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Radio World

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- **SPECIAL 1.4-VOLT VALVE NUMBER**
- **FIELD TESTS ON NEW TASMA RELEASE: 5-VALVE PORTABLE: RESISTANCE**
- **AND CAPACITY BRIDGE: FURTHER LIST OF WORLD SHORTWAVE STATIONS.**

Announcing

NEW

BRIMAR 1.4 volt SERIES BATTERY VALVES

SPECIALLY DESIGNED TO OPERATE ECONOMICALLY FROM A
SINGLE DRY CELL.

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Designed for service in the output stage of radio receivers operating from a low voltage battery filament supply.

1A7G. HEPTODE PENTAGRID CONVERTER

Designed for service as a combined mixer and oscillator in radio receivers operating from a low voltage battery filament supply.

1C5G. PENTODE POWER AMPLIFIER

Designed for service in the output stage of radio receivers operating from a low voltage filament supply.

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SPECIAL 1.4-VOLT VALVE SECTION

Queensland Demonstration Of New 1.4-Volt Valve Receiver

Special Tasma Model Gives Impressive Performance During Interstate Field Tests.

By **DON. B. KNOCK**

RADIO EDITOR, "THE BULLETIN."

THE question of economy of operation in battery receivers has always been of primary importance to me, for the reason that it is only when one experiences a period of isolation outback, that one fully realises just what battery economy means.

Such an experience fell to my lot in 1930, when engaged in short-wave communication in the Kimberley country in north-western Australia. Being two thousand miles or so from the nearest source of supply, it was a case of making the most of one's available batteries. What that means in the life of "B" batteries in temperatures over the hundred mark for weeks and perhaps months on end cannot be conceived by the city man, with his total reliance upon the 240-volt a.c. supply for power.

To the country radio listener, dry batteries may mean everything, for the simple reason that charging facilities for accumulators are often completely non-existent. That is certainly the case in territory such as parts of North Queensland, Northern Territory, and North-Western Australia.

For a long time, the 2-volt valve battery-operated receiver has been the means to the end, and a remarkably good degree of economy has been reached, both in the filament and plate current requirements. With any-



A few members of the party of Brisbane radio dealers who attended the field tests of the new Tasma receiver, conducted at Toowoomba early in December. Included are Messrs. Cantelin, Martin, Swan (Tasma representative for Queensland), Brayne, Herring, Hart, Galloway, Percy and Barber.

thing more than the simplest of four-valve receivers, however, it has yet been almost essential to derive filament power from an accumulator, and this is not always as convenient as it sounds on paper.

New Valve Series Solves Many Problems.

Now, like a gift from the gods, comes a whole series of valves from the laboratories of the valve makers, putting an entirely different complexion on radio reception facilities for the isolated country listener. These valves are designed to take only .05 ampere each at 1.4 volts on the filaments, and no more than a maximum plate voltage of 90 on the plates.

First Australian-Built 1.4-Volt Receiver.

A few weeks ago the first receiver designed around the new valves to emerge from an Australian radio factory was submitted to me for a suburban test. This receiver came from the Tasma factory and is a five-valve dual-wave superhet. It was connected up with a single standard Ever-Ready cell for filaments and two 45-volt Superdynes for plate voltage.

Initial tests were made on an inside aerial

SPECIAL 1.4-VOLT VALVE SECTION



The Tasma receiver under test on Prince Henry Drive, Toowoomba (Q.). The receiver was packed in a carton complete with "A" and "B" batteries for transportation purposes.

of about 20 feet in length, and on this stations far and wide were logged on the broadcast band in the way one is accustomed to get them on the average five-valve a.c. type dual-waver. It has been stated that some falling off in short-wave sensitivity may be experienced with the 1A7G mixer valve, but with this Tasma receiver, at least, there is no sign of any such failing. Even with the inside aerial the Empire station on 16 metres could be played at full volume around 9 p.m. With a dual-wave receiver using mixer input and no r.f. pre-selection, poor short-wave performance may be likely, but the receiver tested has a stage of r.f. in action on the short waves as well as broadcast, which makes all the difference.

Upon changing to the well-elevated 137-foot aerial used at my station for transmission there was not the large increase in signal strength on short waves or broadcast that one would expect over the small indoor aerial. This shows that there is sensitivity to spare and that the r.f. stage is doing a particularly fine job.

Examination of the receiver's internals shows meticulous care in design. Short-wave coils, for instance, are not of the impregnated cardboard variety—they are space-wound on trolitul.

Demonstration Trip To Queensland.

A few days after running this home test, the writer joined forces with Mr. G. K. Herring, Commonwealth sales manager of Ever-Ready, in a brief trip to Queensland by road, in order to introduce the possibilities of these valves to Brisbane radio traders.

Early on the morning of Sunday, December 4, the receiver, cartoned with filament and "B" bat-

teries and with a cut-out for controls, was loaded into a V8 and the procedure of putting Sydney miles astern commenced.

At intervals through the trip north, halts were made and the receiver tried out for daylight reception. Most of the time, the roof aerial built into the car was used, but on occasions a wire was clipped on to a roadside wire fence or to the stays supporting telegraph poles. Remarkably good results were obtained, and up near the border such stations as 2GZ, 2BL, 2TM and 2HD were playable at excellent volume.

The most interesting test was made at night in a lock-up garage at the rear of a Tamworth hotel, with the car enclosed in a space surrounded by chicken-wire and corrugated iron roof—something akin to a radio lab. test-room. Here the dial was full of stations on both bands, despite the obvious screening.

Many N.S.W. dealers were introduced to the receiver, and they expressed opinions that here indeed was the long-awaited answer to the countryman's needs.

In the mountainous country around Mt. Lindsay on the border, indifferent reception was obtained, but once clear of this territory the Queensland stations took full charge on the broadcast band.

Open-Air Test Arranged.

Brisbane was reached on the Monday evening, and the next day was spent in discussing plans for the big test on the following day, arranged in advance by Mr. Charles Hart, Ever-Ready's Queensland manager. About 30 radio dealers and technicians were to be transported from Brisbane to Toowoomba, where the receiver was to be given an open-air test in suitable surroundings.

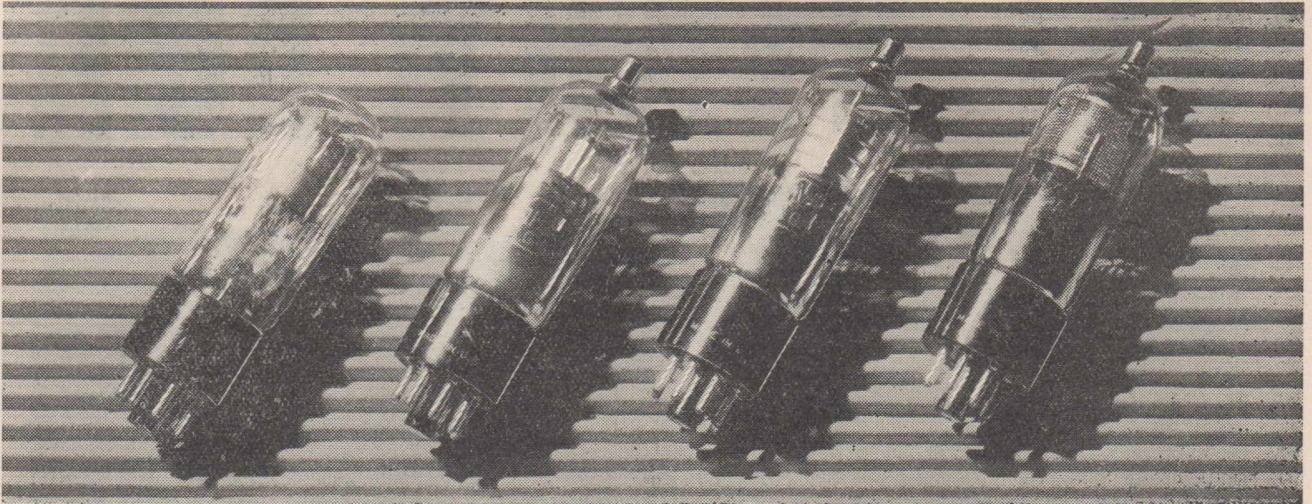
In weather with temperature soaring, the cavalcade of cars covered the 90 odd miles, reaching Toowoomba at noon, where all were guests at a luncheon provided by the Ever-Ready Company. Mr. Herring and the writer were formally introduced by Mr. Hart, and after a few appropriate words on the why and wherefore of the tour, the party proceeded to a spot on Prince Henry Drive, three miles out. In this location the country between Toowoomba and Brisbane lies spread out 3000 or so feet below.

An aerial about 40 feet long was slung into the branches of a handy tree and the receiver switched on. Everybody present handled the controls and observed results. In my experience of receiver tests in Australia, including country locations far and wide, I have never before heard a receiver dial filled with so many stations in daylight on the broadcast range. There seemed to

(Continued on page 6.)

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SPECIAL 1.4-VOLT VALVE SECTION



Four of the five new 1.4-volt type valves. Left to right, 1C5G output pentode, 1H5G diode triode detector amplifier, 1A7G pentagrid converter and 1N5G r.f. pentode. The fifth type that completes the present range is the 1A5G output pentode, which is identical in appearance with the 1C5G.

Photo of Brimar valves, reproduced by courtesy of Standard Telephones & Cables Pty. Ltd.

1.4-Volt Valves Ideal For Country And Portable Radios

EVER since radio began one of the main considerations in the design of battery-operated receivers has been the question of power requirements. Considered from the point of view of frequency of replacement, the "B" supply to-day presents little difficulty. Provided the total "B" current taken by the receiver is kept within reasonable limits, a set of heavy duty "B" batteries will give from eight to nine months of normal service before replacements are required.

Four Types Of "A" Supply.

The "A" supply, however, presents a more difficult problem. For receivers using 2-volt valves there are four main methods of heating the filaments, (a) an accumulator, (b) an air cell, (c) dry cells, and (d) wet primary cells.

The last-named possibility can be disregarded, because while this type of cell was used fairly extensively by experimenters in the early days of radio, to-day it has gone almost completely out of use due to the amount of maintenance trouble involved. To date the third alternative—dry cells—has also been used comparatively little, mainly because two 1½-volt dry cells in series (or four in series—parallel) are needed, together with a suitable series resistor to drop the voltage from the three volts given by the cells to the two volts required by the valves. Also, the average five-valve receiver takes in the neighbourhood of .6 ampere filament current, and this is far too heavy a

drain to take from the average standard dry cell.

The second alternative, the air cell, is a comparatively recent innovation that actually offers one of the best sources of "A" current for two-volt battery receivers. Particularly trouble-free in operation and requiring a minimum of attention, this cell will give up to a year's operation from the smaller types of sets. The remaining source of "A" supply is the acid accumulator, which has the advantage that it can be re-charged, though this type of "A" supply can prove very inconvenient in districts where re-charging facilities are not readily available.

For portable receivers, the air cell, of course, cannot be considered, while the objections mentioned to the dry cell still hold here. Actually, for this application the accumulator is the only logical choice.

Filaments Operate From Single Dry Cell ★ Only 90 Volts Of "B" Supply Needed ★ Light "A" And "B" Current Drains.

Position Changed With New Valves.

Briefly, the above is the position that has obtained for some years now in regard to "A" supplies for battery sets. Towards the end of last year, however, the entire battery receiver outlook was changed completely with the announcement in the States of an entirely new range of battery valves taking only 1.4 volts on the filament, making practicable operation from a single 1½-volt dry cell.

To date five types have been released, four of them having filaments rated at .05 ampere and the fifth having a .1 ampere filament. Complete characteristics of these valves were published in the October, 1938, issue of "Radio World," so the types will only be reviewed briefly here.

The 1N5G is an r.f. pentode designed for service as an r.f. or i.f. amplifier. The 1A7G is a pentode type converter valve, while the 1H5G is a

GET READY FOR



Illustrated at the right is the new Ever Ready "A" battery type X250, specially designed for use with receivers using 1.4 volt valves. Capable of extraordinary long life due to the low current consumption of the new valve, there is no doubt that it will become the most popular of filament current supplies for the new type sets.

GET EVER

THE EVER READY COMPANY (AUST.) PTY.

THE NEW 1.4 VOLT ECONOMY VALVE



EVERY retailer has been waiting for this—the new 1.4-volt dry-cell valve. Operating on a current consumption considerably lower than that of any other type of valve previously introduced into Australia, it is destined to revolutionise country radio, to make old ideas obsolete, and to give a new impetus to the sale of dry batteries in Australia.

Specially designed for use with dry cells, this new valve enables the country listener to obtain a trouble-free receiver that operates on a current consumption equivalent to that of an

ordinary torch bulb. Already many alert radio manufacturers have announced 1.4-volt dry battery-operated sets for use in country districts.

This *must* mean extra dry cell battery business for retailers, so be ready for it—with Ever Ready batteries. Always a step ahead, the Ever Ready Co. (Aust.) Pty. Ltd., has now produced a special "A" battery for use with the new valve. Used in conjunction with two standard 45-volt Superdyne batteries, they guarantee perfect reception and better all-round radio performance.

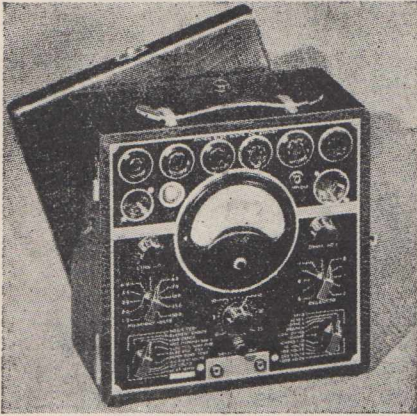
READY

for it!

LTD. ROSEBERY, SYDNEY

SPECIAL 1.4-VOLT VALVE SECTION

★ TEST and CHECK the new 1.4 Volt VALVES



The PALEC MODEL "VCT"

enables the radio mechanic to check and test every component in a radio chassis—valves included.

VALVE TESTING registers the condition of all types of standard valves on the "Good-Bad" scale and also detects element leakages and shorts.

VOLTS, D.C.-A.C. (also output meter ranges) 10-100-250-1,000.
MA's.—1-10-100-250.

OHMS—A special range reading as low as point one of an ohm is provided (for coil and contact tests), together with two additional battery operated ranges to 200,000 ohms.

MEGOHMS—A.C. operated, this range extends measurements to 10 megohms and acts as a megger for breakdown and leakage tests.

PAPER CONDENSERS—Tests Paper and Mica Condensers for open circuit and leakage by the neon flash method.

ELECTROLYTIC CONDENSERS—The instrument supplies a working D.C. potential for both high and low voltage type electrolytics and reads the condition on a "Good-Bad" scale.

Price £15/10/- plus tax.

COUNTRY MODEL "VCT" AC-VIBRATOR (DUAL OPERATION)

Operates with equal efficiency from either the A.C. supply or from a 6-volt accumulator by the simple expedient of changing over the connection cable, giving servicemen in districts "off the line" the advantage of full A.C. specifications (as detailed) when connected to either source.

Trade price country VCT (A.C.-Vibrator), £17/17/- plus tax.

NOTE—Earlier model "VCT" testers can be easily modified to permit of checking the latest 1.4 volt valves. Write for details.

PATON ELECTRICAL PROPRIETARY LTD.

90 Victoria Street, Ashfield,
Sydney. Phone: UA 1960.

Distributors in all States.

diode triode detector amplifier. Two output pentodes are available, the 1A5G with a 1.4-volt .05-ampere filament delivering 100 milliwatts of output, and the 1C5G, with a 1.4-volt filament drawing .1 ampere and delivering 240 milliwatts output. Thus it is possible to design a five-valve receiver using the smaller output pentode drawing only .25 amperes total filament current from a single dry cell. If the larger 1C5G output pentode is preferred, as in the five-valve portable receiver described elsewhere in this issue, the total "A" drain is .3 ampere.

Special Ever-Ready 1.5-Volt Battery.

While ordinary standard dry cells could easily be used for "A" supply, the Ever-Ready Co. has developed a special long-life "A" battery consisting of a number of unit cells connected in parallel. This battery, which will be released shortly, is strongly recommended for use with all battery receivers permanently installed in the home. For portable work, however, the ordinary standard dry cell gives excellent service.

Actually, tests have shown that on the broadcast band excellent results can be obtained with as little as 1.1 volts on the filaments, while fair results from local stations are still possible using only .9 volt. This is actually below useful end-point for this type of cell, and so every ounce of power can be used before a replacement is required.

"B" Battery Considerations.

Leaving the "A" supply for a moment, the "B" requirements for these new valves can be considered. The maximum plate voltage recommended for all types is 90 volts, so that only two 45-volt "B" units are required in place of the customary three, representing an appreciable saving in the yearly cost for "B" batteries.

In addition, the current drain is unusually light. For example, that of the five-valve Tasma receiver reviewed on page 1 of this issue is under 12 milliamps.

With regard to the practical application of the new 1.4 volt valves, there are two useful pointers that can be passed on to experimenters. In the standard four-valve model without an r.f. stage, a surprisingly useful increase in range can be obtained by deliberately introducing a restricted amount of regeneration in the i.f. stage.

This was done in one sample American receiver examined by "Radio World," by locating the two i.f. transformers in close proximity to each other and by only partially shielding them. This, coupled with the fact that no shields were used on the valves, permitted sufficient i.f. regeneration to not only greatly increase the range of the receiver, but also, the re-

sultant side-band cutting that takes place improves tone by partially suppressing the higher frequencies. This effectively counteracts the well-known tendency of output pentodes towards accentuation of the upper register.

Eliminating Microphone Trouble.

The second hint deals with a tendency of the second detector towards giving microphonic trouble. If experienced, it can be overcome by mounting either the second detector valve socket or the speaker on rubber. Incidentally, though several sets of valves were tried in the "One-Four Portable Five" described this month, not the slightest trace of this trouble was encountered.

In conclusion, it can be stated that the introduction of 1.4 volt valves represents one of the most important advances ever made as far as battery-operated receivers are concerned. Receivers using them will undoubtedly become widely popular in country districts, while as far as portable sets are concerned they are the only logical choice.

Queensland Demonstration.

(Continued from page 2.)

be no end to them, stations in Queensland, N.S.W. and Victoria predominating.

This, of course, was reception under ideal conditions, away from electrical interference, but it must be remembered that the people who will be interested in receivers of this class will be listening under very similar conditions, well away from interference other than static.

Excellent Shortwave Results.

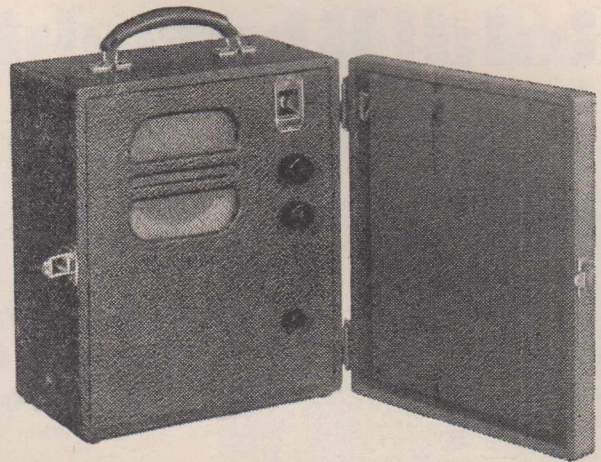
On the short-wave side, the familiar Daventry and Berlin stations, along with many other foreigners, were there in full force.

It is opportune now to consider again just what these results were obtained with. Consider a five-valve superhet, with only a single 1½-volt dry cell lighting the filaments, and 90 volts of "B" battery. The filament current taken is only .3 of an ampere, just about the current consumed by a pocket lamp bulb. Plate current consumption is only 11 milliampères, which again means long life on Superdyne batteries. Everybody present, and they included radio traders interested in handling makes of receivers other than the one demonstrated, expressed their enthusiasm for the very fine results.

Back in Brisbane, an interesting test was conducted by Bert Brayne, of Trackson Bros., in Elizabeth St. Here the receiver was tested in a

(Continued on page 47.)

Build A "One-Four Portable Five" For That Easter Holiday!



For that Easter holiday, week-end jaunt, or in fact for any outing at all—be sure to take a "One-Four Portable Five" with you and have music, entertainment, and news "on tap" anywhere and at any time. Simple to build, cheap to operate, no accumulator to worry about charging . . . you'll be proud to own this exceptional little receiver.

WRITE NOW for our quote on our complete "Fear" kit of parts, sent free and post free by return mail.

RADIO" SPECIALS"

New "9" Hoyt Meter.

Here's a real meter for your test bench. 9" diameter, is accurately calibrated and easily read at a distance of 6 feet or more. Ranges: A.C. and D.C. volts, 0-10-250-1000. Low ohms 0-500. High ohms 50-50,000. D.C. milliamps 0-10-250. Meter mounts on panel and the separate control unit is carried where required. Complete with test leads represents excellent value at £10.

Crystal Microphones.

Latest Astatic Model D-104 is designed to give maximum output of speech frequencies. Complete with liberal length of cable.

NETT PRICE . . . £5/15/-

Model T-3 Acorn designed for perfect reproduction of music and speech, frequency response 40 to 10,000 cycles; may be tipped back for wide angle pick-up.

NETT PRICE . . . £6/15/-

Astatic Streamline Pick-up.

Model 0-7 streamline Astatic crystal pick-up gives remarkable quality of reproduction.

NETT PRICE . . . £2/7/6

The "Micro" Vibrator Power Unit

Special design allows for entirely hash-free operation on any battery receiver using 2, 4 or 6-volt valves. The new "Electronic" synchronous vibrator ensures long, trouble-free performance. Cut out expensive dry batteries now and give your radio new life.

Complete kit £4/2/6
Complete kit assembled
and tested £4/17/6

Sensation Of The New Year!

MEISSNER COMMUNICATIONS RECEIVERS, TUNERS AND COIL ASSEMBLIES

Meissner kits and coil units are the finest in the world for efficient, quality and general all-round performance. Wide variety of receivers includes 1, 2 and 3-valve kits, 4-valve "Rocket," 5-valve t.r.f. model, 7-valve "Utility" superhet, 9-valve "Custom" superhet, and the sensational new Meissner "Traffic Master Communications Fourteen," a 5-band job that incorporates every major circuit improvement known to radio engineers. It is guaranteed to operate to your complete satisfaction.

Write now for further details, mentioning the type of receiver you are most interested in.

"UNIVEX" "UNIVEX" home movie cameras, projectors and Photographic Supplies.

Make a living record of those holiday hours, week-end trips, etc. "Univex" offers for the first time, quality movie equipment at prices you can afford to pay—take the new "Univex" cine B camera with you everywhere you go, it costs only £4/17/6 and uses 8 mm film at 5/6 per roll.

Projectors, Feature Films, Screens, editors, etc., and small standard cameras from 3/11 each.

"Univex" is backed by 100 per cent. after-sales service. Write for catalogue now.

"FEAR'S FOR EVERYTHING IN RADIO"

F. J. W. FEAR and Co.

31 WILLIS ST., WELLINGTON, N.Z.

Telegrams "FEAR"

SPECIAL 1.4-VOLT VALVE SECTION

Rola Reproducers For New 1.4 Volt Valves

Extremely High Sensitivity Fully Compensates For Limited Output Available From High Economy Pentodes ★ Flux Density Of New 42-Ounce Magnet Equivalent To 30 Watts Excitation In Electro-Dynamic Field

By G. R. S. ALLEN

ROLA COMPANY (AUST.) PTY. LTD.

In previous issues of "Radio World" mention has been made of advance 1939 model commercial radio sets using the new series 1.4 volt valves being comparable as regards sensitivity and tone with other models using 2-volt series valves throughout. The many advantages that these new valves offer have already been stressed, and it would seem that in 1939 the country user and the portable enthusiast will get almost double the entertainment value for an equal expenditure as compared with 1938 standards.

Of those commercial models already tested by "Radio World," a point not mentioned in these early reviews was that the receivers were using advance samples of the new Rola permanent magnet reproducers designed specially for the low acoustic power available from these new valves. Previously with valves such as the KL4, 1D4 and 1F5 we have had from 440 to 550 milliwatts available, but now the 1A5G gives us 110 milliwatts and the 1C5G, 240 milliwatts.

Exceptional Sensitivity From New Rola "P.M." Models

These new Rola models, known as 8/42, 10/42 and 12/42, having overall dimensions of 8", 10" and 12", respectively, embody the latest developments in permanent magnet assemblies which include 42 ounce alnico magnets, providing a higher flux density in the air-gaps than has ever before been attained in commercially produced loud-speakers in Australia. This high flux density in conjunction with one-inch voice coils and special diaphragms has resulted in speakers

Exceptionally high sensitivity, coupled with excellent fidelity of reproduction, are outstanding features of these three new Rola models, which (top to bottom) are the 8/42, 10/42, and 12/42, respectively.

of extremely high sensitivity. In one instance, tests conducted outside Rola's laboratory showed twice the volume from one of these new 42-ounce speakers over any other speaker used in the test.

Four Main Requirements.

The four major requirements for pleasant reproduction can be summarised under the following headings:—

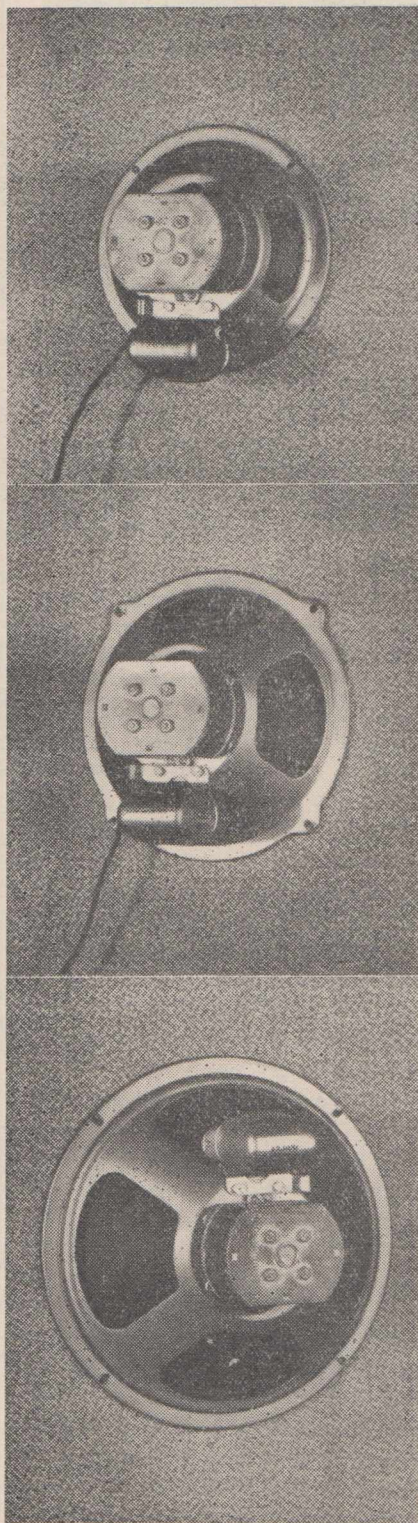
- (a) Good frequency response.
- (b) Good transient response.
- (c) Freedom from harmonic distortion.
- (d) Adequate power.

