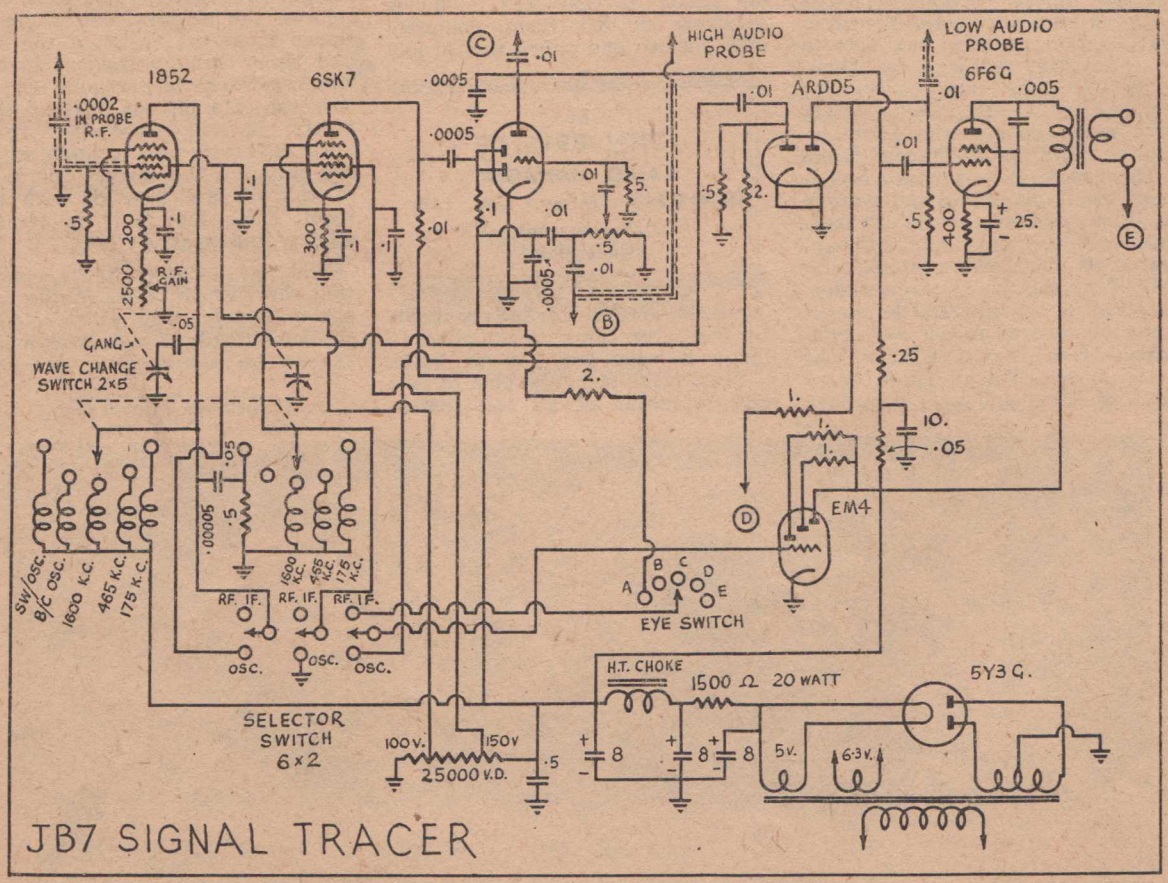
High and low output audio probe sockets.

Cathode ray indicator and switch. Self contained loud speaker on front panel.

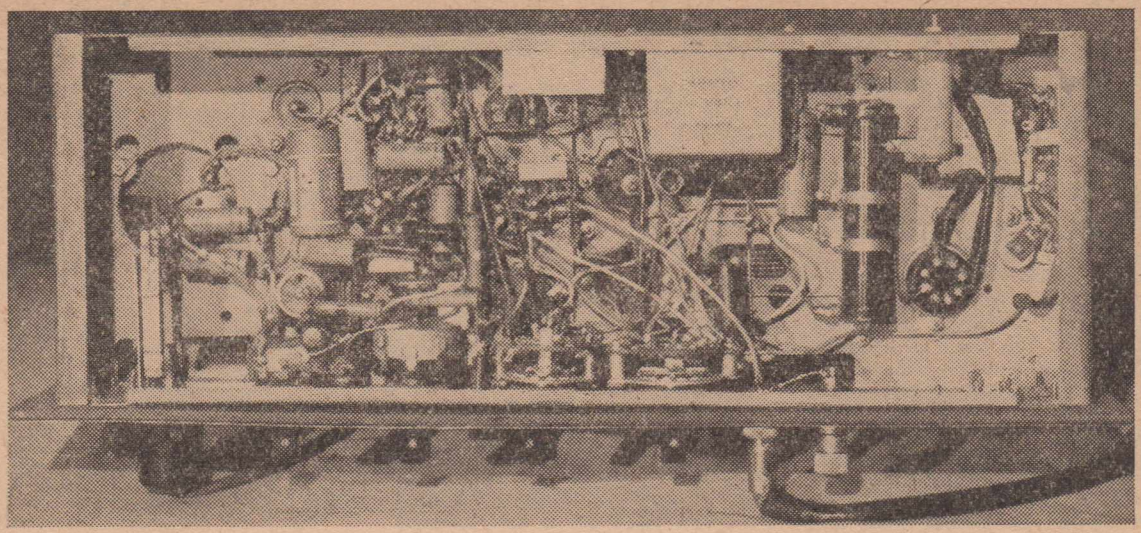
An external power socket is also fitted on front panel.

A Review of the Components used

The panel is thin—about 20 gauge and therefore requires some form of backing such as masonite or if you want the best, get a piece of Laminite sheet. This is an excellent material very similar in appearance to the bakelite sheets we used on the front of early model radios. But it is much stronger, less liable to crack and has splendid insulation properties. However the insulation does not matter on this panel as it is only the backing for a metal panel. The chassis is ready drilled and all valves except the power rectifier are mounted on a small separate chassis that is fitted on to the main chassis by rubber mounting legs. The advantages of this are obvious to any radio man. At each end of the chassis is an angle mounting bracket that supports the front panels. The power transformer is a normal 80 mil upright mounting type similar to that used on ordinary radios. The speaker is very important as most of your tests rely on the quality of it, so see that you get a good one. There are some terrible speakers on the market at the present time. It is possible to use a big speaker if you prefer it, but it would need to be mounted separately and would detract from the portability of the unit. The gang is a type H Stromberg Carlson two gang. The valves are all single ended types which are becoming so increasingly popular these days, and all are octal base types except the magic eye which is a P base. The coils excepting the BC oscillator coil and SW oscillator coil which are standard receiver oscillator coils either Crown or R.C.S., are not normal types. The other



Note: The diode-triode in the top centre is a type 6SQ7, and requires a half-megohm resistor from diodes to earth, this having been omitted from the circuit drawing in error.



Not recommended for the novice, but the wiring is not too complicated, as will be seen from this photograph.

coils on the main tuning sections are made from three different type Intermediate transformers. The first or B.C. Section being a 1,600 KC type. The others 455 KC and 175 KC respectively. In all cases these are the iron core type with adjustable slugs. Before putting these transformers on the chassis it is necessary to take them out of the cans and remove the mica condenser across each winding. When used on the tracer the gang takes the place of these condensers. Looking down on to the top of the chassis, you will be able to see the separate section that is rubber mounted and has the valves on it. At the rear end on right of this an electrolytic condenser is mounted, then ahead of this the 1852 and 6SK7 respectively. On the other side from back to ffont are valves ARDD5, 6F6G, and 6SQ7. The ARDD5 is very similar internally in construction to a 6H6 and can be replaced with this type with very little difference in performance. It is one of the sprayed metal types and if replaced by a 6H6G or 6H6GT should be shielded. The Electrolytics and other condensers throughout the tracer should be 600 volt types right throughout to avoid breakdown. Also make sure that you use good resistors as this unit has to be reliable. It is useless trying to build it from junk. Many of this model Signal Tracer are already in operation throughout Australia as they have been manufactured during the last few months by Denhams, Maryborough, Queensland. Any reports heard about these units up to date are excellent and all the users seem to be very satisfied.

Here are the details for the Operation of the JB7 Denradio Signal Tracer.

Test tracer first by connecting probe to aerial and tuning in broadcast station.

First connect a lead from the earth terminal on the Tracer to the earth terminal of the apparatus being tested. This is important and must always be done before any attempt is made to use the Signal Tracer.

Connect the apparatus to be

(Continued on next page)

TRACER

(Continued)

tested in its normal manner as though it was working properly. That is, if it is mains operated, connect to the mains or batteries, whichever it may be, and switch on. Make sure the speaker etc. is connected, also aerial and earth if a radio set. If an amplifier or transmitter or something similar is being tested the best way is to have a pick-up working and play a record whilst trying to locate the fault. In the case of a radio, of course the broadcast signal is used or a signal can be introduced into the aerial by means of a modulated oscillator or signal generator. However, I recommend that the broadcast signal be used, as this means the radio will be operating in its normal way, and distortion etc. is much easier picked up.

(1) How to locate faults in a radio that has stopped.

Connect tracer to AC mains and switch power on. Pilot on panel indicates tracer is working. First turn wave change switch on Tracer to BC and Channel Selector to RF, IF. Turn RF gain and Audio Volume full on. Make sure RF, IF, OS Probe Cable is properly connected on Signal Tracer. Now apply probe to Aerial Terminal of set and turn tuning knob on Tracer. If any broadcast stations are in a reasonable distance you should be able to tune them in on the Tracer. If not, something is wrong in the aerial circuit of the set. Possible faults are:—

Aerial terminal shorted to chassis or earth.

Aerial coil shorted to earth.

Aerial earthed itself, probably in lead in.

Aerial lead in broken.

Disconnect aerial from set and hold it on Signal Tracer probe. If you can tune a station or stations on Tracer then aerial is O.K. and fault is in set. Remedy fault as above and try same procedure. With aerial coupled to set, signal may be slightly weaker in Tracer, but this is normal.

Next apply probe to control grid of RF valve. If the tuner on the Signal Tracer has not been moved the broadcast signal heard on the aerial section should be picked up here. If not, possible faults are:—

Grid may be earthed, or

Grid coil open circuit.

It is necessary in this position to tune the radio being tested to the frequency of the desired broadcast signal, as you cannot expect to pick up the station on the tracer if this is not done. It may also be necessary to slightly retune the Signal Tracer dial. Once set now, they should be O.K. to test the set right through.

Now move the probe from the grid of RF valve to the plate of same. The signal here should be increased due to amplification of the valve. If not, possible faults are:—

Broken plate coil.

No voltage on screen.

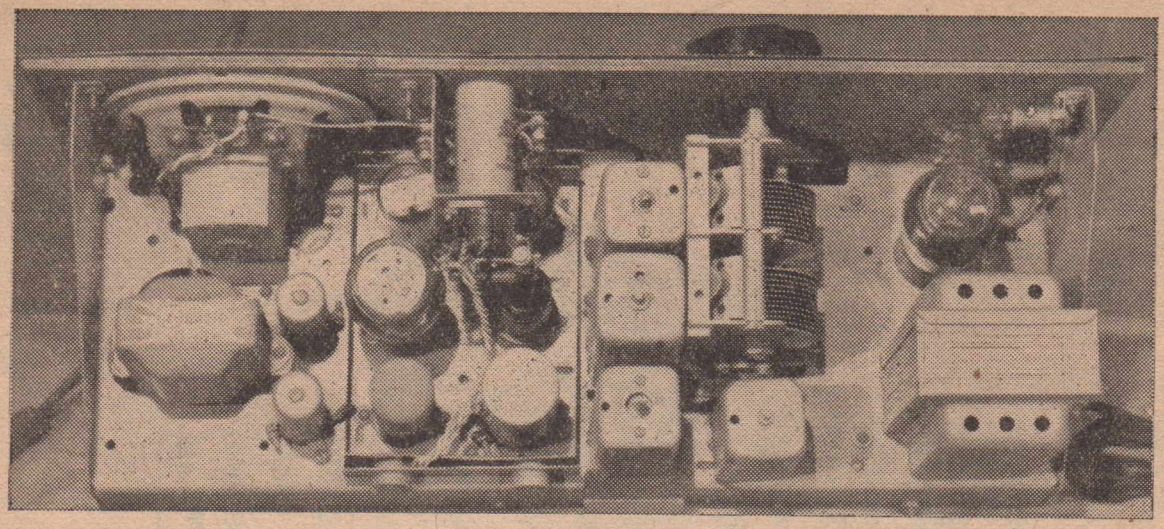
Screen resistor broken down.

Faulty or weak valve.

Next move the probe to the control grid of converter valve and signal should again appear. If not, possible faults are:—

Broken lead to grid short or open circuit grid coil.

A.V.C. can also play funny tricks in this section, so if no signal try shorting out A.V.C. to earth as one of the condensers or resistors in the A.V.C. section may be open circuit. Next move probe to plate



Photograph of the layout showing the placing of the various components.

of converter valve, but before doing so move wave change switch to IF frequency band. For instance, most sets are round about 460 KC so turn to this band and move tuner on Tracer.

Signal should come in now at greatly increased strength. If signal comes in weak, try 175 KC band as the IF frequency may be this in certain types of amateur and communication sets. The IF frequency is 1,500 or 1,600 KC. If this is so, the BC section covers this band. If, however, the set is an ordinary type of broadcast set and has usual type of components in it, the IF frequency will not be found on the BC band. Yet you may find the Signal comes in quite loud when tuned to this band on the Tracer and probe on plate of converter. This can be due to signal being strong and feeding straight through converter, but it can also indicate a fault in the oscillator section. This can easily be proved by moving the probe on to the next point, i.e. the grid of the IF valve. If no signal here possible faults are:—

IFT grid winding open or a short to earth, or as mentioned previously oscillator not operating correctly.

This can easily be located with the probe put back on the plate of the converter. Tune it in on the IF frequency. If the signal is healthy the oscillator section is O.K. but if it is weak, turn wave switch to BC and retune dial on Signal Tracer.

The broadcast signal comes in at a certain point of the dial very loud. This is a sure indication that the oscillator section is not operating so go back to this section and check as follows. Place probe near plate or grid of oscillator section on the side of the valve socket will do, but not actually making contact with either plate or grid. Or another good place to put the probe is right on one of the OSC coil leads, either B+ or padder end, not the grid or plate end. Sufficient indication will be found at these points and no retuning will take place. Now turn W.C.S. to BC. OSC and channel selector to OSC. Turn tuner knob and at same time watch cathode ray indicator. If oscillator is operating the indicator will close right up when tuned to the correct oscillator frequency. The Signal Tracer is actually being used now as a tuned Vacuum Tube Voltmeter with the cathode ray indicator as a visual check. If you do not get any reading on the indicator it is obvious that the OSC is not working. Check to see if this is the case all round the dial, by moving the dial on the radio and checking at both ends, and in the middle, at the same time moving the Tracer dial each time the radio dial is altered. You may get an indication when the tuning condenser on the radio is right out. If so, this will indicate that the plates on the oscillator section of the tuning condenser are touching. If no indication obtained at all, faults possible are:—

OSC valve faulty.
No screen voltage.
Burnt out or shorted OSC Primary or secondary coil.
No HT voltage on OSC plate.
HT voltage too low.
Faulty resistor or condenser on grid side.
Padder shorted or open.
Trimmer shorted.
Faulty wave change switch.

Now to resume our testing of the IF section. Assuming that everything is O.K. up to date, but set is still not operating. The next point is to put the probe on the plate of the IF valve. However, the signal should be so strong here, particularly if you are within reasonable distance of a broadcast station, that it shouldn't be necessary to touch the plate at all, but merely hold it somewhere close. If no signal here, or signal weak, probably faults may be:—

Open circuit.
IFT primary.
No HT volts.
No screen voltage.
Open bias resistor.
Faulty IF valve.
Screen bypass condenser broken down.

Our next point of testing is the secondary of the 2nd IF transformer which usually goes to a diode rectifier. This should be much the same volume as the previous testing point, and is the last point we use the RF IF OSC probe, as from now on we have to deal with audio frequency. When using the RF probe volume in the Tracer can be controlled by RF, gain control right through all sections. If it is still too loud when this is turned right back, the audio volume control can be used. When using the audio probe only, the audio volume control is used, no other control being needed as, of

(Continued on page 31)

HIGH-FIDELITY TRANSFORMERS

Australian types are equal to world's best.

IN the early days of radio there were many cheap audio transformers on the market which had poor performance and there were also good transformers, such as the English Ferranti, which could give the finest of reproduction. The most noticeable difference apart from the performance, was the price of these units. The cheap transformers were sold at anything from 12/6 to 25/-, but the Ferranti transformers listed at 4 to 5 guineas each. Some good transformers were made in America, too, such as Amertran and Sangamo, but these listed from 20 to 30 dollars each, so that their Australian price was even higher than the Ferranti.

By
R. PETERSON
TRIMAX TRANSFORMERS
29 Flemington Rd.,
North Melbourne

To-day we find that the cheap audio transformers have gone from the market, having been completely replaced by resistance-capacity coupling. But the high-quality audio transformers still have their place in the scheme of things, especially with push-pull amplifiers, and in many not so prominent applications, such as matching and mixing in line circuits. For example, the feeding of the signal from a studio microphone to the control room, and from the control room to the actual transmitter, possibly ten or fifteen miles away, is a problem which is most easily solved by the use of audio transformers.

Australian-made audio transformers have been perfected until they have characteristics just as good, if not better than, any transformers from any part of the world. As with overseas transformers, however, the prices are still high, compared with the prices of cheap transformers which were sold in years gone by. Prices are

(Continued on next page)

TYPE	CASE	APPLICATION	IMPEDANCE-OHMS (See Notes 1, 2, 3, 4.) Primary	Secondary	TURNS RATIO	MAXIMUM LEVEL dbm. (See Note 5)	FREQUENCY VARIATION db/cycles	Unbalanced D.C. in Primary M.A.	NET WEIGHT
MIXING (LINE TO LINE) TRANSFORMERS									
TA636	M8-M66	Line, Microphone or Pick-up Matching Balanced or Unbalanced.	50	200	1-2	+18	± 0.5/30—40,000	0	1 lb. 14 ozs.
TA406A	,, ,,		50	600	1-3.46	,,	,, ,,	0	,,
TA101	,, ,,		200	200	1-1	,,	,, ,,	0	,,
TA168A	,, ,,		200	600	1-1.73	,,	,, ,,	0	,,
TA37A	,, ,,		600	600	1-1	,,	,, ,,	0	,,
TA793	M17	See Note 7.	600	600	1-1	+36	± 0.5/30—15,000	0	4 lb.
MIXING (LINE TO LINE) TRANSFORMERS—MULTI SHIELDED									
MS944	M66	Line, Microphone or Pick-up Matching Balanced or Unbalanced.	50	200	1-2	+10	± 0.5/30—40,000	0	1 lb. 14 ozs.
MS866	,,		50	600	1-3.46	,,	,, ,,	0	,,
MS945	,,		200	200	1-1	,,	,, ,,	0	,,
MS946	,,		200	600	1-1.73	,,	,, ,,	0	,,
MS896	,,		600	600	1-1	,,	,, ,,	0	,,
INPUT (BRIDGING) TRANSFORMERS									
TA17	M8-M66	Input from 50-600 ohm Line to Single or Push-Pull Grids.	10,000	100,000	1-3.16	+18	± 0.5/30—12,000	0	1 lb. 14 ozs.
INPUT (LINE TO GRID) TRANSFORMERS									
TA61	M8-M66	Line, Microphone or Pick-up to Single or Push-Pull Grids.	50	100,000	1-44.7	+18	± 0.5/30—12,000	0	1 lb. 14 ozs.
TA47	,, ,,		200	100,000	1-22.4	,,	,, ,,	0	,,
TA82	,, ,,		600	100,000	1-12.9	,,	,, ,,	0	,,
INPUT (LINE TO GRID) TRANSFORMERS—MULTI SHIELDED									
MS860	M66	Line, Microphone or Pick-up to Single or Push-Pull Grids.	50	100,000	1-447	+10	± 1.0/30—10,000	0	1 lb. 14 ozs.
MS837	,,		200	100,000	1-22.4	,,	,, ,,	0	,,
MS878	,,		600	100,000	1-12.9	,,	,, ,,	0	,,
INTERSTAGE TRANSFORMERS									
TA3	M8-M66	Single or Push-Pull 10,000 ohm Plates to Push-Pull Grids.	40,000	160,000	1-2	Whole Sec. 120 v.p.	± 1.0/30—10,000	0	1 lb. 14 ozs.
OUTPUT (PLATE TO LINE) TRANSFORMERS									
TA835	M8-M66	Single 7,000-10,000 ohm Plate to Line.	20,000	50	20-1	+24	± 1.0/30—12,000	6.5	1 lb. 14 ozs.
TA833	,, ,,		20,000	200	10-1	,,	,, ,,	6.5	,,
TA733B	,, ,,		20,000	600	5.8-1	,,	,, ,,	6.5	,,
TA947	,, ,,	Push-Pull 7,000-10,000 ohm Plates to Line.	30,000	50	24.5-1	+27	,, ,,	1.0	,,
TA948	,, ,,		30,000	200	12.3-1	,,	,, ,,	1.0	,,
TA710A	,, ,,		30,000	600	7.1-1	,,	,, ,,	1.0	,,

Table showing the various types of high fidelity transformers listed by Trimax.

