THE AUSTRALASIAN

Radio World

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VOL. 7 ..... NO. 4 SEPTEMBER 15 1942

"VICTORY SET" uses only valves and components readily available

Further interesting circuit novelties and suggestions by Straede

Theory of behaviour of alternating current in fixed condensers

Shortwave reception review and loggings of the month

Price 1/-

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Vol. 7 **SEPTEMBER, 1942** **No. 4**

CONTENTS

EDITORIAL

We hear plenty about the problems which experimenters and radio mechanics have to face on account of the difficulty in obtaining component parts. Yet when we go into the matter fully we find that the position is not nearly as bad as it might be. We proved beyond a shadow of doubt that it is still possible to walk into almost any good radio warehouse and purchase a complete kit of parts for the construction of a serviceable receiver, as mentioned elsewhere in the description of this particular set. Things are bad, but after all, not nearly as bad as in New Zealand, for example, where the construction of radio receivers is totally prohibited.

At the moment of writing there is talk of the new austerity campaign and we wouldn't be greatly surprised if this austerity plan embraced similar legislation to that already in force in New Zealand. Even if this does come about, the position is not hopeless, as the authorities fully appreciate the value of the broadcast receiver and, doubtless, arrangements will be made which will ensure adequate component parts being made available for the maintenance of the million and a half receivers at present in use.

So long as these components are available it would appear that the wide-awake experimenter will find plenty of scope for employing his energies most usefully. Even if the manufacture of sets is totally prohibited he will be able to make a dandy job of taking an old-time chassis to bits and rebuilding it with a modern coil kit and other components to make it into a really effective set.

Your BEST Guarantee of QUALITY . . .

set constructor of to-day cannot afford to use Coil Kits and Components that do not measure up to the highest standards of quality. By insisting on R.C.S. Trolitul Coils and Dials, therefore, he not only secures the finset precision-built radio components available, but safeguards himself against unnecessary future replacements . . .

R.C.S.

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TROLITUL
COILS

R.C.S. TROLITUL BROADCAST COILS

These coils are available in both Air Core and Permeability tuned types. The latter are adjusted to ensure maximum efficiency in our laboratories.

AIR CORE "H" GANG

E342	Aerial	6/6
E343	R.F.	6/6
E344	Osc.	6/6

PERM. TUNED "H" GANG

E345	Aerial	8/6
E346	R.F.	8/6
E347	Osc.	8/6

T.R.F. TYPE-AIR CORE

T88	Aerial	6/6
T89	R.F.	6/6
T87	R.F. with reaction	6/6
T81	Reinartz	6/6

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Long experience in the production of highly efficient transformers, combined with extensive research into raw materials and design, has resulted in the production of an audio transformer of excellent performance and complete reliability.

Cat. No.		Retail Price
TA1	Audio Choke, bakelite case	18/6
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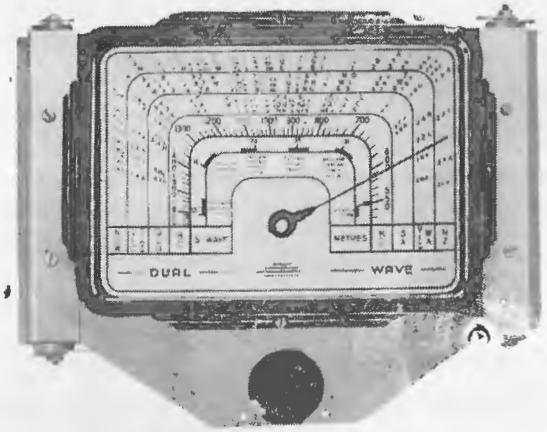
TB6—"B" Class

TB6	Input "B" Class, bakelite case	18/6
TB35	"A" Class High Fidelity, steel case	67/7
TB36	"B" Class Input High Fidelity, steel case	67/6
TB37	""AB" Class, bakelite	28/6



R.C.S. DIALS

Types DA1 and DA2 are single glass dual-wave, the type DA2 having been designed especially for use with the Five-Band Communications Coil Kit and "H" type condenser. Type DA1 is a standard dual-wave dial for use with R.C.S. coils and "F" type condenser. The DA-5 dial is for use on the 1600 to 550 k.c. and 13.7 to 40 metre bands, with "H" type condenser. All this series is edge-lit and wedge-driven. Aperture for the escutcheon is approximately 7" x 4-7/8."

DA1—Standard D/W Dial, "F" condenser	22/6
DA2—Communications Dial	22/6
DA-5—13.7 to 40 metres D/W condenser	22/6
DA-6 Mantel Set Dial, D/W "H" gang	18/9
DA-7 Portable Kit Dial D/W "H" gang	9/-
DA-8 Same as DA-7 but ready ossembled	13/6

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The new R.C.S. permeability tuned I.F.'s are wound on special Trolitul formers into which are inserted the adjustable iron cores. These R.C.S. permeability-tuned I.F.'s are the most dependable and efficient I.F.'s it is possible to produce. They should be used whenever the optimum in results is required.

When three I.F.'s are used:

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IF164 2nd 13/9
IF163 3rd .. 13/9
465 K.C. I.F.'s
IF166 1st 7/6
IF167 2nd .. 7/6
Air Core 175 K.C.
1E68 1st 7/6
1E69 2nd 7/6
IF162
465 K.C. I.F.'s

When two I.F.'s are used:
IF162 1st .. 13/9
IF163 2nd 13/9

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THE "VICTORY SET"

DESIGNED TO USE ONLY THOSE COMPONENTS READILY AVAILABLE

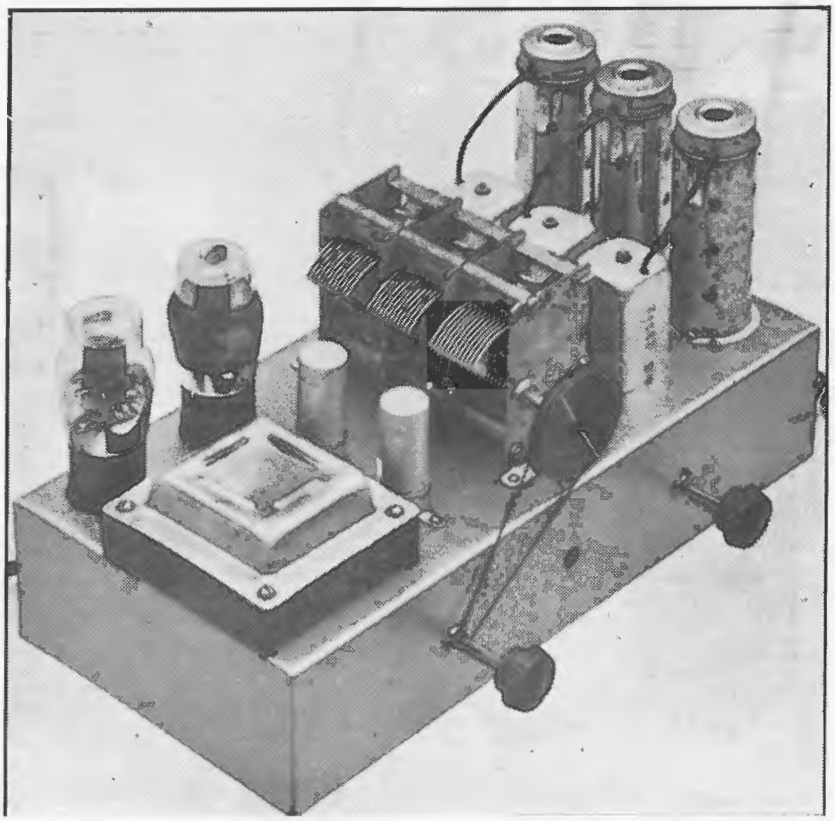
THEY say that the new "Victory" sets are not proving popular, so it might be said that our choice of a name for our feature set in this issue is anything but diplomatic. Yet we stick to the title, for it explains the purpose of the article. We cover the design of a set which has been evolved to use the component parts which are still readily available on the open market. Quite a few items are hard to get in these difficult times

By

A. G. HULL

but by a bit of careful planning we are able to give a circuit for an effective set, for which you should be able to get a complete kit of parts without any undue difficulty.

We do not advance the circuit as representing the last word in efficiency or performance. Gone are those days. But even as the "Victory" suit can be expected to keep you warm, so the "Victory"' set will give you the news and the programmes in a completely satisfactory manner.



A general view of the finished chassis. Any desired style of dial can be substituted.

PARTS LIST

1—Base, size 14x7x3.
1—Power transformer 80 ma. at 385v, with 6.3 filament.
1—3-gang tuning condenser.
1—Dial to suit (Radiokes, R.C.S., Crown).
3—Coils (1 aerial, 2 r.f. — R.C.S., Crown, Radiokes).
1—10,000 ohm potentiometer (R.C.S., Radiokes).

Resistors.

1—10,000 ohm 1-watt (I.R.C.).
2—50,000 ohm 1-watt (I.R.C.).
2—100,00 ohm 1-watt (I.R.C.).
1—250,000 ohm 1-watt (I.R.C.).
2—500,000 ohm 1-watt (I.R.C.).
1—1 megohm (I.R.C.).

Condensers

2—8 mfd. 500v electrolytics, can type (T.C.C.).
1—8 mfd. 500v or 600v tubular type (T.C.C.).
3—.5 mfd. tubular 400v (T.C.C.).
3—.1 mfd. tubular 400v (T.C.C.).
1—.05 mfd. tubular 400v (T.C.C.).
1—.005 mfd. mica condenser (T.C.C.).
1—.001 mfd. mica condenser

Sundries

6 sockets (4-octal, 2-UX), 3 valve cans, hook-up wire, screws and nuts, power flex, solder lugs, 3-bank terminal strip, etc., etc.

Valves

2—6K7G or 6U7G (Mullard, Radiotron).
1—6J7G (Mullard, Radiotron).
1—6F6G (Mullard, Radiotron).
1—80 (Mullard, Radiotron).

Speaker

Suitable size, with field coil of 2,000 ohms and input load of 7,000 ohms.

Walking into Melbourne's leading radio warehouse (Magrath's), we made a thorough enquiry into the position of components and valves, and their availability, and soon found that it was not going to be easy to design a job to embrace these parts only. For example, converter valves of all types seem to be most difficult to obtain, and so we were faced with the alternative of either using tuned radio frequency, or else going back to the old autodyne type of converter. The old autodynes were splendid performers when going properly, but nasty snags when giving service troubles. A little humidity in the oscillator coil and the autodyne becomes a first-class headache. So we plumped for the good old t.r.f. set, which may not have extreme range or selectivity, but can be depended upon to bring through all the local stations with the utmost in fidelity and without any delicate adjustment or alignment.

The Output Valve

To obtain output valves is also

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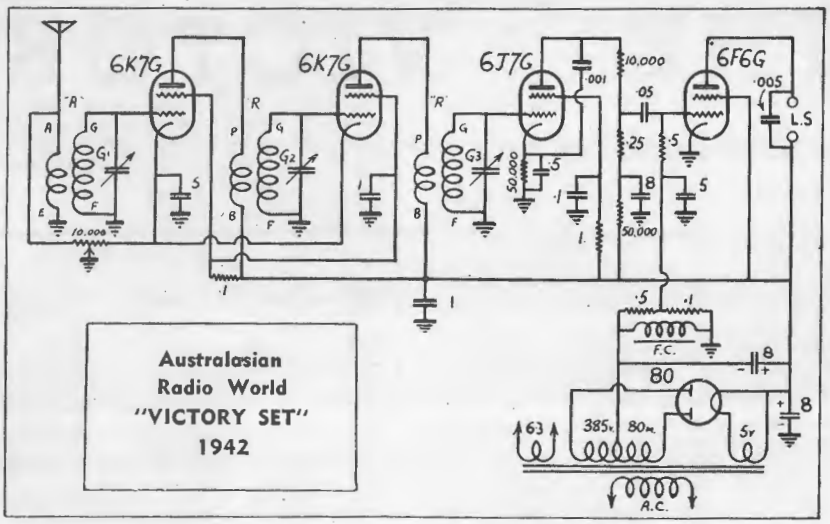


Australasian Radio World "VICTORY SET" 1942

VICTORY SET

(Continued from page 5)

rather a problem at the moment, but apparently there are heavy stocks of the 6F6G pentode still available, also of the 80 rectifier, so we decided on these. Theoretically, the 6F6 pentode is not capable of handling the same power output as the 6V6G beam power valve, nor is it so sensitive. But in practice it is found that the difference is not so marked, and it would be quite impossible to tell the difference by ear. Maybe the explanation can be found in the matter of distortion, as the 6V6G has a heavy distortion content at anywhere near its rated power output, unless inverse feedback is applied, and the application of feedbacks knocks back some of the valve's rated sensitivity, so that it really doesn't have much over the 6F6G.

