

THE
AUSTRALASIAN

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Radio World

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NOVEMBER 1, 1939

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Sydney, for transmission
by post as a periodical

ASSEMBLING AND WIRING
THE "PICNIC PORTABLE"

METERS FOR A.C. AND
D.C. MEASUREMENTS

A.C. AND BATTERY
SHORTWAVE SUPERHETS

WORLD S.W. NEWS; B.C.
BAND DX CONTEST



New Radiola Portable Five—See Page 3.



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In the panel at left is the complete range of Brimar 1.4-volt valve types, of which stocks are available.

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Kit "A" comprises air-cored aerial, r.f. and oscillator coils, and two i.f. transformers complete with 465 k.c. padder. Ask for Cat. No. K114. Retail price, £1/16/9, post paid.

Kit "B" is recommended where maximum possible gain is required. Comprises permeability tuned aerial, r.f. and oscillator coils, and two standard iron-cored i.f. transformers complete with padder. Ask for Cat. No. K116. Retail price, £2/9/9, post paid.

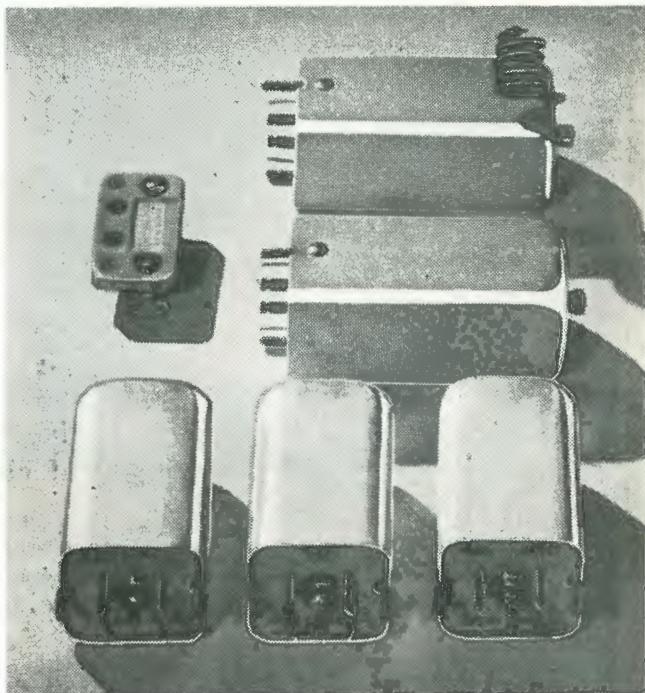
NEW MATCHED LOOP PORT- ABLE COIL KIT

Illustrated at left is the new coil kit specially developed by R.C.S. RADIO for 1.4 volt portable receivers not using an r.f. stage. The kit comprises a specially wound loop aerial ready matched at the factory to ensure perfect tracking, and oscillator coil, padder and a pair of high-gain 465 k.c. i.f. transformers. Ask for Cat. No. K117. Retail Price, £1/11/3.

Obtainable from your local dealer or write direct to

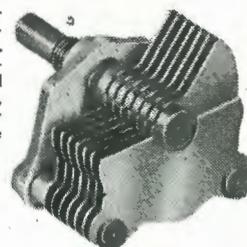
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R.C.S. shortwave components, including Star and M.C. (for gauging) midget condensers, r.f. chokes, potentiometers and rheostats, audio transformers and chokes, aerial accessories, etc., are recommended by the Editor for all "Radio World" shortwave and all-wave receivers.



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Max. Cap. mmfds.	STAR AND M.C. MIDGETS.			Retail Price.
	STAR Cat. No.	M.C. Cat. No.	Price.	
10	CV34	CV41	3/-	6/-
15	CV35	CV42	3/3	6/6
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50	CV38	CV45	4/3	8/-
70	CV39	CV46	4/9	8/6
100	CV40	CV47	5/3	9/-

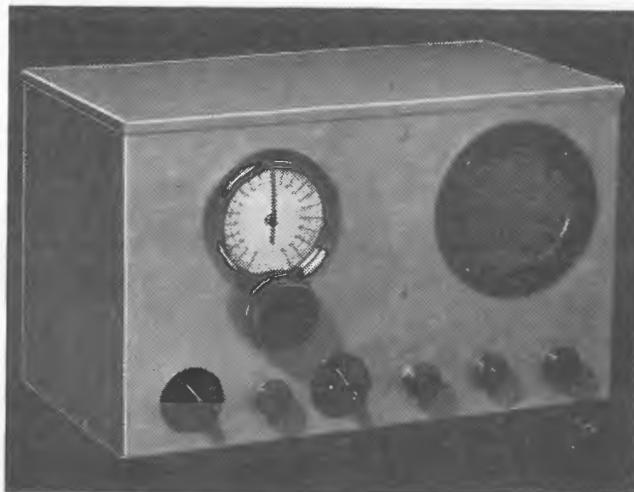
POTENTIOMETERS & RHEOSTATS

The R.C.S. volume controls are the result of improved and new methods of manufacture, together with alterations in design and final testing. Noiseless, they are constructed so as to cut off all volume.

Rheostats:	Cat. No.	Cat. No.
6 ohm	PT40	4/6
10 "	PT38	4/6
20 "	PT39	4/6
30 "	PT34	4/6
Potentiometers:		
400 ohm	PT46	4/6

Keep Up With The News!

Build the VULCAN SHORTWAVER described in this month's "RADIO WORLD"



Write or 'phone for quotation on our PRECISION RADIO model—available either in kit form or fully assembled and air-tested.

"Little Wanderer" Portable Radio

City, beach or bush . . . anywhere, at any time, a flick of a switch will bring you a wealth of radio entertainment from this sensational new 1.4-volt portable radio.

MAIN FEATURES INCLUDE:

- Powerful five-valve superhet circuit (using 1.4 volt valves) specially developed to give maximum in performance with minimum running costs.
- Six-inch Rola P.M. speaker with high-sensitivity magnet ensures ample volume with superb tone.
- Litz-wound iron-cored coils and i.f. transformers give exceptionally high sensitivity.
- New improved a.v.c. system, station-calibrated dial, non-directional lid aerial, with provision for attaching outside aerial.

WANT A RECEIVER BUILT, LINED UP OR SERVICED?

If so, we are fully equipped to handle the job for you. For years we have specialised in building to private orders all types of receivers (A.C., D.C., A.C./D.C., vibrator, battery, dual-wave, all-wave or short-wave), amplifiers of all types (P.A. systems a speciality), auto and portable radios. Sets built to individual requirements, or we will design to suit any conditions.

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The Australasian

RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS

Managing Editor:
A. EARL READ, B.Sc.

Vol. 4. NOVEMBER, 1939. No. 6.

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Fisk Radiola Portable Five

**Smartly Styled Lightweight
Portable Is Ideal For Summer
Outings**

LAST month, Amalgamated Wireless (A'sia) Ltd. announced the release of their new "Portable Five" Fisk Radiola as illustrated on this month's front cover and in the accompanying photographs.

A distinguished newcomer to the wide variety of 1.4-volt portables already on the market, this new A.W.A. release is soundly engineered throughout, and as well combines smart appearance with ruggedness of assembly. Using standard portable type dry batteries both for "A" and "B" supply, the set is compact, light and entirely self-contained, operating without external power, aerial or earth connections of any kind.

Five low drain 1.4-volt valves are used in a specially developed superhet circuit that has remarkable sensitivity. The built-in loop aerial gives adequate reception in practically all localities, while in those particularly remote from radio stations, an external aerial and earth can be used.

Housed in a lightweight, smartly-styled cabinet finished in airplane luggage cloth, with leather carrying handle, the "Portable Five" will make an ideal companion for travellers, holiday-makers, sportsmen . . . for anyone wanting radio entertainment, anywhere and at any time.

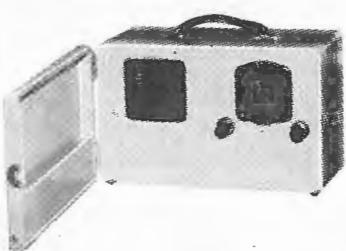
Main Features Of "Portable Five."

Main technical features of the "Portable Five" can be summarised as follows:—

Circuit: Five-valve superhet, using a 1A7G mixer oscillator, 1N5G first i.f. amplifier, 1N5G second i.f. amplifier, 1H5G diode second detector, a.v.c. voltage



CABINET by WESTERN



Built Specially
for the

Picnic Portable Four

The carrying case used for the "Picnic Portable Four" was built by us to the Technical Editor's specifications.

EXCLUSIVE FEATURES:

- Solidly built throughout from light, strong timber, dovetailed joints being used for greatest rigidity, this sturdy lightweight case can be relied upon to stand up to years of hard wear.
- Latest airplane luggage cloth combines smart styling with excellent durability. (Alternatively, grained morocco leather cloth, available in a variety of colours, can be supplied at no extra charge).
- Case is supplied complete with heavily-plated tarnish-proof fittings. (Slight extra charge for lock type catch).

Such an outstanding receiver as the "Picnic Portable" deserves a carrying-case that matches its performance, so be sure and specify a "WESTERN."

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generator and triode driver, 1Q5GT beam output pentode. Incorporates a.v.c. and automatic bias.

Speaker: A special 6½" permanent magnet dust-proofed speaker ensures high quality reproduction.

Chassis: The plated steel chassis measures approximately 7½" x 5¼" x 2."

Tuning Range: Is from 550 to 1600 k.c. (includes new frequencies as allocated last year at the Cairo Convention).

Batteries: One 1.5-volt "A" and two 45-volt "B" standard portable batteries ensure minimum operating costs. "A" drain .3 ampere, "B" drain 9.5 mills. (At these current ratings, a single set of batteries should give approximately 200 hours' service). Separate compartments are provided for both "A" and "B" batteries.

Aerial Equipment: Built-in "air-wound" oval-shaped loop aerial mounted vertically inside rear lid of cabinet ensures adequate pick-up from all but distant stations. For inter-state reception, provision is made for the attachment of an external aerial and earth, coupling being provided by a separate loop winding.

Controls: The four labelled controls are recessed into the case to provide protection during transportation. The controls (left to right) are—tone, volume, tuning, on/off switch. A red and black indicator appearing in a small circle below the dial pointer provides positive indication as to whether the set is on or off. The dial, which is calibrated in k.c., is distinctively finished in cream and gold, with dark brown lettering.

Carrying Case: Measures approximately 14¾" wide x 10" high x 7" deep, and is finished in attractive weather-proof airplane luggage cloth. Loop aerial is wound inside hinged back of cabinet, which can be swung upwards to give increased pick-up when distant stations are being played.

Outstanding Performance During City Tests.

Last month a "Portable Five" was supplied to "Radio World" for test purposes, but as it was received just before this issue went to press, time was not available for more than brief day-time tests in several city locations. These were more than sufficient, however, to prove that this receiver is one of the finest of the 1.4-volt portables released to date.

At every location all eight locals could be played at overloading volume using the loop aerial only, both output and quality being beyond reproach. In addition, 2KA Katoomba, 2KO Newcastle and 2WL Wollongong were pulled in at comfortable volume—striking proof of the receiver's capabilities for DX work.

Its performance provides a striking illustration of what can be accomplished with the 1.4-volt valves in an up-to-date circuit, operating (Continued on page 8)

More Power to You

in SALES
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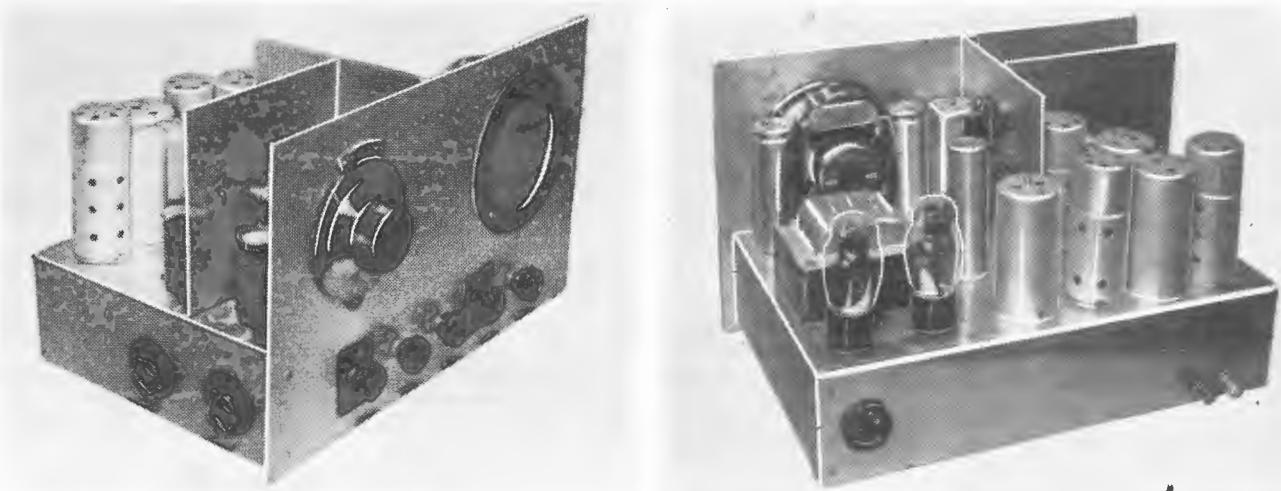
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and all
CARS and TRUCKS



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Front and rear views of the six-valve a.c. communications type superhet, reviewed below. Two i.f. stages are used.

Two Communications Supers.

Bandspread tuning, separate b.f.o., and built-in speaker are features of the six-valve a.c. shortwave superhet reviewed below. Details are also given of a pre-selector unit for the "Vulcan Shortwaver".

SINCE the outbreak of war more interest has been taken in Australia in shortwave reception than ever before, both by amateur experimenters and the general listening public. Communication receivers are steadily coming into vogue, their present popularity having been given

an additional fillip due to amateur transmitters now turning all their attentions from transmitting to receiving. For the first time in the history of radio in this country, Australian-built communication type receivers are making their appearance on the market.

S.W. Superhets For A.C. And Battery Operation.

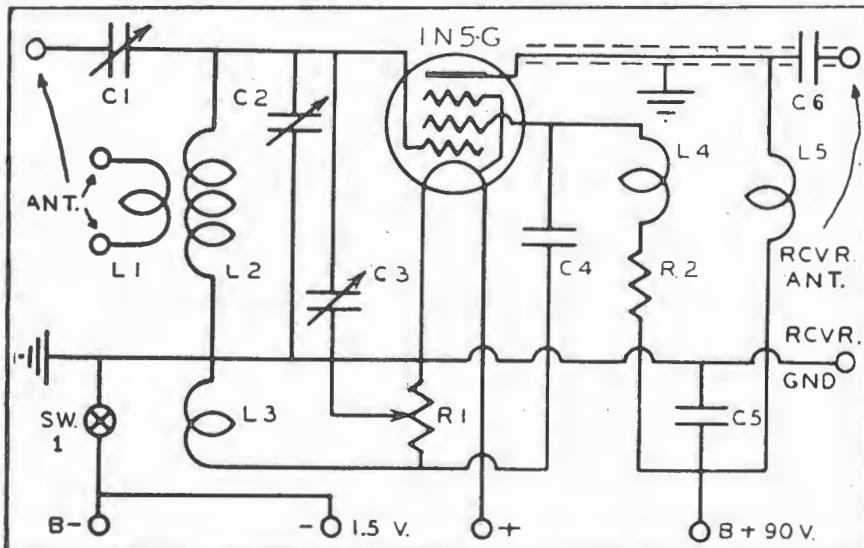
The two designs discussed in this article are standard types of receivers that are not expensive to build. The model illustrated in the photographs

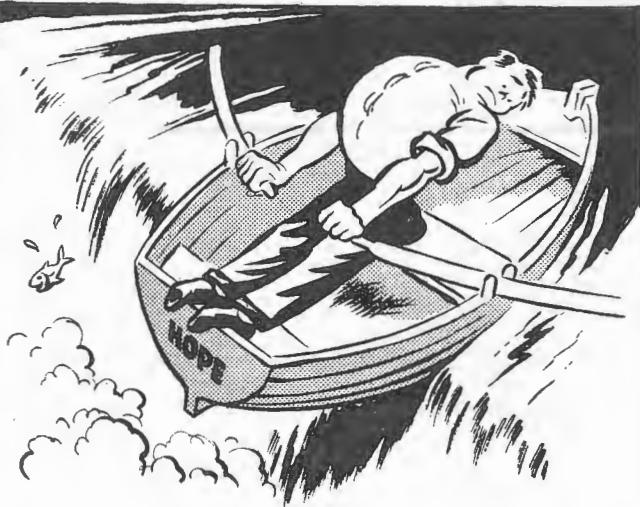
Circuit of the pre-selector:—C1—3-30 mmfd. midget; C2—100 mmfd. (band-set); C3—35 mmfd. bandspread; C4—0.006 mfd. mica; C5—0.5 mfd., 400 volts, paper; C6—0.00025 mfd., mica; R1—2,000 ohms, with SPST switch (SW1); R2—10,000 ohms, $\frac{1}{2}$ watt; L1, L2, L3—plug-in coils (see coil table); L4, L5—R.F. chokes, 2.5 MH, midget.

COIL DATA

Band	Turns	Spaced	Wire	L3	L4
meters	L2	over	size		
10-20	3	1 $\frac{3}{4}$ "	14E.	2 $\frac{1}{2}$	3
17-41	9	1 $\frac{3}{4}$ "	16E.	4	4
40-80	17	1 $\frac{3}{4}$ "	22E.	6	6
80-160	35	1 $\frac{3}{4}$ "	24E.	9	6
160-270	58	1 $\frac{3}{4}$ "	28E.	14	6

All coil forms $1\frac{1}{2}$ " diameter. All tickler and antenna coupling coils are wound close with No. 30 d.s.c. wire. Spacing refers to the length of the winding on the form, not the distance between turns. Range given is only approximate.





ARE YOU WORKING HARD BUT SLIPPING BACK?

THREE'S more in this radio and electrical business than merely fighting to keep above the breadline.

There's MONEY in it, too . . . but you won't see it if you're being swept downstream by High Prices and Slow Service.

Martin de Launay's will help you to surge ahead. You drop the oars and sit at the helm as soon as you send an order to us. You see, right away you get speedy service, keen prices and high quality.

That sounds like—and is—boasting. We're proud of the organisation we have created to handle orders, big or small, from anywhere in Australia.

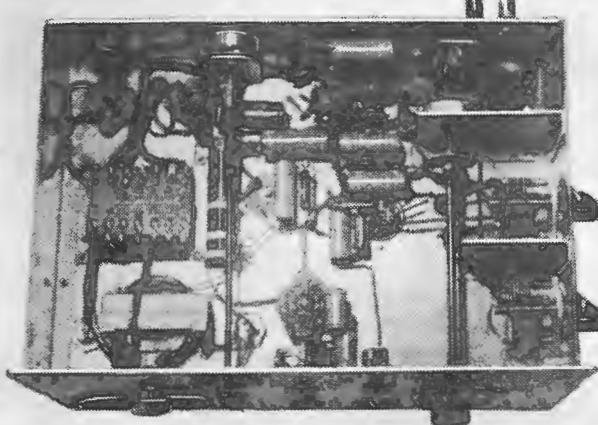
LIKE TO TRY US OUT?

SUGGESTION.—Pin this advertisement to your letterhead and send to us. We will send you a handy order pad, free and post free.

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SYDNEY, NEWCASTLE & WOLLONGONG



Under-chassis view of the a.c. shortwave superhet, reviewed in the accompanying article. Note the location of the band-setting condensers, directly below the coil sockets to which they connect.

above was designed and built by a reader in the radio trade. To date seven of them have been built to fulfil orders and are giving excellent results.

The design used is "sure fire" in operation, there being none of those refinements that so often work splendidly in theory but poorly, if at all, in practice.

A 6K8G is used as mixer oscillator, and is perhaps the best valve type that could have been chosen for this purpose. Next follows a 6F7, the pentode section of which is used as first i.f. amplifier, while the triode section acts as an audio driver for the output pentode. There are two stages of i.f., the pentode section of the 6B7S being used as second i.f. amplifier, one diode as second detector and the other as a.v.c. voltage generator.

The separate beat frequency oscillator is a 6J7 metal valve.

Next follows the triode section of the 6F7 as first audio amplifier, driving a 42 output pentode. The rectifier is an 80.

About The Controls.

As the front view of this receiver shows, there are five front-panel controls, apart from the main tuning control. These comprise (left to right), sensitivity control (operating on the screen of the first i.f. amplifier), beat frequency oscillator switch, b.f.o. note control, audio volume control, and "B+" on/off switch. On the left wall of the chassis there are two band-setters.

Full Details Next Month.

The receiver is built on an aluminium chassis measuring 15 x 10 x 3½ inches, with a 16 x 10 inches front panel, also in 16-gauge aluminium. As the rear view shows, adequate shielding has been provided between the aerial and oscillator tuning circuits, the shielding partition separating the two being continued underneath the chassis between the band-setters.