TRANSFORMERS

(Continued)

not high, however, when considered to the amount of design, work and quality materials which go into them. The pursuit of a wide frequency response is often expensive.

In the Trimax range of transformers the TA types list at £3/10/- each, plus tax, and the MS types at £5/10/-, plus tax. These prices are not high compared to American prices of similar types which range from 18 to 21 dollars for transformers similar to the Trimax TA series.

Design Considerations

The development of modern communication and broadcast equipment has reached the stage where the performance is governed mainly by the frequency response and freedom from distortion of the transformers used. The most important transformer requirements are: (1) Low insertion loss. (2) Uniform frequency response. (3) Negligible wave form distortion and freedom from intermodulation effects. (4) Reliability. (5) When used at low levels additional features required are: (a) Freedom from electro-magnetic and electrostatic pick-up. (b) Effective shielding against longitudinal currents. (c) Balance of windings.

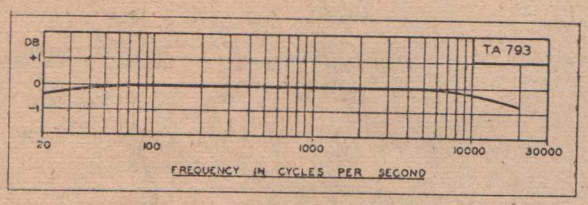
The types of transformer listed in here were designed with these factors in mind, and the soundness of the basic design is indicated, as many of the listed types have been manufactured for eight years without any major changes being made.

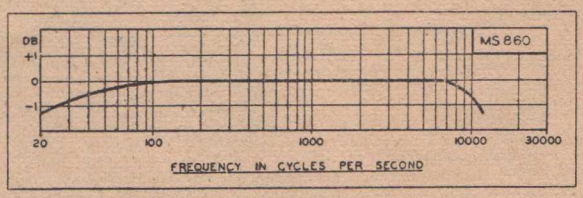
General Specifications

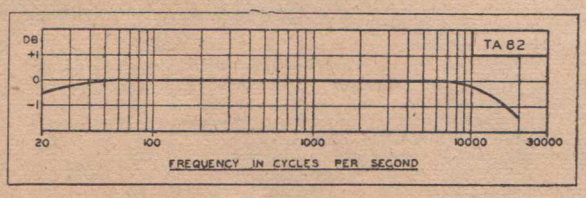
Frequency characteristics: Every unit is guaranteed to have a frequency variation not exceeding ± 1 db from 30 to 10,000 cycles when used under correct conditions. Actual production units usually give performances far better than this. The transformers are designed for use with secondary loaded, and the frequency characteristic is, therefore, a function of power, not of voltage transfer, obtained by careful design without making use of winding resonances. For the best high-frequency response, it is desirable to keep the capacity across the secondary of high impedance input transformers to a minimum, and for this reason pentodes are preferable to triodes because of the large difference in input capacity.

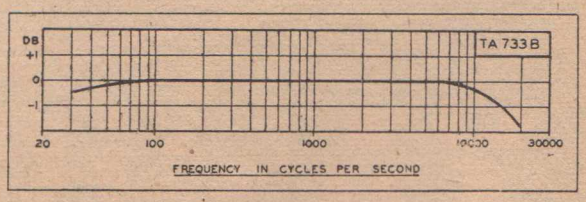
Shielding: (a) Electro-magnetic: All types listed employ an astatic hum balancing structure with primary and secondary coils each in two separate sections. Improvement of this type over ordinary shell cores is of the order of 40 to 50 db. depending on the uniformity of the interfering field. An additional advantage of this construction is the great improvement in symmetry and balance of coil sections. Outer cases of mild steel or high conductivity non-ferrous metal also give additional shielding. For particularly low-level operation, where freedom from hum pick-up is absolutely essential, special types are offered which, in addition to the above,

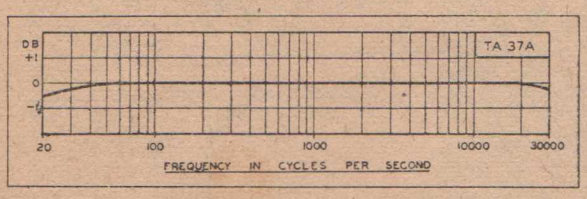
(Continued on page 37)

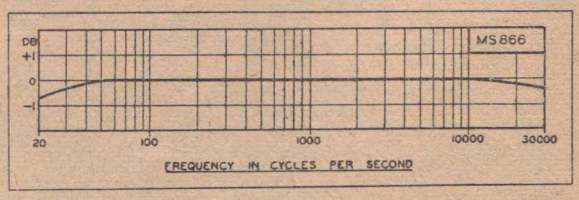












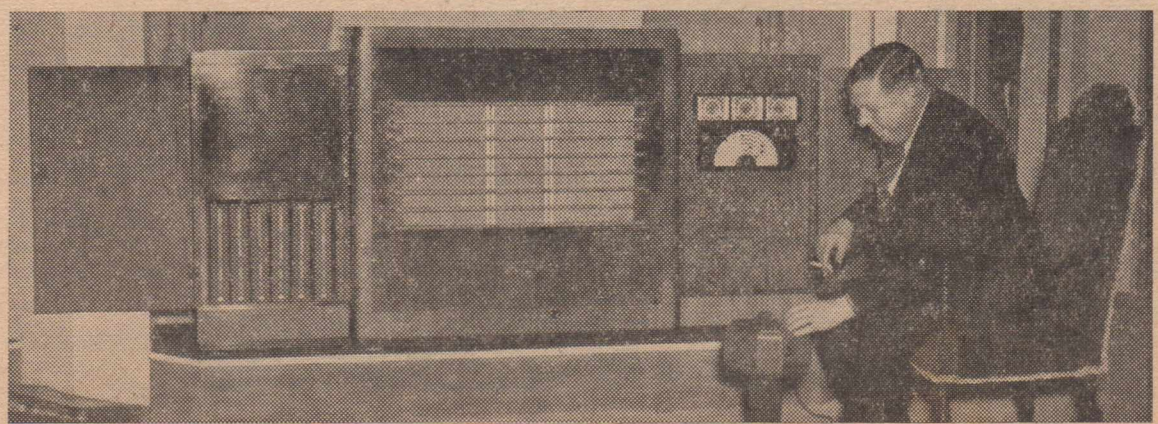
Typical response curves for various types of Trimax transformers.

London's Great Post-war Radio Show.

The "Personalised" set. Jean Campbell, daughter of Sir Malcolm Campbell, tries a set which can have any personal design hand-painted on the Cabinet.

A portable wireless set little larger than the average folding camera—the Marconiphone 4-valve battery superhet model.

A large screen Projection Television Model by H.M.V. with all-wave radio. 340 guineas and purchase tax.



Norman Long, the radio artist, seen with one of the largest models on show, the 43-valve, 12 waveband, remote control, combined radio and television receiver and auto-radiogram. It is an H.M.V. product.

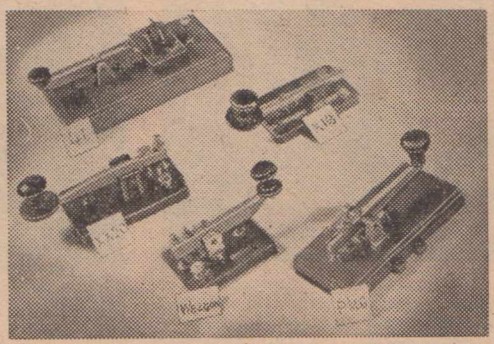
An attractive range of essentials for Radio Technicians

THESE UNITS ARE AVAILABLE FOR IMMEDIATE PURCHASE, BUT LIMITED QUANTITIES ONLY ARE AVAILABLE.

KREISLER
Heavy Duty Resistors

HERE IS THE RANGE:

50	ohm	25	Watt	15,000	ohm	20	watt
75	„	25	„	17,500	„	20	„
100	„	20	„	40,000	„	20	„
125	„	25	„	40	„	10	„
150	„	25	„	300	„	12	„
175	„	25	„	3,250	„	10	„
200	„	20	„	7,500	„	10	„
300	„	25	„	25,000	„	12	„
400	„	20	„	2,000	„	3	„
400	„	25	„	7,500	„	5	„
750	„	20	„	3,000	„	3	„
4,000	„	25	„	2,000	„	5	„
7,500	„	20	„				



MORSE KEYS (as illustrated)

Types: 41, X10, XX20, Weldon, P.M.G.
F.W. English 6" Permag Speakers.
Ethertone Pickups.
Young Atom Pickups.
Cosmocord Crystal Pickups.

WRITE TO US FOR ATTRACTIVE PRICES

B&G **BLOCH & GERBER LTD.**
WITH WHICH IS ASSOCIATED
THE WELDON ELECTRIC SUPPLY CO.
46-48 YORK STREET, SYDNEY
TELEGRAMS: "LESAB" SYDNEY MA6291 (10 LINES)

HOW TO LISTEN ON 50mc.

By
H. K. LOVE (VK3KU)
Kingsley Radio Pty. Ltd.
Melbourne

APART from the Amateurs who frequent the High Frequency section of the spectrum between 50 and 54 m/C, there is room for plenty of listeners in this secta.

Most people will find that on dual wave receivers the interference is very bad indeed. While this is overcome, to a large extent, by the employment of the Communications type of receivers—this type of equipment is not available to the majority.

On 6 metres, 50-54 m/C, there is as yet plenty of room, and the listener can use clear cut, uninterrupted reception of quite interesting transmissions.

To enjoy this type of high frequency listening, the correct equipment must be used—but fortunately, this is simple and inexpensive.

The first piece of equipment necessary is the correct aerial for the 50-54 m/C band. This should be placed up in the clear, and must be cut for the frequency of operation.

For simply listening, no account need be taken of the directional types of aerial, as it is better to place one in the position of being able to receive from any direction. For this reason, a dipole cut to 52 m/C (the centre of the band) is recommended, and to make a good pick up medium from all directions, it should be mounted vertically.

The formula for cutting such an aerial is:—

For a half wave Dipole

$$\text{Length in ins.} = \frac{5540}{\text{Frequency in m/C.}}$$

therefore, if it is desired to use an aerial at 52 m/C by the above formula, it will be found that a dipole of 106.5 inches will be about correct, as the dipole must be in two pieces of equal length; each piece will therefore be 53¼ inches long. These are each mounted on stand off insulators, as shown in the sketch, and the inner end of each half of the dipole connected to the 72 ohm cable.

There are many methods of mounting such an aerial. The two pieces of tube which constitute the dipole can be of copper, brass or conduit, ½" in diameter, or any diameter which will stand erect without sagging.

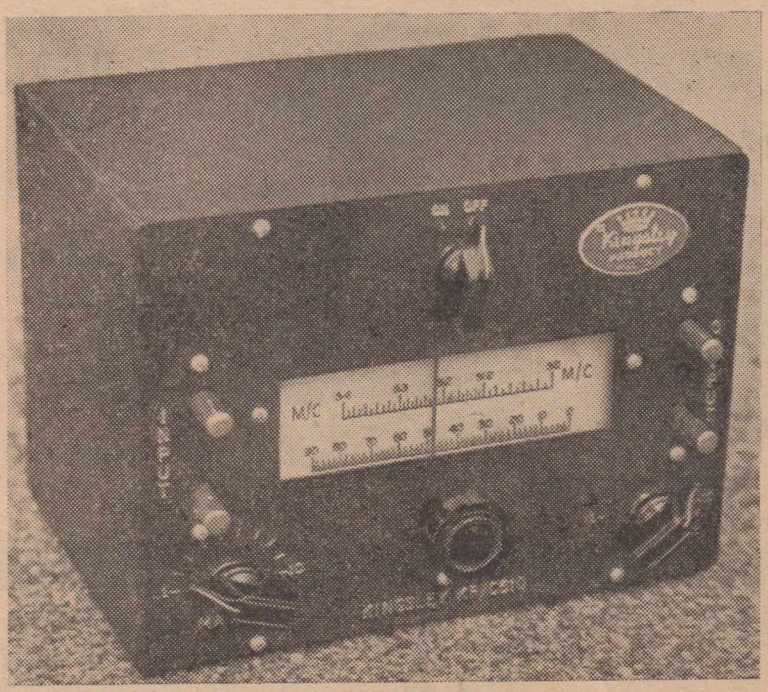
In the event of 72 ohm Coax cable not being available, twisted V.I.R. cable will serve as the lead in—about 5 twists to the foot.

The Receiver

Having provided a suitable aerial for 6 metres, the next thing is to have a piece of receiving apparatus which will tune over the band and pick up the signals.

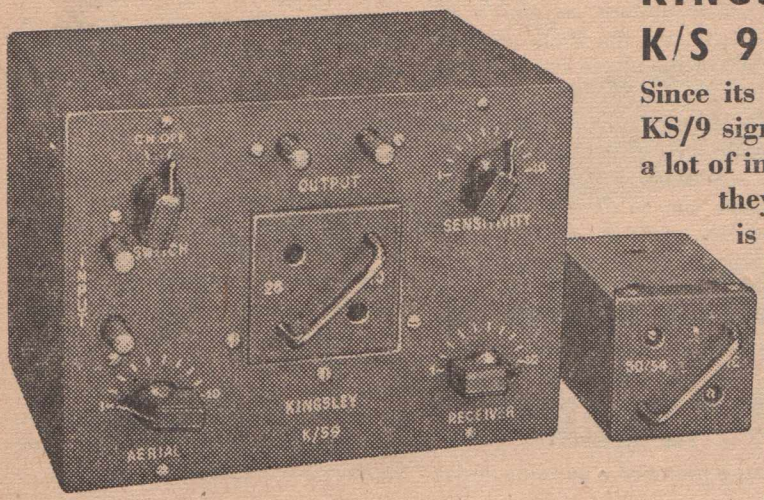
The first essential, therefore, is to have available a calibrated receiver which does, in fact, tune over the band 50 to 54 m/C. The easiest way to be sure of this is to use a short wave broadcast receiver. A converter is so constructed as to take care of short leads and all the bugs which crop up in tuning high frequencies.

In some areas the noise level may be very high. In this event, a distinct advantage will be obtained by mounting the dipole horizontally rather than vertically. The aerial will, however, exhibit some directional properties in this case, and care should be exercised to mount the aerial broadside to the directions from which 6 metre signals are expected.



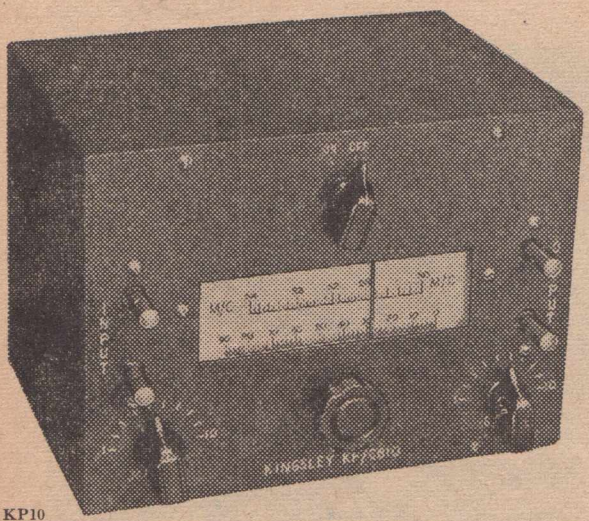
The Kingsley converter, which tunes from 50 to 54 megacycles. Price is only £4/5/-, plus sales tax. It operates with any good dual-wave set.

These Kingsley Products are making Radio History!



KINGSLEY
K/S 9'er SIGNAL BOOSTER

Since its introduction a few weeks ago, the KS/9 signal-strengthening unit has attracted a lot of interest. Kingsley engineers thought they had something pretty good but it is even better than they thought—and that is something to take notice of. Kingsley's new production programme is a busy one and leaves room only for the best and most useful products—so, for the very best in radio equipment—keep your eyes on Kingsley.



KINGSLEY
SHORT WAVE CONVERTER

This unit in its complete form serves as a medium to increase signals from amateurs transmitting on the 50/54 M.C. Band (6 Metres).

Lined and adjusted and ready for immediate use.

Complete installation and circuit details of both units are obtainable on application.

KP10

KINGSLEY QUALITY RADIO PRODUCTS

KINGSLEY RADIO

KINGSLEY RADIO PTY. LTD.

380 St. Kilda Road, Melbourne, Victoria . Phones: MX 1159, MX 3653

A NEW METHOD OF TUNING

First release of latest Kingsley development.

THIS is the most modern method of achieving the very best from iron tuning of inductances by the use of iron dust slabs or discs, and a special pancake shape coil.

One of the most interesting pieces of investigation is at present drawing to its conclusion in the Research Section of Kingsley Radio Pty., Ltd.

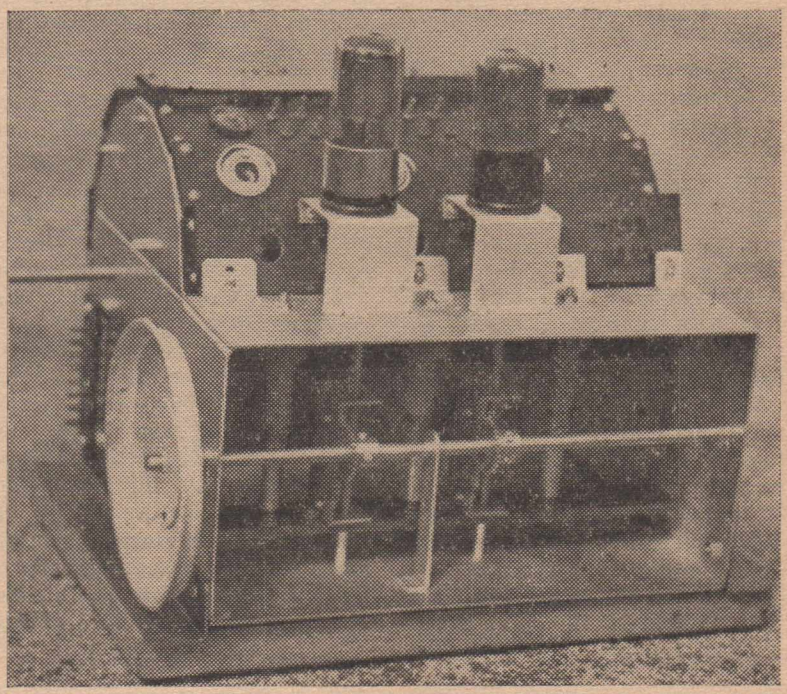
Some months ago, a turret tuning system was developed, embodying a Drum type turret to which was affixed sets of coils. The turret is rotated in order to bring in a new set of coils for each band desired by the operator.

This developed so well, and showed such promise, that it was actually listed for production by Kingsley as a Broadcast Kit covering 5 bands, under the nomenclature of KF/5CR, and was intended to be used in addition for the K/CR/12 Communications version of the multi-band turret.