Wire Wound Resistors

Another interesting feature of the design which was made necessary by the circumstances, is the entire absence of wire wound resistors, not even one of these resistors being used in the whole circuit. To solve this problem and yet provide proper bias for the output valve was quite a difficulty until we ran across some old American circuits of many years ago. In those days the Yanks were keen on economy, as their particular problem was to make a set to sell for about ten dollars complete. One of their economy dodges was to put a couple of grid-leak type resistors to form a voltage divider across the field coil, thereby picking off a portion of the voltage developed across the field coil resistance by its energising current. By placing the field coil in the earth return of the power transformer secondary, it became possible to make this a negative voltage suitable to be applied direct to the grid of the output valve and thereby give it correct bias. And so we have applied the scheme to this set, eliminating the need for a wire wound bias resistor, yet still retaining maximum efficiency.

The field coil can still be used as the main high-tension filter, and hum is thoroughly dealt with in this circuit, just as though the field coil was in the more conventional position in the main high-tension lead. In fact, with this circuit it becomes possible to apply a single tubular condenser to the junction of the two resistors across the field coil, thereby obtaining a sort of de-coupling effect and bringing the hum level to an espec-

WITH WHAT?

I was engaged in putting certain of the soldiery through what is known as a Trade Test. What this boils down to is that if they pass they are entitled to additional pay as adepts in their own line. To one Scotsman who came before me I showed an accumulator.

"What," I asked, "would you do if this had been subject to a high temperature and part of the electrolyte had evaporated?"

"Top it up, sir."

"Yes, with what?"

"With diluted water, sir."

I couldn't help asking whether in Calendonia stern and wild they diluted their water with whisky!

—"Wireless World," England.

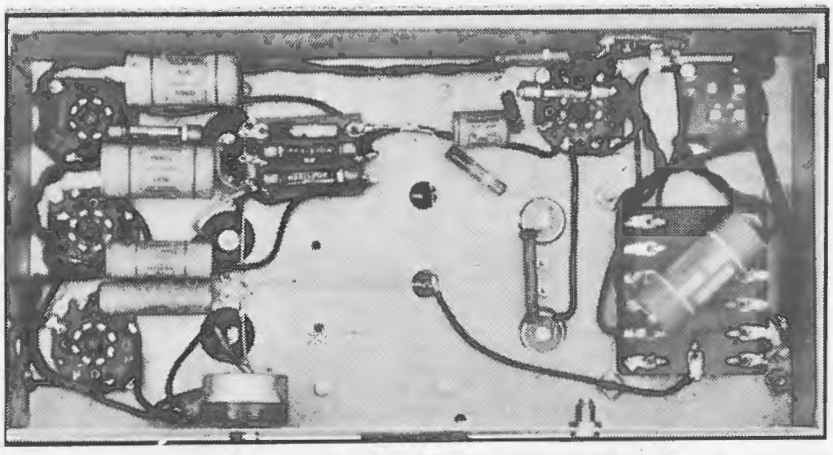
lally low level. Really, this condenser is by no means essential and could be classed as an optional fitting.

Circuit Design

Otherwise the circuit design is more or less conventional, with series feed for the screens, the two r.f screens being tied together and fed through a resistor of 100,000 ohms, while the detector screen is fed through a 1 megohm resistor. This gives a low screen voltage, which cuts down the plate current and brings the operation of the valve down on to a sharply curved portion of its characteristics, making it an excellent anode-bend detector, giving ample power, low distortion and also minimum loading on the tuned stage ahead of it, thereby making the most of the selectivity available from the three tuned circuits. A fairly high value of bias resistor is found necessary to give proper bias with this low plate current.

Options

The circuit is quite flexible and there are quite a few options available. For example, the 10,000 ohm resistor in the plate circuit of the detector is purely a stopper for r.f. and takes the place of the usual r.f. choke. Chokes may be hard to obtain, but on the other hand you may happen to have one on hand, in which case the choke can be substituted.



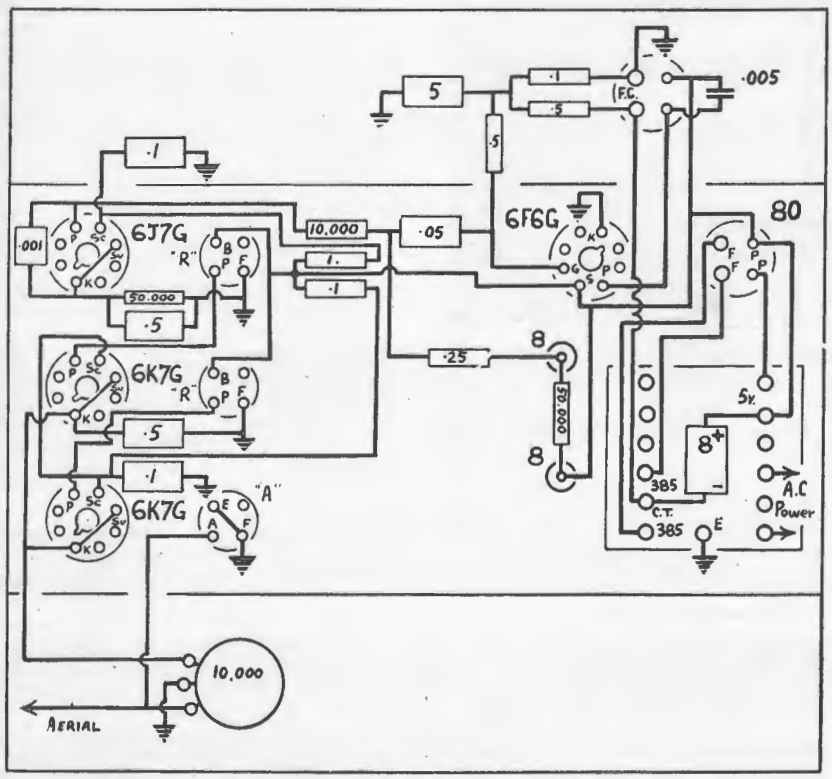
Photograph of the wiring of the original chassis.

The value of the plate by-pass condenser of the detector is a matter for individual taste, a smaller capacity allowing a better high note response, with a tendency towards instability if the value is too low. The value shown on the circuit diagram seems about right to us, as the fairly broad selectivity of the r.f. stages allows a strong high note response and some of this can be afforded with a view to getting the maximum stability. Somewhat similar is the case of the .005 mfd. condenser across the speaker. This can be omitted completely to give a fine high note response, or, on the other hand, it can be increased to .01 or even .02 mfd. if you prefer a more "mellow" tone. In cases of instability a condenser should be tried, but with many sets sufficient stability will be obtained without a condenser at all.

Instability

Speaking of instability may confuse some readers unless we go deeper into this point. With modern superhets the matter of instability is far more complex, yet not so difficult, as with a t.r.f. set. Superhets develop whistles and there may be a dozen different possibilities as to the cause, but with a t.r.f. when the set breaks into a whistle or a squeal, it is almost certain to indicate instability in the r.f. stages. A scrap of r.f. is amplified and then sneaks back into the preceding stage to be re-amplified, thereby "chasing its own tail", until it builds up to a squeal. The use of cans over the coils and valves and shielding plates between the sections of the gang condenser are all steps which tend to stop the amplified r.f. energy from sneaking back, but the layout of the wiring, especially regarding the relative positions of grid and plate leads is still important.

On the other hand, complete stability would not be efficient, as a little bit of feedback can be a great assistance to increasing the overall gain, and therefore the sensitivity of the set. This is especially required at the low frequency end of the dial. At the high frequency end the signals are nippier and they sneak back more readily. It is often found that a t.r.f. set will be completely unstable at the high frequency end of the dial, yet completely stable, in fact, lacking in sensitivity, at the other end.



By comparing this diagram with the photograph above you should have little trouble in following the lay-out and wiring.

(Continued on next page)

VICTORY SET

(Continued from page 7)

To offset this effect a little capacity coupling introduced to assist the normal inductive coupling of the r.f. transformers may be found helpful. This may take the form of having long leads to the grid caps of the valves, and bringing these leads close together so that they have capacity between them. Likewise, in the actual coils it is possible to take a wire from the P terminal, leaving it open-ended, but wrapping it around the outside of the grid end of the coil, thereby creating a capacity for coupling the plate and grid circuits.

Volume Control

In our circuit we do not show any normal bias resistor for the r.f. valves, the volume control operating in practice as a stability control as well as a volume control. Advancing the volume control, the set becomes more and more sensitive until the last fraction of range is obtained just before the set bursts into a squeal. Naturally, the set will not be operated in this condition and the volume control will be retarded to the best operating position. This allows the last microvolt of sensitivity to be obtained.

The Base

The first step in the assembly is to select a suitable base. Gone are the days when you could order a special base by drawing out a sketch on a piece of paper and then collecting the chassis in a few hours time. Fortunately, however, most radio shops have a good assortment of stock bases, and you should find little difficulty in getting a suitable one for this set.

The Coils

For our set we used coils of superhet design, using the standard aerial coil and two of the standard r.f. transformers with iron cores. These were most efficient, the only minor point being a little attention which is necessary to wiring to make them ideally suitable for a t.r.f. set. This consists of bringing the grid lead out through the top of the can for the cap of the valve, and also bringing out a second grid wire through the side of the can to run across to the fixed plate terminals of the gang condenser. This change in the wiring makes it possible to keep all the grid wiring above the base, thereby "insulating" it from the main wiring on the underside of the base. This is highly desirable in the interests of stability.

Assembly

When assembling the original chassis we proceeded along our usual

routine, which consists of mounting first the power transformer, then the valve sockets, taking care to put the filament terminals in the right direction, and to mount the bases of the valve cans under the holding down screws.

The filament wiring can then be carried out with twisted wires, the speaker socket wiring finished off and also the screens and cathodes hitched up.

Then the volume control and electrolytic condensers are fitted and wired up.

BELIEVE IT OR NOT

A human radio daily walks the streets of Chicago, U.S.A. This freak of the twentieth century had a well-known radio station always in his hearing, but from whence it came he knew not.

In desperation, he communicated with the radio management and told them what was happening. They sent along a star reporter to check up.

The reporter met John the radio freak and took him out in his car. Well away from any mechanical contrivances and at a given moment the human freak was asked, "What is your station playing now?" and he answered correctly, as was proved when the reporter tuned in the car radio as a check. The tests were conducted eight times without a failure. Scientists next took a hand, and the answer was found by accident. The victim's teeth were worrying him and he took them out. Then the music stopped, and on examination, it was found that while working in a carborundum factory particles had formed a sort of crystal set. Since changing his teeth he has not been troubled. Now he changes back when he wants the news without disturbing the household, and the mystery is no more.

Next the coils are fitted and wired and the several small components soldered into positions with their wiring. Two points might be noted. First that there are two types of electrolyics used, two having their cans earthed and mounted in the chassis, whilst the other is of the tubular type and is mounted directly across the power transformer terminal board, its negative terminal going to the centre tapping of the transformer secondary, but not to earth. The other point to mention is the great assistance which is obtained if a three bank terminal strip can be obtained to carry three resistors up near the detector socket. All other resistors and condenser can be arranged to hang on their own pigtails, but a strip at this position will strengthen up the wiring rigidity quite a bit.

Alignment

Alignment is carried out by adjusting the iron-core slugs in the coils, or by fitting small trimmer condensers to the gang sections and adjusting them individually to give maximum performance as required. Adjustment is not nearly as critical, or complex, as with a superhet and almost any station will serve for alignment purposes. Actually the aerial circuit may tend to run out of alignment on account of the loading effect of the aerial, but this is not critical, especially if the aerial itself is of moderate length.