The parts required for this receiver are standard throughout, and can be selected from the R.C.S., Radiokes

and Raymart ranges of components.

Next month the complete circuit and coil data will be published, together with sufficient details regarding the assembly to enable readers with a moderate amount of set-building experience to complete the receiver without difficulty.



"Vulcan Shortwaver."

The second receiver is the "Vulcan Shortwaver," the five-valve 1.4-volt shortwave superhet of American design featured in an article in the September issue of the American "Radio News" (reprinted in last month's issue of "Radio World"). It was hoped that an Australian version of this receiver would have been completed in time for description in this issue, but unfortunately this has not been possible, due to the fact that the member of the technical staff in charge of its development has been called up for military service.

In place of this constructional article in this issue, brief details are given below of a special pre-selector unit featured in the October issue of "Radio News," and specially designed

ed for use with the 1.4-volt superhet mentioned above. Actually, this unit is a separate regenerative i.f. stage, and not only greatly improves the signal-to-noise ratio, but eliminates image interference.

As the circuit on page 5 shows, the valve employed is a 1N5G r.f. pentode. As the "A" and "B" battery drains are only .05 ampere at 1.5 volts, and 1.2 mills. at 90 volts, separate midget batteries mounted in the cabinet can be used for power supply. This makes the pre-selector a completely self-contained unit that could be used with any type of receiver, a.c. or battery, without an r.f. stage, for "pepping up" performance on short waves.

Electron-coupled regeneration is used, the reaction winding being placed in the screen grid circuit. The shortwave r.f. choke "L4" should be carefully chosen, as on it largely depends the successful operation of the circuit. The regeneration is controlled by means of the 2,000-ohm potentiometer "R1" shunted across the regeneration winding.

The coils are of the plug-in type, five being required to cover the full

range from 9½ to 200 metres. Turns details are given elsewhere.

The layout adopted by the designer provides for the tuning condenser being mounted in the centre of the chassis, which measures 9 x 4 x 2 inches. The coil is located on one side of the condenser and the 1N5G on the other, the band setter and regeneration control being mounted in corresponding positions on the front wall of the chassis.

Amplion Catalogue Free To Readers.

Messrs. Amplion (A'sia) Pty. Ltd., of 382 Kent St., Sydney, invite readers to write for a copy of their latest catalogue showing full details, with prices, of all Amplion speakers. Electric welding, extremely high output, extended frequency range, complete dust-proofing and sealed matching transformer are main features of newest Amplion models. The catalogue mentioned above is free and post free to "Radio World" readers.

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COIL KITS FOR THE
"PICNIC PORTABLE"

Kit "A" Air Core comprises aerial, r.f. and oscillator coil, 2 465 k.c. if. transformers, 1 465 k.c. padde. Specify Type No. RK114. Price £1/16/9.

Kit "B" comprises permeability tuned aerial, r.f. and osc. coils, 2, 465 k.c. iron-cored i.f.'s, 1 465 k.c. padde. Specify Type No. RK116. Price £2/9/9.

"FIRST WITH THE NEW RELEASE."

RADIOKES COMPONENTS

are used by the Technical Editor for the construction of the sets reviewed in this issue—a guarantee of their high standard of efficiency. Costs must go up—buy NOW!—cash-in on present prices!

VOLUME CONTROL POTENTIOMETER

Manufactured under a new process, the new Radiokes Volume Control Potentiometer upholds the quality and precision workmanship of every Radiokes product.
Type: W.V.C.

Description:

Wirewound Volume Controls	30 to 10,000 ohms ..	5/-
	15,000 ohms	6/6
	20,000 ohms	6/9



RADIOKES INTERMEDIATE TRANSFORMERS

The new Radiokes Trolitul I.F.'s are extremely stable, due to new method of construction, made possible by use of Trolitul formers and base. No loose wires to shift and alter frequency. Positively the best I.F.'s produced.

Air Core, 1st, 465 k.c., sq. can, 3in. x 1½in.

Air Core, 2nd, 465 k.c., sq. can, 3in. x 1½in.

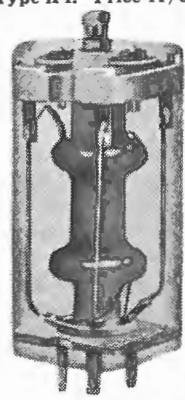
Type IFA. Price 7/6

Iron Core, 1st, 465 k.c., sq. can, 3in. x 1½in.

Iron Core, 2nd, 465 k.c., sq. can, 3in.

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Fisk Radiola Portable Five.

(Continued from page 4)

a high sensitivity permanent magnet speaker.

Actually, as regards sensitivity and tone, the "Portable Five" loses nothing by comparison with many a.c. operated mantel receivers, despite the fact that it consumes only about 1/50th of the power. While maximum output cannot, of course, be compared, the "Portable Five" has ample volume for all ordinary purposes. Actually, its maximum output represents roughly the volume at which the ordinary domestic receiver is generally played.

Designed and marketed to cater for the new vogue for lightweight portable radios that is now sweeping Australia, this latest Fisk Radiola fulfills every requirement of a receiver of this type, and is undoubtedly destined for exceptional sales.

Novel Fault-Finding Idea.

A quick and simple way to determine if the plate of the output valve is getting its current or not is to place a small vest pocket compass on top of the output filter choke. Deflection of the compass needle will indicate that current is flowing. This idea is equally applicable to other plate leads, providing they are choke or transformer fed. Even r.f. chokes will show some deflection.

Using the compass in this way greatly facilitates fault-finding, and is much easier than other methods.—J. N. Jenkins, Wagga, N.S.W.



Screen Pentode Detectors.

When fitting a screen pentode in place of an ordinary diode detector, it will often be found that the set oscillates at the bottom of the short-wave dial when reaction is turned to minimum, due, of course, to the readiness with which this type of valve will oscillate.

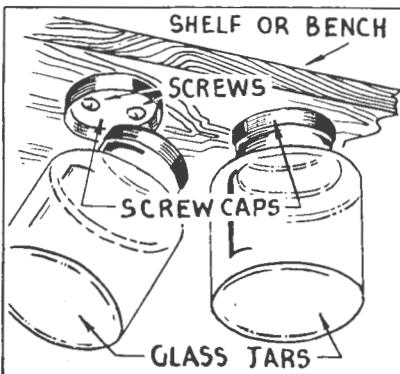
To avoid tampering with the actual reaction winding, a resistor may be placed in series with the coil, between plate and coil. Its value can, of course, only be found by experimenting, but 1000 ohms is suggested as a starting point. A resistor of the composition type should be used, as generally speaking, wirewound resistors are unsuitable, as they are to a certain degree inductive.—L. Murphy, Wellington, N.Z.

Keeping The Workshop Tidy.

A handy space-saving dodge is shown in the accompanying sketch. No doubt many a time you have wondered where you left that tin of screws, or maybe it was solder lugs. It's most annoying, I'll admit, for I was in the same boat many a time myself before I adopted the idea described here.

After saving several glass jars with screw caps, I decided to use them as containers in the workshop. All you have to do is drill three holes in each cap and screw these to the underside of the shelves. Fill the jars with nuts, bolts, etc., and screw them into the caps. Now you have a neat row of containers whose contents can be seen at a glance.

A good idea is to put small accessories, such as nuts and bolts, etc., in large marmite jars under the shelves,



and use jam and honey jars for valve sockets, resistors, fixed condensers, etc., and fix these conveniently under the bench.—J. A. Wallace, Bathurst, N.S.W.

Lakemba Radio Club Notes & News.

By W.J.P.

Until further notice, it has been decided to conduct Lakemba Radio Club meetings once a month instead of fortnightly, as previously. At the last meeting, held on October 24, the attendance was satisfactory in view of prevailing circumstances, the number present being 33. A very interesting lecture was delivered by Mr. Barnes (ex-VK2ABI) on the process involved in the manufacture of coal gas. At future meetings it is proposed to continue with lectures of general interest.

The QSL Officer brought under the notice of members who may be dispatching QSL cards that it would be necessary to fill them in without the usual abbreviations, as such ab-

breviations would not meet with the approval of the censor.

It is interesting to note that the P.M.G. Department has decided to extend the currency of transmitting licences (now being used as receiving licences) to make allowance for the difference paid (30/-) and that which is payable for a broadcast listener's licence (21/-). The result is that many experimenters who renewed their transmitting licences just before the outbreak of war will not be required to take out a listener's licence until the early part of 1941, by which time, of course, it is hoped that world hostilities will be at an end.

The next meeting of the Lakemba Radio Club will be held on Tuesday, November 21, at the Sunrise Hall, near Canterbury Station.

Waverley Radio Club Notes.

By F.A.B.

Despite troubled waters elsewhere, affairs at the above Club have gone on smoothly during the last month.

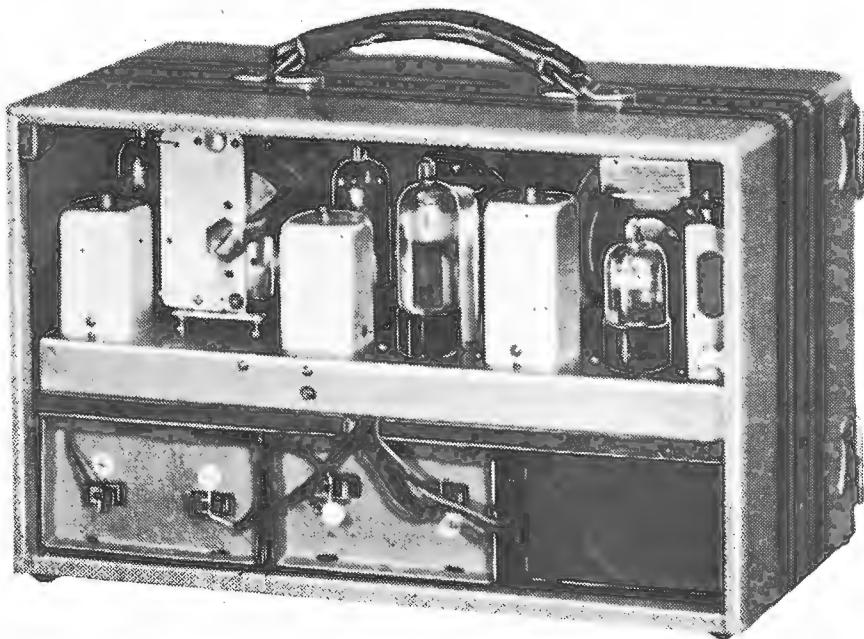
On September 26, a demonstration of "hi-fi" amplifiers was given. Amplifiers were brought along by Ted Rodgers and Dev. Dunn. Ted relied on a large horn with a 3 ft. flare in front of his speaker to give him his low notes, while Dev. used an ordinary baffle. Honours were equally divided, for what one gave in low notes the other made up in highs. The amplifiers were finally checked with an oscilloscope.

I must be forgiven if I digress a little here. At a former amplifier night some years ago arrangements were made to compare the results obtainable with transformer and resistance coupling. Several amplifiers were placed behind a screen and the audience after listening were asked to vote on which they considered was the best. The experts to this day are trying to explain why the bulk of the votes went to one using small "junk" transformers.

Arrangements are being made for another picnic to National Park. The previous one was to have been held on September 3, and was of necessity cancelled. This time, unworried by cranky transmitters and the like, we should have an opportunity to enjoy the beauties of the scenery.

I would like to invite anyone interested in radio to meet the "hams" of yesterday at the Clubrooms at rear of "Almont," 13 Macpherson St., Waverley, on any Tuesday night. They are assured of a pleasant night.

This rear view of the "Picnic Portable," taken with the cabinet back removed, shows the chassis and batteries mounted in position in their separate compartments. The valve on the right is the Bantam type 1D8GT combination diode triode output pentode. The bias battery is located alongside it.



The Picnic Portable Four

In this concluding instalment is given a description covering the assembly, wiring and alignment of the "Picnic Portable," complete with wiring plan and photographs.

THE aerial arrangement finally adopted for the "Picnic Portable" is the same as was developed for the three models of the well-known "Outdoor Portable," described in "Radio World" during the past three years.

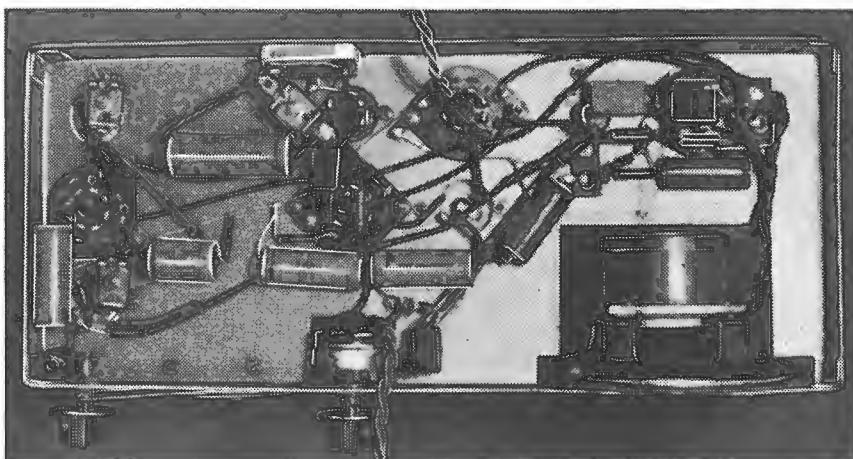
A banana socket is mounted on top of the chassis in the front right-hand corner near the condenser gang. A length of covered flex attached to a banana plug runs from this upwards inside the cabinet and along the top above the dial and speaker. It is

soldered to a lug placed under the nut of a mounting bolt that is used to replace the top wood screw holding the top plated hinge in position. The corresponding screw on the lid portion of the hinge is also replaced by a bolt, another solder lug being mounted underneath the nut. To this is soldered a further length of flex running along the lid of the cabinet (inside top). Thus, when the lid is open, an aerial nearly three feet long is provided, giving ample pick-up on all local stations.

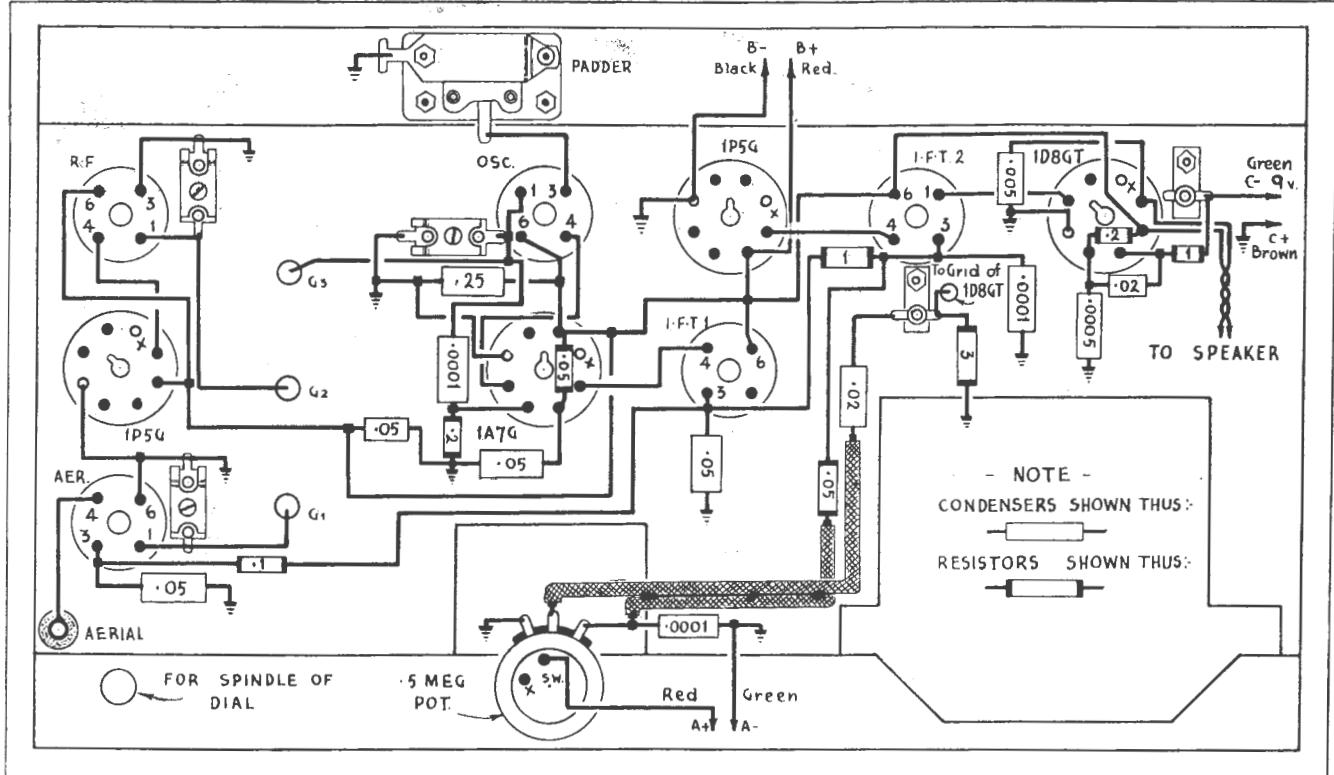
Extra Aerial In Lid Pocket.

For DX work an extra aerial, consisting of eight yards of flex terminating in a banana plug is carried in the pocket in the lid. When required, this aerial is plugged into the top hinge socket after the lid has been removed.

This aerial arrangement provides a very effective alternative to a tuned loop aerial, which for set-builders with limited equipment has several serious drawbacks, the main one being the difficulty in obtaining accurate tracking, especially in a receiver using an r.f. stage. In small receivers with no r.f. stage, this difficulty is not nearly so serious, and commercial coil kits are available, notably in the R.C.S. and Radiokes brands, in which a loop winding approximately 6" square is supplied ready matched to the oscillator coil.



This under-chassis view shows the simplicity of the wiring. The two pairs of twisted leads passing across the front and back walls of the chassis are the "A" and "B" connections, respectively. Note the three midget 30 mmfd. trimmers mounted direct between No. 1 lug on each coil and earth.



The complete under-chassis wiring of the "Picnic Portable" is shown in this sketch. To permit of ready reference to the circuit, the latter is re-printed below from last month's issue.

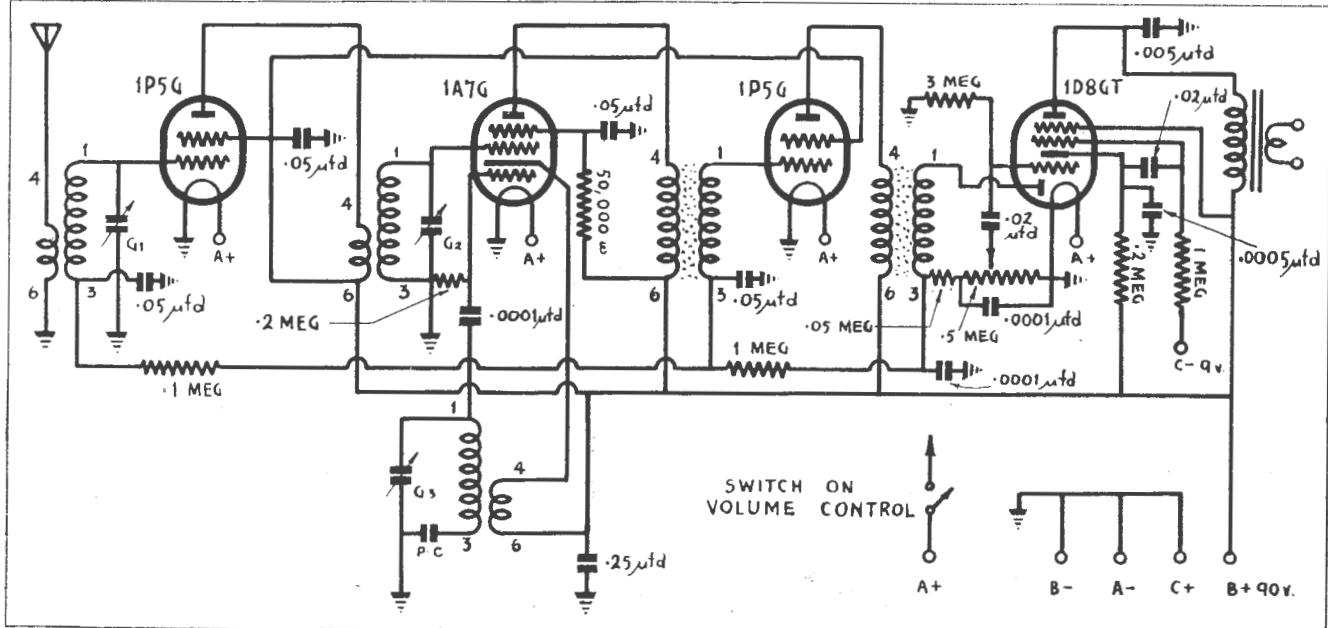
New R.C.S. Kit With Permeability Tuned Coils.