Dealing with these points separately, it has been already pointed out that through the exceptional sensitivity of these new reproducers, the effective power output is brought up to previous standards that have proved acceptable, so that the limitations as to output from these new valves have been immediately overcome.

Frequency and transient response are closely coupled in the design of a (Continued at foot of opposite page.)

This Month's Front Cover.

This month's front cover photo shows a party of Brisbane and Toowoomba radio dealers watching a field test conducted on the Prince Henry Drive, Toowoomba, on a Tasma 1.4-volt valve receiver. This was the special five-valve dual-wave superhet taken to Queensland last month for demonstration purposes by Messrs. G. K. Herring, sales manager of the Ever-Ready Co., and Don B. Knock, Radio Editor of "The Bulletin." An account of the trip appears on pages 1 and 2 of this issue.



SPECIAL 1.4-VOLT VALVE SECTION

Special Ever Ready Cell For 1.4-Volt Valves

Will Give Nearly One Thousand Hours Of Service From Four-Valve Receiver

By **G. K. HERRING**

Sales Manager, The Ever Ready Co. (Aust.) Ltd.

WITH the advent of the new dry-cell operated receivers equipped with 1.4-volt valves, the Ever-Ready Co. (Aust.) Limited has made available a special 1½-volt "A" pack designed for long life, coupled with high economy of operation.

The new battery, which has been designated type "X250," has been put into production after exhaustive tests on 1.4 volt valve receivers in the Company's Laboratories. It is a battery that will give exceptionally long service under normal working conditions.

Specifications of the new battery are as follows:—

Type: X250.

Voltage: 1½ v.

Dimensions: 9¼" high, 5⅞" long, 4¼" wide.

Weight: 10lbs. 13ozs.

Retail Price: 15/-.

In designing the Type X250 radio "A" dry battery, particular care has been taken to distinguish it from a

"B" battery. Unlike all standard Ever-Ready batteries, this new type is not labelled on all sides, but is enclosed in a black leatherette-covered box with a panel label fixed only to the front.

The positive and negative tappings consist of 2 B.A. screw terminals in lieu of the familiar Fahrenstock spring clips. In order to obviate the danger of "A" battery leads being connected by mistake to the "B" batteries, it is recommended that manufacturers affix "eye" type lug terminals to the "A" battery leads.

So far only five valve types are available in the 1.4 volt series, and it is therefore more than probable that all receivers manufactured will have an initial "A" battery drain of .25 amperes at 1.4 volts in the case of a four-valve receiver, and of .3 amperes at 1.4 volts in the case of a five-valve model.

At this drain the type X250 "A" battery will give 970 hours of service



The new Ever-Ready type X250 1½-volt radio "A" dry battery.

on a four-valve receiver, and 840 hours service on a five-valve, assuming the battery to be discharged not lower than 1.1 volts.

This figure of 1.1 volt appears to be the end-point as far as shortwave reception is concerned, although our own tests on 1.4-volt valve receivers indicate that the battery can be taken down to 1 volt for inter-State reception. Where "B" voltage is reasonably high, local reception has been obtained with a voltage of 0.9 volt.

New Rola Reproducers

(Continued from opposite page.)

loud-speaker, and are linked with efficiency of design. The more efficient a loud-speaker and the more "aurally" flat is its overall response, the better its transient response is likely to be. Since the human ear does not register all frequencies equally, it is necessary to compensate for this deficiency in the design of the speaker diaphragm.

New Improved Diaphragms.

The new diaphragms used in this series of speakers have a lower "mass" than usual. "Mass" as represented by heavy moving parts has as a cause (combined with low flux density) poor frequency and transient response.

Transient response is very necessary for the clear intelligible reproduction of words and syllables, and gives "life" to music. A generally ac-

cepted rule with permanent magnet types of speakers is that the bigger and more effective the magnet, the better the loud-speaker's reaction to transients, provided close attention had been paid to the rest of the design.

Equivalent To 30 Watts Excitation.

It is not generally known that these new 42oz. magnets give a flux density of an equivalent of nearly 30 watts excitation in an electro-dynamic field. This high magnetic damping is very desirable, as besides improving transient response it tends to counteract "peaky" reproduction.

In respect to harmonic distortion, the special moisture-resisting diaphragms which are fitted have been so designed as to minimise the reproduction of harmonic distortion.

This distortion generated in a pentode output valve comes in as "even" and "uneven" orders of notes. Sec-

ond-harmonic distortion is not as unpleasant to the ear as third-harmonic distortion. In the former case it shows up more or less as octaves and is therefore "in tune." Third-harmonic distortion, however, being of an uneven order, is reproduced as a discord. Higher orders of harmonic distortion are not of importance, as they fall outside the frequency range. In these new reproducers it has been found possible to give a response curve which cuts down the reproduction of these objectionable harmonics.

Special Isocore Transformer Fitted.

Distortion can also be caused or accentuated by the output transformer on the speaker. Isocore transformers are fitted to these reproducers.

The Rola Isocore transformer embodies a combination of electrical and mechanical principles that are new to loud-speaker transformers, and is designed to eliminate electrolysis. The

(Continued on page 38.)

SPECIAL 1.4-VOLT VALVE SECTION

The completed receiver is housed in a carrying case measuring only 13" x 11¼" x 7½", and with batteries weighs under 20lbs.



. . . The . . . ONE-FOUR PORTABLE FIVE

**First Portable Featured In Australia Using The New
1.4-Volt Valves ★ Amazing All-Round Performance ★
Extremely Light, Compact, And Economical To
Operate.**

WHILE radio design engineers will find the new 1.4 volt valves invaluable for battery receivers intended for operation in country districts, particularly where recharging facilities are not available, for three reasons this new series as well proves ideally suitable for use in portable receivers.

Firstly, as only 1.4 volts are required for the filaments, a single dry cell can be used for "A" supply without any need for a series voltage-dropping resistor. Secondly, the "A" drain of these valves is remarkably low, so that it is possible to design a five-valve receiver drawing only .25 ampere filament current (or using the more powerful of the two

output pentodes, .3 ampere). This current drain can be satisfactorily supplied by a standard dry cell. Thirdly, the maximum plate voltage required by any of the valves is 90 volts; thus two 45-volt light-duty "B" units can be used instead of the two 60-volt units customarily employed in portable receivers, giving an important reduction both in initial and running costs, and in weight.

The "One-Four Portable Five" described below is the first portable receiver using the new 1.4 volt valves to be featured in any Australian magazine. Actually, it was designed and built before the valves arrived from the States. Its performance is nothing



**FOXRADIO
LEADS AGAIN!**

..... COIL KIT
IS CHOSEN EXCLUSIVELY FOR THE
SENSATIONAL NEW "ONE-FOUR
PORTABLE FIVE"

DESCRIBED IN THIS ISSUE

The designer's first and only choice for the amazing new "ONE-FOUR PORTABLE FIVE" described this month, a FOXRADIO Coil Kit must be your choice, too, if you want to ensure duplicating the magnificent performance given by the original receiver. For greatest gain, coupled with highest selectivity and all-round dependability, FOXRADIO Coil Kits are without equal.

Complete Coil Kit

Comprises aerial, r.f. and oscillator coils, two iron-cored i.f. transformers, and padder. Write for quote.

Complete Kit Of Parts Now Available—Write for our Quote

We can also supply a special FOXRADIO kit of parts for the "One-Four Portable Five," complete with valves, batteries, and carrying-case. Nothing more to buy. Write now for our quote, sent post free by return mail.

Try Our 24 Hour Mail Order Service

We maintain a special Mail Order Service for the convenience of country clients. Goods packed and railed within twenty-four hours of receipt of your order. Only highest quality components supplied, at unbeatable prices.

"1939 SKY-KING DUAL-WAVE FIVE" IS FINEST 4/5 YET!

Giving an even better all-round performance than last year's model, the "1939 Sky-King Dual-Wave Five" is a receiver anyone can build with perfect results. For DX work on both broadcast and shortwave, for volume and for tone, it is the finest and most up-to-date 4/5 yet offered to set-builders. Only finest quality parts supplied with each kit—ORDER YOURS NOW!

FOXRADIO

FOX & MacGILLYCUDDY Ltd.

MERINO HOUSE, 57 YORK ST., SYDNEY.

Tel.: B 2409.

SPECIAL 1.4-VOLT VALVE SECTION

short of remarkable, even without considering the fact that it takes only two-thirds the power to operate it needed by the "Outdoor Portable Four" (described in the October and November issues of last year). This, it should be remembered, is despite the fact that till the advent of these new valves, the "Outdoor Portable" was probably the most highly developed and economical receiver of its type ever designed in Australia.

Some Circuit Details.

No claims for originality are made for the circuit, which is perfectly standard throughout.

A 1N5G is used as r.f. amplifier, followed by a 1A7G mixer oscillator. Next follows a 1N5G i.f. amplifier with 465 k.c. iron-cored intermediate frequency transformers. The second detector and triode audio amplifier is a 1H5G, a.v.c. voltage being taken from the negative end of the .5 meg-ohm volume control which forms the diode load resistor. The larger of the two output pentodes—the 1C5G—is used in the output stage.

Battery Requirements.

The battery requirements consist of two 45-volt light-duty "B" batteries (Ever-Ready type WP45), one 9-volt "C" battery, to bias the output pentode (Ever-Ready type W9S), and one 1½-volt Ever-Ready Standard dry cell. If desired, two of these cells can be used in parallel, space

being available in the battery compartment. In this case the drain from each would be only .15 ampere, which means extremely efficient operation coupled with long battery life.

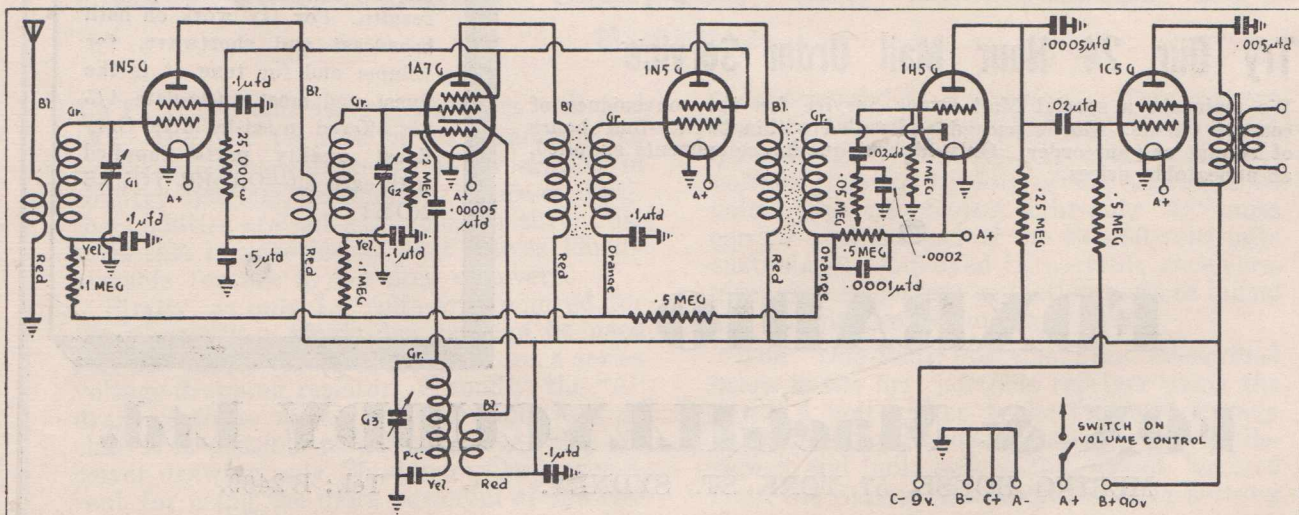
Automatic Bias Not Recommended.

Automatic bias could have been

used for the 1C5G output pentode, but was discarded in favour of battery bias because its use would have meant a reduction of the effective "B" voltage by 9 volts—the bias voltage needed.



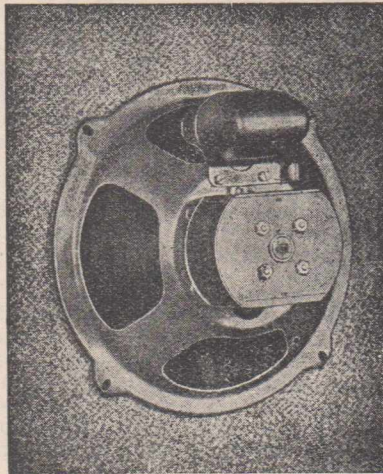
This view shows the arrangement of the "A," "B" and "C" batteries in the battery compartment. If desired, two standard dry cells can be used connected in parallel to give even more efficient operation and longest possible "A" battery life.



The circuit of the "One-Four Portable Five," with all constants. It is standard throughout.

Rola Keeps Pace!

LATEST HIGH-SENSITIVITY "P.M." MODELS ARE IDEAL FOR NEW 1.4-VOLT VALVE RECEIVERS



Coincident with the arrival of the new 1.4-volt battery valves in Australia, Rola has released three new revolutionary permanent magnet speakers utilising the latest extra-heavy 42-ounce magnet. Possessing exceptionally high sensitivity, these speakers are ideally suited for use with limited output valves such as the new 1.4-volt output pentodes. Featuring a higher flux density in the air gap than has ever before been obtained in commercially-produced loud speakers in Australia, these three models have an exceptionally high electro-acoustic efficiency that ensures the maximum in volume from the lowest of outputs. The country user will find that changing over from a normal speaker to one of these new units is the equivalent of adding an extra valve to the set.

NEW REVOLUTIONARY FEATURES ARE EXCLUSIVE TO ROLA !

- Recently-developed diaphragms, moulded by a special process and moisture proofed, make for extremely high sensitivity coupled with excellent reproduction.
- The Rola Isocore transformer fitted to these three new Rola models is hermetically sealed in a drawn case, and obviates the danger of breakdown due to electrolysis.
- The new Rola fully-patented dust-proofing system excludes dust from the moving coil and gap.
- Sensitivity is higher than that of any other make of speaker, while both frequency and transient response have been greatly improved.
- For public address work these units are considerably more efficient than electro-dynamic models, besides needing no field excitation. Prices: 8/42, 61/-; 10/42, 65/-; 12/42, 72/-. All complete with cord and plug.

NEW REDUCED PRICES FOR ROLA SPEAKERS

Twelve months ago the Rola Company built in Melbourne the most modern and efficient speaker factory in the Southern Hemisphere. New plant and new production methods have now permitted price reduction on a number of models, as given below:—

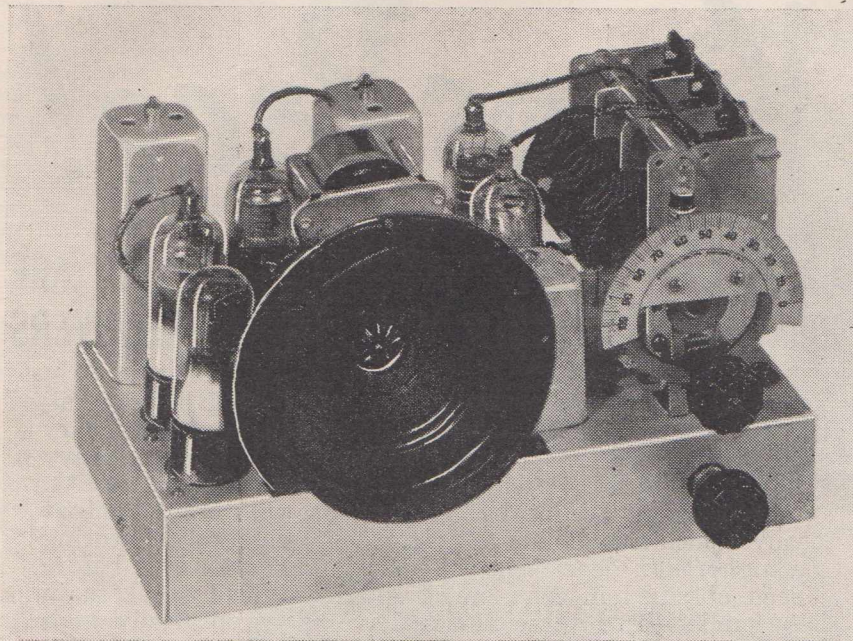
ELECTRO-DYNAMIC MODELS.			
K12	Dustproof	44/-	
F12	Dustproof	35/-	
K10	Dustproof	35/-	
F10	Internal Spider	32/6	
PERMANENT MAGNET MODELS (Dustproof)			
12-21		50/-	
12-20		44/-	
10-21		46/-	
10-20		41/-	
8-21		42/6	
8-20		38/-	

The above prices include plugs.

Rola Company (Aust.) Proprietary Ltd.

The Boulevard, Richmond, Victoria. Telephone J 5451.

SPECIAL 1.4-VOLT VALVE SECTION



This front view of the chassis shows the compact layout adopted. Behind the aerial coil, which is to the left of the dial, is the 1N5G r.f. valve, and to the rear again of this is the 1A7G mixer oscillator. Then, following along the rear and left side of the chassis, comes the first i.f. transformer, 1N5G i.f. amplifier, second i.f. transformer, 1H5G diode triode detector amplifier, and 1C5G pentode output valve.

A Compact Layout.

The receiver is assembled on the same size chassis as used for the "1938 Outdoor Portable." It is of sprayed aluminium, and measures $10\frac{1}{4}'' \times 5\frac{1}{2}'' \times 1\frac{3}{4}''$.

The aerial coil is located on top of the chassis in front of the r.f. valve, while the r.f. and oscillator coils are mounted underneath as in the "Outdoor Portable."

Behind the aerial coil is the 1N5G r.f. amplifier, while to the rear of this valve again is the 1A7G pentagrid converter. Then, following along the rear and left side of the chassis, comes the first i.f. transformer, 1N5G i.f. amplifier, second i.f. transformer, 1H5G diode triode detector amplifier and 1C5G pentode output valve. The Rola type 5-6 permanent magnet speaker is mounted on the chassis by means of the bracket supplied.

Compact Carrying-Case.

The leatherette-covered cabinet used for the "One-Four Portable" was supplied to specifications by the Western Manufacturing Co., of Sydney. Measuring only $13''$ high x $11\frac{1}{4}''$ wide x $7\frac{1}{2}''$ deep, it is more compact than that used for the "Outdoor," despite the fact that it houses a five-valve chassis. Actually, considerably less space is required in the battery com-

partment, which consequently has been made $1\frac{1}{2}''$ shallower than that used for the "Outdoor."

Weighs Under 20lbs.

As well, considerable reduction in weight has been obtained in the new

model, which weighs just under 20lbs. as compared with 26lbs. for the "Outdoor." Though this reduction does not appear spectacular, nevertheless it makes a big difference to ease of carrying.

There are six battery leads passing from the terminal strip mounted on the rear wall of the chassis, through the horizontal shelf supporting the latter, to the battery compartment below. There is a pair of leads for each of the "A," "B" and "C" batteries.

Alternative Aerials For Local And DX Work.

The same aerial system as adopted for the "Outdoor" has been used in the "One-Four." The aerial used for local work consists of a sheet of copper gauze lining the lid, connections from the gauze to the receiver being made via the top metal hinge attaching the lid to the cabinet.

The top wood screw in each section of this hinge is replaced by a $\frac{5}{8}''$ bolt, a short length of flex being connected from the gauze to the lid bolt, while a further length of flex inside the cabinet terminates in a banana plug. This fits into the aerial socket in front of the condenser gang.

The hinges for the lid are arranged so that the latter can be lifted off at will. In the accumulator compartment is carried an extra aerial consisting of about eight yards of rubber-covered flex wound around a piece of 3-ply $2\frac{1}{2}''$ wide x 6" long. A hole

"One-Four Portable Five."—List Of Parts.

- 1 sprayed aluminium chassis to specifications (Acorn).
- 1 leatherette-covered carrying case, with panel, built to specifications (Western Mfg.).
- 1 coil kit including 1 aerial, 1 r.f., 1 oscillator coils, with 2 465 k.c. i.f.'s. and padder (Foxradio).
- 1 2-gang condenser (Stromberg-Carlson).
- 1 midget tuning dial (Efco).
- 2 small bakelite knobs.
- 1 .5 megohm potentiometer with switch.
- 3 2-lug bakelite strips.
- 1 3-lug bakelite strip.
- 1 8-lug bakelite strip.
- 1 6-wire battery cable (2-foot length).
- 5 octal wafer sockets.
- 4 midget grid clips.
- 1 banana socket and plug.
- 1 sheet copper gauze, 10 x 12 inches.
- 3 $\frac{3}{4}$ inch brass spacers.
- 5 $\frac{1}{2}$ inch brass spacers.

FIXED MICA CONDENSERS

- 1 .0005 mfd. (Simplex).
- 1 .0001 mfd. (Simplex).
- 1 .0002 mfd. (Simplex).
- 1 .0005 mfd. (Simplex).
- 1 .005 mfd. (Simplex).

FIXED PAPER CONDENSERS.

- 2 .02 mfd. tubular.

- 5 .1 mfd. tubular.
- 1 .5 mfd. tubular.

FIXED RESISTORS.

- 1 1 megohm $\frac{1}{2}$ or 1/3-watt carbon.
- 2 .5 megohm $\frac{1}{2}$ or 1/3-watt carbon.
- 1 .25 megohm $\frac{1}{2}$ or 1/3-watt carbon.
- 1 .2 megohm $\frac{1}{2}$ or 1/3-watt carbon.
- 2 .1 megohm $\frac{1}{2}$ or 1/3-watt carbon.
- 1 50,000 ohm. 1/3-watt carbon.
- 1 25,000 ohm. 1/3-watt carbon.

VALVES.

- 2 1N5G's, 1 1A7G., 1 1H5G, 1 1C5G.

SPEAKER.

- 1 5 inch permanent magnet speaker to match single 1C5G (Rola 5-6 PM).

BATTERIES.

- 2 45-volt light duty "B" batteries (Ever Ready W.P. 45).
- 1 $1\frac{1}{2}$ -volt "A" battery (Ever Ready Standard).
- 1 9-volt "C" battery (Ever Ready W9S).

MISCELLANEOUS.

- 1 2-volt 60-mill dial light (optional), 2 doz. $\frac{3}{8}$ inch nuts and bolts, $\frac{1}{2}$ yard copper braid shielding, insulating washers for aerial socket, push-back (solid and flexible), solder tags, 8 yards rubber-covered aerial wire.



THERE are three sides to this—and they're *all* your way!

First and foremost—and if *you* don't think it's foremost your *pocket* will—you buy longer life, cheaper current, no bother at all when you buy a *Vesta Right-way* vibrator battery. *Otherwise 30 out of 36 leading radio manufacturers would never have chosen Vesta Right-ways as standard equipment!*

Here's the second point your way—you can't connect a *Vesta Right-way* the wrong way! And if you've ever delved in the semi-dark behind your set trying to guess the right terminals for the right leads you'll sigh with relief at this news.

All terminals are recessed and shaped to take the similarly shaped spade connectors on the set leads. The positive connector just won't fit a negative terminal. And there's nothing you can do about it—except put it in the right place.

So what? So here's your third saving—on valves. You can't blow them with a *Vesta Right-way!* And if you've ever blown a set of brand new valves with a wrongly connected battery—but why bring that up?

See your local Vesta dealer for full details—or write us direct for an explanatory folder:

VESTA RIGHT-WAY

THE VIBRATOR BATTERY WITH THE OUTSTANDING FEATURES . . .

- Hard Rubber lid for smarter appearance, protection for conductive parts, a guard against acid spray.
- Terminals on one side save crossed leads, correct connections can be made in a few seconds.
- The *Vesta Right-way* can't possibly be charged the wrong way—nor until the cover is removed.

There are six types of Vesta Right-way Batteries — all priced the right way for value!

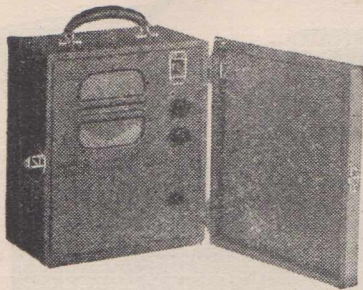
**V E S T A B A T T E R Y C O M P A N Y
P T Y . L T D .**

P.O. BOX 15

And at BRISBANE, MELBOURNE, ADELAIDE, PERTH, WELLINGTON, AUCKLAND.
CHRISTCHURCH and DUNEDIN

LEICHHARDT, N.S.W.

SPECIAL 1.4-VOLT VALVE SECTION



*Built Specially
for the . . .*

**ONE-FOUR
PORTABLE
FIVE**

The leatherette-covered carrying case shown above and in the photographs accompanying the article featured elsewhere describing the construction of the "One-Four Portable Five," was built by us to the designer's specifications. It fulfils the four main requirements of a case of this type . . . it is compact, light, strong and smart.

- COMPACT . . . because it measures only 13" x 11" x 7 1/2".
- LIGHT . . . because it is built from timber specially selected for lightness, coupled with durability.
- STRONG . . . because dovetailed joints are used throughout.
- SMART . . . because it is covered in mottled leatherette (obtainable in a variety of colours) and is fitted with plated hinges and catch.