Performance

Properly built and adjusted, this set should have ample range and selectivity for all normal requirements. In the suburbs of the capital cities it should bring in all the local stations without overlap and with good tone and plenty of power. A few of the Interstate stations should also be possible, the selectivity being the limiting factor and permitting those out in the clear to come through well, even if a few of the others are obscured by the spread of the locals.

DEATH *before* DISHONOR!

Observation of the stress points on glass bead seals around vacuum valves leads is made with this device. Close-up photo above shows the actual view of a faulty lead. Note the change in polarized light creating distorted shadows which show up stress and strain in beads. Such strain sometimes occurs where metal and glass are sealed together.

Casual observation of a vacuum valve does not reveal its flaws. That's why Eimac engineers have developed many devices for the purpose of exposing even slight weaknesses in construction. The above is not a dungeon window, but a close-up photo of a faulty bead on a filament stem as viewed through a special bead testing device. Needless to say, this stem will never reach final assembly... better "death before dishonor" to the Eimac tradition of dependability.

Such care in production plus constant research into the phenomenon of the electron valve assures you of the utmost in performance from every Eimac valve ... provides the answer to why Eimac valves are first choice by most of the leading engineers throughout the world.

Export Agents:
FRAZAR & CO., LTD., 301 Clay St.
San Francisco, California, U. S. A.

Inspecting the entire glass bulb with the help of a polarized light. This device shows up stress and strain on the glass which might be created during the shaping operations.

Follow the leaders to

Eimac VALVES

Mfg. by Eitel-McCullough, Inc., San Bruno, California, U. S. A.

GREAT NEWS . . . FOR ENTHUSIASTS

★ Formation of Amplifier Circle

THE reproduction of recorded music with the highest fidelity is a basis for an interesting hobby, and one which is followed by a large number of our readers.

Originating in Melbourne, but equally applicable to Sydney, is the idea of an amplifier "circle", so that ideas can be exchanged and different amplifiers heard under best conditions.

Outline of the Scheme

A better idea of what we mean by a circle may be gauged from the rough outline of the scheme in operation. A dozen enthusiasts, each having his own ideal amplifier, get together and put aside one night per week to go visiting. They take it in turn to play host to the other eleven members. After the visit each member makes out a report of his impressions, and these, together with the circuit and full description of the amplifier are the subject matter for an article to appear in the following issue of "Australasian Radio World." By this means every reader can share in the benefits of the circle, although the actual membership of the inner circle will have to be limited to a convenient number to be entertained in the average home.

How to Join

If you want to be a member of the inner circle, write immediately to A. G. Hull, at 117 Reservoir Street, Sydney, if you live in Sydney or at 187 Berkeley Street, Carlton, if you live in Melbourne. In each case the first dozen applications received will be considered as forming the inner circle, and members notified accordingly of further appointments.

Send Us Details

When sending in your application, be sure to give a few details of your own amplifier, and state which night in the week is likely to be most suitable to go visiting.

Zoning, if Necessary

Such is the outline of the scheme, but its possibilities are immense. For example, if sufficient applications are forthcoming it may be possible to zone each city into three or four zones, each eventually selecting a representative to compete in an amplifier championship.

Other States, Too

Likewise, in other States, it may be possible to get together sufficient enthusiasts in each capital city to form a circle; in fact, there may be many other towns capable of furnishing a circle of their own, even if of only half-a-dozen members. In all cases those interested, can count on "Australasian Radio World" to put ample space at their disposal for notices of meetings, for the formation of these circles. If interested, be sure to drop us a line, no matter where you live.

Foundation Members

Originators of the scheme in Melbourne and, naturally, foundation members of the "Inner Circle", are two most keen amplifier enthusiasts, one a "big noise" in munitions, who lives at Toorak and operates a truly remarkable outfit, and the other a dentist from Camberwell who listens to twenty watts of music to soothe his nerves after listening to the many watts of yells from his "painless" patients!

Don't Delay

It seems a scheme with plenty of promise to us and so we want to see it on the move as quickly as possible, so drop along your applications right away.

THE AMPLIFIER CIRCLE

Application for Membership to the Inner Circle

I operate an amplifier which I would be pleased to demonstrate to others who are interested. I would also like to hear other amplifiers which are considered by their owners to be good.

My most suitable evening for visiting would be .....

Name .....

Address .....

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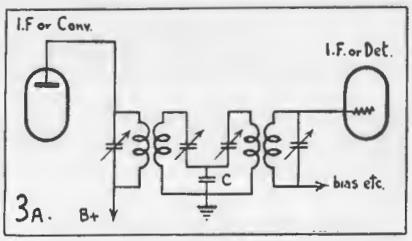
FRESH IDEAS IN CIRCUITS—No. 3

This month:

a. Band-pass I.F.
b. Aperiodic R.F. with A.V.C.
c. Hi-cut output filter.
d. Push-pull system.

Band-pass I.F.

Many superhets have poor tonal quality due to the "cutting of side-bands." The higher audio-frequencies might be 12 or 14 d.c. down.This can be eliminated in three way: reducing the selectivity by shunting the I.F. coils with resistors (say, .1 megohm), staggering the tuning of the I.F.'s, or by using a band-pass I.F. system. The latter can also be used to increase the selectivity. The coupling unit is formed from two No. 2 intermediates. The leads from two of the coils to their trimmers are broken and are connected to "earth" via a good quality condenser, the capacity of which determines the degree of selectivity and the band width. The value of is not at all critical. From .005 to .02 microfarad is suitable for a "hi-fi" receiver and .05 to .25 microfarad for a short-wave, or dual-wave receiver. To make alignment easier,



Circuit for Band-pass I.F. Channel.

shunt the coupling condensers by a .5 microfarad condenser while aligning the two I.F. transformers in the band-pass unit. The leads to the coupling condenser and from the coupling condenser to the chassis must be short.

This band-pass I.F. is also ideally suitable for application to sets such as "My Own," and "Local Tone Four," which do not have an I.F. valve.

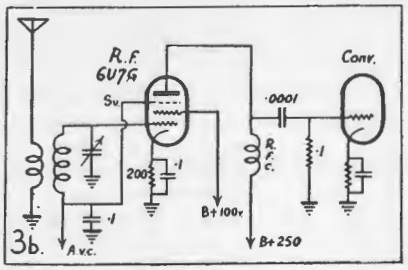
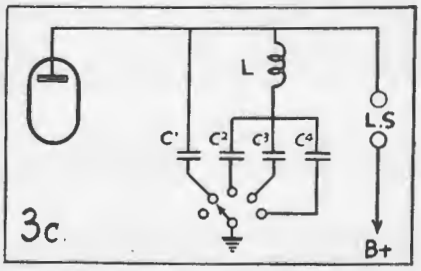


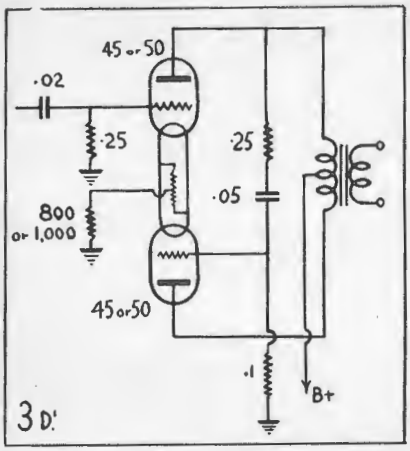
Diagram showing use of untuned r.f. stage.

Aperiodic R.F. with A.V.C.

Short-wave receivers with pentagrid converters are liable to frequency variation and flutter, if an A.V.C. voltage is applied to the converter. If it is not applied, the A.V.C. action may not be sufficient. To overcome these difficulties, an aperiodic (untuned) R.F. stage may be placed



Adjustable tone control for scratch.



Self-contained push-pull circuit.

ahead of the converter and A.V.C. can be applied to this. The R.F. stage also provides a little extra gain if carefully laid out, besides further isolating the oscillator from the aerial. To obtain the maximum A.V.C. effect the suppressor grid of the R.F. voltage valve is connected to the A.V.C. line.

By —

JOHN W. STRAEDE

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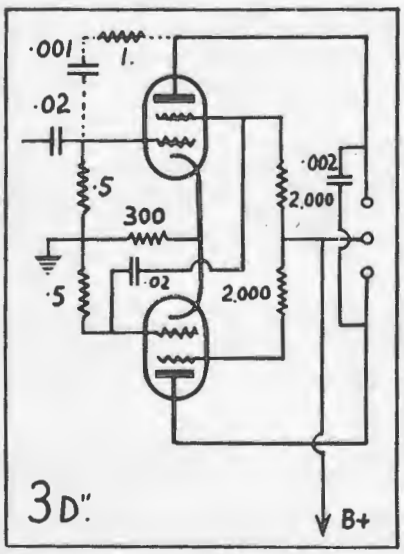
Hi-cut Output Filter

It is frequently desirable to eliminate the higher audio-frequencies. In gramophone record reproduction, scratch is less troublesome if the extreme highs are reduced. In reception



The circuit for use with beam power valves.

(Continued on next page)

CIRCUIT IDEAS

(Continued from page 13)

by a real high-fidelity receiver, the 10 k.c., whistle from two stations may require eliminating. Chopping the "highs" also renders the hiss from a carbon mike less noticeable. Usually the highs are reduced by a condenser from the anode of one valve to the chassis, but this is not very satisfactory, as the not-so-high highs are reduced as well. To obtain a sharper cut-off, to remove the extreme highs without attenuating the less-extreme highs, a tuned filter is necessary. In the circuit an inductance and condensers are connected in series to form an absorption filter. To obtain a number of different cut-off frequencies, the resonant frequency of the filter is varied by changing the capacity of the condenser. The same switch also has positions for "full-range" and for a conventional type of high-cut. Instructions were given in an earlier copy of "Radio World" for winding an inductance, or one can be made from the primary of a speaker transformer by removing the laminations until the cored inductance is obtained.

Values of condensers should be as follows: C1 = .02 mfd. C2 = .005 mfd., C3 = ,001 mfd., and C4 = .0025 mfd. The inductance should be about 1 henry.

Push-Pull System

The two output valves of a push-pull circuit require signal voltages that are in anti-phase, or exactly out of step with one another.

These voltages may be obtained from a single voltage by a push-pull transformer, a centre-tapped choke, a phase converting valve, or phase-splitting valve. The first two systems are liable to introduce hum and are expensive if good quality is desired. The latter two require an extra valve. In the circuit shown, the cost of an extra valve is avoided by making one of the output valves do double duty. The signal voltage for the second output valve is obtained from the anode or screen grid of the first. The circuits are not extremely critical. Oscillation in the triode circuit is usually due to too much excitation for the second valve and is reduced by decreasing the size of its grid resistor. The bias resistor which is common to both tubes has a self-balancing effect and should not be by-passed. The tetrode circuit is not at all critical and the same values will do for both pentodes, such as the 6F6G and for beam tubes like the 6V6G. Even the same bias resistor and speaker transformer are suitable. Inverse feedback can be added, as shown in the diagram by a broken line, by connecting the grid and anode **of the first valve only** by a condenser and resistor.

Next month's "Ideas in Circuits" will include: Reflex with double-acting volume control; A.V.C. circuit; novel SG-voltage idea and a Tone Control.

Mr. Straede will be pleased to answer any enquiries, providing they are made by letter, and a stamped addressed envelope is enclosed. Enquiries will **not** be answered by phone.

AMERICAN PRODUCTION

The order prohibiting American manufacturers from producing civilian receivers after April 22, included a proviso which permits the completion of receivers on which production had started prior to that date. The total value of the materials (excluding cost of wooden cabinets) to be used on these receivers by each manufacturer must not exceed $500.

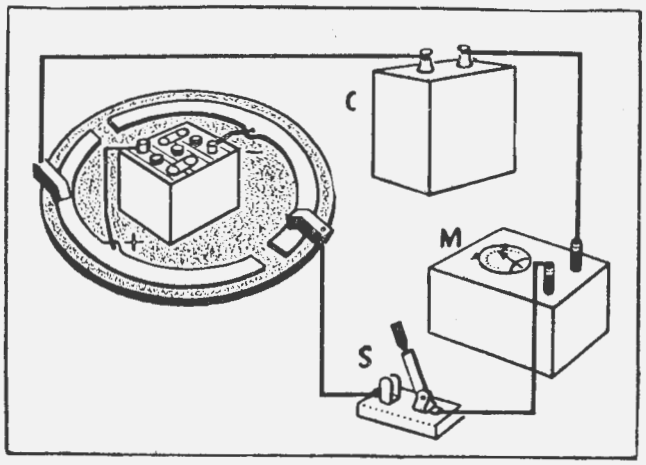
Some idea of the immensity of the task being undertaken by the mobilised American radio and telephone industry in war production is given by the announcement of the War Production Board that production of communications equipment is expected to exceed $125,000,000 worth this year.