As mentioned in last month's issue, R.C.S. Laboratories recently submitted to "Radio World" two sample coil kits for use in the "Picnic Portable." One is a standard air-cored kit similar to the Radiokes kit illustrated last

month, while the second is a more expensive, higher-gain kit using permeability tuned aerial, r.f. and oscillator coils, and standard iron-cored i.f. transformers. (Alternatively, permeability-tuned i.f.'s are also available).

As an experiment, the R.C.S. iron-

cored kit was substituted for the air-cored coils in the original model. As could be expected, sensitivity showed a noticeable improvement, and readers wanting the last ounce of gain from the set are advised to use the iron-cored coil kit (also available from Radiokes). However, for all ordinary



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PRICES:

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Moving Iron types from ..	£1 6 6
Thermo-couple types from ..	£2 17 6

Ranges comprise all standard types

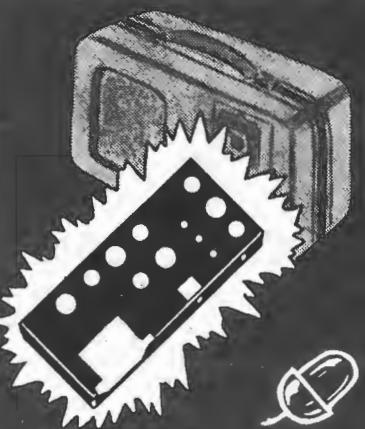
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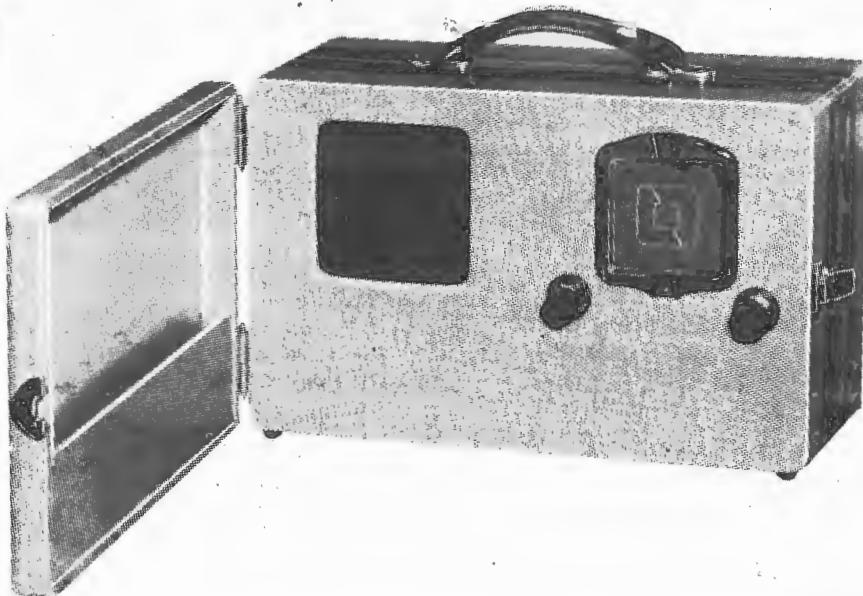
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A front view of the completed receiver. Note the pocket in the lid provided to carry a length of aerial wire for use in difficult locations.

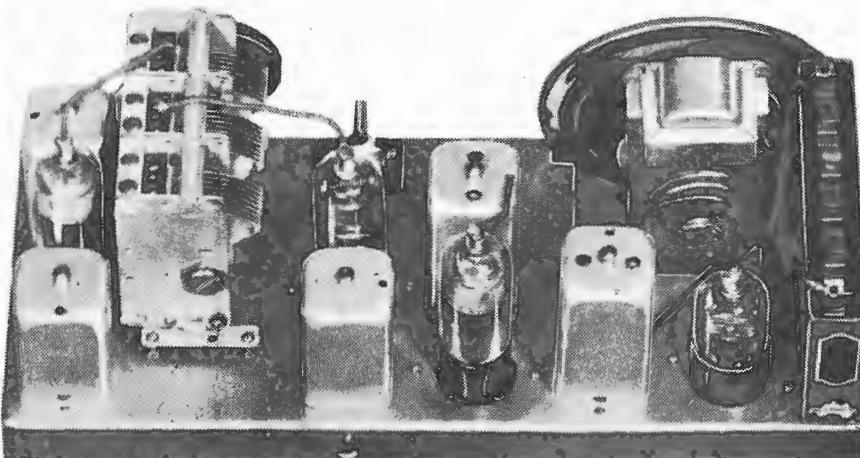
purposes the cheaper air-cored kit (either R.C.S. or Radiokes) will be found very satisfactory.

Effective Substitute For 1D8GT.

Several inquiries have been received from readers with 1H5G and 1C5G valves on hand, wanting to know if these could be used in place of the 1D8GT employed in the original model, and, if so, how the layout could be amended to accommodate the extra valve. The suggested substitution is quite in order, no circuit alterations whatever being required. The 1H5G replaces the diode triode portion of the 1D8GT, and the 1C5G the output pentode section.

In the new layout, the 1H5G will occupy the socket of the present 1D8GT, an extra hole for the 1C5G socket being stamped alongside. The bias battery, instead of being located at right angles to the rear wall of the chassis as at present, can be placed parallel to it behind the speaker. (Reference to the rear view photograph will make these alterations clear).

Actually, the original chassis with an extra hole stamped for the 1C5G could be used. However, to get more even spacing of the valves and i.f.'s, an amended template has been prepared, and together with that of the original chassis, has been supplied to



Though the "Picnic Portable" is particularly compact, the chassis layout is in no way cramped, as the view above shows.

Acorn Pressed Metal Pty. Ltd., Marshall St., Surry Hills. When ordering from distributors, readers should state which chassis they require. If the 1D8GT is being used, then "Picnic Portable" Chassis No. 1 should be ordered. If the alternative 1H5G/1C5G combination is preferred, then the "Picnic Portable" No. 2 Chassis is required.

The Assembly Outlined.

With the kit of parts as listed last month assembled, the construction of the receiver can be commenced by mounting the four valve sockets, which should be arranged so that the key-ways face in the directions shown in the wiring diagram (published elsewhere this month).

The filament wiring can now be put in. The "F" negative lug of each valve socket is taken to the nearest earth. To complete the positive side of the filament wiring, a lead is taken from "X" on the volume control potentiometer switch (see wiring diagram), to "X" on the 1A7G socket. From this lug a further lead is then run to "X" on each of the 1P5G sockets. Finally, a lead is run from

"X" on the 1P5G i.f. socket to "X" on the 1D8GT socket.

Next, the following components can be mounted—aerial socket, padde, volume control and condenser gang; the latter is supported above the chassis by means of $\frac{1}{4}$ " brass spacers. Before it is mounted, a 6" length of flexible pushback should be soldered to each fixed plates lug under the gang. These leads pass through the chassis and are soldered to the appropriate coil lugs (No. 1 in each case).

Next, the dial spindle, volume control potentiometer, aerial, r.f. and oscillator coils and i.f. transformers can be bolted in place. Make sure that the coils and i.f.'s are arranged so that the lugs face in the directions shown on the wiring diagram.

Now commencing at the aerial terminal, wire the aerial coil, the 1P5G r.f. amplifier socket, r.f. coil, 1A7G socket, oscillator coil, first i.f. transformer, and so on till the wiring has been completed. To ensure effective earth connections, it is an excellent plan to run an earth line of 14 or 16-gauge tinned copper wire across the chassis. All wiring should be as short and direct as possible, and well

spaced, while by-pass condensers should be mounted as close as possible to the points they are intended to by-pass.

All lugs on the coils and i.f.'s are numbered, these numbers being shown on the wiring diagram.

The new midget condenser gang used was supplied without trimmers, hence three 30 mmfd. mica trimmers were used instead. These are clearly visible in the under-chassis photograph. The only shielding required is on the two leads running to the volume control (see wiring diagram) and on the lead running up through the chassis to the grid cap of the 1D8GT.

After the wiring has been completed and checked, the speaker can be bolted in position, and the midget grid clips fitted. The Efco tuning dial drum is next mounted on the gang and the cord fitted. To keep tension on the latter, a spring is provided for attachment inside the drum. Satisfactory operation is obtained if the cord is passed $1\frac{1}{2}$ times around both the drum and spindle.

With the wiring completed and checked, the set can be tested and aligned before it is mounted in the

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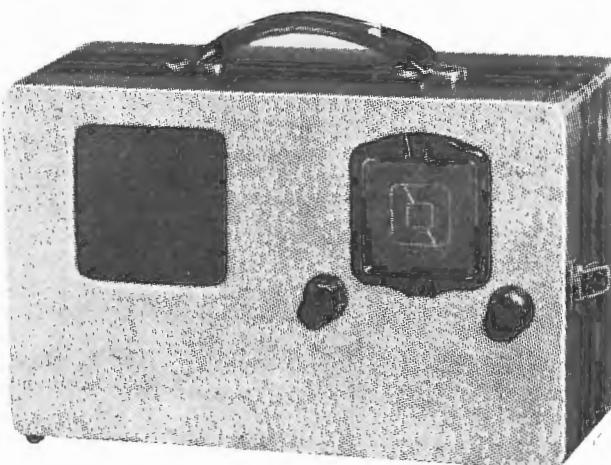
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cabinet. There are three pairs of battery leads, "A-", "A+", "B-", "B+" and "C-", "C+." The last pair pass up through the chassis to the bias battery mounted alongside the output valve. The "A" and "B" batteries—one Eveready PR8 and two Eveready PR45's, respectively—are arranged in the bottom compartment as shown in the rear view of the completed receiver.

The Alignment Procedure.

With the batteries connected up and using a few yards of flex plugged into the aerial socket as a make-shift aerial, switch on and check over the valves to make sure all filaments are alight. Then set the three trimmers underneath the chassis and the padder a couple of turns or so out. Advance the volume control and tune in a station operating on about 220 metres. Adjust the aerial and r.f. trimmers in turn for best results.

Next, a station towards the top end of the waveband should be tuned in, and the padder adjusted. While this

is being done, rock the dial backwards and forwards across the station until a point is found at which volume is greatest. This alignment procedure can then be repeated once again.

Finally, the trimmers on the two i.f. transformers can be given a slight adjustment to ensure peak results, commencing with the second transformer and working towards the first. These trimmers should only be shifted a fraction of a turn, and also the original positions should be marked so that the trimmers can be returned to them if desired.

If carefully carried out, the above should result in substantially correct alignment that will hold satisfactorily over the entire waveband. However, alignment using a service oscillator will ensure maximum results. With the volume control full on, there should be no instability whatsoever, and it should be easily possible to tune in several dozen stations at good speaker volume.

When the set is operating correctly, the three-foot cabinet aerial can be

installed, as previously outlined, and the set mounted in the cabinet. Next, place the "A," "B" and "C" batteries in their correct positions, connect them up and screw the cabinet back in place.

Light, compact, economical to run, and an excellent performer, the "Picnic Portable" will bring builders endless hours of varied entertainment, not only from local stations but from inter-state and across the Tasman, for as regards sensitivity the "Picnic" compares favourably with many a.c. receivers.

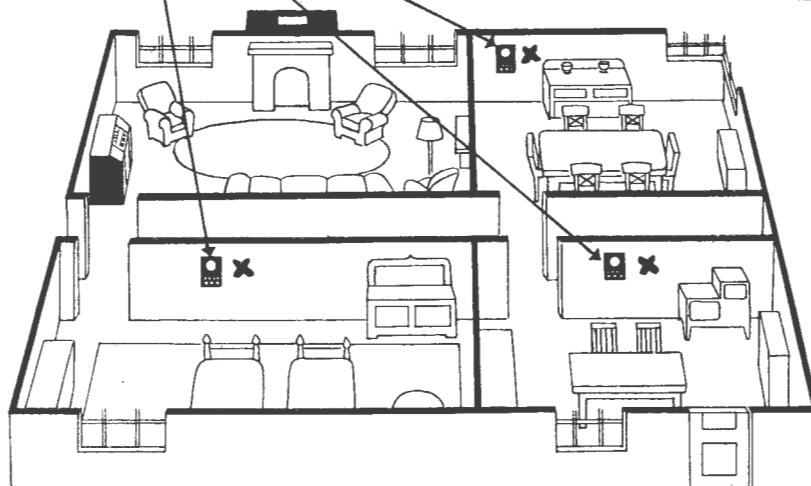
Kits Of Parts For "Picnic."

Readers are advised that kits of parts for the "Picnic Portable" to "Radio World" specifications are available from Messrs. John Martin, 116-118 Clarence St.; Fox & MacGillycuddy Ltd., Merino House, 57 York St.; and Martin de Launay Pty. Ltd., Cnr. Druitt and Clarence Sts., of Sydney; and from A. J. Veall's, of Melbourne (postal address, Box 2135, G.P.O., Melbourne).



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Needle Pointers

. . . For RECORD USERS

"Needles are cheaper than records" is a slogan that all record users would do well to remember. The article below explains why.

By NORMAN HEAD

ENGINEER, AMPLION (A'SIA) PTY. LTD., SYDNEY.
(Illustrations by the author).

THE modern electric pick-up has completely displaced the old type sound-box and horn reproducer because of its greater fidelity of reproduction and its ease of amplification by means of valves. Because of the truer reproduction and extension of frequency range of the electric pick-up, coupled with the use of greater amplification, it is more necessary than ever to reduce distortion from record wear. And, quite apart from the matter of good reproduction, it is advisable to extend record life as far as possible.

Using a phonograph needle of the

ordinary type more than once is to damage deliberately the delicate recording. The once very prevalent idea that a needle could well be used more than once if it was turned in the chuck or holder, offers the surest way of destroying the recording in the quickest possible time—except by hitting it with a hammer!

Four Main Types Of Needles.

Needles for phonograph playing fall into several categories, the most common being the steel needle. The semi-permanent tungsten needle is

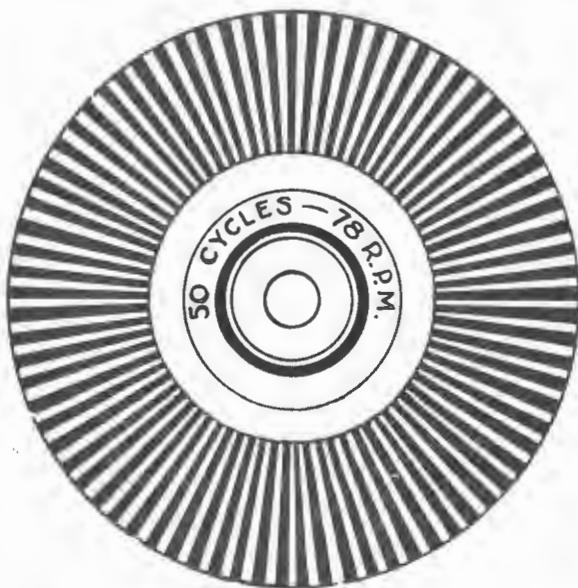
High output and very good overall frequency response are features of this Amplion magnetic pick-up.

credited with a useful life of a large number of playings, while the diamond or sapphire-type points are claimed to be permanent, and at least they obviate needle changing. Lastly, there is the soft wood type needle, or "thorn," which is usually good for one playing only.

It is safe to say that the steel needle will afford reproduction equal to any, and from the view of record wear is accounted best.

The friction of the reproducing point on the record must cause considerable wear—actually the pressure on the point of a needle has been calculated at tons to the square inch! Something must wear, and it is best that the needle should.

The steel needle is designed to wear a limited amount, not sufficient to detract from its performance at the end of one record side, but sufficient to



Cut out the circle on the left, paste on cardboard, punch out the centre hole to fit over the turntable spindle, and you will have a simple but accurate means of adjusting playing speed.

Right: This microphotograph, showing the point of a used steel needle alongside an unused point, illustrates the severe wearing that takes place even during one playing.



ease the strain on the not-so-hard record material. After one playing (one side), it is intended to be discarded. After all, needles are not expensive; records are.

Before And After.

Perhaps there are readers who do not realise the extent of the wear on a needle after playing one side of a record. Glance at the accompanying micro-photograph, showing the points of two Columbia "Talkie" needles enlarged about 60 diameters. At the left is an unused needle, while at the right is a similar needle having played one side of a 10" record in the chuck of a lightweight electric pick-up. Note the chisel-edge worn by the record, showing plainly the playing-angle of about 60 degrees. Now imagine how this supersharp edge would tear through the oscillatory spiral.

Records vary, not only in the number of turns the spiral makes to the inch, but also in the depth of the groove and the angle of the sides. For this reason also it is undesirable to use one needle more than once, quite apart from the fact that once used, its point is no longer of the

right shape to fit. Records used only with new needles will long outlast others.

Use Stroboscope For Adjusting Turntable Speed.

As a final help in getting the best from an electric pick-up, use the "zebra circle," or stroboscope, printed here to check the correct speed of the turntable. Cut the circle out, paste it down on a piece of cardboard and cut or punch out the small central circle. The disc will now fit over the turntable spindle. It can only be used under illumination from the 50-cycle A.C. supply, found almost universally these days. (There are a few exceptions; some parts of the City of Sydney proper and a few country towns only are connected to D.C. mains).

Place the stroboscope disc over the top of a record on the turntable, start the motor, and with the pick-up on the record, observe the disc in motion. If speed is correct (78 r.p.m.), the spokes will appear greyed, slightly blurred, but stationary. If the speed is too great, the spokes will appear to revolve forwards, while if they appear to revolve backwards, the speed is too slow.

The stroboscope is a most accurate measure of turntable speed. Do not be surprised if, after having set the regulator of the motor correctly, with certain types of motors a slight drift appears on records where the recording is particularly "heavy." Very few motors can be relied upon to give absolutely constant speed; such motors are expensive, to say the least. Motors used to drive high quality recorders are most unlike the usual type found in reproducers, and additionally are fitted with complicated mechanical filters and heavy fly-wheels. But do not let that deter you. You can get extraordinarily fine reproduction from standard motors and inexpensive electric pick-ups.

And a final word about only using a needle once. Don't imagine it's a stunt of the record companies to promote needle sales. The best selling needles are manufactured by the record companies, but I'm sure they would not mind greatly if you used one needle two or ten times. It would make for far greater record sales, and after all, needles are cheaper than records.

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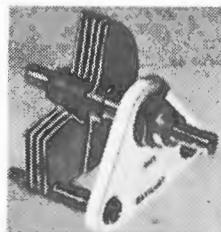
Reduction drive for use with above dial (see article in this issue); ideal for vernier tuning; gives 6:1 reduction.

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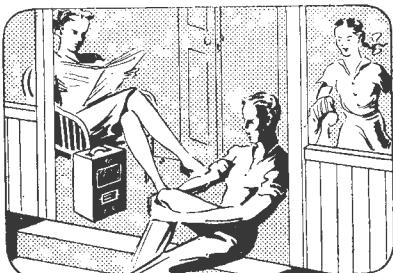
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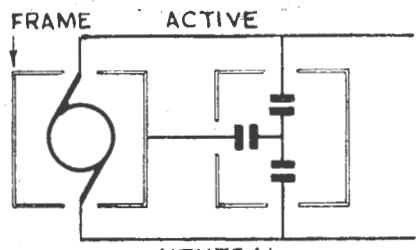
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Right: This circuit shows connections for the Chanex type PNA or PNB 388 interference suppression unit designed for use with unearthed apparatus such as vacuum cleaners or sewing machine motors.



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Leaves From A Serviceman's Diary . (6)

The main sources of electrical interference, together with suggested cures, are discussed in this instalment.

By "SERVICEMAN"

THE suppression of radio interference is very much to the fore in these days of high-power sets. Those people who are situated in localities where it is difficult to obtain satisfactory signals through the appalling noise, will welcome attempts which are being made to combat such disturbance.

Technically it is possible to cure any type of interference, but in actual practice it is very often impossible. In some cases, for instance, a remedy can only be effected at the source of the disturbance itself, and this may be impracticable.

Broadcast reception has become so much a part of our everyday lives that an ever-increasing obligation is developing upon users of industrial plant to render their equipment interference-free.

Four Main Sources Of Noise.

The four chief sources by which the interfering noise may reach a radio

receiver are:—(a) Direct Radiation, or from the interference source through the air to the receiver. (b) Direct Conduction, from the electrical apparatus along the mains to the radio receiver. (c) Mains Radiation, whereby the high frequency energy is conducted along the mains and re-radiated from the house wiring. (d) Re-radiation, in which case the energy is transferred to a subsidiary radiator such as power line, telephone line, girders, gas-pipes, etc. and is radiated from there to the receiver.

It will be obvious that whenever attempts are to be made to minimise or eliminate electrical interference, the first essential and probably cheapest requirement is a good radio installation. If, however, it can be proved that the interference source is originating from any particular machine or appliance in the vicinity, the owner or operator of said machine could be approached and requested to co-operate in the elimination of the trouble.