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

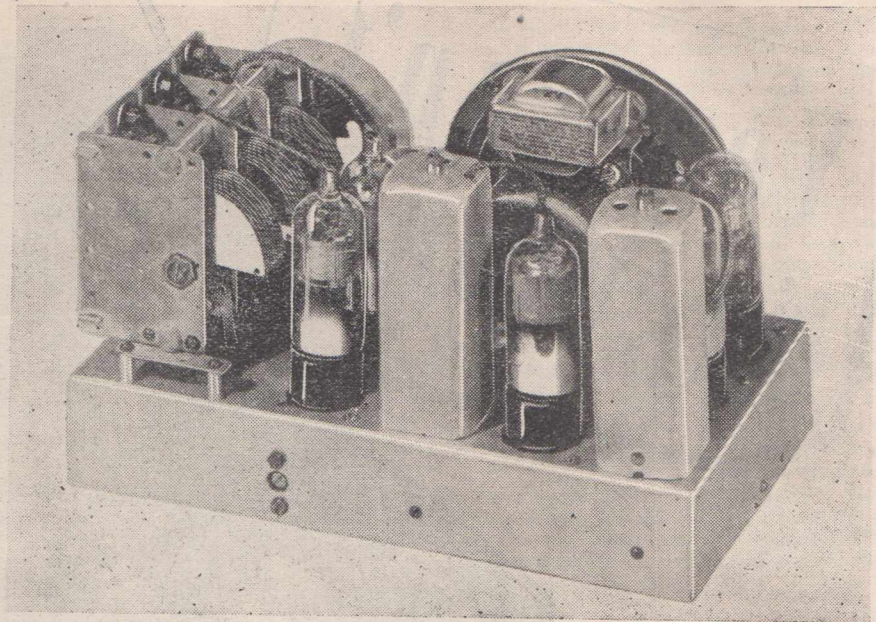
PRICE ON APPLICATION

**MANUFACTURERS,
DEALERS & SERVICEMEN!**

We specialise in making all classes of cases for test equipment, exactly to your specifications. Workmanship and accuracy guaranteed.

**WESTERN
MANUFACTURING Co.,
18 THIRD AVENUE,
FIVE DOCK, SYDNEY**

'Phone U 3444



A rear view of the receiver chassis. Note the padder mounted on the rear wall.

is bored in the centre of this, one end of the aerial passed through, and a knot tied. A banana plug is mounted on the other end of the aerial. In locations where inter-State reception is required, the lid is slipped off and the aerial carried in the case plugged into the top hinge socket.

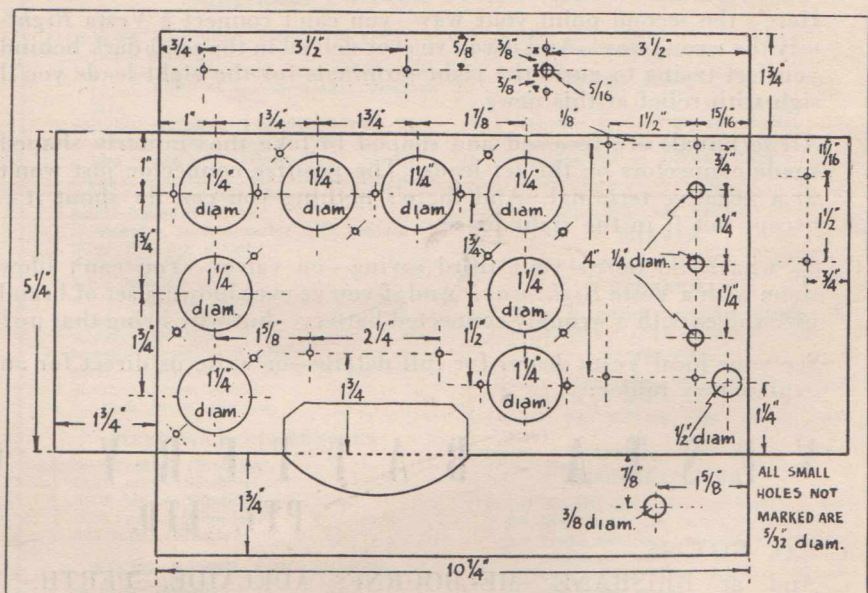
**Over Forty Stations Received During
Test.**

A detailed test report on the receiver's performance will be published in next month's issue. However, it

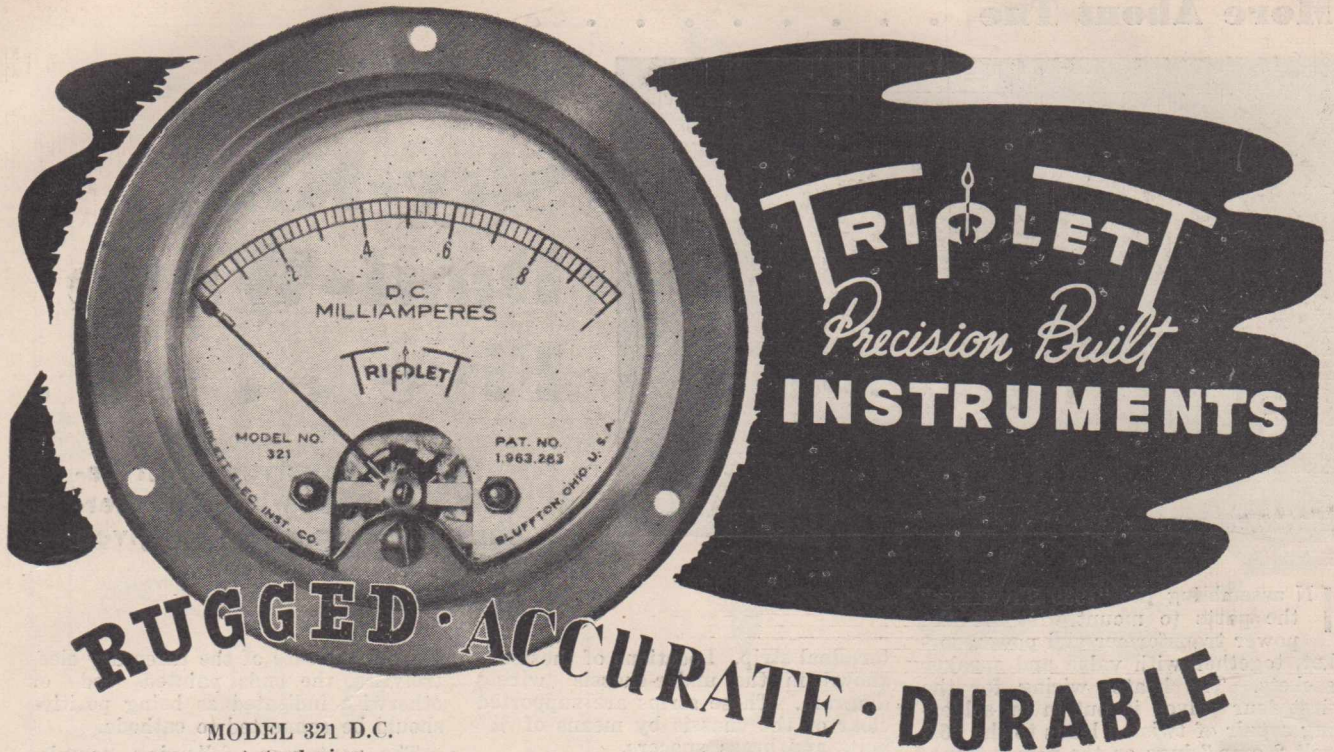
can be mentioned here that during its first thorough try-out over the Christmas holidays at Sussex Inlet, about 130 miles south of Sydney, using the aerial carried in the case slung over a tree, over 40 stations, including the four New Zealand "YA" stations, were received at excellent speaker strength at 10 o'clock at night.

While for a standard five-valve receiver using 2-volt valves and 135 volts of "B" supply these results

(Continued on page 20.)



Full dimensions for preparing the sprayed aluminium chassis are given in this sketch.



RUGGED · ACCURATE · DURABLE

MODEL 321 D.C.
Actual size.

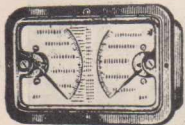
... built in many types and sizes!

Triplet instruments have established a new standard of quality in the field. Precision accuracy at low cost, simplicity with extreme ruggedness and bridge type construction are features that evidence the most approved engineering practice.

Magnets of laminated construction have each lamination exactly gauged after hardening, thus assuring accurate printed scale characteristics. This is one reason accuracy of scales, when not hand-drawn, can be as low as 1%. Triplet's exclusive method of maintaining absolute uniform pole piece accuracy supplants the more expensive milled soft iron type, and is far superior to those formed of soft iron. Cast magnets of cobalt and other alloys are used in some of the larger and more sensitive Triplet instruments and relays.

D.C. instruments are the D'Arsonval type with an extra light moving coil and reinforced parts. A.C. instruments are the movable iron repulsion type; are air damped and have light moving parts. Both A.C. and D.C. have selected sapphire jewel bearings and highly polished pivots; white enamelled metal dials and moulded zero adjusters. Accuracy within 2% except rectifier type instruments which carry a 5% guarantee. Instruments supplied with pointer stops.

TWIN INSTRUMENTS



Twin Instrument.

THE TWIN is furnished in any combination of A.C. or D.C. instruments in the special rectangular moulded case that requires a minimum of space. Permits simultaneous readings on both instruments when connected in the same or separate circuits. Instrument scales are side by side making possible two distinct readings at a glance. Used to balance loads in three-wire circuits; detect line fluctuations when load readings are taken; measure antenna and modulation current; determine filament plate voltages and similar applications.

THERMO AMMETER

High frequency. Accuracy 2%

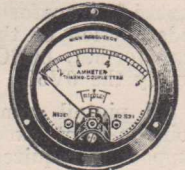
Triplet Thermo Ammeters correspond in size, etc., to corresponding D.C. models. All have moulded cases. Have external couples which withstand 50% overload connected to meter with 2 foot leads. Couples are easily replaced when necessary. Internal couples to order. External Couples only, for any Model.
LIST PRICE - - - - - 50/-
The Model 321, 3 inch dial, illustrated above, is available in 5 and 2 inch dials designated Models 521 and 221.

Typical "321" ranges are:

0.1	Milliamperes, Price	33/3
0.10	" "	27/6
0.50	" "	27/6
0.100	" "	27/6
0.250	" "	27/6
0.500	" "	27/6
0.1000	" "	27/6



529-D.C.

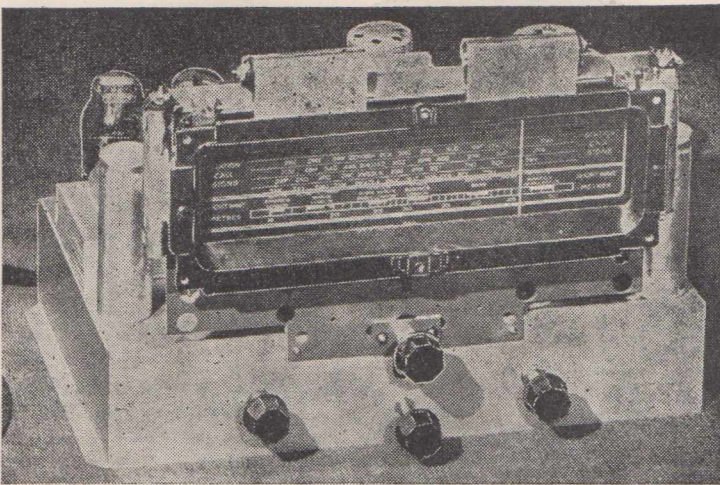


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W. G. WATSON & CO. PTY. LTD.

Head Office: 279 Clarence Street, Sydney. Newcastle branch: King and Bolton Streets, Newcastle.
Branches at Melbourne, Adelaide, Hobart, Launceston and Perth.

More About The



1939 Sky-King Dual-Wave Five

Further constructional details, together with an under-chassis wiring plan, are given below.

IN assembling the "1939 Sky-King," the parts to mount first are the power transformer and power socket, together with valve and speaker sockets. The heater wiring for the first four valves is put in by soldering a pair of twisted leads to the "6.3 volt 2 amp." lugs on the power transformer panel and running them to the heater lugs on the 6V6G socket. A further pair of twisted leads is then run from the 6V6G socket to that for the 6J7G, and so on until the four 6.3-volt heaters are wired. If the power transformer is provided with two 6.3-volt windings, then one of these is used for the 6V6G and the other for the first three valves.

Wiring The Rectifier.

Next, the 5Y3G rectifier socket can be wired by running a pair of twisted leads from the "5 volt 2 amp." winding to the filament terminals of the 5Y3G, and a further pair from the two "385-volt" lugs on the power transformer panel to the rectifier plates. The remainder of the components, with the exception of the dual-wave coil unit, can now be mounted.

Next, commencing at the plate of the 6K8G mixer oscillator, wire the first i.f. transformer, then the pentode section of the 6G8G second i.f. transformer, 6G8G diodes, 6J7G and finally the 6V6G.

All pigtail components are taken point-to-point except in cases where support is required in the form of a

terminal strip. Locations of these are shown in the under-chassis wiring diagram. These strips are supported clear of the chassis by means of $\frac{3}{4}$ " bolts and brass spacers.

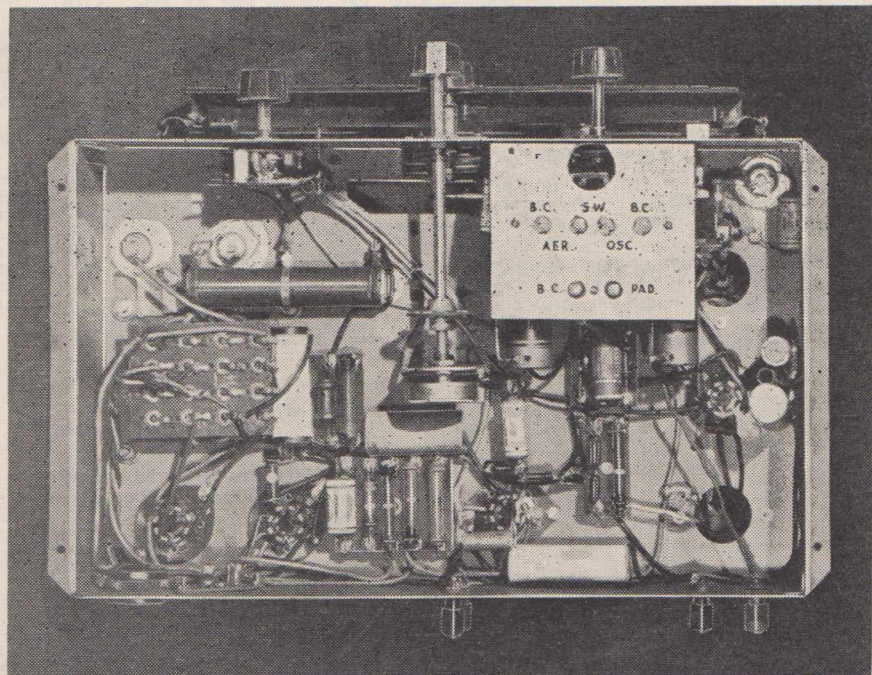
Short Direct Wiring Essential.

All wiring should be as short and direct as possible, and well-spaced. The three leads from the volume control, which is mounted on a bracket near the centre of the chassis, should all be covered with shielding braid for their entire length, the braid being earthed at various points. Note also

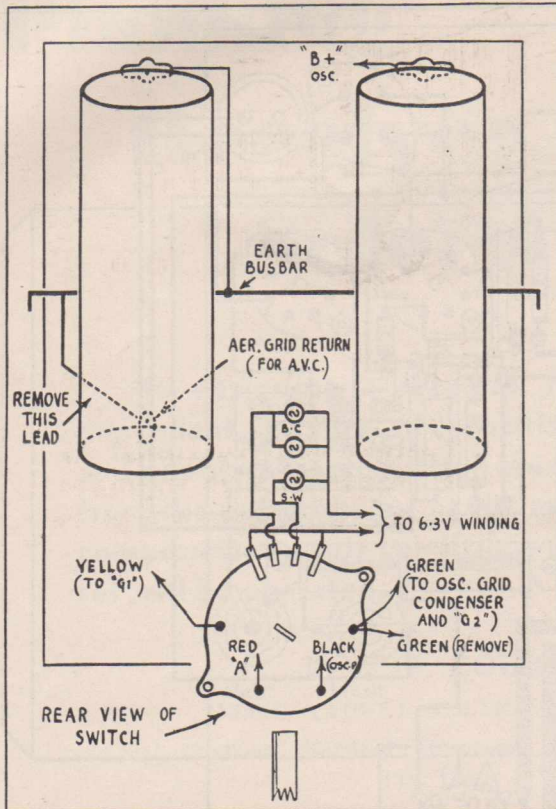
that in the case of the three dry electrolytics, the ends painted red or otherwise indicated as being positive should be connected to cathode.

The next step, following completion of the wiring as far as possible without mounting the coil unit, is to bolt the latter in place and wire it. In the underchassis diagram, leads going to the coil unit are all numbered, and their destinations will become apparent when the diagram is studied in conjunction with that of the coil unit published elsewhere.

The numbered leads and their des-



This view shows the location of components underneath the chassis, and the wiring. Note the method of mounting the volume control near the centre of the chassis.



This sketch shows the wiring of the dual-wave coil unit, including that for the automatic dial light switching. "G1" and "G2" represent the fixed plates terminals on the aerial and oscillator sections of the condenser gang.

tinations are as follows:—

- 1—Lead from aerial section of condenser gang is taken to lug on wave-change switch to which is attached the yellow lead (this is removed).
- 2—Lead from oscillator section of condenser gang. Green lead from wave-change switch is soldered to this point (i.e., to side of oscillator grid condenser to which is attached lead from oscillator section of gang).
- 3—Lead from this point is taken to lug labelled "Aer. grid return (for a.v.c.)" on diagram of coil unit.
- 4—To "B+ Osc." lug on coil unit.
- 5—Is red lead from unit.
- 6—Is black lead from unit.
- 7—To earth busbar on unit.

Check Of Wiring Essential.

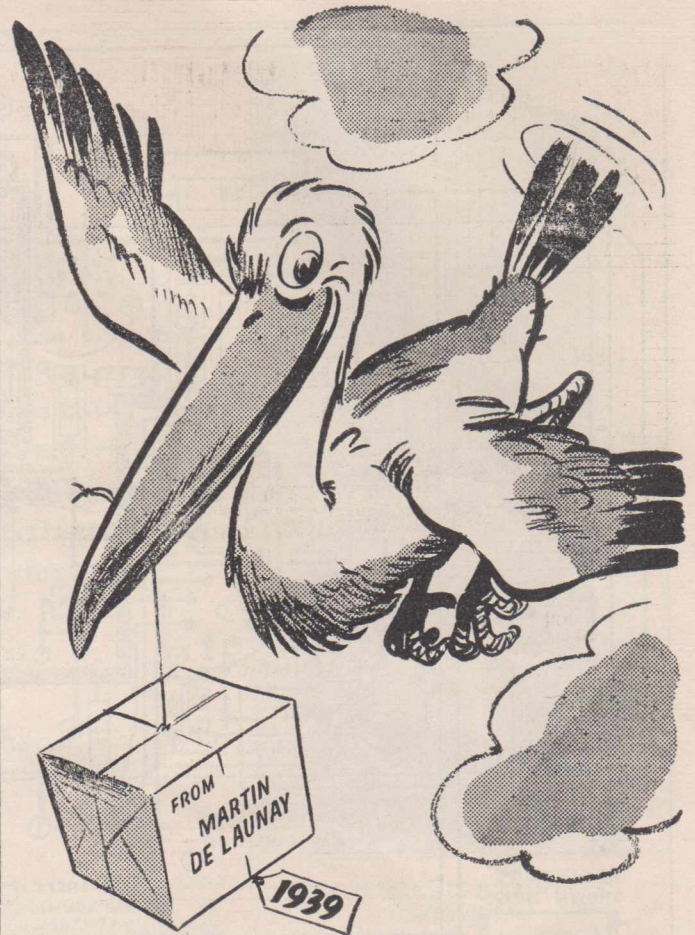
After all coil unit connections have been made, the wiring should be thoroughly checked. The chassis is then inverted, and the grid clips and control knobs fitted. Next, the valves and speaker can be plugged in, the aerial and earth connected up, and the set switched on.

If the rectifier shows any signs of distress in the form of flashes or a blue glow, then switch off immediately, as this indicates a serious error in the wiring. If, however, the heaters all light up and a faint hum is heard from the speaker, it can be assumed that everything is in order, and that the set is ready to be aligned.

Aligning The Set.

To do this, set the wave-change switch to broadcast and turn the volume fairly well up. There should now be a fair amount of noise coming through the speaker.

The chassis can now be inverted and the broadcast band alignment completed. Set the broadcast aerial and oscillator trimmers about half-way out (see under-chassis photo) and the padder screws about one-quarter way out.



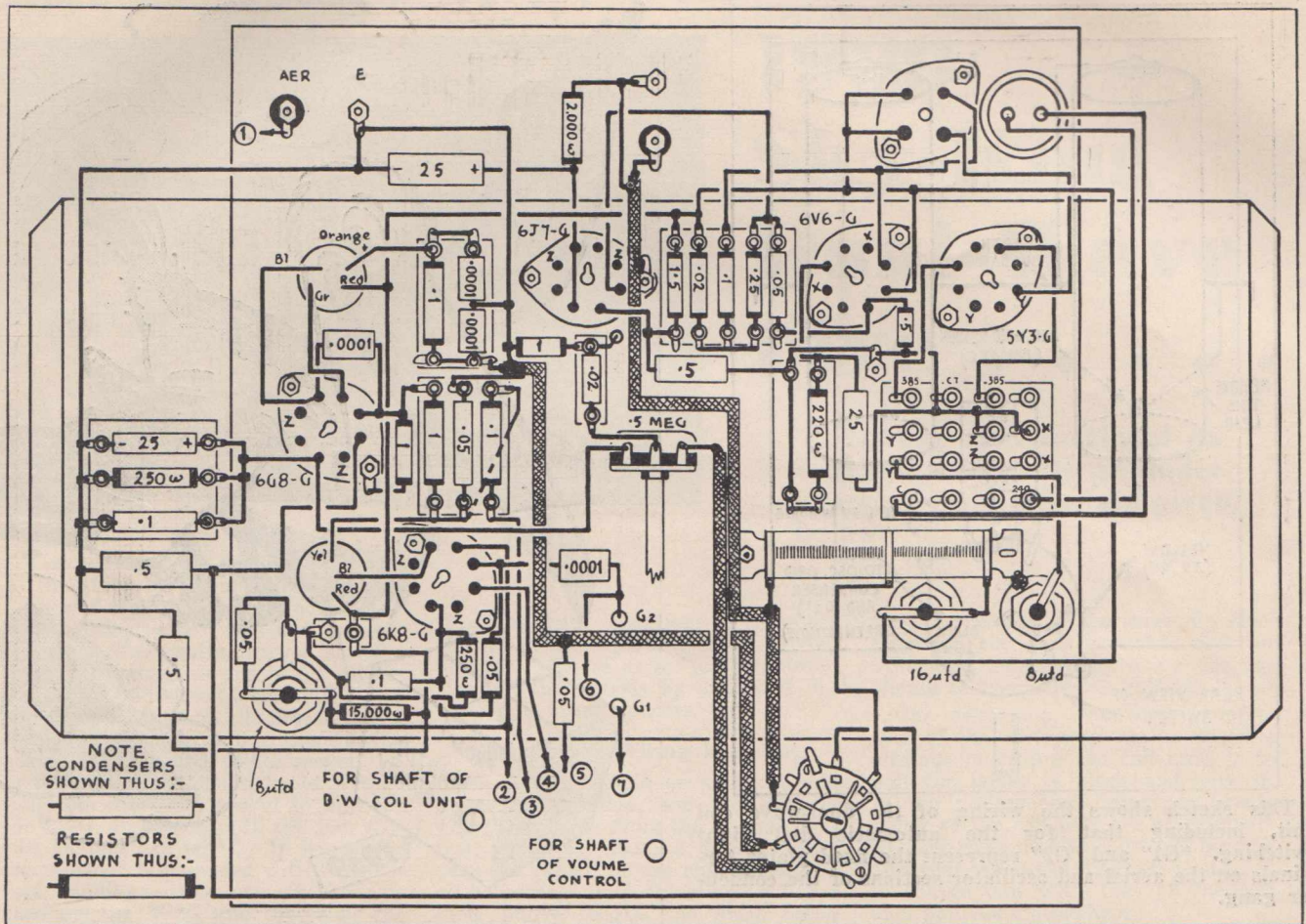
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...WHEN YOU START DEALING WITH

MARTIN DE LAUNAY'S

WHAT "happy event" results in TRIPLETS every time? Why—sending your order to MARTIN DE LAUNAY'S, of course! You see, you get speedy service, keen prices and high quality. If you have never dealt with Martin de Launay's before we can promise you a big surprise. The efficiency and business-like methods of this fast-growing, progressive organisation will seem like the "beginning of a new life" in your business dealings. Maybe this sounds like an extravagant claim. Then challenge it with a trial order.

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 Cr. Druiit and Clarence Streets Phone: M 4268
 And at Newcastle and Woilongong



This sketch showing the main under-chassis wiring should be studied in conjunction with that on the previous page, showing the connections to the coil unit.

Next, tune in a station somewhere around 220 metres and adjust the aerial trimmer for best results. Then swing over to the other end of the band and tune in a station on about 500 metres.

The two condenser sections of the paddler used are connected in parallel, and so both screws can be adjusted. The best scheme is to set one almost full in and make the adjustment required with the other. This screw should be turned gradually while the dial is being rocked backwards and forwards over the station. A point will be found where volume is loudest, and this is the correct setting.

The entire process can be repeated, when the alignment should be fairly exact. The i.f. trimmers can now be carefully adjusted, though the original settings should be marked in case it is desired to return to them.

Finally, the shortwave aerial and oscillator trimmers can both be set about 1½ turns out, and then the former adjusted for best results somewhere around the 25-metre band.

Receiver Tracks Excellently.

An important feature of the Foxradio coil kit used is that it tracks excellently right across both wavebands, maintaining high sensitivity all over the dial.

"One-Four Portable Five"

(Continued from page 16.)

would be nothing out of the way, for a receiver of this type with a maximum "B" supply of only 90 volts, they are little short of amazing.

The parts used should all be exactly as specified; otherwise some difficulty might be experienced in fitting them in place. The dimensions for preparing the chassis are given elsewhere and should be followed exactly. Incidentally, readers are advised that a special kit of parts is being made available for this receiver by Messrs. Vealls, of Melbourne, and Fox and MacGillycuddy, of Sydney.

Foxradio Coil Kit.

