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AUSTRALASIAN

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VOL. 6 NO. 6

NOVEMBER 15 1941

Spot-welding the elements of a valve in the Australian factory of Philips.

CIRCUIT CONTEST
FIRST ESSAY

COMPACT 4/5
D.W. RECEIVER

INTER-OFFICE
COMMUNICATOR

DUAL-WAVE SIX
WITH VIBRATOR

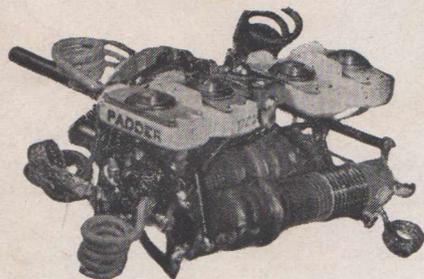
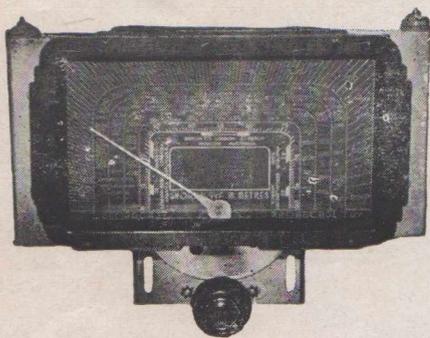


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The Australasian
RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS

Vol. 6 NOVEMBER, 1941 No. 6

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BATTERY CIRCUIT CONTEST COUPON IS ON PAGE 37

EDITORIAL

It is abundantly clear that our Battery Circuit Contest is going to be remarkably successful.

It has created considerable interest in many country towns and provided a topic for conversation in most factories, according to reports from our readers. Country dealers appreciate the value of the publicity angle of having their views published and, from our point of view, we don't begrudge them this free advertising, so long as it is all for a good cause. What better cause could you imagine than helping the country man to get better performance from his set? The candid expression of opinions by country men, who are on the spot obtaining practical experience, must be a big factor in assisting in this direction.

From our own point of view, we are especially delighted, as we have in hand a stock of editorial matter which should make the next half-dozen issues of infinite interest to all country readers.

The "Australasian Radio World" is published monthly by A. G. Hull.

*Editorial Offices: 117 Reservoir St., Sydney, N.S.W.
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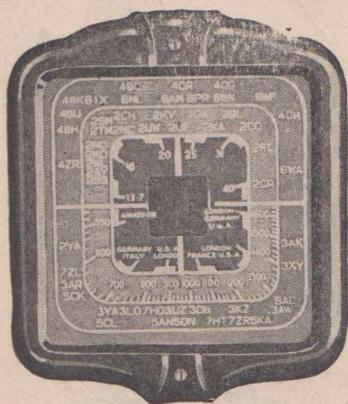


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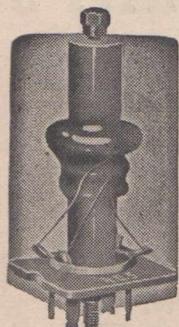
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 - E346 R.F. 8/6
 - E347 Osc. 8/6

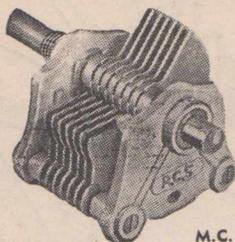
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M.C. Type

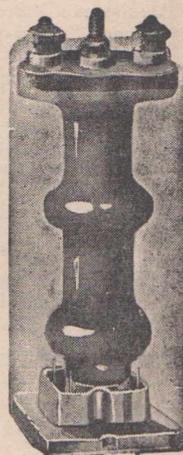
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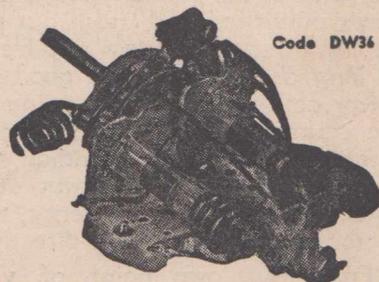
- 465 K.C. I.F.'s When two I.F.'s are used:
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 - IF163 2nd .. 13/9
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 - IF164 1st .. 13/9
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 - IF163 3rd .. 13/9
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AN INTER - OFFICE COMMUNICATOR

INTER-OFFICE communicator systems have been popularised by the movies. Nearly every time it is intended to portray a business executive, you see him pressing down a switch and leaning forward on his desk, whilst he talks to the loud-speaker in the little cabinet.

He tells Miss Smith to "Show in the Governor," and then takes his finger from the switch to hear Miss Smith's reply of "O.K., Chief."

Inter-office communicators will be found to be of immense value in almost any business, office, shop and even in the home. There is almost unlimited scope for their installation. The good radio dealer should make a point of displaying an inter-office communicator in his own office, as there is quite an amount of good business to be picked up in this line.

There are many dozens of different types of communicators, and in most cases it is a matter of designing a special job to suit the requirements of the particular installation.

General Principles

There are certain general principles, however, with which you should be conversant and these are more readily assimilated by a little practical work on a simple outfit. Here is the description of just such an outfit, designed and originally built by Mr.

John Bristoe, radio manager of Denhams, of Maryborough, Queensland.

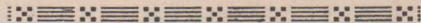
It is simple to build and operate and requires very little attention. The circuit diagram is given on this page.

It is mainly composed of two small permagnetic speakers, and a simple

audio amplifier. One speaker is used as a microphone and the other to reproduce the sound. The simple switching system reverses the use of the speakers as required. An ordinary bell, buzzer or indicator globe is fitted in the same cabinet as the chassis, with the button or bell push at the remote speaker to eliminate the necessity of keeping the unit switched on.

Typical Operation

Here is a typical example of the operation: To speak to the remote end from the master unit, switch on the unit and call the person required. To speak to the master unit from the remote end, press the bell push. If used in a workshop or office where a



Designed and described by

JOHN BRISTOE

Radio Manager
Denhams Pty. Ltd.
MARYBOROUGH, Q.

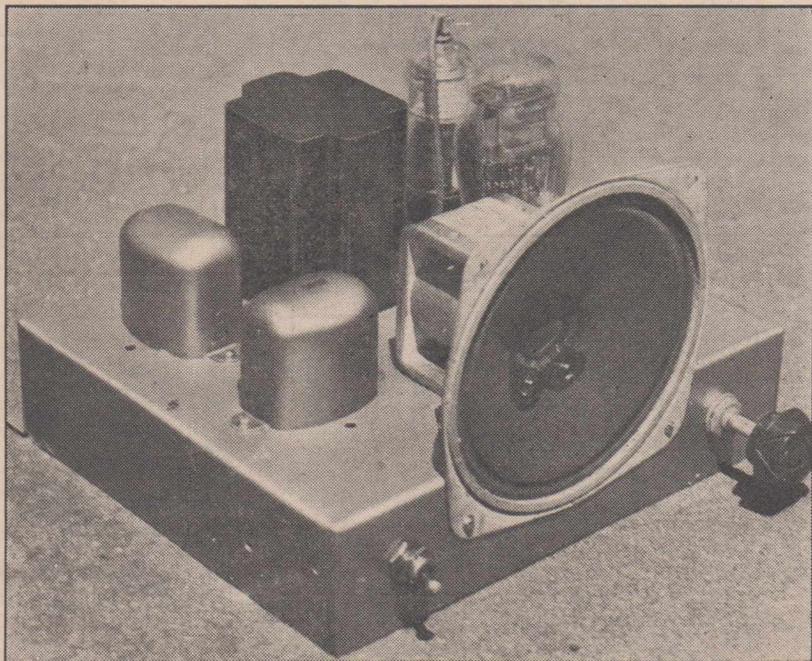
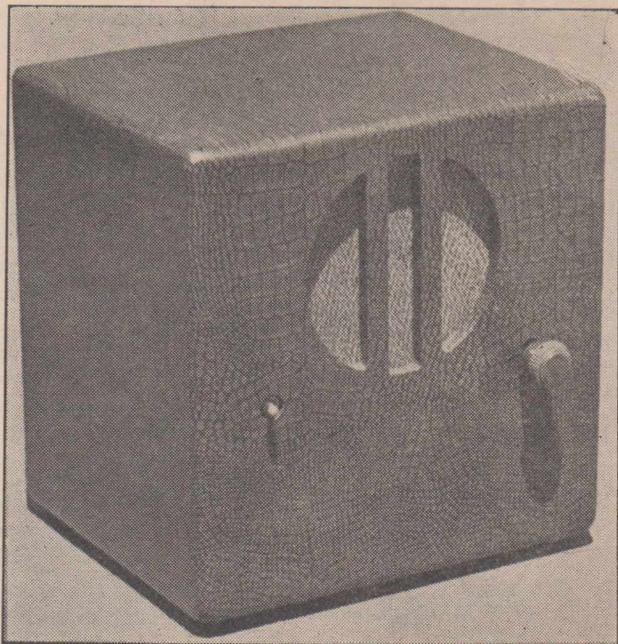


number are employed, a code can be arranged, i.e., Mr. Jones, one long ring; Miss Smith, two short rings, etc.

This unit may be used with any number of speakers by the addition of an extra switching system, details of which will be given on request. When this unit was designed originally 1.4-volt valves were readily ob-

(Continued on next page)

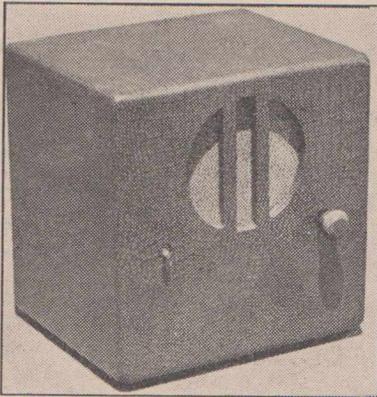
A general view of the master unit, showing the control switch and the volume control adjuster. The cabinet is a leatherette-covered one, provided by the Western Manufacturing Company.



A photograph of the chassis of the master unit, showing the audio transformer at the rear with the two speaker transformers towards the front.

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COMMUNICATOR

(Continued)

tainable. If difficulty is experienced in obtaining these valves, 2-volt valves will substitute equally well.

Cabinet

The chassis is mounted in a small "Western" cabinet with two portable "B" batteries, a single dry cell for filaments, the "C" battery, and the bell.

These "Western" cabinets are made of timber with leatherette covering. They are light in weight, but strongly constructed and most serviceable in use.

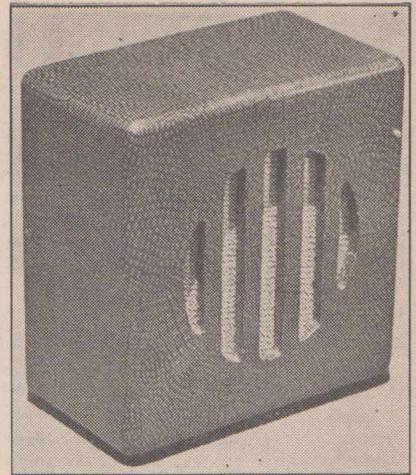
The Western Manufacturing Company provides a remarkably efficient service for the radio trade, making special cabinets to almost any design at short notice.

SERVICE EXAMS

The Institution of Radio Engineers (Australia) will be holding its half-yearly examination for admission to the Graduate and Associate Member grades, and the Radio Service Technicians' examination for the Service Division of the Institution on Saturday, February 7, 1942. Intending candidates are invited to apply to the General Secretary, the Institution of Radio Engineers (Australia), Box 3120, G.P.O., Sydney.

A three-way cable is required to run to the remote speaker and bell. One is the earth, common to both speaker and bell, another is to the bell and the third to the speaker.

No doubt many will wonder why the model described is a battery type and not an A.C. type. The reason is that the battery model is instantaneous in action and there is no delay warming up as in the case of an A.C. system, which would have to use indirectly-heated valves. The A.C. type would, of course, be quite satis-



Speaker cabinet designed for the extension units, which is similar to the one used for the main unit, but slightly smaller. A push-button is fitted to call the master unit.

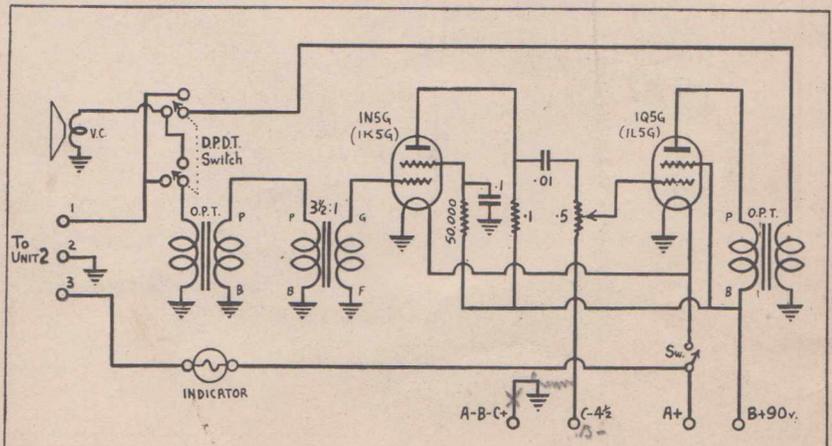
factory if given sufficient use to warrant it being switched on constantly.

The Switching

The construction of the outfit calls for only elementary knowledge, but there are a couple of minor points which may prove tricky. One is in regard to the wiring up of the switch. The diagram shows this quite clearly, but if there is any doubt an ohmmeter should be used to make sure that the switching is carried out as required.

The idea is to have one speaker feeding into one input transformer, whilst the other is connected to the output of the second, and when switched they should be completely reversed in this regard.

Incidentally, another point to watch is that the secondary and primaries of the output transformers are not confused. The heavy wire is always the voice coil winding and should connect up to the switch.



Circuit schematic for the master unit. At the extension the voice coil of the speaker is connected across Terminals 1 and 2, with a push-button between 2 and 3.

A POWERFUL VIBRATOR-OPERATED SET

This Month's Winning Entry in our Battery Circuit Contest

BEFORE going ahead with my essay, I would like to state that I have been permanently engaged in the radio trade for a number of years and had a couple of midget set designs published in "Wireless Weekly" back in 1934.

I have enclosed circuit of a 6-valve vibrator set. As probably the vibrator deal-wave will not appeal to you, I will deal with that after describing the set. I have chosen a set along the lines of your "Countryman's Six." It is not an attempt to follow on from this set. Indeed this set is not original (mine) — although drawn from memory — in any way at all, as the good points used were noticed in the course of service, and I had to borrow a circuit of your "Countryman's" set to see that I was not infringing on your design.

As we are 240 miles from Sydney and in the fading belt, I have found a sensitivity of 5 microvolts, or better, essential for any sort of daylight reception. Also, as 90 per cent. of our business is vibrator and battery receivers, I have a fair indication of the average countryman's desire of good receiver performance.

The circuit is somewhat elaborate, but all extras would not exceed £1 and no set of this type should be cheapened at the sacrifice of performance. I advocate only "Britannic" permature coils and intermediates. I do not wish to cause offence to any advertised lines, but in the remote chance of any extract of this essay being published I am sure they would

This essay submitted by —

Mr. R. BROWN

82 Victoria Street
Taree

be taken entirely as personal views. The types I have used are I.F.'s BT1 and BT2, broadcast coils BRP1/AE, BRP2/RF, BRP3/Osc., shortwave coils BP4/AE, BP5/RF, BP6/Osc.

For anybody not able to manage the switching I recommend B42B kit and ignore gramophone switching of circuit.

It will be noticed all screen voltages are fed independently for the purpose

of stability, the first essential in a high-gain set.

The next point: The oscillator grid leak is returned to the positive filament. This will be found to keep the oscillator grid current remarkably steady especially on the short-wave band towards the 40-metre end.

On service figures I estimate 40 per cent of receivers eventually fade away and drop out or low in oscillation top of short-wave band. These figures are gauged from 1,000 service jobs done in this district in the last twelve months.

The 50-ohm resistors tend to stop bursts of over oscillation which tend to occur sporadically in different spots of band.

The practice of shorting broadcast primary when the set is on short-wave band is also to be highly recommended, as is the idea of leaving pentagrid off the A.V.C. line when on short-wave, but I think A.V.C. desirable here on broadcast band.

The .1 mfd. by-pass on positive converter filament is good precaution when using series filaments. A .1 megohm stopper in return of second I.F.T. secondary by-passed both ends to earth and the load to negative filament (above ground) seems current and good practice in latest commercial productions. Blocking off of volume control entirely results in potentiometers being entirely noise-free indefinitely, whereas in normal hook-up they sometimes become noisy in the first month of operation. The service angle is the greatest bugbear to the country listener.

The A.V.C. system will be found to have the maximum of control on delay with almost entire absence of interstation noise and on a bad day that noise can be very considerable in country districts.

The 126 grids are returned to zero bias on filament to give maximum output (on vibrator hook-up only). The finished job, well aligned and with a 30/40 oz. permagnetic speaker, is capable of fine results.

A note re construction: Earthing systems — Small push-ups in chassis by chassis manufacturers appear to be the ideal way. This not being available, too much attention cannot be paid to running 18-gauge tinned copper wire to lug under every valve shield and coil can. In other words, connecting every earthed point together in a systematic way. Also this is very convenient as the wire, which

BATTERY CIRCUIT CONTEST

FIRST PRIZE £5 CASH

On this page is the first essay to win a prize in our Battery Circuit Contest announced in last month's issue.

We have not been surprised to find that the contest has aroused tremendous interest amongst our readers and we have had hundreds of letters of congratulation on the idea. We have also been happy to receive dozens of entries and, as will be seen from the one published, they are of a particularly high standard. We have not yet been able to read through all the entries so far received, but it is very evident that they contain a wealth of information which could not be obtained in any other way.

If you have any ideas about battery set design or operation, you are invited to enter this contest. There is no entry fee, but the coupon on page 38 of this issue should be filled in and forwarded with your essay.

The Prizes

For the essay we consider the best we will award a cash prize of £5. A free annual subscription, valued at 10/6, will be awarded to the writer of every other essay considered by us to be worthy of publishing.

Essays can be of any length, and no account will be taken of neatness, spelling or anything like that. What we are after is simply some practical ideas that are likely to help the thousands of our readers who are located away from the power supply mains.

Whatever possible, a rough sketch of a recommended circuit design should be included, mentioning where it was first seen, unless it is of your own origin.

Entries must be received by us not later than December 1, and results will be published in the January issue.

VIBRATOR SET (Continued)

should first be stretched in a vice will often pass conveniently by almost every component that is to be grounded.

The gang should be floated in all sets with rubber grommets made specially for this purpose and readily available with a solder lug under the four rubber washers, each connected together joined by gang wipers (independently connected) and then connect at all four points by braid (shielded wire case) to earthing system with all aerial, R.F. and oscillator coil by-pass returns meeting close by, also one wire (braid) direct from frame of gang to chassis.

I strongly advocate the use of tapped aeronoid spacers as binding posts and no panel strips whatever,

firstly, because it is then possible to by-pass right on valve sockets where they are most effective and also a very neat layout can be made as spacers can be mounted anywhere there is room for a $\frac{1}{8}$ " bolt.

Poor-class Bakelite

Secondly, there have been many poor classes of bakelite on the market, giving much trouble through leakage effects such as H.T. to A.V.C. and often giving instability troubles which should never have occurred. (An early term, "Moulded mud.") Also leads are sometimes longer than they are to be desired and condensers, etc., further away than they should be for good design. The use of ceramic condensers is a great help for long service in hot or very changeable climates.

I find that many intermediates with mica type trimmers have too great a

range on some. Consequently adjustment is extremely critical and any slight movement or warp in chassis will greatly upset same as well as being very subject to climatic effects.

Re iron core adjustment coils and I.F.'s. A wise precaution is to ease the core in ind out before putting in the set. These sometimes are stiff or become stiff, and a broken core in a completed set in an inaccessible position is not the best.

On all intermediate (iron core) alignment it is wise to short out oscillator section of circuit so that correct frequency may be obtained. Some have enough range to go to harmonics and humps, etc., but overall gain will be a sure indication of correct peak, etc. Capacity and leads around diode section should be kept at a minimum, and as leads on all iron-cored components are spaced about 1" apart, they must be brought through the chassis like this and kept isolated

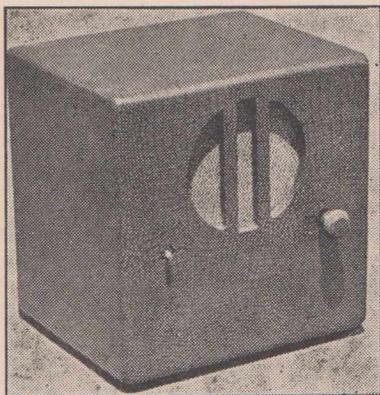


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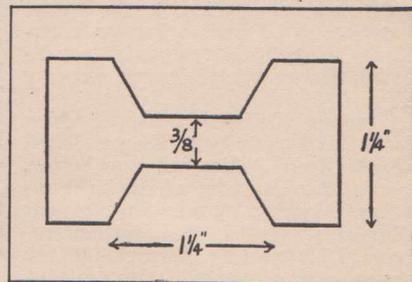


Diagram showing how the choke former is cut from a piece of broom handle. The winding is 40 turns of 18-gauge enamel wire, either layer or jumble wound, and dipped in household cement.

from one another as far as possible. The early way of leading several leads through one hole must be avoided at all costs.

Another point with these coils in regard to ease of perfect tracking — it is possible to calibrate reasonably accurately E, F, G, and H gangs with modern Efeo dials. The "H" type, of course, are recommended, as these have no bakelite mounting and are definitely superior on short-wave.

The early gangs will miss out on 1,600 k.c. calibrations, which seem to be on all dials, but at the present this does not seem to be important.

I have noticed many periodicals shy off construction of sets employing vibrators, but I am convinced that, if tackled with a little forethought, results equal to the best commercial sets can easily be obtained.