Just when it was thought that this thing had reached a satisfactory stage of perfection, Kingsley engineers evolved a new system which, at first glance, indicated so many advantages, that the original turret was set aside pending the results of the research into this new system.

Briefly, the new system employs discs, or slabs, of iron dust material of the right frequency characteristics, which, instead of being inserted into a solenoid coil, are brushed past a pancake type of coil to effect the tuning. This has many advantages, and a few of them are listed hereunder:—

1. The "QQ" of the coil is kept at a very much higher value than when the core is actually inserted in the coil.
2. Particularly excellent band spread is achieved by this method.



An exclusive photograph of the experimental tuning drum which is being perfected in the Kingsley laboratory.

3. Tracking adjustments are extremely accurate and easy of achievement, as not only does the movement provide for the slabs to pass over the coils, but an adjustment can be provided whereby the proximity of the slab can be altered to assist tracking.
4. One of the most difficult operations in coil manufacture is to wind coils of a small number of turns, which preserve the accurate tolerance necessary for band spread short wave tuning. To overcome this, the pancake type of coil can be made to very accurate tolerances by actually punching the coil out of copper sheet with a die fixed in a press.
5. A very accurate mechanical movement to pass the slabs over the coils is achieved by a rack and pinion, loaded against back lash.

In principle, this system is a turret system of coil change, but because the cores are not inserted into the centre of the coils, it is possible to change from one band to another without first rotating the mechanism to remove the cores from the coils; in other words, instantaneous change from one band to another may be achieved by merely turning the turret to the appropriate band without recourse to locks, or other mechanical devices, which obviously would be necessary if the coil-insertion type of turret were used.

(Continued on next page)

TUNING

(Continued)

It will be seen that where a core is inserted into the coil, some provision must be made to lock the turret until such time as the core is withdrawn. This necessitates first unlocking the turret, and secondly, withdrawing the core before the band can be changed—a disadvantage which is entirely overcome with this new slab tuning method.

The photographs which accompany this article indicate, without a great deal of detail, just what the new system looks like in the mechanical form, but it takes much description to summarize the advantages which will accrue to the listener by this system of short wave tuning.

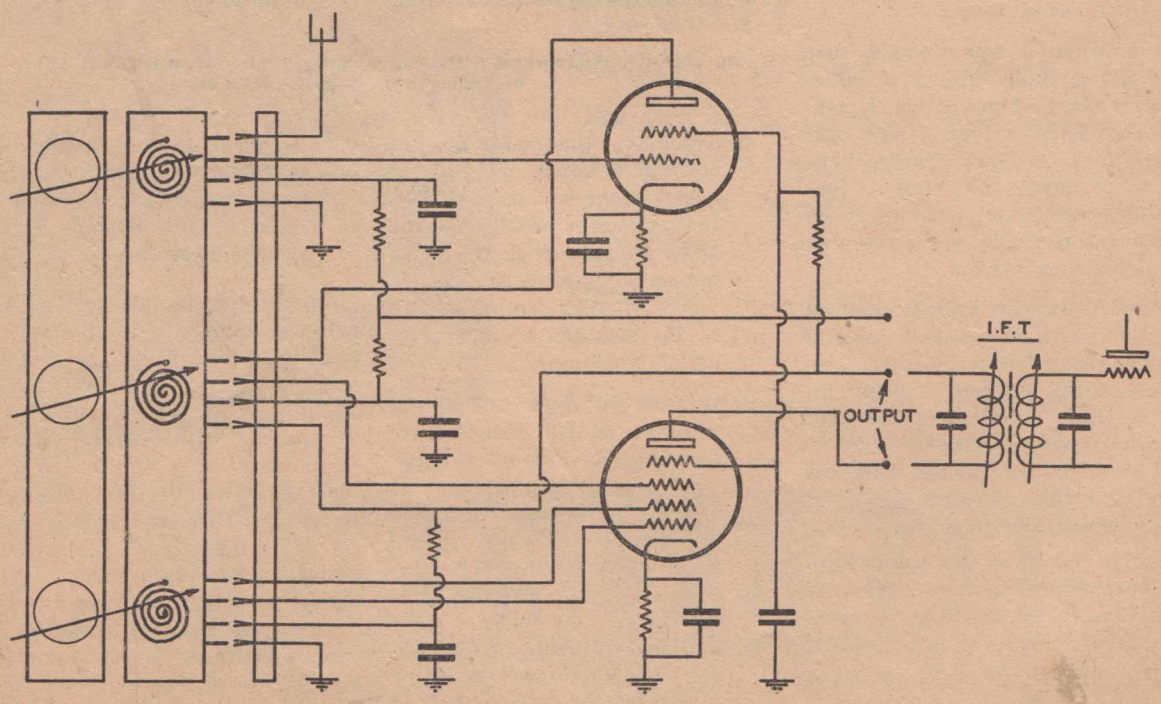
We ask the reader, therefore, to envisage that type of short wave tuning wherein a scale of 6" or 8" long is provided for the broadcast band, and underneath it—or in some portion of that scale—is a long line on which are small sections marked 16, 19, 25, 31 and 41 metre band, approximately ¼" to—of scale will indicate that to tune, for example, the 19 or the 31 metre band, approximately ¼' to—at the outside—½", is provided for this band, and in practice, it is found extremely difficult to separate one station from another with any degree of certainty, and enjoy programmes which come over the short waves.

It is believed that this disadvantage in short wave tuning has, to a large extent, mitigated against its popular use. For example—the case of a listener living in the remote North Western section of Western Australia, or the equivalent section of Queensland or New South Wales, frequently finds himself in the position of not being able to receive the normal broadcast medium-wave transmissions during most of the day, and some periods during the night. This is accounted for by the fact that the listener is outside the service range by many hundreds, and in some cases, thousands of miles. He is therefore at a distinct disadvantage for this broadcast entertainment, unless he can use the short-wave broadcast spectrum to full advantage.

It may be said that these people are in a minority, and while the new system may confer the greatest benefit on this class of listener, it confers no less benefit on the city listener, if he desires to receive short wave broadcasts from overseas. He has the alternative local broadcast programmes but that does not alter the fact that he could, by using this system, receive shortwave broadcasts as easily as he receives the medium-wave local broadcast transmissions.

The reader is therefore asked to envisage the new dial as one which gives complete scale coverage for each of the bands previously mentioned, that is, 19, 25, 31, 40 metres and so on.

The handling of this receiver must be experienced to be believed. One tunes in long distance overseas broadcasts with just as much ease as one is accustomed to tuning the local broadcast transmissions. There is no occasion to resort to the practice of getting

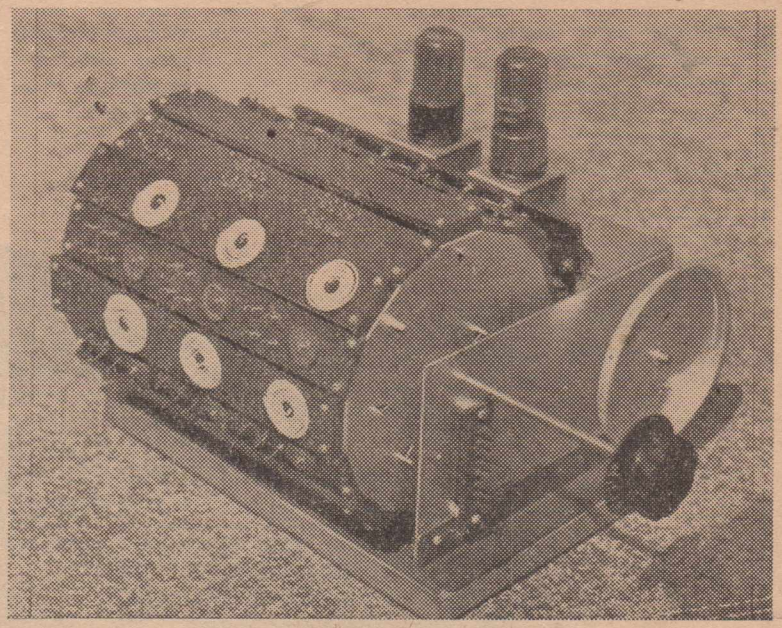


Outline of circuit for use with the new Kingsley tuning system.

down on one's hands and knees and calling for complete silence in the house in order to tune in some remote station. This system of tuning really does what every ardent short wave listener has hoped for over many years.

It would be burdensome to attempt to describe the preparation of the iron dust cores that are used for this system of tuning, but a brief description of the system of making the coils should be of interest to anybody who is keen on short-wave listening.

The coil, as previously mentioned, is flat like a penny, spiral in formation, and is punched out of a sheet of copper, or other appropriate metal. It will be obvious that if the punching were taken straight from the press simply as a spiral, the coil could be, and would be, deformed during the operation of assembly, but by striking a second blow in the press, instead of being a flat spiral, the spiral is shaped into a channel section of metal, giving it strength and rigidity. This means that the coil is more accurate in its tolerances than other coils, when the tedious method of winding short wave coils of only a few turns is entirely eliminated.



Another exclusive photograph showing the "catherine-wheel" coils.

The preparation of the die is an expensive matter, but when it is spread over thousands of coils, amounts to very little, and is very much less expensive than mechanical locking and other devices necessary with the drum type turret when core insertion is used.

Tracking by the method of pancake coil and slab core is very easy of achievement. There are no tricks in the tracking, and everything in the short wave section of the tuner remains completely constant. This interesting piece of development—which will be known as the KF/8CR—will replace the proposed 5CR and provide 7 or 8 tuning bands, one of which will be the proposed broadcast band, in the case of the broadcast kit, and the 7 or 8 full short wave bands in the case of the broadcast kit, and the 7 or 8 full short wave bands in the case of its application to communication equipment such as the proposed K/CR/12.

One major advantage of this 8-band tuning system is that all the noise, high speed morse, etc., between the useful bands on the short wave spectrum are eliminated—the unit is designed to cover the following bands in its production form.

For the Amateur Broadcasts:

80 Metres.
40 „
20 „
15 „
11 „
10 „

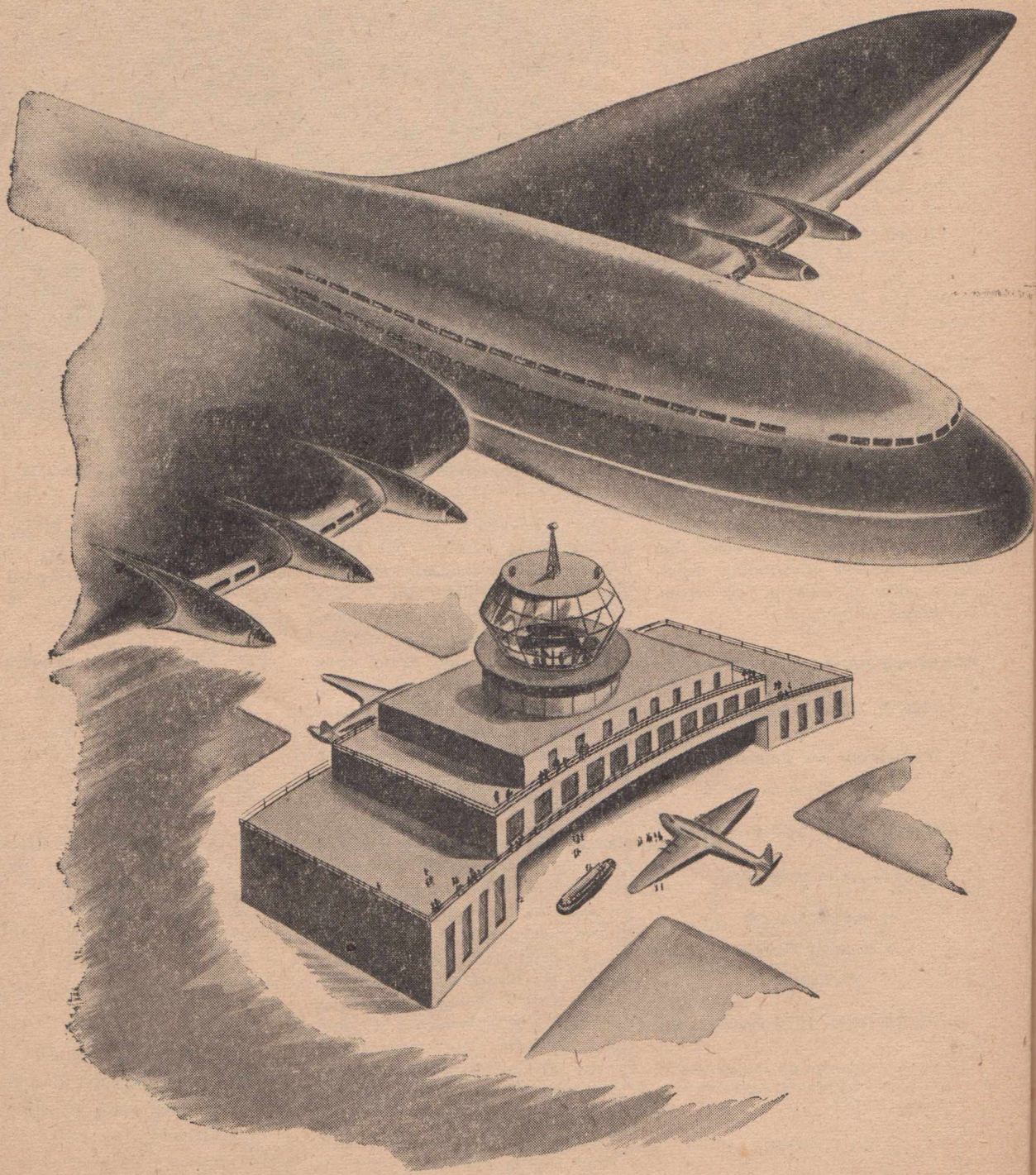
For the Short Wave Listeners:

10 & 11 Metres Amateur Bands.
19 „ BC/SW „
20 „ BC/SW „
25 „ „ „ „
31 „ „ „ „

40 Metres BC/SW & Amateur Bands.

80 Metres S.W. Bands.

and Broadcast Medium Frequency band with the unit as designed it is practicable to receive any 8 bands making this unit most useful for any specified 8 bands.



Success Aloft

The vision of Jules Verne, whilst encompassing the marvels of air transport, passed without comment the essential factor of communication.

Through electronic valves and their application emerged Radar to penetrate the darkest night and the densest fog; beacons to provide directional beams to airports; compasses to aid navigation when visibility is nil; contact with ground control—instant, certain.

And the same Radiotrons, so consistent and efficient as silent sentinels to aircraft safety, provide unsurpassed quality to radio in all its phases.

AMALGAMATED WIRELESS VALVE COMPANY PTY. LTD.

NOTES ON THE "WINDOM" AERIAL

A handy design for multi-band work.

The "Windom" aerial, as it was originally called in America, is an aerial which is fed by a single feeder line. The object is to attach

By

J. MacINTOSH (VSZAA)

Forwarded by courtesy of

Chas. D. Maclurcan

Hotel Wentworth

Sydney

the feeder at a point where the "match" between (a) the impedance of the feeder line and (b) the impedance of the aerial is the same. The impedance of an aerial varies throughout its length; it is low in the centre and high at the ends.

2. The problem is to choose the correct point on the aerial where the feeder line matches exactly. Now this is not difficult when the aerial is designed for one band working, i.e. say on 14 Mcs; the difficulty arises when the aerial is used on different bands.

3. **Multi band** working.

(a) The aerial should be cut using the usual formula to resonate in the lowest frequency band required, i.e. to the highest wavelength. I have found the following lengths suitable:

3.5 Mcs. — 135 to 136 feet or even 138 feet.

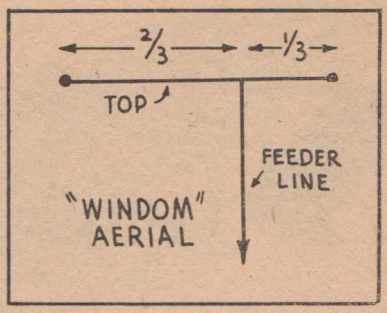
7 Mcs. — 67 feet or 68 feet.

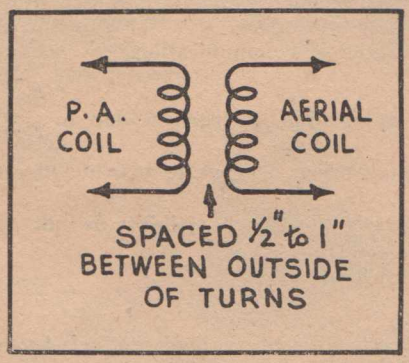
14 Mcs. — 33½ feet or 34 feet.

The **longer** top tends to be directional **along its length,** when used on its **harmonics.**

(b) Matching.

I have shown (in T & R Bulletin of November 1936 article entitled "Experiments with Aerials") that if the feeder is matched to the top on the fundamental or 1st Harmonic, **using the usual formula,** it cannot be matched on the 2nd and 4th Harmonics etc, A little mathematical juggling revealed that a fairly good match on any band could be effected by placing the feeder at a point one-third of the distance from either end of the aerial.





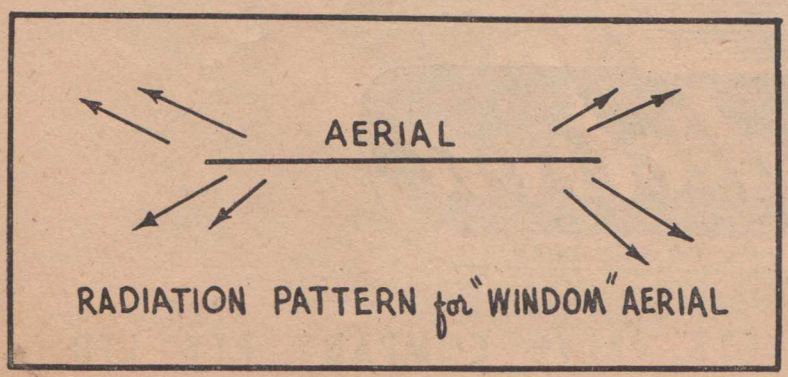
Further it was found that an improvement in the matching resulted when the feeder line was made of thinner gauge than the top. Experiments in this direction were not carried very far. The writer has used No. 6 S.W.G. wire for the top and No. 12 or 14 S.W.G. for the feeder line. Number 10 S.W.G. for the top and Number 14 or 16 for the feeder might do equally well.

4. A meter (R.F. Ammeter) placed anywhere along the feeder should show the same reading throughout. If it does not, then the feeder has "standing waves" on it and is radiating. The problem is to get the feeder to pass all the energy to the top and not radiate any. The top is the radiating part, not the feeder. In practice I suspect most feeders do radiate a little but the ideal of non-radiation is worth aiming at.

5. Using a top of length say 138 feet with the feeder tapped on at 46 feet from one end, it is possible, merely by changing the aerial coil, to tune to:

(a) 3.5 Mcs. i.e. half wave or fundamental.

(Continued on page 40)



"TRANSMITTER, FS6 PLUS"

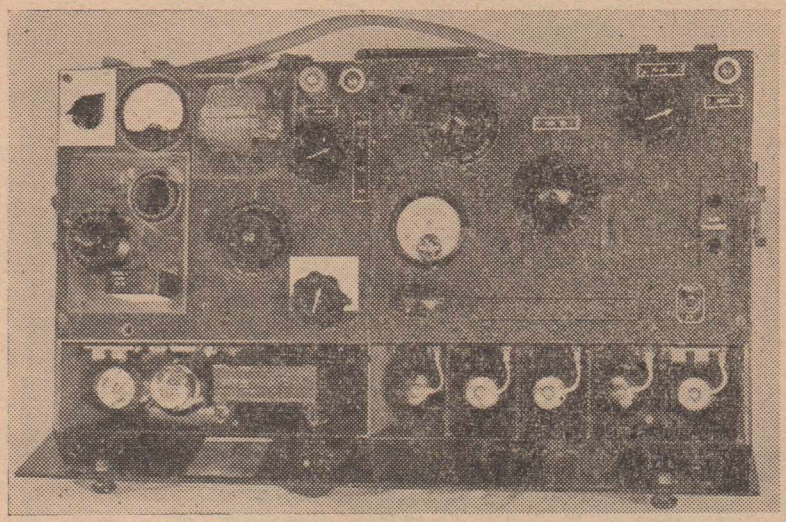
Further data on using ex-army equipment.