The coil kit chosen for the original model is a specially-made Foxradio

kit supplied by Messrs. Fox and MacGillycuddy. It comprises aerial, r.f. and oscillator coils and two iron-cored i.f. transformers, all housed in square aluminium cans and complete with paddler.

Next month a further article will be published, together with additional photographs and diagrams, outlining the construction and alignment of this receiver.

Appreciations From Readers

Being a reader of your very fine periodical, "Radio World," I have decided to join your DX Club, and enclose a postal note for the necessary amount. I would like to state that "Radio World" is the best shortwave magazine in Australia, and hope that the shortwave data, contest, etc., will be kept up.—O. D. Marks.

I have been purchasing your paper since the first edition, and in my opinion, get full value for my money by just reading the "Radio Ramblings." What I admire most about your paper is that you do not, in common with most radio papers, forget the country folk.—F. Gunn, Gippsland, Victoria.

Planning Receiver Selectivity

In designing a receiver, the three inter-dependent factors of sensitivity, selectivity and quality of reproduction must be considered from the point of view of the most satisfactory compromise to suit conditions under which the set will be operated.

By T. P. COURT

M.I.R.E. (AUST.), A.M.I.R.E. (U.S.A.).

Chief Engineer Standard Telephones & Cables (A/sia)
Pty. Ltd.

SELECTIVITY is really rather a dangerous subject to discuss, as it seems inevitable under our broadcasting system in Australia that there must be always dissatisfied listeners.

The Australian problem is rather an unhappy one. We have followed American practice largely, but, owing to certain economic factors, we have had to devise the set best suited to our conditions. Thus the five valve superheterodyne is undoubtedly the most widely used receiver to-day.

However, there is a definite limit to the selectivity which can be obtained from an orthodox five valve set, and there must be conditions where this selectivity proves inadequate. For example, racing enthusiasts in a country town want to hear descriptions which do not form part of their local programme. Thus it is necessary to pick up the desired information from a station maybe hundreds of miles away. This distant station may be operating on a wavelength adjacent to that used by the local station.

Large Aerials Have Adverse Effect.

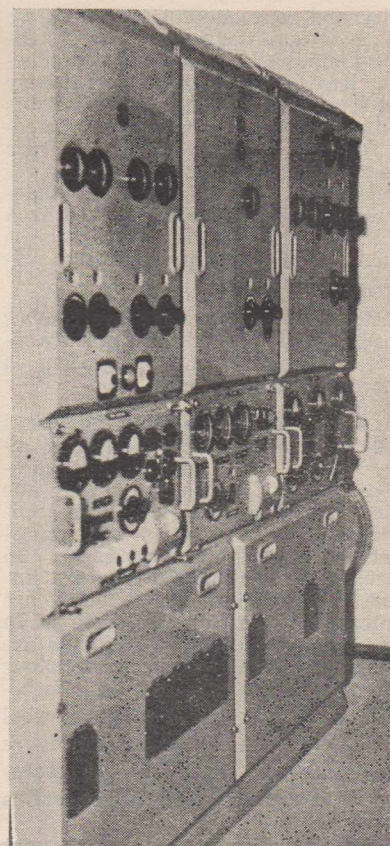
To add to the bother, it is customary to use large and effective aerials in country areas. These aerials are frequently larger than the design of the receiver can tolerate, so that the tuning of the aerial circuit is affected, with consequent loss of

selectivity. Again, in a five valve superheterodyne, the selectivity of the intermediate frequency amplifier is predominant and there is a limit to what can be achieved in this direction. This limit has been reached with present technique and, unless some completely novel developments occur, it looks as though we will have to remain content.

The hunt for selectivity, which is easier to obtain in a superheterodyne than in the tuned radio frequency receiver, has inclined to bring the superheterodyne into disrepute from a reproduction viewpoint. The sharper tuning which modern sets employ undoubtedly affects reproduction by reducing the intensity of the higher sounds. The average tuned radio frequency set could not be made sufficiently sharp in tuning to do this and so, to-day, many people prefer their old fashioned sets for this reason.

Compromise is Only Solution.

The designer is faced with a problem which admits of only one solution—the appeal to the majority. If he makes a broad-tuning set it is hailed with delight by those who can distinguish a slap-fiddle from a buzz-saw—unfortunately a small minority—but on the other hand he is execrated by a large majority of people who want to receive distant stations through a local barrage.



**S.T.C.-LORENZ BEACON AT
ESSENDON.**

Transmitting equipment of the S.T.C. Lorenz radio beacon installed at Essendon aerodrome, Melbourne. The Lorenz type of radio beacon has been chosen as standard equipment by the United States Bureau of Air Service, Department of Commerce, after exhaustive tests.

The solution undoubtedly lies in the erection of a large number of broadcast stations, and it must be admitted that on a population basis, Australia is probably the best-served country in the world. However, our distances and the loyalty of listeners to the older stations presents a problem which at the moment cannot be solved entirely.

A satisfactory technique has been established in the measurement and determination of selectivity, and it is a fairly simple matter for the engineer to design a set having the qualities he has found necessary in practice.

Three Main Factors.

One point must be remembered. In a popular set, such as the five valve, there are definite limitations. We have three main features in the design of a receiver—sensitivity, selec-

tivity and reproduction. Suppose we say these qualities represent one hundred units. Allow sixty for reproduction, leaving 20 each for sensitivity and selectivity. If more selectivity is wanted—that is, more units are needed for this quantity—some feature has to suffer, and this is usually reproduction. This, of course, is undesirable. Really, what is asked is a technique that enables more to be taken out of a pint pot than was originally placed in it.

There are means of overcoming these conditions, but they are expensive, and any set employing them is accordingly not popular.

It is interesting to compare typical modern European and American receivers with their Australian prototypes. It is found usually that our sets, valve for valve, are more sensitive and more selective with reproduction as good, in most cases. In Europe, national boundaries are linguistic boundaries, and listeners are content to listen to a few stations. In America, where over 600 stations are operating, some with tremendous power, long distance reception is restricted largely to dyed-in-the-wool enthusiasts. In Australia, there are locations where long distance reception to ascertain the winner of a

hurdle race is quite vital, and so the designer loses some sleep.

Bandpass Tuning A Solution.

A solution of the selectivity problem in the five valve set is the use of band pass tuning—a most elegant solution, but this results in two grave drawbacks—loss of sensitivity, and increase in cost. Sets of this kind have a very limited appeal, production being uneconomical. The use of "trick" circuits, in which multi-element valves are utilised, also gives some increase in selectivity, at increased cost, also.

The best set undoubtedly is the simplest, and the matter of selectivity is one calling for rational treatment.

The day is in sight when listeners will have to be content with local programmes, as an impossible situation is developing. At the moment the ether is becoming overcrowded, and stations already are forced to share wavelengths. Soon it will not be possible to separate distant from local stations, and when that comes about engineers will be able to design a musical instrument.

Radio Aids Explorers In New Guinea Wilds

Archbold Party's Experiences

THE extent to which the Archbold expedition in the wilds of New Guinea is relying on wireless was indicated recently by Captain Russel R. Rogers, pilot of the Archbold Expedition's Consolidated PYB2 flying boat, before leaving Melbourne on the return trip to Port Moresby.

The expedition at present is based at Humboldt Bay, in Dutch New Guinea, and Captain Rogers explained that parties of explorers leave the expedition's base and travel through unknown country, often peopled by hostile natives. Their business is to collect insects, mammals, plants and geological specimens.

The expedition has installed an advance base at Lake Habbema, at an elevation of over 11,000 feet above sea level, in the vicinity of Mount Wilhelmina. Personnel and equipment for this base are flown in from Humboldt Bay, the flying boat alighting and taking off from Lake Habbema. From this advance base, several land parties have been sent out into the interior. These advance par-

(Continued on page 46.)

Versatile! Dependable! Accurate!

Here is an instrument of such efficiency that it merits a place in every radio laboratory and workshop . . . the Calstan AC 223 Multitester! It will test every valve used in Australia, and in addition to the emission test a Neon leakage indicator is fitted for individual electrode selection. Eleven steps for filament voltage from 1.5 to 30 volts is provided. The 223 Multitester range is:—A.C. and D.C. VOLTS; 5, 10, 50, 250, 1250. MILLIAMPERES; 5 Ranges, 1, 5, 25, 100, 250. OHMS; 5 Ranges; from 1 ohm to 5 megohms.

The CALSTAN (CALibrated to STANdard) AC223 Multitester

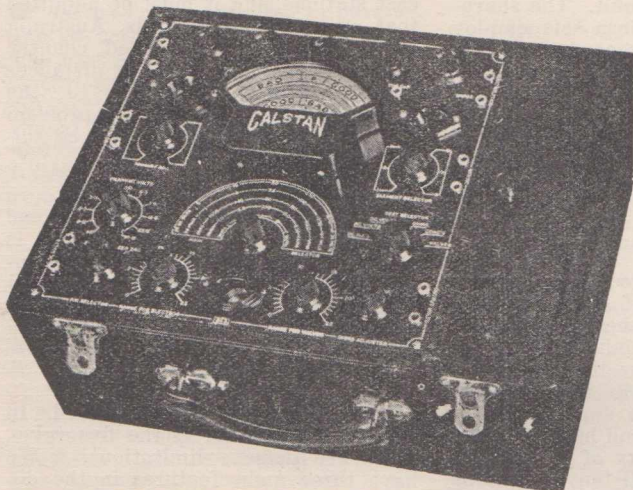
THE Calstan AC223 Multitester is also an excellent instrument for lining up sets and as a "Multitester" operating in conjunction with the Power Supply an electrolytic condenser leakage test is available, and condensers may be checked at 10, 25, 100, 150, and 250 volts, and a "GOOD"—"?"—"BAD" meter scale provides the necessary indications.

Price: A.C. and Vibrator-operated Portable:

FREE For a limited period to purchasers of an A.C. Multitester—A new 6-Volt Vibrator Unit to convert the Multitester to a general purpose instrument for 240-Volt A.C. or 6-Volt Battery Operation. Order early.

£17' 17' -
PLUS SALES TAX

CALSTON PRECISION TEST EQUIPMENT IS
Made and Guaranteed by **Slade's Radio Pty. Ltd**
CROYDON, N.S.W. UJ5381, UJ5382.



World Shortwave Stations

Below is published the second and concluding instalment of world short-wave stations, giving call-signs, locations, frequencies (and wave-lengths) together with schedules in East Australian Standard Time.

NOTE: To convert kilocycles to megacycles shift the decimal point three places to the left (e.g., read 21,540 k.c. as 21.54 m.c.).

Compiled By **ALAN H. GRAHAM**

(SHORT-WAVE EDITOR, "RADIO WORLD")

Call	Kc.	M.	Location.	Schedule, etc.
ZHP	9,680	30.97	Singapore, Malaya.—Sun., 1.40-4.40 p.m., 8.40 p.m.-12.40 a.m.; Wed., 3.40-4.40 p.m.; Mon.-Fri., 7.40 p.m.-12.40 a.m.; Sat., 3.25-4.40 p.m., 7.40 p.m.-12.40 a.m.	
EQC	9,680	30.97	Teheran, Persia.—New allocation.	
DJX	9,675	31.01	Berlin, Germany.—New station.	
DZA	9,675	31.01	Zeesen, Germany.—Irregular.	
—	9,670	31.03	Rome, Italy.—Relays 2RO irreg. 9 a.m.	
CSW-3	9,670	31.03	Lisbon, Portugal.—Daily 3-5 a.m., 8-9 a.m., 9-11 a.m.	
CR6AA	9,666	31.04	Lobito, Port West Africa.—Sun, Thurs, 5.45-7.30 a.m.	
LRX	9,660	31.06	Buenos Aires, Arg.—Daily; relays LR1 12.30 a.m.-2 p.m.	
PSJ	9,660	31.06	Rio de Janeiro, Brazil.—Phones Argentine.	
CS2WA	9,650	31.09	Lisbon, Portugal.—Sun., Wed., Fri., 6.30-9 a.m.	
DGU	9,650	31.09	Nauen, Germany.—Phones Egypt.	
HH3W	9,645	31.10	Port-au-Prince, Haiti.—Daily, 4.5, 10-11 a.m.	
YNLF	9,645	31.10	Managua, Nicaragua.—Daily, 3.30-5.30 a.m., 9.30 a.m.-1 p.m.	
CXAS	9,640	31.12	Colonia, Uruguay.—Relays LR3, Buenos Aires, 9 p.m.-2 p.m.	
12RO3	9,635	31.13	Rome, Italy.—Not in use at present.	
CF45	9,630	31.15	Drummondville, Canada.—Phones U.S.A.	
JFO	9,630	31.15	Taihoku, Taiwan.—Relays JFAK around midnight.	
FZR	9,620	31.19	Saigon, Fr. Indo-China.—Phones Paris.	
HJ1ABP	9,620	31.19	Cartagena, Colombia.—Transferred to 4805 k.c.	
HP5J	9,615	31.22	Panama City, Panama.—Daily 3-4.30 a.m., 9 a.m.-1.30 p.m.	
ZRK	9,615	31.22	Klipheuvall, S. Africa.—Daily exc. Sun., 2.45-3.40 p.m., 6.20-10.20 p.m., mid.-2.40 a.m.; Sun., 7-8.30 p.m., 11 p.m.-2.40 a.m.	
RAN	9,600	31.25	Moscow.—U.S.S.R.—Daily from 10 a.m.-12.15 p.m.	
XFYU	9,600	31.25	Mexico City, Mexico.—Daily, 10 a.m.-1 p.m.	
CB960	9,600	31.25	Santiago, Chile.—Not in use at present.	
HBL	9,595	31.27	Geneva, Switzerland.—Irregular.	
PCJ	9,590	31.28	Huizen, Holland.—Mon., 4-5 a.m., 10 a.m.-12.25 p.m.; Wed., 4.45-7.40 a.m., 10.15-11.45 a.m., noon-1.30 p.m.; Thurs, 10.15-4.30 a.m.; Sat., 11 a.m.-noon.	
VUD-2	9,590	31.28	Delhi, India.—11.30 a.m.-1.30 p.m., 4.30-6.30 p.m., 10.30 p.m.-3.30 a.m.	
VK6ME	9,590	31.28	Perth, Australia.—Exc. Sun., 9 p.m.-mid.	
VK2ME	9,590	31.28	Sydney, Australia.—Sun., 4-6 p.m., 7.30-11.30 p.m., mid.-2 a.m. (Mon.).	
W2XE	9,590	31.28	New York, U.S.A.—Irregular.	
W3XAU	9,590	31.28	Philadelphia, U.S.A.—Relays WCAU, 3 a.m.-10 or 11 a.m.	
GSC	9,580	31.32	Daventry, England.—Daily, 9.20-11.30 a.m., 12.20-2.20 p.m.	
VLR	9,580	31.32	Melbourne, Australia.—Daily, 6.30-11.30 p.m. (Sun. till 10.30); daily, exc. Sunday, 12.35-5.15 p.m.; Sun., 8 a.m.-1.30 p.m., 3.01-10.30 p.m.	
OAX5C	9,580	31.32	Ica, Peru.—Daily, 9 a.m.-1 p.m.	
KZRM	9,570	31.35	Manila, P.I.—Daily (exc. Sun), 7.30-10 a.m., 2.15-3.15 p.m., 7 p.m.-1 a.m.; Sun, 6 p.m.-1 a.m.	
W1XK	9,570	31.35	Springfield, U.S.A.—Relays WBZ, 10 p.m.-4 p.m. (Sun. from 11 p.m.).	
DJA	9,560	31.28	Berlin, Germany.—Daily, 3.05- p.m.-2 a.m.	
W2XAD	9,550	31.41	Schenectady, U.S.A.—Daily, 9.15 a.m.-1 p.m.	
VUB-2	9,550	31.41	Bombay, India.—Daily, 12.30-1.30 p.m., 3-5.30 p.m.	
HISE	9,550	31.41	Ciudad Trujillo, D.R.—Unknown.	
TPB-11	9,550	31.41	Paris, France.—Daily, 2.15-9 a.m., 5-7 p.m.	
OLR3A	9,550	31.41	Prague.—Cz-Slovakia.—Irregular.	
XEFT	9,550	31.41	Vera Cruz, Mexico.—Daily, 1.30-7 a.m., 1.30-3.30 p.m.	
YDB	9,550	31.41	Soerabaia, Java.—Daily, 9-10.30 a.m., 7.30 p.m.-1 a.m. (Sun. to 2.30 a.m.).	
HH2R	9,545	31.44	Port-au-Prince, Haiti.—Irregular.	
DJN	9,540	31.45	Berlin, Germany.—Daily, 7.50 a.m.-1.45 p.m.	
VPD2	9,540	31.45	Suva, Fiji Is.—Daily, 8.30-10 p.m.	
JZI	9,535	31.46	Tokyo, Japan.—Irregular.	
—	9,535	31.46	Berne, Switzerland.—Testing 4-5 a.m.	
W2XAF	9,530	31.48	Schenectady, U.S.A.—Daily, 7 a.m.-3 p.m.	
W6XBE	9,530	31.48	Belmont, U.S.A.—New G.E. transmitter.	
VUG-2	9,530	31.48	Calcutta, India.—Daily, 5-7 p.m.	
ZBW3	9,525	31.49	Hong Kong, China.—Daily, 2.30-4 p.m., 6 p.m.-1 a.m.	
LKJI	9,525	31.49	Jeloy, Norway.—Daily, 8-11 p.m.	
ZRH	9,523	31.50	Roberts Heights, S. Africa.—Daily, 8-10.30 p.m.; Sun., 8.30-10 p.m.	
HJ6ABH	9,520	31.51	Armenia, Colombia.—Transferred to 4875 k.c.	
—	9,520	31.51	Addis Ababa, Ethiopia.—Daily, 4-4.45 a.m.	
OZF	9,520	31.51	Swamleboak, Denmark.—Daily, 5-9.40 a.m., 11 a.m.-2 p.m.	
YSH	9,520	31.51	San Salvador, Salvador.—Irregular, 9 a.m.-1 p.m.	
XEDQ	9,520	31.51	Guadalajara, Mexico.—Irregular, 10.30 a.m.-3.30 p.m.	

Call	Kc.	M.	Location.	Schedule, etc.	Call	Kc.	M.	Location.	Schedule, etc.
GSB	9,510	31.55	Daventry, England.	Daily, 3.20-7 a.m., 9.20-11.30 a.m., 12.20-2.20 p.m.	CGA5 PCJ-1	9,091 9,091	33.00 33.00	Drummondville, Canada.—Phones Europe. Curacao, D.W.I.—Mon., 1.36-3.36 a.m.; Tues., Thurs., Sat., 9.36-11.36 a.m.	
HJLABE XEWV	9,505 9,500	31.57 31.58	Hanoi, Fr. Indo-China. Cartagena, Colombia.	Daily, 3-5 p.m., 9 p.m.-1 a.m. —Transferred to 4800 k.c.	TFK TYA2 COBZ	9,060 9,037 9,030	33.11 33.19 33.12	Reykjavik, Iceland.—Phones London. Paris, France.—Phones Algiers. Habana, Cuba.—Relays CMBZ daily, 10.45 p.m.-4.15 p.m.; Sun., 10.45 p.m.-3 p.m.	
HS8PJ VK3ME OFE HJU	9,500 9,500 9,500 9,500	31.58 31.58 31.58 31.58	Bangkok, Siam. Melbourne, Australia. Lahti, Finland. Buena Ventura, Colombia.	Thurs., 11 p.m.-1 a.m. Daily (exc. Sun.), 7-10 p.m. Daily, 5.15-8 a.m. —Tues., Thurs., Sat., 11 a.m.-2 p.m.	GCS KEJ	9,020 9,010	33.26 33.3	Rugby, England.—Phones U.S.A. Bolinas, U.S.A.—Relays NBC and CBS programmes, irreg.	
PRF5 EAR PLW KET TAO CB946 WET ICK TGWA HCODA YVR COCH	9,500 9,488 9,478 9,478 9,465 9,460 9,478 9,460 9,450 9,440 9,430 9,428	31.58 31.61 31.65 31.65 31.7 31.71 31.65 31.71 31.75 31.78 31.80 31.80	Rio de Janeiro, Brazil. Madrid, Spain. Bandoeng, Java. Bolinas, U.S.A. Ankara, Turkey. Santiago, Chile. Rocky Point, U.S.A. Tripoli, N. Africa. Guatemala City, Guat. Guayaquil, Ecuador. Maracay, Venezuela. Habana, Cuba.	—Irreg., 7.45-8.45 a.m. —Irregular, 10.30 a.m. —Phones Australia. —Phones New York. —Testing soon. —Phones S. America & Bermuda —Not in use at present. —Irregular around noon. —Tests. Daily, 11 p.m.-12.30 p.m. (Sun. till 3 p.m.).	ZLS HCJB	8,900 8,841	33.71 33.5	Wellington, N.Z.—Phones Sydney. Quito, Ecuador.—Daily (exc. Tues.), 2.45-5.30 a.m., 8 a.m.-1 p.m., 10-11.30 p.m.; Mon., 3-4.30 a.m., 8.30 a.m.-1 p.m.	
PLV	9,415	31.87	Bandoeng, Java.	Broadcasts, 9 a.m.-8.30 p.m.; phones Holland, 12.45 a.m.	ZMBJ HCJB LSD	8,840 8,830 8,830	33.94 33.96 33.96	ss "Awatea."—Phones around 4 p.m. Quito, Ecuador.—Exc. Tues., 11.30 a.m.-1.30 p.m. Buenos Aires, Arg.—Tests with New York.	
XDR	9,400	31.92	Mexico City, Mexico.	Phones XAM, Merida, Yucatan.	HKV TIR PNI DAF GCQ FZE8 WXV GCI VPD3 KBB HKV GBC COJK	8,795 8,790 8,775 8,765 8,760 8,750 8,740 8,730 8,720 8,710 8,700 8,680 8,665	34.13 34.14 34.19 34.23 34.25 34.29 34.33 34.36 34.4 34.43 34.46 34.56 34.03	Colombia.—Irregular. Cartago, Costa Rica.—Phones C. America. Makasser, D.E.I.—Phones Java, 7 p.m. Norddeich, Germany.—Phones ships. Rugby, England.—Phones Africa. Djibouti, Fr. Somaliland.—Phones Paris, 5.30 p.m. Fairbanks, Alaska.—Phones WXH. Rugby, England.—Phones India, 11 p.m. Suva, Fiji Is.—Daily, 8.30-10 p.m. Manila, P.I.—Tests irregularly. Bogota, Colombia.—Wed., Sat., 10-10.20 a.m. Rugby, England.—Phones ships. Camaguey, Cuba.—Exc. Sun. and Mon., 8.30-9.30 a.m., and 11 a.m.-2 p.m.	
PGC HC1ETC COCD	9,380 9,375 9,355 9,350	31.96 32.00 32.05 32.09	Tananarive, Madagascar. Kootwijk, Holland. Quito, Ecuador. Habana, Cuba.	Daily, 1-2 a.m., 3.30-3.45 p.m., 6.30-7.30 p.m.; Sun., 5.30-7 p.m. —Phones D.E.I. —Friday till 12.30 p.m. —Relays CMCD, daily 1 a.m.-2.30 p.m.; Mon., 1 a.m.-noon.	W2XGB HJ4ABU JIB YNPR WOO HPI IAC JZF HC2CW	8,665 8,650 8,650 8,580 8,560 8,550 8,515 8,500 8,400	34.53 34.71 34.71 34.92 35.05 35.09 35.23 35.29 35.71	Hicksville, U.S.A.—Tues. to Sat. news at mid. and 8 a.m. Medellin, Colombia.—Daily, 10 a.m.-1 p.m. Taihoku, Hawaii.—Relays JFAK; irregular. Managua, Nicaragua.—Daily, 10.30 a.m.-12.30 p.m. Ocean Gate, N.J., U.S.A.—Phones ships. Panama City, Panama.—Phones irregularly. Pisa, Italy.—Phones irregularly. Naraki, Japan.—Phones ships. Guayaquil, Ecuador.—Daily, 2.30-3.30 a.m., 11 a.m.-2 p.m.	
YNGU HIG	9,300 9,300	32.26 32.28	Managua, Nicaragua. Ciudad, Trujillo, D.R.	Daily, 3-5, 9-10 a.m. Daily, 2.40-5.10 a.m., 6.40 a.m.-12.40 p.m., 10.10 p.m.-12.40 a.m.	W2XGB HJ4ABU JIB YNPR WOO HPI IAC JZF HC2CW	8,665 8,650 8,650 8,580 8,560 8,550 8,515 8,500 8,400	34.53 34.71 34.71 34.92 35.05 35.09 35.23 35.29 35.71	Hicksville, U.S.A.—Tues. to Sat. news at mid. and 8 a.m. Medellin, Colombia.—Daily, 10 a.m.-1 p.m. Taihoku, Hawaii.—Relays JFAK; irregular. Managua, Nicaragua.—Daily, 10.30 a.m.-12.30 p.m. Ocean Gate, N.J., U.S.A.—Phones ships. Panama City, Panama.—Phones irregularly. Pisa, Italy.—Phones irregularly. Naraki, Japan.—Phones ships. Guayaquil, Ecuador.—Daily, 2.30-3.30 a.m., 11 a.m.-2 p.m.	
GCB HC2CW	9,280 9,280	32.33 32.31	Rugby, England. Guayaquil, Ecuador.	Phones Canada and Egypt. Daily, 2.30-3.30 a.m., 11 a.m.-2 p.m.	W2XGB HJ4ABU JIB YNPR WOO HPI IAC JZF HC2CW	8,665 8,650 8,650 8,580 8,560 8,550 8,515 8,500 8,400	34.53 34.71 34.71 34.92 35.05 35.09 35.23 35.29 35.71	Hicksville, U.S.A.—Tues. to Sat. news at mid. and 8 a.m. Medellin, Colombia.—Daily, 10 a.m.-1 p.m. Taihoku, Hawaii.—Relays JFAK; irregular. Managua, Nicaragua.—Daily, 10.30 a.m.-12.30 p.m. Ocean Gate, N.J., U.S.A.—Phones ships. Panama City, Panama.—Phones irregularly. Pisa, Italy.—Phones irregularly. Naraki, Japan.—Phones ships. Guayaquil, Ecuador.—Daily, 2.30-3.30 a.m., 11 a.m.-2 p.m.	
ZP-8 PDP COBX ZSR WNA YVR HAT4	9,275 9,240 9,200 9,180 9,170 9,150 9,125	32.27 32.47 32.59 32.68 32.72 32.79 32.88	Asuncion, Paraguay. Kootwijk, Holland. Habana, Cuba. Kliphuevel, S. Africa. Lawrenceville, U.S.A. Maracay, Venezuela. Budapest, Hungary.	Daily, 11.05-11.30 a.m. —Phones D.E.I. —Relays CMBZ, 10 p.m.-3 p.m. —Phones England. —Phones Europe. —Phones Europe. Sun., 9-10 a.m.; Mon., Thurs., 10-11 a.m.	IAC DAS PSK PGB LSC KTP ZP10 WEZ	8,380 8,330 8,185 8,155 8,140 8,120 8,110 8,075	35.80 36.01 36.65 36.79 36.86 36.95 37.00 37.15	Pisa, Italy.—Phones ships. Rugen, Germany.—Phones ships. Rio de Janeiro, Brazil.—Irregular. Kootwijk, Holland.—Phones Java. Buenos Aires, Arg.—Tests irregularly. Manila, P.I.—Phones U.S.A., Japan and Java. Asuncion, Paraguay.—Daily, 11 a.m.-1 p.m. Rocky Point, U.S.A.—Irregular.	
KUW COCA	9,110 9,095	32.93 32.96	Manila, P.I. Habana, Cuba.	Tests irregularly. —Relays CMCA daily, mid.-3 p.m.	IAC DAS PSK PGB LSC KTP ZP10 WEZ	8,380 8,330 8,185 8,155 8,140 8,120 8,110 8,075	35.80 36.01 36.65 36.79 36.86 36.95 37.00 37.15	Pisa, Italy.—Phones ships. Rugen, Germany.—Phones ships. Rio de Janeiro, Brazil.—Irregular. Kootwijk, Holland.—Phones Java. Buenos Aires, Arg.—Tests irregularly. Manila, P.I.—Phones U.S.A., Japan and Java. Asuncion, Paraguay.—Daily, 11 a.m.-1 p.m. Rocky Point, U.S.A.—Irregular.	