The output of valves alone is expected to total $90,000,000 worth, compared with $11,000,000 in 1941.

RADIO STEP BY STEP — Part 6.

ALTERNATING CURRENT AND THE FIXED CONDENSER

It is vitally important that the beginner in radio should have a clear understanding of the way a fixed condenser behaves towards A.C., and so this instalment will be devoted to a detailed explanation of this point.



This circuit, which is explained in the article below, illustrates the behaviour of a condenser towards alternating currents.

"I am following your series of articles for beginners with great interest, and so far have understood everything except one thing—I cannot grasp how an alternating current can pass through a condenser. There is no connection between the condenser plates, and yet a current flows. Could you explain this a little more fully?"—So writes Mr. C. E. South, a "Radio World" reader in Newcastle. The point he raises is often a stumbling block for newcomers to radio, and so this month's instalment will be devoted to explaining it more fully.

In the last instalment it was shown how a battery, providing direct current, charges a condenser, the amount of charge depending on the condenser's capacity, and the voltage of the battery.

An Interesting Experiment

The sketch on this page shows a meter M, condenser C and switch S, all connected in series with a battery mounted on a gramophone turntable provided with two semi-circular contact plates. Contact is made from these to the rest of the circuit through two brushes bearing on the contact plates.

If the switch is now closed, with the turntable motionless, a momentary current will flow, charging the condensers in the way explained in the July "Radio World."

If the switch is kept closed and the turntable rotated through half a revolution, the battery will be put into circuit with its polarity reversed. The result of this reversal is that the negative pole of the battery is now connected to that terminal of the condenser which, owing to the charge acquired before the turntable was moved, is positive, the positive terminal of the battery being simultaneously connected to the negative terminal of the condenser.

Double Current Now Flows

The tendency of the condenser to discharge is now assisted by the battery, and thus a double quantity of electricity flows, being made up of the discharge current of the condenser, immediately followed by a charging current charging it the other way round. This double current will flow afresh every time the turntable is rotated far enough to reverse the direction of the battery connections.

Next, suppose the turntable to be set spinning by its motor at such a rate that the momentary current has not quite ceased before the connections are reversed. The meter will then show a deflection all the time, the needle moving first to the right and then to the left as the direction of the current in the circuit changes.

If the meter is now replaced by one of a type that always deflects in the same direction, no matter which way the current is flowing, and the turntable spun so fast that the meter needle cannot flicker fast enough to keep up with the rise and fall of the current, we shall have visible evidence of a current flowing, apparently continuously, in a circuit that is broken by the insulating material between the two sets of plates in the condenser.

But we know, from the way we have had to run together a series of momentary impulses flowing in opposite directions, that current is not really flowing through the condenser, but is passing in and out of it so continuously that the net effect, taken over any appreciable period of time, is practically the same as though the insulating material were allowing quite a heavy current to pass. In practice, the effect is as if the condenser were replaced by a resistor equal in value to the reactance of the condenser at the frequency of the "a.c." supplied by the turntable.

A Practical Proof

A practical proof that a.c. will pass "through" a condenser can be obtained by connecting a condenser of large capacity (4 mfd., for example) in series with, say, a 40-watt lamp across the a.c. mains. The lamp will light, though not at full brilliance. With a 2 mfd. condenser the light will not be as bright, while with a 1 mfd. condenser it will be dimmer still.

Thus we now know that a condenser will permit a.c. to pass through it, and that its opposition to the flow is less the greater the capacity of the condenser.

The amount of alternating current that a condenser will pass is also directly dependent on the frequency, which will be illustrated by a further reference to the sketch.

The Effect of Frequency

Suppose the turntable were to revolve very slowly — making, say, one revolution every 20 seconds. Every 10 seconds there would be a momentary passage of current, but there would be long gaps between eash pulse and the next. The average current, taken over the whole time, would be minutely small, because for most of the time no current at all would be passing.

Now imagine the turntable speeded up to standard gramophone speed, 78 revolutions a minute, or about 1¼ turns every second. Clearly, current will now be flowing for a much greater proportion of the total time, and the average current will therefore be greater.

But, in imaginttion if not in fact,

Continued on page 23)

HOW TO MAKE A METAL CHASSIS

THERE is no doubt that a neat metal chassis enhances the appearance of a radio set. Indeed, for the larger sets nothing else is considered, although this was not the case in the early days of radio. This article is intended primarily for those who are more or less beginners in the art of assembling radio sets, and are now ambitious to try their hand at something a little more advanced. Those who are accustomed to using metal chassis will find that they can effect a considerable saving by making their own, besides getting exactly what they want instead of having to adapt the nearest available.

To simplify the making as much as possible, the chassis described has the top, front and back made of metal while the sides are made of wood. This method of construction is much easier than making the sides of metal and provides a sturdy, rigid chassis of pleasing appearance.

Tools Necessary

Most hobbyists possess a few tools, probably all that are necessary for the work in hand, and it should not be thought that if you do not happen to have the tool mentioned, and do not wish to purchase it, that you cannot carry on. Usually there are several ways of doing a particular job, all of which will achieve the same result. Some are easier than others—that's all. The following tools are needed for the work in metal: A scriber for scratching ("scribing" is the correct term) lines on the metal. You haven't one? Well, how about a pointed brad-awl, the sharpened tang of a small file or a sharpened steel knitting needle? A centre punch for marking the holes to be drilled. It is essential that a good deep punch mark be made so that the drill point will start in the correct place. A brace or hand-drill, set of small drills, small cold chisel, smooth cut half-round file, and engineer's vice complete the list.

Now to make our chassis:—

Step 1.—Collect all the components for your set and arrange them on a piece of paper in the position they are to occupy on the chassis. In doing this try to keep the tuning section of the set separate from the amplifying section, visualising the position of the wires in order that the components may be so placed that the wiring will be as short as possible. If compactness is your aim, be careful that the moving condenser blades do not foul any other part as they are being turned out. Measure the outside dimensions of your lay-out.

Step 2.—Remove the parts and draw the shape of your chassis on the paper. Allow ⅜-in. each side for the thickness of the wooden sides. The depth of the chassis should be about 2½-in., as this is sufficient to allow the mounting of a midget condenser underneath.

Step 3.—Place all the parts on the paper, in their proper places, and if everything fits in quite well, mark in all the bolt holes and valve socket holes. Check very carefully at this stage, because it is much cheaper to make alteration on your paper plan than to spoil your piece of metal. If everything is correct you are ready to start on the metal.

Step 4.—Secure a piece of metal of the correct size. A piece of sheet aluminium is ideal but not easy to find these days, so probably ordinary sheet steel will have to do, and it does very well, too. Probably a large plumber's establishment will be the best place to buy it; so go along with your dimensions and ask them to cut a piece of 20-gauge black steel plate to size. They have a large guillotine which cuts the steel cleanly, and if you get it cut to size with the corners perfectly square, you will be saved a lot of trouble, 20-gauge metal is easy to bend, though stiff enough to be rigid when made up. A small variation in the gauge will not make an appreciable difference to the job.

Step 5.—Now proceed to mark out the positions of your parts on the metal. Measure 2½-in. from each end and scribe a line across the metal. These lines indicate the positions where the plate is bent to form the front and back of the chassis. A carpenter's square could be used, or else the distance must be measured on each side and a line scribed across.

Step 6.—Mark out the positions of all sockets. If these are in line, their centres should fall on a line squared from the edge of the chassis, while lines are scribed at right angles to the first line or lines, so that the centre of the socket is on the point of intersection of the two lines. If you have dividers, make a punch mark at each centre and scribe two circles about each centre, one 1⅛-in. diameter and one ⅞-in. diameter. If you do not possess dividers, make a mark ⅝-in. from the centre on each of the four lines coming from the centre and place a penny so that its circumference touches the four points marked. Scribe round the penny and you will have a 1¼-in. diameter circle which will serve very well. Use a half-penny to mark the inner circle.

Step 7.—Make very light punch marks around the outside circles so that their position may be located accurately should the scribed lines rub out. Make deep centre punch marks every $\frac{3}{16}$-in. around the inside circles. Later, ⅛-in. holes mill be drilled at each of the punch marks in order to remove the waste metal from the insides of the holes.

Step 8.—Scribe through the bolt holes of the condenser, transformer, etc., punch these positions and also punch the positions where the wires are to come through the chassis to reach these components. Mark the position of the potentiometer, remembering a small hole for the locking stud, if it has one. This small stud, which is about ½-in. above the centre of the spindle prevents the whole body of the instrument from turning with the spindle. A hole which may have a rubber grommet round it is necessary for the aerial and earth wires, as are holes for the phone terminals or jacks.

Step 9.—Punch positions for valve socket bolt holes. This is best done by measuring the distance between the centres of the holes and then marking half this distance each side of the centre of the socket hole.

Step 10.—$\frac{3}{16}$-in. in from the side edges of the plate and 1½-in. apart, make punch marks for drilling $\frac{1}{16}$-in. holes. These holes will take small nails known as "finishing brads," which are used to nail the metal on to the wooden ends.

Step 11.—Drill all holes. Bolt holes should be drilled $\frac{9}{64}$-in., as this size is an easy fit for ⅛-in. bolts and compensates for any slight inaccuracy in drilling. The same drill may be used to drill round the inside circle of the valve socket holes.

Step 12.—Hold plate on a solid block of wood and cut, with the cold chisel, the small thickness of metal left between the holes around the valve sockets. The centre part should chip out quite easily, but be careful not to buckle the plate.

Step 13.—Clamp plate between two boards so that a socket hole is just above the boards. A vee, cut in the boards, will allow the plate to be supported even better. Using the half-round file, remove waste metal util the outline of the outer circle is reached. This is easy to do provided that the metal is well supported and not allowed to vibrate, as it would do if you attempted to file the unsupported plate. Finish all the socket holes this way.

Step 14.—The next job is to bend

(Continued on page 25.)


Wireless alone can meet the exacting needs of communication for Mobile Units...
INSTANT ★ CONSTANT CERTAIN
AUSTRALIAN-MADE
RADIOTRON
RADIO VALVES

Shortwave Review

CONDUCTED BY
L. J. KEAST

NOTES FROM MY DIARY

There is only one "Lord Haw Haw"

The Sydney Press have given a lot of space to the broadcasts from Japan by what seems certain to be the voice of Capt. Charles Cousens, well remembered as the principal announcer on 2GB.

The consenus of opinion is that Charles Cousens is speaking, or rather reading, under duress—reading prepared script, and minus the expression that was a characteristic of this fine announcer.

There is no Haw Haw about this great fellow. Would that I could employ the language used by John Dease in his splendid reference to Capt. Cousens, when talking to the 2GB Junior Reporters—a session pioneered by Cousens, and ably continued by John Dease.

For those who have not heard the session, tune to JZJ, 11,800 k.c., 25.42 metres, at 7.15 p.m. and 10.15 p.m. The signal at 7 p.m., when News in English commences, (talk is generally fifteen or twenty minutes after news begins), is sometimes spoilt by noise, but at 10 pm. is invariably good. It is also to be heard on JZK, 15,160 k.c., 19.79 metres, and JZI, 9535 k.c., 31.46 metres, but I find JZJ the best at my listening post.

August, 1942.

August was certainly a funny old month for reception, but perhaps the anniversary of the First World War on the Fourth, and, incidentally, my birthday, together with highest temperature during the month for eighty years, had somehing to do with it.

Round about breakfast time signals from Europe have been poor, London's session for North America at noon on some days was almost impossible to hear, and at night one was compelled to wait until just on 10 o'clock to bring in London or Berlin.

Have received from Mr. R. G. Gillett, of Adelaide, a most comprehensive report of his listening over July and early August. It arrived just too late for inclusion in August issue.