In actual practice, however, this is not always easy. From the nature of the noise, the serviceman may be assured that it is coming from a machine in the building, but in cases of large blocks of flats, it is usually a thankless and discouraging job going from door to door enquiring if

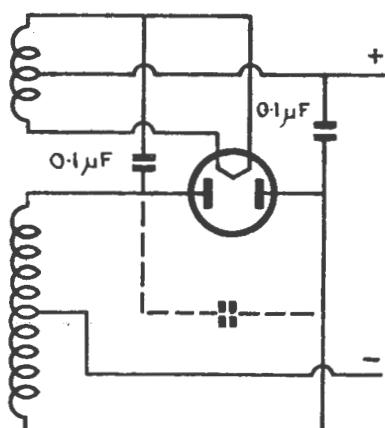
the residents are using an electric motor of any kind.

The most practical method is first of all to try and improve the reception at the receiver end, with a view to picking up more station signal in proportion to noise. A good earth should be tried, preferably connected to a water-pipe directly entering the ground, even though it may mean running a longer wire. A case was recently encountered where connecting an earth wire to a nearby tap on the third floor of a block of flats did not have the slightest effect in eliminating the noise, but on running it directly to a pipe entering the ground the noise disappeared.

Efficient Outdoor Aerial Recommended.

It is very often found that the customer does not at first seem inclined to spend money on a special aerial kit for the suppression of interference. However, if electrical interference is being experienced when the receiver is being operated on an indoor aerial system, the serviceman could explain that in any case the reception generally would be improved with a well-erected outdoor system. To illustrate this he may run a more or less temporary affair, and demonstrate to the client the improvement in results.

Interference from battery-charging equipment employing mercury vapour type rectifiers can generally be suppressed by the connection of Chanex type PN condensers from the plates of the rectifier as shown. In extreme cases, additional suppression, either by means of an additional condenser, as shown by dotted lines, or a suppressor condenser can be included in the main input leads to the transformer, but usually this is not necessary.



Outdoor aerials, whether of the ordinary or specially-designed types, should always be erected as high as possible above surrounding buildings, down-pipes, power mains, etc., for best results. It should always be remembered that irrespective of the performance of a radio receiver on a makeshift indoor aerial, the performance will always be improved with a correctly-designed outdoor system.

In order to eliminate the possibility of the lead-in picking up interference from nearby power wires, etc., a low capacity shielded cable is sometimes used. The outer shield is earthed, and thus prevents any pick-up except from the aerial proper, which has been erected in a clear space. It will be obvious that the shielded cable must be kept as short as possible and must be of low capacity, as the radio frequency energy would be by-passed through the capacity existing between the lead-in and the shield.

Better results are obtainable with a properly-designed shielded aerial, complete with matching line transformers. There are a number of these available on the market in kit form, and usually prove very effective if it is possible to erect them in accordance with instructions.

Other types include the doublets and double-doublets with twisted and transposed lead-ins. Space will not permit the discussion of these, but reference to the diagrams on this page should emphasise the advisability of the best form of aerial to overcome the interference problems of the present day.

Line Filters Often Successful.

Line filters are also very successful in cases where the noise is entering the set through the power lines, and, as mentioned last month, to eliminate troubles caused by defective house wiring. In this instalment the subject of eliminating the trouble at its source has not been discussed. As there are so many machines and appliances which create electrical noise, and different cures are applied to each, reference to same would occupy considerable space.

For those interested, however, it might be mentioned that the Ducon Condenser Co. issued a bulletin some time ago on this subject which should prove useful to all servicemen. The subject is treated briefly and concisely, and contains useful data on special condensers and filters available for this type of radio service work.

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Amplion present the latest advance in modern speaker practice with their revolutionary "Electric Welding" process. Electric Welding ensures that Amplion Speakers possess outstanding fidelity and amazing sensitivity because the entire magnetic circuit is projection welded to provide an absolute minimum of magnetic leakage, reduced reluctance and increased sensitivity.

AMPLION VL has greater power handling capacity than other speakers of similar type, larger voice coil diameter and impedance, and possesses tonal quality never equalled. A new type of transformer has been developed for the Amplion V speaker, in which the centre leg has a square cross-section, of $\frac{7}{8}$ inches. With low leakage and high-fidelity characteristics it carries maximum D.C. currents without saturation, is double-impregnated, sealed and insulated from core. Normal Field Excitation of the VL is 10 watts, maximum 14 watts, minimum 8 watts, voice coil impedance at 400 cycles is 12.5 ohms, and diameter of voice coil is $1\frac{1}{4}$ inches, while power output ranges from 13 to 20 watts. **Amplion VL, PRICE**

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- **BETTER**—Electric Welding is 1939's most outstanding speaker development.
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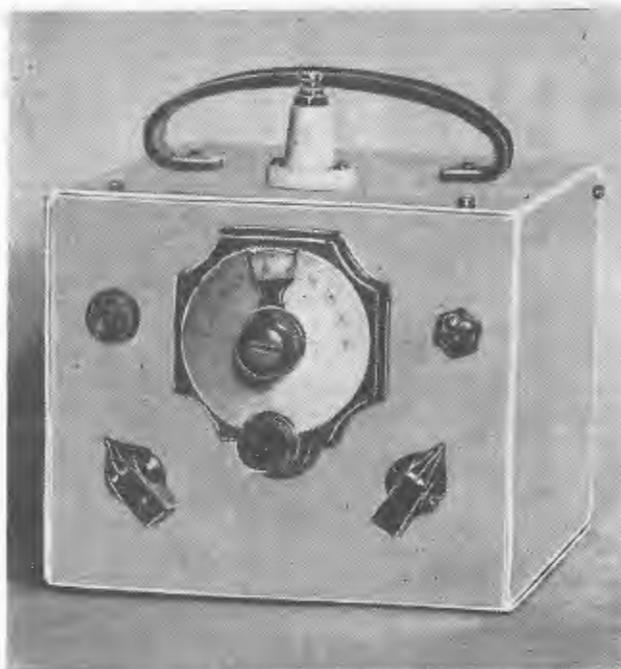
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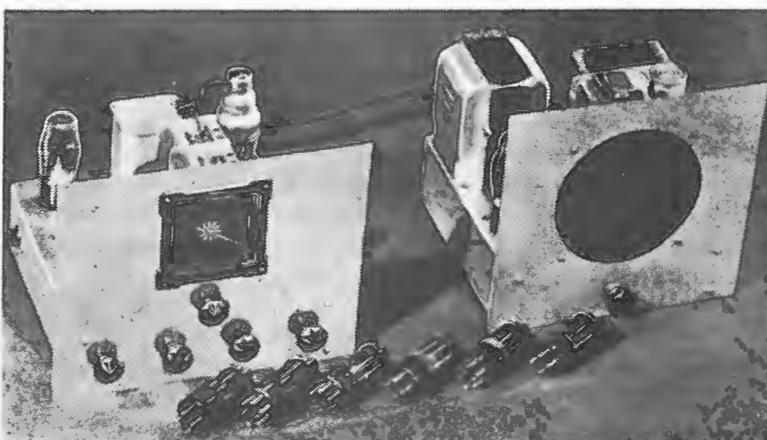
Name.....

Address.....



Illustrated above is the "Tiny Tim," described in the May, 1939, issue of "Radio World." A two-valve all-wave receiver using a 1N5G as detector and a 1A5G audio, the "Tiny Tim" is housed in an aluminium cabinet measuring only 5" x 6" x 6," complete with midget "A" and "B" batteries. The "Tiny Tim" was designed by J. Ferrier, "Radio World" Official Shortwave Observer in Victoria, who logged 29 countries with it using only a 3-foot vertical aerial.

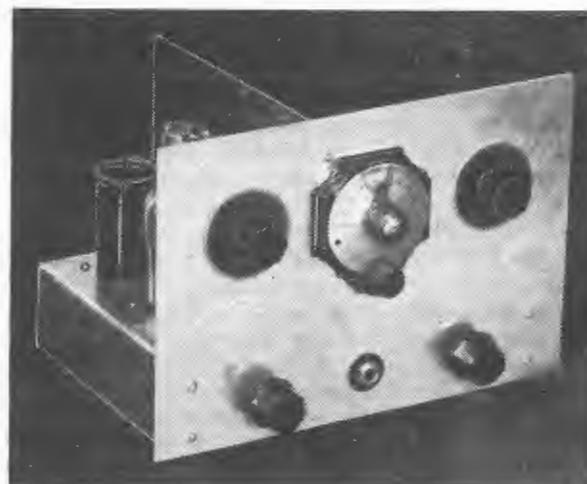
Illustrated below is the "Empire All-Wave Three," together with combination power pack and amplifier unit with built-in speaker (described in the December, 1937, and January, 1938, issues of "Radio World"). In this three-valve all-wave a.c. receiver, a 6D6 is used as r.f. amplifier, a 6C6 as detector with a.c. regeneration and a 76 as audio amplifier. Valves in the combination power pack amplifier unit comprise a 42 output pentode and 80 rectifier. The battery version of this receiver was described in the May and June issues, 1937.



Shortwave and All-Wave Receivers from Back Numbers

See Page 39 for Full Details of Special Offer

Since the outbreak of war widespread interest has been aroused in shortwave and all-wave receivers capable of picking up latest news bulletins from the main shortwave stations throughout the world. On these pages is shown a selection of receivers of this type described in "Radio World" during the past two years. These back numbers are available to readers at special rates, of which details will be found on page 39 of this month's issue.



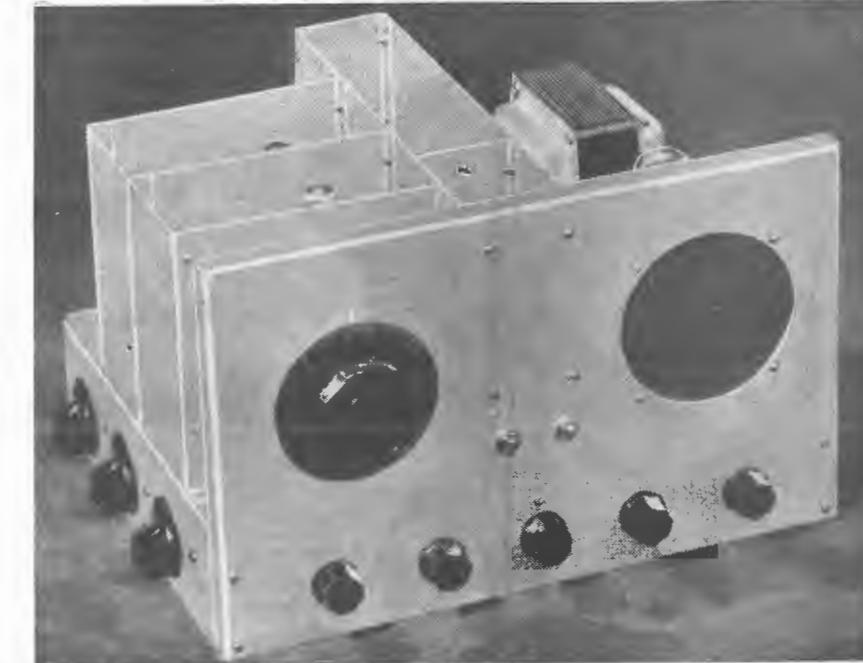
Excellent all-round performance on all wavebands, coupled with remarkable economy of operation, are features of the "1939 Atlas All-Wave Three" illustrated above (described in the July-August and September issues of "Radio World"). This battery all-waver uses 1.4-volt valves throughout. Following a

1N5G in the r.f. socket is a 1G6G class "B" valve, with one triode section used as leaky grid detector, and the other triode section as first audio amplifier, resistance capacity coupled to a 1C5G output pentode. Equivalents of the two-volt series of valves that could be used equally well comprise the 1C4 as r.f. amplifier, 19 twin triode as combined detector and first audio amplifier, and 1D4 output pentode. Further equivalents in the two-volt octal-based series of valves are the 1D5G, 1J6G and 1L5G, respectively. Cheap both to build and operate, the "1939 Atlas" gives an outstanding performance on all wavebands. During initial tests of this receiver, the main shortwave stations of the world could be brought in at overloading volume while using only three feet of wire as an aerial.

Illustrated below is the "Tom Thumb Portable Two," featured in the September and October, 1937, issues of "Radio World." This receiver is a compact two-valve all-wave portable, using a 49 as space-charge detector, transformer-coupled to a 49 audio amplifier. Weighing under twelve pounds complete, this set will give world-wide reception on 'phone. The receiver is fully self-contained, "A" and "B" batteries being carried in the lower compartment of the case, while the headphones, aerial wire and coils are accommodated in the lid.

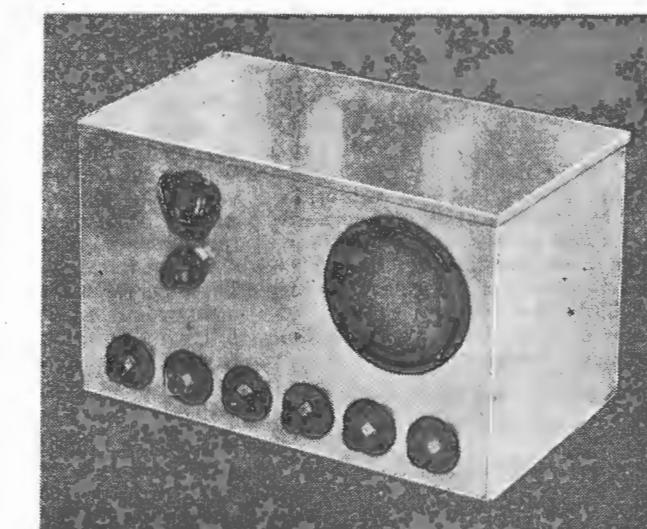


Right: The "Air Ace Communications Four," a four-valve battery-operated communications type t.r.f. receiver designed for all-wave operation (featured in "Radio World" for August and September, 1938). The "Air Ace" is housed in a frosted aluminium cabinet and incorporates band-spread tuning, together with built-in speaker, and uses a 1D5G as r.f. amplifier, 1K5G leaky-grid detector with regeneration, 1H4G first audio amplifier and a 1L5G output pentode.



Illustrated above is the "1938 Amateur Communications Eight," described in the October and November, 1938, issues of "Radio World." An eight-valve a.c. shortwave superhet originally developed by Amalgamated Wireless Valve Co. Pty. Ltd., it is easily the most popular receiver of its type ever described in an Australian magazine. This latest model incorporates octal-based valves, two stage i.f. amplifier, separate beat frequency oscillator and optional a.v.c.

Valve types used in this receiver comprise a 6U7G r.f. amplifier, a 6L7G mixer, 6U7G separate oscillator, 6U7G i.f. amplifier, 6G8G combined second i.f. amplifier, diode second detector and a.v.c. voltage generator, 6J7G beat frequency oscillator, 6AG6G high gain output pentode, and a 5Y4G rectifier.





Meters For A.C. And D.C. Measurements

Left: A selection of latest Calstan meters of different types, the fan-shaped instrument at the top being a moving coil 0-10 m.a. d.c. meter. In the centre is a 0-50 microamp. galvanometer, while below it is a third moving coil instrument, designed for use in conjunction with a rectifier for measuring a.c. current (0.5 amperes).

This series of articles has been taken from the lectures on radio service equipment arranged by Amalgamated Wireless Valve Co. Pty. Ltd. for presentation in the Radiotron Lecture Service for radio technicians. The instalment below discusses meters for a.c. and d.c. measurements.

Introduction.

Under this heading, it is proposed to discuss the design and application of instruments and equipment which are required for the efficient servicing of radio receivers. It is not intended to provide constructional data of any of the instruments described, but rather to explain their operation and general application in order to promote a better understanding by the average serviceman of the principles involved, so that he may employ the instruments at his disposal to the maximum advantage.

The first lecture has been divided into four sections:—

1. General.
2. Meter Movements.

3. Volt-Ohm-Milliammeters.

4. Modulated Oscillators.

General.

When testing radio receivers, it is necessary as a first essential to be able to measure the currents flowing in, and the voltages developed across various portions of the receiver circuits. In addition, it is also frequently necessary to be able to check the D.C. resistance of certain components. These requirements involve the use of instruments capable of enabling the following measurements to be performed, which are those usually encountered in the servicing of the modern receiver.

- (a) D.C. voltages between approximately 0.25 and 750 volts.
- (b) A.C. voltages between similar limits.

(c) Direct currents between approximately 20 microamperes and 250 milliamperes.

(d) D.C. resistances between approximately 10 ohms and 2 megohms.

Extreme accuracy is seldom required and an instrument having an error of not more than 2% at full scale deflection is usually considered satisfactory. In addition, however, meter movements must also be of reasonably robust construction, particularly when intended for use in portable equipment. Although in the past it was usually necessary to employ separate instruments for the measurement of each of the above quantities, it is now usual by the use of suitable shunts, multipliers and switching arrangements to read the ranges of current, voltage and resistance required with the same meter movement.

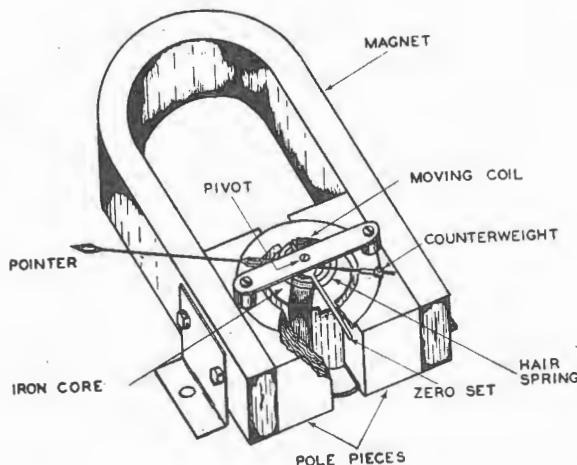


FIG. 1

Instruments For D.C. And A.C. Measurements.

For D.C. measurements, the permanent magnet moving coil type of instrument is normally used, while for A.C. measurements either the moving iron or metal rectifier types are employed. Other types of measuring instruments not so commonly encountered in radio servicing include the dynamometer, electrostatic, hot wire and thermocouple types.

To measure the current flowing in a circuit, a milliammeter (or ammeter), being a current operated device, must be connected in series with the circuit, so that the current to be measured will flow through it. The resistance of the instrument (or its impedance in the case where an alternating current is being measured) must therefore be small in comparison with that of the rest of the circuit, in order that the current flowing through the latter will not be altered by the insertion of the meter. This is equivalent to saying that the voltage drop occurring across the meter must be small in comparison with the total voltage drop occurring across the whole circuit. Current indicating instruments must therefore have a low resistance for accurate measurements. Where the meter resistance, however, is appreciable, an accurate indication of the current in a circuit can be readily obtained by correcting for the effect of the meter resistance.

To measure the voltage drop or potential difference across a circuit, a voltmeter, on the other hand, must be connected in parallel with the circuit, and must therefore have a very high internal resistance in comparison with that of the circuit across which it is connected, in order that the loading effect on the latter will not

produce any appreciable change in the voltage to be measured.

The D.C. resistance of a circuit is normally checked by means of an ohmmeter, which should be connected in parallel with the circuit under test, since the method consists actually of measuring the voltage developed across the circuit due to the current from a local battery which is connected in series with a voltmeter reading directly in ohms.

Meter Movements.

(a) Moving Coil Meters.

A moving coil meter consists essentially of a coil of wire pivoted in a magnetic field, and held to a suitable position by one or two hair springs. When a current is passed through the coil, it tends to rotate on its axis and set up in the springs opposing forces of tension or compression.

The deflection of the coil is dependent on the amount of current flowing through it, so that if the coil is made to control a pointer or a beam of light, it is possible to calibrate a scale to indicate directly units of current.

Fig. 1 illustrates the most popular form of moving coil meter known as the D'Arsonval movement. The initial magnetic field is provided by a powerful permanent magnet which is carefully "aged" in order that its strength will remain constant over long periods. The soft iron pole pieces attached to the magnet are so shaped as to produce a uniform radial magnetic field for all positions of the moving coil. The soft iron core within the coil further aids in this direction and leaves only a small air gap within which the coil is free to rotate.

The efficiency of the magnetic circuit is such that it is possible to ob-

Fig. 1. This sketch illustrates the construction of the D'Arsonval movement — most popular form of moving coil meter.



*Lived out
with playing*

... Rest will recover a child's energy; but only new valves can bring back the original brilliance to your radio ...



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Specify ... RADIOTRONS for the "Picnic Portable" and "Vulcan Shortwaver" described in this issue.

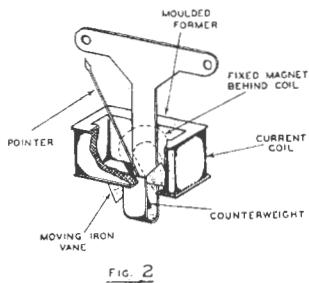


FIG. 2

tain extremely high sensitivity with this type of construction. In addition, the high flux density in the air gap ensures that the readings of the meter are not easily affected by stray magnetic fields.

The moving coil is wound on a light aluminium former and pivoted upon two jewels. The initial position is determined by the adjustment of two phosphor-bronze hair springs, which are attached to and mounted one above and below the coil. These "control" springs also serve to conduct the current to and from the coil.