The whole secret, I think, is to entirely isolate the vibrator from the receiver circuit, especially L.T. Commercial vibrator units marketed generally have external terminals (unshielded) and are so congested that individual adjustment is extremely difficult to a competent radio man.

The following one will pan out about half the price of some.

I have used an external unit mounted

on the bottom shelf about 2 feet away from the set and connected to same by two shielded wires — kept to the most popular type of trembler 6-pin, 6v. synchronous. This job has been connected to 50 converted receivers of practically every brand of set with 100 per cent. results. I have kept to power choke, but a centre-tapped resistor may be used with 3rd electrolytic (2 x 24 mfd., 1 x 16 mfd. if desired) but, as secret of electrolytics — the reason why they became unpopular — I think is in totally enclosing components in airtight and moisture-proof cans.

Reliable Chokes

The present transformers on the market are so constructed, as are chokes, and I do not see any reason by which the choke should give any more trouble than the transformer if they are both treated the same. As many transformers as chokes gave trouble in early days.

The low tension hash choke is easily constructed and is not at all critical. The removable chassis inside the vibrator box is a good help. Lid batten and chassis are all held in place by six self-tapping screws, each to avoid any trace of field or directional hash. A push-on fit and all contact places cleaned would no doubt suffice, but our boxes are ducoed right over. In any case, a tight fit and screws biting in, seal it well electrically.

It is well not to put socket connecting to vibrator too close to the tuning end of chassis, and the two .5 mfd. must be right at the socket. Negative return of the vibrator unit is O.K. by using braid of shielded wire, no separate return being necessary.

The pilot light hash choke is also essential.

If any hash is noticed, the socket at the chassis is the most likely place to effect a cure, and it is well to remember that the higher the frequency it occurs at, the smaller will be the by-pass needed to effect a cure. Possibly a little may occur on short-wave, and a .0001 on L.T. or .005 approx. on H.T. will be found to effect a cure. A .1 meg. resistor across the vibrator itself is a great help.

The box is also very accessible, being separate, and many troubles which occur through mounting on the chassis are non-existent.

I have tested many vibrator sets from the production line but have found this layout to be much more uniform in results.

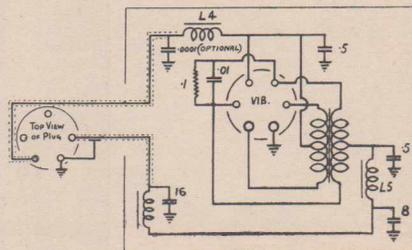
Overall sensitivity of the receiver should be better than 3 M/v each end of the band.

Re L.T. filter chokes in 6v. valve jobs. Two are not essential but are desirable for lack of hum.

Peculiar Hum

A peculiar trouble common to many vibrator sets is the high hum level with the volume control shut off, disappearing as the control is advanced. Two suggested cures — the condenser in the control grid of the second detector "Z" increased to .1 mfd. This sometimes appears to cut off below hum frequency, but the most effective is trying the negative cable (shield) from the 6v. input at different spots on the chassis away from the volume control earthing. Hum will be first heard to rise to point where the vibrator noise is audible also and, in correct position, to almost entirely remove all trace of same.

This sounds like laboratory work, but if readers are capable of constructing 8-valve dual-wave A.C. jobs, then this should give no trouble. They are expected to, and do go through here with no more trouble than ordinary service jobs. I admit that laboratories in town spend a long time on design and still have production worries re hash even with every wire in every set identical, but after 50 jobs I think I have proved this job O.K. I even have one (with box)



Schematic of the vibrator unit, showing the full filtering which is required to give noise-free results when maximum sensitivity is used on short-waves.

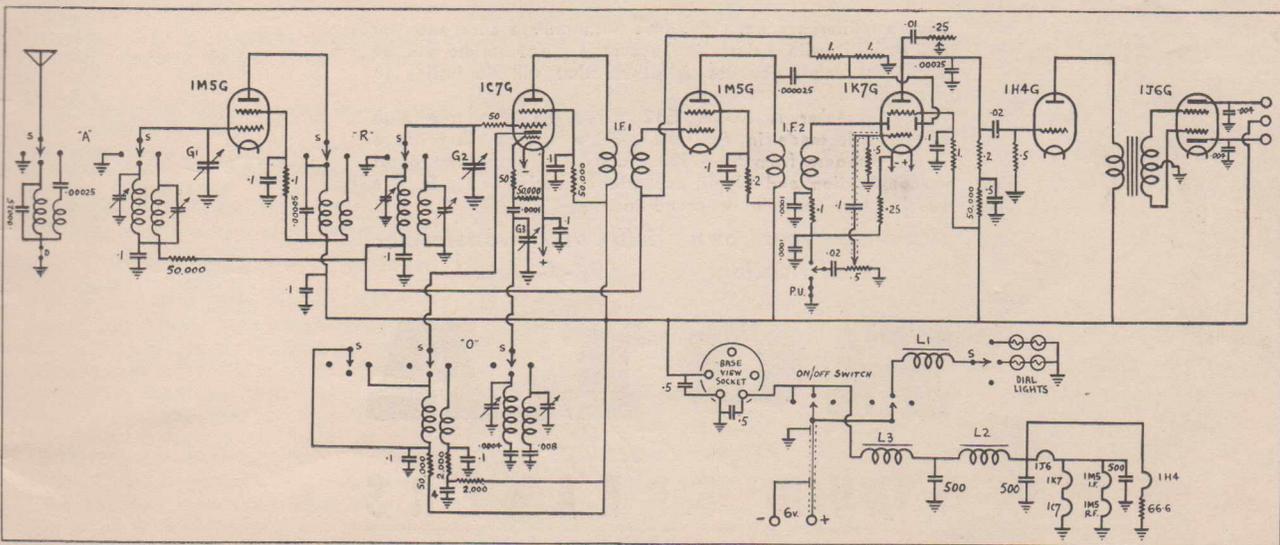
mounted directly on chassis of tuner of genemotor-powered P.A. outfit, with entire absence of noise.

As "B" batteries are now severely rationed, I am sure the vibrator will be the first choice of many.

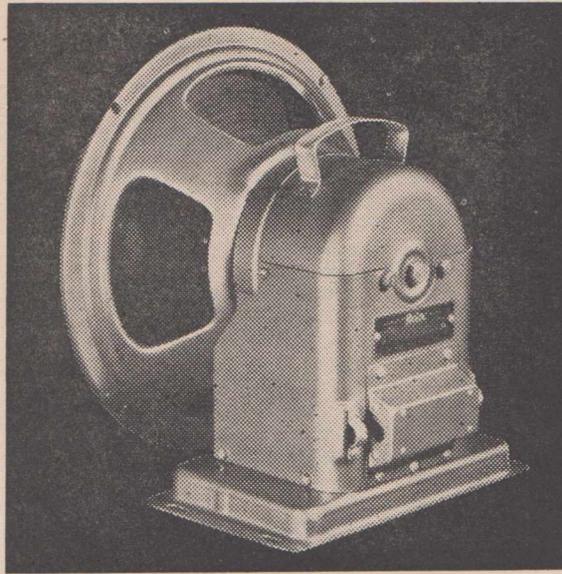
I have not touched on other systems of vibrators, such as tapped accumulator, i.e., 4v. vibrator unit, 2v. parallel filaments, with right way battery, as wrong connection of these cables paralyzes all valves and is not at all foolproof. One set of valves per week to people who have owned this type for a couple of years is good proof of this.

The split reed vibrator introduces a

(Continued on page 38)



Circuit of the vibrator-powered dual-waver, showing the intricate coil switching. Great care should be taken to observe the filament circuit and filtering.



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MOST of our readers have a fairly comprehensive knowledge of radio theory and practice. They have a pretty fair idea of how to go about the construction of a set without any need for picture diagrams or even the written instructions. Give them a circuit schematic and a kit of component parts and it is only a matter of a few hours before

The smaller receivers can be most difficult to stabilise and get into perfect operating condition. There is no reserve of power available, so that it is essential to have them in perfect condition in order to get satisfactory performance.

Little sets of one or two valves are O.K. for headphone work, but even those can give a lot of trouble with regeneration which does not behave itself.

1941 NUGGET

Parts List

- 1—Base, 11" x 7" x 3" (Arcadian).
- 1—Power transformer, 80 mA.
- 1—Coil kit with intermediates (Radiokes, R.C.S., Crown).
- 1—2-gang tuning condenser (Stromberg-Carlson).
- 1—Dial to suit (Radiokes, R.C.S., Crown).

CONDENSERS:

- 2—8 mfd. 500v. electrolytics (T.C.C.).
- 2—25 mfd. 40v. electrolytics (T.C.C.).
- 5—.5 mfd. tubular paper condensers (T.C.C.).
- 2—.1 mfd. tubular paper condensers (T.C.C.).
- 1—.02 600v. tubular paper condenser (T.C.C.).
- 1—.00005 mica condenser (T.C.C.).
- 2—.00025 mica condensers.
- 1—.0001 mica condenser.
- 1—.005 mica condenser.

RESISTORS:

- 1—2,000 ohm wire-wound resistor (I.R.C.).
- 1—350 ohm wire-wound resistor (I.R.C.).
- 1—250 ohm wire-wound resistor (I.R.C.).
- 5—1 megohm 1-watt (I.R.C.).
- 1—.5 megohm 1-watt (I.R.C.).
- 1—25 megohm 1 watt (I.R.C.).
- 2—50,000 ohm 1-watt (I.R.C.).
- 1—40,000 ohm 1-watt (I.R.C.).
- 1—20,000 ohm 1-watt (I.R.C.).
- 1—500,000 ohm volume control (I.R.C.).

VALVES:

- 1—6J8G, 1—6U7G, 1—6B8G, 1—6V6G, 1—5Y3G (Mullard, Brimar, Philips or Radio-tron).

SPEAKER:

To suit 6V6G, with 2,000 ohm field (Rola or Amplion).

SUNDRIES:

- 5—Octal sockets, 1—4-pin socket, 3—valve cans, knobs, power flex, hook-up wire, terminal strips, solder lugs, screws, etc.

they have finished off a completely satisfactory receiver.

But all such things must have a beginning. There never was an expert who was not, at some time or other, just an inexperienced novice.

So, whereas most of our articles are written in a manner to suit the experienced radio men, here is one which should be of help to those just starting out in the set building game.

To some it may seem that a fairly complicated dual-wave receiver is not the ideal start for a beginner, but on this point we feel certain that we are right in recommending such a receiver.

Standard Type

But with the standard type of five-valve dual-waver there is ample reserve of performance and nothing tricky about obtaining stability.

The coils are being produced in thousands and quite a large proportion of these go straight to factories, where sets are rolling off the production line at so many per hour. Needless to say, there is no chance of any mistakes being undetected under such circumstances.

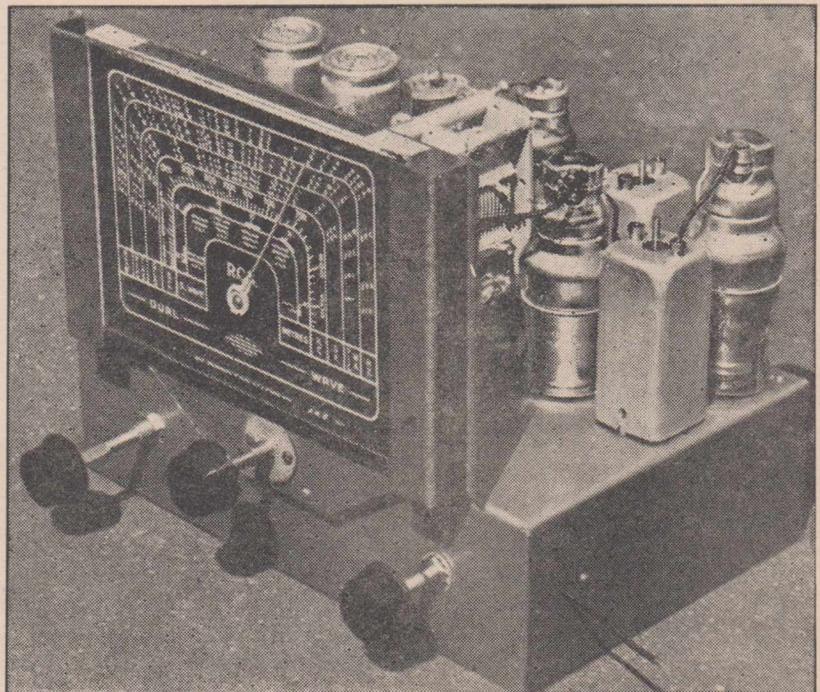
The coils and intermediate transformers are produced to close tolerances for this mass-production factory requirement, and this accuracy



A rear view of the chassis.

still holds good for home-built sets. In dozens of cases which have come under our notice we have found that novice set-builders have been able to assemble their sets and get immediate results without any alignment adjustments of any kind.

Another attraction of building a set of similar type to the most popular commercial models on the market is that there is not the slightest likelihood of experiencing trouble in getting assistance should things go wrong. If you build some extraordinary freak set you may find that



Front view of the completed chassis.

1941 NUGGET (Continued)

you can't get it to go properly, and then when you show it to the local radio serviceman his face will show his amazement when he is asked to delve into its intricacies. But surely every radio serviceman has had experience with the popular style of five-valve dual-waver and will soon be able to indicate the reason for any unsatisfactory performance which may be encountered.

Obtaining the Kit

The first step is to obtain a kit of component parts, and here again will be found the advantage of working on a standard type of receiver, for the man behind the counter will be fully

acquainted with the ins and outs of the various brands and types.

There is no particular reason why you should not go around town shopping for the various components one at a time, thereby saving a half-penny here and a half-penny there, but we strongly advise against such a procedure, especially if you are making this your first effort.

It is especially important, for instance, to have the base to suit the dial mounting, to have the dial calibrations suit the type of gang condenser used, and the gang to suit the coils. Unless these are all matched, there is every chance that the stations will not fall on their proper markings on the dial. This in itself is not so vitally important, but, on the other

hand, if the dial, gang and coil matching is correct the dial calibrations can be used to give a valuable guide to correct padder adjustment.

Assembly

First step in the assembly is to fit the valve sockets into the base, with the necessary valve can bases under the heads of the screws. Each socket has an indicating loop on the circular hole in the middle and these loops should be fitted so that they face in the direction as shown on the wiring diagram No. 1. This is most important, as otherwise the whole of the socket connections will be wrong, possibly resulting in damage to the valve.

Then the two intermediate transformers can be mounted, and also the power transformer.

Now the wiring job can be started by wiring up the filament circuits, the only difficulty being that of soldering. To those who have not had any experience with a soldering iron, the job of wiring up a set looks so easy, but proves most difficult. The difficulty, however, soon disappears when you use the right tools and materials in the right way.

It is a great help to have a good electrically-heated soldering iron and, since these tools are available at a price of under a pound and will last a lifetime, they can be considered as a good investment. Then it is a further help to have the right kind of



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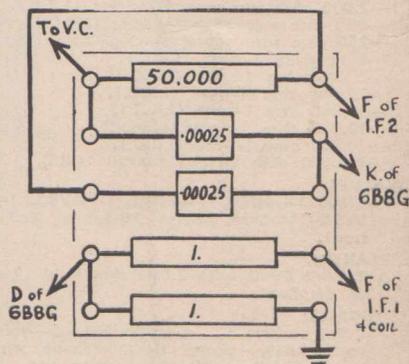
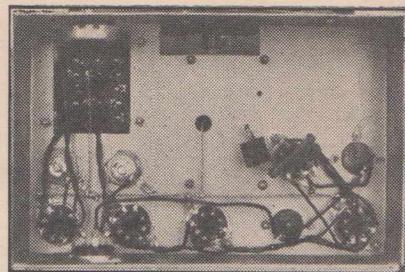
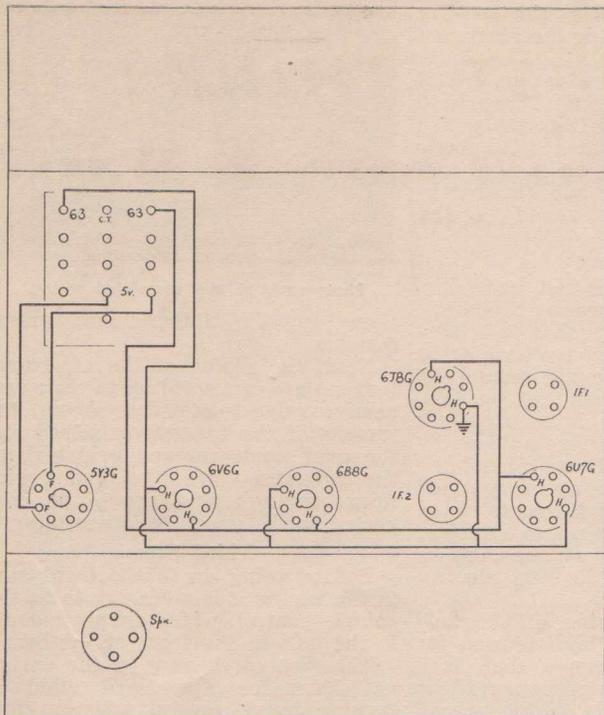


Diagram showing the arrangement of the second terminal strip.

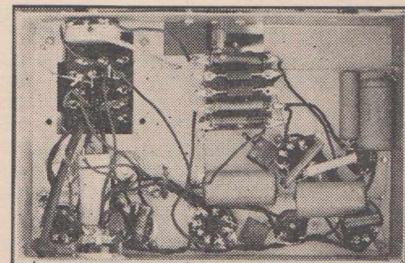
hook-up wire, with tinned stranded copper which will take the solder readily and insulation which can be pushed back to bare the cable. Resin-cored solder is a further help, but even so a tin of Fluxite or other soldering flux should be on hand to make certain of the more difficult joints.

The idea in soldering is to get the solder to run thoroughly on to both the wire and the terminal first, and then put the two together and apply just the right amount of heat from the iron to both portions of the joint so that they fuse together perfectly.

At left: The diagram of the first step in the wiring, with the photograph below to show the appearance of the chassis when this step is finished.



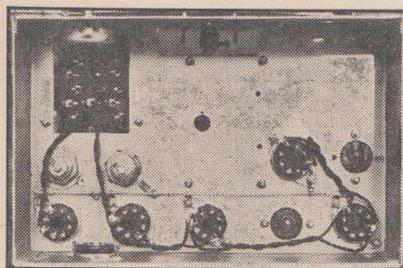
At right: Photographs showing the appearance of the wiring after the second and third steps have been completed.



mentioned before, in most cases the set will give reasonably satisfactory performance immediately it is switched on. As soon as the valves have had time to warm up it should be merely a matter of swinging over the dial to pick up stations.

Selecting a station at the lower end of the dial (down around 2SM), the dial should be attached to the shaft of the gang condenser in such a manner that the dial pointer falls on 2SM, or whatever station is being used. Then on swinging up to the other end of the dial it should be possible to bring in 2FC, and if this does not fall according to the dial marking it should be merely a matter of pulling it into place by adjusting the padding condenser of the coil unit.

Returning to a station about the middle of the dial, a check may be made of the general alignment and the
(Continued on page 25)



NUGGET (Continued from page 13)

tached and so they are not mounted up on the terminal strips.

The Terminal Strips

Two separate terminal strips are used and the components are mounted on these as shown in the diagrams, and the terminals connected up.

After the rest of the wiring has been done, wires are brought up from the points indicated, so that when the terminal strips are mounted it is only a matter of minutes to connect them up.

Above-base Wiring

There are a few above-base wires, but these present no difficulty.

After the gang condenser and dial have been mounted, the gang leads are connected up and the cap clips fitted to the leads coming through to the caps of the valves.

The Power Lead

Shown in wiring diagram No. 3 are the power leads which bring the a.c. power supply to the power transformer. These are the really danger-

ous wires and should never be touched whilst the set is switched on, or even when the set is switched off, unless the power plug is completely withdrawn from the power supply. Needless to add, great care should be taken to see that these wires are firmly soldered to the terminals and thoroughly insulated. Where the power lead comes through the metal of the base a rubber bushing should be provided to make certain that there is no chance of the insulation being scraped off the power wires.