By

H. R. FITZSIMMONS

(VK3FI)

Technician, 3WV Regional
Horsham, Vic.



IT was thought that a more efficient design and layout could be achieved, also improvement made to the modulation system of the transmitter section.

The original arrangement is not the best; for instance, the 807 PA should not need neutralizing. With more compact grouping and shielding, it proved to give better performance.

Grid modulation is inefficient compared with other systems, and fussy as regards plate loading. The possibility of using plate and screen modulation was considered, and after trial proved very satisfactory.

It was intended to retain the vibrator HT supply unit, from 6V battery, and to keep expense at a minimum. Use is made of original valves and of as much of original equipment as possible.

Crystal control was considered foolproof. Crystal oscillator and Power amplifier chosen as line-up for RF section.

In defence of the "FS6," may I mention some interesting features:

A rugged receiver with an excellent performance when improved along the lines of my recent article. In fact its performance surprised me when compared with an A.W.A. Communication Rceiver of larger size.

Very reliable vibrator HT supply unit, that can take it!

A 6V battery of high capacity is an advantage over other types.

The selection of a modulator proved the biggest headache. It was found that if the HT current requirements were increased beyond a certain figure the voltage suffered. Class B modulation with its higher efficiency was considered the prize winner. The type 19 has insufficient AF output, so a 6N7

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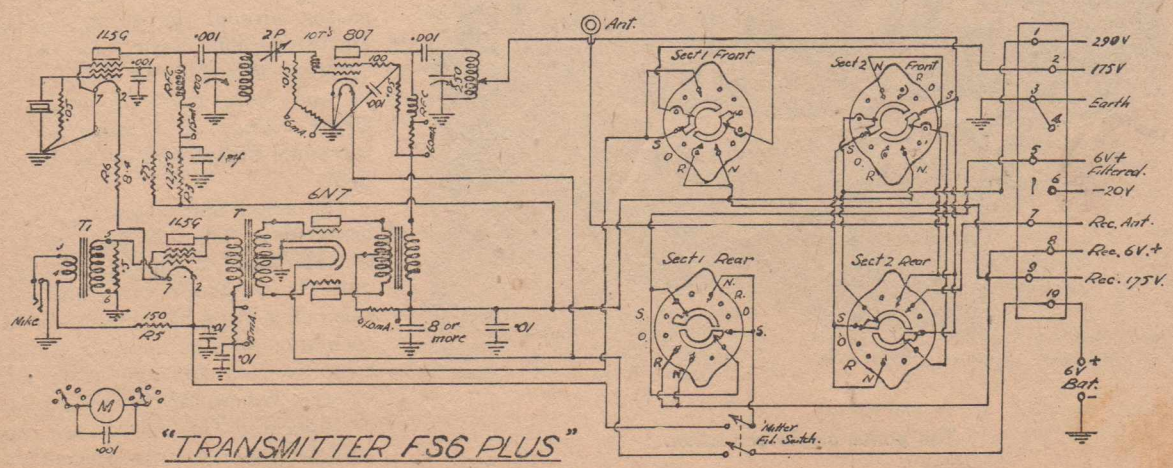


FS6 PLUS

(Continued)

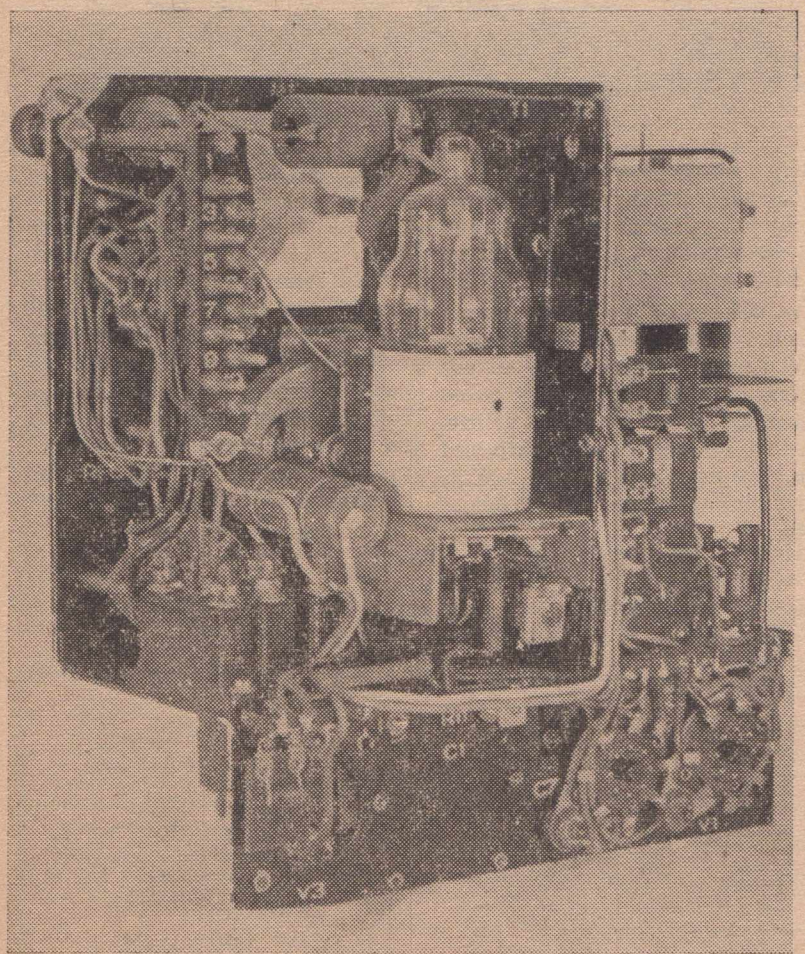
was finally chosen. Special precautions are taken to keep plate current and power output down, as the full output 6N7 is not required. By operating into a higher than recommended plate load, this was obtained with no loss in audio quality. A small power transformer with a 280V aside HT winding worked out nicely.

A carbon mike is used because of its high output. Its quality can be improved by mounting the carbon inset in a wooden block, removing the guard from the diaphragm and replacing with a wire screen for protection against damage.

It was decided to switch the transmitter filaments so as to save battery if receiving alone is being done. Also the change over switch was retained, but the wiring altered as illustrated.

In the 'Net' position both units are on and enables a check to be made on transmission and frequency channel.

All valves are metered. I had a switch that would do this. Current shunts are mounted in wiring C leads taken to the switch C metre. The switch C meter out of a No. '19' or '22' set does the job, but the switch must be "non-shorting."



The power amplifier section.

Plugin coils are used for both the oscillator and PA as it is intended to operate also on 3.5 m/C band.

The oscillator coil is made by cementing coil former on to a valve base, while to obtain maximum efficiency in the PA the coil was wound "on air" and supported by polystyrene strip. Two plugs are fitted which enables it to be plugged into sockets on the front panel.

Coil details:—

Osc: 15Ts 20 SWG enamel 1¼" diam.; length ¾".

PA: 13Ts 16 SWG tinned copper 2" diam.; length 1¼". 7 m/C.

PA: 25Ts 18 SWG tinned copper 2¼" diam.; length 1½".

3.5 m/C.

PA coils computed for maximum efficiency and low harmonic radiation. Now for tackling the job:—

Heavier leads were fitted from the battery to vibrator unit and also from vibrator to the transmitter unit, carrying the filament supply, to keep voltage drop to a minimum.

The transmitter unit was stripped, leaving only the changeover switch and terminal strip. Two panels of insulating material, perspex is quite good, are made up to cover up the gaps left by the MO condenser and the meter.

These panels are drilled to take the sockets for the PA coil, and the other for the oscillator condenser, crystal holders and one through which the oscillator coil passes without damaging it. The crystal sockets were made so as different size holders would plug in and were built up with the metal fittings of a valve socket, the panel drilled and taped to hold them.

The meter and meter switch are mounted in top left hand corner. A metal plate was made up to support the oscillator valve and coil; this being fitted horizontally in the oscillator section, leaving enough room on top for the valve and enough underneath for wiring and components. The mike pack and transformer, receiver type Class

B transformer are also fitted underneath.

The audio driver occupies the corner valve socket and the modulator valve the next. Alongside the 6N7 is mounted the modulation transformer.

A piece had to be cut off the mike jack before it would fit in. It is mounted against the front panel directly under the crystal holder.

Coming to the PA section—the tuning condenser was considered too baulky, so I insulated an old "Pilot" 250 PF job which could also have some plates removed. This fitted in nicely. A small chassis was made up for the 807. Its dimensions being 2¾" x 2½" x 1¼" deep. It was fitted with the socket also a shield, just to make certain of eliminating self oscillation. This is mounted with its wiring underneath, on the dividing plate. A lead is brought through a convenient hole from the oscillator to the 807 grid coupling condenser which consists of a two-plate mica trimmer. A small R.F. choke, consisting of ten turns of 20 SWG enamel wire wound on a pencil, then slipped off, was found necessary in the grid of the 807. This cleared up a spurious oscillation which occurred slightly off crystal frequency.

The amount of grid drive does not appear to be critical, anything between 0.6—1MA rectified current performed satisfactorily. The conventional anti-parasitic arrangement is used in the screen grid of the 807.

Room is found for the filament switch in the lower right-hand corner.

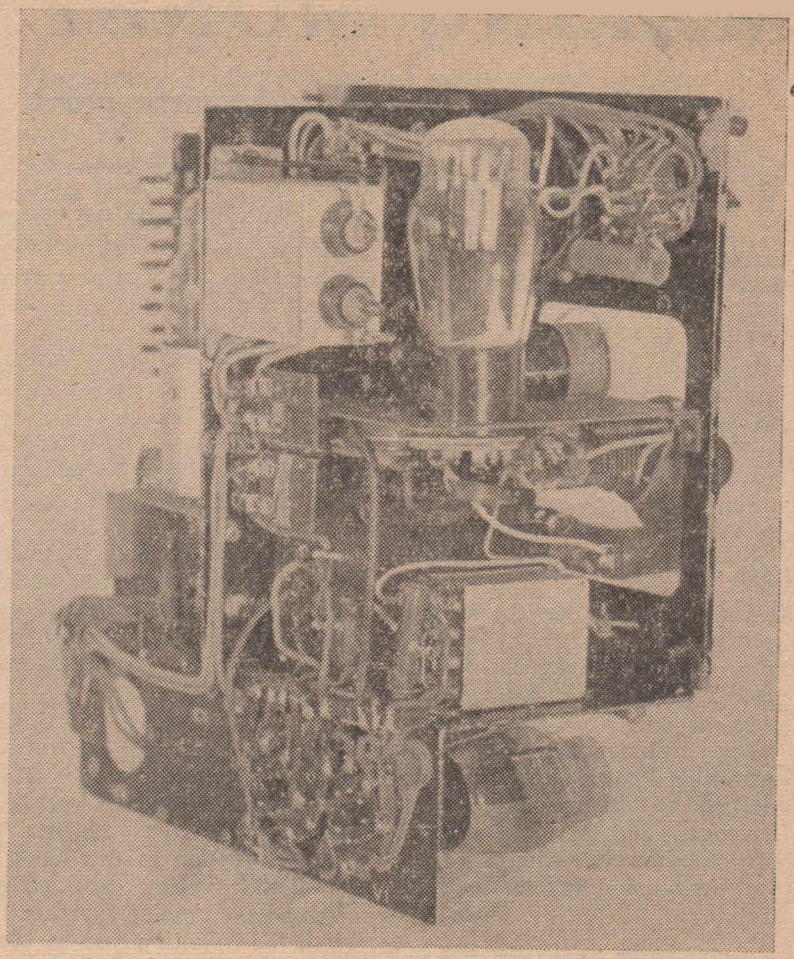
Having the PA coil on the front panel makes it convenient for adjustment to the aerial connection. A wire brought through from the change-over switch and terminating in an alligator clip, is connected on to taps soldered on to some of the PA coil turns.

The 807 plate current, aerial connected, should not exceed 24 MA.

The total H.T. current is 66 MA. This does not present an overload to the vibrator unit, as the original official figure is approximately 60 MA on CW.

The current from the 6V battery is 6.9 Amp.

As a portable station, the FS6 Plus is a pleasure to handle and I have made some very interesting experiments with it out in the country, despite frequent organised mosquito attacks!



The modulator section.

SIGNAL TRACER

(Continued from page 15)

course, audio frequency need not be tuned for our purpose. All that is needed in audio section is to plug audio probe into one of the audio sockets on the panel and start from the first grid in the audio section, then to the plate, then on to the next grid and so on until you reach the loudspeaker voice coil, which is the last link in the chain. The audio system is not normally very complicated, so I need give you no further instructions on this section.

MAKING MONEY IN RADIO

Advice from a dealer with years of experience

TWO articles in a recent issue of your paper on (a) Starting a Radio Business, and (b) Problems of Trade Discount, aroused my wholehearted attention.

These two subjects are vitally co-related and I felt that, even combining the information in both articles, a void of information remained unpresented to the would-be radio retailer cum serviceman. I am moved to suggest, via the following short summing-up, that we look at things as they really are today and soberly size up the unvarnished facts.

Let us assume that the average man wishing to start up a business is a returned serviceman with a good background of radio experience, or one fresh from a radio college or technical course with a reasonable knowledge of commercial sets as they were pre-war and are today. Suppose him to be full of enthusiasm but without experience in running any sort of business.

Secondly, let us suppose that our radioman will start as financially modestly as possible, commensurate with earning a living. He most likely has not a great deal of capital to outlay, and will certainly be hoping to be earning at least an average wage from the business after, say, three months.

Thirdly, as stock in trade and average discounts have been dealt with in the two previous articles, let us take it that our man has rented a shop, stocked it, and owns a car or is going to use taxis for a start, as several I know have done. He is now nicely settled in with equipment and goods to sell, rent to pay, and transport expenses to be looked forward to for sets needing to be brought in for overhaul, and returned.

This is now the place to frankly tear the veil aside and assess the absolute minimum turnover he must handle in order to take out of the business weekly *merely the radio man's accepted wage.* (Present award in N.S.W. for a radio repairer is £7/15/-.)

The article on trade discounts tells us that one may expect 33-1/3 per cent. profit as an average on sales. In my own personal experience of twenty years in radio the same per centage profit may be expected on repairs. (Some will disagree with this last statement, but, if he is of average ability, wants repeat business and reasonable average profit, this is the basis on which the serviceman will operate.)

Suppose, then, that our man is prepared to accept a wage only (as profit) from his business—a weekly debit against the business of £7/15/-. Added to this must be the further weekly debit of his overhead and running expenses, for which the following may be taken as average and reasonable:

Phone		4	0
Light and power		4	0
Rent	5	0	0
Own car or taxi transport	2	0	0
Insurance		2	0
	£7	10	0

(Own car would be much dearer to maintain as there are petrol, oil, repairs and depreciation to cover.)

Total weekly commitments are then, we see, a matter of £15/5/-, meaning that the turnover of the business must be £45/15/-. And this to give merely a weekly wage to the owner with no compensation whatever for capital outlaid, responsibility taken, worry entailed and, in all likelihood, extra hours worked.

The figures quoted may be twisted around a little to suit special rentals, special transport facilities, etc., but fundamentally they will affect the required turnover by very little. For instance, if a shop is obtained at less than £5 a week rent it will be out of the way for counter trade and the owner will have to rely on bringing more sets in for repair, entailing a heavier transport bill, and bringing him back to the average overhead again. What he gains on the swings he will lose on the roundabouts.

The writer of this article is weary of the tall stories of knowalls with regard to the colossal profits to be made in a radio business starting from tors. Such profits are a myth and a figment of vivid imaginations. Radio has no advantage over any other business in the way of starting legitimately with nothing and quickly climbing the ladder of big business success. The right radio man, in the right location, giving first-class service and keeping always on his toes will, as in any other business, make the grade —eventually—over the usual period of years. That's all.

This article has no other object than to present the sober facts of the business side of starting a very small radio concern, and is meant particularly for the man in a small way who may be considering it.

This is a world of difference between doing a £3 radio repair for a neighbour in your own home on Saturday afternoon and making £1 for yourself—and paying yourself a weekly wage from a small established radio business. Yet, strangely enough, this home repair business is the motive which prompts most newcomers to think there is an El Dorado just around the corner in that little Radio Shop.

AMONG OUR READERS

They say that Hollywood has a habit of turning out pictures from time to time which become "hits" although not expected. We feel a bit the same way about a feature we started in the September issue. We published some letters from our subscribers and knew they were interesting but they have aroused enthusiasm far beyond our fondest hopes. It is obvious that this feature will have to be a regular one in future.

"I play with radio purely as a hobby. I started when I was still at school in 1939. The first set I ever tried was a four-valve superhet with a home-made cabinet. It is still going strong. I became interested in A.R.W. when I was looking for a portable circuit not using the 1D8 and a friend, Eric Cleburne (VK2A11) gave me some back numbers of A.R.W. to look through. I liked the mag so much that I put in a sub for it and have been getting it ever since. My next effort was a big set for Dad, which I did in 18 hours flat on the second last night of my final leave. The circuit was from A.R.W. using voice coil feedback. It gave the nicest tone of any set I've heard. That particular set ran for two and a half years, eight hours a day, without a spot of trouble. I've since built it as a broadcast version with r.f. stage in a table model for our cottage at Leura, where it drags in stations from W.A. to N.Z. It is the only set I've struck up here that could be called a success; most commercial models seem to suffer blackout above 2UW and one car radio of well-known make which was normally perfect could only get 2KA outside the house!

During the war when I had no opportunity to build sets I amused myself covering the theory side.

Anything I build up now has to be altered to use parts on hand, or from sundry disposals bargains (?), though I do think I picked a few goods, for example, a complete No. 11 including valves, genemotors, etc. for £8 and a complete 108 for £3-15-0.

When I returned from overseas I found that fifteen back numbers had been lost and I have been chasing to replace them. I finally obtained the last missing copy a few months ago, but I had to buy quite a few duplicates to get the ones I was after. Should any reader be requiring back copies I have the following available. I am afraid I'll have to make a charge of 1/- an issue as it cost me a few pounds to get them, in one instance I had to buy thirteen to get one I wanted. Here are the issues I have to spare: November 1941 to May 1942 inc., July 1942 to November 1942 inc., July 1943, November 1943, and October to December 1944 inc. — Donald H. Stitt, 68 Catalpa Cres., Turramurra, N.S.W.

(Glad to hear from you and to know that you are getting settled down again. Best of luck with the engineering course. I feel sure that plenty of our readers will appreciate the chance to get the back numbers you have to spare. The genemotors are O.K. for power supply for car radio with normal filtering. The small c.r.o. would not be of much value in tracing distortion in audio work. A better proposition seems to be one of the 5" disposals jobs with r.f. high tension supply from a 6V6, which is an easy way of getting a couple of thousand volts—A.G.H.)

* * *

"Your request for the personal touch gives me the opportunity of expressing my appreciation of your fine little journal. Radio with me is just a hobby, my interest lying mainly in the audio side. I had a lot of fun out of Charlie Mutton and his direct-coupled circuits, and had a lot of headaches, too. My ultimate was direct-coupled 2A3's with G12 permag, pick up an Astatic LP6, sapphire-tipped permanent stylus. It was extra good until a pal of mine dropped the pick-up and wrecked the sapphire. I sent the cartridge back to America and had it repaired for a dollar seventy-five cents, the height of impudence, what! I am using a moving coil pick-up now. I can drop it with impunity. I wonder if any of our readers have had any success with Mr. Davies ideas about electro-acoustic coupling? I commenced to operate on a Rola 12/42 but then found that I could not buy a suitable spider coupling for the voice coil. I wonder how others fared in this direction. Well, sir, let me congratulate you on your good mag and your excellent service. Trusting you are happily established in your new "digs" at Mornington."—L. W. Oxley, 112 Were Street, Brighton, Vic.