Call	Kc.	M.	Location.	Schedule, etc.	Call	Kc.	M.	Location.	Schedule, etc.
TYB2	8,075	37.15	Paris, France.	Phones Morocco.	FET6	7,168	41.85	Palma de Mallorca, Majorca.	Nationalist station.
NR	8,036	37.33	Rabat, Morocco.	Mon., 5.30-7 a.m., and irreg.	FET	7,147	41.97	Las Palmas, Canary Is.	Nationalist station.
HC2TC	7,975	37.62	Quito, Ecuador.	Fri. and Mon., 11 a.m.	EA7BA	7,142	42.00	Cadiz, Spain.	Nationalist station.
ZGL	7,970	37.64	Shanghai, China.	Tests p.m.	FET21	7,134	42.05	Ceuta, Spain.	Nationalist station.
VLZ	7,960	37.69	Sydney, Australia.	Phones Wellington.	YN3DG	7,130	42.07	St. Leon, Nicaragua.	Daily, 12.15-12.30 p.m.
HSJ	7,955	37.71	Dangkok, Siam.	Phones Berlin, Manila and Java	—	7,110	42.2	Baghdad, Iraq.	Testing irreg.
PSL	7,935	37.81	Rio de Janeiro, Brazil.	Phones New York & Madrid.	FO8AA	7,100	42.25	Papeete, Tahiti.	Wed., Sat., 2-2.30 p.m.
GCP	7,920	37.88	Rugby, England.	Phones Sydney.	FET5	7,100	42.29	Burgos, Spain.	Nationalist station.
LSL	7,901	37.97	Hurlingham, Arg.	Phones Rio.	—	7,090	42.29	Guadalajara, Mexico.	"Radiodifusora del Pueblo." Daily, noon-2 p.m.
YSD	7,894	37.99	San Salvador, El Salvador.	Irreg., 10 a.m.-2 p.m.	PIIJ	7,088	42.30	Dordrecht, Holland.	Sun., 2.10-2.50 a.m.
IDU	7,890	38.02	Asmara, Eritrea.	Irregular.	EAIBO	7,070	42.43	Salamanca, Spain.	Nationalist station.
CJA2	7,890	38.02	Drummondville, Canada.	Phones Australia.	FET10	7,027	42.69	Vitoria, Spain.	Nationalist station.
JYR	7,880	38.05	Kemikawa-Cho, Japan.	Tests irregularly.	FET1	7,006	42.82	Valladolid, Spain.	Nationalist station.
HC1RB	7,870	38.1	Quito, Ecuador.	Daily, noon-2 p.m.	EA2AA	7,002	42.83	Saragossa, Spain.	Nationalist station.
SUX	7,860	38.17	Abou Zabal, Egypt.	Phones Europe, 7-9 a.m.	EA1AV	7,000	42.85	Salas, Spain.	Nationalist station.
HC2JSB	7,854	38.20	Guayaquil, Ecuador.	Til 2 p.m.	EA2BL	7,000	42.85	Ejea de los Caballeros, Spain.	Nationalist station.
PGA	7,840	38.27	Kootwijk, Holland.	Phones Java.	EA9AH	6,996	42.88	Tetuan, Sp.	Morocco.—Nationalist station.
DFT	7,812	38.40	Nauen, Germany.	Phones irregular.	XEME	6,990	42.89	Merida, Mexico.	Irregular.
HBP	7,797	38.49	Geneva, Switzerland.	Irregular.	JVS	6,990	42.92	Nazaki, Japan.	Phones Eastern stations.
YNA	7,790	38.5	Managua, Nicaragua.	Phones Cent. & S. America.	XBA	6,977	43.00	Tababaya, Mexico.	Daily, 12.30-4 a.m., 10-11.30 a.m.
PDM	7,765	38.63	Kootwijk, Holland.	Phones D.E.I.	HCETC	6,966	43.00	Quito, Ecuador.	Fri. around noon.
CEC	7,740	38.76	Santiago, Chile.	Phones irregular.	ZL2ZB	6,960	43.1	Wellington, N.Z.	Testing.
PDL	7,730	38.81	Kootwijk, Holland.	Special relays to D.E.I.	WKP	6,950	43.17	Rocky Point, U.S.A.	Special relays.
TYC2	7,700	38.96	Bolinas, U.S.A.	Relays NBC and CBS programmes.	GBY	6,950	43.17	Rugby, England.	Phones U.S.A.
KEE	7,626	39.37	Paris, France.	Phones Egypt.	IUF	6,922	43.34	Addis Ababa, Ethiopia.	Irregular.
RIM	7,620	39.37	Tachkent, U.S.S.R.	Phones Moscow.	GDS	6,905	43.45	Rugby, England.	Phones New York.
IUB	7,610	39.42	Addis Ababa, Ethiopia.	Irregular.	H20	6,899	43.48	Ciudad Trujillo, D.R.	Daily, 1.40-5.40, 7.40-11.40 a.m., 9.40-11.40 p.m.
KWX	7,610	39.42	Dixon, U.S.A.	Phones Hawaii, P.I., Japan & Java.	KEB	6,890	43.45	Bolinas, U.S.A.	Phones P.I. and Java.
T18WS	7,550	39.74	Punta Arenas, C. Rica.	Daily, 9 a.m.-3 p.m.	CGA7	6,880	43.60	Drummondville, Canada.	Phones Europe.
RKI	7,520	39.87	Moscow, U.S.S.R.	Relays RAN, 10 a.m.-12.15 p.m. Phones RIM.	KEL	6,860	43.70	Bolinas, U.S.A.	Tests irreg., 2 and 9 a.m.
KKH	7,520	39.87	Kahuku, Hawaii.	Phones U.S.A.	XGOX	6,850	43.80	Nanking, China.	Doubtful.
JVP	7,510	39.95	Nazaki, Japan.	Irregular.	CFA	6,830	43.92	Drummondville, Canada.	Phones N. America.
CFA6	7,500	40.00	Drummondville, Canada.	Phones U.S.A.	H7P	6,805	44.06	Ciudad Trujillo, D.R.	Daily exc. Sun., Mon., 3.40-4.40, 9.40-11.40 a.m.; Sun., 3.40-4.40 a.m.; Mon., 1.40-2.40 a.m.
JVQ	7,470	40.16	Nazaki, Japan.	Relays irreg.	GAB	6,795	44.15	Rugby, England.	Phones Canada.
T12RS	7,450	40.27	San Jose, Costa Rica.	Exc. Mon., 12.30-2 p.m.	—	6,790	44.16	Paramaribo, Surinam.	Daily, 9.06-11.36 p.m., 8.36-11.36 a.m.; Mon., 12.36-2.36 a.m.
HCJB-4	7,410	40.46	Quito, Ecuador.	Irreg., 10 a.m.-12.30 p.m.	HIH	6,770	44.26	San Pedro de Macoris, D.R.	Daily, 10.30 a.m.-noon; 3.10-4.40 p.m.; Sun., 6-7 p.m.; Mon., 7.15-9 a.m.
YDA	7,410	40.46	Tanojongpriok, Java.	Daily exc. Sun., 1.30-5 p.m.; Sun., 10.30 a.m.-5 p.m.	CJA6	6,765	43.32	Managua, Nicaragua.	Around noon.
ZLT2	7,390	40.6	Wellington, N.Z.	Phones Sydney, 6-10 p.m.	WOA	6,760	44.38	Drummondville, Canada.	Phones Australia.
XEQR	7,380	40.65	Mexico City, Mexico.	Mondays, 10-11 a.m.	FJT	6,755	44.41	Lawrenceville, U.S.A.	Phones England.
KEQ	7,370	40.71	Kahuku, Hawaii.	Special relays.	H3C	6,730	44.58	Nazaki, Japan.	Irregular.
GDL	7,345	40.84	Rugby, England.	Phones Japan.	PMH	6,720	44.61	La Romana, D.R.	Daily, 3.30-5, 8-9 a.m.
DLC	7,332	40.92	Rehmate, Germany.	Phones irreg.	TI2P	6,690	44.82	Bandoeng, Java, D.E.I.	Relays NIROM progs., 7.30-2.30 a.m.; also Sun., 12.30-4.30 p.m.
HKE	7,220	41.55	Bogota, Colombia.	Tues., Fri., 9.30-10 a.m.; Wed., Sun., 11 a.m.-noon.	CGA6	6,690	44.82	San Jose, Costa Rica.	Daily, 10 a.m.-1 p.m.
EAIBL	7,212	41.59	Malaga, Spain.	Daily, mid-1 a.m., 7-8.30 a.m.	HBQ	6,675	44.94	Drummondville, Canada.	Phones Europe.
EAJ8	7,203	41.65	Pontevedra, Spain.	Nationalist station.	YVQ	6,672	44.95	Geneva, Switzerland.	Broadcasts and phones irreg.
FET8	7,202	41.65	San Sebastian, Canary Is.	Nationalist station.	H15G	6,660	45.04	Maracay, Venezuela.	Irreg.
EAME	7,200	41.66	Melilla, Spain.	Nationalist station.	GBY	6,650	45.11	La Vega, D.R.	Unknown.
EASAE	7,200	41.66	Las Palmas, Canary Is.	Nationalist station.	IAC	6,650	45.11	Rugby, England.	Phones U.S.A.
EAIBL	7,200	41.66	Pontevedra, Spain.	Nationalist station.	—	—	—	—	
YNAM	7,200	41.66	Managua, Nicaragua.	Daily at noon.	—	—	—	—	
EA2BA	7,177	41.80	Jaca, Spain.	Nationalist station.	—	—	—	—	
CR6AA	7,177	41.80	Lobito, Port W. Africa.	Sun. & Thurs., 5.45-7.30 a.m.	—	—	—	—	

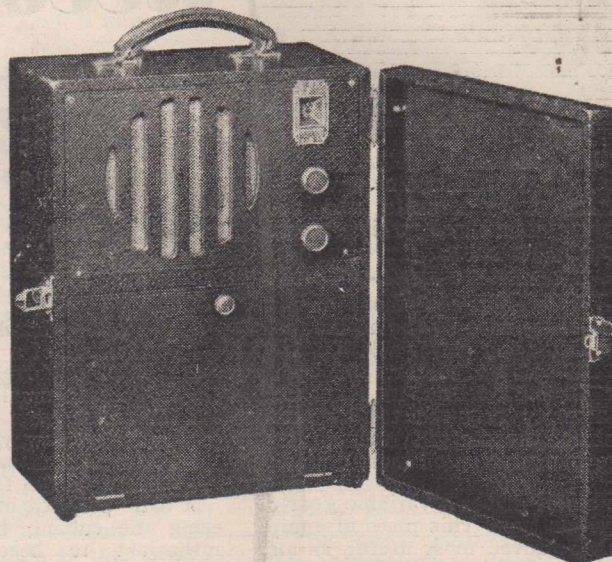
Call	Kc.	M.	Location.	Schedule, etc.	Call	Kc.	M.	Location.	Schedule, etc.
HC2RL	6,635	45.18	Guayaquil, Ecuador.	Mon., 8.45-10.45 a.m.; Wed., noon-2 p.m.	HIIX	6,340	47.32	Cuidad Trujillo, D.R.	Daily, 3.10-4.10 a.m.; Sun., 10.40 p.m.-1.40 a.m.; Wed., Sat., 11.10 a.m.-1.10 p.m.
HIT	6,630	45.25	Ciudad Trujillo, D.R.	Daily exc. Mon., 3.10-4.40, 8.40-11.40 a.m.; Sun., 1.40 p.m.-3.40 p.m.	OAX1A COCW	6,335 6,324	47.33 47.40	Ica, Peru.—Daily, 11 a.m.-2 p.m. Habana, Cuba.—Daily, 9.55-3 p.m.; Mon., 1 a.m.-1 p.m.	
PRADO	6,625	45.28	Rio Bamba, Ecuador.	Fridays, noon-2.45 p.m.	HIZ	6,310	47.52	Ciudad Trujillo, D.R.	Daily exc. Sun., Mon., 1.10-3.25 a.m.; 8.10-11.40 a.m.; Sun., 8.10 a.m.-2.10 p.m.; Mon., 2.40-4.40 a.m.
YNLG	6,610	45.39	Managua, Nicaragua.	Daily, 4-6 a.m., 10 a.m.-2 p.m.	YV4RD	6,300	47.62	Maracay, Venezuela.	Daily, 9.30 a.m.-12.30 p.m., exc. Mon.
DAF	6,600	45.45	Nordelch, Germany.	Phones irreg.	OAX4G HIG	6,295 6,280	47.63 47.77	Lima, Peru.—Daily, 10.10 a.m.-1.30 a.m. Trujillo City, D.R.	Daily, 2.40-4.10 a.m., 6.40 a.m.-12.40 p.m., 10.10 p.m.-12.40 a.m.
HI6H	6,600	45.45	Ciudad Trujillo, D.R.	Unknown.	COHB	6,280	47.77	Sancti Spiritus, Cuba.	Reported off air.
COCU	6,590	45.52	Habana, Cuba.	Relays CMCU, 10 p.m.-3 p.m.	YV5RP YV5RJ	6,270 6,275	47.79 47.90	Caracas, Venezuela.	Daily till 1.30 p.m.
HC1VT	6,575	45.63	Ambato, Ecuador.	Tues., Thurs., Sat., 11 a.m.-1.30 p.m.	HIN	6,243	48.00	Caracas, Venezuela.	Schedule unknown.
HI5P	6,565	45.69	Puerto Plata, D.R.	Unknown.	ZGE	6,240	48.1	Ciudad Trujillo, D.R.	Daily, 3-5 a.m., 9 a.m.-1 p.m.
HI4D	6,558	45.74	Ciudad Trujillo, D.R.	Daily exc. Mon., 2.55-4.40 a.m.	HRD	6,235	48.12	Kuala Lumpur, F.M.S.	Sun., Tues., Fri., 9.40-11.40 p.m.
XBC	6,550	45.80	Vera Cruz, Mexico.	Daily, 11.15 p.m.-mid.	HCJB	6,230	48.13	La Ceiba, Honduras.	Daily, 11 a.m.-2 p.m.; Sun., 11 a.m.-4 p.m.; Mon., 7-9 a.m.
TIRCC	6,550	45.80	San Jose, Costa Rica.	Daily, 3-5 a.m., 9-10 a.m.; Fri., 9 a.m.-2 p.m.; Mon., 2-5 a.m., 9-10 a.m., 11 p.m.-noon.	YV1RG	6,225 6,220	48.15 48.28	Quito, Ecuador.—Irregular. Valera, Venezuela.—Daily, 9 a.m.-12.30 p.m.	
YV6RB	6,545	45.84	Bolivar, Venezuela.	Daily, 9 a.m.-1.30 p.m.	—	6,220	48.28	Saigon, Fr. Indo-China.	Daily, 7.30 or 8.30 p.m.-12.30 a.m.
YV4RB	6,520	46.01	Valencia, Venezuela.	Daily, 2-5 a.m., 8 a.m.-1 p.m.	YV5RI	6,205	48.32	Coro, Venezuela.	Irregular.
TGWB	6,520	46.01	Guatemala City, Guatemala.	Testing; may shift to 49 ms. Relays TGW.	HI8Q TG-2	6,200 6,190	48.36 48.4	Ciudad Trujillo, D.R.—Irregular. Guatemala City, Guat.—Relays TG-1; Tues.-Sat., 9 a.m.-2 p.m.; Sun., 9 a.m.-4 p.m., and 10 p.m.-2 a.m.; Mon., 6-11 a.m.	
YN1GG	6,516	46.02	Managua, Nicaragua.	Daily, 11 a.m.-noon.	HI1A	6,185	48.50	Santiago, D.R.	Daily, 10 p.m.-8 a.m.
HIL	6,500	46.15	Ciudad Trujillo, D.R.	Daily, 3.10-4.40, 8.40-10.40 a.m.	YV5RD	6,156	48.71	Caracas, Venezuela.	Daily, 2-5 a.m., 7 a.m.-1.40 p.m.
YV1RM	6,500	46.15	Maracibo, Venezuela.	Daily, 9 a.m.-12.30 p.m.	HI5N	6,153	48.75	Moca City, D.R.	Daily, 9.40 a.m.-12.10 p.m.
HIIL	6,490	46.20	Santiago de los Caballeros, D.R.	Daily, 12.40-2.40 a.m., 10.40 a.m.-12.40 p.m.	ZP-14	6,150	48.78	Villarica, Paraguay.	Daily, 8-9 a.m.
HI4D	6,482	46.28	Ciudad Trujillo, D.R.	Tues. & Sat., 2.55-4.40, 7.40-10.40 a.m.	GP-12 ZRD	6,150 6,150	48.78 48.78	Cochabamba, Bolivia.—Testing soon. Durban, S. Africa.—Daily exc. Sun., 2.45-3.45 p.m., and 6.30-10.30 p.m.; daily exc. Mon., 12.01-6.45 a.m.; Sun., 8.30-10 p.m.; Mon., mid-2.30 a.m.; 3-6.20 a.m.; Also 7-8 p.m. third Sunday each month.	
EDR-4	6,480	46.30	Palma de Mallorca, Balearic Is.	Daily, 7.30-8.15 a.m.	CJRO	6,150	48.78	Winnipeg, Canada.	Daily, 9 a.m.-3 p.m.; Mon., 8 a.m.-1 p.m.
HI8A	6,479	46.30	Ciudad Trujillo, D.R.	Daily, 11.40-1.40 a.m.; Sun., 7.10-8.40 a.m.	ZEB	6,147	48.80	Bulawayo, S. Africa.	Tues., Thurs., Sat., 4.15-6.15 a.m.; Wed., 2-3 a.m.; Fri., 1-3 a.m.; Sun., 6.30-8 p.m.
WMI	6,470	46.36	Lorain, U.S.A.	News at 2 a.m. and 1 p.m.	HJ1ABE	6,145	48.80	Medellin, Colombia.	Daily, 2-3 a.m., 9 a.m.-1.30 p.m.
YNLAT	6,470	46.36	Granada, Nicaragua.	Irregular.	W8XK	6,140	48.86	Leopoldville, Belg. Congo.	8.35-10 p.m. Sun. & Hol.
YV3RD	6,465	46.37	Barquisimeto, Venezuela.	Irregular.	CR7AA	6,140 6,137	48.86 48.87	Pittsburgh, U.S.A.—Relays KDKA daily, 2-3 p.m. Laurencio Marques, Port E. Africa.—Daily 12.30-2 a.m., 3.05-4 a.m., 7.30-9.30 a.m.; Sun., 8-10 p.m.; Mon., 1-4 a.m.	
HI4V	6,450	46.48	San Francisco de Macoris, D.R.	Daily, 2.40-4.40 a.m., 8.10 a.m.-12.40 p.m.	XEXA	6,133	48.93	Mexico City, Mexico.	Daily, 5.30-7 a.m., 10.30 a.m.-3.45 p.m., 11 p.m.-2 a.m.; Mon., 4.30 a.m.-3.45 p.m.
TGQA	6,440	46.56	Quezaltenango, Guatemala.	Mon., 4-6 a.m.; daily, 9.10 a.m.-1.10 p.m.	—	6,137	48.87	—	—
HI1S	6,420	46.73	Santiago, D.R.	Daily, 2.40-4.40, 8.40-10.40 a.m., 12.40-2.40 p.m.	—	6,145	48.80	—	—
YV6RC	6,416	46.73	Bolivar, Venezuela.	Irregular.	—	6,145	48.80	—	—
TIPG	6,410	46.80	San Jose, Costa Rica.	Daily, 3-5 a.m., 9 a.m.-2.30 p.m.	—	6,145	48.80	—	—
YV5RH	6,400	46.88	Caracas, Venezuela.	Daily, 10 a.m.-2 p.m.	—	6,145	48.80	—	—
HI8J	6,388	46.92	Las Vegas, D.R.	Irregular.	—	6,140	48.86	—	—
VP2LO	6,384	46.94	Ste. Kitts, B.W.I.	Daily, 7-7.45 a.m.; Mon., 1-1.45 a.m.	—	6,140	48.86	—	—
YV5RF	6,380	46.96	Varacas, Venezuela.	Daily, 9 a.m.-1.30 p.m.	—	6,137	48.87	—	—
T18WS	6,370	47.07	Puntarenas, C. Rica.	Daily, 9 a.m.-3 p.m.	—	6,133	48.93	—	—
YV1RH	6,364	47.18	Maracibo, Venezuela.	Daily, 9-10.30 p.m.	—	6,133	48.93	—	—
HRP-1	6,360	47.19	San Pedro Sula, Honduras.	Daily, 10.30 a.m.-12.30 p.m.	—	6,133	48.93	—	—
ICC	6,355	47.22	Rome, Italy.	Relays 2RO.	—	6,133	48.93	—	—

Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
TIEM	6,130	48.94	San Jose, Costa Rica.	Daily, 2 a.m.-2 p.m.; Mon., 1-9 a.m.	VE9CS	6,070	49.42	Vancouver, Canada.	Daily, 9-10.30 a.m.; Mon., 4.45 a.m.-noon, 1.30-4 p.m.; Wed., 9-10.30 a.m.; 2.30-4.30 p.m.
VPD	6,130	48.94	Suva, Fiji Is.—New freq.			6,069	49.42	Tananarive, Madagascar.	Daily, 1-2 a.m., 3.30-3.45 a.m., 6.30-7.30 a.m.; Sun., 5.30-7.30 p.m.
VP3BG	6,130	48.94	Georgetown, Br. Guiana.	From 8 a.m. on.	SBO	6,065	49.46	Motala, Sweden.	Relays Stockholm, 4.30-8 a.m.
COCOD	6,130	48.94	Habana, Cuba.	Relays CMCD 10-4 p.m.	W8XAL	6,060	49.50	Cincinnati, U.S.A.	Relays WLW, Tues., Wed., Fri., Sun., 8.45 p.m.-3 a.m.; Mon., Wed., Sat., 2-5 p.m.; Thurs., noon-2 p.m.; Mon., Thurs., Sat., 8.45 p.m.-5 p.m.
VE9HX	6,130	48.94	Halifax, Canada.	Relays CHNS Mon.-Fri., 10 p.m.-2.15 a.m.; Sun., 2 a.m.-2 p.m.; Mon., 3 a.m.-2.15 p.m.	W3XAU	6,060	49.50	Philadelphia, U.S.A.	Relays WCAU, Mon., Wed., Sat., 3 a.m.-2 p.m.; Thurs., 3 a.m.-noon.
LKL	6,130	48.94	Jeloy, Norway.	Daily, 2-9 a.m.	ZHJ	6,057	49.51	Penang, F.M.S.	Exc. Sun., 9.40-11.40 p.m.; Sun., 2-4 p.m.
CXA-4	6,125	48.98	Montevideo, Uruguay.	Daily, 1-3 a.m., 5-11 a.m.	HJ6ABA	6,054	49.52	Pereira, Colombia.	Daily, 9.30 a.m.-1 p.m., 12.30-3 a.m.
HP5H	6,122	49.00	Panama City, Panama.	Daily, 1-4 a.m., 8 a.m.-2 p.m.	HP5F	6,050	49.59	Colon, Panama.	Irregular.
OFH	6,120	49.02	Lahti, Finland.	Not in regular use yet.	XETW	6,045	49.62	Tampico, Mexico.	Irregular at 10 a.m.
HJ3ABY	6,120	49.02	Bogota, Colombia.	Unknown.	HJ1ABG	6,042	49.65	Barranquilla, Colombia.	Daily, 2 a.m.-2 p.m.; Mon., 2-11 a.m.
W2XE	6,120	49.02	New York City, U.S.A.	Daily, 1.30-2.30 p.m.	TGWB	6,040	49.65	Guatemala City, Guatemala.	Daily, 10 a.m.-3 p.m.
XEUZ	6,177	49.03	Mexico City, Mexico.	Relays XEFO, 4-6 p.m.	W4XB	6,040	49.65	Miami Beach, U.S.A.	Relays WIOD, noon-2 p.m.
HJ3ABX	6,115	49.05	Bogota, Colombia.	Transferred to 4795 k.c.	W1XAL	6,040	49.65	Boston, Mass., U.S.A.	Irregular.
OLR2C	6,115	49.05	Prague, C-Slovakia.	Irregular.	YDA	6,040	49.65	Tandjoprjok, Java.	Daily, 1.30-5 p.m.; Sun., 10.30 a.m.-5 p.m.
XEGW	6,110	49.10	Mexico City, Mexico.	Relays XEJW, 2-4 p.m.	HP5B	6,033	49.75	Panama City, Panama.	Daily, 3-4 a.m., 10 a.m.-1.30 p.m.
VUC	6,110	49.10	Calcutta, India.	Daily, 6-8.30 p.m., 12.30-3 a.m.; Sun., 10.30 p.m.-3 a.m.	VE9CA	6,030	49.75	Calgary, Canada.	Fri., 12.01 a.m.-4 p.m.; Mon., 3 p.m.
VPB	6,110	49.10	Colombo, Ceylon.	Daily, 10 p.m.-12.30 a.m.; Sun., 9.30 p.m.-12.30 a.m.	OLR2B	6,030	49.75	Prague, C-Slovakia.	Thurs., 8.15-8.40 a.m.; Fri., 7.45-8.10 a.m.
HJ6ABB	6,108	49.14	Manizales, Colombia.	Transferred to 4855 k.c.	XEUW	6,023	49.82	Vera Cruz, Mexico.	Daily, 11 a.m.-3.30 p.m.
YUA	6,100	49.18	Belgrade, Jugo-Slavia.	Daily, 4-9 a.m., 3.45-5.30 p.m., 7-11 p.m.	DJC	6,020	49.83	Berlin, Germany.	Daily, 1.40-7.30 a.m.
—	6,100	49.18	Noumea, New Caledonia.	Exc. Mon., Tues., 5-6.30 p.m.	ZHI	6,018	49.84	Singapore, Malaya.	Mon., Wed., Thurs., 8.40-11 p.m.; Sun., 1.40-4.10 p.m.
W3XAL	6,100	49.18	Bound Brook, U.S.A.	Daily, 11 a.m.-3 p.m.	HI3U	6,017	49.85	Santiago de los Caballeros, D.R.	Daily, 3-5, 8-10 a.m., 11 a.m.-12.30 p.m., 10.30 p.m.-mid.; Mon., 3.30-5, 8-9 a.m.
W9XF	6,100	49.18	Chicago, U.S.A.	Daily, 7-9.50 a.m., 3.05-5 p.m.; Mon., 4-9.50 a.m.	PRA-8	6,015	49.85	Pernambuco, Brazil.	Daily, 9 a.m.-noon.
ZRK	6,097	49.20	Kliphevel, S. Africa.	Daily, 3-7 a.m.; Mon., 3-6.20 a.m.	OLR2A	6,010	49.92	Prague, C-Slovakia.	Thurs., 8.15-8.40 a.m.; Fri., 7.45-8.10 a.m.
ZRJ	6,097	49.20	Johannesburg, S. Africa.	Daily exc. Sun., 2.45 p.m.-3.40 p.m. and 6.15-10.30 p.m.; daily exc. Mon., 12.01-2.30 a.m.; Sun., 6.30-7.30 p.m., 8.30-10 p.m.	COCO	6,010	49.92	Habana, Cuba.	Daily, 10.55-3 p.m. (Mon. till 2 p.m.). Relays CMCK.
JZH	6,095	49.22	Tokyo, Japan.	Irregular	VK9MI	6,010	49.92	ss "Kanibla."	Irregular at night; 9.55 p.m.
CRCX	6,090	49.26	Toronto, Canada.	Daily, 10.45 p.m.-8 a.m.; Mon., 1.30-3 a.m.	CJCX	6,010	49.92	Sydney, Canada.	Relays CJCB, 7-11 a.m., 10 p.m.-4 a.m.
ZBW-2	6,090	49.26	Hong Kong, China.	Irregular.	ZRJ	6,007	49.94	Johannesburg, S. Africa.	Exc. Mon., 6.30-7 a.m.
HJ5ABD	6,085	49.30	Cali, Colombia.	Transferred to 4825 k.c.	ZRH	6,007	49.94	Roberts Heights, S. Africa.	Daily exc. Mon., 1-6.30 a.m.; daily exc. Sun., 2.45-3.50 p.m.; Mon., 1.30-3 a.m., 3.15-6.15 a.m.
VQ7LO	6,083	49.31	Nairobi, Kenya Colony.	Mon., Fri., 8.30-9 p.m.; Tues., Sat., 2.15-4.15 a.m.; 11.15 p.m.-12.15 a.m.; Sun., 2.15-5.15 a.m.; Mon., 1.45-4.45 a.m.	HP5K	6,005	49.96	Colon, Panama.	Daily, 1.30-4 a.m.; 8 a.m.-2 p.m., 10 p.m.-mid.
YV1RD	6,081	49.32	Maracaibo, Venezuela.	Daily, 9 a.m.-2 p.m.	CFCX	6,005	49.96	Montreal, Canada.	Relays CFCF, 9.45 p.m.-3 p.m.; Sun., 11 p.m.-1.15 p.m. (Mon.).
TIRA	6,080	49.34	Cartago, Costa Rica.	Testing soon.	VE9DN	6,005	49.96	Drummondville, Canada.	Sun., 2.30-4 p.m.
WJXAA	6,080	49.34	Chicago, U.S.A.	Relays WCFL, irregular.	RV59	6,004	49.97	Moscow, U.S.S.R.	Irregular, 6-8 a.m.
DJM	6,079	49.34	Berlin, Germany.	Irregular.					
OAX4Z	6,077	49.35	Lima, Peru.	Daily, 10 a.m.-1 p.m.					
VP3MR	6,075	49.35	Georgetown, Bri. Guiana.	Daily, 7.45-11.45 a.m.; Sun., 10.45 p.m.-11.15 a.m.					
HJ3ABF	6,073	49.40	Bogota, Colombia.	Daily, 10 a.m.-2.15 p.m.					
CFRX	6,070	49.42	Toronto, Canada.	Relays CFSB, 10.30 p.m.-3 p.m.; Mon., 1 a.m.-3 p.m.					

Call.	Kc.	M.	Location.	Schedule, etc.	Call.	Kc.	M.	Location.	Schedule, etc.
CXA-2	6,002	49.98	Montevideo, Uruguay.—Relays LS-2, Buenos Aires, daily 1.30 a.m.-1.30 p.m.		ZFA	5,025	59.65	Hamilton, Bermuda.—Phones New York.	
ZEA	6,000	50.00	Salisbury, S. Africa.—Same as ZEB, 6147 k.c.; also Sun., 6.30-8 p.m.		TFL	5,000	60.00	Reykjavik, Iceland.—Phones Europe.	
HJ1ABC	6,000	50.00	Quibdo, Colombia.—Unknown.		YV5RM	5,000	60.00	Caracas, Venezuela.—Unknown.	
XEBT	6,000	50.00	Mexico City, Mexico.—Daily, 11 p.m.-4 p.m.		VUD-2	4,995	60.06	Delhi, India.—Daily, 10.30 p.m.-3.30 a.m.	
CS2WD	5,977	50.15	Lisbon, Portugal.—Daily, 6.30-9 a.m.		GBC	4,975	60.30	Rugby, England.—Phones ships.	
OAX4P	5,975	50.16	Huancayo, Peru.—From 11 a.m.		VUM-2	4,950	60.59	Madras, India.—Daily, 10 p.m.-mid.	
YV5RC	5,970	50.24	Caracas, Venezuela.—Unknown.		VUB-2	4,905	61.16	Bombay, India.—Daily, 10 p.m.-3.30 a.m.	
HVJ	5,968	50.27	Vatican City, Italy.—Daily, 5-5.15 a.m.; Sun., 8-8.30 p.m.		HJ3ABH	4,900	61.19	Bogota, Colombia.—Daily, 3-5 a.m., 10 a.m.-2 p.m.; Mon., 3-5 a.m. and 7 a.m.-2 p.m.	
HH25	5,950	50.37	Port-au-Prince, Haiti.—Daily, 10 a.m.-1 p.m.		HJ4ABP	4,885	61.38	Medellin, Colombia.—Unknown.	
TG2X	5,940	50.47	Guatemala City, Guatemala.—Reported off air.		YV6RU	4,880	61.44	Ciudad Bolivar, Venezuela.—Unknown.	
PCJ-1	5,940	50.47	Curacao, Dutch W. Indies.—Tues., Thurs., Sat., 9.36-11.36 a.m.; Mon., 1.36-3.36 a.m.		VUC-2	4,880	61.44	Calcutta, India.—Daily, 5.06-7.06 a.m.; 10.06 p.m.-3.36 a.m.	
YV1RL	5,935	50.52	Maracaibo, Venezuela.—Daily, 2.43-4.43 a.m., 8.13 a.m.-1.13 p.m.; Mon., 12.13-6.13 a.m.		HJ6ABH	4,875	61.5	Armenia, Colombia.—Daily, 9 a.m.-1 p.m., 11 p.m.-2 a.m.	
YV4RE	5,913	50.71	Valencia, Venezuela.—Irregular.		HJ6ABB	4,855	61.78	Manizales, Colombia.—Tues., Sat., 3.15-4 a.m.; Wed., Sat., 10.30 a.m.-1 p.m.; Mon., 5.30-8 a.m.	
ZNB	5,900	50.84	Mafeking, S. Africa.—Daily, 4-5.30 a.m., 9-10 p.m.		HJ3ABD	4,842	61.95	Bogota, Colombia.—Daily, 3-5 a.m., 10 a.m.-2 p.m.; Mon., 8 a.m.-noon.	
TILS	5,900	50.84	San Jose, Costa Rica.—Daily, 9 a.m.-1 p.m.		HJ5ABD	4,835	62.18	Cali, Colombia.—Daily, 3-4.30 a.m., 8 a.m.-12.30 p.m.	
YV3RA	5,898	50.86	Barquisimeto, Venezuela.—Daily, 3-4 a.m., 9 a.m.-1 p.m.		GDW	4,820	62.24	Rugby, England.—Phones New York.	
JIC	5,890	50.90	Taihoku, Formosa.—Phones Tokyo, 8 p.m.-1 a.m.		YV3RN	4,820	62.24	Barquisimeto, Venezuela.—Unknown.	
HI9B	5,885	50.95	Santiago, D.R.—Irregular, 9 a.m.-2 p.m.		HJ7ABD	4,815	62.3	Bucaramanga, Colombia.—Around 11 a.m.	
HRN	5,875	51.06	Tegucigalpa, Honduras.—Daily, 4.15-6.15 a.m., 11.30 a.m.-1 p.m.; Mon., 6.30-8.30 a.m., 11.30 a.m.-12.30 p.m.		HJ1ABP	4,810	62.37	Cartagena, Colombia.—Daily, 2-4 a.m., 8 a.m.-2 p.m.; Mon., 1-4, 6-9 a.m.	
HI1J	5,855	51.25	San Pedro de Macoris, D.R.—Daily, 3-5 a.m., 9.30 a.m.-noon.		YDE-2	4,810	62.37	Solo, Java.—From 8.30 p.m.	
WOB	5,853	51.26	Lawrenceville, U.S.A.—Phones Bermuda.		HJ1ABE	4,800	62.46	Cartagena, Colombia.—Daily, 11.30 p.m.-2 a.m.; Mon., 1 a.m.-noon.	
YV1RB	5,845	51.31	Maracaibo, Venezuela.—Daily, 2.15-3.15 a.m., 7.45 a.m.-12.15 p.m., 11.45 p.m.-12.45 a.m.; Mon., 2.45-3.45 a.m.		HJ3ABX	4,795	62.51	Bogota, Colombia.—Daily, 3-5 a.m., 8.30 a.m.-2 p.m.; Mon., 9 a.m.-2 p.m.	
YV5RR	5,835	51.42	Caracas, Venezuela.—Unknown.		HJ2ABC	4,790	62.57	Cucuta, Colombia.—Unknown.	
YV1RE	5,830	51.46	Maracaibo, Venezuela.—Unknown.		HJ1ABB	4,780	62.72	Barranquilla, Colombia.—Daily, 2.30-4 a.m., 7.30-9 a.m.	
TDD	5,830	51.46	Shinkyo, Manchukuo.—Phones Tokyo, 8 p.m.		HJ7ABB	4,775	62.82	Bucaramanga, Colombia.—Relays HJ7ABA, 2.30-4 a.m., 9 a.m.-1.30 p.m.	
TIGPH	5,825	51.50	San Jose, Costa Rica.—Daily, 2-4 a.m., 9 a.m.-1 p.m.; also relays TIX irreg.		HJ2ABJ	4,772	62.85	Santa Marta, Colombia.—Daily, 2.30-5 a.m., 8.30 a.m.-2.30 p.m. (exc. Thurs.).	
TIGPH-2	5,813	51.59	San Jose, Costa Rica.—Irreg.		WAQ	4,752	63.10	Ocean Gate, U.S.A.—Phones ships.	
YC5RC	5,800	51.72	Caracas, Venezuela.—Daily, 1.30-5 a.m., 6.45 a.m.-noon, 10-11 p.m.; Sun., 11.30 p.m.-1.30 a.m. (Mon.).		HJ7EAB	4,750	63.13	Bucaramanga, Colombia.—Relays HJ7EAK till 1.10 p.m.	
TGS	5,790	51.81	Guatemala City, Guatemala.—Unknown.		HJ6ABC	4,740	63.25	Ibaque, Colombia.—Daily, 10 a.m.-3 p.m.	
JVU	5,790	51.81	Tokyo, Japan.—Irreg. Phones JIC and TDD.		WAQ	4,272	70.22	Ocean Gate, U.S.A.—Phones ships.	
YNOP	5,758	52.11	Managua, Nicaragua.—Daily, 11 a.m.-12.30 p.m.		RV15	4,250	70.42	Khabarovsk, U.S.S.R.—Daily, 4 p.m.-1 a.m.	
YV2RA	5,740	52.23	San Cristobal, Venezuela.—Daily, 2.30-3 a.m., 8.30 a.m.-noon; Mon. till 1 p.m.		HCJB	4,107	72.99	Quito, Ecuador.—Daily, 2.45-5.30 a.m. (exc. Tues.); Mon., 3-4.30 a.m., 8.30 a.m.-1 p.m.	
HC1PM	5,735	52.28	Quito, Ecuador.—Tues., 11 a.m.-2 p.m.		CS2WZ	3,599	83.35	Ponta Delgada, Azores.—Daily, 8.30-9.30 a.m.	
OK1MPT	5,145	58.31	Prague, C-Slovakia.—Sat., 7.45-8.10 a.m.; Sun., 8.15-8.40 a.m.		CR7AA	3,490	85.95	Laurencio Marques, Mozambique.—Daily exc. Mon., 12.01-2 a.m., 3-7 a.m., 3-4 p.m.; exc. Sun., 7.30-9.30 p.m.; Mon., 1-5 a.m.; Sun., 8-10 p.m.	
PMY	5,145	58.31	Bandoeng, Java.—Daily, 8.30 p.m.-2 a.m.		YDA-7	3,270	91.74	Pekalongan, Java.—From 8.30 p.m.	
WCN	5,077	59.03	Lawrenceville, U.S.A.—Phones England irreg.		YDA	3,040	98.68	Tandjongpriok, Java.—From 8.30 p.m.	

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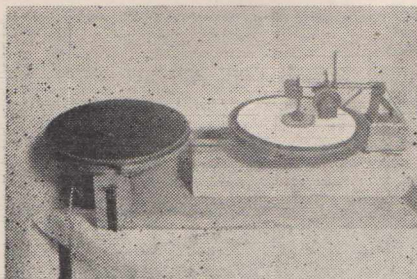
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In this equipment, designed by the authors, considerable pains have been taken to ensure accurate and constant turntable speed while recordings are being made.

THE recording equipment at present being used by the authors has for its driving power a $\frac{1}{4}$ h.p. 1400 r.p.m. 240-volt a.c. motor. While this power is considerably in excess of that actually required to drive the turntables, the margin makes any change in motor speed most unlikely.

The motor drives a variable gear of the friction type. This piece of equipment has proved most useful, as any speed between 25 r.p.m. and 90 r.p.m. can be obtained, while its fine adjustment to secure accurate 78 r.p.m. and 33 1-3 r.p.m. speeds (as checked with a stroboscope) leaves nothing to be desired.

A round belt running in wedged pulleys is then used to drive the first turntable, as shown in the photograph on this page. This turntable is weighted with lead, and is running about three times the cutting turntable speed. The first turntable is used only for its flywheel action, its weight and comparatively high speed serving as an additional aid against speed variation. A further belt drive then transmits the power from the flywheel turntable to the cutting turntable.

Each table, after being loaded with lead until its weight is approximately 10 lbs. is, of course, dynamically balanced, and both turntables are running on well-lubricated ball bearings. All of these precautions have been taken in order to secure a cutting turntable speed which is quite constant, but satisfactory results can be obtained from equipment using only a single table and a less complicated drive arrangement from the motor.

The Drive Mechanism.

The drive mechanism for the cutting head is quite conventional. A clamp drops down over the centre boss on the turntable, and through a bevel gear transmits the cutting table revolutions to a horizontal threaded rod, which is screwed so as to give the head a sideways motion, and a cutting pitch of 96 grooves to the inch.

Home Recording . . . (2)

In this instalment the authors describe the equipment at present being used by them, and discuss the advantages of the soft acetate type recording disc.

By J. C. WARREN and T. M. O'DONNELL

Attached to the head itself is a screwed piece of mild steel somewhat similar to half of a machine nut having a thread corresponding to that on the rod. A small lever is used to lift the screw from the rod, thus arresting the sideways motion of the head, and at the same time raising the cutting needle from the disc.

A little practice in raising and lowering the cutting head enables the enthusiast to become surprisingly adept in following an interrupted cut. To quote an example, where a track had been damaged, two words were inserted fairly successfully upon the disc.

In the matter of an amplifier for home recording, opinions vary considerably as to what constitutes the ideal type. The enthusiast, however, will be well advised to instal the best type he can afford, the power output depending on the type of cutting head being used. Full details on the power required to drive the cutting head should be obtained from the agents when making the purchase.

A single 2A3, properly excited, would have been sufficient for the head in the equipment being described, although it is always advisable to have a little power to spare.

The Output Transformer.

While quite good results may be obtained by connecting the cutting head through condensers from the output load of the amplifier, a correctly-designed output transformer is strongly recommended.

It may be necessary to have this specially made to suit the respective impedances of output valve and cutting head. (The approximate impedance of the head in use is 1800 ohms at 900 cycles.) One advantage of using triodes in the output stage of the amplifier is that the matching is not nearly so critical as is the case with pentodes.

The Level Meter.

Connected right at the cutting head is that most important piece of apparatus, known as the level meter. A level meter of some kind is absolutely essential if good results are desired.

Advantage Of Soft Acetate Discs.

At this stage it would be well to discuss the work which is being done on soft acetate discs by some of the companies who are commercially interested.

To these users the discs offer the following advantages when compared with wax recordings:—

CORRECTION.

The authors of "Home Recording" (No. 1) last month were shown as T. O'Donnell and W. J. Phelps. This should read J. C. Warren and T. M. O'Donnell.

Releasing the clamp on the centre boss enables the whole of the head and screwed rod to be lifted clear of the turntable so that the discs may be removed, permitting the cutting needle to be inspected, replaced or adjusted. As the motor and variable gear are mounted upon the floor and the cutting table placed on a pad, there is little chance of motor vibration modulating the cutting stylus.

The amplifier used on the original equipment consisted of a 57 and a 56 pre-amp., 57 (triode), 42 (triode) driving two parallel '50s. The last two stages were transformer-coupled using high-grade equipment, and all stages decoupled, eliminating high-tension from the primaries. A crystal microphone (type D104) was used for speech recordings. 2.5-volt valves were used in the early stages because it was found that the hum level was slightly lower.

(1) They require no previous preparation before cutting, while the wax type must be correctly warmed. The only necessary precaution with acetate discs is to make certain that they are "fresh"; in other words, that they have not been exposed to the air for lengthy periods, as such exposure tends to harden the surface.

(2) Their surface noise level is lower than that of the wax.

(3) By the use of the correct equipment, together with a thorough understanding of the certain other limiting factors, a frequency response may be obtained which is quite satisfactory and which is constantly being improved.

(4) The discs can be used as masters for pressing, a quite important feature being that more than one master can be made from each acetate disc, whereas the wax is useless when one master has been taken from it.

Long Playing Cuts.

Realising the advantages of this type of disc, many of the companies are using them for recording plays, etc., for broadcasting. However, the equipment for using them is very costly, as no effort is spared to ensure that the disc is running at an

absolutely constant speed, and that the audio channel from microphone to cutting head is flat in response from about 40 to 9000 cycles.

As a result, a 16½in. disc can be cut at 33 1-3 r.p.m., using the extremely fine pitch of 200 lines per inch. As the usual pitch is only about 96 lines per inch, it will be observed that double the playing time is available on the same size disc.

Hardening Processes.

Normally a soft acetate disc does not require hardening. When such a disc has been cut, the sides of the groove are freshly exposed to the air, and are therefore a little soft. After a time they harden like the original surface, but few, if any, home recording enthusiasts would wait before playing back the record. There is, however, a method of hardening the surface which may be of some use.

A small piece of soft cloth is saturated with carbon tetrachloride (obtainable from any chemist) and is held against the disc, which is still revolving. The cloth is then wiped sideways over the record so that the liquid runs into the grooves.

One wipe is generally quite sufficient, and the carbon tetrachloride

produces an effect which is of a similar nature to that of case-hardening in metal. A thin skin of one-thousandth of an inch thick is hardened, the action being known technically as de-plasticising the plastic—the plastic being the materials put in the acetate to keep it soft and suitable for cutting. The disadvantage of this hardening process is that it increases the scratch level.

However, a definite improvement in both scratch level and disc playing life can be obtained by treating the disc with some form of greaseless lubricant such as french chalk, talc or paraffin in solution. The first two are simply dusted on, while the latter is applied in a similar fashion to that adopted in the hardening process. These substances, being lubricants, tend to prevent the playback needles from cutting shavings from the sides of the grooves.

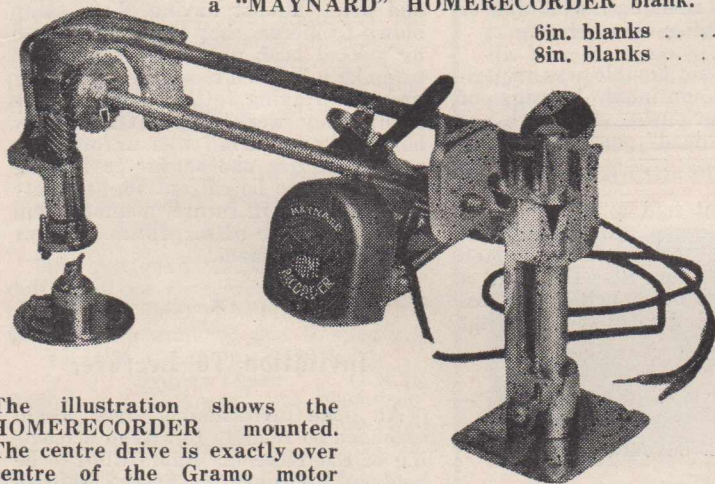
The progress made in instantaneous playback recordings over the past few years has been really remarkable, but it can be safely stated that the really greatest single contributing factor has been the research conducted in producing a satisfactory coated disc.

(To be continued.)

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The illustration shows the HOMERECORDER mounted. The centre drive is exactly over centre of the Gramo motor spindle. When not in use the HOMERECORDER can be swung away from the table.




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By W.J.P.

Testing and changing the 6-volt batteries used to drive the heavy duty genemotor. Left to right: 2ACS, 2PX, L. Martin, 2VA, Martin Junior, 2IC and 2BN.

THE week-end of December 3 and 4 proved to be much more favourable for the 1938 W.I.A. National Field Day than that of the previous year. As far as Sydney was concerned, conditions generally were fair, the two days being fine and hot. The Lakemba Club site at Macquarie Fields, with its delightful swimming pools, was voted by those present as an ideal spot for the occasion.

Unfortunately, the arrangements this year were very hurried, due to some delay in fixing the date, the result being that our party was not as large as last year, there being only about 14 in attendance.

Last year, the main problem was battery supply to drive the genemotor for the transmitter H.T. supply. This year, however, the Battery Equipment Supply Co., of Allen Street, Waterloo, generously supplied twelve 6-volt heavy duty accumulators. The first batch of these batteries drove an extra heavy duty genemotor during an 18-hour period, and were only changed at this stage because a few showed a slight voltage drop on maximum load. The above photograph shows the change being made to provide the greatest output for the remaining few hours of the contest.

Two transmitters were in use, one on 40 and the other on 20 metres. The club transmitter has been constructed in a semi-portable manner similar to that of 2EH's, described in a previous publication of "Radio World." Three receivers were used, one being of the

communications type recently featured in this magazine. For the receivers and bias supply, the usual bank of Ever-Ready batteries was used.

Three operators were on duty at once, each shift lasting four hours. A double-pole double-throw switch connected the genemotor supply to either transmitters. Those off duty spent the time sleeping, swimming or otherwise enjoying themselves.

Fortunately, no trouble was experienced from a continual barrage of static as previously, although at times several "dead" periods were encountered.

Those present had a most enjoyable week-end except 2BN, whose activities were somewhat restricted through being taken ill. He spent a very bad night, but much to the relief of all, had recovered somewhat by the morning.

★

Dots, Dashes And Ticks!

A few of the younger club members are obtaining rather good results with their portable signal apparatus. This consists of two small boxes each containing buzzer, key and battery arrangement, and is used for code practice in the bush. The output is attached to a convenient wire fence, and ground; and providing the fence wire is continuous, code messages are transmitted from one to the other

over quite a distance. 2CL vouches it to be an excellent method for making beginners concentrate on the code.

While out on a recent week-end camp with this apparatus, Les Taylor, Jim Duncan and Adrian Nall had a rather unfortunate experience. It was the Saturday of the Sydney hurricane, and after almost having their camp blown to pieces, they were threatened by a local bush fire, and were forced to make a hurried departure for safer ground. Having settled down for the night, they were then attacked by bush ticks. Adrian was unfortunate enough to get one so far in his leg that it had to be cut out immediately with a knife. In future, members will include a bottle of turpentine in their camping equipment!

★

Invitation To Lecture.

An open invitation is once again extended to readers to attend a meeting of the Lakemba Radio Club to be held on February 14 at the Sunrise Hall, Canterbury, when Mr. A. Luciano, chief chemist of the Ever-Ready Battery Co., will deliver a lecture on the process involved in the manufacture of dry batteries.