Alignment

Alignment instructions are supplied with coil units, and these instructions should be carried out, although, as

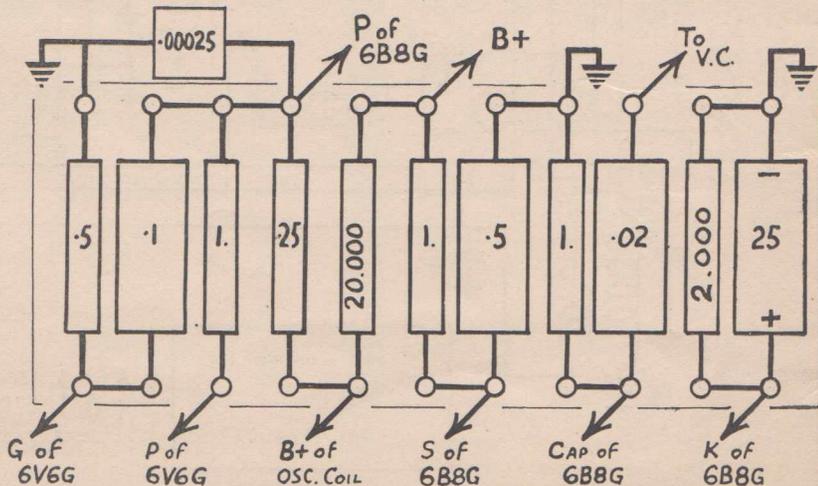
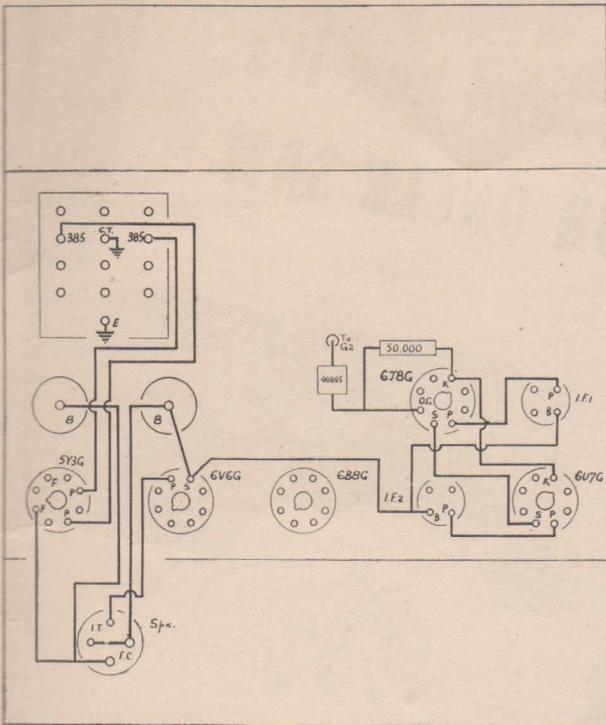
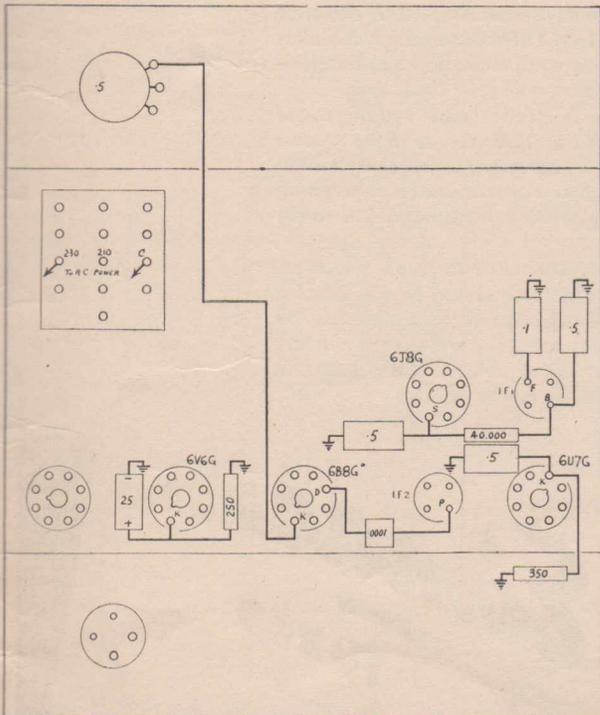


Diagram showing connections to the main terminal strip.



The second step in the wiring, showing how the high tension is picked up from the rectifier socket, fed through the speaker field and then on to the main high tension terminals.



The third step in the wiring job, showing the connection to the volume control and also the mounting of several minor components which are tucked away against the base, instead of being lifted to the terminal strip.

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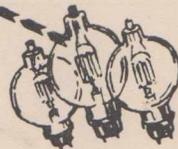
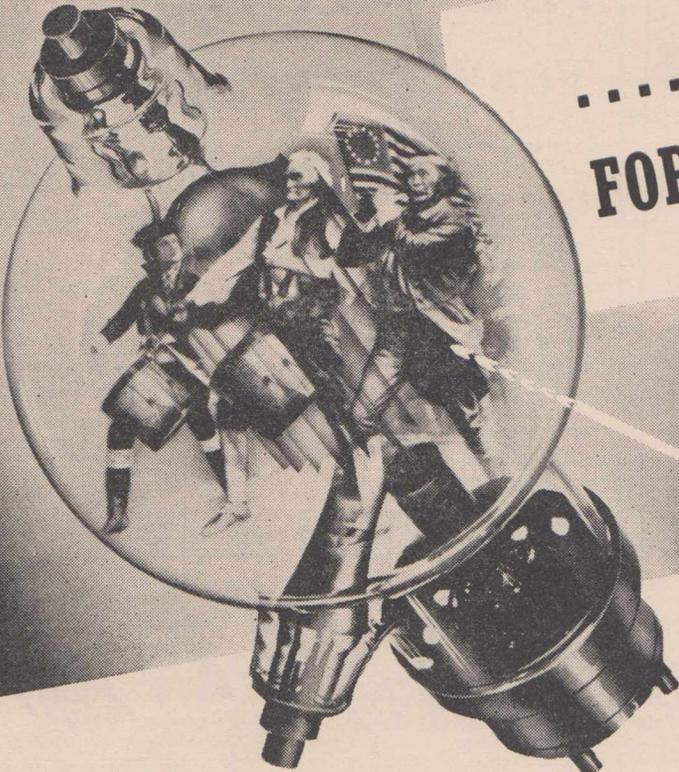
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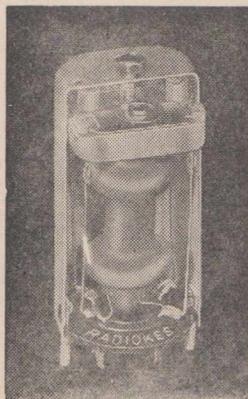
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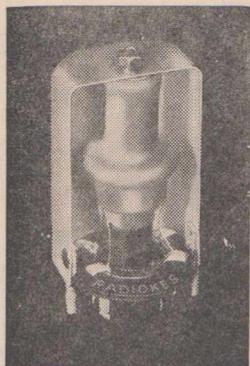
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(Continued)
grid feedback).

Tone Control

"Ah!" sneers pseudo-expert, "it can't be so good if you've gotta chop off the highs and harmonics." However, acoustics, voices, records, gramophone needles and tastes vary considerably. A tone-control of the old-fashioned high-cut type is very useful for reducing record scratch and some types of acoustic feedback, especially when a crystal microphone is used. If you are interested in a high-cut, high-boost tone control, the circuit is easily modified and only an extra condenser is necessary.

Inputs

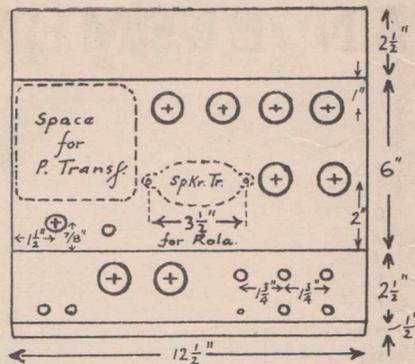
Jacks were used in this particular amplifier, but tip-jacks, valve sockets, spring terminals or even banana plugs could be used. If metal jacks are unobtainable, a valve socket is probably the best. The unused contacts are earthed. A medium level crystal microphone and a modern magnetic pickup give good results. The D104 (Astatic) and the 9822A (Shure) mikes are quite suitable, as are the Garrard and Amplion pickups. Input sockets and wiring should be as far as possible from the power transformer, the choke and from the filament wiring. The load on the pick-up is reduced at low volumes to give tone compensation.

Outputs

A 20,000-ohm centre-tapped speaker transformer is mounted on the chassis, the secondary being connected to the two speaker outlets which are in parallel. These sockets and their plugs must make good contact. The speakers used were Rola 12/20 per-mags. Mounting the speaker transformer on the chassis has the advantage that breaks between the plates of the output valves and the H.T. supply are less likely to occur. (If the transformer were on a speaker, say, 30 feet from the amplifier, and a single break occurred, then one of the output valve screens would glow a beautiful bright red and possibly melt.) By using permags with the "voice-coil leads" extended, there are no high voltages between the speaker wires and no-one gets the thrill of a lifetime if they touch them where the insulation has frayed. The speaker leads should be twin power flex for best results. DON'T use the speaker cords sold in shops; their resistance is far too high — about 100 times too much!

Layout

The diagram shows the development of the chassis. An extra inch each way would make things much easier if you are not adept at jigsaw puzzles. The original chassis was of



Development of Chassis. (Ends of wood 6x2½x¾).

gauge 24 black sheet iron with wooden blocks in the ends. Socket holes were cut with an ordinary brace and centre-bit, after an 1/8-inch hole was punched at the centre. The small holes for volume controls were first drilled 1/4-inch diameter and then filed to size.

Wiring

The order of wiring is particularly important. The filament leads were connected first, keeping them right in the angle between the back of the chassis and the top. Then came connections between one valve and the next, then all leads to H.T. supply, then grid circuits (if not already done), then volume controls and jack wires. Last of all, an earth busbar (16-gauge) was run up and down the chassis and all resistors and condensers to be earthed were connected to it, as was the chassis (near the inputs). After getting the amplifier going, try earthing first one side of the filaments, then the other, to see which way gives the less hum. If excessive hum is present, connect one side of a .1 m/F. condenser to "earth" and then try connecting the other side to (a) grid of first valve, (b) plate of first valve, (c) grid of second valve, and so on, until the source of hum is narrowed down. It may be due to a resistor too close to the filament wiring. The metal covers of the volume controls should be earthed. The first valve and possibly the second may require shielding.

Using the Completed Amplifier

Keep the speakers as far as possible from the microphone, yet at the same distance from the audience. Howling due to acoustic feedback can be reduced by shifting the speakers, using short horns on the speakers, reducing the gain, or changing the tone.

When playing records, keep the tone-control towards the bass position until the music starts, to avoid "needle hiss" and to hide any scratch. If the amplifier is used to provide dance music at a large party, keep

(Continued on page 38)

AN ELEMENTARY SIGNAL TRACER

IN OUR September issue we described a signal tracer outfit for servicemen. This article, which was contributed by Mr. John Bristoe, radio manager of Denham's, of Maryborough, Queensland, created immense interest. We have been quite unable to answer the dozens of enquiries we have received from dealers who have immediately appreciated the value of

Designed by —

JOHN BRISTOE

Denham's Radio, Maryborough, Q.

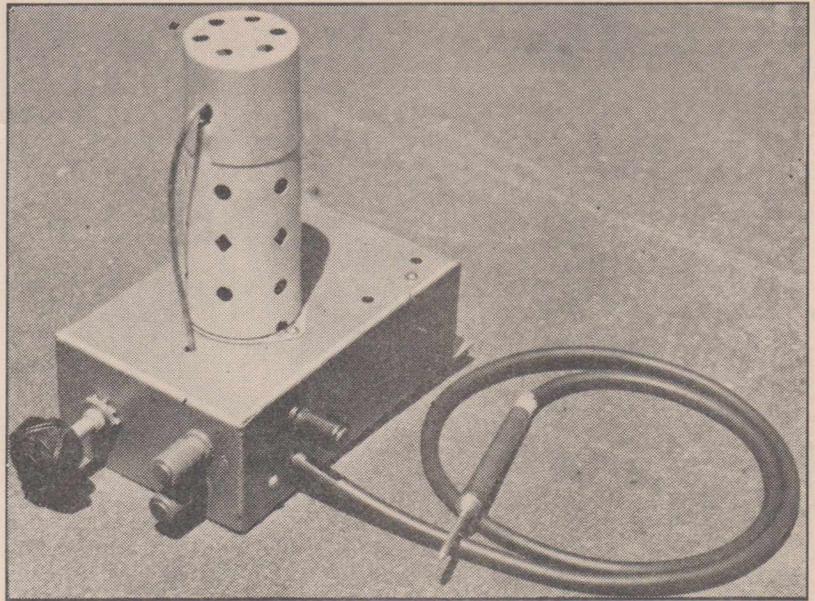
such equipment, and yet they cannot fully grasp the full features of the design of this rather elaborate equipment.

Rather than attempt to deal with the many points raised, we feel that it is best for us to detail a much simpler equipment, which will prove of wonderful value in any service or radio repair workshop, and give a complete insight to the underlying principles of the operation of this type of equipment.

So, as a result of further co-operation from Mr. Bristoe, we are able to describe an elementary type of signal tracer which can be either a.c. or battery operated, in both cases using a battery for high tension.

Few Components Needed

In either case there are only four or five components in all, and the little signal tracer can be built and put into operation within a few minutes. It



A photo of the complete signal tracer, which uses only three of four components and yet has a thousand uses.

will immediately reveal the many ways in which it can be used to assist in repair work. Hitherto complex troubles, such as intermittents and distortion, faulty components, shorted or leaking by-pass condensers, shorted or open transformers of various types, open or short-circuited resistors and tuning coils, in fact just about every possible fault in a receiver, can be quickly and easily located with a signal tracer.

With such a simple signal tracer, of course, there is no claim that it can do miracles, but we can strongly recommend it, as working with this elementary job will prove a perfect foundation for deeper work with one of more elaborate design at a later date.

Signal Tracing Explained

Signal tracers are quite simple to
(Continued on next page)

For All . . . Radio Receivers and Test Equipment



No piece of equipment is better than the valves it uses . . . no one can afford to take the risk of breakdowns or unreliability. That is why every builder should —

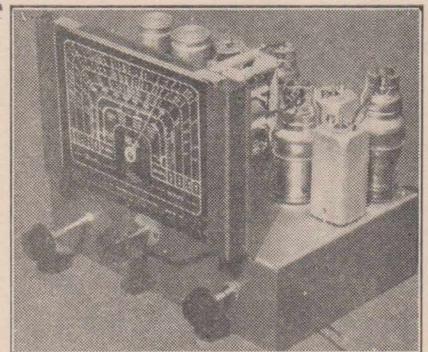
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Mullard Valves have that extra reserve of efficiency and dependability that has made the name of Mullard a household word wherever the British flag is flown.

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Mullard



For the "Nugget" dual-wave receiver the following MULLARD valves are recommended: 1—6J8G converter, 1—6U7G intermediate amplifier, 1—6B8G diode-pentode detector, 1—6V6G beam power output valve and 1—5Y3G rectifier.



AUSTRALIAN MADE
 . . . always available



Behind Australian-made Radiotron Valve equipment stands the largest radio valve manufacturing organisation in Australasia — extensive works, modernly equipped — skilled engineers, experienced operatives — production capacity equal to maximum demand.

For Initial Equipment, Replacement Types, Modification needs —

ALWAYS SPECIFY . . .

RADIOTRON

Advertisement of Amalgamated Wireless Valve Co. Pty. Ltd.

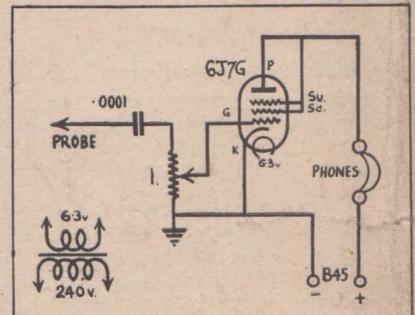
SIGNAL TRACER (Continued)

understand. Take a look at the circuit diagram of this job, and you will soon figure out what it is all about.

If the probe is connected to the aerial terminal of any set, you have an untuned one-valve set. Then, by placing the probe on the grid of the first valve, you have a one-valve set that can be tuned by turning the gang condenser on the set being tested.

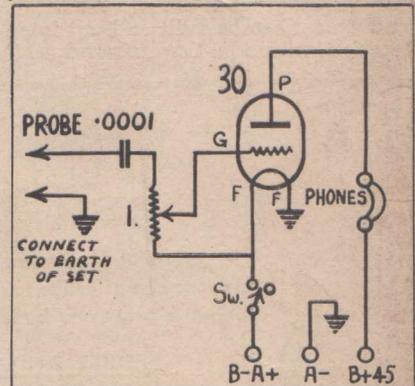
So far the signal tracer with the probe in the above position creates an ordinary one-valve receiver.

Now move the probe to the plate of



Circuit of the a.c. version, with indirectly-heated valve, but battery for the h.t. supply.

the first valve; this valve is the T.R.F. amplifier, with the signal tracer acting as a detector. However, if the set being tested is an ordinary superhet without an r.f. stage, the probe would be placed on the plate of the mixer. This would make a two-valve superhet with the signal tracer acting as the output valve and detector. Proceed right through the radio from grid to plate until the plate of the second



Circuit of the battery-operated version. A 1.4-volt valve can be used if preferred.

detector is reached, and note how the signal tracer automatically merges itself into the circuit as you proceed. To this stage the signal tracer has been working as a detector. From here on, it works as an audio amplifier.

This will give an idea of just what signal tracing is, and this system can be tested with little expense by the instrument for which the circuit diagram is given.

Interesting Experiments With Amplifiers

FROM one of the competitors in last year's Amplifier Championship comes a letter to tell of further experiments with amplifiers and speaker baffling. As we know that a large number of our readers are interested in these subjects, we are printing his letter in full. Here it is:—

"As promised, I am sending you some details of my experiments with amplifiers.

"I always use a separate power supply, with two switches on this base, one for the 5Z3 and the other for switching in and out the first filter condenser, changing from choke input to condenser input. I also use a separate base for my output transformer.

Remarkable Sensitivity

"I use one to three speakers. All are 8-42 permags. Owing to their remarkable sensitivity, I suggest that anyone intending to experiment with different amplifiers should use one of these speakers, thus eliminating all problems associated with the energizing of field coils.

"The speakers are matched to a 500-ohm line. A tapped-secondary push-pull transformer is mounted on a separate base with selector switch and outlet plugs.

"By using different numbers of speakers and tapings, various loads may be obtained covering most output valve load impedances.

"I have a folded horn type speaker box, and to hear one with various output valves would surprise you, as you would not believe it unless you heard it. I have used 6L6G's, 6A3's, 6V6G's, 45's, all in push-pull, as well as single ended.

"I have a K12 and, even with a 3-foot square 1¼-inch thick board, with a tunnel 14 inches x 14 inches x 21 inches, felt-lined, and 20 watts in the field, it is not as good as the 8-42 in the folded horn box. I have used all sizes of amplifiers on this box, and even a single 76, with 90 volts on plate, is very loud.

"I built a small box with flares on it, to take out on Sundays in the car. I used a 6C6 and 6V6 or 6L6G, with about 20 per cent. feedback, 135-volts plate and screen, and this two-valver sounds good in the bush among the trees.

Power with Low Voltages

"A single EL3, with 50 volts plate and screen, is loud enough for a room and, with 145 volts at 15 mA., the volume is too loud, showing the sensitivity of these speakers.

An Invitation

"Should any reader like to try his

By

ALBYN E. HUGHES

18 Gordon Street, Marrickville

amplifier on my box, I would be only too pleased to allow him, and he could note any difference in output or quality.

Box Baffle

Fig. 1 shows the construction of the box baffle, or acoustic labyrinth, as you might call it. You will notice that it is designed exclusively for the eight-inch type of permagnetic speaker. It is made up out of plywood of 5/8-inch thickness and is solidly put together without any air

leaks apart from the column formed by the back plates. All joints are firmly screwed with heavy wood screws about every three inches. Although not essential, it is good practice to line the inside of the box with hair-felt or some absorbent material of some kind.

Stereoscopic Effects

"Fig. 2 shows a method of fitting a separate speaker to separate the highs and lows so as to allow the box baffle speaker to handle the lows to perfection, whilst a separate speaker handles the highs.

"The high note speaker is mounted on a simple baffle board of quite small dimensions, about nine inches square,

(Continued on next page)

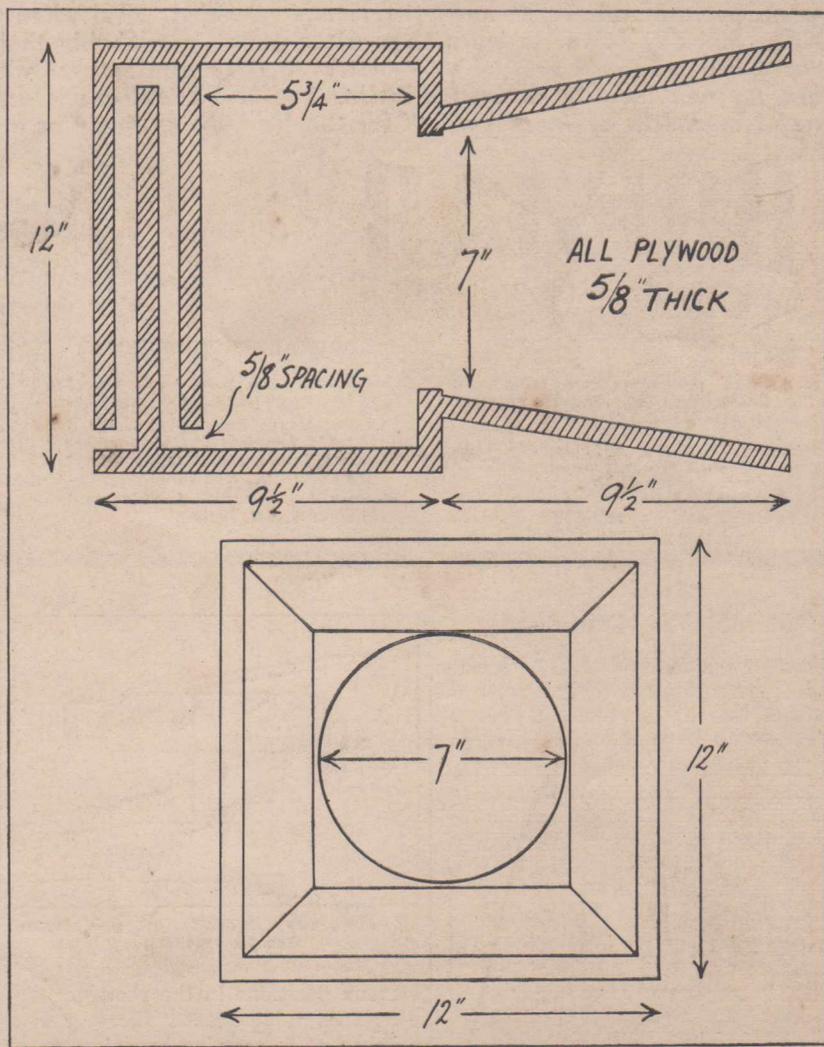
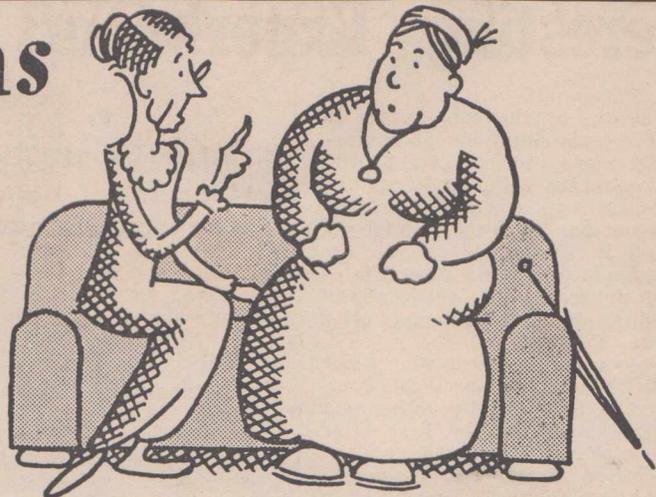


Diagram of the portable box baffle with flare and acoustic labyrinth, suitable for use with 8" permagnetic speaker.

reputations going cheap!