(Yes, playing around with direct-coupled circuits is good fun if you have a few meters to let you see where you are heading, and when everything balances up you can get splendid reproduction. I haven't been able to check up much on readers' efforts with the speaker tricks, but doubtless some will see these remarks and let us know how they progressed. Building homes and getting the garden straight and all that sort of thing is something like direct-coupled amplifiers. It keeps you busy for quite a time. However the worst is over now and hope soon to run a little story and some photos of the effort. —A.G.H.)

* * *

"I read your publication because my hobby has been radio for the past ten years, beginning in a radio factory, and then building myself an amazing all-waver with plug-in coils, a battery set using a single 30, and dragging in the whole world on it. The broadcast band covered every State reception. I ended up with a 6C6/6V6 receiver on going into the A.I.F. in 1940. I had five years of it as a radio operator and radio service man. Since then, with taking a wife and child, plus our new home, I am not in a position to go laying money down on radio parts, so go for the ex-disposals bargains. I have a 1N5-1Q5 broadcast set driving an eight-inch permag speaker on 45 volts and drawing 2 milliamps yet giving quite good

(Continued on next page)

OUR READERS

(Continued)

volume while I play around in my shack, which is at one end of the (empty) car shed.

My main interest is in short-wave sets that have band-spread, so I'm hoping that some such circuits will come along in my next batch of Radio World's. I would like to make a suggestion to the valve makers. The type numbers should be marked more permanently, at present they wipe off too easily."—L. A. Collins, 8 Park Avenue, Rosslyn Park, S.A.

(I have just been looking at some of the band-spreading devices which are being engineered in the Kingsley Laboratories, and your letter makes me think that they might also be applied to simple sets.

The idea would be to have a piece of iron arranged mechanically to move closer to the coil. This would affect its inductance slightly and give you a band-spread effect without upsetting the normal tuning and band setting by use of the ordinary tuning dial. It would be interesting to experiment along those lines. Wish I had the time to do it myself.—A.G.H.)

* * *

"I am a very busy and much abused person these days, having for my trade — Builder and Contractor. Having always been interested in radio I decided, a few years ago, to take a course with the Australian Radio College for two reasons; firstly to give myself an interesting hobby, and secondly, to give myself another egg in the basket, so to speak. I have never regretted taking this step, as it turned out to be not only a good hobby but also a good side line. It was at the Australian Radio College where I first learned of Radio World through one of the instructors, Mr. Lackey. Since then I have not missed a copy. I find it the most interesting all-round radio publication I have ever read. The feature I like best is your circuit diagrams of radio receivers. I get quite a lot of fun building receivers, play them for a while, then pull them to pieces and try some other circuit. The only suggestion I can make for improvement is for you to give us the benefit of some of your experiences in the servicing of obscure faults in radio receivers."—C. J. Cannings, 1 Christie Street, Crows Nest, N.S.W.

(Thanks Mr. Cannings. Many of our readers find that they can make their hobby of radio pay for itself, without making hard work of it. Your suggestion for improvement is O.K. but my experience in this direction is somewhat limited. Seems that it is a subject which could be handled so much better if a large number of our readers were to write and let us know about the particular snags which they have been up against and how they dealt with them. Such little stories would be greatly appreciated.—A.G.H.)

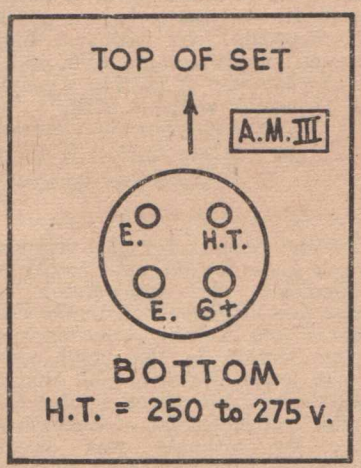
* * *

"I have been reading Radio World for several years now, mainly because I have been an ardent DX'er for many years. Naturally the sections I like best are the short-wave and amateur notes. I first began DX'ing in 1938 with a commercial five-valve dual-waver. From then until the end of 1941, when I entered the army, I received 150 verifications from 34 different countries. Since my discharge late in 1945 I have once again taken up the hobby and, deciding to start my verifications from scratch again, have since that time collected 170 verifications from 25 different countries with over a hundred more reports of more recent date still outstanding. Until a couple of months ago I was still using the old 4/5 dual-waver, but I have now been able to obtain a brand new nine-valve Hallicrafters Communications set, so that I am chasing the DX with a vengeance, as it is certainly a vast improvement on the old set. All I can say is keep up the good work with your short-wave and amateur notes."—Harold Tesch, Plimsoll Street, Greenslopes, Queensland.

(Nice going with the DX. You forgot to mention how and where you got the brand new Hallicrafters! — A. G. H.)

A HINT ABOUT THE A. Mk. III

FROM Mr. Berwick, of the State Nursery, Macedon, Victoria, comes a hint about the Type A Mark III transceivers which are being offered in disposals stocks. Mr. Berwick says that there are two types of these, the original and a modified version. The original can be used straight off the a.c. mains as indicated in the brochure supplied. The modified version, however, which comprises most of the surplus stocks so far released, requires an external power pack which plugs into a four-pin valve socket which is in the position occupied by the a.c. voltage tappings on the original version. The sketch shows the correct connections, looking into the set from the front, but if there is any doubt the internal wiring should be checked to make sure that the high tension is not applied to the valve filaments. The modified version contains dry rectifier, filter chokes and condenser but no mains transformer. Mr. Berwick shorted the rectifier out and used a 5Y3G and a 300 volt transformer as an external pack, also an 80 milliamp choke to give extra filtering as the choke in the set looks a bit small. Whichever way the set is sold an external transformer must be used to give 6.3 volts for the filaments. Apart from this the only



fault which Mr. Berwick could find with the set was the regeneration control which was a bit erratic, sometimes it would and sometimes it wouldn't. This was cured by winding more turns on to the feedback of the second i.f. coil, the tuned anode coil. It now works like a song and is really the goods. Mr. Berwick concludes with a list of loggings he has made with a 20 foot aerial slung into a shrub without insulators. "At about £10 definitely a bargain" he says.

AEGIS AGAIN

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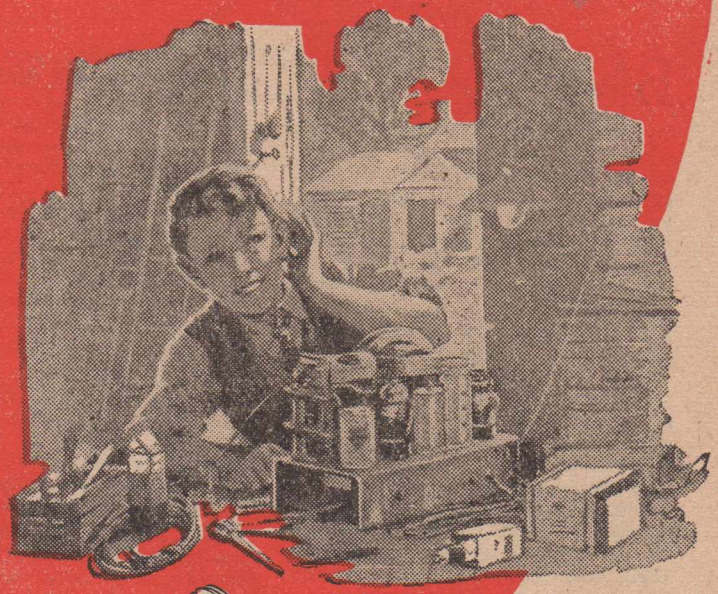

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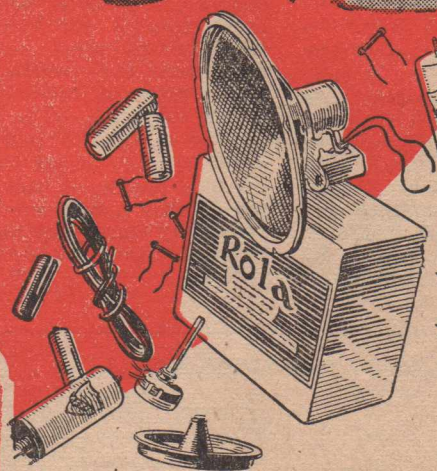

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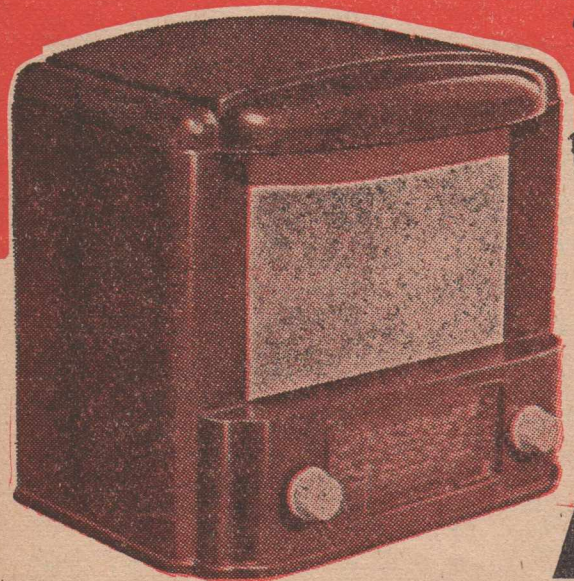

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PRACTICAL POINTERS FOR HAMS

How to use types 811 and 812.

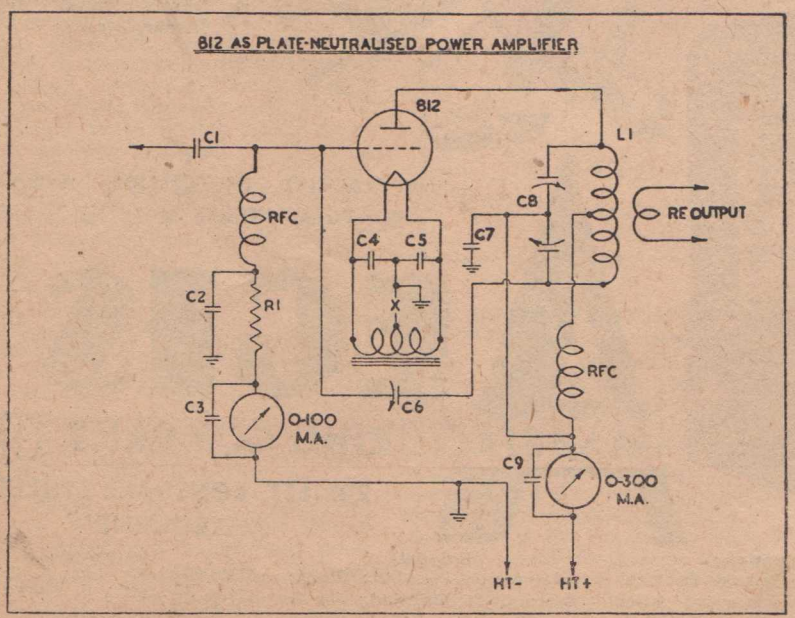
BY courtesy of Philips "Modulator," a publication circulating among the staff of that Organisation exclusively, the writer is enabled to pass on some useful application data for the type 811 and 812 triodes. These valves are becoming increasingly popular with Australian Amateur transmitters, and justifiably so for the purchase price is reasonable enough at 34/9d. each, and such triodes are excellent consideration for Class B Modulator and Power amplifier service respectively. In Figure 1 is shown the circuit arrangement of an audio amplifier or transmitter Modulator using a pair of 811's in push-pull, and capable of delivering 175 watts of audio power, more than enough for the 100 watt station. Anode voltage needed for this is 1250 volts DC, and at this the valves are operated at zero bias.

Because of the High Mu of 160, the 811 needs only 4.5 to 9 volts negative in Class B service with 1500 volts on the anode. The advantages are obvious. There is no need for bias supplies with complex regulating systems and so Modulator design is simplified considerably. In the circuit of Figure 1, the purpose of the resistor R1 (50 ohms, 25 watts) is to maintain a constant earth potential for the driver and filament transformers in case of meter failure; otherwise both would assume the H.T. potential. Good quality transformers should be used throughout and the output (Modulation) transformer should be capable of handling 300 watts of audio power. Figure 2 shows a type 812 as a plate-neutralised RF Power Amplifier for CW or telephony operation.

For a plate voltage of 1500 the telegraphy power output is of the order of 170 watts, whilst for telephony service, carrier power is 120 watts with 1250 volts. This amplifier must be neutralised correctly for proper operation, and in this connection, advice regarding neutralisation is in order.

Most triodes, when used as RF amplifiers, will oscillate readily due to the effect of positive feedback through grid/plate capacitance. Steps must be taken to counteract the feedback voltage which produces oscillation.

This may be done by taking portion of the RF voltage developed in the output "tank" circuit and feeding it back to the input in such a manner that it will effectively cancel out the RF voltage at the grid due to G/P capacitance.



Two systems are in use generally, and they are Plate and Grid neutralisation respectively. In the case of Figure 2, the amplifier uses Plate neutralisation.

The parts list is as follows:

C1—500 Pf mica 1000 volt.
R1—7000 ohms 10 watts.
C2—.005 mfd mica.
C3—.002 mfd mica.
C4—.005 mfd mica.
C5—.005 mfd mica.
C6—5.3 Pf (approximately).
C7—.002 mfd mica.
C8—100 Pf variable.
C9—.002 mfd mica.
L1—adjusted for frequency of operation.
RFC—RF chokes.
X—Keying Relay.

Condenser C6 is the neutralising capacity, and in theory, it should be equal in capacity to the valve G/P capacitance, which, for the 812, is 5.3 Pf. Practically however, the actual capacity range will exceed this value because of stray capacities in wiring etc. Portion of the RF voltage developed in L1 is fed via condenser C6 back to the 812 grid. Method of adjusting neutralisation is as follows:—

1. Open circuit the Plate voltage but leave the filament ON.
2. Couple loosely some form of RF indicator to the Plate "tank" coil. This may be a neon tube, a pea-lamp in series with a loop of wire, or a meter type absorption wavemeter.
3. Apply excitation from the driver stage.
4. Tune the Plate circuit to resonance. This will be indicated by a maximum reading on the indicating device employed.
5. Adjust C6 until this indication shows a minimum. This will de-tune the "tank" circuit and this will need re-adjustment.
6. Retune the amplifier Plate "tank" for resonance. This will give another "maximum" but considerably diminished from that in step 4.

7. Again adjust C6 for minimum RF indication.

8. Repeat the entire procedure until a setting of C6 is reached which results in a zero RF indication at any setting of the plate "tank" condenser. Coupling to the RF indicator will need to be tightened as the amount of RF decreases with adjustment of C6.

When zero voltage is present in the plate "tank" coil, the stage can be said to be correctly neutralised.

Careful attention should be paid to the chassis lay-out and all leads to the 812 should be as short as possible. Otherwise, parasitic oscillations may develop which are entirely dis-associated with neutralisation and which may require special precautions.

VFO Consideration

For the benefit of those building VFO's, those little red coloured Philips 33, 47, and 100 Pf pigtailed condensers are comprised of a ceramic tube, silver sprayed. They have negative temperature coefficient. Operating voltage is 600 maximum and tolerance plus or minus 10%. Continuous operating temperature is 85 degrees C and they are tropic proof . . . suitable for use in 80% relative humidity.

TRANSFORMERS

(Continued from page 18)

incorporate triple shields of high permeability nickel iron alloy. The additional improvement is approximately 40 db.

(b) Electro-static: Transformers are guarded against this type of external interference by the use of an efficient outer case. The high conductivity, non-ferrous case is best for this purpose.

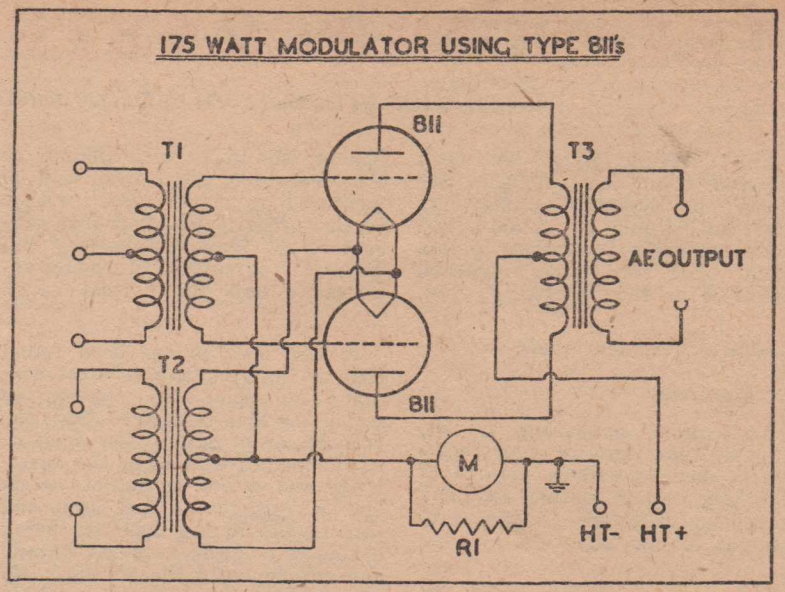
(c) Longitudinal currents: The transfer of longitudinal currents from primary to secondary is attentuated to a considerable degree by the provision of high-conductivity shields between windings. These shields also improve the balance to ground of the windings.

Coils are carefully layer-wound on precision machines with high-quality paper interlayer insulation. Interwinding insulation normally used is a plastic material of very low moisture absorption characteristics. After winding, the coils are vacuum impregnated with a micro-crystalline wax, offering the maximum resistance to moisture, and finally the complete transformer is sealed in the case with a bituminous compound. This treatment ensures long, trouble-free life under any Australian conditions.

Cores are constructed of correctly heat-treated, high-permeability nickel-iron alloy laminations, the type of alloy being selected to suit the conditions of operation.

Electrical Efficiency has been kept high by the liberal use of high-grade materials, correctly employed. The insertion loss for most types is well under 1db. and is only exceeded on those designs made to carry unbalanced dc.

Trimax is equipped to design and manufacture transformers of characteristics differing from those listed, and correspondence is invited in cases where standard types are unsatisfactory. It must be remembered, however, that usually the price is higher and the delivery period longer for special types.



Note:

1. The above transformers are designed for use with secondary winding terminated. For use unterminated the low-frequency variation would increase by approximately 1 to 2 db.

2. Both primary and secondary windings are in two sections. Impedances shown are for the series connection in which a centre tap is available. If coils are connected in parallel, impedances are equal to 25% of those shown, and no centre tap is available.

3. Most of the above transformers are usuable in circuits with impedances differing ± 25% of the values shown, without exceeding guaranteed response. (Both primary and secondary impedances would be altered in the same ratio).

4. If either primary or secondary is terminated in the rated impedance, the impedance measured on the other side will be higher than the value shown, due to the dc. resistance of the transformer windings. This increase is negligible in all types with the exception of output transformers and line transformer, type TA. 793.

5. dbm. equals decibels referred to 1 milli-watt.

6. If transformers specified with unbalanced dc. of zero, in actual use, have unbalanced dc. present, low-frequency response will drop. On removal of unbalance the response will revert to normal.

7. Type TA.793 transformer has extremely accurate balance of coil sections and is suitable for phantom working. The transformer will also handle 17 cycles ringing current in telephone circuits. An electrostatic shield between windings is not provided in this type.

BIAS FOR BATTERY SETS

Oscillator grid current scheme needs watching.

The following letter has been received from the Products Engineer of Eveready (Australia) Pty. Ltd., Peter H. Adams, and opens up some interesting points about bias for battery-operated portables of the "personal" type.

Here is what Mr. Adams says:—

Dear sir,

An article appearing in the August, 1947 issue of your publication, dealing with a method of obtaining a bias voltage in small portable receivers, has been brought to our attention.

This arrangement, in which the bias for the output valve is obtained from the voltage developed across the oscillator grid resistor, appears attractive at first glance, but closer investigation will show that it has a number of serious disadvantages.

Firstly, it is difficult to maintain constant oscillator output over the normal tuning range of the receiver and this results in the B battery drain showing considerable variation as the set is tuned from one end of the broadcast band to the other.