When a current flows, the coil begins to rotate and the springs become distorted, setting up a restoring torque opposing the motion and proportional to the angle through which the coil has turned. The coil takes up a position of equilibrium in which the torque due to the springs just balances the electro-magnetic torque due to the current. Since the torques are respectively proportional to the angle of rotation and to the current, it follows that the deflection of the pointer attached to the coil is directly proportional to the current and the scale is uniform.

As the coil rotates in the magnetic field, eddy currents are set up within the aluminium former upon which the coil is wound and tend to oppose the motion. If, as is usual, the coil and pointer possess small inertia, the damping due to these eddy currents minimises mechanical oscillation about the point of equilibrium, and the action is said to be "dead-beat."

In general this type of meter is regarded as being the most satisfactory for all normal D.C. measurements.

The D'Arsonval movement is not suitable for use with alternating currents unless some form of rectifier is used with the meter. The most commonly used and most practical is the copper-oxide rectifier.

A D'Arsonval movement may be used in conjunction with a full-wave rectifier to read alternating currents. The arrangement is, however, not ideal for use with external shunts as a multi-range current meter, since the

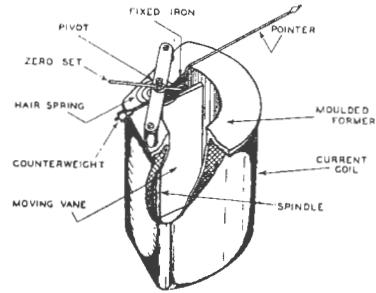


FIG. 3

characteristics of the rectifier are sufficiently variable to cause considerable inaccuracy.

When used with series resistance as an A.C. voltmeter either a half-wave or a full-wave rectifier may be used. The effects of rectifier variations are not serious and a high degree of accuracy is attainable.

Rectifier type meters are usually calibrated at a frequency of 50 cycles per second. At higher frequencies the effect of self capacitance in the rectifier becomes apparent and readings are usually low. In general the calibration may be regarded as correct for frequencies up to approximately 5,000 cycles per second.

Due to the non-linear characteristic of the rectifier, the scale of a rectifier type meter is not uniform, but is somewhat contracted for small deflections. For the same reason, the calibration is affected by the amount of resistance in series with the meter. The effect is particularly noticeable for low values of series resistance, and multi-range A.C. voltmeters frequently have separately calibrated scales for lower and higher ranges.

In the "Dynamometer" type move-

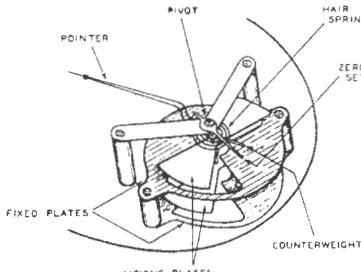


FIG. 4

ment the permanent magnet is replaced by an electro-magnet and the field coil connected in series or parallel with the moving coil, depending on whether the meter is to be used to read voltage or current. Alternatively, the field winding may be brought out to separate terminals for independent excitation.

These meters find wide application in electrical engineering and can be made to give a high degree of accuracy. Even the smaller types applicable to radio measurements are frequently guaranteed to afford accuracy better than 1%. Dynamometer type meters can be used to measure alternating voltages and currents. The frequency error is usually negligible for frequencies below 5,000 cycles per second.

They are less sensitive than the best D'Arsonval movements, requiring at least 15 millamps for full scale deflection. As voltmeters the resistance is therefore less than 65 ohms per volt. In this regard they are comparable to moving iron types but are more accurate.

Another interesting application is that as mutual conductance meters in valve testing equipment.

(b) Moving Iron Meters.

Moving iron meters are not as accurate as the best moving coil types, but are usually simpler and of more robust construction. In these meters a soft iron vane is pivoted within the magnetic field of a fixed current coil. When a current is passed through the coil the iron is magnetised and the consequent forces of repulsion or attraction cause the iron to rotate about its axis.

In the attracted iron type shown in Fig. 2, the vane is pivoted eccentrically at one end of the current coil. When current flows through the coil, the vane is drawn into the coil, and the pointer which is coupled to it moves across the scale. The controlling force may be supplied either by a hair spring or a permanent magnet. When a hair spring is used the meter

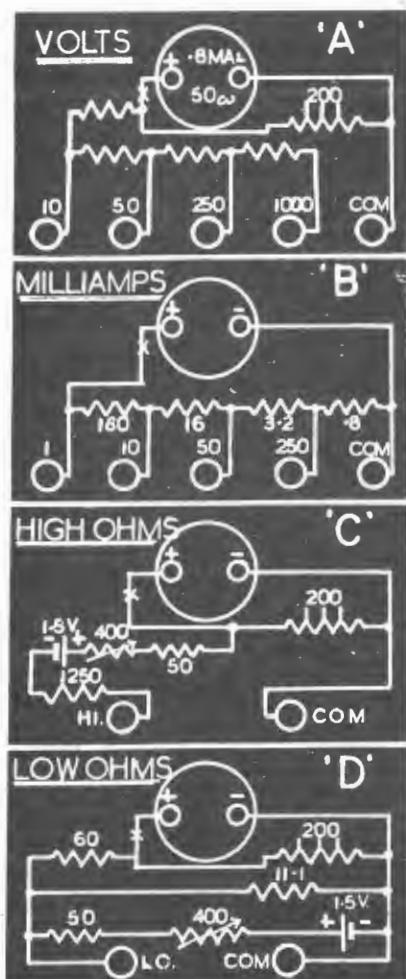
"Companionette" Steps Out!

I have just completed the "1939 Companionette," and results on locals are all one could wish for as far as tone, volume and selectivity are concerned. I have yet to hear better from a receiver so small. Also, I have had a few mainland stations at R2-5, 2GB, 2UE, 3LO and 3GI being the best; this is without automatic reaction, as I have not put it in yet. However, when I do and we get the B.C. band DX section in "Radio World," I hope to give a good account of myself.

Best wishes and further success to "R.W."—G. E. Notley (AW40DX), Tasmania.

will read either A.C. or D.C., but only D.C. in the case of a permanent magnet.

In the repulsion type shown in Fig. 3, the spindle carrying the pointer is parallel to the axis of a solenoid through which flows the current to be measured. A wedge-shaped soft iron vane is attached to one side of the spindle. Within the coil is also a



The circuit of a small multi-meter (Delta pocket type, described in the March, 1939, "Radio World") dissected into four sections to illustrate how the voltage, current and two resistance ranges are provided for.

second soft iron plate so placed as to be adjacent to the moving vane when the meter is indicating zero current. When current flows through the coil, both irons become magnetised longitudinally in the same direction. The moving iron is repelled from the fixed plate, causing the

spindle to rotate and the pointer to move across the scale. The controlling force is supplied by a hair spring and the meter reads both A.C. and D.C.

The magnetic fields in moving iron meters are neither as intense nor as concentrated as in moving coil types, and the deflection sensitivity is consequently less. The majority of such meters require at least 10 to 15 millamps for full scale deflection, so that when used as a voltmeter the internal resistance is seldom higher and usually very much less than 100 ohms per volt.

The forces of repulsion and attraction are proportional to the square of the current flowing and the scales of these instruments are therefore nonlinear, being crowded in the low current regions. Moving iron meters are susceptible to influence from external magnetic fields, and are liable to hysteresis errors which cause them to read low with increasing currents and high when the current is decreasing. These errors may, however, be made very small by adequate shielding and by use of moving irons having negligible hysteresis effects.

In this type of movement, the damping due to eddy currents is not sufficient to prevent mechanical oscillation of the moving parts. In the better class of meter some form of air damping is normally used. In the type of construction shown in Fig. 3, the top and bottom of the former may be sealed with two plates and the clearance between the moving vane and the walls of the former made small. As the vane turns upon its axis the air on either side of it is then compressed or rarified and the motion is damped. The loading may also of course be obtained in a separate air chamber, but the general principle is the same.

(c) Electrostatic Voltmeters

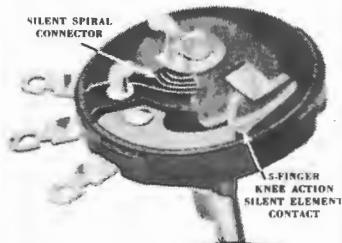
The operation of an electrostatic voltmeter (shown in Fig. 4) depends on the force of attraction between two opposite charges insulated from one another. The meter is necessarily a voltmeter, and is quite unsuitable for measuring current.

The movement is in reality a carefully balanced variable condenser held to zero setting by a light hair spring. When a voltage is applied to the terminals the moving plates are drawn into mesh with the fixed, and the pointer (attached to the moving plates) moves across the scale. The scale itself is far from linear, being seriously crowded at each end.

Electrostatic voltmeters may be used to measure either D.C. or A.C.

(Continued on page 39)

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NO FRICTION**

Metal-to-metal, sliding contact between rotor arm and end terminal is "out." Noise hasn't a chance. The IRC Silent Spiral (positive contact) Connector sees to that.

THE GLIDING ELEMENT RIDER

Instead of a single "rough-riding" contact to element, five separate spring-like contacts give a cushioned "knee-action" effect. Contactor acts independently; each tracks smoothly in perfect unison; each is plated, rounded, smoothed to avoid abrasion and wear.

SMOOTH AS GLASS . . .

The ideal surface for noise-free contact is supplied by the famous IRC Metallized type resistance element permanently bonded to a moisture-proof bakelite base. You can actually feel the difference as the 5-Finger Knee Action Contactor is rotated across this element.

Standard Types 4/6
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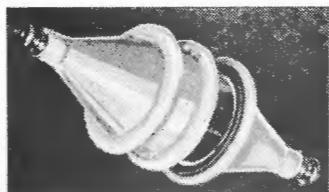
WM. J. McLELLAN & CO.

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What's New In Radio

Raymart Aerial Accessories.

In view of the keen interest now being taken by shortwave fans in the erection of special shortwave aerials, Messrs. John Martin Pty. Ltd., of 116 Castlereagh St., Sydney, wish to advise that ample stocks are available of Raymart aerial "T" pieces, specially designed for use with doublet



aerials with transposed lead-ins. A highly-glazed porcelain finish ensures maximum r.f. efficiency.

Raymart lead-in insulators, type DCL (double cone) and SCL (single cone) are also available (double cone type is illustrated). Made of glazed vitreous porcelain, these insulators are designed to provide maximum surface leakage path.



Acorn Pressed Metal Establishes New "Specials" Department.

"Radio World" readers will be interested in the announcement by Acorn Pressed Metal Pty. Ltd., Marshall St., Surry Hills, Sydney, that a new department has been established for handling "specials" (single chassis and cabinets, etc., in both aluminium and steel) in any desired standard finish. Prompt delivery on all orders is assured, while accuracy is guaranteed.



Calstan Radio And Electrical Instruments.

The latest range of Calstan moving coil meters manufactured by Slade's Radio Pty. Ltd., of Lang St., Croydon, is illustrated in their advertisement elsewhere in this issue. These comprise the rectangular semi-projection "R" type, measuring 4" x 4½," the fan shape "F" type, occupying a space of 3½" x 4½," the round flush-mount-

ing type 331 meter, and the round full-projection type 331 model.

All types are available in sensitivities ranging from 100 to 20,000 ohms per volt, and can be supplied with any desired scale (more than 100 different types are available). Scale lengths for types R, F and 331 meters are 4", 4" and 2½", respectively.

Range Of Moving Iron Instruments

Moving-iron voltmeters in a variety of ranges from 2½ to 600 volts, milliammeters from 0 to 250 m.a., and ammeters from 0 to 250 amps., are available in each style. External thermocouples are also available for connection to any style moving coil meter, while current shunts are available up to 500 amps.

Full details of the range of Calstan meters now available, and of meter accessories, such as shunts and multipliers, metal rectifiers, meter faces, etc., are given in a pamphlet available free to readers from the address given above.



Shortwave Components From Price's Radio.

Messrs. Price's Radio, of 5-6 Angel-Place, Sydney, wish to advise readers that at present ample stocks are available of all standard shortwave components as listed in their latest catalogue, though at the moment the position regarding future supplies is uncertain. Copies of the catalogue mentioned are available free on request at the address given above.



I.R.C. Power Wirewound Resistors.

An art folder, packed with useful information on I.R.C. power wirewound resistors, has just been issued by the sole agents in Australia, Messrs. W. J. McLellan & Co., of Bradley House, 55 York St., Sydney.

Nearly 400 types, in ratings from 3 to 200 watts, and in a variety of

resistances from .5 to 100,000 ohms, are listed, together with maximum current that can be passed through each. As well, a family of curves is published showing the average temperature rise of I.R.C. power wirewounds in free air, for percentage of rated maximum wattage.

Copies of this pamphlet are available to members of the trade free on request from the address given above.



Test Equipment Booklet Free.

Latest releases in Triplett, Ranger, Delta and Walsall test equipment are illustrated and described in a booklet entitled "Preview of Test Apparatus," issued by the sole Australian agents, Messrs. W. G. Watson & Co. Pty. Ltd., of 279 Clarence St., Sydney.

Instruments included comprise Delta models D1503 multi-tester, D666 and D735 multimeters, 1200D volt-ohm-milliammeter; Triplett models 1200A volt-ohm-milliammeter, 1220A free-point tester, 1230 and 1231 signal generators; Walsall model "D" megohm (insulation testing set and a.c./d.c. voltmeter), VA748, 749 and 750 combined volt-ammeter testing sets; and Ranger-Examiner models 557 direct-reading signal generator and 735 pocket volt-ohm-milliammeter.

Complete details are also given of the wide range of latest type a.c. and d.c. Triplett meters that are now available in Australia. Copies of this booklet are available free and post free on request from the address given above.



Remington-Rand Electric Shaver.

One of the leading makes of electric razors in the States, where millions have been sold during the past few years, the Remington-Rand close-shaver illustrated below is also proving a fast seller in Australia, according to Messrs. Fox & MacGillycuddy Ltd., of 57 York St., Sydney, New South Wales distributors.

The shaving head is designed to give a fast, smooth shave as close as that obtainable from a blade razor, but with complete protection from nicking and cuts.

The Remington-Rand is supplied complete with zipper case, cord and plug. The high-speed motor built into the head is precision built, and with



reasonable care will give years of shaving satisfaction. It is wound to operate from 240 volts a.c. or d.c., no transformer being required.

An illustrated pamphlet on the latest model Remington-Rand is available post free from the address given above.



New R.C.S. Price List Free To Readers.

A four-page price list, effective as from October 6, 1939, and superseded-

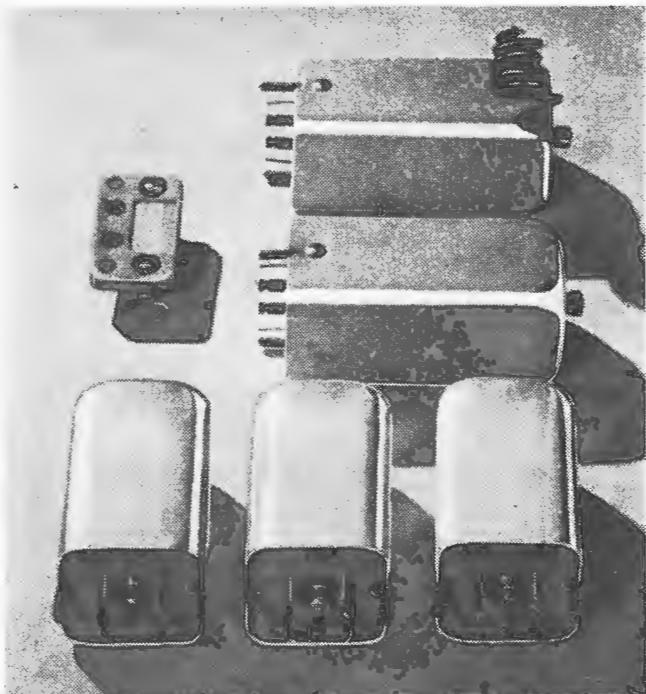
ing all previous lists, has been released by R.C.S. Radio Pty. Ltd., of 50 Glebe St., Sydney.

Brief specifications, with prices, are given of the wide variety of up-to-date lines that comprise the complete range of R.C.S. radio components. These include the following:—Star and m.c. type midget variable condensers, shortwave, broadcast and dual-wave coils and coil units for all types of receivers, air and iron-cored and permeability-tuned i.f. transformers, rheostats, potentiometers, wirewound resistors and voltage dividers, audio chokes and transformers (input and output, single and push-pull, class "A," "B" or "AB"), filament transformers, power chokes, vibrator chokes, line filters, vibrator units, r.f. chokes, aerial accessories, etc.

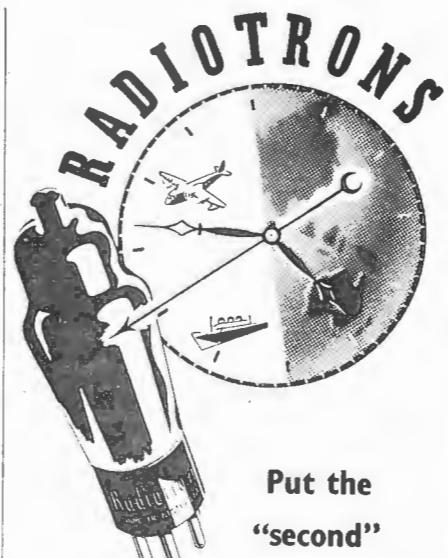
Copies of this list are available free to "Radio World" readers forwarding a 2d. stamp to R.C.S. Radio Pty. Ltd. (address given above).

Iron-Cored Coil Kit For "Picnic Portable."

Illustrated below is an iron-cored coil kit submitted by R.C.S. Radio as an alternative to the air-cored kit used in the original model of the "Picnic Portable." The aerial, r.f. and oscillator coils are permeability-tuned, the adjustment screws being set at the factory for correct inductance and locked in place. The two i.f.



This R.C.S. kit (Type No. K116) recommended for the "Picnic Portable" comprises permeability-tuned aerial, r.f. and oscillator coils, two iron-cored i.f. transformers, and 465 k.c. padder.



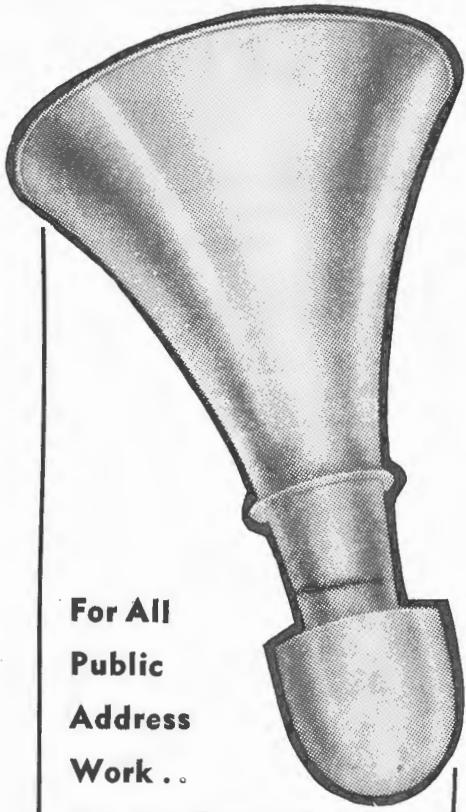
**Put the
"second"
hand on the
clock of communication**

In the space of a split second, the latest news flashes across the world to you with clarity and brilliance — when your radio is re-valved with



Sealed for your protection

Specify . . . RADIOTRONS
for the "Picnic Portable"
and "Vulcan Shortwaver"
described in this issue.



For All
Public
Address
Work..

Use the Type 150

BROWN PROJECTION UNIT

Many leading public address installations throughout the Commonwealth, both permanent and mobile, now use the Type 150 Brown Projection Unit to obtain high, easily-focussed power at low cost.

FEATURES:

- Small throat opening and acoustic transformer effect of baffle plate provides maximum air loading of vibrating diaphragm.
- Proper focussing allows minimum wastage. Unit delivers up to 5 times effective power available from same speaker unit used with flat or box baffle. Reduces feedback. Allows more amplifier gain to be used.

SPECIFICATIONS:

Overall length of assembly is 35½ ins., the horn having a mouth diameter of 23½ ins. The flare of the horn is demountable for transport purposes, and the throat and loud speaker housing may be placed inside the flare. Capacity ranges from 5 watts (Rola 8/21) to 14 watts (8/42). Can be used on electro-dynamic and permanent magnet reproducers. Units are of specially spun 16-gauge aluminium throughout, with heavy rolled bead to reinforce the bell-mouth opening. Finished in standard iridescent Rola grey.

Write for free pamphlet to:

**GEORGE BROWN
& Co. Pty. Ltd.**

267 CLARENCE ST., SYDNEY
Phone: M 2544.

transformers are standard iron-cored types, though if preferred the permeability-tuned variety can be supplied. However, for the "Picnic Portable" the standard type gives ample gain.

Price Error In R.C.S. Advertisement.

In the R.C.S. advertisement on page 30 of last month's issue, the coil kit type K114 for the "Picnic Portable" was incorrectly priced at 25/-. This should have been 31/9.