It is probably one of the finest and most comprehensive sheets, and there are several of them, that I have read.

NEW STATIONS

KWU, Dixon, California, U.S.A., 15,350 k.c. 19.54 m.: This station is reported by Mr, Gillett, of Dudley Park, South Australia, which he has heard at 7.45 p.m.
Schedule is 7.15 to 8.15 a.m. See under "Notes from my Diary."

Mr. Gillett makes suggestions regarding the technical side of "A.R.W." which will be passed on to Mr. Hull. While generally congratulating us on the Short-wave side of the magazine and referring very nicely to "Notes from my Diary," he expresses surprise that so many of the loggings seem to appear month after month, whether reported or not. This calls for an explanation, and here it is: Whilst our circulation amongst subscribers is enviably high, there are a great number of sales made to the man in the street and because of this and the great demand from our American cousins and others who, from choice, or international reasons, have made Australia their home, to know when and where they can hear their respective home towns, I have endeavoured to print schedules when known or where space will permit. Some could be erased, of course, but then we must not forget the newcomer to the short waves who wants to know what every station is that he hears, and also finds listed stations at odd hours on seldom used parts of the dial a great help in making up his log, or very often in assisting to calibrate his receiver.

But pressure on space will compel some new form of listing Loggings.

At present we are more or less exhausting a few countries at a time rather than make reference to one or two stations in each country. By this means listeners will be able to make a complete list of stations audible in this part of the world.

KGEI, 'Frisco.

The programme sheet for August shows KGEI as listed to transmit on 41.38 metres, so it looks as though the change to 31.41 metres was decided on very quickly. I have not seen or heard any reason advanced for the alteration, but it is definitely a mistake as far as good signal is concerned at Carlingford. The afternoons are quite fair, but around 8 p.m. no good at all, but at 10.30, O.K.

The same mail brought a nice letter from The General Electric Company thanking me for my report on their activities, and a photograph was enclosed of a number of Australian and New Zealand airmen talking from WGEO to their respective countries.

Thai

In August issue I referred to Bangkok on 41.72 metres. According to "The Broadcaster," Perth, our old friend of many years ago HS8PJ, 9510 k.c., 31.55 metres, has bobbed up again. Reported as being heard at 11 p.m. (1 a.m. Sydney). According to my records this laddie was discontinued in April, 1940. Well, perhaps Japanese influence is about.

Mr. Hugh Perkins, with justifiable pride, advises having purchased a new receiver and is astounded at the number of stations he is now hearing for the first time. I know the machine and can vouch for the brand. Although a dairy farmer, Mr. Perkins spends a lot of time at his radio and has an uncanny habit of noticing the change in schedules or frequencies; he was one of the first to report KWID on 31.35 metres from 5 p.m.

Mr. Condon, of Laura, South Australia, while convalescing after a batch of measles, sends in a fine report and has noticed the changes in the American stations. He refers to several verifications received and considers one of the best to arrive to date that sent by HI2G, Cuidad Trujillo, Dominican Republic.

STANDARD SERVICE CHARGES

The Radio Retailers' Association of N.S.W. has secured an agreement between Sydney radio dealers regarding a standard of conditions and charges on interchange service work.

The scheme is an attempt to overcome transport difficulties, manpower and parts shortage, which render distant service costly and inefficient. The plan is entirely voluntary.

In brief, the points decided are:

Where the received that requires service is within its guarantee period and consequently no charge is to be made to the customer, the dealer who requires the service shall be charged at a flat rate of 5s. by the dealer who does the job on his behalf. In addition any parts used in rendering this service are charged at cost price plus 20 per cent.

Two exceptions are provided.

Where the fault to be remedied is of a major character, then the dealer who has been asked to do the job must contact the original dealer and quote a price which must be confirmed before the job is completed. Also, in some outlying districts, where distances prohibit the flat rate of 5s. per call being a sound proposition, the charge for each individual job must be agreed upon by the two dealers concerned when the job is ordered.

SHORT-WAVE REVIEW

(Continued)

In August issue I said the Americans were getting very chummy. According to NZ-DX-TRA just to hand, WGEA has been granted additional frequencies on 7000 k.c. and 11,730 k.c. (42.85 m. and 25.57 m.), sharing time with KGEI and WGEO on 7000 k.c., and with WRUL-W-S on 11,730 k.c. KGEI have had authority to add 15,130 k.c. and 15,210 k.c. (19.83 and 19.72 m.), sharing time with WRUL-W-S on 15,130 and WBOS with the latter.

A letter from a member of the AW-DX-AW club, James J. Ferguson of Toorak, Victoria, shows that although only purchasing a dual wave set in the last week of February this year he has already logged 88 stations in 28 different countries. Well, that's the way records are made, so stick to it James, and send in a report each month. While I am typing you may hear of a new station, or an alteration in a regular, and it shows a fine co-operative spirit to let other members know.

Roy Hallett sent in another fine report and mentions hearing what he takes to be KZRH from 8 to 9 a.m., on 31.12 metres. Roy is a champ on Broadcast DX-ing, but still finds time to keep a sharp look-out on the Short waves. Agrees with me that the signal from KGEI, now on 31.41 metres, is very poor at 8.30 p.m., while at 4.30 p.m. is splendid. Most likely before this paragraph is read they will have changed again.

An air mail letter from Arthur Cushen shows that he, too, is aware of the latest moves of the overseas stations. While not discounting Arthur's ability to tune them in, the Shaky Isles is certainly Utopia as far as Short-wave listening is concerned. I would love to be able to hear the South Americans on 60 metres at 2 p.m. Under "Loggings" I have shown some of them he has sent reports to. North Americans have also occupied his attention and he refers to WDI, 5065 k.c., 59.23 metres at 5.45 p.m. This is a Press wireless outlet in New York, but reporters say signal is spoilt by morse.

Dr. Gaden has been hearing a couple of Americans off the usual band, viz., WGI, New York, 5053 k.c., 59.4 m. Opens about 5.45 p.m. and at 5.50 had Spanish session. 6 p.m. News in English; 7 p.m. news in English; 7.15 German; 7.30 French; 7.45 Italian; closed at 8 announcing would be back in two hours on 20.7 metres. This report was dated July 29. On July 31 I received a wire from Dr. Gaden saying that the 5 m.c. American will be changed on Sunday afternoon at 5.45 p.m. to 9.7 m.c. I listened intently to 30.93, but did not hear any station on this wavelength.

The other is WDJ, 7556 k.c., 39.7 m. (mentioned in July issue) giving news at 5 p.m., commentary at 5.10, then Spanish at 5.15, Musical item at 5.26 and closing at 5.30. On closing announce will be back in 15 minutes on

HELP WANTED

Mr. Gillett, of Adelaide, is hearing a stranger on approximately 8772 k.c. 34.2 metres at 8 a.m. Signal is good strength, and language is Spanish. (Assuming frequency is correct, I have no suggestions.—Ed.)

Mr. Du Faur, of Melbourne, heard a call-sign HTOA very clearly at 2.12 a.m. He figures it was an approximately 9,650 k.c., 31.08 metres. No English and station played Asiatic music.

WGI, 5035 k.c., 59.4 m. Dr. Gaden says WDJ announces 7565 k.c., this by our reckoning, would make the wavelength 39.65 m.

Watch for These

Associated Broadcasters Inc., who conduct KWID, 'Frisco, are asking a permit to install 50 k.w. stations at Los Angeles and Seattle.

EIRE

Would be glad to know if any readers have heard Radio Eirrean, Athlone, lately. They were recently using two frequencies, viz., 15,120 k.c. (19.84 m.), from 4.30 a.m. till 7 a.m. and 9595 k.c. (31.27 m.) from 7.10 a.m. till 8 a.m.

WGEO

Heard a great programme from Schenectady on Sunday, August 30, at 8.30 a.m., when "Showboat" was put over from St. Louis. It was also coming through WGEA, 31.41 m. and KGEI, 19.56 m., but while it could be just followed on WGEA, KGEI only had a carrier wave as far as I could figure out.

By the way, at 8.15 a.m. news is given by Jarvis Rice.

WRUL

After being silent for quite a while, listeners will welcome WRUL, Boston, 11,790 k.c., 25.45 m. back on the air in the morning.

By last mail I received a letter from The World Radio University, together with particulars of their special programmes to Australia. Boston puts over a session "Calling Australia," on Tuesdays, Thursdays and Saturdays at 7.15 a.m. Signal at present is fairly good.

KGEI

Roy Hallett and Hugh Perkins remind me that "March of Time" is heard at 7.30 p.m. on Fridays.

Moscow

"Radio Centre" announced, on August 29, at 10.20 p.m. when closing, they would return on 15,750 k.c., 15,230 k.c., 15,180 k.c., and 15,110 k.c. I missed the hour, but for those who prefer wave-lengths you have a choice of four in the 19 metre band, viz., 19.04, 19.70, 19.76 and 19.84 metres.

KWV

This station was briefly referred to in August issue. It is situated in Dixon, California, and is not actually a new station. As a mater of fact, it appears in Station Lists as far back as 1935. However, it is new to us and is heard at good strength in parallel with KWID, 'Frisco, until 9.05 p.m., closing with a round-up of the news for five minutes. Play-out is "Star Spangled Banner." Then announcement, "This is KWV, Dixon, California, on an assigned frequency of 10.84 m.c., 10,840 k.c., by authority of The Federal Bureau of Communications."

VUD-3

Delhi on 15,290 k.c., 19.62 metres has a good news session at 6 p.m. and signal is very fine.

Excerpts from Letters

In a further excellent list of loggings accompanied by an equally fine and informative letter, Mr. Gillett, of Adelaide, mentions hearing KLL, Bolinas, California, on 13,720 k.c., 21.87 metres at 9 a.m. in a Point-to-Point transmission to Honolulu on Sundays.

At 9 a.m. XIRS, Shanghai, 11,990 k.c., 25.02 metres, give their first news in English and signal is better than at night.

KZRH Manila, 11,600 k.c., 25.86 m. at 10 p.m. give their programme for the following day, which opens at 8 a.m. and continues till 2 p.m. At 8.15 a.m. they use 31.12 metres also, and signal is quite fair.

Mr. Gillett says he found WRUL, 25.42 m. and WRUW, 30.93 m. on August 21, at 10.45 p.m. carrying the same programme as WJQ, and asking for reports. He considered WRUW good, but WRUL was hopelessly jammed.

(Continued on page 24)

The MONTH'S LOGGINGS

ALL TIMES ARE AUSTRALIAN EASTERN STANDARD TIME

Listeners are reminded Daylight Saving Time will operate as from September 27. Clocks in Australia will be advanced one hour.

Further pressure on space only permits of sectional Loggings. (See August issue for Australia, Africa, Central and North America and Mexico.)

North America:

KWID, San Francisco 9370kc, 31.35m
Schedule: 5 p.m. to 11.15 p.m. First heard July 25. Terrific signal. (Hallett).
(Said to be using 100,000 watts.—Ed.)

KWU, San Francisco 15,350kc, 19.54m
Another outlet from California. Heard at splendid strength from 7.15 a.m. till closing. Good news service at 8 p.m.

KET, Bolinas 9480kc, 31.65m
This old timer is heard from 3.30 p.m. At 6 p.m. is in parallel with KWID. Announces at 7 p.m. then seems to join up with KGEI. News every hour, on the hour.—Ed.

WDI, New York 5065kc, 59.23m
Another Press Wireless Station heard from 5.45 p.m. to 8 p.m. Reported by Cusher and Gaden. Signal here is spoilt by morse. News is given at 7 p.m.—Ed.

WGI, New York 5053kc, 59.4m
Dr. Goden reports heoring this station at 5.50 p.m. in Spanish.

South:

Argentina

LSX, Buenos Aires 10,350kc, 28.98m
Heard weakly at 9 a.m.

LRX, Buenos Aires 9660kc, 31.06m
Schedule: 8.30 p.m. till 9.05 p.m., 10.30 p.m. till 2.30 p.m. Reported heard in evening session and again around breakfast time.

Brazil:

PSH, Rio de Janiero 10,220kc, 29.35m
Poor strength at 9.30 a.m. (Gillett).

PRE-9, Fortelezo 6105kc, 49.14m
Fair signal at 7.10 o.m. (Gillett).