A further and more serious disadvantage is that, due to the decreased oscillator Gm at low A battery voltages, the B battery drain will increase as the A battery voltage falls in normal use. In the case of a personal radio using No. 950 flashlight batteries for the A supply the No. 467 Mini-Max B battery will outlast several sets of A batteries and, as this type of receiver will generally operate down to .9 volt on the filaments, a condition will often be encountered where a low A battery will be used whilst the B battery voltage is still quite high. In tests that we have made with this circuit, it is found that an increase in B current of more than 50% can occur at an A battery voltage of .9. This naturally will result in a considerable reduction in B battery life.

A final point concerns the converter valve itself. These valves show considerable variation in oscillator Gm and, by simply replacing this valve with another of the same type, the B drain can be increased up to 50%. An increase of this order in the discharge current of a small dry battery can result in the service life being reduced to half the normal value.

In our tests it has been found that by the substitution of the normal automatic bias system, in which the bias is derived from the voltage drop across the resistor in the negative B lead, the sensitivity and power output at low A and B voltages is increased and this results in the batteries being usable to a lower endpoint voltage and consequently the effective life of both batteries is increased. This system entails no additional parts because an electrolytic condenser from B plus to earth is necessary in any case to avoid instability which would occur when the internal resistance of the B battery increases towards the end of its life. With this condenser in circuit, there is then no necessity to bypass ticle referred to was used prior to the bias resistor.

The circuit described in the arthe war by a few American manufacturers, but was abandoned when its shortcomings were fully realised and, in conclusion, we would draw your attention to "Radiotronics" July-August issue, page 60, where it is indicated that the valve manufacturers do not favour the use of this circuit.

Author's Reply

Referred back to the author of the article in the August issue, T. E. Seymour, A.M.I.R.E., design engineer at R. W. Steane & Co. Pty. Ltd., makers of Q-Plus radio components reply was received and is published in full.

Briefly, the Eveready Co's remarks are approximately true when considering ordinary portable designs using conventional oscillator circuits, however, the points mentioned were carefully considered before being incorporated into the 3¾-Pounder kitset. (It has been noticed the Eveready Co. have tactfully refrained from direct reference on the kitset article.)

We submit therefore the reasons for our choice of this method, when considering the basic factors in the design of a PERSONAL Portable. e.g.—

(1) Maximum power output in relation to battery size. (2) Maximum Sensitivity also in relation to battery size.

Considering the first point, we maintain that it is not difficult to keep oscillator grid current within close limits, if due attention is given to the design of the oscillator coil, it's associated circuit arrangement and component values. A 4-valve miniature type of receiver, subjected to exhaustive tests, showed a variation of plus or minus .8 of a milliamp when tuned over the broadcast band, with a B supply of 67½ volts, and 1.4 volts applied to the filaments. This percentage variation does not rise during the life of the B Battery, and does not affect the performance of the receiver during the useful battery life. It is not detrimental to valve life, and if the desired operating current drain is intelligently selected, allowing for this margin, battery life will not be impaired.

With regards to the second matter, we feel that owing to the higher degree of space charge limited operation than is usual with the miniature output valve used, a small increase in current drain is apparent when the A supply battery decreases below a certain voltage. This condition does not arise with other tube types tested as their total current reduces with decreased filament voltage in step with the oscillator transconductance.

Using the type of valve indicated in the article on this system of bias, a current rise of 10% occurred when the B supply was a new 67½ volt battery and the filament voltage was .9 of a volt. It should be pointed out that this is an extreme case very seldom arising in practice, and is the most unfavourable condition under which the set could be operated. The stan-

dard layed down for a dead battery test, in the case of 1.4 volt valves is 1.1 volt, and the set current showed a rise of less than 2% with this filament voltage and 67½ volts B supply.

Current also drops rapidly with decreasing B supply voltage, therefore the effect of low A voltage is not very apparent by the time the first set of A batteries are discharged, and even though the B battery is still high in value the B current drain will show a decrease from the commencement of battery life.

It is most difficult to see how any claim could be made for a

COMMENT BY MR. STEANE

Whilst I had nothing to do with the authorship of the article on bias published in the Australasian Radio World, it bears a slight reference to the 3¾-Pounder, in which article actual component values are given.

Having studied the new bias method before using it in our kitset, we were amazed at the technical points raised by the Eveready Co.

In order to ascertain that no points had been overlooked, certain independent checks were made in my own laboratory, and I can support Mr. T. E. Seymour's views implicitly.

My conclusions are that the system used with properly designed component values, is definitely superior to the alternative automatic bias system, and that in the case of personal sets is absolutely essential in order to obtain a maximum sensitivity and power output to battery drain ratio.—Yours, etc.,

R. W. STEANE.

50% rise in current drain in view of the figures quoted, as the highest rise possible was found to be in the vicinity of 10%, and this rise could only become apparent for a small fraction of the life of the battery. From our own observations and information obtained regarding these batteries, life of the battery would not be impaired under the operating conditions outlined.

Continuing with point 3, it is difficult to know from the typing of the Eveready Co's letter, whether they claim 50% or 5% variation with different convertor valves, so the case for both claims will be considered. If replacement of a convertor valve showed a 50% rise in current drain the valve would obviously have either reached the end of its life or would be defective and would not operate with any efficiency, regardless of what system of bias is used. If, on the other hand, the claim is for a 5% variation, a little reflection will show that the resistors normally obtainable for automatic bias systems are usually plus or minus 10% of their marked value and will show equally large variations.

To illustrate this point, the bias resistance in a receiver using the automatic system was replaced with another having the same specified value, and equal tolerance. This resulted in the current drain of the receiver increasing by 7%. It has been found from observation over a period that the variation in oscillator transconductance of these convertor valves is probably in the vicinity of plus or minus 1½%.

Comparative checks were made on midget receivers powered by No. 467 B battery and 1½ volt A supply. It was proved that between an efficiently designed method of supplying bias from the oscillator, and the automatic bias system, better sensitivity is obtained, and the higher transconductance of the output valve is apparent throughout the life of the battery supply. Better end of life performance was also obtained because of the above considerations.

The reference to "Radiotronics" is not any true indication of the ideas of the valve manufacturers, as it must be pointed out that the article referred to concerned the design of a 5-valve standard portable type of receiver in which 90 volts B supply was used, and the aims of the designer would be different when for a "personal-type" set.

In conclusion, our evidence is of an increasing overseas trend to the method described.

DUTCH HAM

(Continued from page 10)

understandings in the matter. A switch was thrown over and we promptly heard the voice of the man in Capetown coming through the loudspeaker. He told us how excellently Mr. Zaayer's transmission on the 6 meter band had been received on 26th March and how on the 29th March he had held a long conversation with Mr. Zaayer. He had not heard PAUM, the transmitter belonging to Mr. A Bles of Rotterdam. No better proof of the accuracy of Mr. Zaayer's statements could be desired and it afforded us a great pleasure when, as a great exception, Mr. Zaayer permitted us to thank Mr. Rieder in Capetown for his verification of the facts.

The first Dutchman

Mr. Zaayer is the first Dutchman to have booked such a great success. Amateur transmiters usually employ the 80, 40, 20 and 10 meter bands, but Mr. Zaayer has bridged a distance of more than 6,000 miles, about one quarter of the earth's circumference, on the unusual frequency range of 6 meters, something that had never yet been achieved anywhere in the world. The longest distance hitherto covered on the 6-meter band was about 4,600 miles, from Okinawa to Hawaii, by an American on 25th January 1947.

Six-thousand miles, and that with an amateur's transmitter of no more than 100 W input, corresponding to an aerial energy of only 50—60 Watt. And when one only thinks that a lamp of this wattage in your living room is hardly sufficient to be able to read a newspaper properly, one must agree with us that an amateur transmitter cannot leave things to mere chance. Far from that, for it requires expert practice and serious preparation if any success at all is to be expected.

We wish Mr. Zaayer every success in his enterprise and congratulate him heartily upon this achievement, to which we add the hope that he and his wife may have many more successes in the ether.

Item from the Atlanta Radio Club's publication, "The Atlanta Ham": "In case you get across the high voltage in your transmitter, we suggest Patterson's at Spring Hill. They are kind enough to loan us additional chairs for our meetings."

—"QST" (U.S.A.)

TECHNICAL TOPICS

A BARGAIN to be had in the way of a first-rate VHF receiver is the British ex-Navy type B38; that is, if anybody can still locate any on the Disposals market. A few fortunates in the Sydney region acquired B38's and realised at once that for the price involved, £20 or so, here was something really good. Operation is a pleasure and the sensitivity over the entire range, from 10 to 60 mC/s in three bands, is excellent. It is a handy job for keeping a watch on the frequencies slightly lower than "Six" to spot occasions when the MUF climbs toward DX conditions. Quite standard valves are used in this receiver, the front end employing a type EF39 (Philips) RF amplifier with 6K8G Mixer/oscillator with a conventional three-gang condenser and padded, slugged coils. Several purchasers of B38's found that the lower frequency range, 10 to 20 mC/s was inoperative. Explanation is simple, although one doesn't always tumble readily to these simple things. The Fleet Air Arm units, in a certain area of Sydney had apparently little use for that range for communication work, but they did enjoy broadcasting programmes for relaxation purposes. So they disconnected the mixer grid coil and connected a 1,000 ohm resistor from 6K8G grid to earth, plus an aerial lead. The oscillator section they padded until they hit 2FC or whatever station they wanted, and Presto . . . there they were. Your scribe was in process of checking such a B38 for a friend and ran across this set of circumstances. A reader, overhearing a 50 mC/s reference to the mix-up on the 10-20 mC/s range, promptly telephoned and volunteered the information as to how to fix matters in a jiffy. Thanks OM! you saved a bit of diagram tracing and head-scratching!

* * *

For the benefit of those who may be unaware . . . the Philips type RL7 RF pentode (a glorified EF-50), is now referred to in British publications as the EF54. The RL-16 triode in the same series is now the EC52.

* * *

Here's a tip for those wondering what to do with some of those 500 cycle 180 volt primary Radar transformers so prolifically scattered through much ex-Service gear. Your scribe needed a bias supply for a modulator, to provide fixed bias on a pair of 807's in AB1. A transformer of the 500 cycle breed was on hand with three or four 4 and 6 volt windings and a 180 volt primary. The filament windings were connected in series and then placed across the 6.3 volt heater supply in the modulator. The 180 volt primary, used thus as a secondary, gave 30 volts. With one of those copper oxide rectifiers of the 100 milliampere variety connected across this the result was a 25 volt D.C. supply at around 80 Ma, which, with a smoothing capacity and variable resistor gives a handy adjustable bias voltage from 25 to zero volts at ample current rating. Used thus, with a low voltage input, the transformer doesn't get hot.

* * *

You will be hearing something about practical applications of the RL37 (CV66) grounded-grid RF amplifier for use on 28 and 50 mC/s, to say nothing of higher frequencies. A special VHF Converter has just been worked out and tested by the writer using this form of RF amplifier, and the results are outstanding. The signal to noise ratio with this form of RF amplifier on Six and Ten metres is incredible . . . so much so that one at first has a feeling that the set-up isn't working . . . that is, until one tunes in signals. Practical considerations are simple enough with observance of one or two common-sense points. Meanwhile, here are the characteristics of the type RL37 . . . known also as the CV66. Heater 6.3 volts at .45 amperes. Anode volts 300 Max, Anode current 25 Ma, Anode watts dissipation 3, Amp: factor 98, Mutual Conductance 9.0, Grid bias volts 1.5 neg, Cathode bias resistor 150 ohms, Working anode volts 250, Working anode current 10 Ma, Cathode-Grid cap: 9.8 Pf, Anode-Grid cap: 7.5 Pf, Anode-Cathode cap: 0.12 Pf, Max: Frequency 250 mC/s.

—VK2NO.

WINDOM

(Continued from page 28)

(b) 7 Mcs. i.e. 2nd harmonic.
(c) 14 Mcs. i.e. 4th harmonic.
(d) 28 Mcs. i.e. 8th harmonic.
(e) 56 Mcs. was not experimented with.

6. As VS1AA, the writer has used a long top (138 feet) and worked very successfully on 7, 14 and 28 Mcs.

7. The feeder should leave the top at a right-angle. The length is not very 'finicky' but resonating lengths of 35 feet, 66 feet, etc. should be avoided. I believe feeder lengths up to several hundreds of feet have been used in U.S.A.

8. **Coupling to Aerial.**

The feeder should not be tapped on to the P.A. Coil (through an H.V. condenser). This may result in harmonic radiation and anyway, it is bad practice.

The feeder should not be tapped on to the aerial coil which is coupled to the P.A. Coil. The writer has used a Pushpull P.A. as well as the single ended type. Coupling from P.A. Coil to aerial coil may be direct inductive or by link. The two coils could be placed side-by-side (not end on) with about ½" to 1" between the outside of the turns—thus:

This method was used very successfully on 7 Mcs, 14Mcs and 28 Mcs and tends to preserve the balance when using a Pushpull P.A. Link coupling should be entirely satisfactory.

9. This aerial is also quite efficient for receiving purposes.
10. It is desirable to use a good earth on the TX.

CALLING CQ!

By Don Knock, VK2NO

G5UB/P is back in circulation again in these waters and is heard oft-times on CW on "40" and "20." By the time these words hit print he will be back on this Eastern VK Coast and renewing in person, friendships made by QSO, HF, and VHF. Jim says that he is a bit fed up with G's who will persist in working with each other back home there, when all the time out on Pacific waters they are Strength 6. Must be something akin to "Network" or "Emu Club" transmissions, wherein the "members" aren't interested in anything outside their own little gambit. It arises from "over the garden wall" conversations on DX channels. Point is that it is seldom that 14 mcs is completely "folded." It usually has DX propensities in some direction.

* * *

Was interested in a survey in the American publication, "Electronics," which says that in USA most new types of broadcast receivers, now at the design stage, **will not include coverage of the short-wave bands.** Reason for this is stated to be that FM is a better selling feature, and that in any case "foreign reception is of lasting interest only for a few customers." That seems to be a very debatable point, and certainly not true of Australian trends. In many parts of this country, outback people, especially in the N.T. and N. West areas, rely very definitely upon "Radio Australia" for static-free news and entertainment service. Perhaps the foreign-origin transmission holds interest for a minority of Australians but internal short-wave broadcasts are certainly of importance. Shore-wave listening, will, I consider, be important enough here to warrant continued receiver design consideration. Incidentally, if the "Electronics" writer is correct about lack of interest in overseas broadcasts—why, then, does Amateur Radio have to put up a scrap at Atlantic City with the broadcasters who have grabbed the higher frequency end of the 7000 kcs band?

G's GET ATLANTIC CITY DELIBERATIONS

The following information came to VK2NO by airmail from G6FO, Editor of "Short-Wave Magazine," London, and is authentic. It contains the frequency allocations as they apply to **British** Amateurs, following on the just concluded Atlantic City Conference, held in U.S.A. to determine International and domestic communication channels.

This is how the G's fare, and there is no indication when the new rulings come into force. They get:

1800 - 2000 Kc/s: shared with commercial services.
2500 - 3800 Kc/s: shared with commercial services.
7000 - 7100 Kc/s: amateur exclusively.
7100 - 7150 Kc/s: shared.
14000 - 14250 Kc/s : Amateur exclusively.
14250 - 14350 Kc/s: shared.
21000 - 21450 Kc/s : amateur exclusively.
28000 - 29700 Kc/s : amateur exclusively.
144 - 146 Mc/s: amateur exclusively.
420 - 460 Mc/s: shared.
1215 - 1300 Mc/s: amateur exclusively.
2300 - 2450 Mc/s: amateur exclusively.
5650 - 5850 Mc/s : amateur exclusively.
10,000 - 10,500 Mc/s : amateur exclusively.

From this it is seen that there are losses and gains. The G's have no eleven metre band, **and no 6 metre band.** They now share the whole of the 80 metre band and half of what is left of 40 and 20 with commercials. They have the much discussed new 15 metre band in entirety, and get new VHF allocations in the 144 and 420 Mc/s regions. Whether or not much of this arrangement is applicable only to Great Britain remains to be seen. As this is written, early in October, there is no indication regarding new Australian frequency allocations for amateurs. The report from G6FO stresses that the preponderance of "sharing" was due to pressure at the Conference from U.S.S.R., which confirms similar reports from A.R.R.L.

—D.B.K.

There is no doubt that the higher register type of microphone, crystal or otherwise, has certain DX advantages, but it can certainly sound pretty awful as a general means of verbal conversation. If some of the users of No. 7 dynamic ex-Army microphones would get somebody to talk at their own locale, whilst listening to another station, they would, I feel sure, squirm at the tinny performance of some. Those No. 7's by the way, vary considerably —I know—having done certain lab. tests on them in the 1942 era, and there were local and overseas inserts. The latter were preferable and are recognised by the different appearance of the plated grille. They have a regular pattern of holes in the centre. Not all stations put out unpleasant sounding speech with the No. 7's though. I spoke to one VK3 with a first-rate transmission, but he was using some form of correction filter in the speech amplifier set-up. Still—the little mikes are only 10/- each around town, so what is more natural than the boys putting them to use? Bet-

(Continued on next page)

HAM NOTES

(Continued)

ter however, that a reasonably good carbon mike be applied in cathode input (grounded-grid) arrangement. The appellation of a microphone as a "dynamic" is not a guarantee that it will compare with a Steane Dynamike or some other equally faultless production.

* * *

Have just been listening to a VK5 on 14 mcs CW with a signal that would have caused raised eyebrows even in 1928. This was a perfect example of a "Rock-Crusher"—T3 or thereabouts, and so parasitic. It was a fundamental signal. Brother— how could you?

* * *

As this is written late in September, a few salient points are to hand from Atlantic City. These proposals were made in June, and since then may have been changed. Egypt insisted that there be no amateur 80 metre band at all, but of course, was over-ruled, as was fitting. In contrast, Italy, that country where Dictatorship of the black-shirt variety once put the complete kibosh on amateur radio . . . asked for elimination of the morse code examination for phone men. The 7 Mc/s band was the usual bone of contention and here the Australian delegate voted for only 200 Kc/s of the former 300 Kc/s allocation, and later expressed willingness for allocation of 7000-7300 Kc/s on a shared basis. Seems that the broadblasters will always be with us there. 14 M/cs was primarily endorsed by all Nations as now in force with 400 Kc/s but U.S.S.R. did some "Vetoing" with the result that 50 k/Cs was lopped off and a portion of 50 k/Cs of the remaining allocation is likely to be very uncomfortable with "internal domestic services" operating therein with kilowatts to spare. Advance California Kilowatts . . . and we hope you more than hold your own!

* * *

Whilst talking on 14 Mc/s phone to a J3 in the Kyoto region of Japan, he complained of CW interference from a commercial station . . . hitherto unusual inside the American phone channel of that band. After a moment or two he opined that "the U's weren't wasting any time in moving their commercials into the band." And the ink isn't dry on the Atlantic City deliberations which aren't due to come into effect for some time yet. But that doesn't matter apparently in some quarters.

* * *

G stations on 14 Mc/s are in most early morning periods in Eastern VK, workable with comparative ease. There are "off" occasions when short skip conditions at that end make it difficult for us to get through the interference. Elgar Treharne (VK3-AFQ) has been heard from that star station G8PO, talking to brother Ross (VK2IQ) in Sydney. G8PO bids fair these days to excel even G6XR's signal, and that takes some doing, but Ted attributes it to the special twin dipole of his own concoction that he uses. There are two driven dipoles arranged something like a W8JK beam, spaced one tenth-wave apart and with a delay feeder section switched in the shack to control phasing and consequent directivity. Another G station using the scheme is G8NY who applies two folded dipoles with similar effect. There are three members of the station personnel at G8NY, namely Les, Ron, and Cyril. The latter

NEW TITLE

Well fellow VK's—at last you can discard the time-worn fetish that you are essentially radio "experimenters," for in its wisdom the PMG Department has followed the British Post-War move and decided that henceforth, we are known officially as "Amateur Station Licensees." That is, in this era, just how it should be. Everybody has been well aware of the fact that the impetus of wartime left the pre-war radio experimenter with no justifiable claim to such title. Radio has reached a well-established stage and is now past the unknown category. In pioneer times radio amateurs were truly experimenters to a correct degree—they were ahead of the then commercial laboratories—because they were individualists and liked to delve into the fascinating unknown. Now radio amateurs are owner operators of private stations for **communication** purposes, minus financial gain from such communication. Also, in Australia, the expected abolution of the classes of license is announced—now there is only one rated at 100 watts maximum. Now that the new hand gets the same power rating as the long-experienced man, perhaps the latter will, where applicable, be granted extended power facilities as on the lines of the 150 watt pre-war permits? Generally speaking however, most VK's agree that 100 watts or so is enough to get around the globe with in fine style.