BROWN PROJECTION UNIT POPULAR WITH PUBLIC ADDRESS OPERATIVES

Greatest Coverage At Lowest Cost.

SINCE the Brown Sound Projection Unit, marketed by Geo. Brown & Co. Pty. Ltd., 267 Clarence St., Sydney, was released eighteen months ago, it has proved exceptionally popular with public address operatives throughout the Commonwealth.

Designed to give maximum possible sound distribution efficiency from standard Rola 8" speakers, these units permit far greater coverage to be obtained from a given sound output, compared with flat or box baffle speakers. Alternatively, those designing public address systems will find that by using one or several Brown Projection Units, highly efficient coverage can be obtained from inexpensive, low-powered amplifiers.

The Brown projection horn is spun from heavy gauge aluminium, and

has an overall length of nearly three feet. At the throat end is a weather-proof speaker housing and mounting plate. The flanged throat and bell-mouth sections are locked in place by wing nuts, and so can easily be dismantled. For convenience in carrying, the throat section can be packed inside the bell-mouth.

The throat baffle plate fitted is in effect an acoustic transformer, providing maximum air loading for the diaphragm, thus protecting it from damage, and ensuring the fullest transfer of energy from the relatively large diaphragm area to the small throat section. The projectors can be supplied either with or without Rola units in capacity ranges of from 5 to 14 watts, and they can be used

(Continued on page 39)

During a recent show at Cairns, Q., ten Brown projection units were used to provide effective sound coverage of the showgrounds and grandstand. This photo shows a mechanic mounting a unit on a power line pole by means of clamping rings.





The new S.T.C. Model 542 five-valve a.c. dual wave chassis is available in either the horizontal or upright type of mantel cabinet as illustrated on this page.

Three New S.T.C. Releases

Modern cabinet design, with large multi-colour dials and excellent all-round performance are main features of latest S.T.C. models

A LARGE multi-coloured edgelit tuning dial with "spin" type drive, excellent all-round performance, and attractively-styled cabinets are notable features of the three new-season receiver releases by Standard Telephones & Cables Pty. Ltd., illustrated on this page. These comprise horizontal and upright mantel models, 542R and 542S, respectively, and console model 509T.

A feature of technical interest is the use in all three receivers of the Brimar 6AG6-G high slope output pentode. This valve has a sensitivity such that an input of 2 volts r.m.s. will fully load it, thus enabling the intermediate audio frequency stage usually required to be omitted if desired. However, modern practice calls for fairly high level audio amplification, and in each of these three receivers the triode section of a 6Q7G second detector is used as driver, the combination giving a high-quality high-gain audio amplification system.

Brief specifications of the Model 509T five-valve a.c. broadcast console are given below.

Model 509T: Brief Specifications.

This model is built on a full-size chassis with 10" fully edge-lit dial, glass bezel and black bakelite escutcheon with inlaid medallion.

Features: Straight line frequency tuning, automatic volume control, tone control, clearly marked multi-zoned dial, with station calls individually coloured in State groups and visual indicators for tone and volume controls. Dial movement is die cast with inbuilt pointer drive, and has optimum drive ratio with flywheel loading. Twelve-inch electro-dynamic moving coil loud speaker. Threshold sensitivity control.

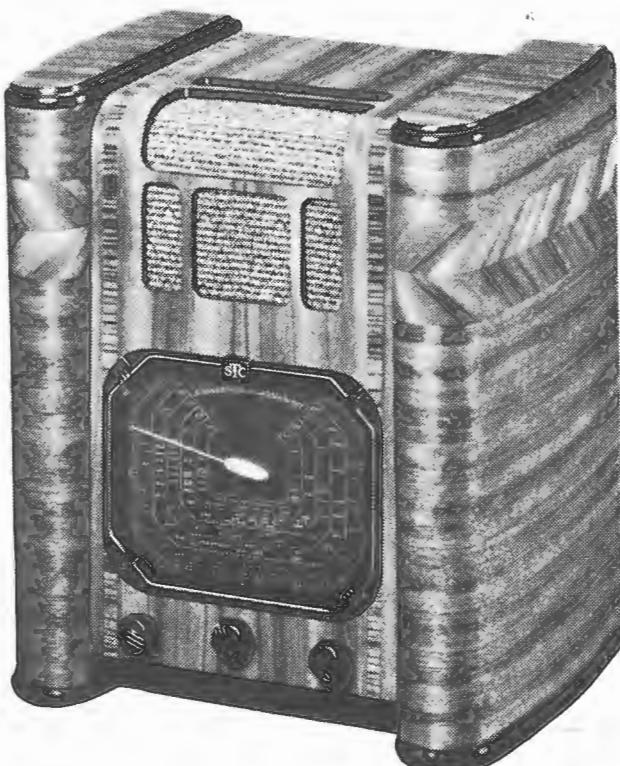
Circuit specifications: 455 k.c. air-trimmed super-heterodyne, using frequency converter, one stage permeability-tuned i.f. amplifier, 1 diode-triode detector amplifier, resistance-coupled to high gain steep slope output pentode.

Tuning range: 1600 - 550 kilocycles (includes

extension of broadcast band authorised by last Cairo Convention):

Valve equipment: 1 6K8G, 1 6D6, 1 6Q7G, 1 6AG6G, 1 5Z4G.

A.C. supply: 200, 240 volts, 50 cycles.





Cabinet: "T" type console.

Models 542R And 542S.

These are a.c. dual-wave mantel models, Model 542R being housed in a horizontal and 542S in an upright mantel cabinet as illustrated. Each is built on a compact chassis and is provided with a large, fully edgelit multi-coloured dial, glass bezel, and black bakelite escutcheon with inlaid medallion.

Except for the cabinet design these models are identical, so that the review given below on a Model 542R submitted to "Radio World" last month for test, applies equally well to both receivers.

"Radio World" Test Report On Model 542R.

The Model 542R is assembled on a chassis measuring 10½" long by 8" wide by 2½" deep, approximate dimensions of the walnut veneer cabinet housing it being 18" long by 10" wide by 10" deep.

Five latest-type octal-based valves are used, comprising a 6K6G mixer

oscillator, 6D6 i.f. amplifier, 6Q7G combined diode second detector, a.v.c. voltage generator and triode audio driver, 6AG6G high gain output pentode and 5Z4G rectifier. The receiver is designed for operation from a.c. mains within the limits of 190 to 250 volts at 40 to 60 cycles.

Main technical features include straight-line frequency tuning, an effective a.v.c. system, step-by-step tone control, permeability tuned i.f. transformers, provision for pick-up, and threshold sensitivity control.

The new dial fitted to this and other latest S.T.C. models is well worthy of mention. A "spin" type dial with fly-wheel loading, it has a particularly smooth action with no trace of backlash. The drive ratio has been well chosen, for, while it makes fine tuning on the short waves a simple matter, no laborious turning of the knob is necessary to traverse the entire scale. Several flicks of the tuning knob will send the pointer travelling smoothly right across the band.

Broadcast station calls are grouped in States, a different colour being

used for each. On the shortwave scale, which is calibrated in metres, the five broadcast bands are clearly indicated.

Waveband coverage is from 1600 to 540 k.c. on the broadcast band, which includes the additional frequencies allocated at Cairo last year, and from 16.5 to 52 metres on the short waves.

There are four controls—tone, tuning, volume and wave-change.

On test, the Model 542R proved an excellent performer on both wavebands. The a.v.c. system is very effective, its value being best appreciated during reception of shortwave transmissions from powerful overseas stations. All of these provide excellent entertainment under average conditions, signals being particularly steady with perfect readability.

On the broadcast band the performance is also above the ordinary. Sensitivity is well above the average, while tone is also unusually good, being actually better than that of some consoles on the market.

Taken all round, the Model 542R represents excellent value at 20 guineas, and is a worthy successor to the S.T.C. Model 528F that has proved such an excellent seller throughout the Commonwealth during the past twelve months.

A Hint For Smoother Reaction.

Many shortwave enthusiasts are troubled by fierce reaction, and in many cases when the reaction is advanced it ends up with a grunt. With the reaction in this condition, searching is out of the question.

This position can be improved considerably by simply altering the size and shape of the moving plates of the reaction condenser, thereby introducing a suitable taper to the point of entry of the moving plates. The amount each plate is cut will depend on the number of plates in the condenser.

Remove the moving plates and cut as follows:—The first plate is left as it is, and the last is cut at right angles. Now, starting from this last plate, cut each of the remaining plates so that each one projects a little past the last one.

With a condenser of 23 plates, 11 moving, the amount each moving plate projects should be approximately $\frac{1}{8}$ ". Smooth reaction will now be available on various coils.—C. J. Pike, Coff's Harbour.

Shortwave Review

CONDUCTED BY
ALAN H. GRAHAM

Details Of War News Broadcasts ★ New Stations ★ Notes On Amateur Band Conditions ★ Station Changes And Schedules

War News Broadcasts.

Shortwave transmissions from Europe continue to be dominated by broadcasts of war news, propagandist and otherwise, from belligerent and neutral countries alike. The slow tempo of recent developments has had its effect on American transmissions, resulting in a considerable slowing down of news services.

At times the lack of news leads to a good deal of repetition and promotes a tendency to futile speculation on probable developments. To avoid this, listeners should note the following services, attention to which will enable them to obtain a comprehensive view of world opinion:

Mornings: From London (GSD), at 7.45 a.m. From Boston (W1XAR) at 9 a.m.

Afternoons: From Paris (TPA-3), at 3.30 p.m. From London (GSD), at 4.15 p.m. From Berlin (DJB), at 5 p.m.

Evenings: From London (GSG), at 9.30 p.m. From New York (WCBX), at 10 p.m. From San Francisco (KGEL), at 10.30 p.m.

New Stations In List Of Month's Loggings.

Once again we are able to list a number of new stations in our usual full list of the past month's loggings. In addition, a number of transmitters seldom heard in this country are listed. The attention of keen dx-ers is especially directed to the following:—VOFB, Newfoundland, 24.37 metres; FET-22, Oveido, Spain, on 42 metres; LZA, Bulgaria, on 35.4 metres; FG-8AH, Guadeloupe, French West Indies; on 40.32 metres; XZZ, Burma, on 86 metres; HS4PJ, Siam, on 48.94 metres; and JIE and JIE-2, Formosa, on 41.1 and 30.9 metres, respectively.

Correspondence.

Repeating our request of last month—will readers forward all correspondence dealing with shortwave matters to the S.W. Editor, Alan H. Graham, 258 Lower Plenty Road, Rosanna, N22, Victoria. All broadcast-band DX material should be sent to Kevin A. Crowley, 188 Chapel Street, Prahran, Victoria.

Latest Station Changes and Schedules.

Ceylon.

VPB, Colombo, has now ceased its shortwave transmissions on 48 metres, as it was found that it served scarcely any wider area than the medium-wave transmitter. Dxers will regret the passing of this station, which was one of the most reliable of the low-frequency transmitters.

Chile.

Now under construction in Santiago, CB-946 will soon be on the air, relaying CB-150 and CB-118, on 9460kc., 31.7m.

Colombian Republic.

Once again the Colombian stations have changed their call-signs. This time they have dropped the numeral and the last but one letter of their old calls. Thus HJ3CAH becomes HJCH; HJ2BAC becomes HJBC; HJ7GAB becomes HJGB, and so on.

Cuba.

COCO, Habana, has recently shifted to 8695kc., 34.48m. Latest schedule gives hours of transmission at 10.25 p.m.-2.30 p.m.

COCN, Habana, is expected to be on the air soon on 9487kc., 31.8m.

France.

The latest Paris Mondial schedule is as follows:—

TPB-3, 17850kc., 16.81m.: 11.30 p.m.
till 1 a.m.

TPA-2, 15243kc., 19.68m.: 8 p.m.
till 1 a.m.

TPB-6, 15130kc., 19.83m.: 4 till 7
p.m.

ALL-WAVE ALL-WORLD DX CLUB

Application for Membership

The Secretary,
All-Wave All-World DX Club,
214 George Street,
Sydney, N.S.W.
Dear Sir,



I am very interested in dxing, and am keen to join your Club.
The details you require are given below:

Name.....

Address.....

[Please print
both plainly.]

My set is a.....

[Give make or type,
number of valves,
and state whether
battery or mains
operated.]

I enclose herewith the Life Membership fee of 3/6 [Postal Notes
or Money Order], for which I will receive, post free, a Club badge and
a Membership Certificate showing my Official Club Number.

(Signed).....

[Note: Readers who do not want to mutilate their copies of the "Radio World" by
cutting out this form can write out the details required.]

TPB-12, 11885kc., 25.24m.: 9 till 11.15 a.m. and 11.30 a.m. till 2 p.m.

TPA-3, 11885kc., 25.24m.: 1.15 till 8 a.m. and 4 till 7 p.m.

TPA-4, 11718kc., 25.6m.: 9 till 11.15 a.m. and 11.30 a.m. till 2 p.m.

TPB-11, 7280kc., 41.21m.: 1.15 till 3.45 a.m., 4 till 8.15 a.m. and 11.30 a.m. till 2 p.m.

Listeners should also look out for the new transmitter used by Paris Mondial during their afternoon transmissions, on 9680kc., 30.99m.

French Indo-China.

Radio Saigon are now operating on both the 25 and 49 metre bands. They are most anxious to receive reports comparing the signal strengths of the two transmitters. Address is Box 412, Saigon.

Haiti.

A new station located in Port-au-Prince, call **HHK**, is now under course of construction. Power will be 20 kilowatts, and the following channels are available:—6200kc., 48.36m.; 9620 kc., 31.19m.; 11820kc., 25.89m.; 17850 kc., 16.80m.; and 21670kc., 13.84m.

Portugal.

Schedules for the various transmitters of the national shortwave station now in use are:—

CSW-4, 15215kc., 19.71m.: 10 p.m. till midnight and 3 till 4.30 a.m.

CSW-6, 11040kc., 27.17m.: 0.35 till 7.50 a.m.

CSW-7, 9740kc., 30.8m.: 9.13 till 10 a.m. and 10.05 a.m. till noon.

CSW-8, 7260kc., 41.32m.: 8.05 till 9 a.m.

Roumania.

The new station in Bucharest is now reported to be operating on the 19 metre band—on 15410kc., 19.40m. Schedule is given as 11.55 a.m. till 1.15 p.m. The majority of announcements are given by a lady. Announces as "Radio Bucuresti" (NNRC).

United States.

For the convenience of readers we repeat the recent changes in American call-signs.

W8XK to **WPIT**; **W1XK** to **WBOS**; **W2XAF** to **WGEO**; **W3XL** to **WNBI**; **W2XAD** to **WGEA**; **W6XBE** to **KGEI**; **W8XAL** to **WLWO**; **W3XAU** to **WCAB**; **W3XAL** to **WRCA**; **W2XE** to **WCBX**; **W4XB** to **WBKM**; **W1XAL** to **WRUL** (**W1XAR** not checked yet).

Latest schedules for **WPIT** just to hand from the Westinghouse stations:

On 21540kc., 13.93m., from 8.30 p.m. till midnight.

15210kc., 19.71m., from midnight till 5 a.m.

11870kc., 25.25m., from 5 a.m. till 2 p.m.

6140kc., 48.8m., from 2 till 3 p.m.

Brazil.

A new station in Rio de Janeiro, with a power of 20 kilowatts, will

shortly commence transmissions on 15145kc., 19.81m. (Universalite).

Hungary.

A new experimental station in Budapest, **HAD**, will use the following frequencies—9625, 11850 and 21680kc., or 31.17, 25.32 and 13.84m. (Universalite).



Ultra-High-Frequency Notes.

Police Bands Should Soon Provide Interesting DX.

In the writer's locality at least conditions on the U.H.F. bands have been rather unsettled, and it has proved most difficult to estimate when the 9-metre bands will open up. However, towards the middle of October definite signs of activity on the police bands on 9 metres were noted. On several occasions exceptionally strong signals were heard from the Fort Worth transmitter.

11-Metre Signals Poor.

On 11 metres conditions have been poor, and no strong signals have been noted for some time. **W4XA**, 26150kc., 11.47m., is the most reliable station on this band.

The new station reported last month, **W9XPD**, operates on 25900kc., 11.58m.



Amateur Bands Review.

20-Metre Band Still of Interest.

Although amateur transmitters in many countries were ordered off the air at the commencement of the war, and although further reductions in the number of countries still on the air were made at the end of September, 20-metre fans have nevertheless found much to interest them.

At present it is possible to log a good number of Asiatic and American transmitters, which continue to come through at good strength. Over thirty countries are listed in the "Calls Heard" section, having been reported by listeners in all States. Quite a number of South Africans are listed, these being logged before the ZS stations went off the air at the end of September; a number of the Baltic States also suspended amateur licences at about the same time.

Non-QSL-ing Amateurs.

It had been intended to publish this month a revised list of non-QSL-ing amateurs, but for various reasons it has been decided to temporarily suspend this feature. It has been found most difficult to compile an accurate list, as widely differing information regarding a number of amateurs has been supplied by interested readers. It is probable that a list of amateurs who do QSL SWL reports might be

more useful. Readers' comments on this matter are invited.

Addresses Of KF6 and KD6 Amateurs.

The following addresses will be of interest:—

KD6OPJ, D. P. Van Gieson, U.S. Naval Reservation, Midway Is.

KF6QMQ, R. H. Beatty, Enderbury Is.

KF6OWJ, I. A. McKellar, Canton Is.

KD6QLS, H. J. Strickland, Pan-American Base, Midway Is.

KD6MV, W. H. Hobdy, C/- Pan-American Airways, Midway Is.

10-Metre Band Much Improved.

During recent weeks a considerable improvement has been noted on the 10-metre band. Although only "W" stations are listed in the calls heard, these have been coming in at greatly improved strength—a feature being the increased number of East Coast stations logged.



Calls Heard.

20-Metre Band.

(Compiled from information supplied by the following observers, Messrs. Taylor, Hastings, Neill, Linehan, Coggins, Cushen and Keen).

Africa.

South Africa: **ZS-1AV**, **1CD**, **2AB**, **2X**, **2G**, **2AZ**, **4H**, **5BZ**, **5F**, **5Q**, **5CL**, **5TT**, **5DA**, **6TO**, **6DJ**, **6AJ**, **6CN**, **6AD**.

Uganda: **VQ5-JM**.

Belgian Congo: **OQ5-AB**.

Europe:

Italy: **I-1MZ**, **1RE**.

Lithuania: **LY-1J**, **1DX**.

Portugal: **CT-1QA**, **1AX**, **1QS**.

Sweden: **SM-5JB**, **7MU**.

Norway: **LA-8J**, **1F**.

Denmark: **OZ5BW**.

Estonia: **ES5F**.

Spain: **EA7BA**.

South America.

Argentine: **LU-1HI**, **2DG**.

Peru: **OA-4C**, **4R**, **4AI**.

Uruguay: **CX2BK**.

Venezuela: **YV-1AP**, **1ABQ**, **3AQ**, **4AE**, **5AK**, **5CH**, **5ABQ**, **5ACA**.

Chile: **CE-1AG**, **3BM**, **3CG**, **3CO**, **3CW**, **3AG**.

Ecuador: **HC-1FG**, **2HP**.

Bolivia: **CP1BA**.

Central America And West Indies.

Mexico: **XE-1CQ**, **1FG**, **1BG**, **2FA**, **2HB**.

Porto Rico: **K4FAY**.

Dominican Republic: **HI5X**.

Panama: **HP1A**.

Pacific.

Guam: **KB6OCL**.

Wake Is.: **KC6-OZL**, **IDB**.

Dutch New Guinea: **PK6OM**.

The East.

Korea: **J8CI**.

Japan: **J-2KN**, **2NG**, **2XA**, **2NQ**, **3CX**, **4CT**, **5CW**, **7CB**.

China: XU-A, 1B, 8RB, 8ZA, 8RJ, 8MC, 8RA, 8ET, 8AM, 8MA, 8LA.

Dutch East Indies: PK-10G, 1RI, 1JM, 2LZ, 2AY, 3AA, 3ST, 3DD, 3KA, 4ES, 4KS, 4MM.

Hawaii: K6-ILW, KKC, MVA, BHL, LCV, OTH, PTW, OCM, OJI, OES, GBD, MZQ, RVU, BNR, PUL, NYD, OQE, PIT, PAS, BDW.

Philippine Is.: KA-1AZ, 1AP, 1FH, 1LB, 1JP, 1ME, 1OZ, 1CW, 1BD, 1UB, 1MM, 1AF, 1CS, 1LZ, 3KK, 7HB, 7EF.

10-Metre Band.

(Loggings supplied by Observers Taylor and Linehan)

Hawaii: K6LCV.

United States: W-1LTC, 2DFM, 2JAS, 2ALK, 3HOH, 3AQH, 3DQ, 5FIY, 5HMH, 5ECL, 5HAJ, 6COX, 6PMB, 6KKV, 6FZM, 6EOW, 6ANU, 6NRO, 6QZA, 7GIU, 8QBR, 8HHZ, 8NZW, 8BZY, 8REQ, 8QQN, 9YCV, 9ARA, 9FFB, 9ROQ.