Information relative to club matters may be obtained from the Secretary, 14 Park Avenue, Concord, or the Publicity Manager, 14 Watkin Street, Canterbury ('phone UA 4751).

**Gladesville Radio Club Notes
And News.**

The Gladesville experimental radio club has not had a great deal to report during the last few weeks. Our outstanding meeting was when Mr. Choules (2HB) gave an interesting lecture on ham transmitters and their construction, etc. We also have had our coffee and biscuit night once a month, and this proves to be a very popular night indeed, if the way the boys go for the coffee is any indication. Mr. Jim Walters capably prepares the spread, and his efforts are not wasted.

Another night which was interesting was a questions and answers night, which resulted in many technical arguments. On the same night, Mr. Harry Clay gave an explanation of some of the mysteries of police radio. There is every probability of some interesting lectures from prominent radio men in the near future. On December 13, we held an auction night, and on the following Tuesday a lecture was given by Mr. J. Paton (2VQ) on X-ray apparatus and its applications.

The club's receiver built by Mr. Manley (2XH) is now working well, and we are now waiting on our call sign. Activity among the transmitting members of the Club seems to have waned somewhat. I believe 2AEX puts over a few records on Saturday mornings on "40," Dick of 2AHR is also on "40" on c.w., 2NP varies between "40" and "20" (also c.w. crank), 2AL is on "20" occasionally, while 2XH and 2EW are very rarely on at all now.

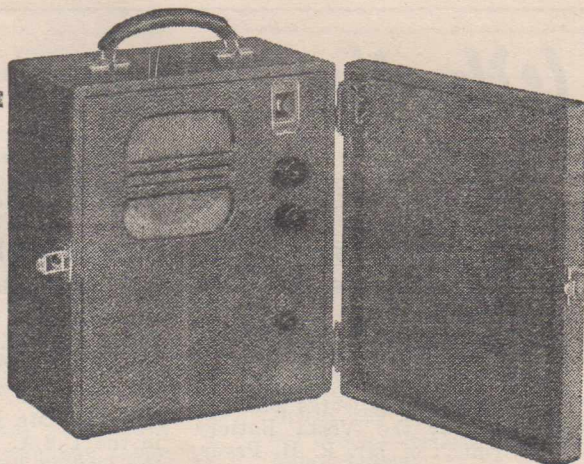
We would appreciate inquiries re membership at the club meetings, which are held on Tuesday nights in the Protestant Hall right at the Gladesville tram terminus.—E. W.

**VK2ME, 3ME And 6ME —
Schedules For January And
February, 1939.**

The following transmission schedules will be observed by shortwave stations VK2ME, VK3ME and VK6ME during January and February.

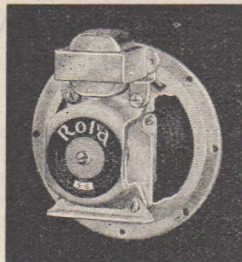
VK2ME (31.28 m., 9590 k.c.).		
Sydney Time. G.M.T.		
Sundays:	4-6 p.m.	0600-0800
	8 p.m.-midnight.	1000-1400
Mondays:	Midnight-2 a.m.	1400-1600
VK3ME (31.5 m., 9510 k.c.).		
Melbourne Time. G.M.T.		
Nightly		
Monday to	7 p.m.-10 p.m.	0900-1200
Saturday		
(inclusive)		
VK6ME, Perth (31.28 m., 9590 k.c.).		
Perth Time. G.M.T.		
Nightly		
Monday to	7 p.m.-9 p.m.	1100-1300
Saturday		
(inclusive)		

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**Model 5-6 CHOSEN EXCLUSIVELY
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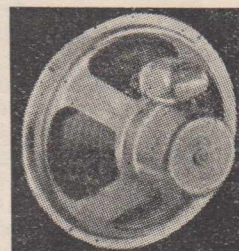
For each of the three models of the well-known "Outdoor Portable Four" described in "Radio World" during the past three years, the technical editor has chosen and specified exclusively a ROLA speaker. Now for the "One-Four Portable Five," first receiver of its type to be described in an Australian magazine, ROLA has been chosen again... indisputable proof of Rola superiority.



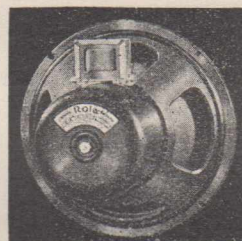
The model recommended is the 5-6 PM illustrated alongside. A 5" midget designed for all applications where space is at a premium, it is light, compact and sturdily built. For its size it has no equal for sensitivity, tonal quality and power-handling ability.

PRICE 26/-

Illustrated alongside is the well-known Model K-12 Rola speaker recommended for the "1939 Sky King Dual-Wave Five." A de luxe 12" wide range reproducer of the electro dynamic type, the Rola K-12 has been designed to meet the ever-increasing demand for fidelity of production and power handling capacity. It is the ideal choice for those wanting a large high-quality speaker at reasonable cost.



NEW REDUCED PRICE 44/-



The Rola G-12 has long been recognised by discriminating engineers as the finest high fidelity reproducer sold in the Commonwealth. It is particularly recommended for de luxe receivers such as the well-known "Radio World" "Fidelity Eight." A 12" speaker with massive field coil structure (maximum 3½ lbs. of wire capacity), its features include the new wide range cone, new method of cone suspension, new spider and new high efficiency voice coil.

PRICE £8

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amplifying systems proof positive of Rola quality !**
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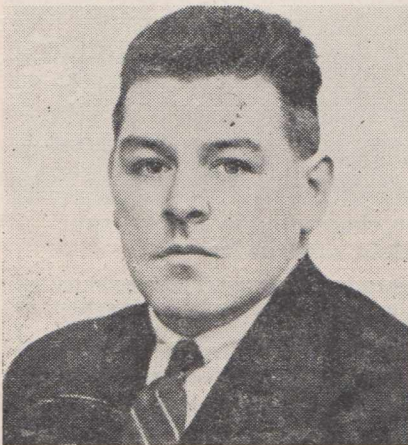
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What's New In Radio

A monthly review of latest releases
in sets, kit-sets, and components

New Works Manager For Vesta Battery Company

The appointment as works manager is announced by the Vesta Battery Co., of Sydney, of Mr. R. H. Pryor,



Mr. R. H. Pryor.

late works manager of Edison Swan Accumulator Co., of Enfield, England.

Now on his way to Australia, Mr. Pryor is now in New York where he will spend some time in the battery plants of Vesta and Emark-Edison, and in the research laboratory of the National Lead Co. This firm supplies most of the lead and lead oxide for the battery industry in the States, and maintains a miniature battery factory with a staff of seven men continually engaged in research.

After leaving New York Mr. Pryor will inspect factories at Gould and Buffalo, U.S.L. at Niagara Falls, Solar at Milwaukee and many others. Arrangements have also been made for Mr. Pryor to spend a week in the Vesta plant in Wellington, New Zealand, before arriving in Sydney towards the end of January.

Mr. Pryor is a highly qualified metallurgic chemist, battery and electrical engineer, and his battery manufacturing experience covers every phase of the industry's development during the past 25 years. He was for two years with the Exide Company and for ten years with Oldham & Sons Ltd., one of the largest battery manu-

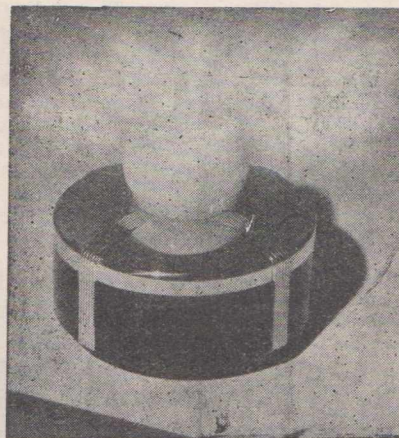
facturers in England, the last four years being general works manager of their huge plant.

In 1931 Mr. Pryor spent six months in the U.S.A. on a technical tour of the leading battery factories in that country. In 1935 a similar technical tour was undertaken of the larger factories in France and Germany; so he is well versed in every new development in America, England and the Continent during the last ten years. The policy of the Vesta Battery Company has always been to employ the best personnel available and, with the engagement of Mr. Pryor, with his English and Continental experience, combined with the information available from the research laboratories of the huge plants of National Battery Co., Gould and Vesta in U.S.A., the Vesta factories in Australia and New Zealand now have at their disposal a wealth of knowledge of the battery industry.



Ever-Ready Dual-Purpose "Masterlite."

One of the newest additions to the popular Ever-Ready range of torches is the novel dual purpose "Masterlite" No. 2238, illustrated above. Made in solid chromium-plated brass



with a modernistic black finish, it offers the buyer both a softly glowing night light (see left) and a powerful searchlight (see right), with a range of 400 feet, the latter being built into the base.

It lights automatically when the glass ball is lifted and uses two Ever-Ready U4 batteries, bulb 2111.



Triplett Push-Button Tester.

Messrs. W. G. Watson & Co. Pty. Ltd., 279 Clarence Street, Sydney, Australian representatives for Triplett instruments, announce the arrival of the latest Triplett Model 1611 robot valve tester and volt-ohm-milliammeter. This instrument is provided with simplified push-button control—the newest development in servicing. The particularly wide range of tests possible with this instrument are taken care of by the 47 push buttons mounted on the front panel.

The valve-testing circuit is the modified emission type, and is constructed to RMA load requirements. A push-button controlled filament location switch enables filament voltages to be applied to any prongs of the valve, while a return location switch allows the return circuit to be applied to the proper prongs. The results show directly on the GOOD-BAD three-colour scale. A neon shorts test indicates the slightest inter-element shorts and leakages, while separate plate tests on diodes and rectifiers are provided. The test-ballast types.

er checks any receiving valve, plus Volt-ohm-milliammeter ranges are: —D.C. volts 0-10-50-250-500-1000 at 1000 ohms per volt; D.C. milliamperes 0-1-10-50-250; low ohms, backup circuit, ½ to 500; 300,000 ohms, 1.5 and 3 megohms. A.C. volts 0-10-50-250-500-1000 at 400 ohms per volt. The



The Ever-Ready dual-purpose "Masterlite," which lights automatically when the glass bulb is lifted.

plug-in copper oxide rectifier used simplifies replacement in case of unintentional damage. Operating instructions are on the rotating chart, and indicate buttons to be pressed for the desired range. Coloured buttons are provided for easy selection.

A unique shadow type A.C. meter is used for line volts adjustment, controlled by push-buttons. Front illumination is regularly supplied on the indicating instrument. The attractive all-metal case has a lustrous satin finish and sloping panel, and is provided with a removable cover. Case size is 15¼" x 11⅝" x 6½", closed.

New Triplett Meters.

The particularly wide range of Triplett meters now available is also well worth inspection. Several new types have been added recently, in-

cluding the 7-inch edgelit square type provided with coloured glass dial with contrasting scale markings, and the new 529 D.C. and 539 A.C. fan types.

Complete information on the above tester and meters, and on the entire range of Triplett and Delta testing equipment, is available free on request from Messrs. W. G. Watson & Co. Pty. Ltd., at the address given above.

★

New Range Of Palec Moving-Iron Meters

The Paton Electrical Instrument Co. announce that a complete range of Palec moving-iron voltmeters and ammeters is now available. Inquiries are invited.

RADIO BOOK REVIEWS

New Radio Amateur Handbooks

1939 Radio Amateur's Handbook.

The sixteenth (1939) edition of "The Radio Amateur's Handbook," for many years now recognised as the amateur's "bible," continues the long record of comprehensive and authoritative coverage of its field—amateur short-wave radio—established by its fifteen predecessors. The new volume contains 560 pages with over 300,000 words, as well as some 815 illustrations, 50 charts and tables, and 87 practical equations and formulas. Increased space provided by the addition of several pages of text and a somewhat more compact format has been devoted to new material.

The thorough revision of the material in terms of latest amateur practice has been carried to the extent of actually designing, building and testing more than thirty pieces of new equipment. The equipment described represents the best in current amateur practice, rather than striking or novel innovations of unproved merit, and is based on time-tried circuits and layouts of established worth.

The introductory chapter on fundamentals has been completely re-written, and represents a fresh approach to this most important phase of the manual. The vacuum tube tables have been considerably expanded, with comprehensive data on the characteristics of approximately 400 types; tables for control and regulator tubes as well as cathode-ray tubes have been added.

The important chapters on receivers, transmitters and radiotelephony contain data dealing with the bulk of the new equipment. The presenta-

tion demonstrates the fruits of an intensive analysis of the requirements of the modern amateur and a painstaking, logical effort to fulfill these requirements. A greatly revised treatment of antenna systems, with considerably wider scope and much new material, completes a wholly up-to-date consideration of the basic requirements of the amateur station.

New constructional material is presented in the chapters on power supplies, emergency and portable equipment, and instruments and measurements as well. Other chapters have likewise been freshened and brought into step with the times.

The 1939 edition of the Handbook is dedicated to the late Ross A. Hull, for ten years editor of the volume, who was accidentally electrocuted during the preparatory work on the present edition. Publication was carried to conclusion by the remaining collaborating members of the A.R.R.L. Headquarters staff, but the book still bears the unmistakable impress of Hull's editorial guidance, and thus it represents a fitting symbol to the influence he exerted on amateur radio.

"The Radio Amateur's Handbook," sixteenth (1939) edition, by the Headquarters staff of the American Radio Relay League. Published by the American Radio Relay League, West Hartford, Conn. 560 pages, with approximately 815 illustrations and 50 charts and tables. Obtainable from McGill's Newsagency, 183-185 Elizabeth Street, Melbourne. Price 8/-, postage 10d.

★

1939 Edition Of "Radio" Handbook Now Available

Supplies of the fifth (1939) edition of the "Radio Handbook," released by the publishers of the well-known

RADIO TEXTBOOKS

For

1939

- RADIO AMATEUR HANDBOOK for 1939. Published by Q.S.T.—American Radio Relay League. Price, 8/- (postage 10d.).
- JONES RADIO HANDBOOK 1939, by "Radio" California. Price, 9/- (postage 8d.).
- ADMIRALTY HANDBOOK of Wireless Telegraphy. New edition in two volumes. Price, 17/- the pair (2/- postage).
- TESTING TELEVISION SETS by Reyner. Price, 14/6 (postage 6d.).
- AMPLIFICATION & DISTRIBUTION OF SOUND by Greenlees. Price, 16/- (postage 6d.).
- RADIO LABORATORY HANDBOOK by G. Scraggie. Published by Wireless World. Price, 13/9 (postage 6d.).
- WIRELESS TRANSMISSION FOR AMATEURS by Camm. Price, 3/9 (postage 4d.).
- P.M.G. HANDBOOK FOR W/T. Price, 1/3 (postage 2d.).
- RADIO ENGINEERING by Terman (new edition). Price, 36/- (postage 10d.).
- PRACTICAL RADIO COMMUNICATION. Nilson and Hornung. Price, 32/6 (postage 9d.).

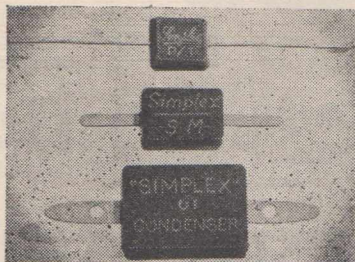
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AGENTS IN ALL STATES.

American amateur magazine "Radio," are now available in Australia.

Comprising 592 pages with 20 chapters and an appendix containing many useful formulae, tables, amateur abbreviations, etc., this latest edition has been thoroughly revised throughout. The greater portion of the equipment described was built especially for this handbook, though a few outstanding items from other "Radio" publications have been included.

Amateur transmitters will be interested in the new methods that have been evolved for the presentation of buffers and amplifiers. By means of them, the reader will be able to select the oscillator, buffer, and doubler or final amplifier which he prefers, regardless of the type of tube he has or wishes to use. This will permit the design of a transmitter employing one of several suitable combinations of the respective units. It is not necessary to adhere to one complete set of instructions in planning a transmitter. But for those who so desire, several completely-built transmitters are described.

Taken all in all, no effort has been spared in an attempt to compile the most comprehensive book on the subject, both as a reference for those with wide knowledge of the field and as a practical text for those of limited knowledge and means.

The "Radio Handbook," 5th edition, published by Radio Limited, 7460 Beverley Boulevard, Los Angeles, California. Our copy from McGill's Newsagency, 183-185 Elizabeth Street, Melbourne. Price 9/-, postage 8d.



Testing Television Sets.

The steadily-increasing number of textbooks available on television has been augmented by a new publication just released by Messrs. Chapman & Hall, of London, entitled "Testing Television Sets." It is written by that well-known English radio and television authority, J. H. Reyner, B.Sc., A.C.G.I., A.M.I.E.E., M.Inst.R.E.

While so far there are no television sets in Australia to need servicing, the book can nevertheless be recommended to those studying the subject, because by becoming familiar with typical faults and with the methods of diagnosing and curing them, an excellent knowledge can be gained of the fundamental principles involved.

By methods of deductive reasoning rather than rule of thumb guesswork, the reader is conducted through the various essential portions of a television receiver, the possible faults noted and their diagnosis and cure discussed. The book is well illustrated with typical circuit diagrams and photographs of actual fault conditions.

"Testing Television Sets," by J. H. Reyner, B.Sc., A.C.G.I., D.I.C., A.M.I.E.E., M. Inst. R.E. Published by Chapman & Hall Ltd., of

London. Obtainable from McGill's Newsagency, 183-185 Elizabeth Street, Melbourne. Price 14/6, postage 6d.



The Amplification And Distribution of Sound.

The need that has existed for a textbook on sound amplifying equipment has at last been fulfilled with the publication of "The Amplification and Distribution of Sound," by A. E. Greenlees, A.M.I.E.E. The book presents a general survey of the principles of sound amplification and distribution, together with sufficient technical detail to enable the reader to appreciate the fundamental principles. The mathematical treatment of the subject has only been introduced where really necessary, and no advance knowledge of mathematics is necessary to follow the text.

Details of transformer design are included so as to enable the reader to appreciate the requirements of transformers for various impedance matching and circuit coupling purposes.

Decibel levels and calculations have received special treatment, together with methods and examples of all the calculations involved.

Fault location and tests on components and amplifiers, microphones and loudspeakers are described, also arrangements for performance measurement.

Microphone and loudspeaker location, power requirements, distribution lines, load matching and acoustics are dealt with in various chapters, with examples of practical applications and the calculations involved.

The volume contains 82 figures of circuits, block schematics, response curves and constructional details of components. A very comprehensive index is included to facilitate easy reference, and decibel and wire tables are included so that the engineer has all necessary information contained in the volume.

To all radio and public address engineers, wireless operators, talkie operators and students, this book should prove of great help and value.

"The Amplification and Distribution of Sound," by A. E. Greenlees, A.M.I.E.E. Published by Chapman & Hall Ltd., of London. Obtainable from McGill's Newsagency, 183-185 Elizabeth Street, Melbourne. Price 16/-, postage 6d.

QSL Exchange Bureau

The following member would like to exchange QSL cards with other readers:—

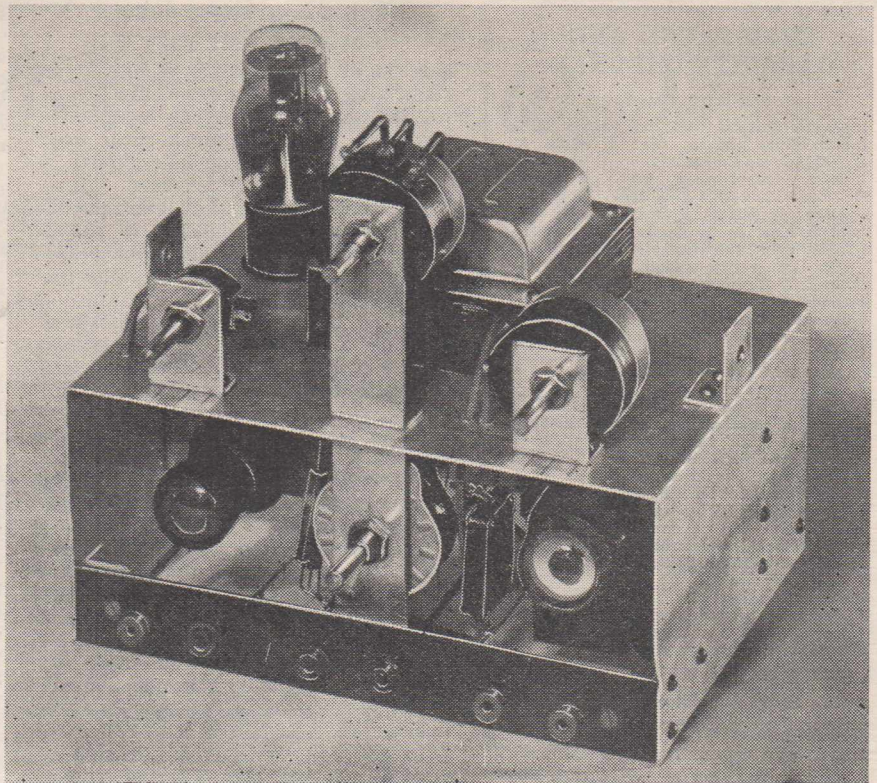
Miss M. E. Carson (AW453DX), George Street, Bowen, North Queensland.

TEST EQUIPMENT . No. 5

Resistance And Capacity Checker

Further details of the assembly and wiring of the "C" and "R" checker featured last month are given below.

By **W. McGOWAN**
(VK2MQ)



THERE is scope for individuality in regard to the design and construction of the resistance and capacity checker described last month, but as it is intended to match the other instruments in this series, the case dimensions decided on were 9" x 9" x 6". The case is made of 18 gauge iron and is crystalline-lacquered.

The photographs reproduced with

this article give an excellent idea of the disposition of parts. In front view shown, the on/off switch is on the left, calibrated control top centre, range switch bottom centre and power factor control on right.

The chassis on which the instrument is assembled is aluminium, and measures 8" x 5 $\frac{3}{4}$ " x 3 $\frac{1}{2}$ " deep. The front is open except for a strip of

bakelite 1" wide x 8" long bolted along the bottom. The six sockets mounted on it project through the front panel.

The transformer is mounted at the rear in the centre so that the leads from the 50-volt a.c. lugs come up through the chassis on to the terminal lugs of the calibrated potentiometer. All a.c. leads must be spaced well away from the 6E5 grid or otherwise a blurred pattern will result. Incidentally, if difficulty is experienced in getting a sharp balance with very high impedance, an earth lead can be tried.

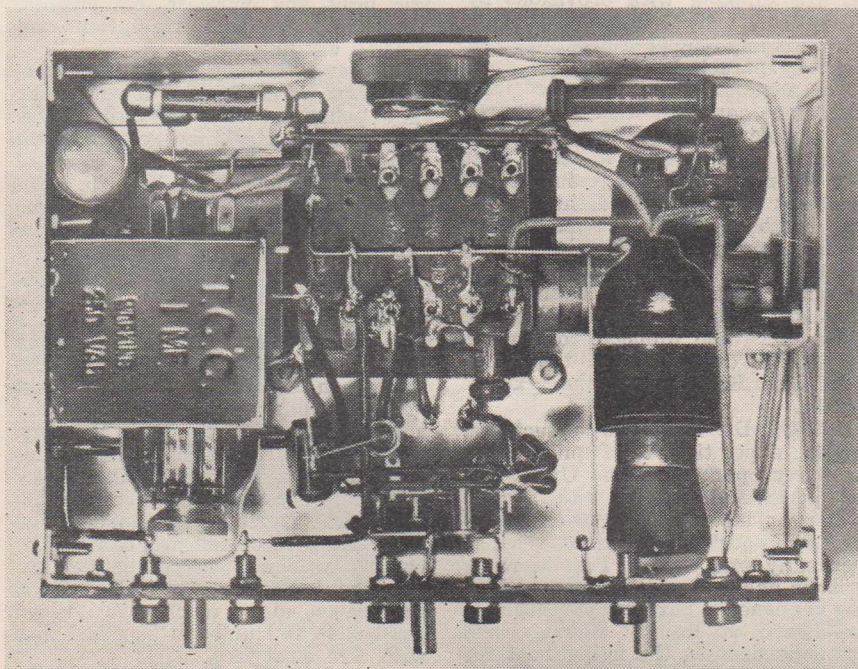
The placement of the standard resistors and capacitors is very important. Each should be mounted directly on the selector switch with a minimum of capacity to each other and to chassis.

The actual reading of the scale is very simple, the following method being that to adopt for making actual measurements. Top centre of the circular scale is marked "1," and all values around to left bottom consti-

1
tute $\frac{1}{100}$ of the value in circuit. All

values around to the right represent 100 times the value in circuit. For example, if the selector switch is on

An excellent idea of the assembly of the instrument can be gained from the illustrations on this page, showing front- and under-chassis views.



RESISTANCE AND CAPACITY CHECKER

List of Parts

- 1 crackle-finished carrying case.
- 1 aluminium chassis, 8in. x 5 $\frac{1}{4}$ in. x 3 $\frac{1}{2}$ in., and brackets.
- 1 power transformer, 6.3v. .3 amp., 6.3v. .3 amp. c.t., 200v. 10 m.a., 50v. 10 m.a.
- 1 1,000 ohm potentiometer (Radiokes).
- 1 2,500 ohm potentiometer (Radiokes).
- 1 s.P. D.T. toggle switch, rotary type.
- 1 4-pin, 1 6-pin wafer sockets.
- 1 ebonite panel, 8in x 1in. x $\frac{1}{8}$ in.
- 6 banana plugs—3 red, 3 black.
- 1 power socket and plug.
- 1 bakelite covered light adaptor.
- 2 large and 2 small G.R. knobs.
- 2 Magic-eye escutcheons.
- 1 indicator plate to specifications.
- 1 piece of celluloid cut to specifications.
- 1 6 x 1 switch (Yaxley).
- FIXED RESISTORS:**
- 1 4 megohm 1-watt carbon.
- 2 1 megohm 1-watt carbon.
- 2 10,000 ohm 1-watt carbon.
- 1 1,000 ohm 3-watt carbon.
- 1 100 ohm 1-watt carbon.
- FIXED CONDENSERS:**
- 1 .0001 mfd. mica.
- 1 .01 mfd. mica.
- 1 .01 mfd. tubular.
- 1 1mfd. block condenser (T.C.C.).
- 2 8 mfd. dry electrolytics.
- VALVES:**
- 1 1V (Radiotron).
- 1 6E5 tuning indicator (Radiotron).
- 1 Neon bulb (Philips).
- MISCELLANEOUS.**
- 2 doz. $\frac{1}{2}$ in. nuts and bolts, 2 yds. flexible push-back, 2 yds. 18-gauge tinned copper wire, 2 yds. spag-hetti.