THE most vital part of any Radio is its valves.

The serviceman who sells cheap valves to unsuspecting customers is selling his reputation — and selling it very cheaply. Some of the public may be hypnotised by the lure of price, but when performance falls short, the trance is ended. And when they wake up, it doesn't make them feel any better to learn that, after all, it is probably their own fault. They will blame the dealer who sold the valves — not even the manufacturer who made them, for to them he has no real identity. But with BRIMAR — the British-made valves — you're always safe . . . never any kicks or "comebacks," for they're built as finely as a watch.

BRIMAR

BRITISH MADE VALVES

- ★ Because of their definitely non-microphonic properties, BRIMAR valves are especially suitable for portable radios.
- ★ Your nearest BRIMAR Distributor has ample stocks, and can assure you prompt delivery.

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Standard Telephones & Cables Pty. Ltd., 71 Magellan Street, Lismore.

S.T.C. Radio Sales and Service, 389 Hunter Street, Newcastle.

Queensland: Trackson Bros. Pty. Ltd., 157-9 Elizabeth St., Brisbane.

Victoria: Noyes Bros. (Melbourne) Ltd., 597-603 Lonsdale St., Melbourne.
Standard Telephones & Cables Pty. Ltd., Bourke Street, Melbourne.

Western Australia: M. J. Bateman Ltd., Milligan Street, Perth.

Tasmania: W. & G. Genders Pty. Ltd., 69 Liverpool Street, Hobart, and 53 Cameron Street, Launceston.

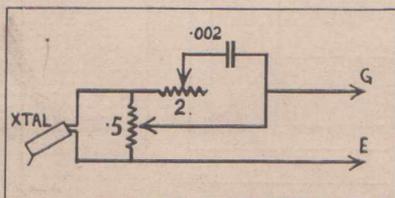
South Australia: Radio Wholesalers Ltd., 31 Rundle Street, Adelaide.

New Zealand: Standard Telephones & Cables Pty. Ltd., Trojan House, Manners Street, Wellington.

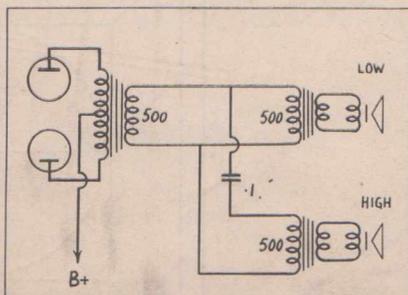
EXPERIMENTS (Continued)

without any sides or back. As hardly any of the low note response is handled by this speaker, it is not necessary to have it well baffled.

"The high note speaker can be wired to long leads and moved about to



Tone control circuit for use with crystal pickup.



Discriminating network for use with stereoscopic speakers.

various positions in the room to give a stereoscopic effect. There are a number of interesting experiments in acoustics which can be carried out

with two separate speakers in this way.

Tone Compensation

"Fig. 3 shows the tone compensating network which I use to get added brilliance from the crystal pickup at low volumes. The high output of the crystal pickup makes it usual to operate this unit with the volume control set back quite a way. Sometimes this tends to affect the brilliance of the unit, but I find that the 2-megohm potentiometer, used as a rheostat in conjunction with the .002 mfd. mica condenser, will remedy this difficulty in a most effective way.—Yours, etc.,

ALBYN E. HUGHES.

18 Gordon Street,
Marrickville.

HOW TO USE YOUR OSCILLOSCOPE

THE oscillograph is the most versatile and one of the most useful instruments yet offered to the radio field.

Yet it has unfortunately (in this country) not achieved a great deal of popularity. There is only a small percentage of the radio world fully alive to the potentialities of this instrument.

There seems to be one good reason for this. That is the difficulty of obtaining reliable information on how the cathode ray may be applied, and more especially, how it may be interpreted.

The mass of contemporary literature which appears on the subject cannot be too greatly damned, and the fact it has failed to help popularise the instrument is a sure proof of its inexactitude. The general trend of these articles is to purport to completely explain all about the oscillograph in about two easy lessons, and, anyway, using them is just too, too easy, so you had better hurry and buy one before it's too late.

Such statements have only helped to confuse and make cautious technicians who otherwise would have become adept at using the cathode ray tube.

Analysis of Results

At present, to satisfactorily analyse the results possible with the instrument, a small library is the only solution, and the average technician cannot be expected to do literary research as well as engineering.

Applications — Customer Confidence

But suppose that such information were available. Suppose you knew just how to use that oscillograph to give you the picture of events, and suppose you knew how to analyse what is on the screen.

Just in what way, you ask, can it help in my work?

Let us take some of the points by which its true value may be assessed.

Firstly, the major point — customer confidence. If your clients see "pretty pictures," they may be awed, but it doesn't help when they see you are too! If you handle that "peculiar gadget" with surety and ease, their respect is immediate.

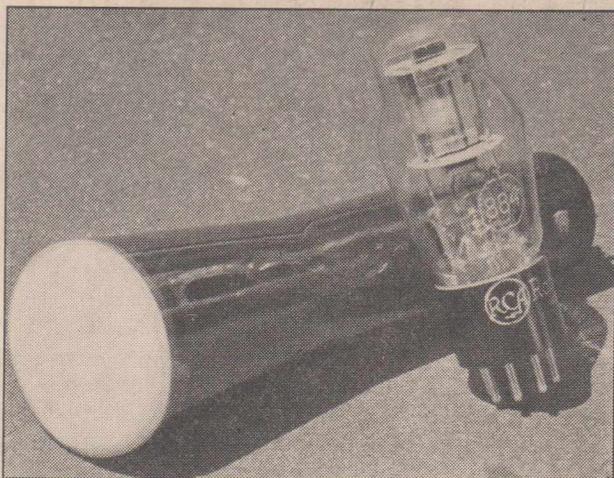
Coupled to the output of a set having distortion, it is only a matter of a moment's logical thinking to discover which component can cause the particular effect taking place.

Distortion previous to the detector can be immediately localised.

Again, very rapidly, you may determine whether "unpleasantness" is due to frequency response or plain overload.



Important factors in the C.R.O., the type 902 electrostatic cathode ray tube, and the type 884 gas triode for its sweep circuit oscillator.



Are you sure you have correct matching or are operating valves at their correct points? The oscillograph will tell you instantly which circuit is going wrong, and save you hours of experimenting. Do you want to check your special tone systems without

Special Receivers

Today's receivers, with volume expansion, variable selectivity, inter-channel muting, automatic tone compensation, push button tuning, delayed and amplified A.V.C. circuits — all are highly engineered jobs. How can a set be completely rechecked and adjusted without the engineer's tools. More and more the days of makeshift are passing. And with each passing day a higher demand is placed on the man who must work in the field, competing with highly-specialised jobs and equipment.

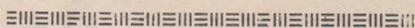
The amplifier whose hum is too much, but which no amount of filtering lessens. Why not see what it is and where it starts, then do something?

Do your testers align your "flat-topped" intermediates? Or does everyone just hope for the best?

Do you want to observe your valves working under dynamic conditions? And just which harmonic is the worst and where is it coming from and why anyway, in your set, amplifier, or just your "brainchild"?

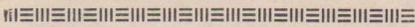
That "noise" you have been trying to locate for three days in Mrs. X's

(Continued on page 25)



THE C.R.O.

This is the first of a series of articles on the cathode ray oscilloscope, and should show to every radio man that it is well worth his while to become acquainted with the practical advantages of this type of equipment. Watch for further articles in this series.



driving the neighbours mad from the B.F.O.? The C.R.O. is your "silent talker."

Is your oscillator modulated or is there a superposed wave on the carrier?

Do you want to know if the phase shift in your feedback amplifier is causing trouble?

That hum or motorboating which is so darned difficult to cure. Is it really hum, or is high-frequency oscillation causing one of the grid circuits to "block" and so motorboat?

That set you repaired but were never really satisfied with. It had a raspiness, and you did lose a good customer. The oscillograph would have told you had you only known how to make it.

That rectifier which is always blowing, even if you have tried "eighteen circuits." Why not measure the peak current with your oscillograph? No meter will tell you the truth here.

THERE'S AN

ARCADIAN

CHASSIS

For Every
Radio Circuit

**JUST
OUT**

THE AUSTRALIAN OFFICIAL RADIO SERVICE MANUAL

VOL. 4, 1940 & 1941 CIRCUITS

Bigger and better than ever, this year's Australian Official Radio Service Manual covers both 1940 and 1941 national receivers—and there is **no increase in price.**

Clear, concise, accurate, this book is specially compiled for quick, easy to follow reference. It is the one standard book of Australian receiver circuits — there is **no other way** of securing complete year by year reference of every national model.

The four volumes of the Radio Service Manual cover the five-year

period 1937 to 1941. To the fortunate owner of these easy-to-carry books, guesswork and calculations are avoided. There, in a moment, is the wanted circuit and data.

Owing to restrictions on new models, the 1940-41 volume will be the most valuable yet produced since it will be current during the war, and no further issues will be published for the duration.

But be sure to place your order now as, owing to the paper position, the issue is definitely limited.

IT'S THE LAST FOR THE DURATION OF THE WAR

You will save the cost of the Radio Service Manual on the very first set you service with its aid. It is the greatest time and trouble saver a serviceman could have.

The latest number, Vol. 4 (1940-41 circuits), sells at the usual price of 15/- (stiff cover), and 12/6 (limp cover).

A small quantity of previous issues is available — Vol. 3 (1939 circuits), 15/- and 12/6; Vol. 6 (1938 circuits), 10/- and 7/6; Vol. 1 (1937 circuits), 7/6, in limp covers only. Postage, 8d. per volume extra.

**5 YEARS' CIRCUITS (1937-1941) IN
4 VOLUMES FOR 40/-**



Obtainable from your wholesaler, bookseller, or the publishers, "The Electrical and Radio World," Box 1538V, G.P.O., Brisbane.

OSCILLOSCOPE (Continued)

set. It sounds like hiss; it is hiss, but wouldn't it be nice to know where it is originating?

Do you wish to test your loud-speakers? Must you measure that special impedance for that very special job on which you will make a nice little profit? Or do you just want to get some idea of that very small capacity without buying still more equipment? Your oscillograph can be put to service right here.

But let us hasten to assure you that is not all. It is not just "something which enables you to see if something is distorted." Such is the statement of the unhappy but un-schooled man who feels he has been caught.

All those mentioned cases are ones that happen time and again. There is no special case quoted. How many good customers have been estranged because those annoying faults have occurred? And if you are developing receivers, how much quicker and more satisfactory would your work have been.

Transmitter distortion, overmodulation or just percentage modulation, envelope distortion spurious radiations, off carrier adjustments, may not only be detected, but almost immediately localised by their appearance on the screen.

Faults Immediately Localised

That is the very important point to remember. These faults are not only apparent, but they may be immediately localised. Everything that is not quite right in your particular system, whatever it may be, must have some

NUGGET (Continued)

alignment of the intermediates by trying a fraction of a turn at these adjustments and noting results. While this work is being carried out the volume control should be retarded in order to keep the output at a whisper, as changes in volume level are then more readily detected. Naturally the idea is to set all the adjustments to give maximum output for any given setting of the volume control.

Short-wave Adjustment

On the short-wave band the adjustment is just as simple. Selecting a station in the 25-metre band the short-wave aerial trimmer can be adjusted a fraction of a turn or so to give best results. If it is found that the dial markings are O.K. for broadcast but not for short-waves, it will be necessary to adjust the short-wave oscillator trimmer to bring the station on to its marked wavelength.

Then the short-wave aerial trimmer can be adjusted again.

effect on the final output power you are interested in. Therefore you must also get a picture on your C.R.O. screen in which every departure from regularity is caused by some definite fault. It follows that every part of that picture must have particular significance and it is only logic to realise that if the interpretation is understood, of any C.R.O. pattern, the particular fault may be almost immediately localised, purely from looking at and studying the particular waveform concerned.

The increase in efficiency in any department of radio is as a consequence immediate and great, for the costly methods of trial by experiment can be greatly minimised, time is saved, and results are better.

The Golden Rule

The golden rule may be stated—
"If the pattern on the screen tells

you nothing, it is not the fault of your instrument, but the fact that you just can't interpret it."

Time and again the point has been proved that the application of this instrument is limited only by the knowledge of its user.

Yes, Mr. Radioman, you may get by without your oscillograph, but if you really want to improve your overall efficiency, if you really want to save time and often heartbreaking experiment, you should give that instrument a new lease of life.

Easy? No, why should we say it very easy; nothing that was any use to you or anybody else was obtained easily. But certainly not hard. With a little guidance, a lot of common-sense, an ordinary amount of logic, plus a determination to "have another go," you will find your efforts repaid a hundredfold. Try it.

UNEQUALLED DEPENDABILITY UNDER THE MOST SEVERE CONDITIONS



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Initiative—Resourcefulness—Cooperation
to advance the interests
of the industry

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**POWER WIRE WOUND
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WHY THEY CHANGE THE B.B.C. WAVELENGTHS

A technical article from the Engineering Staff, British Broadcasting Corporation.

"What wavelengths are you now using to serve us, and why have they been changed since I last listened?" Of all the questions listeners ask the B.B.C., these undoubtedly are the most common. In this article the B.B.C.'s Engineering Division explains how the sun, the season of the year, and the time of day vitally affect the operation of a short-wave broadcasting service.

The most important consideration in the choice of wavelengths for a given service is the state of the ionosphere over the route between the transmitter and the country it is designed to serve.

Most short-wave listeners will know that two reflecting layers above the earth are responsible for the propagation of short waves over great distances, and that the reflecting

properties of these layers govern the choice of wavelength in short-wave broadcasting.

Any change in the physical state of these layers will affect their reflecting properties. This, in turn, if the alteration is large enough, will necessitate a change in wavelength in order to maintain the service to you.

The state of the layers is conditioned by the ultra-violet light radiated from the sun; the greater the radiation, the more the layers are affected or "ionised," and thus, within limits, the more efficient reflectors they become.

Ultra-Violet Light

Conversely, the less the radiation of ultra-violet light, the less the layers are ionised and the worse reflectors of the shorter wavelength they become. (There is, however, the advantage

that under such conditions they usually become more efficient reflectors of the longer wavelengths.)

As the reflecting power of these layers is governed by the amount of ultra-violet light radiated by the sun, it will be seen that the amount of daylight and darkness over the route is of first importance.

This is governed by three considerations:—

- (1) The bearing of the area to be served from the transmitter — north, south, east or west.
- (2) The time of the day over the route, e.g., a service to India takes place when it is early morning at the transmitter, late morning half-way along the signal path, and afternoon at the receiving station.
- (3) The season of the year over the route. At the time of writing, for example, it is midsummer in England but mid-winter in South Africa.

Analysis of these considerations shows why it is necessary to change the wavelengths during a transmission, and also to use different wavelengths at different seasons of the year.

As a rule, the bearing of an area to be served does not vary.

The daily variation of sunlight over the route controls the wavelengths used at any time of the day, and is also responsible for the changes in wavelengths during a given transmission to any area.

Service to the East

During the first part of the B.B.C. service to the East — 10.55 to 13.30 G.M.T.—there is the maximum amount of daylight over the whole route, and therefore ionisation levels are high, it being noon in this country and late afternoon in India. Consequently, the highest frequencies can be used, such as GSV (17.81 Mc/s) in the 16-metre band, and GSF (15.14 Mc/s) in the 18-metre band. During the second part of this transmission (13.45-16.30 G.M.T.), however, although it is still daylight in this country, darkness has set in in India, and therefore the ionisation levels over the distant part of the route are falling. The higher frequencies will tend to fail because of insufficient reflection, and lower frequencies are necessary to maintain the service.

During the second half of the Eastern service, therefore, it is the B.B.C.'s general practice to use lower frequencies, such as GSD (11.75 Mc/s) in the 25-metre band, or GSB (9.51 Mc/s) in the 31-metre band, according to the season of the year. This introduces the third point — the season of the year — which exercises a further control over the wavelength

BEAT FREQUENCY OSCILLATOR

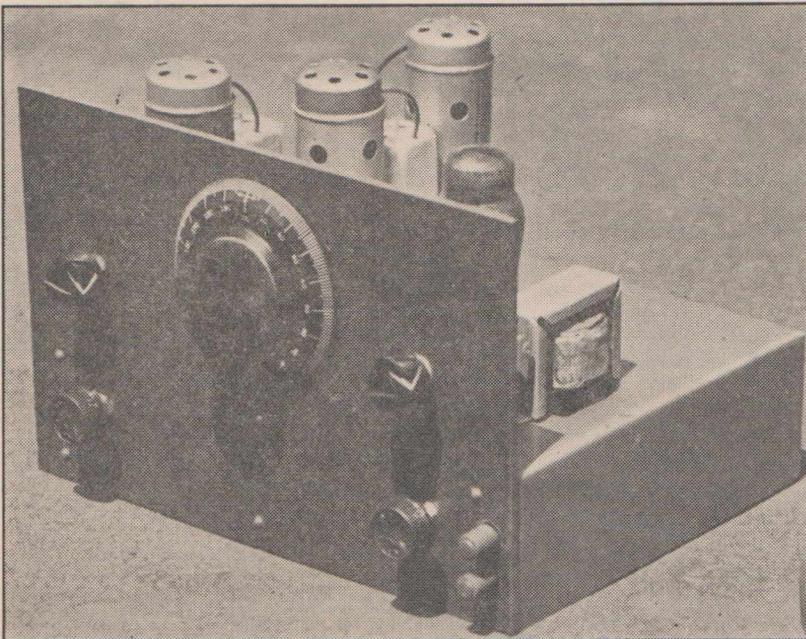
Advanced Technical Feature for an Early Issue

In pursuance of our policy of offering technical articles of the kind which appeal to the advanced experimenter and the radio serviceman who wants the best of workshop equipment, we are at present working on an article on the construction of a beat frequency oscillator. This article should be ready for publication in either the December or January issue.

Although nothing has been spared in the design of this unit, it cannot be considered as difficult, and its con-

struction should be well within the reach of the type of person to whom it will appeal.

Another article on the subject of signal tracers is also due for publication at an early date. This article covers the construction of a medium-cost signal tracer, a step between the big job which was detailed in the September issue and the baby one which is featured in this month's issue.



A photograph of the beat frequency oscillator on which we are at present working in our laboratory.

to be used.

Over routes that are in one hemisphere — such as England to the Far East or to India, and England to Canada or to the West Indies — the entire route is governed by the same seasonal conditions. But if the route traverses both hemispheres — such as the route from England to Australia or to Africa — then there is a varying seasonal effect — it is winter in the Northern Hemisphere, of course, when it is summer in the Southern.

The seasonal effects, however, are most pronounced over those routes of which either part or whole are in darkness — it will be seen that in the winter season there is the minimum amount of sunlight over such a route, with an absolute minimum during the winter late-night period.

Route to India

Taking the route to India, as an example, the effect of the darkness at the distant end of the route in mid-summer is to require a change in wavelength from 16 to 25 metres. But in midwinter the effect is so great that it is often necessary towards the end of the Eastern service to change to the longest wavelength available for short-wave broadcasting — 49 metres — in order to maintain the service. As has been said, this is entirely owing to the low ionisation levels that then prevail over the distant part of this route under mid-winter night conditions.

Another interesting example is the B.B.C. service to Canada. Here the route is westward, which gives rise to one or two points. Almost a continuous service to Canada is provided from 10.55 to 04.45 G.M.T. At the start of the Eastern service at 10.55 G.M.T., it is full daylight in this country, but in Canada, where the time is five hours behind G.M.T., it is

early morning, and in winter the sun has not risen at that hour. Consequently, there is little sunlight over the Canadian end of the route, ionisation levels are low, and so it is necessary to use lower frequencies in order to obtain adequate reflection over that part of the circuit. The B.B.C. therefore uses GRY (9.60 Mc/s) in the 31-metre band in winter, and GSD (11.75 Mc/s) in the 25-metre band in summer for the first hour of the transmission.

As the transmission proceeds, the daylight at the distant end of the circuit increases, ionisation levels rise, and, it still being full daylight in England, the ionisation level over the whole route becomes high. It is then possible to use higher frequencies to obtain the maximum performance. At 12.00 G.M.T., therefore, the wavelength for Canada is changed to either GSV (17.81 Mc/s) in the 16-metre band, or GSF (15.14 Mc/s) in the 19-metre band.

Long Hours of Sunlight

In summer in the Northern Hemisphere the long hours of sunlight maintain these high ionisation levels until quite late at night, and so the higher frequencies can be left in service until sunset in Britain. In contrast to the Indian circuit, darkness first falls at the transmitter end of the Canadian circuit, but the effect is the same and lower frequencies are required. Thus, at the start of the North American service at 22.10 G.M.T., GSD (11.75 Mc/s) in the 25-metre band, and GSC (9.58 Mc/s) in the 31-metre band are used. GSD usually provides the better service during the first part of the transmission, but towards the end, when there is darkness over the whole of the route, GSC is often the stronger signal.

During the summer months the engineering of this service to North America is a relatively simple matter, but in winter it is not. Then, day conditions are very similar to those of summer days, but in the winter night very low ionisation levels are experienced, owing to the fact that the route to the North-west passes through areas that then obtain very little daylight.