VK2CM USING A "WINDOM" AERIAL

That G.O.M. of Australian Amateur Radio, Charles D. Maclurcan of VK2CM is to be heard when time permits, with a typically good quality 2CM transmission on 80, 40, 20 and 10. Charles had enough of the ex-Service Field equipments, which served to renew interest in the old game, and is now operating a natty rig made for him by this writer by converting an ex-RN B36 outfit for all bands. There are three stages, using 807's and finishing with paralleled 807's in the final. Various types of microphone input channels are provided but the microphone used mainly is an Astatic 600S crystal . On Sunday evenings there is an 80 metre get-together with VK2HC, Ray Carter of Quirindi, and VK3KU, Howard Love of Melbourne. Antenna used at VK2CM is a 138 feet "Windom" with multi-band antenna coupling unit; and how that antenna performs! Don't let anybody fire you with the idea that the "Windom" (otherwise single wire feed matched-impedance) antenna isn't a first rate utility radiator for multi-band purposes. It is a tried and proved system, and one hears and works many a G with strong signals emanating from the type.

says he is "QSL card Manager and Cutter-up-in-Chief of feeder lines!

* * *

There is a country in this world where transmitting radio amateurs exceed all other people in ownership and operation of short-wave receivers. This is Cuba, where there are 366 licensed "hams." The Cuban army possesses only 140 SW receivers and Civil Aviation 64. The population sports but a handful of SWL's.

* * *

In contrast to Australia where the probationary period for operation of amateur stations was recently waived, Canada has very strict rulings for the newly licensed operator. He must do a 6 months probationary period on CW only and can only do so inside certain channels. The idea is much along the same lines as the New Zealanders who are confined virtually to 3.5 Mc/s until considered eligible for a High Frequency permit for other bands.

Which observation prompts a thought, 3.5 Mc/s is virtually one of our most useful domestic communication channels . . . it is good for local and distant communication up to 4 or 500 miles or so in daylight, and all of 2000 miles in hours of darkness. Yet the VK population is quite sparse. The reason? Probably the BCI bugbear. At least, so far as phone is concerned. But BCI is a relatively easy matter to cure for CW operation at 3.5 mC/s . . . you don't think so? Take a look at "QST" articles of the 1927-8 era and you will see that they licked the BCI bogey even in those times. Apart from which . . . there are thousands of W's using the band nowadays, and on phone with plenty of power. As it is at present, one can call CQ for long periods on 3.5 Mc/s phone or CW without hearing a peep from another VK.

* * *

Not every early morning on 14 Mc/s is a picnic for G-DX . . . there are occasions when the band goes completely dead in all directions . . . sun-spots no doubt. Such a morning was that of September 25 last when receivers produced a blank wall of silence and even such die-hards as VK2AGU and VK2XG had to give up the quest. At least George was able to go and milk the cow in between times looking for G's that didn't appear!

The idea of a number of stations getting together locally and indulging in a 7 or 8-way QSO party is a good one from the viewpoint of fellows getting to know each other better. But the right place for such transmissions is a VHF channel; certainly not a DX region like 14 Mc/s. There is no time when the 14 Mc/s band is really completely dead for DX somewhere or other, but when the hilarious round-table lads can find nothing else to talk about and start to bring in the YL's, XYL's, it is apt to be a bit like morning tea-time in the average city cafe.

* * *

With the amount of splatter that now shows up in the phone-channels, some steps need to be taken to clear the air a bit. A simple precaution is the "building-out" of driver and modulation transformers etc. Use about a .01 mfd mica condenser (high voltage kind) across the Modulation transformer secondary and about .001 or .002 mfd across the driver secondary. Such treatment will limit the upper response, which is where most of the trouble occurs, especially with over-driven 807's as modulators.

* * *

Here are some Fijian QTH's, and some of these callsigns you will hear active on the DX bands.

VR2AG C. Brooks RNZAF Laucala Bay.

VR2AJ A. J. Verity RNZAF Laucala Bay.

(Continued on next page)

DISHONOUR

Honours . . . or Dishonours, for the most atrocious signal, (not including Commercials), heard on an Amateur band . . . go to C9JK. That station was in action on the evening of 30 Sept. last on 14 mC/s whilst QSO an LU6 with a noise that sounded like a throwback to the days of pioneer CW. It was the kind of thing most of us were guilty of in the early 20's, what time the move was on to oust King Spark! This signal was truly 'rock-crusher' kind . . . a grating raspy sound with a lot of furry edges and a 'Chwa Chwe Chwa Chwe' swooping effect. After considering that this might be a parasitic of some basic signal elsewhere, a search was made for such, out of curiosity, but it was reluctantly decided that it really was a noise in China! . . . at its fundamental . . .!

HAM NOTES

(Continued)

VR2AK J. P. Shortall Met. Office Nadi Airport.

VR2AL J. W. Peacock Aeradio Nadi Airport.

VR2AM Thor Gundersen "SS Tambua" Suva.

VR2AO T. A. Duxbury Aeradio Nadi Airport.

VR2AR L. F. W. Mercer RNZAF Laucala Bay.

VR2AS S. H. Mayne Victoria Parade Suva.

VR2AT E. H. Armstrong Aeradio Nadi Airport.

VR2AU L. B. Lambie Aeradio Nadi Airport.

VR2UH D. A. Leslie P and T Dept. Suva.

Did you hear that YL with the silvery voice one recent evening on 14 mC/s phone . . .? and did you hear the pack of NSW wolves in full cry?

* * *

Noticed quite a few W's using FM at the HF end of the Ten metre band . . . as allocated for that purpose in U.S.A. Whereas they probably, and no doubt do sound as intended with the correct kind of RX at the receiving end . . . they are just an indefinable noise on the average Ham AM receiver. In contrast, there are one or two American NBFM stations to be heard in the 14.2-3 mC/s phone band and these are perfectly copiable on an AM receiver, although maybe a bit croaky.

* * *

Britains' excellent "Short-wave Magazine" put out by G6FO gives details of the F.O.C. . . . which being interpreted means . . . First Class Operators Club. Interesting to note that the President is none other than England's Number One Old Timer, Gerald Marcuse, (G2-NM) and that the Secretary is Capt. A. M. Fergus (G2ZC) . . . a couple of long experienced brass-pounders. There are lots of VK's that could qualify for the standards of membership as witness some of the star efforts in the present CW Contest this end. On the other hand, membership of the F.O.C. would be somewhat out of the reach of so many, who are better fitted to be moronic members of the HI and HANDLE brigade!

* * *

This business of getting up in the early morn this end to work with G's on 20 . . . a case of come and go. Conditions are inclined to be somewhat exasperating, with excellent signals both ways one morning, and a complete negative the next. After telling one or two friends that it is worth the early effort, it comes as a bit of a sell for the new aspirant to G-DX to find the receiver dial completely devoid of the expected sigs. Usually however, there is some alternative DX to be had in the way of French, Italian and other Europeans.

* * *

Elgar Treharne, (VK3AFQ) now in G-land for a couple of years, has been heard from various G stations at odd times. Any day now Elgar expects to get his own G call, having secured the license, so that it is odds on that he won't waste much time getting a rig of his own into action there.

THE OLD AMATEUR SPIRIT —TRAVESTIED!

To point out undesirable features of the old hobby isn't pleasant; but when instances of plainly rotten operating are brought into the open it isn't likely that those who have serious regard for the future would wish to see them glossed over or ignored. Rather is it fitting that something be said to help keep things on the rails.

Nine times out of ten the VK amateur is as good a scout as the next lad, his overseas counterpart, but in all countries there are the inevitable blotters of copybooks. They are a small minority, but, from the verbally considered point of view they can cause resentment to rankle by brainless utterances unworthy of the scientific hobby that most amateurs regard with jealousy as the finest in this world. Occasionally fellow VK's write to this scribe in condemnation of some instance of bad taste or operation. One such communication comes from VK-4GZ, E. Waddle, of Charters Towers, Qld. He has this to say . . . "What do you think of a fellow who very pettishly tells a CW man that 'if he wasn't a bit of DX and known to him he wouldn't be bothered working him. . . . and anyway . . . . working a CW station is just so much waste of time. This, I heard from VK2-who was working a VS6 a few weeks ago. He—VK2—may be a decent sort of fellow, but when I hear a statement like that at S9 plus, it kind of puts one off Ham Radio . . . modern vintage. I have never wished for a kilowatt more than when I heard this remark. With that, it would have given me great pleasure, childish though it may seem, to have blasted his signal off the band. That appears to be Ham Radio to-day!"

With VK4GZ's feelings this scribe and all amateurs worthy of the name will agree. Nevertheless, it is considered that such an exhibition of rotten operating is NOT typical of Ham Radio to-day. There is really nothing wrong at heart with the old game, merely that there are a few square pegs trying to fit round holes.

It is up to Amateur Administration itself to remedy matters, and that means the functioning of Advisory Committees in other than merely "Advisory" fashion.

—D.B.K.

V.H.F. NOTES AND NEWS

On the evening of 15th September, 1947, the first direct two-way 6 metre QSO between Newcastle and Sydney (NSW) took place between stations VK2BZ and VK2NO respectively. The communication was by CW and signal strength everaged R4S5, characterised by fading very similar to DX signals on lower frequency bands. There is nothing really new or outstanding about this QSO—merely the fact that it does happen to be the first direct two-way between the cities on Six. In 1935 VK2ZC Newcastle and VK2NO worked with each other on the old 56 m/Cs band. For some weeks, even months, VK2NO had been hearing VK2BZ and vice versa, but all attemps to tie up directly went by the board for various reasons. The same evening, 15th September, Ray Priddle, VK2RA of Pymble, NSW, worked two-way with VK2ADT of Cessnock—also the first contact of its kind, and done in this instance on horizontally polarised aerial systems. The VK2BZ-2NO QSO was with vertical polarisation.

VK2ADT of Cessnock has been hearing VK2NO for a week or so, but as yet no sign can be heard of Jack at the writer's station.

Further afield, VK2YQ of Schofields RAAF station, inland from Sydney, worked with VK2BZ during a recent evening of pronounced temperature inversion, and up in the Blue Mountains at Katoomba, Stan Skinner of 2K2LY has worked two-way with both VK2BZ and VK2ADT. Thus, do 50 m/Cs signals penetrate into regions which a decade or so ago were thought to be so screened as to be impenetrable unless from highly elevated positions. Reasons are, that there is far more activity on Six than ever there was on Five, and that equipment is miles ahead in efficiency, both for transmission and reception. All this reference does, I know, sound small potatoes against the recent achievement of Clarry Castle, VK5KL Darwin, in working two-way with W7ACS/KH6 Pearl Harbour on Six on August 26th last. And that, by the way, was on phone, not CW. Even so, the local aspect of the Six metre band takes pride of place with those who are so placed as to make full use of the band as an outstandingly appropriate channel for cross-city and new intra-city, work. Some of those who nightly clutter up the HF end of 14 mcs with back-fence "Network" blather in emulation of a Chinese laundry in full swing, would do better, at least, to give the DX men on that band a break and turn to Six. Not that Six would be graced or enhanced by foolery—but at least there is 166 mcs as an admirable stamping ground for the ear-basher types!

It is pleasing to note the return to 6 metre activity of Les Day, VK2AZ, formerly of Brighton-le-Sands, and now of Drummoyne. His signal hasn't quite the former punch in some directions that it had from the old QTH, but this scribe will take a bet with anybody that if and when the DX happens along on 6 metres, VK-2AZ won't be behind in the running!

A relatively new station with a nice transmission on 6 around the Sydney area, is VK2DB of Guildford, near Liverpool. His signal is gradually building up, although QRP is used at present with a pair of VT501A's in PP in his final. For the benefit of the querists—those valve types are ex-British Service equipment and are in the nature of being 6V6G's with the anode on a top cap. Nice handy little fellows—they are found in some forms of IFF equipment. A visitor to the writer's station, and one who had thereby his first introduction to 6 metre communication, was old-timer, Hermann Asmus, VK3ET. Using phone comes strangely to Hermann—and no wonder, he is and has been for a lifetime, a key-puncher. At sea in the early days, he is Life behind Keys at Melbourne Central Office of the G.P.O. There is something more than a rumour behind the idea that Number One OT in VK2 will in the near future be heard on the Sydney air on 6 metres, for Charles Maclurcan, VK2CM, is getting fitted out for all bands—and that of course, includes 6 metres!

* * *

Of necessity these notes are largely about NSW VHF activities—if you Interstaters want space in these columns, then it's up to one or other of the gang to pop a few things on to paper and mail them along to VK2NO. One can't just imagine what you are all up to—but your doings can be of interest equally to the next laddie.

Those who don't use the Ten metre band these days and nights just don't know what they are missing, for it is a veritable feast of DX most times. Conditions there are quite unlike anything on 20, for there are periods when signals seem to arrive from all directions at once. Strong stations appear on the dial from South America, Africa, India, Burma, Japan, China, Britain and Holland . . . all at the same time. Of course, those of us who use Six as well are hoping that something of the kind might happen there . . . but as this is written . . . it is still a case of hoping.

—Don.

* * *

AMATEUR TRANSMITTERS

The number of licensed amateur transmitters in Great Britain and Northern Ireland on June 9 was 5,101.

Shortwave Review

CONDUCTED BY
L. J. KEAST

NOTES FROM MY DIARY

Wedding Bells

We have become accustomed to hearing Bow Bells when listening to the BBC but on Thursday, November 20 the Wedding Bells of H.R.H. Princess Elizabeth will come over the air. The BBC will give two hours to the broadcast and it will be one of the greatest coverages made by them. Microphones will be placed at vantage points from Buckingham Palace to Westminster Abbey and the ceremony in the Abbey will also be broadcast. Tune in to London from 9-11 p.m.

* * *

Radio Newsreel

"When the familiar tune of 'Imperial Echoes' comes on the BBC's overseas programmes, listeners know they are about to hear—or have just heard—another edition of 'Radio Newsreel.'

"In its day—a long day ago that started in summer of 1940—'Radio Newsreel' has had several homes: a studio deep underground in Broadcasting House, until a German bomb drove it further afield; a study in a country house in the Midlands; another studio in another country house within sight and sound of the London barrage; and, finally, back to London for the 'buzz-bombs,' the rockets, the Victory Parade—and two years of peace.

"In its present home, which is known as Studio 'Mixer One,' 'Radio Newsreel' puts on the air six main editions every twenty-four hours, with special editions at the week-end. Except for a spell during the war when the Forces Edition was 'overheard' in Britain, the programmes were for overseas listeners only—and they still are, although a seventh, main edition, is soon to be added for listeners in Great Britain."—"London Calling."

Now the McGees Are Book Stars

One of my favourite programmes from 'Frisco is "Fibber McGee and Molly." I note that Don Quinn, scripter for this NBC session, is writing a book about them. Publishers will be Simon and Schuster.

* * *

North and South

I think it was Rudyard Kipling who said, "East is East and West is West and never the twain shall meet." But it looks as though the North and South of New Zealand cannot meet. Both islands are now putting out a DX magazine, but I guess it will not be long before the hatchet is buried and the forces will combine and once more bring out a joint bulletin.

SAYS WHO?

Mr. Geoffrey C. Wood, of Moonee Ponds, Victoria, writes: "In answer to 'Help Wanted' by Rex Gillett, asked for in 'Radio World,' September issue: On looking through my copy of 'Radio Calls of the World,' issued by the N.Z.R.A.DX Club, I find that station HI2T, Monsenor Nave Dominica 'La Voz del Yuna' is listed on frequency 6.48mc. I should imagine this is the station Mr. Gillett is receiving on 6.10mc, as he mentions it moving from 6.48mc. I trust this information is useful to you, though by this time I dare say many others will have given you what you want.

"I have been actively interested in DX for some time now; in fact, the 'bug' bit me whilst in the N.E.I. on war service, and though I am only a new-chum to the game I have hopes of pinning a few QSL veries up on the wall some day soon. My first is in the ? being for HER-5 which I have tuned in like a broadcast station these last Tuesday and Thursday evenings. QSA 4 and comfortable speaker strength with two-thirds volume on the volume control.

"Many thanks to you and your paper for the splendid coverage of all useful and topical radio items. I might add, the receiver I am using is built up from the R.W. August 15, 1941, and is the Tradebuilder Mantel Model with a couple of minor alterations. I've used a 6SS7 in place of the 6U7G as primarily it was on hand, also, being metal, it is good from the stability angle. Apart from this, the output is a 6F6 with simple negative feedback of a 1.5megohm resistor. The set has amazed me. On short-wave with 16 feet of wire bound into a neat roll, with about four feet lead in, most of the listenable stations are at good volume. For example, I have identified: 8 Americans, 2 Swiss, 1 Dutch, 1 Chinese, 1 French and 1 Indonesian stations in the past three evenings. Trusting this diatribe is not too boring, I shall bid '73' and am looking forward to more of your mag's instructive items."

(Thank you, Mr. Wood, for your kind reference to "Radio World"

NEW STATIONS

KZRC, Cebu City, 9.515mc, 48.94m: This is not actually a new station as this Philippine station was heard before the war on this same frequency. They appear to open about 10.30 p.m. with news and continue with a musical programme till 1 a.m. Slogan is as prewar: "The Voice of Cebu."

KZFM, Manila, 9.515mc, 31.55 m: This appears to be a new Phillippine and uses the slogan "The People's Station."

and your report is quite interesting and I trust that you will very quickly cover your wall with verification cards from many countries.—L.J.K.)

* * *

Rex Gillett, of Prospect, South Australia, sends a fine list of loggings:

LKV, Oslo, 15.175mc, 19.76m, heard opening Sunday at 6 p.m. with time signal. Severe interference from Moscow and BBC.

Japan. Since about September 11 I have heard WLKS, the B.C.O.F. station in Japan, on the announced frequency of 6.065mc, in lieu or 6.105mc as previously. It also remains on the air until 11.30 p.m. instead of 10 o'clock as was the case. Signals have been quite good until sign-off with "God Save the King." Commercial and Radio Australia features are broadcast. Tokyo in the Home Service was heard on 15.235mc at 9 a.m. Call-sign announced was JOAK.

Norway. LLG was the call-sign of a Norwegian on 9.61mc. This country is again using this channel in relay with LKQ until both leave the air at 8.05 a.m. LLG? has been heard as early as 3 a.m. However around sign-off time signal suffers interference from what may be ZYC-8. (This Brazilian is on from 5.15 p.m. till 7.45 a.m.—L.J.K.)

Roumania. Radio Roumania Libera on 6.21mc has been heard at 5.30 a.m. using English. After the playing of a little recorded music, English is again used. Sign off is at 6 a.m. with a vocal anthem. Fair signals.

Denmark. OZH-2 is believed to be the station heard on 15.32mc under VLC-4 on a recent Sunday. When the latter closed at 2.15 a.m. reception of the former was much improved but, apart from ascertaining that the former's language was of a Scandinavian type, I could not definitely say whether it was OZH or not. Just before 2.30 a.m. an interval signal of about 14 chimes was heard, followed by a church service. The station was still on after 3.30.

Czechoslovakia. Since September 11 the Czech Radio has ceased to operate on 6.01mc. English periods are as follows: 3.45-4 a.m. on 11.84mc; 5.45-6 a.m. and 7.45 to 8 a.m. on 9.55mc.

Holland. PCJ's Pacific Service on Tuesdays now commences one hour later, viz., 7 p.m. on 15.22mc and 17.77mc; duration is 1½ hours.