Letter Box Section.

Mr. O. G. Washfold (AW257DX), Camberwell Victoria:-

Many thanks for your letter with complete details of reception in your locality. Will be pleased to hear from you again.

Mr. F. Schumann, Jugiong, via Coolac, N.S.W.

Will answer your query re receiver by letter.



QSL Exchange Bureau.

The following are interested in the exchange of QSL cards:-

C. Cuthbert, 286 Northdown Rd., Margate, Kent, England.

Tokio Muajazono, 2838 Church Lane, Honolulu, Hawaii.

R. R. Longyear, Genthod, Geneva, Switzerland.

Loyall Mumby, 36 Burr Ave., Middletown, Conn., U.S.A.

Shokichi Yoshimura, 3-chome, Shojimachi, Moji, Japan.

J. R. MacDonald, 944-A Padre Faura, Manila, Philippine Is.

P. J. Masterton, 98 Bangor Rd., Crumlin, Dublin, Eire.

P. A. Madsen, Noorevej 23, Shekkessten, Denmark.

Petras Jastrzembskas, Hipodrome 14b, Kaunas 1, Lithuania.

Murray B. Gunn, "Farm Rome," Somerset West, Cape Province, South Africa.

Basil Green, C/- 5 Pallinghurst Rd., Parktown West, Johannesburg, South Africa.



This Month's Loggings.

SOUTH AMERICA.

Peru:

OAX4J, 9340kc., 32.12m., Lima: Heard most afternoons, but best on Sundays till 4 p.m.

OAX4T, 9566kc., 31.38m., Lima: Now very erratic; heard best just af-

ter opening at 11 p.m. (Chapman, Johns).

OAX5C, 9350kc., 31.96m., Ica.: Heard at good strength on Sunday afternoons, closing at 3 p.m. (Chapman, Johns).

Argentine.

LRA-1, 9690kc., 30.96m., Buenos Aires: Much weaker signal than dur-

DX Club Requirements.

All-Wave All-World DX Club members are advised that the following DX requirements are obtainable from Club headquarters, 214 George Street, Sydney.

REPORT FORMS. — Save time and make sure of supplying all the information required by using these official forms, which identify you with an established DX organisation.

Price . . . 1/6 for 50, post free.

NOTEBOOK. — Headed Club notepaper for members' correspondence is also available.

Price, 1/6 for 50 sheets, post free.

DX CLUB STICKERS. — Enlarged two-colour replicas of the Club badge, in the form of gummed stickers, designed for attaching to envelopes, QSL cards, etc. Price, 5 dozen for 1/6, post free.

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ing winter months; best on opening at 7 a.m. on Saturdays (Chapman, Johns).

LRX, 9660kc., 31.06m., Buenos Aires: Also much weaker than previously; best around 2 p.m.

Ecuador.

HCJB, 12460kc., 24.08m., Quito: Now barely audible.

Paraguay.

ZP-14, 11720kc., 25.6m., Villarica: Still heard at fair strength from 8.30 a.m. till after 10 a.m. (Crowley). Chile.

CB-1170, 11700kc., 25.64m., Santiago: Not too good now, but still heard very well in N.Z. from noon till closing at 2 p.m. (Johns).

CD-1190, 11910kc., 25.19m., Valparaiso: As CB-1170, very good in N.Z., from noon till 2 p.m. (Johns).

CB-960, 9600kc., 31.25m., Santiago: Excellent signal on Sundays till 4 p.m. (Johns).

Brazil.

PSH, 10220kc., 29.35m., Rio de Janeiro: Just audible on occasions on opening at 9 a.m.; but reported at good strength in N.Z.

Uruguay.

CXA-2, 9570kc., 31.35m., Montevideo: Fair signal at times in the early afternoon.

CXA-8, 9640kc., 31.12m., Colonia: Another of the Sunday afternoon South Americans—till 4 or 5 p.m.

CENTRAL AMERICA AND WEST INDIES.

Guatemala.

TGWA, 9685kc., 30.96m., Guatemala City: Best known of Latin American stations. Excellent signals every afternoon till 2.45 p.m., with special DX programmes on alternate Sundays (Washfold, Linehan, Crowley).

TGWB, 6490kc., 46.2m., Guatemala City: Same programme as TGWA on Sundays; fairly strong.

TG-2, 6190kc., 48.47m., Guatemala City: Another Sunday afternoon station.

Costa Rica.

TIPG, 9620kc., 31.19m., San Jose: One of best signals on 31 metres at night; opens at 10 p.m. Also reported in early mornings in N.Z. (Chapman, Keen, Johns).

TILS, 6165kc., 48.66m., San Jose: Regular station at night, opening at 10 p.m. (Washfold).

Mexico.

XEWX, 9500kc., 31.58m., Mexico City: Very consistent afternoon signal; also heard around 11 p.m. (Johns).

XEUZ, 6117kc., 49.04m., Mexico City: Reported from N.Z.; fairly strong in the afternoons (Keen).

XEXA, 6175kc., 48.58m., Mexico City: Just audible at night; identify by programme of exercises.

Panama.

HP5J, 9590kc., 31.28m., Panama City: Another regular from 10 p.m. (Chapman).

HP5K, 6005kc., 49.95m., Colon: One of most regular stations on this band; opens at 10 p.m.

Cuba.

COCH, 9437kc., 31.8m., Habana: Fair late at night and in the early a.m. (Neill, Johns).

COCQ, Habana: Still varying a good deal in frequency around 34 metres; opens with "Siboney" (Johns, Neill).

COJK, 8665kc., 34.46m., Camaguey: One of best Cubans at present, from 9.55 p.m.

COCO, 8695kc., 34.48m., Habana: New frequency for this station; heard fairly well around 3.30 p.m.

COBC, 9985kc., 30.03m., Habana: Good signal from 9.55 p.m. (Johns).

COCM, 9850kc., 30.46m., Habana: Fair at night from 11 p.m.

French West Indies.

FG8AH, 7440kc., 40.32m., Point-a-Pitre, Guadeloupe: Unusual station reported in N.S.W. No details yet as to time when audible (Chapman).

Nicaragua.

YNPR, 8580kc., 34.92m., Managua: Reported from N.Z.; heard till 3 p.m. (station usually closes 1.15 p.m.).

YNRF, 6730kc., 44.58m., Managua: Also reported from N.Z.; same programme as YNPR.

NORTH AMERICA.

United States.

WGAE, 15330kc., 19.57m., Schenectady: Now being heard at excellent strength in the mornings around 8 a.m. (Washfold, Johns).

WGAE, 9550kc., 31.41m., Schenectady: Reasonable signal around 8 a.m. (Cushen).

WCBX, 17830kc., 16.81m., New York: New call letters for W2XE; still heard well around 10 p.m.

WCBX, 15270kc., 19.64m., New York: Heard once or twice in the very early morning.

WCBX, 11830kc., 25.36m., New York: One of best morning signals. News service in variety of languages, including French, German, Spanish, etc., from 8 a.m. (Washfold, Chapman, Johns).

WCBX, 6120kc., 49.02m., New York: Heard fairly well during afternoons around 3 p.m. (Cushen, Johns).

WBOS, 9570kc., 31.35m., Boston: Excellent afternoon signal, closing at 3 p.m. (Chapman).

WPIT, 15210kc., 19.71m., Pittsburgh: Opening at midnight with a fair signal.

WPIT, 11870kc., 25.27m., Pittsburgh: Now on the air from 5 a.m. till 2 p.m.; excellent signal around 8 a.m. Don't be misled by Spanish sessions. (Cushen, Johns).

WLWO, 6060kc., 49.5m., Cincinnati: Now putting in a very strong signal during the late afternoons (Washfold).

WGEO, 9530kc., 31.48m., Schenectady: Very strong signal around 8 a.m., and also heard before closing at 3 p.m. (Neill).

WRCA, 9670kc., 31.03m., Bound Brook: Good afternoon signal till 3 p.m. (Johns).

WCAB, 9590kc., 31.28m., Philadelphia: Also heard irregularly in the afternoons.

WNBI, 17780kc., 16.87m., Bound Brook: Call of this station is definitely WNBI and not WNEI, as reported in other publications (was formerly

W3XL). Heard very well during forenoon (Johns).

WBKM, 6040kc., 49.65m., Miami Beach: New call for W4XB. Reported as heard at excellent strength in N.Z. till 3.30 p.m. on Sundays (Johns).

WRUL, 11790kc., 25.45m., Boston: Heard at good strength in the early mornings. Was formerly WIXAL (Chapman, Cushen).

WIXAR, 11730kc., 25.58m., Boston: Now heard at excellent strength, opening at 8.30 a.m.; news at 9 a.m. New call not checked as yet.

KGEI, 15330kc., 19.57m., Treasure Island: Good signal in early afternoon. (Washfold, Neill).

KGEI, 9530kc., 31.48m., Treasure Island. Splendid signal from 10 p.m. with news at 10.30 p.m. and 12.30 a.m. Also heard on afternoon session again till 6 p.m. (Washfold, Chapman, Linehan, Keen, Johns).

KGEI, 6190kc., 48.47m., Treasure Island: Heard on 3-6 p.m. session, but recently replaced by 31 metre transmitter (Washfold, Johns, Cushen).

KKZ, 13690kc., 21.91m., Bolinas: Special relay to Hawaii on Sunday afternoons till 2.45 p.m.

Newfoundland.

VOFB, 12310kc., 24.87m., St. Johns: Real DX catch reported from Queensland. Heard at good strength at 9 a.m. by Observer Neill. Schedule is 8.30-10.30 a.m.

AFRICA.

Kenya.

VQ7LO, 6082kc., 49.31m., Nairobi: This well-known transmitter is easily logged around 5 a.m. (Neill).

Ethiopia.

IABA, 9650kc., 31.09m., Addis Ababa: Fairly strong early morning signal; schedule uncertain, but heard between 2 and 4 a.m.

Canary Is.

EAJ-43, 10370kc., 28.93m., Teneriffe: Still putting in a fair signal in the early mornings.

Angola.

CR6AA, 7177kc., 41.75m., Lobita: Heard fairly well during the early mornings.

Mozambique.

CR7AA, 6137kc., 48.88m., Lourenco Marques: Heard till 7 a.m.

Madagascar.

Radio Tananarive, 6063kc., 49.48m., Tananarive: Opens at 1 a.m. with "Marseillaise." Poorly modulated signal.

OCEANIA.

New Caledonia.

FK8AA, 6122kc., 49m., Noumea: Heard from 5.30 p.m.; seem to operate only on Wednesdays and Saturdays now (Chapman).

Fiji Is.

VPD-2, 9538kc., 31.38m., Suva: Very strong signal from 8.30 till 10 p.m. nightly (Chapman, Johns).

Hawaii.

KQH, 14290kc., 20.11m., Kahuku: Special relay to U.S.A. on Sunday afternoons.

AUSTRALIA.

VLR, 9580kc., 31.32m., Lyndhurst: Now used during afternoons and nights.

VLR-3, 11880kc., 25.25m., Lyndhurst: Now used during morning (Johns).

THE EAST.

Philippine Is.

KZIB, 9500kc., 31.58m., Manila: Very strong signal every night (Washfold, Chapman, Neill, Johns).

KZIB, 6040kc., 49.67m., Manila: Relays same programme as transmitter on 9500kc.; very loud (Washfold, Keen).

KZRM, 9570kc., 31.35m., Manila: Good signal during both morning and evening (Washfold, Chapman, Johns).

KZRF, 6140kc., 48.86m., Manila: Announces as "Radio Philippino"; operated by the Far Eastern Broadcasting Co. Calls KZRM and KZEG, also heard occasionally on this same frequency (Washfold).

KZRH, 6110kc., 49.1m., Manila: "The Voice of the Philippines"; a fair signal at night (Washfold, Johns). Malaya.

ZHP, 9690kc., 30.96m., Singapore: Very steady signal heard every night; best around 10 p.m. (Washfold, Chapman, Keen).

ZHJ, 6080kc., 49.3m., Penang: Also heard very well nightly from 8.40 p.m. (Washfold).

India.

VUD-2, 9590kc., 31.28m., Delhi: Strong signal from opening at 10.30 p.m. nightly (Chapman).

VUD-3, 15290kc., 19.62m., Delhi: Heard around midday, and also occasionally late in the afternoon (Johns, Cushen).

VUD-2, 4960kc., 60.48m., Delhi: Fairly strong around 11 p.m. (Chapman).

VUM-2, 4920kc., 60.98m., Madras: Just fair at 11 p.m. (Chapman).

VUC-2, 4840kc., 61.98m., Calcutta: Not as strong as formerly (Chapman).

VUB-2, 4880kc., 61.48m., Bombay: Better than last month (Chapman).

Burma.

XYZ, 6007kc., 49.94m., Rangoon:

Another of the 49 metre regulars;

fairly strong. Listed by mistake last month as XYO.

XZZ, 3488kc., 86m., Rangoon: Re-

ported from N.Z., with same pro-

gramme as XYZ.

French Indo-China.

Radio Saigon, 6116kc., 49.05m.,

Saigon: Very strong signal nightly, with special English session from 9 p.m. (Washfold, Linehan, Keen, Johns).

Radio Saigon, 11780kc., 25.47m., Saigon: Nightly from 11.30 p.m.; very strong signal (Washfold, Chapman, Johns).

Hong Kong.

ZBW-3, 9525kc., 31.49m. Regular at night, with good signal. It is understood that this station will again verify reports (Washfold).

China.

XGX, 11900kc., 25.21m., Yunnan: It is understood that XGX has replaced XGOY, which has disappeared (Washfold, Johns).

XGOX, 17800kc., 16.85m., Chungking: Heard weakly in midday session (Washfold, Neill).

XGOX, 15190kc., 19.75m., Chungking: This frequency is again being used for special broadcasts.

XMHA, 11850kc., 25.32m., Shanghai: Not very strong now, but still audible almost every night (Washfold).

XPSA, 7000kc., 42.8m.. Kweiyang: Still heard nightly at good strength (Washfold, Neill).

XGOK, 11810kc., 25.4m., Canton: Heard occasionally between 10 p.m. and midnight; not very strong.

XOJD, 6880kc., 43.6m., Hankow: Fairly strong.

Manchukuo.

MTCY, 6125kc., 48.98m., Hsinking: Heard nightly; strong.

MTCY, 11775kc., 25.48m., Hsin-king: Still at good strength in 7 a.m. session (Chapman, Johns).

JDY, 9920kc., 30.24m., Dairen: Nice signal at 10 p.m. (Johns).

Siam.

HS8PJ, 9510kc., 31.55m., Bangkok: Still as reliable as ever; best just before midnight (Chapman).

HS4PJ, 6130kc., 48.94m., locality uncertain: Relays HS8PJ from 11 p.m.-1 a.m. Difficult to separate from MTCY.

Taiwan (Formosa).

JIE, 7295kc., 41.1m., Tyureki: New station for China and the South Seas, from 11 p.m.; same programme as JFO.

JIE-2, 9695kc., 30.9m., Tyureki: Another new station; same programme as JIE.

JFO, 9635kc., 31.13m., Taihoku: Heard nightly 11 p.m.-1.20 a.m.

Japan.

JZK, 15160kc., 19.79m., Tokyo: Best of Japanese stations at present in use. Heard well at 3 p.m. and 10 p.m. (Johns).

JVW-3, 11720kc., 35.6m., Tokyo: Heard best in early mornings.

JLG-3, 11705kc., 25.63m., Tokyo: Japanese programme at night.

Stations also logged: JZZ, JZL and JLG.

Dutch East Indies.

YDD, 6045kc., 49.63m., Bandoeng: Difficult to separate from KZIB. This station was previously listed as YDA (Neill).

YDC, 15150kc., 19.8m., Bandoeng: Excellent signal from 9 a.m., with very bright musical programme (Washfold, Linehan, Johns).

YDB, 9550kc., 31.41m., Bandoeng: Better signal at night now (Chapman).

YDX, 7220kc., 41.55m., Medan: Very loud signal, with both native and regular NIROM programmes (Chapman, Johns).

YDP-3, 4895kc., 61.29m., Java: Reported in N.Z.

YDG-5, 4865kc., 61.67m., Java: Reported in N.Z.

Stations also logged: PMY, PMH, PMN and PLP.

Siberia.

RV-15, 4250kc., 70.2m., Khabarovsk: Regular signal above plenty of noise; will not verify.

EUROPE.

England.

GSW, 7230kc., 41.63m., Daventry: Still heard at fair strength in Transmission 1.

GST, 21550kc., 13.92m., Daventry:

Now being used in Transmission 2; signal very poor at present.

GSH, 21470kc., 13.98m., Daventry: Still poor.

GSJ, 21530kc., 13.93m., Daventry: Easily best signal on this band.

Also logged: GSA, GSB, GSC, GSD, GSE, GSF, GSG, GSI, GSO, GSV, GSP and GRX.

France.

The new Paris Mondial station on 9680kc., 30.99m., has again been heard testing in the afternoons (Chapman).

Also logged: TPA-2, TPA-3, TPA-4, TPB-3, TPB-7, TPB-6, TPB-11 and TYA-2.

Italy.

2RO-3, 9635kc., 31.13m., Romé: Best session for this station is between 4 and 5 p.m.; special programme for New Zealand (Washfold, Chapman, Johns, Cushen).

Also logged: 2RO-6, 2RO-8, 2RO-9, 2RO-4, 2RO-12, IRF and IQY.

Sweden.

SBP, 11705kc., 25.63m., Motala: Still a good signal till 7.15 a.m.

SBO, 6060kc., 49.46m., Motala: Fairly good from 7.15 a.m. till 8 a.m. (Chapman).

SBT, 15155kc., 19.79m., Motala: Rather weak, but audible at about 6.30 a.m. (as SBP); also from 11 a.m.

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Bohemia.

OLR5A, 15230kc., 19.7m., Prague: Difficult to log, as seldom very loud; closes 1 p.m.

Yugo-Slavia.

YUA, 6100kc., 49.18m., Belgrade: Fairly strong in the early mornings.

YUC, 9500kc., 32.58m., Belgrade: Correct call of new transmitter; much better signal than YUA (Chapman, Linehan, Crowley).

Turkey.

TAP, 9465kc., 31.7m., Ankara: Still as consistent as ever till closing at 8 a.m. (Chapman, Neill, Johns).

TAQ, 15195kc., 19.74m., Ankara: Quite good at times from 10 p.m. (Chapman).

Portugal.

CSW-6, 11040kc., 27.17m., Lisbon: Good early morning signal (Chapman).

CSW-8, 7260kc., 41.3m., Lisbon: Excellent morning signal on new 41 metre broadcast band (Chapman).

CSW-7, 9740kc., 30.81m., Lisbon: Very consistent signal around 9 a.m., although never very strong (Johns).

Finland.

OFD, 9500kc., 31.58m., Lahti: Heard occasionally closing at 8 a.m.; weak.

Belgium.

ORK, 10330kc., 29.04m., Ruyssselede: Fairly consistent early morning station, best 5-6 a.m. (Chapman).

Holland.

PCJ, 9590kc., 31.28m., Huizen: Heard occasionally around noon (Chapman).

PCJ-2, 15220kc., 19.71m., Huizen: Best on special Tuesday afternoon session (Washfold, Chapman, Johns).

Spain.

EAQ, 9860kc., 30.44m., Madrid: Still announces as EAQ; good signal (Crowley, Neill, Johns).

FET-22, approx. 42m., Oviedo: Reported with good signal around 6.30 a.m.; English session 6.15-6.30 a.m. (Johns).

Eire.

Radio Eireann, 9595kc., 31.27m., Athlone: Reported from N.Z.; English news at 7.30 a.m.

Denmark.

OZF, 9520kc., 31.51m., Skamlebaek: Heard best just before 2 p.m. (Neill).

OZH-2, 15320kc., 19.58m., Skamlebaek: Fairly strong around midnight.

Norway.

LKV, 15170kc., 19.78m., Oslo: Only one of Norwegian stations now audible here; just before 7 a.m.

Bulgaria.

LZA, 8465kc., 35.4m., Sofia: New station reported in N.S.W. by Observer Chapman; heard around 7 a.m. Schedule is believed to be 2.30-7 a.m. and 8-9.30 a.m., with close at 8 a.m. on Mondays and Thursdays (Chapman).

U.S.S.R.

RV-96, 7365kc., 40.76m., location

unknown: New frequency; Sundays, at 8 a.m.

Also logged: RNE, RKI, RAN (call is RAN and not RAL, as was previously thought), and RV-96 on 15400, 15180, 9526 and 6030kc.

Germany.

Stations logged: DJA, DJB, DJC, DJD, DJE, DJH, DJL, DJN, DJP, DJQ, DJR, DJZ, DXB, DZC and DZH.

Broadcast Band DX Notes

Conducted by Kevin A. Crowley in collaboration with the DX Editor.

Station Notes And News.

Australia: Information to hand states that 3CS, Colac, Vic., on 1131 kc., 265m., officially opened on September 30.