Instead of continuing to use 15 Mc/s until 21.00-22.00 G.M.T., it is found that 11 Mc/s and 9 Mc/s are required as early as 20.00 G.M.T., and that 6 Mc/s is generally required at 22.00 G.M.T. Often after midnight G.M.T., a frequency lower than 6 Mc/s may be wanted, but these are not available for broadcasting.

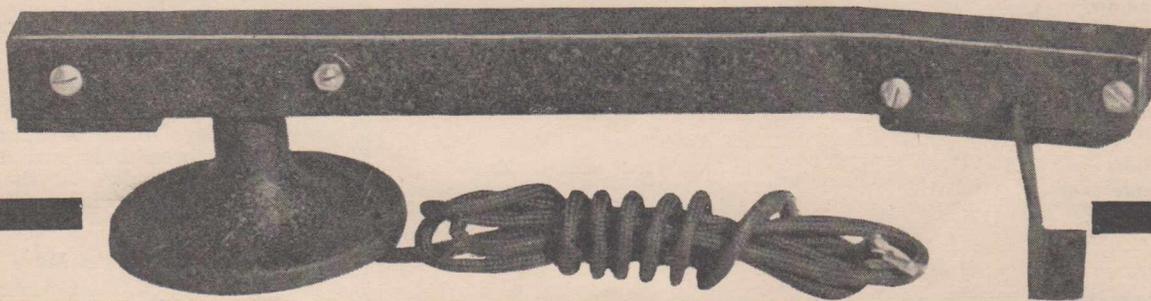
Late Winter Nights

It is, in fact, during these late winter nights that long distance reception of medium waves becomes possible between Britain and North America, as the ionisation levels can become so low that wavelengths of the order of 100-200 metres are reflected by the ionosphere in a similar way to the usual short wavelengths.

From these examples it will be seen that the choice of wavelength for any circuit depends on the state of the ionosphere over the route which itself is controlled by the amount of daylight over the route, this in turn being conditioned by the season of the year. The highest frequencies are used over all daylight routes, and the lowest frequencies are necessary over all dark routes in the winter.

Regular listeners to B.B.C. programmes may find it interesting to note the wavelength changes the B.B.C. will make in the early autumn in readiness for the approach of early winter conditions, and interpret them in the light of these facts.

ROTHERMEL CRYSTAL PICKUP



- EXTENDED FREQUENCY RANGE, FREE FROM DISTORTION.
- BRILLIANT REALISTIC TONE REPRODUCTION.
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Shortwave Review

CONDUCTED BY
L. J. KEAST

NOTES FROM MY DIARY

News From Home

When George Ivan Smith was leaving Sydney to join the British Broadcasting Corporation, I begged of him to try and persuade the authorities in London to arrange a better hour for Howard Marshall in his session. Well, whoever or whatever was responsible for the change in schedule does not matter, but I guess there are thousands like myself who find 10 p.m. on a Saturday far preferable to 5 p.m. on the same day.

Howard Marshall's "News From Home" is truly one of the most delightful of the numerous fine programmes given us by the B.B.C.

On Hulbert's Farm

Here is another that occupies my attention—from 7.30 a.m. on a Sunday till GSF closes down at 8.15, I'm being amused by Jack Hulbert and his clever wife, Cicely Courtneidge.

Listeners have probably noticed TAQ, Ankara, 15,195kc, 19.74m, is back on the air again, and from 8.30 p.m. to 10 p.m. puts in a very good signal. With the exception of about half an hour of music, most of the session is in several foreign languages.

Just before "Lord Haw-Haw" commences at 10.30 p.m. on 19.85 (DJL), Berlin announces they are broadcasting on DXT, 15,230kc, 19.70m also, but at 96 Frenchman's Road, Randwick, the swirling noise makes this frequency almost impossible and the same interference upsets PCJ-2 on 19.70.

On Saturday morning, October 25, at 7.10, I heard a station which so far I have been unable to identify. My suspicions are that it was VONG, New Foundland, on 9.48mc, 31.68m. I discovered it by leaving the set tuned just off TAP, Ankara, who had as usual closed at 7 o'clock. Fading and a bad morse whistle made listening difficult, but operatic items were prominent.

Mr. Nelson, of Cairns, is hearing a station on 27.7m at 3.30 p.m. with an R8 signal, using several languages including French. This is one of the many new Russians. News in Italian at 3.15 p.m. and French at 3.30. At night News in English at 8.45.

Remember Miss Margaret Denholm, of Radio Saigon? Well, the lady is now at Broadcast House, Perth, with the A.B.C. Miss Denholm, who is English by birth, lived for a considerable time

in French colonial territory.

Under loggings I have included a great number of Russian transmitters, believing listeners will be anxious to know who the "strangers" are on so many new frequencies. The space occupied by this may necessitate excluding Germany and Italy, but as quite a lot of English is to be heard away from channels previously giving it, I figured our readers would welcome the information. I am indebted to a friend of mine who speaks Russian fluently for the assistance that has made this long list possible.

Quite a number of other countries include a great amount of Russian in their schedules lately, and this becomes confusing, so Dx-ers can now definitely correct their logs.

I am told that RNE, Moscow, who for years on 12mc or 25m was one of the loudest stations on the air has not been heard since war broke out between Russia and Germany. As XGRS, the German Club-owned station in Shanghai, gives "news" in Russian at 9.45 p.m. and also at 1.30 p.m., it is quite possible this may have caused confusion.

By the way, the Russian on 27.77m can be heard from just after 8.30 p.m., with the striking of a bell for about twelve minutes before giving News in English at 8.45.

Radio Unconnu, who is heard most afternoons, has been busy in the early mornings imploring their listeners "to down with Petain," reminding them they have many chances to kill more than one Bosche a day but that one Bosche is not enough; they must exterminate the lot. It also tells them their first duty is to do away with their own traitors, Petain, Darlan, Laval and de Brinon.

Radio Unconnu, which operates on 30.77m, is interesting.

A.I.F. Extra

Listeners' attention is drawn to the several changes in the Department of Information broadcasts and also to the additional session for the A.I.F. in Malaya through VLG-6 from 6.15 p.m. to 6.45 p.m.

Germans on the Move

KGRS, Shanghai, the German Club-owned station, has had a run around but now seems settled on 12,065kc, 24.87m, and "The Voice of Europe" gives news at 8.45 p.m., 9.30 p.m., 11.15 p.m. and 12.15 a.m.

Japan First With the Latest

Tokyo have brought their news sessions forward half an hour, and both

ALL-WAVE ALL-WORLD DX CLUB

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(Signed)

(Readers who do not want to mutilate their copies can write out the details required.)

NEW STATIONS

JZJ and **JVJ** now give same at 8 p.m. On the other hand, **Saigon** has gone back a quarter of an hour, and we now have to wait till 9.30 p.m. to hear from them the world's news.

Mr. Nelson reports having heard **KZRB**, Manila, on 11,840kc, 25.34m. This is one of the mobile units of the Far East Broadcasting Corporation and was heard quite a lot during November, 1939. Has either been idle or on at such times as not to suit us, because this is the first reference to it since the time mentioned.

Mr. Arthur Cushen, of Invercargill, reports **TI4NRH**, Costa Rica, as back on the air again but on a slightly different frequency. They are now in 9720kc, 30.86m, according to Mr. Cushen, although they announce as 9690kc. Certainly a fine station to log and, as reports are again being asked for, those who do value verifications should write at once. Send a full report and enclose international reply coupon and in all probability an excellent diploma will come along. The writer received a diploma when reporting the station in 1938, it being the occasion of its tenth year on the air. (See March, 1941, issue for further particulars of **TI4NRH**.)

Mr. Beattie, of New Lambton, writes that he is hearing **WRCA** on 17,800kc, 16.87m, at fair strength till 7 a.m., when they change to **WNBI**. Only on very favourable days can **WRCA** be heard on 16 metres, but **WNBI**, on 11,890kc, is excellent at 7 a.m.

On Sunday, October 26, at 8 a.m., heard **WNBI** on what to me is a new frequency, namely, 15,145kc, 19.81m. When London on 19.82 closed at 8.15 the signal was much better and remained good till 8.30, when **YDC** commenced. However, a little tuning and **WNBI** was held. If a reason was ad-

WNBI, Boundbrook, 15,145kc, 19.81m: First heard on Sunday, October 26, at 8 a.m. Cannot find any mention of this frequency in my reference books, so it may have been a test. All language was in Spanish. Beautiful music was played, and there appeared to be a lot of chapping. An announcement in Spanish followed and I heard Tchaikovsky mentioned, followed by further delightful music, which was still being played when **YDC** opened up at 8.30. A little adjustment on the tuning and they were heard quite well. London closing on **GSF** at 8.15 gave me an uninterrupted fifteen minutes.

ZHP-4, Singapore, 11,730kc, 25.58m: Using Malayan programme except for relay of B.B.C. news at 11 p.m., this new and extra transmitter of the Malayan Broadcasting Corporation is heard from 7.30 p.m. till 1.15 a.m. According to reports from Perth they have been heard testing at 9.30 a.m. also.

XGAP, Pekin, 10,260kc, 29.24m: This station should have been mentioned in the October issue, as Sergeant Clack dropped in to see me and mentioned he had definitely established the call-sign of the station that had jumped in on the frequency made available by **PMN**, when **PLS** opened up. Unfortunately loggings had been printed, and pressure on space made it impossible to mention.

GRP, London, 17,890kc, 16.77m: The British Broadcasting Corporation have brought into use an additional transmitter on the 16-metre band and it is heard in the Central American session from 8.57 p.m. till 1.15 a.m. I am indebted to Mr. Perkins, of Malanda, Queensland, for the first information re this station.

SUP-2, Cairo, 6320kc, 47.47m: Another transmitter goes on to the three already in use by the Egyptian State Broadcasting, and under the call-sign of **SUP-2**. Definite schedule is not known, but it is reported heard around 2 a.m. Signal is good, and from 2.30 to 3 a.m. talk in French, concluding with "Marseillaise." Station closes at 3 a.m. with a time signal of six pips.

MTCY, Hsinking, 5990kc, 50.08m: The Central Broadcasting Station in Hsinking, not to be

outdone, have added another transmitter. While schedule is not exactly known, can be heard from 11 p.m. to mid-night. At closing call-sign is given in English. —, Delhi, 6130kc, 48.49m: All-India Radio have also added another transmitter to their already formidable array, and the latest mentioned here is on the air from 11.15 p.m. to 2 a.m. Mostly Hindustani, but news in English at 1.50 a.m.

WRUL, Boston, 7750kc, 16.9m: The World Radio University of Boston have opened up another outlet, and have been heard on the 16-metre band on Sunday mornings from 12.30 till 3.30 a.m. This seems to be the accepted schedule, although latest American magazines give different times, one stating 2 a.m. till 4.45 a.m. As is usual with **WRUL**, the signal is good.

WRUL, Boston, 17,750kc, 16.9m: This new outlet of the World Radio University is on the air from 2 a.m. till 3.15 a.m. on Tuesdays to Saturdays and from 1 a.m. till 4.15 a.m. on Sundays, while on Mondays the session opening at 1 a.m. is a devotional service from one of many churches. With the exception of Sundays the opening item is a bulletin in Persian, Armenian and classical Arabic, followed by news in Turkish, Arabic, German and Greek. On Sundays the session on opening at 1 a.m. is Rainbow House—children's programme directed by "Big Brother Bob Emery" (courtesy of Mutual Broadcasting System). This station is being heard in Sydney and the signal is quite good and will most likely improve as warmer weather draws near.

GRH, Daventry, 9825kc, 30.53m: Here is another transmitter used by the B.B.C. in the North American Service from 7.15 a.m. till 2.45 p.m. At the 31-metre band fades out here in the mornings, we only get a "glimpse" of **GRH**, as by 8 it is only just audible. However, at 1.30 p.m. it comes back and can be held till closing at 2.45 p.m.

GRH 9825kc, 30.53m
This is the new outlet for North American service from 7.15 a.m. till 2.45 p.m. (See "New Stations.")

vanced for being on this wave-length, I did not catch it, as all talk was in Spanish, but the call-sign was easily distinguishable.

DIRECTIONAL AERIALS

How are the directions for transmission chosen? is explained by the Technical Division of the B.B.C.

The problem of choosing the direction for the shortest route between two places in the world is not so simple as it might appear. If the reader considers a map of the world of the familiar type—that is, Mercator's Projection—and makes a casual estimate of the shortest path between London and, say, North Island, New Zealand, he will probably conclude that the path would go over Arabia, India and Australia. Actually the shortest path goes from London over Norway and nearly over the North Pole.

A special map has been prepared that shows the direction of this shortest path—or, as it is called, Great

Circle Path—from London to anywhere in the world. The map takes the form of a circle centred upon London, the circumference of the circle really representing the Antipodes. A straight line drawn from the centre of this map is then the Great Circle route and the route which the wireless waves will take, and it gives at once the bearing from north on which radiation should be made.

The aerials actually used for the B.B.C. Overseas Service are designed to transmit over a fairly wide beam so that the area covered is not too restricted, while at the same time giving an improvement over an omnidirectional aerial in the matter of signal strength. The centre line of the beam is chosen to fall on any important areas lying in the area concerned.

Interest in Short-waves

Further proof of the interest in short-waves was clearly given last month. I had prepared for David Jones Ltd. a short-wave bulletin, setting out the various times at which overseas stations were to be heard. In a one-minute advertisement over **2GB**, just before "To-day's War Diary," it was announced a copy could be had free by calling at Radio Hall on the third floor of the George Street store. In a chat I had with many hundreds who availed themselves of the offer I was particularly pleased to find how well informed a great number were of the stations heard nightly. These people were promptly recommended to follow these pages.

Then, on the other hand, there were those who, metaphorically speaking, had owned a sedan car but had not used the back seat. A little tuition, in most instances on a model similar to the one they possessed, and they became converts at once. The number who have since been in to express appreciation of the service convinces me that interest in short-wave listening is growing daily.

The MONTH'S LOGGINGS

ALL TIMES ARE AUSTRALIAN EASTERN STANDARD

AUSTRALIA

- VLG-6**, Melbourne 15,230kc, 19.69m
Schedule: 6.30 a.m. to 3.45 p.m.
- VLR-3**, Melbourne 11,880kc, 25.25m
Schedule: Noon to 6.15 p.m. Relays national programme.
- VLW-3**, Perth 11,830kc, 25.36m
Schedule: Daily, 8.30 a.m. to 11.45 a.m.; 1.30 p.m. to 8.45 p.m.; Relays W.A. national programmes. Sundays, 9 a.m. to 8.45 p.m.
- VLR-8**, Melbourne 11,760kc, 25.51m
Schedule: 6.30 a.m. to 10.15 a.m.: Relays national programme.
- VLR**, Melbourne 9580kc, 31.32m
Schedule: 6.30 p.m. to 11.30 p.m. Relays national programme.
- VLW-2**, Perth 9560kc, 31.38m
Schedule: 9 p.m. to 1.30 a.m.: Relays W.A. national programme. To South-east Asia. Sundays: 9 p.m. to 1 a.m.

Department of Information Broadcasts

- VLQ-3**, Sydney 15,315kc, 19.59m
Trans. VI.a: To A.I.F. abroad, 3.04 p.m. to 3.30 p.m.
- VLG-6**, Melbourne 15,230kc, 19.69m
Trans. VI.(a): To A.I.F. in Middle East: 3 p.m. to 3.30 p.m. Trans. VII.: To A.I.F. in Malaya, 6.15 p.m. to 6.45 p.m. Trans. VI.: To North America (West), 3.55 p.m. to 4.40 p.m.
- VLQ-2**, Sydney 11,870kc, 25.27m
Trans. II.: In English to North-east Asia, 8.40 p.m. to 9.15 p.m.
- VLQ-5**, Sydney 9680kc, 30.99m
Trans. III.: In English to North America (East Coast), 10.20 p.m. to 11.05 p.m. (also on **VLG-2**).
- VLW-2**, Perth 9650kc, 31.09m
Trans. IV.: In Dutch, French and English to South-east Asia, 11.10 p.m. to 1 a.m. (also on **VLG-2**).
- VLQ**, Sydney 9615kc, 31.2m
Trans. I.: In French to New Caledonia and French Oceania, 6.25 p.m. to 7.25 p.m.
- VLG**, Melbourne 9580kc, 31.32m
Trans. V.: In English to North America (West Coast), 1.25 a.m. to 2.10 a.m. Heard well in N.Z. (Cushen).
- VLG-2**, Melbourne 9540kc, 31.45m
Trans. III.: See **VLQ-5**. Trans. IV.: See **VLW-2**. Trans. V.(a): To A.I.F. in Middle East, 2.25 a.m. to 2.55 a.m. Trans. VI.: To North America (West), 3.55 p.m. to 4.40 p.m. Trans. III. heard well (Cushen).

OCEANIA

- Fiji:**
- VPD-2**, Suva 9535kc, 31.46m
Schedule: 7-8 p.m. except Sunday.
Very good, most nights (Gaden). French session 3 to 3.30 p.m.
- New Caledonia:**
- FK8AA**, Noumea 6130kc, 48.94m
Schedule: 5.30 to 6.25 p.m., except Sundays. On opening and closing plays "Marseillaise," "God Save the King" and "The Star-Spangled Banner." Also uses " - - -" when opening.
- Papua:**
- VIG**, Port Moresby 15,770kc, 19.02m
Reported heard around 10.30a.m.
- Tahiti:**
- FOBAA**, Papeete 7100kc, 42.25m
Monday and Thursday afternoons around 3.30 p.m.

AFRICA

- Algeria:**
- TPZ**, Algiers 12,120kc, 24.76m
Schedule: 4 a.m. to 9 a.m.
Excellent at 7 a.m. (Gaden).
- TPZ-2**, Algiers 8960kc, 33.48m
Schedule: 4 a.m. to 9 a.m.

Usually not as good as **TPZ**, although sometimes R9 (Gaden).

- Belgian Congo:**
- OPM**, Leopoldville 10,140kc, 29.59m
Schedule: 4.55 a.m. to 5.45 a.m.

- Egypt:**
- SUV**, Cairo 10,055kc, 29.84m
Some mornings, round about 5.30. Fair signal.

- SUX**, Cairo 7865kc, 38.15m
Schedule: 4.30 a.m. to 6.30 a.m.

- SUP-2**, Cairo 6,320kc, 47.47m
Schedule unknown, but heard from 2.30 to 3 a.m. See "New Stations."

- French Equatorial Africa:**
- FZI**, Brazzaville 11,965kc, 25.06m
Reported on the air again in the afternoons.

- Gold Coast:**
- British West Africa:**
- ZOY**, Accra 6000kc, 50.00m
Relays B.B.C. at 4 a.m.
Weak at 5.30 a.m. when closing.

- Kenya:**
- VQ7LO**, Nairobi 6060kc, 49.5m
Schedule: 2.15 to 5.15 a.m. (News, 2.30 and 4 a.m.).
(Note change of frequency.—Ed.)

- South Africa:**
- Rhodesia:**
- The Post Office Station**, Salisbury, 7317kc, 41m
Schedule: 2 a.m. to 6 a.m. Relays Daventry at 4 a.m. Closes with "God Save the King." Fair signal just before closing.

- Portuguese East Africa:**

- Mozambique:**
- CR7BD**, Lourenco Marques 15,250kc, 19.66m
English by a woman, Portuguese by man, between 3 and 4 p.m. Chimes are given between various items. Not as good as it was (Gaden).

- CR7BE**, Lourenco Marques 9840kc, 30.48m
Schedule: 5 to 7 a.m. except Mondays. News 5.55.
Note change in frequency.

- CR7AA**, Lourenco Marques 6175kc, 48.58m
Very poor signal at 7 a.m. (Gaden).

AMERICA

- Central:**
- T14NRH**, Heredia 9695kc, 30.96m
Mr. Cushen says they are now on 9,720kc (see "Diary"). Closes just before 3 p.m. on Sunday, Wednesday and Friday.

- Costa Rica:**
- TIPG**, San Jose 9620kc, 31.19m
Schedule: 10 p.m. to midnight.
Loudest of the Central Americans and sometimes heard from 2 p.m. to 4.45 p.m. Going off at 2 p.m., good 10 p.m. (Gaden).

- TILS**, San Jose 6165kc, 48.66m
Opens at 10 p.m. with "Stars and Stripes." Good (Rogers).

- TIGPH**, San Jose 5910kc, 50.76m
Good around 10.15 p.m. (Gaden).

- El Salvador:**
- YSM**, San Salvador 11,720kc, 25.62m
Another National. Schedule: 4-5 a.m. and occasionally 11 a.m. to 1.30 p.m. (Dissinger, U.S.A.).

- YSD**, San Salvador 7894kc, 37.99m
"Radio Difusora Nacional Alma Cuscatleca." Schedule: 10 a.m. - 2 p.m. (Dissinger, U.S.A.).

- Guatemala:**
- TGWA**, Guatemala 15,170kc, 19.78m
Very loud at 7.30 a.m. on Mondays (Beattie).

- TGWA**, Guatemala 9685kc, 30.98m
Schedule: 2 p.m. to 2.45 p.m.
Failing at 2 p.m. (Gaden).

- TGWB**, Guatemala 6470kc, 46.37m
Opens at 11 p.m. with physical jerks.

- Nicaragua:**
- YNRS**, Managua 8585kc, 34.95m
"Radio Nicaraguense," relays **YNCH**, "Radio Philips." Schedule: 11 p.m. to midnight, and 9.40 a.m. to 1.40 p.m.
Usually R4-5 at 11 p.m. Fades out by 11.30 p.m. (Nelson).

- Panama:**
- HP5A**, Panama City 11,700kc, 25.64m
Schedule: 2 p.m. to 3 p.m., 10 p.m. to midnight.
Chugs on merrily after 3 p.m. Equal strength with **WLWO** (Gaden).

- HP5J**, Panama City 9607kc, 31.22m
Schedule: 10 p.m. till midnight.