Germany. Nordwestdeutcher Rundfunk Rothenbaumchaussee 132-134 Hamburg 13 stated that the transmitter is located at Elmshorn 9 degrees 40 min. east long. 53 degrees 45 min. north lat. (approximately 30 kilometres N.W. of Hamburg.) Present power is 25 K.W. but 50 K.W. will be employed in the near future. Frequency is 6.115mc. Verie was a letter in German.

Belgium. Schedule received direct from Brussels is as follows: 21.45mc from 9-10.30 p.m. and 2-3 a.m. and on 17.845mc from 4.55 to 6 a.m.

Machau. Asst. Manager L. G. Gomes of Radio Clube de Machau has indicated that his station is at present off the air awaiting the arrival of new equipment. Schedule was 7 p.m.-12.30 a.m. on 9.248mc.

Philippines. KZRC is an old-timer to reappear on short-waves. It has been heard since about September 23 on the announced frequency of 6.13mc. Call and slogan "The Voice of Cebu" are given frequently. Power is stated to be 1000 watts. I have heard it from about 9.30 p.m. until sign off at 1 a.m. News is read at 10.30 p.m. KZRC is operated by the Manila Broadcasting Co., which also runs KZRH and KZMB. Rather severe interference from VLR-2. KZFM is now on short-wave on 9.515mc. It was only heard previously on 710 kc. Slogan used is "The Peoples' Station." I have heard it from about 8 p.m. with programmes in English. Signals suffer from interference from neighbouring stations.

Sumatra. A Dutch-speaking station on about 7.26mc announces as "Radio Sumatra" or at least I am almost positive that is the call. It leaves the air at 11.55 p.m. with "The End of a Perfect Day." Programme was of recorded music. Interference was caused by the Jap on 7.258mc.

Trinidad. Announces as 9.625 mc, but actually operating on 9.645 mc. VP4RD, Port-of-Spain, is asking for reports, but send an IRC. Address is: Radio Trinidad, Broadcasting House, Port-of-Spain, Trinidad, British West Indies. Times on the air are: 9-11 p.m.; 2-4 a.m.; 6 a.m.-1 p.m.—*"Radio News."*

* * *

SHORTS

FORT DE KOCK, East Coast, Sumatra is the location of the Indonesian heard at 9.30 p.m. on 7.20mc.

* * *

YDA, Java, is to increase from 10,000 watts to new 100,000 watts G.E.C. transmitter by end of year.

* * *

WLKS, Kure, Japan, has moved to 6.06mc. Is better signal than when on 6.105mc.

* * *

OAX4W (9.38mc) and OAX-4V (5.90mc) is verifying at long last with letter in Spanish from J. Antonio Umbert, Direct General, "Radio America," Casilla 1192, Lima, Peru.

* * *

Vienna reports are being verified by Mr. H. Hartuer, General Secretary, Osterradioverkehrs, Rovag, Argentinaerstrabe 30a, Vienna 4, who writes in English and asks for stamps for his collection.—Cushen.

* * *

Power of the WEIN transmitters is: WEIN I, 6.155mc, 300 watts; WEIN II, 7.175mc, 250 watts;

WEIN III, 9.664mc, 250 watts; WEIN IV, 11.785mc, 200 watts.

* * *

KZRC, "Voice of Cebu," Cebu City, Philippines, is back on pre-war channel of 6.13mc. The former owners were H. E. Hancock & Co. Ltd.

* * *

According to American reports, the Spanish station heard on 6.18 mc, running late programmes to 3 and 5 p.m. on Sundays is HC1TR, Ilbarra, Ecuador, which was formerly in the 60-metre band. (This may be Rex Gillett's station.—L.J.K.)

* * *

ZMKO, "Pamir," the New Zealand Government's barque which left Wellington on October 3 for London via Cape Horn, has a short-wave transmitter operating on a frequency of 8.28mc, with an estimated range of 5000 miles. It is hoped to be able to keep in regular communication direct with New Zealand or through the Falkland Islands or London. — NZ. DX-TRA.

* * *

Frequencies allotted to the New Zealand short-wave transmitters are 6.08, 9.54, 11.78 and 15.28mc. Watch out for further test transmissions.—N.Z. DX-TRA.

* * *

Canadian Broadcasting Corporation Schedules

CKNC, 17.82mc, 16.84m: 11.45 p.m.-9 a.m. Sundays from M/N).

CKCS, 15.32mc, 19.58m: 2 a.m.-9.05 a.m.

CKCX, 15.19mc, 19.75m: M/N-2 a.m.*

CKRA, 11.76mc, 25.51m: 9.20 a.m.-10.35 a.m.

CHOL, 11.72mc, 25.60m: 7.15 a.m.-9.05 a.m.; 5.45-7 p.m. (Sundays only).

CHLS, 9.61mc, 31.22m: 5.45 p.m.-7 p.m. (Sundays only).

* To Latin America 9.20-10.10 a.m., 10.35 a.m.-12.05 p.m.

Burma Broadcasting Service Rangoon

Daily Broadcasts (English):

11.15-11.30 a.m.: Headline news at 11.25 a.m., 9.542mc, 31.44m.

4.15-4.45 p.m.: News at 4.30.

12.15-1.5 a.m. News at 1 a.m. 6.035mc, 49.71m.

* * *

International Broadcasting Station

Chungking, China.

XGOY, 11.913mc, 25.18m: To Australia, New Zealand and South-East Asia from 6.55-8.30 p.m. in English.

7.153mc, 41.96m: To East Asia and the South Seas 8.35-10.35 p.m.

9.658mc, 31.06m.: To East Asia and the South Seas, 8.35-10.35 p.m.

* * *

Verifications

Arthur Cushen, Invercargill, N.Z., advises: This month I verified my 100th country in a veri from Capetown, 5.88mc, and brought my total veries to close on 1300. (Congrats, Arthur; that is a very fine show.—L.J.K.) The following have also come to hand: HEU-5, HEU-6, HER-4, HER-5, YV-5RU (4.88mc), LLI (6.185mc), LLS (7.21mc), LKQ (11.735mc), KRHO (15.35mc), CFRX, Hamburg (6.115mc)—this was first report from Australasia; Saigon (11.78mc); XMAG (4.275mc); AFRS, Nanking; CE622, CE1173; SEAC (17.77mc); CR7AB, CR-7BU; VUM-2 (9.59); Capetown (5.88); Singapore (4.825); Nairobi (4.855mc); HI2T (6.48mc, 7500 watts); HP5H (6.122mc); CE970 and CE1180.

Further news on verifications: Nortwestdeutscher Rundfunk, Rothenbaumchaussee 132 - 134, Hamburg 13, is full address of the Hamburg station. Verification was by letter in German. Were using 50,000 watts, present power is 25,000 watts on 6.115mc. Transmitter 30 k.m. north-west of Hamburg. Schedule is: 2-6.30 p.m., 7 p.m.-8 a.m.

CE622 and CE1173 verification by letter in Spanish from F. Eliseo Marino, Engineer, Casilla 2626, Santiago, Chile.

HI2T "La Voz del Yuna" verification was by colourful card showing map of Dominican Republic and towers rising from Ciudad Trujillo. Power is 7500 watts. Were on 6.48mc, but now using 7.275 and 11.90mc.

XMAG, S.S.O. Army Advisory Group, APO 999, c/- Post Master, San Francisco. Verification by letter signed by Paul W. Laisure, Station Manager. They sent schedule which is: 1 p.m.-1 a.m. daily except Sundays, when they open at 10 a.m. They broadcast on 1540kc (250 watts) and 4.275mc (1000 watts) Collins transmitter with half-wave antenna bearing on Shanghai. Is affiliated with A.F.R.S.

Saigon, 198 Rue Chasseloup-Laubat, Saigon, veri by card and schedule, signed by English announcer who says they will soon put into effect my suggestion of a letter box session at 8.15 p.m. for Australasian listeners. Present session is at 11.50 p.m. Saturdays. English sessions are: 8-8.45 p.m.; 11.30 p.m.-12.30 a.m.

YV5RU on 4.88mc verified with fine card; has slogan "Ondas Populares" down the right-hand side, mike at the bottom with radiating lines fading into studio shot. It is affiliated with the CBS. Relays YV-5RG, Caracas, Venezuela.

Oslo verified with three photo cards showing Oslo harbour, docks and bush scene.

CE1174 has verified an old report and gives address as CB93-CE1174, Orlandinly Raggio Ltda., Casilla 6009, Santiago, Chile.

YNVP, "La Voz de Nicaragua," 6.76mc — formerly YNPS — sent veri in shape of long-air-mail letter.

Veri by letter from Dr. Siegmund Guggenburger, Public Administrator for the Austrian Broadcasting System.

Further veries are: XGOA 9 (9.73mc); Weine 1 (6.155mc); Wein II (7.175); Wein III (9.664); Wein IV (11.785).

* * *

And here is Rex Gillett's list:

Veries have been coming along steadily and my total of 336, although not impressive in number, is representative of 88 countries. (That is a mighty fine effort, Rex, in the short time you have been DX-ing and you also have my congratulations.—L.J.K.)

XGOA, 15.36mc, 11.83mc; SEAC, 15.23mc; XTPA, 11.65mc; XMAG, 4.275mc; HEU-5, 11.815 mc.

KZPI, 9.50mc; KZOK, 9.69mc; Saigon, 6.165mc; CR7AB, 3.49mc; VUM-2, 9.59mc; Radio International Tangiers, 6.20mc; Capetown, 5.88mc; Macao, 9.248mc; Nordwestdeutcher Rundfunk, 6.115mc; Johannesburg, 9.87mc; Brussels, 21.45mc; NAVE, 9.67mc; 9.24, 9.28, 17.84, 19.09mc; and second veries from LLI, 6.185mc; LKJ, 9.54mc; and LKQ, 11.735mc.

* * *

PCJ ANNIVESARY CONTEST PRIZE-WINNERS

During broadcast announcements from the famous Netherlands short-wave broadcasting station PCJ, at Hilversum, "Happy Programme" director-announcer Edward Startz indicated the winners in the contest held on March 30, 1947. This contest was by way of celebrating the 20th anniversary of station PCJ, and listeners were requested to answer the question: "Can International Short-wave Radio Promote World Peace?" . . in a limit of 200 words. Entries were very numerous and came from many countries.

The first prize, consisting of a free round-trip to Holland with a week in the country, was won by Miss Elizabeth Holland, of St. John's, Newfoundland. Second prize, a Philip's all-wave radio receiver, model 1947 AERO DX 665X, was won by Lieut-Col. D. M. C. Morrison of HQ Northern Command, India.

The third prize goes to an Australian SWL, Miss Margaret Boyd, of 50 Darebin St., Heidelberg, N22, Melbourne, Victoria. She wins a Philips gramophone-amplifier with pick-up, Model HX372A.

Station PCJ, which was built by the Philips Organisation, formerly operated under Philips control, but is now administered by the Netherlands Overseas Service. The transmissions are heard well in Eastern Australia, particularly in the higher frequency allocations during the evening period at this time of the year.

TECHNICAL TOPIC

A tip about sockets for EF50's, RL7's, RL37's and the like . . . there are good and bad sockets. One of the best is to be found in ex RN gear and is of a grey coloured insulation material with silver-plated side springs. These are always fitted with a plated screw-thread locking ring. Beware of some of the wafer sockets . . . those that have been subjected to varnish treatment by sig workshop personnel cursed with a heavy hand on the varnish brush. In many instances the varnish is all over the contact springs as well, with the result that they are gummed up. A valve inserted therein may or may not make contact to one or more pins. A remedy is to soak the socket in its entirety in acetone or a good brand of lacquer thinner for half an hour or so . . . then drain off and allow to dry out properly. Press the springs inward so that the two make definite contact with the valve pins and all should be well. There are other wafer sockets with a worse fault . . . a locally made type. There is nothing wrong with the actual spring contacts excepting that they are not intended for "Push-in" connection with the valve pins. The valve needs to be snicked slightly to the right after insertion in order to clip the pins into the springs. To ensure that this is possible the key-way for the key on the metal locator pin in the centre of the valve needs filing out slightly to the right, using a nail or warding file. This will permit a "loktal" movement of the valve into position. All of the valve types mentioned should be fitted with some form of "holding-down" clips to make sure that the valves don't ride gradually out of the socket springs.

Speedy Query Service

A.A. (Collaroy) asks about back numbers with Ferrotune circuits.

A.—Yes, we have all these available at 1/- each, post free.

* * *

S.R. (Dungog) is having trouble with an amplifier having a direct-coupled phase changer, adapted from a circuit we published several years ago.

A.—Your trouble is most likely to be in regard to the by-pass condenser for the bias resistor of the first valve. A 25 mfd. condenser is shown across a resistor of 50,000 ohms. Often enough the internal resistance of a 25 mfd. electrolytic is only a couple of thousand ohms. Putting it across a 50,000 ohm resistor brings the effective resistance down to below 2,000 ohms and upsets the balance of voltages. The cure is to replace the 25 mfd. condenser with either an 8 mfd. 525 volt type or else a .5 mfd. paper tubular condenser.

* * *

P.R.G. (Bendigo) has the A.R.R.L. Handbook, but is worried about the circuits being detailed for 110 volt mains.

A.—In many cases it is merely necessary to use a power transformer with 240 volt primary to suit local conditions and no other changes are neccessary. The exception to prove this rule is in regard to anything described to fit direct to the mains without a power transformer. Great care is needed with these and in most cases the only safe answer is "no."

* * *

F.A. (Fremantle) is interested in tone control by means of inverse feedback.

A.—This subject was covered in a most comprehensive manner by an article by Parry in our issues of February and March, 1941. On account of the conditions which prevailed at the time a number of readers missed these two issues and article in question. Fortunately the two issues are still available from our Back Dates dept. and we cannot do better than suggest that you get them. We feel sure the article will tell you all you want to know.

NOTE RE C.R.O.

In the September issue we mentioned a leaflet on a c.r.o. which is available from J. H. Magrath & Co. To avoid any misunderstandings we wish to point out that the leaflet deals mainly with the scheme of using r.f. for he high tension supply of a c.r.o. and although a circuit is given, the leaflet does not give full constructional details of the instrument. The demand for the leaflet has been so heavy, however, that steps are being taken to prepare an article on the construction of a c.r.o. of this type and it may appear in an early issue of Radio World.

K.L.H. (Toowoomba) enquires about an amplifier contest held in Brisbane recently.

A.—Yes, we heard about this contest, which was won by an amplifier featuring cathode coupling. It sounds most interesting and we are hoping to get the circuit to run in next month's issue. Our experiences with cathode coupling were not a hundred per cent., but it would appear that this winning amplifier must have been something out of the box. We are just as interested in it as you are, so you can rest assured that if we can get hold of the circuit we will publish it as soon as possible.

* * *

S.P. (Neutral Bay) enquires about a certain brand of English pick-up which gives outstanding fidelity, yet has enough voltage output to be used without pre-amplifiers.

A.—Yes, we have heard about this pick-up and the most excellent reports about its performance. We also happen to know of a firm which has a dozen samples arriving any day now and we have earmarked them for our own readers. The price has not been worked out yet, but will be about half the price of other pick-ups of similar capabilities. If you want one, drop a line for further particulars. Other readers also please note.

BARGAIN CORNER

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

FOR SALE. Motor Generator sets, 12, 14, 18, 28 volt input, 240, 450, 1,500, 2,200 volt output. Write for full details. C. Patterson, 211 Main St., Peterborough, South Aust.

FOR SALE. Torpedo microphone with stand and attachments, never used. Phone FA2832 or write. J. Shoppee, 8 Wyldefel Gardens, Potts Point, Sydney.

FOR SALE. Two Ferranti audio transformers, type AF5CC. What offers? MacLean, 4 Monroe St., Napier, N.Z.

WANTED, in any condition, a copy of "Radio-craft" (American) for July, 1940. C. Werndly, Langley St., Bayswater, West Aust.

FOR SALE. FS6 vibrator unit, unused, complete with leads and spare vibrator. £4/15/-. G. Keating, Pyke St., Woodend, Vic.

WANTED. Information regarding valves, capacities of tuning condensers, i.f. frequency, etc., of wireless set No. 108, Mk 111, ZAA 1088. Also base connections and data on VR66 pentode. K. Harding, 42 Spring St., Lismore, N.S.W.

FOR SALE. Velco CR50 oscilloscope. £85. Bendix frequency meter. £25. Perfect condition, etc. J. W. Nairn, 22 McLean St., Morwell, Vic.

WANTED. Garrard pick-up type E magnetic, also AR7 receiver. Particulars to R. V. Francis, Narracoorte, South Aust.

WANTED. One copy of "Radio & Hobbies," volume 2, No. 9. W. G. Sargent, 11 Barkley St., Camperdown, Vic.

RED LINE

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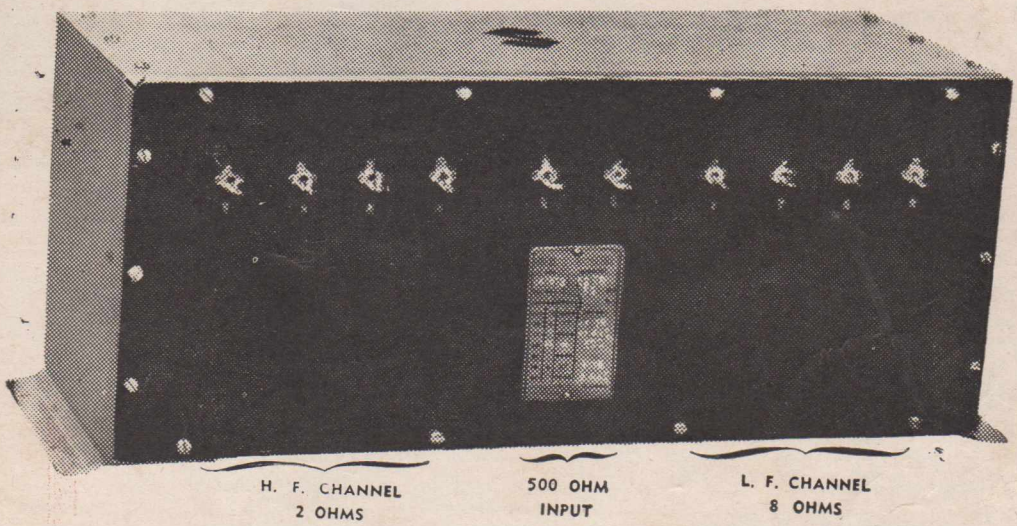
FREQUENCY DIVIDING NETWORKS



GENERAL

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Weight: 18 lbs. **Size: 13 x 5½ x 5.**

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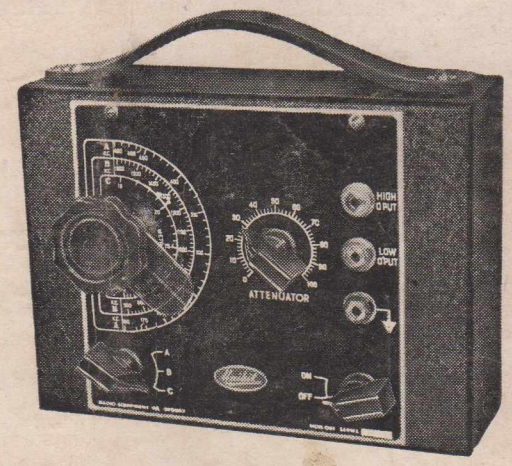

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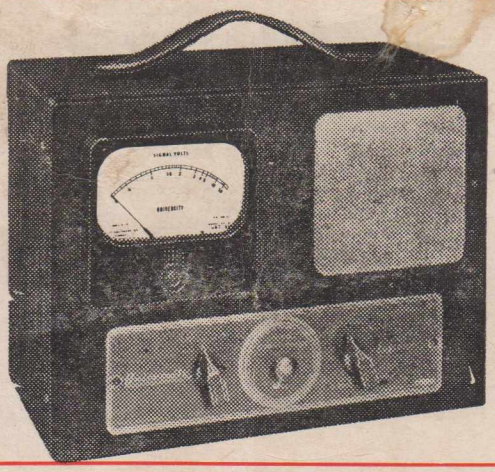

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