PRA-8, Pernambuco 6010kc, 49.92m
Heard at 5.30 a.m.

Chile:

CB-1180, Santiogo 11,975kc, 25.05m
Heard at good strength at 2.30 p.m. in languages, etc. (Gaden). Splendid at 9.30 p.m.

CB-970, Valparaiso 9730kc, 30.82m
Nice signal occasionally around 10 p.m. (Gillett).

Columbia:

HJAP, Cartagena 4930kc, 60.85m
"Radio Cartagena". Heard at 2 p.m. (Cushen).

HJCW, Bogoto 4945kc, 60.67m
Logged at 2 p.m. and reported (Cushen).

HJEX, Cali 4865kc, 61.67m
Another logged and reparted by Mr. Cushen.

HJCA, Bogota 4855kc, 61.78m
Signs with "Goodnight Melody" (Cushen).

HJDX, Medellin 4795kc, 62.57m
Logged at 2 p.m. and reported (Cushen).

Ecuador:

HCQRX, Quito 5972kc, 50.23m
R5-6 at 9.50 p.m. (Perkins). Reported heard on Monday mornings at 8.30—Ed.

HCJB, Quito 9970kc, 30.09m
This new frequency heard at 10 p.m. Good signal but spoilt by morse interference (Clack). See "New Stations".

HCJB, Quito 12,460kc, 24.08m
Great strength in news at 9.30 a.m. Heard them announce would be operating on 31m. band, also that they are at present using 73m. band (Gillett).

Peru:

OAX5C, Ica 9540kc, 31.45m
Slogan, "Las ondas di Ica para tod el pais." ("The waves of Ica for all the country.") Best time Sundays at 4 p.m.

OAX4J, Lima 9340kc, 32.12m
Nightly at 11 p.m., Sundays at 2 p.m.

Venezuela:

YV5RN, Caracas 9,850kc, 30.45m
Now said to be on 6200kc, 48,39m. Schedule: 7 o.m. to 2.30 p.m.

THE EAST

China:

XGOX, Chungking 15,190kc, 19.75m
News in English for Europe at 8.30 a.m. Excellent signal (Clack).

FFZ, Shanghai 12,068kc, 24.86m
Schedule: 6.30 p.m. to 12.05 a.m. Good at 9 p.m. (Du Faur). News at 10 p.m.—best in early evenings (Gillett).

KIRS, Shanghai 11,980kc, 25.02m
Schedule: 7.30 p.m. to 12.05 a.m. Good signal (Gillett).
Excepting for morse, this Italian owned station has good signal. News at 9.15 p.m. News in English at 11.30 p.m. (Condon).

XGOY, Chungking 11,900kc, 25.21m
Schedule: 7.15 to 8 a.m. News 7.30; 8 p.m. to 9.30 p.m. News 8 p.m.

XMHA, Shanghai 11,855kc, 25.3m
This Jap-controlled station, "Call of the Orient," is heard from 6.30 p.m. to 12.30 a.m. News 8.30 and 11.15 p.m.

XGRS, Shanghai 11,675kc, 25.7m
This German owned station still has a good signal nightly. News at 10.30. When closing at 1 a.m. give summary of programme for morning and afternoons. On Sundays are heard at 9 a.m. (Hallett).

KZRH, Manila 11,600kc, 25.86m
At 10 p.m. gave prog. details for following day (Gillett) .Morning schedule is 9 a.m. to 3 p.m.

XGAP, Peking 10,260kc, 29.24m
Heard nightly from 9.30 p.m. till 1.30 a.m. Am heoring an Oriental on this frequency as early os 9 p.m. (Gillett).
Good at 10.35 p.m. (Du Faur).

XGOA, Chungking 9720kc, 30.86m
English News at midnight. Midnight to 1 a.m. Nice and clear at 10 p.m. (Gillett).

XGOI, Shanghai 9665kc, 31.04m
News at 10.10 p.m.

KZRH, Monila .. 9640kc, 31.12m
Heard ot good strength at 8.15 a.m. (Gillett).

XGOY, Chungking 9625kc, 31.17m
News at 10.30 p.m., 11.30 p.m., m/n, and 1 a.m. Excellent signal nightly (Clack), (Hollett) (Gillett). Schedule: 9.30 p.m. till 1.30 a.m.

JQHA, Hongkong 9470kc, 31.68m
Note new call sign and new frequency. Announcement and news at 11.10 p.m.—Ed. Same prog. also on 265m.) News in English 2.15 a.m. (Condon). Good (Hallett).

XLMA, — 9370kc, 32.02m
Heard around 10.30 p.m. (Gillett).

XPSA, Kweiyang 8465kc, 35.44m
Heard at 9 p.m. and 6.45 a.m. in Chinese dialects. Very good records around 10 p.m. (Gillett).

XGAP, Peking 6100kc, 49.18m
Very good signal late at night (Gillett).

XGOY, Chungking 5950kc, 50.42m
News at 9.30 p.m. and 11.30 p.m. Heard again from 5 to 7 a.m. Heard talk at 10 p.m. (Du Faur).

Portuguese China:

CR8AA, Macao 6250kc, 48.00m
Generally noisy around 10.30 p.m.

French Indo-China:

Radio Saigon, Saigon 11,780kc, 25.47m
News, 9.30 p.m. and 1 a.m. Good signal at 1 a.m. (Hallett). Mr. Perkins hears this one at 9.30 a.m. (Understand schedule is: 9.45 to 10.15 a.m.; 8 p.m. to 2 a.m.—Ed.)

Radio Saigan, Saigon 6188kc, 48.48m
Opens at 10 p.m. Loud signal. News 10.15 p.m. Closes at 12.30 a.m. (Hollett).

Dutch East Indies:

PMC, Batavia .... 18,135kc, 16.54m Good mid-day station (Du Faur). (Gillett). Tokio time quoted at 12.30 p.m. (Perkins). (Reported also heard at 7.30 a.m.—Ed.)

PLG, Bandoeng .... 15,950kc, 18.81m Mr. Perkins of Malanda, Qld., reports hearing this station playing Western type music. Closing announcement at 10.30 a.m. Signal fades.

"The Voice of Batavia," —— —— 8846kc, 31.92m Heard closing at 2 a.m. It was directing anti-British programme to India. Closed with "Liberty Bell March." (Condon)

Caroline Islands, (Japanese controlled):

——, Palao .... 11,704kc, 25.55m Schedule: 6.30 p.m. to 10.30 p.m. Often gives talks from Tokyo. Talk in Japanese at 8.25 p.m. (Du Faur).

——, ... 9565kc, 31.37m Schedules: 10.45 p.m. to 12.45 a.m. Like its sister station relays Tokyo, and using power of 10 kilowatts puts in a great signal.

India:

VUD-3, Delhi .... 15,290kc, 19.62m News at 2.30 p.m. (Gillett). Good at 6 p.m. (Hallett). 4.30 p.m. to 7 p.m. News 6 p.m. Since KWID moved to 31.35 at 5 p.m. signal O.K. Then opens again 8.30 p.m. closing at 9.45 p.m. This session is in Indian dialects.

Voice of Free India, ... 14,750kc, 20.34m News in English at 1.25 a.m., followed by two talks in English.

Voice of Free India, ... 11,469kc, 26.16m Same programme as 20.34 and very good signal.

VUD-4, Delhi .... 11,830kc, 25.36m 9.50 p.m. till 11 p.m. News 10.30 p.m.

VUD-3, Delhi .... 11,790kc, 25.44m 8.30 p.m. to 11 p.m. News 10.30 p.m. Just clear of JZJ and Saigon (Perkins).

VUD-2, Delhi .... 9590kc, 31.28m 9 p.m. to 2.30 a.m. News 10.30 p.m. and 1.50 a.m.

VWY, Kirkee .... 9045kc, 33.17m Announcing as "Radio Francais libre d'orient" is heard at 3.30 a.m. Pleasant volume at 3.30 a.m. (Gillett).

VUD-4, Delhi .... 7270kc, 41.27m 10 p.m. to 3.30 p.m. News 10.30 p.m. and 1.30 a.m.

VUB-2, Bombay .... 7240kc, 41.44m News at 10.30 p.m. (Du Faur).

VUD-4, Delhi, ... 6130kc, 48.94m 11 p.m. to 3.30 a.m. News at 1.50 a.m. (Gillett).

VUB-2, Bombay .... 4880kc, 61.48m Heard after midnight.

VUD-2 .... 4960kc, 60.48m Good after midnight.

Japan:

JLU-4, Tokyo .... 17,790kc, 16.86m News 6 p.m. (Du Faur).

JZK, Tokyo .... 15,160kc, 19.79m News at 4 p.m.

JLG-4 .... 15,105kc, 19.86m Heard calling and talking Rome at 6.22 p.m. (Perkins)

JZJ, Tokyo .... 11,800kc, 25.42m News at 7 p.m., 10 p.m. and 1 a.m. Talk at 7.20 and 10.20 p.m. One of the clearest night stations (Du Faur).

JIE-2, Tai-wan (Formosa) .... 9690kc, 30.95m News in English from 10.30 to 10.50 p.m. Lady announcer. Fair signal (Condon).

J——, Tokyo .... 9565kc, 31.37m Good signal when giving news in Dutch at 11.30 p.m.— Ed.

JZI, Tokyo .... 9530kc, 31.46m Gives news at 7 p.m., 10 p.m., 1 a.m. and 5 a.m. News in Dutch at 11.30 p.m. Very strong signal.

JLG-2, Tokyo .... 9505kc, 31.57m News at 5 a.m.

Malaya:

ZHJ, Penang .... 6095kc, 49.23m Heard in the evening in peculiar foreign language. At 10.30 in English "This is Penang calling. Transmission is for Australia. Here is the war news." Very anti-British.

Manchuria:

MTCY, Hsinking .... 9545kc, 31.43m News at 7 a.m. News 11 p.m., 12.30 a.m. and 7.03 a.m. English from 11 p.m. and at 1 a.m. long announcement in English.

(Continued on next page)

LOGGINGS

(Continued)

——, Harbin 6030kc, 49.75m
This new station is heard at 11.45 p.m. Very jumpy and good deal of static (Du Faur).

MTCY, Hsinking 5740kc, 52.28m
Heard around 12.30 a.m. with fair signal in English prog. Close 1 a.m. (Condon).

Philippines:

KZRF, Manila 6140kc, 48.86m
Just audible at 10.15 p.m. in same prog. as KZRH.

KZRH, Manila 9640kc, 31.12m
Heard opening at 8 p.m. with Japanese anthem (Gillett).

KZRH, Manila 11,600kc, 25.86m
Heard irregularly in same prog. as 31.12m But signal not as good.

Straits Settlement:

Singapore Radio, ... 12,000kc, 25m
Now back on the air under Jap control. Announcer gives Jap name for Singapore. English at 11 p.m. Closes 11.30 p.m. (Condon). Announcer refers to Shonan (Japanese name for Singapore) Broadcasting Station.—Ed. Good Western music heard from here (Perkins).

Thai:

HSP—, Bangkok 6060kc, 49.50m
Good at 12.15 a.m., same prog. as HS7PJ on 825kc (Hallett).

HSP-5, Bangkok 11,715kc, 25.61m
News at 10.55 p.m. and 11.35 p.m.

Voice of Thailand, Bangkok 7190kc, 41.72m
Reported by Mr. Condon of S. Aus. as heard on July 28 at 11.30 p.m. See "New Stations."

GREAT BRITAIN

Listeners should keep a sharp look-out for changes in frequencies around end of September or early October.

One or more BEC transmitters can be heard right round the clock, with the possible exception of, say, 6.30 p.m. till 10 p.m., but this interval is being shortened weekly.

GRQ 18,030kc, 16.64m
Must wait for warmer weather.

GRP 17,890kc, 16.77m
Not heard at Carlingford now.

GSV 17,810kc, 16.84m
Opens at 8.45 p.m. in Eastern service, but probably 11 p.m. before audible.

GSG 17,790kc, 16.86m
Not heard for some time.

GRD 15,440kc, 19.42m
5 to 6.15 p.m. Thought I also heard it in Eastern service at 8.45 p.m.

GRE, London 15,375kc, 19.51m
5 to 6.15 p.m.; 8.45 a.m. to 1.15 a.m. Gets weak around 11 p.m.; opens again at 1.30 a.m. and with few breaks is on till 7 a.m.