- Fair at 10 p.m. (Gaden).

- HP5B**, Panama City 6030kc, 49.75m
"Radio Estacion Miramar."

- HP5K**, Colon 6005kc, 49.96m
Heard occasionally from 10 p.m. English announcements.

- North:**

- WRCA**, New York 17,780kc, 16.87m
Fairly good till 7 a.m., at which time it changes to **WNBI** (Beattie). (Unable to hear at Randwick.—Ed.)

- WRUL**, Boston 17,750kc, 16.9m.
Opens up at 12.30 a.m. and on favourable nights (mornings) can be heard till closing at 3 a.m. (See "New Stations.")

- WRUW**, Boston 15,350kc, 19.54m
Schedule: 5a.m. to 8.30 a.m. News, 6.30 and 8.15 a.m.
Good at 6.30 (Beattie, Gaden).

- KGEI**, Frisco 15,330kc, 19.56m
Schedule: 10 a.m. to 3 p.m. News, 10.45 a.m. 2.55 p.m.

- Often hear him at 10 a.m. (Gaden). (Very, very weak at Randwick.—Ed.)

- WGEA**, Schenectady 15,330kc, 19.56m
Fairly loud at 6.30 a.m. (Beattie, Gaden). (Only heard occasionally at Randwick.—Ed.)

- WCBX**, New York 15,270kc, 19.65m
News at 10.30.

- Signal is erratic at night, fair at 7 a.m.

- WLWO**, Cincinnati 15,250kc, 19.67m
Schedule: 1.30 a.m. to 10.45 a.m. News at 10.30.

- Quite good till closing (Beattie). Weakens after 10.30 a.m. (Gaden).

- WRUL**, Boston 15,130kc, 19.83m
O.K. round about 7 a.m. (Gaden).

- WNBI**, Boundbrook 15,145kc, 19.81m
(News at 8 a.m. in Spanish, followed by music.—Ed.)

- KKQ**, Bolinas 11,950kc, 25.11m
Good Sunday afternoons (Rogers, Gaden).

- WNBI**, Boundbrook 11,890kc, 25.23m
Schedule: 11 p.m. to 9.45 a.m. News at 11.15 p.m.

- Fairly loud at 6.30 (Beattie). Splendid till 9.45 a.m. closing (Gaden). (Closed at 6.45 a.m. on 18/10/41; opened again at 7.—Ed.)

- WBOS**, Boston 11,870kc, 25.26m
Schedule: 7 a.m. to 2 p.m. News, 9 a.m. and 1 p.m.

- Splendid till after 10 a.m. Not bad near 2 p.m. (Gaden). Good signal (Beattie).

- WCBX**, New York 11,830kc, 25.36m
Fairly loud at 6.30 (Beattie).

- WRUL**, Boston 11,790kc, 25.45m
Schedule: 5 a.m. to 8.30 a.m. (News 6.30 a.m. and 8.15 a.m.)

- Fair at 7.30 (Beattie).
Very good at 6.30 (Gaden).

- WRUW**, Boston 11,730kc, 25.58m
Schedule: 8.56 to 1.30 p.m. News 9.15 a.m. R7 at 8 a.m. (Nelson). (Note change in schedule.—Ed.)

- WLWO**, Cincinnati 11,710kc, 25.62m
Schedule: 11 a.m. to 3 p.m. (News at 1 p.m.).

- Have heard just after 12 noon; improves to 3 p.m. (Gaden).

- KGEI**, Frisco 9670kc, 31.02m
Schedule: 4.05 to 7 p.m. (News 4.05 and 5.45 p.m.). From 6 to 7 p.m. session is "Good Neighbour Hour" in Chinese from Chinatown, San Francisco. 10 p.m. to 3.10 (News 10.30 p.m., 12.30 a.m., 1.30 a.m., 3 a.m.).

- Excellent at 4 p.m. and at midnight (Beattie, Gaden, Gallasch, Medley, Perkins).

WRCA, Boundbrook 9670kc, 31.02m
Schedule: 8 a.m. to 4 p.m.
Very good at 4 p.m. (Beattie, Gaden).

WLWO, Cincinnati 9590kc, 31.28m
Schedule: 11 a.m. to 3 p.m.

WGEA, Schenectady 9550kc, 31.41m
Schedule: 8.15 a.m. to 11.15 a.m.
Fairly good at 10.30 (Beattie). R5 opening
at 8.15 a.m. (Nelson).

WGEO, Schenectady 9530kc, 31.48m
Schedule: 6 a.m. to 8.45. News 7.55.
Good (Beattie, Gaden).

KEI, Bolinas 9490kc, 31.61m
Fair on Sundays (Rogers).

Mexico:

XEBR, Hermosillo 11,820kc, 25.38m
"Radio Difusora de Sonora."
Generally good till 3 p.m. (Rogers).

XEQQ, Mexico City 9680kc, 30.99m
Heard between 2 and 4 p.m.
Going off in afternoons (Gaden). (Better
at 11.30 p.m.—Ed.)

XEYU, Mexico City 9605kc, 31.24m
Only just audible at 3 p.m. (Gaden).

XEWW, Mexico City 9503kc, 31.57m
Between 2 and 3.30 p.m.
Going off in afternoons (Gaden).

XEXA, Mexico City 6170kc, 48.62m
Physical exercises at 11.30 p.m.

XEUX, Vera Cruz 6120kc, 49.02m
Fair at 3 p.m. on favourable days.

XEUW, Vera Cruz 6023kc, 49.78m
Opens at 10 p.m. Very weak signal. Listen
for four chimes.

XEBT, Mexico City 6005kc, 49.96m
Closes at 3.30 p.m.

South:

Argentina:

LSX, Buenos Aires 10,350kc, 28.98m
Appears to be only audible on Sunday
mornings.

LRX, Buenos Aires 9660kc, 31.06m
Heard at 7 a.m. now and then (Gaden).
(Heard almost nightly at 9.—Ed.)

Bolivia:

CP-5, La Paz 6200kc, 48.39m
Hear him at 10 p.m. occasionally (Gaden).

CP-2, La Paz 6110kc, 49.10m
Reported fair at 2.30 p.m.

Brazil:

PRA-8, Pernambuco 6010kc, 49.92m
Heard around 6.30 a.m. at good strength
(Gaden).

PSF, Rio de Janeiro 14,690kc, 20.42m
Heard in same programme as **PSH** between
9 and 10 a.m. Very seldom (Rogers).

PSH, Rio de Janeiro 10,220kc, 29.35m
Opens at 8.30 a.m. Very fair signal till
9 a.m. (Gaden, Cushen).

British Guiana:

VP3BG, Georgetown 6130kc, 48.94m
Heard weakly at 7 a.m. (Gaden).

Chile:

CB-1180, Santiago 11,975kc, 25.05m
Often heard soon after noon (Gaden,
Cushen). (Closes at 2 p.m., 3 p.m. Sundays.
Very weak at night.—Ed.)

CB-1174, Santiago 11,740kc, 25.55m
Slogan: Radio Huckle. Schedule: 9.30 a.m.
to 3 p.m. Very, very weak.

CB-1170, Santiago 11,700kc, 25.64m
Hearing at 7 a.m. what I believe to be
this station (Gaden). (Quite likely is **CB-
1170**; their latest schedule is: 7 a.m. to
11 a.m.—Ed.)

CB-970, Valparaiso 9730kc, 30.83m
Radio la Cooperativa Vitalicia. Slogan is:
"La Vuz de Chile para toda America."
Opens at 9.30 p.m.

CB960, Santiago 9600kc, 31.25m
Reported heard at 3 p.m. and again at
10 p.m.

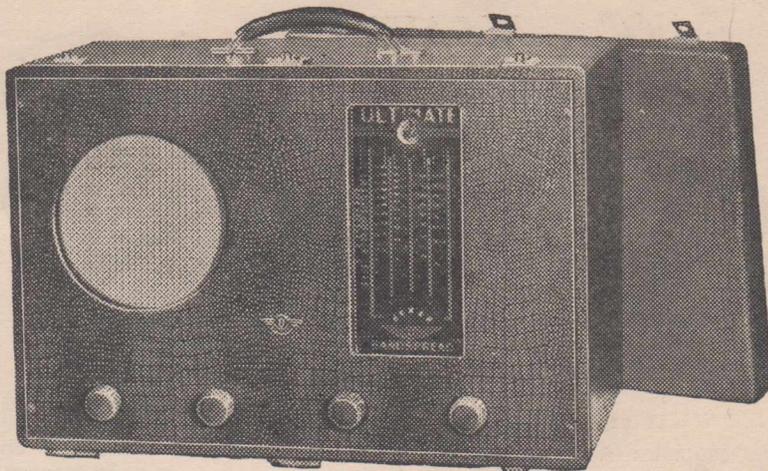
Colombia:

HJCT, Bogota 9630kc, 31.15m
Closes weakly at 2.30 p.m. just as **2R0-3**
opens up.

HJCX, Bogota 6018kc, 49.85m
Excellent at 4 p.m. Specialises in dance
items Sunday afternoons.

Ecuador:

HCJB, Quito 12,460kc, 24.08m
Noon to 12.40 p.m.; 9.55 p.m. to midnight.
Heard in religious service at 11.15 p.m.
(Nelson).



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117 RESERVOIR STREET, SYDNEY

LOGGINGS (Continued)

HCQRX, Quito 5975kc, 50.21m
"Radio Quito" opens at 9.45 p.m. with march.
Paraguay fair, but noise high (Gaden).

Paraguay:

Peru:
OAX3A, Huanuco 6205kc, 48.35m
Have just logged this new one. Excellent strength till closing a few minutes after 3 p.m. Closes with "Ah, Sweet Mystery of Life" on organ (Cushen).

OAX4J, Lima 9340kc, 32.12m
Heard fairly well in afternoons.

THE EAST

Burma:

XYZ, Rangoon 6007kc, 49.94m
Schedule: 9.45 p.m. to 1 a.m. News at 12.30 a.m.

XZZ, Rangoon 3488kc, 86.00m

China:

FFZ, Shanghai 12,068kc, 24.86m
Schedule: 7 p.m. to 12.05 a.m. (News 10 p.m.).
Good when free of interference.

XGRS, Shanghai 12,065kc, 24.87m
Schedule: 6.30 p.m. to 1 a.m. "The Voice of Europe." News 8.45 p.m., 9.30 p.m., 11.15 p.m. and 12.15 a.m.
News in Russian at 9.45 p.m.

XIRS, Shanghai 11,980kc, 25.02m
Schedule: 8 p.m. to 11.30 p.m.
News in English at 9.15 p.m.

XGOY, Chungking 11,900kc, 25.21m
Schedule: 8 to 10.15 p.m. (News, 8.15)

XMHA, Shanghai 11,853kc, 25.31m
Schedule: 6.30 p.m. to 1 a.m. News, 9 p.m. and 11.15 p.m.
Erratic (Cushen).

XGDN, Shanghai 11,920kc, 25.16m
Schedule: 6.30 p.m. to 1 a.m. (News 10 p.m., midnight and 12.40 a.m.).
Very good on new wavelength (Gaden, Perkins, Nelson).

XGOK, Canton 11,650kc, 25.75m
Schedule: 8 p.m.-midnight (News at 10.30).

XGAP, Peking 10,250kc, 29.23m
Note corrected call-sign.
Certainly a grand signal at 9.30 Call-sign

XGAP (Gaden) ..

XGOA, Chungking 9720kc, 30.85m
Heard give call-sign clearly at 9.30 p.m. (Gaden).

XGOY, Chungking 9620kc, 31.17m
Schedule: Midnight to 2 a.m. News at midnight and 1 a.m.

XLMA, 9240kc, 32.46m
Heard from 10 p.m., but no English or call-sign (Gaden). (Call-sign is given at 12.40.—Ed.)

XPSA, Kweiyang 8484kc, 35.36m
Schedule: 9 p.m. to 1 a.m.
Loud at 9 p.m. (Beattie).

XOZS, Peiping 10,050kc, 29.85m

XGOY, Chungking 5950kc, 50.42m
Schedule: 6-7 a.m.; 10.20 p.m. to 11.55 p.m. News at 10.30.
Better in a.m. than at night (Gaden).

Dutch East Indies:
PMA, Bandoeng 19,380kc, 15.48m
Heard clear call at 9.30 p.m. (Gaden).

YDC, Bandoeng 15,150kc, 19.81m
Patchy, day and night.

PLJ, Bandoeng 14,630kc, 20.51m
Good night station.
Heard from 7.30 p.m. to 3 a.m. in Malay programme.

PLP, Bandoeng 11,000kc, 27.27m
Very good at night.

PLS, Bandoeng 10,365kc, 28.94m
7.30 p.m. to 1.30 a.m.
Excellent, nightly (Gaden, Cushen).

YDB, Bandoeng 9550kc, 31.41m
Weak at 9.15 p.m. (Schodel). (Badly QRM'd here.—Ed.)

YDX, Medan (Sumatra) 7210kc, 41.55m
Schedule: 8 p.m. to 3 a.m.

PMH, Bandoeng 6720kc, 44.64m
Excellent at 5.30 a.m. (Cushen).

PMY, Bandoeng 5145kc, 58.31m
7.50 p.m. to 1.30 a.m.

YDA, Bandoeng 3040kc, 98.68m
Heard from about 9 p.m.

French Indo-China:
Radio Saigon, Saigon 11,780kc, 25.47m
Schedule: 8.30 p.m. to 2 a.m. News, 9.30 p.m., 1.45 a.m.
English session is now 9.15 to 9.45 p.m.

Radio Saigon, Saigon 6180kc, 48.54m

Schedule: 8.15 p.m. to 2 a.m. News at 9.15 p.m. and 1.45 a.m.
Very loud signal.

Hong Kong:

ZBW-3 9525kc, 31.49m
Schedule: 7.30 p.m. to 12.15 a.m. Relays B.B.C. at 11 p.m.

India:

VUD-3, Delhi 15,290kc, 19.62m
Good at 6 p.m. (Gaden).

VUD-4, Delhi 11,830kc, 25.36m
Schedule: 9 p.m. to 11 p.m. News, 10.30 p.m.

VUD-2, Delhi 9590kc, 31.28m
Schedule: 9 to 2 a.m. News, 10.30 p.m., 1.50 a.m.
Good at 10.30 p.m. (Gallasch).

VUD-2, Delhi 7290kc, 41.15m
Schedule: 9.30 p.m. to 1 a.m. News 10.30.

VUB-2, Bombay 7240kc, 41.44m
Opens at 9.30 p.m. Closes at 1.15 a.m.

VUC-2, Calcutta 7210kc, 41.61m
R6 in English programme at 11 p.m. (Nelson).

Delhi 6130kc, 48.94m
Heard from 11.15 p.m. (See "New Stations.")

VUD-8, Delhi 4920kc, 60.98m.
Schedule: 10.30 p.m. to 2 a.m.

VUB-2, Bombay 4880kc, 61.48m
Good at 3 a.m. (Cushen).

Japan:

(Tokyo considered source of supply unless otherwise mentioned)
Pressure on space does not permit of full schedules.

JLU-4 17,795kc, 16.86m
Weak signal at 5 p.m. (Gallasch).

MTCY, Hsinking 15,320kc, 19.58m
Schedule: 7 a.m. to 8 a.m. News at 7 a.m.

JVW-4, Tokyo 15,235kc, 19.69m
Good at 9.30 p.m. (Gaden).

JZK, Tokyo 15,160kc, 19.79m
Schedule: 2.30 p.m. to 6.30 p.m. News at 4.35.

Very good around 5 p.m. (O'Brien).

JLG-4, 15,105kc, 19.86m
5 a.m. to 8.30 a.m. News, 8 a.m.

JVZ 11,815kc, 25.39m
7 p.m. to 12.30 a.m. News, 8 p.m.

JZZ 11,800kc, 25.42m
Schedule: 1 a.m. to 2.55 a.m. News 1.45 a.m. 3 a.m. to 4.30 a.m. News 4 a.m. 7 p.m. to 12.30 a.m. News, 8 p.m. and 11.30 p.m.

Excellent right through (Beattie).

MTCY, Hsinking 11,780kc, 25.49m
Schedule: 11 p.m. to midnight. News at 11.15.

..... 11,740kc, 25.55m
Schedule: 4.30 p.m. to 5.30 p.m. News, 4.35.

Parallels with **JLU-4**, opening at 4.30 p.m. (Nelson).

JVW-3 11,720kc, 25.6m
Schedule: 6.45 a.m. to 8.30 a.m. (Exercises 7.7 a.m.). 6.45 p.m. to 12.30 a.m.
Good at 9.30 p.m. (Gallasch).

..... 10,274kc, 29.20m
Opens with Japanese national anthem at 9 p.m.

JIE-2, Formosa 9690kc, 30.95m
R5 at night. News at 12.15 a.m. (Nelson).

JZI 9530kc, 31.46m
1 a.m. to 2.55 a.m. News at 1.45. 3 a.m. to 4.30 a.m. News at 4 a.m. 5 a.m. to 8.30 a.m. News at 5 a.m.

MTCY, Hsinking 5990kc, 50.08m
Heard from 11 p.m. to midnight. (See "New Stations.")

Malaya:

ZHP-4, Singapore 11,730kc, 25.58m
Schedule: 7.30 p.m. to 1.15 a.m. Relays B.B.C. at 11 p.m. (See "New Stations.")

ZHP-1, Singapore 9700kc, 30.92m
Schedule: 7.30 p.m. to 1.15 a.m. B.B.C. News at 9 p.m. and 12.30 a.m.
Good at 9 p.m. (Gaden).

ZHP-3, Singapore 7250kc, 41.38m
ZHP-2, Singapore 6175kc, 48.58m
Schedule: 7.30 to 1.15 a.m. (B.B.C. News at 9 and 11 p.m.).
Better than **ZHP-1** (Gaden).

ZHJ, Penang 6095kc, 49.23m
Schedule: 8.35 p.m. to 11.45 p.m. News 9 p.m. and 11 p.m.

Philippines:

(Manila, unless otherwise stated)
KZRB, Manila 11,840kc, 25.34m
Logged this station at 8.15 p.m. on 5/10/41 transmitting a special programme. R7 (Nelson). (See "Diary."—Ed.)
KZRH 9640kc, 31.12m
Schedule: 7.30 a.m. to 9.30 a.m. (News 8.15 a.m.). 6 p.m. to 2 a.m. (News 6.10 p.m., 10.30 p.m. and midnight).
Terrific strength nightly (Perkins, Gallasch, Medley).
KZRM 9570kc, 31.35m
Schedule: 6.45 p.m. to 1.30 a.m. News, 8.35, 10.45 and 11.45 p.m., also 12.45 a.m. Good nightly (Medley).
KZIB, Manila 9520kc, 31.58m
R7 at 9 p.m. (Medley).
KZND, Manila 8790kc, 34.13m
Schedule: 9.25 p.m. to 10.30 p.m.
O.K. when clear of morse (Gallasch).
KZRF, Manila 6140kc, 48.86m
Schedule: 7 p.m. to 2 a.m.
Signal improving.

Portuguese China:
CRY-9, Macao 6080kc, 49.33m
Now reported to be on 6070kc, 49.42, and giving call-sign as **CR8AA**.

Thai:
HSP-5, Bangkok 11,715kc, 25.61m
Schedule: 9.30 p.m. to 1 a.m. (except Mondays). News, 10 p.m.
Never very loud (Beattie). Good at 9.45 p.m. with American dance records (Perkins, Gaden).

GREAT BRITAIN

"This Is London Calling"

GST 21,550kc, 13.92m
GSJ 21,530kc, 13.93m
GSH 21,470kc, 13.97m
Getting stronger, and good nights more frequent (Gaden).
(Audible occasionally around midnight.—Ed.)
GRQ 18,030kc, 16.64m
Heard at 10.15 (Perkins, Gaden).
GRP 17,890kc, 16.77m
8.57 p.m. to 1.15 a.m. (Perkins).
GSV 17,810kc, 16.84m
5 p.m. to 7.57 p.m.; 8.57 p.m. to 1.15 a.m.
GSG 17,790kc, 16.86m
Session for China at 8.30 p.m.
GSP 15,310kc, 19.60m
4.10 p.m. to 7.57 p.m.; 5.30 a.m. to 7 a.m.; Turkish at 8.30 p.m.
French at 9 p.m.
GSI 15,260kc, 19.66m
4.10 p.m. to 7.57 p.m.
GSO 15,180kc, 19.76m

10.15 to 10.45 p.m., Portuguese; 10.45 to 11.15 p.m., Spanish.
(Can be heard now Moscow is not using frequency till 11.30.—Ed.)