Other new stations heard testing are 4GY (1430kc.) and 4QS (760kc.). 6TZ was scheduled to open during October, on 1340kc.

Japan: JOSK, 740kc., located at Kokura, is to close down and a new station, JOUG (exact frequency unknown) is under construction at Bofu.

Europe: It is hoped to publish a comprehensive list of Europeans, complete with slogans, identification signals, etc., in the next issue.



Review Of Conditions And Listening Times.

Seasonal conditions are changing. Early August marked the beginning of the gradual change from winter to summer conditions, as evidenced by the higher noise level and static barrage. European stations are replacing the Eastern stations, which are weakening now. Some Eastern stations, however, will remain at good strength throughout the year.

Dxers should now listen between 2.30 and 5 a.m. and even later if conditions are good, as this is the best DX period now. Static is never troublesome in the early morning, and reception and identification of weak signals is easier.

European stations will now replace the weaker Asiatics in the list of calls heard. Only the stronger Eastern stations are listed.



Best Stations Of The Month.

These stations represent the best of many excellent stations heard this month. Here they are.

Japan.

JBCK, 850kc., Seishin, Korea: Heard well in Eastern Australia around 11 p.m. Verifies promptly.

JFAK, 750kc., Taihoku, Formosa: Best at 11 p.m., Sundays. Difficult to log week days.

JOAK-1, 590kc., Tokyo: Audible 8.30-11 p.m. Closes with musical chimes.

JOAK-2, 870kc., Tokyo: Best after 11.30 p.m. English news at 11.45.

Manchuria and Siberia.

MTBY, 890kc., Mukden: Best at midnight.

MTCY, 560kc., Hsinking: Best at midnight. Badly heterodyned by 6WA.

RW-28, 635kc., Vladivostok: Excellent programme of classical music around midnight. No Siberian station verifies.

Philippines and Hawaii.

KGU, 750kc., Honolulu: Opens 2.30 a.m. Programme identical with KGMB.

KZEG, 780kc., Manila: Best at 12.30 a.m. Closes 1 a.m.

KZIB, 900kc., Manila: Best at midnight.

KZRS, 780kc., Manila: Transmits 1-2 a.m. Slogan, "Radio Filipino."

KZRM, 618kc., Manila: Excellent signal till close at 1.30 a.m.

KGMB, 1320kc., Honolulu: Opens 2.30 a.m. with Japanese programme.

China.

XGAP, 640kc., Peking: Best after 1.30 a.m. Subject to bad heterodyne.

XGOA, 1180kc., Chungking: Heard well at 2 a.m. Bad frequency drift.

XGOW, 1010kc., Hankow: Strong till as late as 6.45 a.m.

India.

VUB, 1231kc., Bombay: Audible around 3 a.m. but very weak.

VUC, 810kc., Calcutta: Very strong at 3 a.m.

VUD, 882kc., Delhi: Very strong. Closes 3.40 a.m.

VUL, 1087kc., Lahore: Good at 3 a.m.

VUM, 1420kc., Madras: Best at 2.30 a.m.

Broadcast Band DX Contest

Six-Guinea Pacific Trophy First Prize

Competition Rules.

The following rules will govern the forthcoming contest for the Pacific Trophy, to be awarded to the dxer amassing the greatest aggregate of points under the rules.

The trophy, valued at £6/6/-, is for competition among dxers submitting verifications from stations heard on frequencies between 550 and 1600kc. A photo of the trophy will be published next month.

Second prize is a cheque for £2/2/- for the most meritorious verification.

The DX Editor, in collaboration with the writer, will judge the competition. Location, receiving equipment and time of reception will receive due consideration in determining both the ultimate winner and the most meritorious verification.

Here are the rules:—

1. Competition is open to all members of the All-Wave All-World DX Club and any other approved club. Such members must be resident in Australia or New Zealand and members of the club prior to January 1, 1940.

2. Competitors may only enter verified stations. Mere acknowledgment of correspondence is insufficient. Verifications must state that the station has actually been heard, and

must be addressed to the entrant for the competition. The envelope addressed to the entrant and containing the verification should be retained where the card itself does not state name and address of entrant.

3. The trophy shall become the absolute property of the winner and shall not be subject to further competition.

4. The judges may disqualify any communications furnished as verifications should they consider them fraudulent, or, if in their opinion, they provide insufficient proof that the station concerned has been heard. The judges may call upon any member to supply additional proof to support his verification.

5. Members may be disqualified if their conduct in matters directly pertaining to the contest is considered unethical or unfair, such disqualified member or members having no further redress or right of appeal.

6. Any letter or card dated after November 30, 1939, and before June 1, 1940, may be submitted.

7. Logs without cards may be submitted no later than May 31, 1940.

8. Verifications may be submitted up to July 31, 1940.

9. "Radio World" takes all care of

but no responsibility for cards, etc., entrusted to their care.

10. "Radio World" reserves the right to use temporarily cards, etc., and/or information supplied by competitors, without further permission or payment.

11. Decision of the judges is legally binding and final.

12. Entry in the competition is accepted only on the above conditions.

For the guidance of entrants, the following rules define a verification:—

(a) Letter or card must definitely admit that the recipient has heard that station.

(b) Inference that the station has been heard is not sufficient.

(c) Acknowledgment of relays will not be admitted as verifications.

(d) In the case of transmitters operating on separate wavelengths, but having same call sign, each transmitter must be identified separately, and cards must indicate which transmitter has been heard.

13. Points are allotted by means of a zoning system. Here are the specific zones and scale of points.

Zone 1. Includes Eastern States of Australia and New Guinea. 1-250 watts, all members 3 points; 251-1000 watts, all members 2 points; 1001 watts and over, all members 1 point.

(Continued overleaf).

VUT, 758kc., Trichinopoly: Good at VUY, 1176kc., Dacca: Good around 2 a.m.

—, 730kc., Hyderabad: New Indian. Best around 2 a.m.

VPB, 705kc., Colombo: Still audible at 2 a.m., but weakening badly. Europe.

The following calls (which do not include Daventry stations, who refuse to verify) are listed in order of frequency, but best times are not stated, as Europeans are not at peak strength yet. Only the stronger stations are listed. Here they are:—

546kc., Budapest. 1, Hungary. Power, 120kw.

556kc., Beromunster, Switzerland. 100kw.

565kc., Athlone, Eire. 100kw.

574kc., Stuttgart, Germany. 100kw.

592kc., Vienna, Germany. 100kw.

638kc., Prague, Germany. 120kw.

648kc., Lyons, France. 100kw.

658kc., Cologne, Germany. 100kw.

695kc., Paris, France. 120kw.

713kc., Rome, Italy. 120kw.

740kc., Munich, Germany. 10kw.

749kc., Marseilles, France. 100kw. 776kc., Toulouse, France. 120kw.

785kc., Leipzig, Germany. 120kw.

841kc., Berlin, Germany. 100kw.

850kc., Sofia, Bulgaria. 100kw.

859kc., Strasbourg, France. 100kw.

868kc., Poznan, Poland. 50kw.

904kc., Hamburg, Germany. 100kw.

913kc., Toulouse, France. 60kw.

950kc., Breslau, Germany. 100kw.

959kc., Poste Parisien, France. 60

kw.

986kc., Bologna, Italy. 50kw.

995kc., Hilversum, Holland. 65kw.

1031kc., Konigsberg, Germany. 100

kw.

1040kc., Rennes Bretagne, France.

120kw.

1077kc., Bordeaux-Lafayette, France.

60kw.

1095kc., Radio-Normandie, France.

20kw.

1113kc., Melnik, Germany. 100kw.

1131kc., Horby, Sweden. 100kw.

1140kc., Turin, Italy. 100kw.

1185kc., Nice Cote D'Azur, France.

60kw.

1195kc., Frankfurt, Germany. 25kw.

1213kc., Lille, France. 60kw.

1222kc., Rome 2, Italy. 60kw.

1393kc., Lyons, France. 25kw.

1420kc., Vaasa, Finland. 10kw.

Around The Dial.

These Asiatics are still audible:—

XGOC, 560kc., Chengtu: Good after midnight.

JONG, 600kc., Miyazaki: Best at 11 p.m. Sunday.

JOKK, 630kc., Okayama: Strong till midnight.

JOCK-1: Strong on Sundays around 10.45 p.m.

JQAK, 760kc., Dairen: Good at midnight. Interference from VUT.

JOIK, 810kc., Sapporo: Strong at 11 p.m. Later heterodyned by VUC.

JBBK-2, 820kc., Heijo, Korea: Best at 11 p.m.

HS7PJ, Saladaeng, Siam: Best 1-2.30 a.m.

JODK-2, 970kc., Seoul, Korea: Best on Sundays around 11 p.m.

JOCK-2, 990kc., Nagoya: Best at 11 p.m. and later.

Zone 2. Includes New Zealand and Fiji. 1-250 watts, A.M. 5, N.M. 3 points; 251-1000 watts, A.M. 3, N.M. 2 points; 1001 watts and over, A.M. 2, N.M. 1 point.

Zone 3. Includes Dutch East Indies, Malaya, Siam, French Indo-China, China, Japan, Philippines and Hawaii. 1-1000 watts, A.M. 10, N.M. 7 points; 1001-10,000 watts, A.M. 8, N.M. 6 points; 10,001 watts and over, A.M. 6, N.M. 5 points.

Zone 4. North American Pacific Coast (including Mexico). 1-1000 watts, A.M. 10, N.M. 5 points; 1001-10,000 watts, A.M. 8, N.M. 4 points; 10,001 watts and over, A.M. 6, N.M. 3 points.

Zone 5 Includes Pacific Coasts of Central and South America. 1-1000 watts, A.M. 14, N.M. 7 points; 1001-10,000 watts, A.M. 12, N.M. 6 points; 10,001 watts and over, A.M. 10, N.M. 5 points.

N.B.: A.M. represents Australian, and N.M. New Zealand members.

An additional 40 points will be granted to Australian and 20 to New Zealand members where the member and his receiver are situated within the boundaries of a city of more than 20,000 inhabitants. The member with the greatest number of verifications shall be awarded 50 points if resident in Australia, and 30 points if resident in New Zealand.

Owners of sets of three valves or under (not including rectifier) shall be awarded a bonus of 20 per cent. on total points obtained.

Notes On Framing Of Competition.

In framing the competition we took into account the areas from which best reception will come during the contest period. The rules were framed to afford all entrants a reasonable chance of winning either trophy. The scale of points for American stations has been computed in favour of Australians because summer and autumn are the peak periods for reception of such stations, which are heard in far greater numbers in N.Z. than in Australia. Eastern stations are heard equally well in both countries.



Stop-Press News.

Japanese Transmitters.

The following transmitters are now used for the daily broadcasts from Tokyo:—**JZJ**, 11800kc., 25.42m.; **JZK**, 15160kc., 19.79m.; **JZI**, 9535kc., 31.46m.; and **JVW**, 7258kc., 41.34m. Change of Call Sign.

The new call for station **W1XAR** is **WRUW**.

Additions to List of Stations Logged.

LYR, 9280kc., 32.33m., Kaunas, Lithuania: Heard once or twice in the

late afternoon; usually closes around 4.35 p.m.

ZAA, 15765kc., 19m., Tirana, Albania: Heard with programme for America, closing at 11.55 p.m. (Bantow).

XGOY, 11900kc., 25.21m., Chung-

king, China: This Chinese station is again using call **XGOY** (not **XGX** as listed above).

Letters Received.

Letters are acknowledged from Messrs. W. E. Bantow (AW353DX) and C. Taylor (AW409DX).

Radio in the Outback

Free Medical Advice to Settlers

TO the people of the vast open spaces still plentiful in Australia, wireless is one of the most beneficial inventions of modern times.

Things are vastly different now to the old pioneering days, when people of the outback just suffered in silence. To-day, what a difference there is, due chiefly to three things—wireless, aeroplanes and the courage and foresight of the bushman's greatest friend and benefactor, the Rev. John Flynn, of the A.I.M.

We now have wireless bases such as Port Hedland, Wyndham, Cloncurry, Alice Springs and others—also a very capable doctor with an ambulance aeroplane who will go to anybody, anywhere he is required. This has all been made possible by wireless, and to make the scheme possible, Mr. Tregeear, of South Australia, designed what is commonly called a pedal set.

With one of these a person can communicate with any of the base stations in his particular district by either 'phone or morse. For the latter a special typewriter has been constructed which automatically sends out the correct morse signal for every letter on the keyboard. There is also a morse key. However, c.w. is seldom used, as 'phone generally gives excellent results.

Range of the equipment is calculated at six hundred miles. This, of course, is subject to locality and conditions, static being very bad in the outback, especially in the tropics. By 5 p.m. it is nearly impossible to get anything through during the summer.

What a change from the days when the Rev. John Flynn used to travel the far north and inland with camels! On one occasion he heard someone singing away in a lonely spot, and upon investigating he found some prospectors burying one of their

mates and singing at the top of their voices, "He's a jolly good fellow." They explained it was the best way they could do as none of them remembered any prayers or hymns.

To-day somebody would get to a pedal set, and the flying doctor would probably arrive in time to save the person's life—thanks to wireless. The operator in charge at each base is an expert of no mean ability, besides having the patience of several "Jobs" and being ever-ready to render any assistance within his power. Another point I would like to stress is that all medical advice given over the air from any of these stations is free.

A few particulars of the pedal sets mentioned may not be amiss. The first set in use used pedals on the bicycle principle to generate the power for transmission. Later models use a genemotor driven by a 6-volt accumulator. This, of course, is for transmission only. The receiving part of the set is worked by two dry batteries, 45 volts each, in conjunction with an air cell or any 2-volt battery for filaments.

A later model is soon to be available using a Delco system for power, which I understand will also supply lighting for the home. The sets have three bands—high, medium and low, really two s.w. and one b.c. band. High is from 15 metres to 65 (approx.), medium, 65m. to 200m., and low, 200m. to 600m.

Port Hedland works on 43 metres for general work from 7.40 a.m. to 4.30 p.m. daily except Sundays, when medical calls are 8 a.m. to noon and 6 p.m. On week-days after 4.30 p.m., 74 metres is used. A third wavelength—187 metres—is seldom if ever used. This schedule does not apply to all stations, some of which work on 34m. and other bands.

Last summer a willy-willy (cyclone)

Shortwave and All-wave Receivers

Special Back Issues Offer to Readers

On pages 20 and 21 of this issue is illustrated a selection of shortwave and all-wave receivers described in back issues of "Radio World." Apart from several issues that are now out of print, back copies to May, 1936 (Vol. 1, No. 1) are still available, and are now on sale at the following reduced rates.

All copies in volumes 1, 2 and 3 up to and including the December, 1938, issue are priced at 9d. each, post free, for single copies. Any six copies up to the date mentioned are available at 4/-, post free, and any twelve for 7/6, post free.

Inquiries are invited from readers in regard to special types of receivers, transmitters, or associ-

ated radio equipment in which they are interested. If the required information has been published in "Radio World," details of date of issue will be sent by return mail (a stamped and addressed envelope must accompany all enquiries). If details have not been published in "Radio World," other sources will be suggested if possible, though readers are reminded that equipment cannot be designed specially to suit individual requirements.

Those wishing to have the "Radio World" posted to them each month direct are invited to forward a remittance of 10/6 (for 12 issues, post free), with name and address, to "Radio World," 214 George St., Sydney.

wrecked the Port Hedland wireless station, the ambulance plane and nearly wiped the town itself off the map. Mr. Fred Hull, the operator in charge, by dint of hard work and makeshifts, was soon able to get in touch with the outside world, besides handling all telegraphic communication which could not follow its usual channel for some time.

To-day the station has been rebuilt, a new ninety-foot wireless mast erected, and a new and much more powerful plant has been installed. This, I understand, has all been done under the supervision of Mr. Coxton, chief engineer of the A.I.M. wireless stations.

Besides the services rendered to pedal set users and others, weather and aviation reports are handled by A.I.M. stations. Reports are forwarded at stated times from the base stations to the Meteorological Bureau, though of course any S.O.S. or medical call takes precedence over any other.

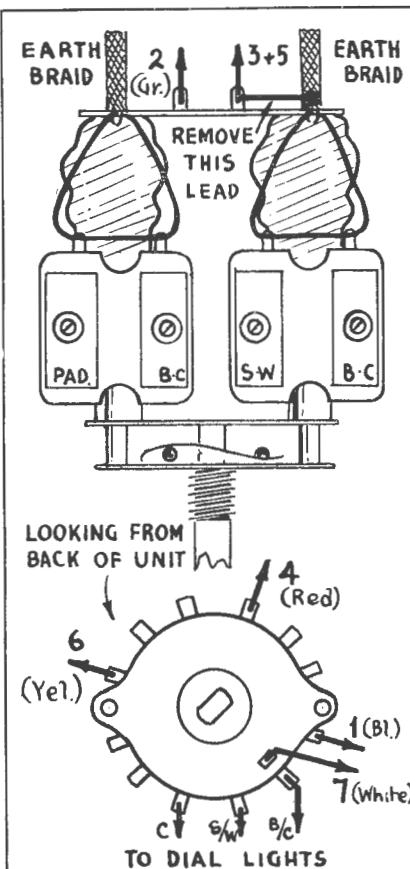
In conclusion, the author recently met a visitor from London, who mentioned that the B.B.C. are making a special feature of these pedal sets in their sessions, and also in pamphlet form.—"P.4."



Error In Dial Light Wiring.

The attention of readers is drawn to an error that occurred in the sketch on page 18 of last month's issue, in labelling the three dial light lugs on

the switch of the dual-wave coil unit of the "Falcon Dual-Wave Four" and the "Sky Chief Dual-Wave Five." The three lugs—common, shortwave and broadcast—are correctly identified in the accompanying sketch.



Brown Projection Units.

(Continued from page 28)

with either electro-dynamic or permanent magnet reproducers.

Geo. Brown Pty. Ltd. also cater for public address equipment requirements, including amplifiers, microphones, motors and turn-tables, microphone stands, pick-ups, valves, transformers and chokes. Further details are available free on request from Geo. Brown & Co. Pty. Ltd., 267 Clarence St., Sydney.

Meters For A.C. And D.C. Operation.

(Continued from page 25)

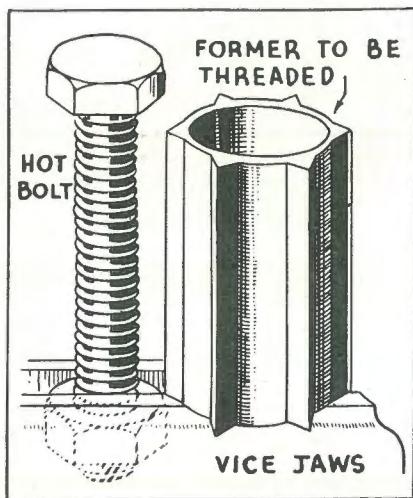
voltages, and do not draw current from the circuit. They will, however, flash over between plates with comparatively small overloads. In the majority of meters a high resistance is connected in series with one set of plates to prevent damage. The resistor must be removed or reduced in value for frequencies over 1,000 cycles per second. Above this frequency, too, care should be taken that the internal capacity of the meter does not affect the circuit to which it is connected.

Electrostatic voltmeters are unsuitable for use as multi-range instruments and their application is consequently limited. Individual meters are available to cover ranges between 50 and 3,500 volts.

Threading Ribbed Bakelite Formers.

I appreciate very much the technical articles that appear in "Radio World," also the "Shortwave Review." If the present high standard is maintained I am sure everyone will be as satisfied as myself. Enclosed is an idea for the "Radio Ramblings" page.

Very efficient grooved ribbed short-wave coil formers can be made in the following manner. Ribbed formers are on sale at almost every radio shop, but only the more expensive ones are grooved to take heavy gauge wire.



Anyone who has tried to file grooves in these formers knows what a tedious and difficult job this is.

All that is needed is a large nut and bolt. The bolt must have the same number of threads per inch as the turns per inch needed for the coil. A $\frac{1}{2}$ " Whitworth bolt has 12 threads to the inch. The bolt must be heated almost red hot and then gripped by the nut in a vice. Now the coil former is pressed against the bolt; the result is grooves are neatly burned into the rib or the former. The bolt is then given a sixth part of a turn and the next rib grooved in the same manner.

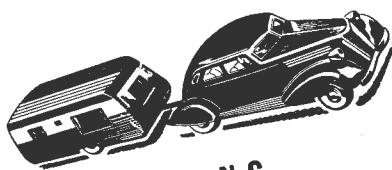
This process is repeated, giving the bolt a sixth part of a turn each time until all the ribs are done. By turning the bolt each time the slots in the ribs will be in the form of a thread. The slots can be deepened with a three-cornered file if desired.—A. Wilkins, South Port, S.A.

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(To be continued next month).

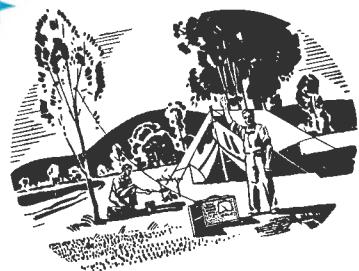
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