GSF 15,140kc, 19.82m
News at 6.45 a.m. and 7.45 a.m. Closes 8.45 a.m. Eastern session at 9 p.m. is getting better each week. Good in mornings.

GRF 12,095kc 24.80m
8.30 a.m. to 12.45 p.m. In Spanish and Portuguese for Latin America.

GRV 12,040kc, 24.92m
Special session for South America from 8.30 a.m. to 12.45 p.m. Far European service 1.30 a.m. to 8.15 a.m.

GSN, ... 11,820kc, 25.38m
Swedish at 3 a.m.

GSD 11,750kc, 25.53m
Probably the most consistent of the B.B.C. transmitters and one of the earliest of the after-lunch stations. N. America service heard from 11 a.m. till 2.45 p.m. News 11 am., 12.45 p.m. and 2.30 p.m. Pacific service now opens at 2.57 p.m. and is heard till 6.15 p.m. Opens again at 8.45 p.m.

GRG, ...11,680kc, 25.68m
Used in North American service. News 11 a.m., 12.45 and 2.30 p.m. Newsreel 1.30 p.m.

GRH 9825kc, 30.53m
Another transmitter used in N. America service. News at 7.45 a.m., 8.45 a.m. and 11 a.m., 12.45 p.m. and 2.30 p.m. Radio news reel 1.30 p.m.

GRX 9690kc, 30.96m
At 12.45 a.m. Italian, at 1 a.m. Polish; 3-4 a.m. French, German, Dutch; English 6 a.m., but getting weak then.

GRY 9600kc, 31.25m
Used in Pacific 3 p.m. to 4.45 p.m., African 4.30 o.m. to 7 a.m., N. America, 7.15 to 8.45 a.m.

GSC 9580kc, 31.32m
Signal now very good in North American session, opens 7.15 a.m. News 7.45, 8.45 and 11 a.m., 12.45 and 2.30 p.m. Newsreel 1.30 p.m.

GSB 9510kc, 31.55m
Good afternoon station for Pacific service 2.57 to 6.15 p.m. Excellent in afternoons (Gillett).

GRU 9450kc, 31.75m
Used in African service 1.30 a.m. to 2.15 a.m.

GRI 9515kc, 31.86m
Not sure of schedule but heard occasionally around 9.30 p.m. Often very noisy.

GRJ 7320kc, 40.98m
Now used in North American service from 1 p.m. to 2.30 p.m. This is the best station in N. America session (Perkins).

GRM 7250kc, 41.38m
Heard from 2 to 2.30 a.m. with R7 signal (Perkins). This is a special session for the Polish people.—Ed.

GSW 7,230kc, 41.49m
European service 2-7 p.m. News 6 p.m., 2 a.m. to 8.45 a.m. News 6.15 a.m.

GRK 7185kc, 41.75m
Home service, but often audible here early mornings and again late afternoon.

GRT, ... .7150kc, 41.96m
Not been heard for some time, but have lately at 6.45 a.m. with news (Gillett).

GRS 7065kc, 42.49m
Reliable transmitter for Pacific service 2.57 p.m. to 6.15 p.m. (Condon).

GRN 6194kc, 48.43m
1.30 to 8.45 a.m. News 6.15 a.m.

GRO 6180kc, 48.54m
Excellent from 6.45 to 7 a.m. in "Music While you Work." (Perkins).

GRW 6140kc, 48.86m
2.30 p.m. to 6 p.m.; 2 a.m. to 7 a.m.

GSL 6110kc, 49.10m
3 p.m. to 4.45 p.m.; 1.30 a.m. to 8.45 a.m. News at 6.15 a.m.

GRR 6080kc, 49.34m
2.30 p.m. to 6 p.m.; 2 a.m. to 8.15 a.m.

GSA 6050kc, 49.59m
2 p.m. to 7 p.m.

(To be Continued.)

STOP PRESS

Elsewhere in this issue I mentioned the probability of changes in the B.B.C. frequencies. Here are a few already in operation.

Please make alterations in "Loggings" accordingly.

GSF, ... 15,140kc, 19.82m
On some nights can be heard from opening at 8.45 p.m., but often 9.30 or 10 p.m. before good. Closes 1.15 a.m.

GRF, ... 12,095kc, 24.80m
Used in Latin-American session from 8.30 a.m. till 11 a.m.

GRV, ... 12,040kc, 24.92m
Latin-American service from 8.30 a.m. till 12.45 p.m.

GSD, ... 11,750kc, 25.53m
This old reliable often audible before GSF in Eastern session. Closes 1.15 a.m., but till closing at 7 a.m. Opens up again at opens again at 1.30 in African session. O.K. 7.15 in North American session.

GRG, ... 11,680kc, 25.68m
Fair at 6 a.m. till 7 a.m. Good in North American service, 7.15 a.m. to 2.45 p.m. Poor between 9 and noon.

GRH, ... 9,825kc, 30.53m
Another good one in North American service after mid-day.

GRY, ... 9600kc, 31.25m
Audible from 4.30 a.m. till 7 a.m. in African session. Opens again at 7.15 in North American session and goes off the air at 8.45 a.m.

GSC, ... 9580kc, 31.32m
Now being used in North American session. Good from mid-day.

GSB, ... 9510kc, 31.55m
Heard in African session from 1.30 a.m. till 4.15 a.m. Good at mid-day in Latin-American service.

GRM, ... 7125kc, 42.11m
Heard just after mid-day.

GRS, ... 7065kc, 42.46m
Good in Pacific service.

GRW, ... 6140kc, 48.86m
Home session audible till 7.30 a.m. and again in late afternoons.

GSL, ... 6110kc, 49.10m
Withdrawn from Eastern service.

GRR, ... 6080kc, 49.34m
Home session in parallel with GRW.

RADIO STEP BY STEP

(Continued from page 15)

we can speed up that turntable still more, until eventually we arrive at such a speed that the inactive periods have vanished altogether, the current in one direction having not quite died away when the next reversal comes and a fresh burst of current comes. The average current will now be higher still, since current is flowing in one direction or the other at every moment. Is it possible to obtain a still greater current by inincreasing the speed of rotation? At first sight one would say not, and that if a speed had been reached at which there were no intervals in the flow no further increase in the speed would make any difference.

The Meaning of Reactance

This argument, however, overlooks the fact that during each momentary burst of current the flow is greatest at the beginning, and tails off towards the end. At the moment of reversal of the battery connections the voltage driving a current through the circuit is double that of the battery (battery voltage **Plus** charged condenser voltage), but as the condenser loses its initial charge it ceases to assist the battery, and when it begins to acquire a charge in the opposite direction it actively opposes it. The first burst of current, is, therefore, large, but towards the end the flow falls off.

It now becomes clear that if we wait until the current drops practically to zero before reversing the connections of the battery, and starting off again with the maximum current, we are, in effect, getting remarkably little return in current for the extra time expended.

It will therefore pay us not to be content with a speed of rotation that is only just high enough to cut out the periods of complete inactivity that follows each successive charging current, but to whirl the turntable round ever faster and faster so as to take fuller and fuller advantage of the tremendous initial burst of current that follows each reversal of the battery. The faster we can spin the turntable the greater will be the current, until finally, with an infinite speed of rotation, we attain the current that would flow if the condenser were short-circuited out altogether.

The frequency of an alternating current is simply the number of complete reversals (from plus to minus and back again) that occurs in each second, and corresponds exactly with the number of revolutions of the turntable in our hypothetical experiment. If the turntable were revolving at the very high speed of 50 revolutions per second, or 3,000 revolutions per minute, the alternating current generated would have a frequency of 50 cycles, and would be identical (apart from waveform) with the ordinary alterating current used for house lighting.

Reactance Depends on Frequency

From what has been said it will therefore be clear that as the frequency of a current is increased, the opposition offered to its flow by a condenser (known as the condenser's "reactance") will decrease. Further, it is found that the relationship is a simple one, doubling the frequency of a current resulting in the reactance of the condenser, or, alternatively, allowing the original value of reactance to be reached with a condenser of half the capacity.

(Next Month: **The Tuned Circuit**)

GLASS-INSULATED WIRE

Continuous Operation at Temperatures up to 140 deg. C.

Winding wires insulated with glass fibre have been introduced recently by British Insulated Cables, Ltd., England. The primary object of this new insulating material is to enable windings to be run safely at higher temperatures than could be possible with conventional materials such as cotton; indeed, the upper temperature limit (approximately 140 deg. C.) is set not by the insulation but the possibility of oxidation of the copper. The high temperature rating combined with increased thermal conductivity in the covering enable very economical designs to be evolved.

The covering consists of alkali-free glass filaments impregnated with a special varnish and stoved to produce a smooth, dense layer well bonded to the conductor. In the "Fine" covering, which adds about 3 to 5 mils to the diameter of the wire, a single layer of glass yarn is used, while in the "Standard" covering two layers applied in opposite directions give an increase of diameter of 6 to 8 mils.

Gauges at present available range from 8 to 33 SWG in high conductivity copper, but the covering can be applied to other conductors in special cases. Magnet strips insulated with "B.I. Glass," as the new covering is called, can be supplied in a limited range of sizes.

Points About Aerial Efficiency

NO matter what make of set, or how powerful your set is, you are not getting the best out of it unless you have a good aerial and earth system.

Your first consideration must be height—always remember that this is a lot more important than length—the higher the better. Trees, high buildings, etc., make suitable objects to attach your Aerial to, but failing these you should obtain a mast (about 30ft.).

Our next requirement will be aerial wire. Copper wire is the best. and 7-strand wire is usually used. Enamelled copper wire will repay you in the long run, although it costs more to start with, the enamel covering stops erosion and is also an insulation. Aerial wire is sold in 100 ft. coils, and that length is sufficient for aerials, lead-in, and earth wires. Don't make the mistake of having your Aerial too long, 50 to 60 feet is ample.

The Aerial has now to be insulated. Two or three egg insulators should be placed on each end.

It is advisable to attach one end (or both) of the Aerial to a halyard rope run through a galvanised pulley. This allows the Aerial to be lowered for examination.

The lead-in should be taken from the end nearest to the house, and if the aerial is not level the end nearer the house should be the lower. Make the lead-in as short as possible, and use a lead-in tube where it enters the house. A lightning arrester should be placed on the outside of the house close to the lead-in tube.

Never cut the Aerial wire except as a last resource, as soldered joints unless done by an expert are never satisfactory, and sooner or later will cause artifiicial static. It is usually possible to use one length of wire for the complete Aerial and lead-in.

Make sure that the lead-in does not touch any spouting, chimneys, or other objects; there are plenty of insulating gadgets available at little cost that will enable you to get past all kinds of obstructions.

The earth wire is connected to a waterpipe by means of an earth clip. Keep the earth wire as short as possible, and rather than running the wire all around the house before coming to a pipe it is much better to obtain an earth tube. This is driven into the ground as near to the set as possible, and if in a dry situation it is a decided advantage to wet the soil now and again with a bucket or two of water. There is usually a terminal provided on the earth tube for attaching the wire.

* * *

One difficulty which often confronts an amateur is what length of earth lead he can use with efficiency. The choice often lying between a good contact with a longer lead, and a bad contact with a much shorter lead. The general advice is to keep the earth lead short. Often this misleads the amateur into abandoning his pet earth, because to get to it a long lead need not have a high resistance if a reasonably heavy gauge of wire is used. Never use anything under 7/22 gauge. A long lead is only really bad when you use too small a gauge of wire.

* * *

You should not share either your Aerial or your Earth with your neighbour, as you will run the risk of interference between the two sets.

* * *

When handling a new coil of aerial wire you must be careful not to kink it.

* * *

When atmospheric discharges are distressingly bad, the position can sometimes be relieved by connecting a 100,000 ohm resistance directly across the aerial and the earth terminals of your set.

* * *

Should you use a wooden mast that goes right into the ground, have a look beneath the surface of the soil and make sure that the bottom of the pole is not rotten.

* * *

For preference take the lead in from one end of the aerial; if you have to take it from the centre, make sure that it is the true centre.

—"Lamphouse Annual" (N.Z.)

SHORT-WAVE REVIEW

(Continued from page 19)

Meet Mr. Du Faur.