GSF 15,140kc, 19.82m
4.10 to 7.57 p.m.; 8.57 p.m. to 1.15 a.m.; 1.30 a.m. to 5.15 a.m.; 6.35 a.m. to 7 a.m.; 7.15 a.m. to 8.15 a.m.; 10.15 p.m. to 10.45 p.m., Portuguese; 10.45 to 11.15 p.m., Spanish.
Night session excellent (Medley).
GRV 12,040kc, 24.92m
Eur., 2.55 a.m. to 4.15 a.m. (News at 4 a.m.).
Heard in French at 7 a.m. Spanish at 7.30 a.m.
GSN 11,820kc, 25.38m
8.40 a.m. to 12.30 p.m. (Spanish) and Portuguese).
Intended for Latin America.
GSD 11,750kc, 25.53m
4.10 p.m. to 7.57 p.m.; 8.57 p.m. to 10 p.m.; 1.30 a.m. to 7 a.m.; 7.15 a.m. to 2.45 p.m.
GRX 9690kc, 30.96m
3.55 p.m. to 8 p.m. News at 6 p.m. 2.55 a.m. to 8 a.m.; 8.40 a.m. to 12.45 p.m. (Spanish and Portuguese).
GRY 9600kc, 31.25m
1.30 a.m. to 7 a.m.; 7.15 a.m. to 2.45 p.m.
GSC 9580kc, 31.32m
7.15 a.m. to 2.45 p.m.
GSB 9510kc, 31.55m
4.10 p.m. to 7.57 p.m.; 8.40 a.m. to 12.45 p.m. (Spanish and Portuguese).
GRU 9450kc, 31.75m
E.T., 11.45 p.m. to 1.15 a.m.
GSW 7230kc, 41.49m
3.55 p.m. to 6 p.m. News 6 p.m. (European service).
GRS 7065kc, 42.49m
GRW 6145kc, 48.82m
Home service, 3.30 p.m. to 5.15 p.m. News 4 and 5 p.m. 2 a.m. to 8 a.m. News 3 and 6 a.m.
GRR 6075kc, 49.38m
3.30 p.m. to 7.30 p.m. News 4 and 5 p.m. 2 a.m. to 8 a.m. News 3 a.m., 6 a.m. R5 at 7 a.m. (Perkins).
GSA 6050kc, 49.59m
Eur., 3.55 p.m. to 8 p.m., 2.55 a.m. to 8 a.m. News 6 p.m.
News: 4.15 p.m., 6 p.m., 9 p.m., 11 p.m., 2 a.m., 4 a.m., 6.45 a.m., 8.45 a.m., 11 a.m., noon, 2.30 p.m.
Radio Newsreel: 1.30 p.m., 7.30 p.m.
All London transmitters are good excepting 8 a.m. to 1.30 p.m.

EUROPE

Czecho-Slovakia:

"Radio Bratislava," Bratislava 9525kc, 31.49m
Can just hear after 9 a.m. (Gaden).

France:
(Of course, Nazi controlled)
Paris Mondial 15,240kc, 19.68m
Between 3 p.m. and midnight.
(Now known as Radio National Vichy.—Ed.) Heard at 9.30 at good strength (Medley).

Radio Vichy, Vichy 11,840kc, 25.33m
Heard between 2.15 p.m. and 5.15 p.m. Also sometimes between 1 a.m. and 7.30 a.m. Marseillaise at 4.30 p.m., followed by news.
Very clear at 3.30 p.m. (Gaden). Great strength at 4.30 p.m. (Cushen).

"Y" 9520kc, 31.51m
Schedule: 7.50 a.m. to 2 p.m. (News 1.30 p.m.).

Germany: "Station Ananias," Berlin
Most Berlin transmitters put in very loud signals for most part of the day, but from early evening are subject to interference of a swirling sound nature.

DJH 17,840kc, 16.81m
5.30 p.m. to 2 a.m. News 7.30 p.m. and 10 p.m.

DJE 17,760kc, 16.89m
4.30 p.m. to 9.30 p.m. News 5 p.m. and 7.30 p.m.

DZG 15,360kc, 19.53m
Reported being heard in late afternoons.

DJR 15,340kc, 19.56m
Schedule: 3 p.m. to 2 a.m. News 5 p.m. and 10 p.m.
(Delightful meditation music follows 10 p.m. News on Sundays.—Ed.)

DJQ 15,280kc, 19.63m
3 p.m. to 2 a.m. News 5 p.m., 10 p.m. and midnight.

DJB 15,200kc, 19.74m
7.50 a.m. to 2.05 p.m. 9.30 p.m. to 11.45 p.m. News 9.30 p.m. and 11.30 p.m.

DJL 15,100kc, 19.85m
1.40 a.m. to 3.15 a.m. News at 2.15 a.m. 9.30 p.m. to 11.45 p.m. "Lord Haw-Haw" at 10.30 p.m.

DZH 14,460kc, 20.75m
Russian News at 2 p.m., 5.15 p.m., 1.15 a.m., 6.30 a.m., 7 a.m. and 8.15 a.m.

DZE 12,130kc, 24.73m
Very loud at 12.30 a.m. in Front-line News.

DJP 11,855kc, 25.31m
8 p.m. to 2 a.m. News at 10 p.m.

DXC-2 11,740kc, 25.55m
Schedule: 3.40 a.m. to 7.25 a.m. News 6.15 and 7.15 a.m.

(Continued on next page)



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LOGGINGS (Continued)

DZD 10,530kc, 28.45m
7.50 a.m. to 2 p.m. News 8.30 a.m. and
1.30 p.m. 5 a.m. to 7 a.m. News 5 a.m.,
6.45 p.m.

DZC 10,290kc, 29.25m
Very loud before mid-day.

DJD 11,770kc, 25.49m
Schedule: 1.40 to 7.25 a.m. News, 2.15,
5.15 and 7.15 a.m. Talk at 3.30 a.m.
7.50 a.m. to 2.05 p.m. News 1.30 p.m.

DJX 9670kc, 31.01m
1.40 a.m. to 7.25 a.m. News 2.15 a.m.
and 7.15 a.m.

DJW 9650kc, 31.09m
3 p.m. to 2 a.m. News at 5 p.m., 10 p.m.
and midnight.

DXB 9610kc, 31.22m
Heard opening at 3.15 p.m. (Gaden).

DJA 9560kc, 31.38m
Schedule: 3.30 a.m. to 6 a.m. News 3.30
and 4.30 a.m., and 5.30 "Lord Haw-Haw."

DXM 7270kc, 41.27m
Schedule: 4 to 8 a.m. "Lord Haw-Haw" 6.30
and 7.30 a.m.

DJC 6020kc, 49.83m
3.40 a.m. to 7.25 a.m. News at 6.15 and
7.15.

DXZ 9570kc, 31.35m
1.40 a.m. to 7.25 a.m. News 2.15 and
7.15 a.m. 7.50 a.m. to 4 p.m. News 1.30
and 3 p.m.

Holland:
PCJ-2, Huizen 15,220kc, 19.71m
Heard nightly, but swirling noise makes
listening unpleasant.

Hungary:
HAT-4, Budapest 9123kc, 32.88m
Still heard at good strength at 11 a.m.
(Cushen).

Italy:
IRW 19,590kc, 15.31m
This is the announced frequency at 9.31
p.m. News follows in Italian, English and
French (Gaden). (News in Russian, 10.31
p.m. News in English, 11.30 p.m.—Ed.)
"This is Radio Roma"

2RO-8 17,820kc, 16.83m
Heard in Arabic at 8.30 p.m., but still
weak at 9 p.m.

2RO-6 15,300kc, 19.61m
12.30 a.m. to 8.55 a.m.; 11 a.m. to 3.20
p.m.; 5 p.m. to 5.30 p.m.; 6.10 p.m. to
6.20 p.m. News: 1.40 a.m., 7.12 a.m., 8.20
a.m., noon, 1.30 p.m., 3 p.m., 5.20 p.m.,
6.10 p.m.

2RO-4 11,810kc, 25.4m
12.30 a.m. to 8.55 a.m., 11 a.m. to 2.20
p.m., 2.30 p.m. to 3.30 p.m., 6.10 p.m. to
6.20 p.m. News at 1.40 a.m., 7.12 a.m.,
8.20 a.m., 1.30 p.m., 3 p.m., 6.10 p.m.

2RO-15 11,760kc, 25.51m
2.30 a.m. to 8.55 a.m.
..... 11,695kc, 25.65m
No call-sign is given, but at 5.15 p.m.
announces in Russian: "Here is Italian short-
wave station." Heard again at 1 a.m.

IRF 9835kc, 30.52m
Closed down at 2.35 p.m. after calling
WDJ and **WJK**, New York.

2RO-18 9765kc, 30.74m
11 a.m. to 2.20 p.m.

2RO-9 9670kc, 31.03m
2.30 a.m. to 8.55 a.m.

2RO-3 9630kc, 31.15m
2.30 a.m. to 8.55 a.m.; 11 a.m. to 2.20
p.m.; 2.30 p.m. to 3.30 p.m.; 5 p.m. to
5.30 p.m.

2RO-11 7220kc, 41.55m
2.30 a.m. to 8.55 a.m.

HVJ, Vatican City 11,740kc, 25.55m
Heard between 4 and 6 p.m. Wednesdays
and Fridays, giving names of prisoners of
war.
Good when opening at 4 p.m. (O'Brien,
Medley). (Signal strong enough to be
heard in City.—Ed.)

HVJ, Vatican City 6190kc, 48.47m
5.15 a.m. to 5.30 a.m. Talks.
Great signal when signing at 5.30 a.m.
(Cushen).

Portugal:
CSW-6, Lisbon 11,040kc, 27.17m
Schedule: 3 a.m. to 7.30 a.m., except
Sundays.
Splendid signal.

CSW-7, Lisbon 9740kc, 30.8m
Schedule: 7.40 to 9 a.m. Talks: On Wed-
nesday, Friday and Sunday from 7.50 to
8 a.m.

CS2WD, Portugal 6200kc, 48.38m
Schedule: 6 to 9 a.m.
Very faint and fades out by 6 o'clock.

Rumania:
Radio Bucharesti, Bucharest 9234kc, 32.44m
Heard what I took to be this station giving
News in English at 8 a.m. until closing at
8.15 a.m. with anthem. Signal weak and
interfered with by a morse station. Also
heard this station on Saturday, September
27, between 4 and 4.35 p.m., giving musical
programme (Nelson).

Russia:
("This is Radio Centre, Moscow, calling")
..... Moscow 15,500kc, 19.34m
(Foreign broadcasts: German for South
America, 11 to 11.30 p.m. Frequently Lenin-
grad is connected and English is sometimes
heard.—Ed.)

RW-96, Moscow 15,410kc, 19.47m
Schedule: 6 p.m. to 11.45 p.m. News at
6.03 p.m.
Strong and good music, but no English
(Gaden). (Also heard at 2 p.m. with news
in Russian.—Ed.)
..... Moscow 15,282kc, 19.63m
..... 11 p.m. to midnight.
..... 15,230kc, 19.70m
News in English at noon.

RW-96, Moscow 15,180kc, 19.76m
11 p.m. to 11.15 p.m. Midnight to 3.30
a.m. News at 1.10 a.m.
..... 15,100kc, 19.85m
News at noon.
..... Moscow 14,920kc, 20.11m
Heard at 1.55 p.m., 3.30 p.m. and some-
times at 8 p.m.

Radio Centre, Moscow 14,720kc, 20.38m
9 to 9.30 p.m., English News; 9.30 to 10
p.m., German; 10 p.m. to 10.30 p.m.,
Italian; 10.30 p.m. to 11 p.m., English.
..... 13,768kc, 20.78m, 21.79m or some-
times 20.81m
11 to 11.40 p.m., English. At 7.30 p.m.,
News in Russian. At 8.20 p.m., Front News
(Russian) for soldiers.
..... 12,240kc, 24.51m
Heard in concert at 1 a.m. and in Russian
News at 1.30 a.m.
..... Moscow 12,190kc, 24.61m
(Lithuanian, Latvian and other languages
at night.—Ed.)
..... 12,111kc, 24.77m
Concert at 4.55 p.m.
..... 12,090kc, 24.81m
"Radio Centre, Moscow." Talk at 2.30 p.m.
News at 2.45 p.m. and 10.30 p.m.
..... 12,067kc, 24.86m
3.30 p.m., Russian; 5 p.m., Italian; 6.30
to 6.55 p.m., English.
(Hard portion of News at 6.40 p.m. on
October 19.—Ed.)

RW-96 11,829kc, 25.36m
Schedule: 3 p.m. to 5 p.m. News 3.34 p.m.
News at 3.34 p.m. (Beattie, Gaden).
..... 11,740kc, 25.55m
News in Russian at 12.30 a.m.

RW-96, Moscow 11,645kc, 25.77m
(Hard to separate from **XGOK**, Canton, but
heard some nights at 10.55.
..... 11,620kc, 25.82m
News in English at mid-day.
..... 10,830kc, 27.70m
One of the strongest Russian stations. 8.45
p.m., English; 10.30 to 11 p.m., Polish;
11 to 11.30, German (for South America);
11.30 to midnight, Italian; midnight to
12.30 a.m., Hungarian; 12.30 a.m., News in
Russian. (At 12.30 a.m. moved to 27.76
to avoid morse interference and announced
they were on 19.78, 20.11, 24.51, 25.55,
31.82 and 50.93 metres.) 12.50 a.m., Front
News; 1 a.m. to 1.30 a.m., Spanish; 1.30
a.m. to 2 a.m., Czechoslovakian.

RW-15, Khabarovsk 9566kc, 31.36m
Schedule: 5 p.m. to midnight; 5.50 a.m. to
7.30 a.m.
Excellent concert at 11.30 p.m.

RW-15, Khabarovsk 9546kc, 31.43m
5 p.m. to midnight.
Irregular now.
At 10 p.m., Hungarian; 10.30, Polish.

RW-96, Moscow 9520kc, 31.51m
10.30 p.m. to 9 a.m. News 6 a.m.
Heard News at 3.34 p.m. (Beattie). (Seems
to be irregular of late.—Ed.)
..... 9430kc, 31.82m
News in Russian at 12.30 a.m.

RW-15, Khabarovsk 6050kc, 49.59m
5 p.m. to midnight.
..... 50.93m
At 12.30 a.m., News in Russian. At 12.50
a.m., Front News (Russian). At 1 a.m.,
Concert.
..... Leningrad 60.20m
5.15 p.m. to midnight. At 11.15 they
broadcast greetings from workers to com-
rades in the U.S.S.R.

RV-15, Khabarovsk 4457kc, 67.31m
RW-15, Khabarovsk 4273kc, 70.2m
5 p.m. to midnight.

Spain:
Radio Malaga, Malaga 7210kc, 41.61m
Fairly good strength at 6.30 a.m. (News at
6.15 a.m. Weak.—Ed.)

EAJ22, Oviedo 7140kc, 42.02m
Being heard again in the mornings, opening
at 6 (Gaden).

"Radio Mediteranee" (Spain?)
..... 7130kc, 42.07m
See "New Stations."
..... Malaga 6993kc, 42.9m
Between 6 and 7 a.m., good signal.

Switzerland:
BBH, Geneva 18,480kc, 16.23m
Schedule: 11.45 p.m. Fridays to 1.10 a.m.
Saturdays. Mostly English, little French.
News 11.45 p.m. Mondays to 1.10 a.m.
Tuesdays, Italian, German and French.

HBJ, Geneva 14,535kc, 20.65m
First Sunday in the month. 3.45 p.m. to
5.10 p.m.
Good on October 5 (Gallasch).

HBO, Geneva 11,420kc, 26.31m
Same remarks as **HBJ**.

HER-3, Schwarzenburg 6165kc, 48.66m
Schedule: 3.30 to 7.30 a.m.
Only Swiss and French heard.
Good till 7.05 a.m. (Perkins). (Note ex-
tension of time.—Ed.)

Yugo-Slavia (now Nazi controlled):
YUC, Belgrade 9505kc, 31.56m
Broadcast in Russian at 2.25 p.m., 1.15
and 2.15 a.m.

YUB, Belgrade 6100kc, 49.18m
Heard almost every morning at 6.

SCANDINAVIA

Denmark:
Radio Denmark, Copenhagen 9710kc, 30.9m
Terrific strength at 3.30 p.m. (Rogers,
Perkins).

Finland:
OIE, Lahti 15,190kc, 19.75m
1.30 a.m. to 8 a.m. News at 5.30 a.m.
Female announcer heard at 7.
Heard giving News in English at 10.30
p.m. (Medley).

OFE, Lahti 11,780kc, 25.47m
Schedule: 1.30 a.m. to 8 a.m. News 5.30
a.m. 4 p.m. to 7.30 p.m. News 5.50 p.m.
R7 at 4.30 p.m. (Nelson). (Russian at
5.15 p.m.—Ed.)

OFD, Lahti 9500kc, 31.58m
Schedule: 1.30 a.m. to 8 a.m. News, 5.30
a.m.
R5 at 4.30 p.m. (Nelson).

Norway:
LKO, Oslo 11,735kc, 25.57m
Schedule: 3.05 to 6 p.m.; 12.30 to 7.30 a.m.
Exercises at 3.10 p.m.
(Excellent afternoon signals, even heard in
City.—Ed.)

Sweden:
SBT, Stockholm 15,150kc, 19.8m
Schedule: 6 p.m. Sundays to 7 a.m. Mon-
days. Daily: 3.56 a.m. to 7.15 a.m.

SBP, Stockholm 11,710kc, 25.63m
Schedule: 3.56 a.m. to 7.15 a.m. Opens
again at 11 a.m. with News for U.S.A. 4.40
p.m. to 7 p.m. (Sundays 6 p.m. to 7 a.m.
Mondays).

SBU, Stockholm 9535kc, 31.47m
Same programme as **SBO**, but weak.

SBO, Stockholm 6060kc, 49.46m
Schedule: 7.18 a.m. to 8 a.m. News, 7.20
a.m.

MISCELLANEOUS

Arabia:

Electric Frequency Clocks

By

P. J. MANLEY, M.Inst.R.E. (Aust.)

Managing Director, Amplion (A/sia) Pty. Limited

ZNR, Aden 12,110kc, 24.76m
English call at 3 a.m., followed by News in French; 3.15 a.m., English call, News in Italian; 3.30 a.m., call in English, News in Somali; 3.45 a.m., call and sign off (Cushen).

Canada:
CBFY, Montreal 11,705kc, 25.63m
Heard from noon to 2 p.m. and 9.30 p.m. to midnight. News 9.30.
Good nightly (Nelson, Gallasch). Received verification (Beattie). Sometimes heard in mornings around 8.

CJRO, Winnipeg 6150kc, 48.78m
Heard till 3.30 p.m. on occasions (Cushen).

CKFX, Toronto 6080kc, 49.34m
Fair, but interfered with at 5 p.m. (Cushen). (Interference is probably caused by GRR.—Ed.)

CBFW, Quebec 6160kc, 48.70m
Heard opening in same programme as **CBFY** at 9.30 p.m. Good at 9.30 p.m. (Cushen).

CFRX, Toronto 6070kc, 49.42m
Opens at good strength at 8.45 p.m. (Cushen).

Eire:
Radio Eire, Athlone 9590kc, 31.27m
Can be heard on favourable days about 7.15 a.m.

Radio Eire, Athlone 15,120kc, 19.83m
Heard sometimes at 7 a.m. with R7 signal (Dissinger, U.S.A.). (Try between 7 and 7.15 a.m. while **GSF** is off the air.—Ed.)

Iran:
EQC, Teheran 9680kc, 30.98m
Schedule: 11.45 p.m. to 3.30 a.m.

EQB, Teheran 6155kc, 48.74m
Schedule: 4 a.m. to 6 a.m. (News 4.30 a.m.).
Man and woman announcers. Woman generally gives News. The Persian stations are of great interest now.—Ed.

Turkey:
TAQ, Ankara 15,195kc, 19.74m
Schedule: 8.30 p.m. to 10 p.m.
(Mostly Turkish, Arabic and French, and has been heard by 3.30 p.m.—Ed.)

TAP, Ankara 9465kc, 31.70m
Schedule is: 12.15 a.m. to 7 a.m. News at 5.15, and on Sundays English at 5.50. Excellent signals. Splendid dance records.

Location Unknown:
Christian Peace Movement 9430kc, 31.84m
Heard singing hymns around 5.45 a.m. (Heard good talk from London regarding this and other Nazi "trick" stations.—Ed.)

European Revolutionary Station 9640kc, 31.12m
(Note, has moved a little.—Ed.)
Heard from 7 to 7.20 a.m. and from 3 to 3.14 p.m.

Radio Antoine 9750kc, 30.77m
(This station, which appears to be the same as **Unconsu**, is heard from 4 to 4.15 p.m., at good strength.—Ed.) R4-5 at 4 p.m. on favourable days (Nelson).

WEST INDIES
Cuba:
Havana unless otherwise mentioned

COGF, Matanzas 11,805kc, 25.41m
"Radio-Emisoras **CMGF** and **COGF.**"
Schedule: Midnight to 2 p.m. occasionally. One you have to fish for (Dissinger, U.S.A.).

COCY 11,745kc, 25.54m
Closes at 4.15. (Note moved again.)

COK 11,620kc, 25.82m
Ministerio de Educacion, Direccion General Nacional de Deportes (National Sports Director). Schedule: 4 a.m. to 4 p.m.
Best about 2 p.m.

COCM, Cadena Sauritos 9810kc, 30.58m
9.30 to midnight.

COCH 9435kc, 31.82m
Signal strength both afternoon and night has dropped.

COBC 9360kc, 32.05m
R4-5 at 3.30 p.m. R7 at 10 p.m. (Nelson).

COCX 9270kc, 32.36m
(Note moved again.)

COBZ 9030kc, 33.32m
Opens at 10.45 p.m.

COKG, Santiago 8920kc, 33.50m
Weak and only seldom heard at night.—Ed.

COCC 8850kc, 33.9m
These people have gone back to 11 p.m. for their religious service (Nelson).

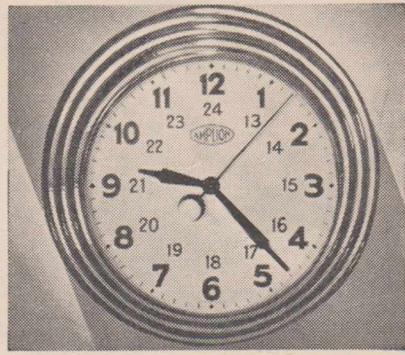
ALTHOUGH electric frequency clocks have been marketed throughout Australia for some twelve years, quite a large number of people are not conversant with the operating principle of these clocks.

Electric clocks have, of course, been marketed for many years, but the electric frequency clock has been a comparatively recent introduction.

In the case of the earlier electric clocks it was mainly a substitution of electric power in place of mechanical energy, generally in the form of a spring. There was also another advantage, however, in the case of master control clocks, as by means of a master clock all other clocks con-

controlled by the frequency of the power mains.

A word at this juncture may be appropriate with regard to power supply to further explain the point. In the first place, power supplies generally are divided into what are known as direct and alternating current. Direct current for home lighting and heating is rapidly passing, for certain technical reasons, and is being replaced as quickly as possible by alternating power current supply. There are still some direct current supplies in parts of Australia, such as many places in the city of Sydney a few parts of the city of Melbourne, and some country centres. The great majority of residences and offices today, however, throughout Australia are connected to alternating current, or what is known as A.C. supply. Furthermore, all new power supplies are A.C. Still further, A.C. power supplies for connecting to the average home or office are of the order known as 50 cycles, which is the frequency of the supply.



nected to it were kept to reasonably correct time. There were certain disadvantages, however, with this system, as in the first place all the secondary clocks had to be connected to the master clock, and there was nothing to ensure that the master clock kept correct time.

In the case of electric frequency clocks, however, it is not merely a substitution of one power for another—that is to say, electrical for mechanical energy—but the time is

This frequency or periodicity is the number of times the power alternates in a second. On looking at a light operating off an A.C. power supply it would appear that the power supply was continuous, but actually such is not the case, as since the power alternates in each direction fifty times in a second, it is quite obvious that fifty times in a second there is actually no power supply at all—that is, between each alternation. The pauses, however, are infinitesimal, with the result that they are not discernible by the human eye. Such, however, does not apply in the case of a sensitive synchronous clock, and it is each alternation that impulses the sensitive mechanism, with the result that the motor is not only operated by the power, but keeps invariably in step with each alternation or impulse.

COCO 8700kc, 34.48m
(Not listed in "Radio-Guia."—Ed.)

COHI, Santa Clara 6455kc, 46.48m
Opens at 8.30 and is heard till 11.30 p.m. Ed.

COCC 6375kc, 47.06m
Schedule: 2 p.m. to 3.15 p.m.; 9.30 p.m. to midnight.

COCW 6320kc, 47.47m
Very poor signal at night.

Dominican Republic:
HI1N, Trujillo 12,480kc, 24.03m
R5 at 10 p.m. (Nelson).

HI2G 9295kc, 32.28m
Received veri for report, September, 1940. Give schedule as 10.30 p.m. to 1.30 p.m.

(Cushen). Often heard in parallel with **HIG** and **HIG** (Dissinger, U.S.A.).
R5 at 10 p.m. (Nelson).

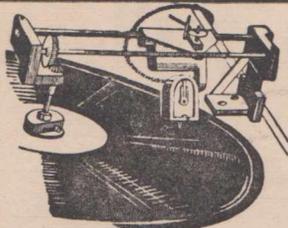
HI1J, San Pedro Demacoris, 6025kc, 49.79m
Now using 250 watts. Have received veri (Cushen).

HIG 6280kc

HI3C, Larumana 6145kc, 84.82m
-Fair from just after 10 p.m.

Martinique:
Radio Martinique, Forte-de-France
9705kc, 30.92m

Schedule: 8.30 a.m. to 11.30 a.m.
Excellent on July 6 (Gaden). R7 when closing at 11 a.m. (Cushen).



LIKE-A-FLASH Overhead Cutting Head and Cutting Gear £5/5/-
MAKE YOUR OWN RECORDINGS. Cutting head and overhead cutting unit complete, £5/5/-
 Plain Records, 2/11, 3/11, 4/11, 5/11. Cutting Needles, 2/-
 Aluminium discs, 1/-, 1/6.



NOW READY 1/2 posted

4-in-1 Metal and Bakelite Pocket Screwdriver Sets, 2/-.

LEVENSON'S WIRELESS

Wholesale, Retail. Wholesale, Retail.
 Games, Hobbies, Novelties, and Slot Machine Specialists.
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Everything from A to Z in Radio at Sane Profit Prices.
 'Phones: M 2525 and M 2526-7. Goods forwarded C.O.D. Post or Rail.
 (C.O.D. Mail within N.S.W. only. Not Interstate). We welcome
 Prepaid Telegrams and Long-Distance 'Phone Calls.

SPECIAL! SPECIAL!

Cosmocord Crystal Pickup
 British manufacture

List Price
 84/-

Now 49/6

Special price to traders, lots of 6 or more.



COSMOCORD CRYSTAL TYPE BRITISH BUILT AND DESIGNED GRAMOPHONE PICK-UP DE LUXE, with volume control built in as illustrated, 59/6.

AMPLION British built Gramophone Pick-up with volume control. Moulded bakelite tone arm. List Price 37/6 Now 32/6. Dealers write for wholesale price.

COLLARO Spring Gramophone Motor and Turntable, 27/6.



Reconditioned Hygrade 'phones, 15/-, 17/6, 20/-
 Headphones—13/6, 15/-, 17/6, 21/-
 Ericsson's Professional 4,000-ohm 'phones, 47/6.

Just arrived! British-made Gramophone Pickup Needles. Will play 10 records. 100 in tin, 2/6.

Extra loud and medium, 2/6.



"Vico" Electric Dry Shavers. Brand new, original cartons. A.C. - D.C. 240 - volt, 110 and 240 - volt, 6 - volt, 32 - volt, 50 - volt.
 £5/5/- list price. NOW 50/-.

VALVES AT SANE PROFIT PRICES. ALL GUARANTEED.
 New 227 Valves, 5/9; used, 3/6.
 New 4XP, 5/-; S215, 5/-; MH4, 2/6. 38, 78, used 5/6.
 Raytheon B.H. Rectifier, new, 15/-; DU10, 5/-; 2A6, 35, used, 5/6.
 Used 224, 5/6. 610RC, 610XP, new, 6/6. Used 42, 5/6. New 41MRC, ML4, 3/-.
 44SU Rectifier, 5/-.
 PM22, new, 7/6. Used 1C6, 6A7, 6A8, 6B7, 6U7, 6F6, 6F7, 6L7, 6/6. Used 57, 58, 59, 6/6; 201A, 3/6; A409, 6/6; A615, E406; E452, 6/6. Used PM6, PM5B, A609, 6/6. Used 6J7, 6J8, AL2, EK2, 2B7, 226, 5/6. New PM12, PM2A, 18/-.
 Let's know your valve wants.

How to Build Modern Crystal Sets, 1/2 posted free.

Radiokios Straight-vision Illuminated Dials, 5/-.
 Circular Stop Light type, 4/-.

Strong Bench Vice, 6/9.

Radio and other Publications
 Learn Morse, 1/-.
 Radio Dictionary, 1/-.
 Beginners' Radio Book, 1/-.
 Everyman's Radio Book, 5/6.
 The Television and Short-wave Handbook, 5/6.

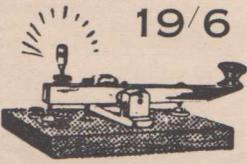
Pick-up Heads. Fit and suit all tone arms and gramophones. For operating gramophone through radio. 15/-, 19/6 each.



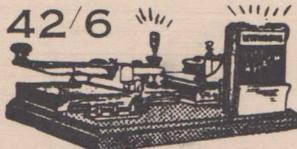
No. 1.—Adjustable Morse Code Key, with long or short taper arms, splendidly made and finished. Strong reliable

heavy plated fittings mounted on bakelite moulded base, 12/6.
 P.M.G. Type Sounders 35/-.

No. 2.—P.M.G. Type adjustable Morse Code Key, strong and reliable; will last a lifetime. Heavy plated fittings on thick solid wooden base. Perfect action.

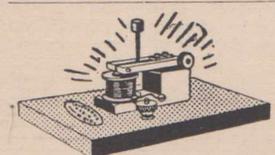


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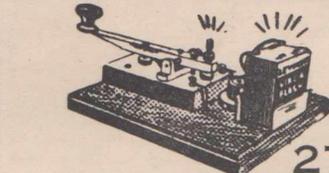


42/6

No. 3.—Set comprising No. 2 Morse Code Key P.M.G. Type, with light. Professional De Luxe Buzzer Battery. Throw-over Switch for buzzer or light. Use as required. Mounted on baseboard. Complete.

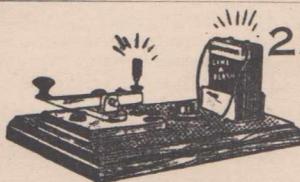


Highest-pitch Buzzer, finger-tip adjustment for professional or amateur use, 11/3.



27/6

No. 5.—Outfit comprises the P.M.G. No. 2 Morse Code Key, with adjustable buzzer and battery all mounted on a stained baseboard, ready for immediate operation. Battery included.



22/6

No. 6.—A real good little outfit which incorporates the No. 1 adjustable Morse Code Key, in moulded bakelite base, with a smart little adjustable buzzer all complete to operate. Junior model, 13/6.



Remote controls for Car Radios, U.S.A. make, 25/-.



Ormond Slow Motion Front Panel 2-action Vernier Dial, 8/6.

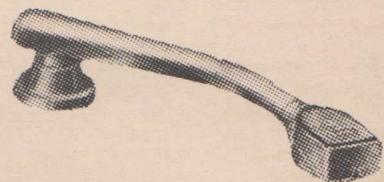
Model Electric Motors. Work off small wet or dry batteries. 5/9, 10/6, 12/6.

MICROPHONES

Batteryless hand-holding type, 30/-.
 Others, bench type, 15/-, 17/-, 21/-, 30/-.



High-pitched "Stay Put" adjustable Tone Buzzer, 3/9.
 Adjustable Buzzers in Bakelite cases, 4/6, 5/6.
 Special price to traders. Write for lists.



Collaro Highest Definition Pickup. New needle holder. Sturdy, compact, well made, with Volume Control. 50/-.

SET TESTING LEADS WITH SILK FLEX and METAL TIP ENDS. 3/9 value. NOW 2/6

Police Patrol Multi-Strand Rubber-covered Aerial. Needs no separate lead - in. 50ft., 3/3; 100ft., 6/6.
 Man-o-war Heavy Duty Insulated Aerial, multi-strand wires, 50ft., 6/6; 100ft., 13/-.



SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

J.S.S. (North Bondi) wants a circuit of a commercial receiver of some years ago.

A.—Sorry, but we have been unable to get a copy of this circuit, and it was brought out some time before the present service manuals were thought about. From the sound of it, and especially of the price you paid for the chassis (5/-), we feel sure that it will take a fair bit of attention to make it into a worthwhile DX receiver.

INTERESTING LETTER FROM DX-er

From Mr. John V. Davis, of Castle Road, Wootton, near Woodstock, Oxon., England, comes an interesting letter as follows:—

"Dear friends of AWDX H.Q.—Received the membership certificate to the All-Wave All-World DX Club, and badge, for which I thank you a thousand times, yes sir! It sure is good to be in a DX Club at the other side of the world. I'm proud of it. I also would like pen pals in Australia, anywhere. I'll answer all correspondence 100 per cent. to any X.Y.L., Y.L. or O.M. any age, or swap newspapers, stamps, P.C. views. So what can be done in the matter will be very much appreciated.

"Well, friends, as I write this letter our boys of the R.A.F. are going over in waves. The Huns are going to have a headache to-night, and old Nasty is going to have some more worry, hi, hi! To your boys over there—I have seen them over here, soldiers and airmen. I do feel proud of them, to think what a vital part the Empire is taking to help smash Hitlerism. To Radio—I hear your S.W. broadcasts on VLQ2, 5 and 7 and VLW2.

"This darn war has certainly fixed things for the "hams" and S.W.L.'s. Never mind. Let's hope it will soon be over, then we will get down to some F.B. DX, and all the boys of your country can go back to their homes to settle down. Here's wishing all you 'Aussies' the best of luck in everything, and thumbs up. Well, cheerio, friends.—Yours sincerely,

JOHN V. DAVIS,
(AW701DX).

"P.S.—Since starting this letter, I have received a QSL card from VLQ7, Sydney. It's a swell card."

M.B.S. (Pennant Hills) enquires about a pre-amplifier for a microphone.

A.—There are lots of points to be watched in the design and construction of the pre-amplifier stage, as otherwise you will run into no end of bother with hum, instability and distortion. Even in the commercial talkie equipment it was not until quite recently that they were able to get away with a.c.-operated pre-amplifiers, previously using batteries and accumulators for the pre-amplifier and a.c. only for the main amplifier. The whole subject is thoroughly treated in the latest "Radiotronics" technical bulletin released by the Amalgamated Wireless Valve Company, and we suggest that you should get a copy of this bulletin, as it answers all your questions in a far more thorough way than we could hope to do in these columns. Ask for Bulletin 116.

A.C. (New Farm) wants to improve the tonal quality of an old commercial receiver.

A.—It will be a pretty big job to make any startling improvement in the quality, mainly on account of the inherent selectivity which was built into this type of set. With such selectivity it is impossible to get really good reproduction of the high notes. You do not mention what ability you have or how far you are prepared to go in order to get quality, so we do not know how far to go in recommending you to re-build the job. If you are prepared to sacrifice range we think that you might pull out the intermediate amplifier valve and use only one i.f. transformer. This will then allow the highs to be handled and the rest of the attention can be given to the audio end along the lines suggested in "Push-pull Proposition" on page 43 of the January, 1941, issue. Simpler way would be to use inverse feedback on the existing circuit, by putting a 1 meg. resistor from plate to plate of output and detector valves, as in the "Nugget" circuit in this issue.

S.C. (Dungog) asks about circuit service.

A.—Afraid it would be quite impossible to help you in this matter. We are particularly short-handed at the moment and there is little chance of having sufficient spare time to handle the job. At present we make every effort to dodge even the reply-by-mail query service and also the laboratory service.

W.L. (Coff's Harbour) wants to submit an article on an a.c.-operated set for our Battery Circuit Contest.

A.—Sorry, but the contest is devoted exclusively to battery-operated sets, including vibrator-powered, but definitely not a.c. operated. Whilst we readily agree that hundreds of distant listeners live in country towns and have a.c. available, it was not the idea of the contest to deal with a.c.-operated sets. We wanted first-hand and essentially practical articles from those using battery sets. Apart from the contest, any contributions are welcome.

C.M.N. (Box Hill, Vic.) wants us to settle an argument about output valves.

A.—We have the greatest respect for the old 50 type triodes, notwithstanding the modern types of beam power valves available. From a commercial point of view the use of the high voltage on the 50 makes it an unsuitable type, requiring an expensive power supply and filter system. High voltages also tend to unreliability unless the components used are entirely suitable. This is especially noticeable in the matter of filter condensers. But a good pair of 50 type valves, well loaded up with about 500 on the plates and feeding into a modern type of speaker or speakers can give mighty fine reproduction.

B.R.W. (Warracknabeal) asks about a circuit published some time ago.

A.—As the author's name and address was given, we think it would be quite O.K. to write to him direct. In such a case, of course, it is only courtesy to enclose a stamp for reply. As your request is also in the nature of asking quite a considerable favour, you will need to word the letter most factually if you expect it to be productive of results.

F.R.M. (Warragul, Vic.) enquires about a base for a set.

A.—The Arcadian factory does not supply direct to the public, but they have the template and can supply the correct base to you through your local radio dealer. Melbourne agents for Arcadian are Magrath's, and they may be able to help you.

T.H.K. (Broadford, Vic.) built an amplifier which won't work.

A.—Sorry, but almost anything could be wrong. Suggest you do some further experimenting and then let us have all the detail you can. Last amplifier brought in for laboratory test would not work and when inspected we found that the builder had omitted to connect up the heater circuit of the valves.

Unobtainable in most places but we can supply new 2A3, 6A3, 6L7, 6L6, 6N7, 6F6, EK2P Valves and dozens of other types.

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THE AUSTRALASIAN RADIO WORLD

Battery Circuit Essay Contest — First Prize £5 cash

ENTRY FORM

NAME (in block letters)

ADDRESS

(State)

To: A. G. HULL,
117 Reservoir Street, Sydney.

I enclose herewith essay on battery circuit design for the above contest.
I agree to accept your verdict as final.

Signature

Entries close on December 1, 1941

Results in January issue

QUERIES (Continued)

J.R.S. (Hurstville) suggests a description of a simple valve tester.

A.—Yes, this appears to be a subject which would lend itself to a good article. Will go into the matter and see what can be done. Thanks for the letter.

M.P. (Mayfield) asks for another circuit for a portable.

A.—Sorry, but there doesn't seem to be any chance of such an article at present. The big problem at the moment would be to obtain supplies of the 1.4-volt valves which are so desirable with a receiver of this type. At the present moment these valves are practically unobtainable. If you can get the valves we would suggest that you work from the circuit given in our issue of December, 1940. Copies of this issue are still available from our office at 6d. each post free.

H.K. (Essendon) wants further details on handling the signal tracer.

A.—A further article on the subject of signal tracers and how to use them is scheduled for publication in next month's issue. From what you say we would imagine that a signal tracer would be of great assistance.

T.H.L. (Mosman) enquires about back numbers.

A.—We are quite out of stock of the July, 1940, issue, and we do not know where you are likely to pick up a copy. If you want the circuit of "Tip Top" you will find it reprinted in the December, 1940, issue, copies of which are available at our office at 6d. each.

H.T.H. (Delungra) enquires about valve testing.

A.—If the filaments are intact it is usually an indication that a battery-type valve is O.K., but it is by no means a certain test, as the valve can still have internal short-circuits, open-circuited grid, plate or screen. It is also remotely possible that the filament will lack emission, although showing continuity. The only thorough test is to heat the filament and apply high tension to the plate and screen and then check the plate current, and the mutual conductance.

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and overseas reception guaranteed. RE-NU LTD. (Est. 1932), opp. Richmond Stn., Melbourne. 75 other lines. For particulars, employment offers and free sample send 10d. stamps, refundable first order.



G.C. (Bendigo) enquires about changes to the "Super Seven," also about speaker field energising.

A.—We have no data as to what would happen if you changed the valves as suggested, and we would advise against it as these circuits are sufficiently critical to let us imagine that you would stand a fair chance of running into trouble with the feedback circuit. The original design was most carefully calculated and engineered, and we strongly advise you to stick to it as closely as possible. A full article on speaker field energising was given in the issue for last May. From the chart which was given with this issue, you should have no difficulty in working out any required wattage, field, voltage drop or current drain. For the K12 speaker you want something between 8 and 14 watts, with 10 watts as a good all-round figure.

J.S.M. (Cygnet, Tas) is interested in the resistance-coupled amplifier detailed in the August issue, but wants to use a heavier power pack.

A.—The actual rise in voltage due to working a power transformer at a lower load than its rating will depend on the regulation of the transformer, which in turn depends on the size of the core, gauge of wire used, and so on. For a rough guess, however, we would expect your high tension to be around 400 volts, so that if you use a field coil of something between 1,000 and 1,500 ohms you can expect that the output valves will be nicely loaded and the speaker properly energised. Carbon resistors of one-watt rating would be quite O.K. for use in biasing the first valve and the phase changer. The 750-ohm main bias resistor will need to be of a heavier type, one with a 20-watt rating to be on the safe side.

C.O.N. (Belmore) wants to get in touch with Mr. Parry.

A.—You can address a letter to Mr. Parry care of our office and we will see that he gets it. We hope that you do not want to ask him any questions which are too involved, as his time is precious. A few minutes' consultation with a specialist is always computed in guineas.

No name (Allansford) enquires about power output from the 6B8G when used as an output valve with a vibrator power supply delivering 150 volts.

A.—There should not be any great difference in the efficiency of modern pentodes, and no matter whether you are feeding into a 1L5G, or any other pentode we would expect that a given amount of high tension wattage, so many volts at so many milliamperes will give you the same amount of noise. There is more chance of lost efficiency in the actual speaker. Modern permagnetics are remarkably efficient. Even with indirectly heated valves there is a chance that there will be trouble if you attempt to run the set when the filament accumulator is actually on charge. If nothing else, you could expect to pick up some noise from the charging generator or the engine which drives it.

H.C.M. (Wonthaggi) ends a copy of a simple circuit he is using.

A.—We were glad to get your letter and to have the circuit. We regret, however, that we cannot possibly reproduce this circuit as it contravenes all the electricity supply regulations. The vast difference with sets of the Dandy type was that they did not make a direct connection to the power supply mains, the only coupling being inductive through the transformer. With your type of set the plate of the rectifier valve has to be connected directly to the power mains, which is usually considered a foul felony.

For those hard-to-obtain odd type Valves, Transformers, Dial Glasses, Condensers, etc., both new and used, write to Queensland's Premier Distributors—

DENHAMS RADIO SERVICE
Box 145, P.O.
MARYBOROUGH - - QUEENSLAND

AMPLIFIER

(Continued from page 18)

the volume moderately low except when dancing is in progress. The amount of distortion that can be tolerated depends on the noise level.

Refinements You Can Add

A stand-by switch in series with the pilot light to reduce the load on the valves except when in use. A 6-volt pilot lamp in series with a 15-ohm resistor across the speaker transformer secondary to act as a level indicator. A multi-tap speaker transformer so that the number of speakers used can be changed.

Volume expansion and compression can be applied via the feedback system (a la Parry). A push-button switch can be used to short the pick-up for making announcements during a dance when the amplifier is already fully loaded on the pick-up.

VIBRATOR SET

(Continued from page 9)

little more complication, is dearer, scarcer and more liable to trouble. With properly-designed filaments, it runs, correct bias for almost any set of valves can be easily obtained with minimum of shunts. The calculating of these shunts seems to frighten many constructors, but is probably the most simple of all calculations.

Re using 6v. valves in converter of vibrator sets: Filament consumption is immediately doubled, and with 6J8G (logical choice at moment) under optimum conditions, converter noise increases up to 40 per cent, i.e., with 135v. supply, and is therefore not to be recommended.

In your "Countryman's Six," the practice of the condenser straight across the speaker load in push-pull jobs is not recommended by valve-makers and tends to mar reproduction somewhat at some frequencies. Separate condensers or one condenser series with resistor of about 20,000 ohms is capable of finer results. 19 or 1J6 under these conditions is capable of a couple of watts of really good tone.

Aerial lead on high sensitivity jobs should be brought straight out of the chassis from the switch, passed around outside of chassis to the terminal, to avoid instability. Average drain of these jobs with pilots off is .9 amp.

— R. BROWN.

82 Victoria Street,
Taree.



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but he won't use it**

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