Received a very fine list of loggings from Mr. Du Faur, of Melbourne. Mr. Du Faur speaks kindly of our magazine and has found the short wave pages of great help in the calibrating of his home-built seventeen valve receiver. Well, the number of stations logged suggest the "hook-up" is O.K. particularly when he says he is situated at the bottom of a hill and signals are often spoilt by man-made static that he unable to trace.

The times and remarks shown in the nine foolscap pages clearly indicate that many hours of intense listening have been spent in an endeavour to completely cover the tuning range of the machine, which apparently, is 16 to 51 metres.

At Long Last

Had been wondering what had happened to Mr. Neville Gandy, of Wellington, N.Z., when a short note from him advised he had been transferred to another town and had not been able to spend any time at the controls, but has promised to try and send some notes shortly,

The Short-wave Ears of the Atherton Tableland.

Yes, you've guessed it, friend Hugh Perkins is the laddie I have in mind. With his usual thoroughness he forwards another fine list of observations over the past month. Conditions in Queensland suggest (as I have always maintained) that signals are, for the most part of the day, louder and clearer than down here. The same thing applies to medium waves. I was talking to some people the other day who lived at Roma, and were able to bring in most of the Sydney stations all day. But try, in Sydney, to bring in the Queensland stations before nightfall and the result is not so good.

Mr. Perkins received a verification from COCQ, Cuba, 33.9 metres, an acknowledgement from ZRH, Johannesburg, South Africa, 6007 k.c. 49.95 metres, and a QSL card from VLQ-4.

With the R.A.A.F.

Regular readers of these columns will remember Mr. Eric Jamieson, of South Australia, who has contributed on many occasions some fine loggings. A letter received this month advises he is now a member of the R.A.A.F., and will welcome letters from members of the AW-DX-AW club. Address is:

11534
ACI Jamieson, E. C.,
Course 19A W.M.
No. 1 S.T.T.,
Exhbition, Melbourne, Vic.

September 27, 1942.

Respectfully reminding listeners that daylight saving time comes into operation at 2 a.m. on September 27, when clocks will be advanced one hour.

All times mentioned in these pages are Eastern Standard Time, so adjustments must be made accordingly.

Stranger on the 19 metre Band.

On August 31, at 10.50 p.m., heard a station on approximately 15,060 k.c., 19.92 metres. Man was speaking slowly in what I took to be Indian language. Signal was loud, but in the ten minutes I listened, got no idea of who it was. My surmise is PLI, Bandoeng.

TO MAKE A METAL CHASSIS

(Continued from page 16)

the plate at right angles at each of the bending lines. procure two pieces of angle-iron, a bit longer than the width of the chassis. Old bed irons serve admirably. Failing angle-irons, two pieces of wood may be used, but they do not make such a sharp bend. Hold the plate between the two pieces of angle-iron so that these coincide exactly with one of the bending lines and clamp them in a vice with the longer section of the chassis upwards. The angle-irons thus form extra long jaws on the vice.

Step 15.—Hold a stout piece of wood along the edge of the bending line and push evenly, bending the metal over against the corner of the angle-iron. When it is bent right over, hold the wood on the top and hammer along it to secure a sharp right angle. Bend the other end in a similar manner.

Step 16.—Cut the wooden ends from ⅜-in. wood, to fit accurately into the ends of the chassis, where they may be nailed in place or else left until the wiring is completed. It is much easier to get at the inside of the chassis for soldering while the ends are out.

Step 17.—Sandpaper the chassis and paint with aluminium paint, which gives a good finish and renders the wooden ends indistinguishable from the metal part.

Should the drilling worry you, an engineering shop or garage with a power drill could drill all the holes in a few minutes provided the metal is marked out and punched with the hole sizes indicated.

The chassis may be mounted in a cabinet and screwed down by means of wood screws inserted at an angle through the sides into the base, or by screws coming upwards through the base into the sides. If a cabinet is not to be used, a three-ply or metal panel may be bolted to the front of the chassis and holes to take the spindles of the condensers, potentiometer, etc., drilled through the panel.

—"Lamphouse Juornal," (N.Z.)

SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

T.A. (Williamstown, Vic.) enquires as to whether we have any information about the radio trade in England under wartime conditions.

A.—Yes, we still obtain the English trade and technical magazines, and from these we get a fair idea af conditions. Apparently the building of new radio sets for the public is at o standstill, and we see mention of 125,000 sets which are partly completed and waiting for the releose of certain components so that they may be finished off. They were sets which were started in 1940. Then we see that there are a million sets out of action due to service and replacement problems.

Another indication of the position is given in recent legislatian which prohibits a second-hand radio set being sold ot a price greater than the original list price. It would seem that the demand for second-hand sets is so great that people are prepared to pay more than the original list price in order to get hold of a second-hand set.

Incidentally, it is interesting to note that the purchase tax, similar to our sales tax, is at the rate of 66 per cent. on the wholesale value of radio-gramophones, these being recognised as luxuries, as against ordinary radio sets which have a much lower purchase tax rating.

* * *

A.S.H. (Wiluna, W.A.) wants to know whether batteries have an ampere hour rating and, if so, what is the maximum current drain for various batteries.

A.—Doubtless batteries have an ampere-hour rating, but several effarts, from time to time, have failed to get the battery factories to commit themselves to stating any facts in this regard. Once or twice the American battery people have issued guides to battery drain, but the local factories will neither confirm nor deny that their batteries should give the same service. As a typical example af a 45 volt unit, used about 3 to 4 hours per day, this unit (weight 2 lbs.) should give 320 hours service if the drain is 5 milliamps, 140 hours if the drain is 10 ma., 81 hours if the drain is 15ma., and 54 hours if the drain is 20 ma. This tables assumes that the battery is exhausted when the voltage on load drops to 34 volts.

Torch batteries of the U2 type appear to be designed to deliver about 300 milliamps for intermittent use only, whilst bias batteries are not designed to deliver any current at all, although in practice they will deliver a little. Continuous use of any battery can be expected to exhaust it twice as quickly as if used only intermittently.

Our own practicol experience would indicate that the safe drain from a light duty B battery is about 8 ma., about 10 fram a heavy duty and about 18 from a super. Comparing local batteries with the tables given for American ones, we would imagine that the local batteries will not stand up to the heavy overloads of 30 and 40 milliamps which the Yanks state can be drawn from theirs,

NEW B.B.C. RULES

Some new B.B.C. rules are:

1. If the War Office, Admiralty or Air Ministry—or any other Department, such as the Post Office—asks the B.B.C. to broadcast a talk by a serving member or official, no fee can be paid to the speaker.

2. If the B.B.C. asks a soldier, sailor, airman or civil servant to talk about his job, they pay only half the fee to the broadcaster. The War Office, Admiralty, Air Ministry, or appropriate Civil Service department, puts the rest of the fee into its own fund.

3. If the B.B.C. asks a soldier to talk about something other than his job, such as coal-mining, or asks a postman to talk about butterflies, not letters, it pays each individual the full fee.

W.J.K. (Lismore) has a big amplifier, and notices that when reading the plate volts on the output valves there is a run af sparks to the prod even when the negative side is not earthed.

A.—There may be a number of explanations for this, some of them quite harmless, but on the other hand we think your safest plan would be to assume that there is r.f. in the output stage as well as the normal audio frequency. This means a loss of efficiency, if nothing worse, and should be cured by putting r.f. by-pass candensers from the plates of the previous stages, also from each output plate, to earth. Mica condensers of .00025 mfd. should be O.K. for the earlier stages and, say, .002 mfd. for the output. These may tend to cut the high note response a trifle, but not seriously. Grid stoppers of 10,000 each, right on the socket and in series with the grid lead might also be fitted to the output valves.

* * *

M.G. (Castlemaine) enquires about the licence necessary to play gramophone records in public, as he has an amplifier which he lends for dances.

A.—As stoted on the record, it cannot be legally performed in public, or samething to that effect, but we haven't heard of any licences being issued, or any action being taken in regard to amplifiers at small dances. If you want to be on the safe side we suggest you write to the Gromophone Company at Hamebush, N.S.W., ond ask for details of the necessary licence and this should clear up the point for you.

* * *

T. McK. (Chester Hill) raises some interesting points about coils and alignment.

A.—The term "465" is loosely applied to all intermediates intended far operation around and about that frequency, as against "175" which is used to indicate the old-style intermediate frequency of anything between 156 and 196 k.c. So with the newer i.f. channel, we often refer to 465 ond expect to cover all frequencies between 440 and 490. More or less standard at the moment is 455 k.c., and even transformers marked 465 may be found to be roughly aligned to this frequency.

As you say, the alignment of superhets is quite critical, but this does not mean that the actual i.f. frequency is critical, it being a matter of the having of the aerial and oscillator tuning correct to give the i.f. frequency, and then to have all the i.f. tuning circuits aligned to that frequency. The only difference between, say, 455 and 465, will be the position af the second spat and the effect of harmonics and whistles which may result from these. The present 455 frequency has been adopted to dodge the whistle which is encountered on 2UE in certain localities. With regard to the gangs, the H type is very efficient in having a big ratio between its maximum and minimum capacity and if other gangs are used with coils designed for this gang there is a chance that the full 1500 to 550 will not be covered. Apart from this point, if your dial is not calibrated, you can use any type of gang without affecting results, apart fram the minar variations in actual efficiency which, however, are not vital with nearly all gangs mode during the past five or six years.

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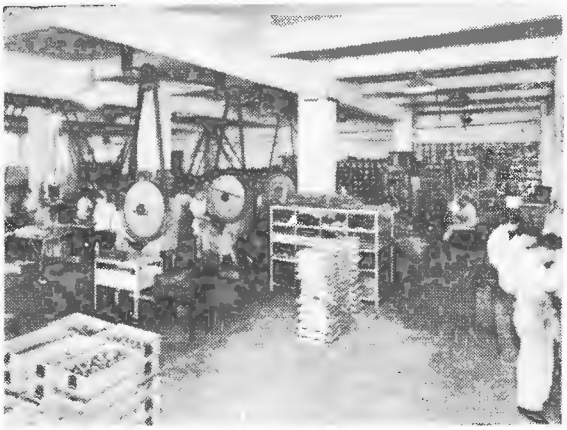

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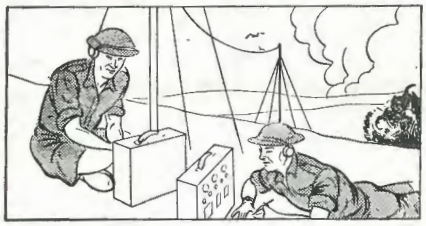
How John Stepped O

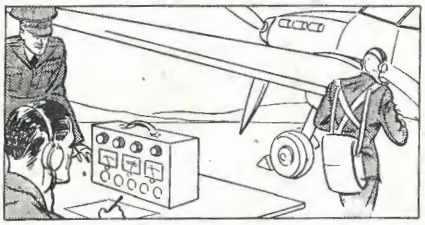
Not so very long ago, there was a young shop assistant named John, who wanted to do his best in the War effort. Being untrained, he did not know what do about it.

Until he heard about A.R.C. Radio Engineering training, and wrote for details of the course. He quickly saw the advantages of learning Radio Engineering, and started the A.R.C. course in his spare time.

John quickly learned enough to take a position at Radio Defence work, which was found for him by the College. This meant more money and good opportunities for advancement.



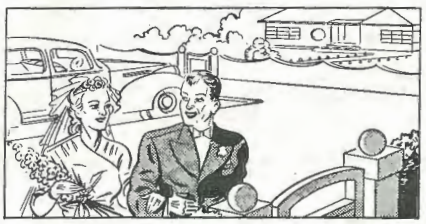
Had he wished at that time, he could have joined a Radio Unit in the Army at communications work, radio maintenance, or some other form of military radio work.



Or in the R.A.A.F. as a Radio Operator in air crew, or on the ground staff. Radio maintenance work, and radio location work, were also open to him.

Still on Defence Work, he carries on with his spare-time Radio training with the Australian Radio College. All the time making himself more and more proficient at Radio work.

Soon, by reason of his training, he is promoted to take control of his section of the work. This means another rise and prospects of even more promotion.



This extro money means wedding bells for John, and a home of his own. He can see the fulfilment of his highest ambitions quickly taking shape.

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