100 ohms and the calibration pointer on .05, then the value of the resistance being measured = 5 ohms. With the selector switch in the same position and the calibration pointer on 20, the value is 2000 ohms.

In most cases there will always be two reference points to provide a check. Take, for example, a resistor of 5000 ohms. With the selector switch in the same position and the calibration pointer on 50, the value is 5000 ohms. With the selector switch on the 10,000-ohm range, however, the pointer would be on .5, giving the same value.

Readers are advised that block-maker's proofs of the front scale of the instrument, as illustrated on page 6 of the December issue, are available from the "Radio World," price 6d. each, post free.

Rumanian "Ham" Wants VK Contacts

Mr. V. Vasilescu (AW449DX) who operates under the call of YR5VV, and is keen to contact VK's and will answer all SWL reports. He operates on 14 m.c. on c.w., and his QRA is Str. Gr. Alexandrescu 93, Bucuresti, Roumania.

New Rola Reproducers

(Continued from page 9.)

core is of special steel, generous in size, with the primary of the transformer wound over it on a bakelite former. The high turns ratio used provides for maximum inductance.

When assembled, the bare transformer has heavy bakelite strips fitted, the core is connected to the B positive wire, then placed in a seamless drawn steel case and vacuum impregnated.

In a battery set the primary winding of the transformer previously was maintained at a positive potential with respect to the frame for twenty-four hours a day, whether the receiver was in use or not. With the Isocore transformer, even if moisture is present, because all metal parts are at the same potential, electrolytic action is obviated.

It may therefore be said of these new Rola reproducers that they have exceptionally high sensitivity, a very good transient response, are not peaky in reproduction, are effectively and properly dust-proofed, and are designed electrically and mechanically to give years of trouble-free reproduction.

In addition to their application to sets using the new 1.4-volt valves, these speakers will also improve reception if used as replacements on other battery sets. They have also been found very suitable for public address installations where a high quality unit is desired.

Radio Aids Explorers.

(Continued from page 22.)

ties are supplied with provisions by flying boat, which, in cases where landing is impossible, drops stores and petrol by parachute.

The advance base and the land parties are equipped with small wireless transmitting and receiving sets to enable them to keep in touch with each other and with the main base at Humboldt Bay. Much of this equipment has been supplied to the expedition by Amalgamated Wireless, principally that Company's teleradio equipment, five of which installations have been supplied to the explorers.

The expedition proposes to conduct scientific investigations in the vicinity of Lake Habbema for the next six months.

In 1936, Dr. Archbold conducted a similar expedition to Papua where the party operated in the Upper Fly and Strickland Rivers, with a base at Daru. This expedition used a Fairchild "Clipper" flying boat, which eventually was sunk in Port Moresby harbour and was a total loss. When this happened a party of seventy was established at Mount Mabion, and was dependent on the flying boat for

provisions. They had rations sufficient for only eight or ten days, and the nearest supply was at least fourteen days journey to the Black River, where they had made a cache. The Mt. Mabion party, which was then also equipped with an A.W.A. teleradio set, was informed of the loss of the flying boat.

The party having replied that supplies were insufficient to enable them to reach the Black River safely, arrangements were made for a plane to fly from Lae, over previously unexplored and unmapped territory.

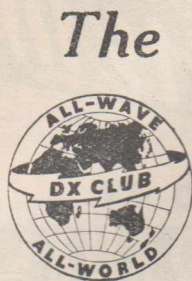
Mr. Aubrey Koch, pilot of the relief plane, was directed by Captain Rogers. They could not find the party owing to rain and fogs on the mountains, but Captain Rogers' experience enabled him to judge where the expedition should be. There, fourteen bags of rice and two gallons of petrol were dropped. The petrol, which was needed to provide power for the teleradio equipment, was in gallon tins attached to parachutes. Twelve of the bags of rice and all the petrol were recovered by the stranded party and the stores were sufficient to keep the party alive until they reached their cache on the Black River, whence they proceeded by raft to the Fly River where they were picked up by a relief vessel chartered by Dr. Archbold.

The present expedition's flying boat has been named the "Guba," a Motu word meaning "North-west wind squall."

During the establishment of the base at Lake Habbema, this flying boat made frequent trips carrying in over one hundred of the personnel with six months supplies, including many modern amenities such as electric light and wireless equipments, food storage and refrigeration and heating equipment.

Wherever the members of the Archbold expedition travel, however far they penetrate into the wilderness, Capt. Rogers said, they keep in touch by wireless with the main base of their expedition which, in turn, is in touch with the A.W.A. Radio Stations at Port Moresby and other New Guinea centres.

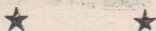
Throughout the recent non-stop flight from Moresby to Sydney, the Guba was in direct touch with the A.W.A. Port Moresby Radio Station on the one hand and Sydney Radio Station on the other from the moment of taking off. In fact, immediately after taking off from Port Moresby, one of the party in the Guba received a wireless message from Sydney informing her that a relative was seriously ill. During the trip she was kept informed of the progress of the patient, who was out of danger before the plane's arrival. The Guba was also in direct touch with its own main base at Humboldt Bay and also with San Francisco.



The All-Wave All-World

Official Organ of the
All-Wave All-World DX Club

DX News



DX News And Views.

I have recently been on a vacation and made it my business to see as many DX fellows and their shacks as I could, and must say that some are excellent. My own is very plain. I have a two-valve portable and a six tube super., and the antenna system is a zepp about sixty feet long and about 40 feet high.

One of the best I saw was owned by M. W. Eglington (AW268DX), Murwillumbah, N.S.W., who takes dxing on in a big way. All "junk" is placed away, and out of it he makes useful parts. For instance, old phono. records are used for making insulating points, washers, sockets and coil formers. If a temporary speaker is needed he will set to work and make it out of an old earphone and a piece of deal board. Among his home-made equipment he has receivers of one, two and three valves, a six-valve superhet, amplifiers and home records. On the experimental side he has built apparatus to switch lights on and off when one walks past the ray, and



A happy moment during dxer R. J. Shorty's holiday tour, when he visited many club members' shacks.

also to switch lights on and off by shortwave radio.

The outfit also includes a 90-volt power supply worked from a Ford coil and a six-volt battery, instruments to see and feel music, aerial and mains filters, home recording outfits, and a battery-charging plant in a bottle. Besides this equipment he has a very fine collection of QSL cards from all over the world, totaling 228 and 116 swl cards.

He has four ordinary antenna systems and one directional, which is worked on an excellent principle for direction finding. He also has a home-built one-tube set using an RK43 valve, which is the most remarkable set I have seen. Americans come

through as good as on a three or four-tube set.—R. J. Shorty, Brisbane, Queensland.

Is Satisfied With "R.W."

I have been a constant reader of your magazine since the first issue, and have found it far superior to any main attractions are the A.C. short-wave sets that have been described other radio magazine I have seen. My lately, and also the notes by Mr. A. Graham. Keep up the high standard you have achieved of late, and the club member with whom I correspond and I could not wish for anything better.—J. E. Shrubbs (AW80DX), Byron Bay, N.S.W.

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.]



Short-wave Review

CONDUCTED BY

ALAN H. GRAHAM

World Shortwave Stations — Additions And Amendments ★ Reports From Ob- servers ★ Hourly Tuning Guide

Angola.

CR6AA, Lobito, is now using three frequencies in an effort to extend the area in which its transmissions are audible. In addition to its old 7177 k.c., 41.75 m. channel, it now transmits on 9660 k.c., 31.06 m., and 13,000 k.c., 23.07 m. It is understood that all three frequencies are used simultaneously on Thursdays and Sundays from 5.45 to 7.30 a.m. Reports to Box 103.

Bechuanaland.

ZNB, Mafeking, 5901 k.c., 50.84 m., has extended its hours of transmission. It is now on the air from 4.30 to 5.30 a.m., and from 9 to 10 p.m. daily. Power is 200 watts: QRA---Box 106.

Bolivia.

CP-1, Sucre, "Radio Chuquiaca," is a new station on 9890 k.c., 30.33 m. On the air from 2 to 3 and 10 to 11 a.m. daily.

Brazil.

PSH, Rio de Janeiro, 10,220 k.c., 29.35 m., is now broadcasting every Tuesday from 11 to 11.30 a.m., as well as daily from 9 to 10 a.m.

Canada.

CHNS is the call of the station previously listed as VE9HX. New frequency is 6150 k.c., 48.78 m. Location, Halifax. At present station is on the air irregularly around 8.30 a.m.

Canary Islands.

EAJ43, Santa Cruz de Tenerife, is believed to be using a new channel—7500 k.c., 40.0 m. Schedule is from 10-11 a.m. Presumably transmissions on 10,370 k.c., 28.93 m. will be discontinued.

Chile.

CEC, Santiago, is now on a regular schedule, from 10 to 10.30 a.m., daily except Sundays and Mondays. Information regarding CEC's frequency is conflicting—it is either 10,600 k.c., 28.27 m., or 10,670 k.c., 28.12 m. QRA is Casilla 16-D.

China.

From a Japanese source comes mention of XCAP located at Peiping, operating from midnight till 5 a.m. Programmes are native in character. Frequency 9570 k.c., 31.35 m. XCAP is stated to be putting out a very strong signal.

Several Chinese commercials are still operating. These include XTR, 9400 k.c., 31.9 m., now at Chungking. Also XTS, 11,440 k.c., 26.2 m.

The station on 11,680 k.c., 25.7 m., was XGJ—not XTJ as first believed.

XGOW, Shanghai, 9300 k.c., 32.28 m., is on the air around 10.30 p.m. It sometimes shifts to 9190 k.c., 32.6 m.

Denmark.

OZH, Copenhagen, tests on 15,175 k.c., 19.77 m., from 11 p.m. to 4.30 a.m. Transmissions open with the sounding of a gong, and conclude with a selection entitled "There is a Winsome Land."

OZF, 9520 k.c., 31.51 m., uses the same identification signals. On the air from 5-9 a.m.

Dutch Borneo.

A rare DX "catch" is YCP at Balikpapan, Dutch Borneo, which may be heard on 9120 k.c., 32.9 m., contacting Java around 8 p.m. Send reports to Bandoeng. (Engineer-in-Charge, Java Wireless Stations, Bandoeng, is sufficient QRA.)

ROUND THE SHACKS

Amateur operators desirous of having their transmitters and activities featured under this heading are requested to forward details to "Reporter," C/- "Radio World," 214 George St., Sydney. Articles should be similar in style to those already appearing in the series, and should, where possible, be accompanied with photographs of operator and transmitter.

French Indo-China.

"Radio Boy-Landry," Saigon, now transmits on 11,710 and 9760 k.c., 25.63 and 30.72 m. Interval signal is 10 notes on the piano. Announcements are usually given in French by a lady announcer.

FZS, Saigon, 18,388 k.c., 16.3 m., may be heard calling FTM. Paris, usually around 10 p.m. Calls "allo Parea, ici Saigon. QRA for FZS and FZR is Box 238.

Ecuador.

HC2RL, Guayaquil, 6635 k.c., 42.2 m., often broadcasts special programmes for SWL clubs. As these are on the air around noon, it is unlikely that they will be heard in Australia. However, should any listener log HC2RL, send report to Box 759, enclosing a 5-cent United States stamp to cover return postage.

Guatemala.

TGWB relays TGWA on 6490 k.c., 46.2 m. TGWB uses a power of 1kw. It is heard from 3.45 to 4.45 a.m. daily except Monday. No International Reply Coupon is required for verification of any Guatemalan station.

Holland.

PDV, Kootwijk, sometimes relays PCJ on 12,060 k.c., 24.88 m. Such relays usually take place at 10 a.m.

Hungary.

HAT-4, Budapest, 9125 k.c., 32.88 m., may be heard on Mondays from 9 to 10 a.m. Interval signal is a music box melody. QRA: Royal Hungarian Post, Gyalai St. 21, Budapest.

India.

Schedules of the new Indian transmitters:—

VUM-2, Madras, 4950 k.c., 60.1 m.: Daily, 10 p.m. to 1 a.m.

VUC-2, Calcutta, 9530 k.c., 31.48 m.: Daily, 5.06 to 7.06 p.m., and 9.36 p.m. to 3.06 a.m.; 4880 k.c., 61.48 m., as on 31 m.

VUB-2, Bombay, 9550 k.c., 31.4 m.: Daily, 12.30 to 1.30 p.m., 4 to 6.30 p.m., and 10 p.m. to 3.30 a.m... 4905 k.c., 61.06 m., as on 31 m.

VUD-2, Delhi, 9590 k.c., 31.3 m.: Daily, 11.30 a.m. to 1.30 p.m., 4.30 to 6.30 p.m., 10.30 p.m. to 3.30 a.m., and 7.40 to 9.30 a.m.; 4995 k.c., 60.0 m., as on 31 m.

VUD-3, Delhi, 15,160 k.c., 19.8 m.: Daily, 7.30 to 9.30 a.m., 11.30 a.m. to

1.30 p.m., 10.30 p.m. to 3.30 a.m.

Iraq.

Baghdad is now carrying out tests on 7110 k.c., 42.2 m. Several languages are spoken, but the majority of announcements are in English.

Italy.

2RO is being relayed extensively by both IQY, 11,670 k.c., 25.7 m., and IRF, 9830 k.c., 30.52 m. All three stations carry the American Hour programme at 10.30 a.m. IRF's transmission is frequently marred by a bad hum.

Japan.

A new Japanese station is reported on 9730 k.c., 30.8 m. It carries the same programme as JVN.

Another unusual Jap is JZO on 10,270 k.c., 29.2 m. Recently heard around 11.30 p.m.

Malaya.

Latest information from Singapore shows that ZHP, 9760 k.c., 30.91 m., and ZHO, 6012 k.c., 49.89 m., are operating on the following schedule:—

Monday to Saturday: 7.40 p.m. to 12.40 a.m.; Wednesday, 3.40 to 4.40 p.m.; Saturday, 3.25 to 4.40 p.m.; Sunday, 1.40 to 4.10 p.m.

Mexico.

XECR, Mexico City, is testing on an additional frequency—15,150 k.c., 19.8 m. Tests are usually on Sunday or Monday.

Mozambique.

Schedule of CR7AA (6137 k.c., 48.87 m., and CR7BH (11,718 k.c., 25.6 m.): Daily, 12.30 to 2 a.m., 3 to 7 a.m., 7.30 to 9.30 a.m., 3 to 4 p.m.; Sundays, 8 to 10 p.m.; Mondays, 1 to 5 a.m.

New Guinea.

VHSU at Salamaua has been reported testing on 8070 and 6540 k.c., 37.1 and 45.8 m. Heard around 8 p.m.

Papua.

VHPM, Port Moresby, on 8080 k.c., 37.1 m., has been on telephony between 7 and 9.30 p.m.

VIG, also at Port Moresby, on 7310 k.c. 41 m., occasionally relays programmes from a local BCB station. These relays are usually on Saturdays from 6-8 p.m.

Peru.

"Radio International," OAX4J, 9300 k.c., 32.2 m., will be pleased to receive reports. Identification is three chimes of a gong. Schedule is from 2 a.m. to 3 p.m. daily except Sundays, when they continue till 4 p.m. QRA is Casilla 1166, Lima.

Philippine Islands.

KZGH, Iloilo, operates on a number of frequencies from 9 a.m. to 1 a.m. daily. Most used channels are 6755 and 5445 k.c., 44.4 and 55.2 m. Reports to the Station Supervisor will be verified.

Poland.

There are now four transmitters carrying the Polish programmes. These stations operate simultaneously from 9 a.m. to noon daily. The programmes open with a few bars from "The Haunted Castle," and conclude with the National Anthem. Stations are SP-19, 15,120 k.c., 19.84 m.; SP-25, 11,700 k.c., 25.64 m.; SPW, 13,635 k.c., 22 m.; and SPD, 11,535 k.c., 26 m. All are located in Warsaw.

Russia.

RNE, 12,000 k.c., 25 m., now transmits a special Chinese programme at 2 p.m. daily. Incidentally, it is not necessary to include a Reply Coupon with reports to this station or RAN.

Siam.

HS6PJ is the new call of HS8PJ's 19,020 k.c., 15.77 m. transmitter. This station broadcasts every Monday from 11 p.m. Programmes open with three chimes, and regular announcements are made in English.

Turkey.

TAO, 15,195 k.c., 19.74 m., is on the air from 4.20 to 8 a.m.

TAP, 9465 k.c., 31.7 m., transmits from 9 to 10.30 p.m.

Both stations are located in Ankara. It is reported from America that TAP sometimes relays the programmes of 2RO-4, Rome.

United States.

A new UHF transmitter located at

Bolinas, Calif., will commence tests on 31,380 k.c., 9.5 m., in the near future. Call will be W6XI.



Reports From Observers.

Mr. J. Ferrier (Victoria) :

Conditions are just fair on the UHF bands. The European amateurs were not as good as last month, only one night, December 18, being really good. These Europeans come in between 8 and 11.30 p.m., being best between 8.30 and 10.30 p.m. I find that the antenna now in use for these frequencies is most satisfactory—a 16ft. vertical.

As far as the broadcast stations are concerned, W9XUP on 11 metres is outstanding.

10-metre amateur loggings:—

VE—5OT, 5AAR, 4ALO, 5AEZ, 5GQ.

G—2PU, 2IS, 5VM, 5BI, 6LC, 8SA, 2ZP, 2QY, 6RH, 8IX, 6TW, 6WU, 6XQ, 5SY, 8DM, 2ZV and 5BM.

ON4EJ.

PAOFB.

HI7G.

GM—6RG, 6RV.

SU1MW.

Also a fair number of W's, K6's, and ZL's.

Mr. C. J. Anderson (West Australia) :

DX has been very poor this last month generally speaking, although an occasional hour has given quite good results. For example, one morn-

Have Your "RADIO WORLD" Posted To You Direct

Readers who want to take the "Radio World" on a subscription basis and have their copies posted to them direct each month are invited to complete the coupon below (annual sub. 10/6). New readers are advised that all back numbers in Volumes 1 and 2 are still available, price 9d., post free for copies in Volume 1 (May 1936 to April 1937) and 1/-, post free, for copies in Volume 2 (May 1937 to April 1938).

Enclosed please find remittance for 10/6, in payment for an annual subscription to the "Australasian Radio World," commencing with the.....issue.

Name.....

Street and No.....

City..... State.....

Country.....

Note.—N.Z. Subscribers can remit by Money Order or Postal Note.

THE AUSTRALASIAN RADIO WORLD, 214 George Street, Sydney, N.S.W., Australia.

ing at 6 a.m. (Perth time) the only two stations audible on 20 metres were VP9L, Bermuda, using 40 watts.; and CT1ZA, Portugal, using 50 watts. Both these stations were at fair speaker strength, and both faded out fairly rapidly.

Earlier in December some ZS signals were logged, but none have been audible lately. In the evenings 20 metres is very mediocre—mainly VU, PK, KA, W, with an occasional VS7, XZ or XU. None of these put in a very good signal.

Very little time has been spent on the broadcast bands. However, it has been noted that COCQ has shifted to 33 metres.

On December 10 unusual conditions were noted on 31 metres around 11 a.m., when this band is usually quite dead. W2XE, W3XAL and W2XAF were all at good strength; W3XAL being particularly strong. KZIB is strong on this band in the evenings.

Mr. G. O. La Roche (West Australia):

DX has not been very interesting of late, nothing but the same old stations on all bands. The amateurs on 20 metres have provided the best DX for the month, and even here results have not been startling: 10 metres seems a total loss over here, even the local amateurs are complaining.

General comments on broadcast bands:—

13 metres: Daventry still good, but W2XE and W8XK are now missing.

16 metres: Paris, TPB-3, no longer audible.

19 metres: All the usual stations, with HVJ, 19.85 m., very good.

20-25 metres: SPW, good; TFJ, just audible, very noisy.

25 metres: VLR-3 very good; OLR4A and 2RO-3 very strong. Also noted were COGF, W1XAL, W2XE, W9XF and XTJ.

31 metres: Usual stations still good; KZIB good.

49 metres: Reception poor, signals weak, noise-level high.

50-100 metres: Signals from DEI stations good; noise-level very high.

Mr. La Roche includes reports from Mesdames Osborn and Nicholls. These indicate that conditions are much the same as in previous months. The most interesting stations reported by these listeners are as follow:—

16 metres: W3XL.

19 metres: Rome on 19.6 m., relaying 2RO.

20 metres: Hawaiian station, call unknown.

25 metres: VLR-3; XGJ, China.

31 metres: HS8PJ, KZIB, YDB.

40 metres: JVP.

49 metres: ZHP, Singapore, Rangoon.

60 metres: Indian stations at Madras, Calcutta and Bombay.

65-100 metres: D.E.I. stations, mostly carrying native programmes.

Mr. H. A. Callander (Tasmania):

(Mr. Callander wishes to advise all those who have sent him SWL cards and have not received replies as yet that he will QSL early in the New

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.

NOTEPAPER.—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.

DX CLUB LOG SHEETS.—Designed by the Shortwave Editor, these headed and ruled log sheets are indispensable to dxers who wish to keep a simply-prepared and accurate list of loggings. Price, 3 dozen for 1/6, post free.

Year. A most painful accident to his hands has prevented him from keeping up to date with his correspondence. This same injury has also prevented him from doing much DX for some time, but he forwards the following report.)

The interesting feature of recent DX has been the logging of a new station on 19 metres. As yet this station has not been identified, although it is located in South Africa. Frequency is 15,220 k.c., or 19.71 metres. Announcements are given by a man, and are followed by three short and two long Morse signals. Signals are not strong, and QRM has always prevented a call-sign being obtained.

20-metre amateurs have rather fallen away of late, and nothing of unusual interest has been noted on the band.

Verifications to hand are from W9TIV, W5APW, W9GIC and KZRM.

Mr. R. S. Coggins (South Australia):

Generally speaking, reception was very poor at the beginning of the past month, but has improved greatly during the last week. This has been particularly the case with regard to the amateur bands. On 20 metres reception between midnight and 7 a.m. is really good; daylight conditions are poor, only a few W's.

The American broadcast stations W3XL and W3XAL are strong in the mornings—good R6-7.

The usual stations, Daventry, Berlin and Huizen, have been very inconsistent in this locality at present. At times they are a strong R9 (usually with quick fading), whilst at others they are barely audible. Possibly this is due to the prevalence of thunder and humid weather.

Mr. J. K. Sorensen (Queensland):

Intense heat and heavy static have made conditions for DX very unpleasant.

The outstanding station this month has been HVJ, Vatican City, on 19.84 m. This station has been testing and asking for reports. Two different aeri-als were used on 19 metres and then a change was made to 25 metres at 11.40 p.m. The transmission on 25 metres was not audible.

Archerfield aerodrome has been heard on a number of occasions on 43 metres—giving weather data to various airliners. On the same wavelength Mascot 'drome was heard calling the 'plane "Canberra."

Mr. H. I. Johns (New Zealand):

Owing to the very bad weather experienced in New Zealand recently reception has been anything but good. Evening stations have been particularly poor, but perhaps things will pick up when the weather settles down.

On 19 metres TPA-2 is good around 5.30 p.m.; also DJQ and DJB at fair strength, improving steadily as the night advances. RV96 is also good. DJE, 16.89 m., puts in one of the strongest signals at the present time.

On 25 metres I have found GSE, 25.2 m., better than GSD, 25.5 m., when opening at 6 m. TPA-3, 25.2 m., is excellent at the same time. Also on the same band RNE. By the way, listeners reporting to RNE should give details only when announcements are made in English; programmes entirely in Russian will not be verified. (This also applies to RV15 on 70 m.—S.W. Ed.)

EAQ, 30.4 m., "The Voice of Republican Spain," has been heard with a strong signal at 5.45 p.m.

HCJB, Quito, using one of its new wavelengths, has been heard at 1 p.m. on 24 metres.

At the same time VUD-2, 19.8 m., is fairly strong. Transmits a native programme till closing at 1.30 p.m.

N.B.—All above times Australian Eastern Standard.)

Senor Richard F. Rubio (Yest Indies) :

Senor Rubio sends interesting details of DX conditions in Cuba, together with a budget of short-wave news.

"Well, this is our autumn, which means the beginning of our DX season. Conditions have improved a great deal lately. All enthusiastic DX-ers are having their sets checked in preparation for a good season. Although conditions have improved generally, the 20-metre amateur band is still best. Best reception is possible around midnight.

"Best amateur loggings: VK4HN, VK5CX, VK3PE, VK3ZX, VK4BB, VK4JU, VK4TH, VK4VD, VK5TR; J5CC; VU2FU, VU2BT, VU2JL, VU2LL; VS7RF; TI2OFR; AC4YN, XU6TL, PK6XX, PK2WL, PK1VY, KA1JZ, KA1FH, KA1ZL; ON4MZ, ON4BG; CN1AF; PAOMZ; CT1QG; ZS6AJ, ZS6ED, ZS5AW; VS2AL; XZ2DX; G3DO, G5GS; K6FAB, K6KGA; VP3AA; PY1RF; CE1AO; YV1AP, YV5ABY; HC1JW; LU4PB, LU4FG; and VE1GF."

Short-wave News.

COCQ is roaming around apparently looking for a definite channel. After testing on 30.98 m., they are now trying 30.92 m. (Latest reports indicate that COCQ is now on 33 metres.—S.W. Ed.)

COKG, 33.4 m., are very desirous of receiving reports on their transmissions, and will verify promptly. QRA is Box 137, Santiago, Cuba.

Two new Cuban stations are in course of erection. One at Santa Clara; and the other at Holguin, on 48.38 m. (6195 k.c.).

LRA, "Radio del Estado," now uses call LRA-1. Often has special programmes around 7.30 a.m.

Radio Sofia, Bulgaria, which used to be on 14,918 k.c., 20.2 m., is now testing on 8445 k.c., 35.5 m. On the air around 8 a.m.

TIGPH, San Jose, 5825 k.c., 51.5 m., is on the air from 10 p.m.-midnight in addition to their usual schedule.

CR7AB, Lourenco Marques, Mozambique, is a new transmitter on 85.93 m. Transmits same type of programme as CR7AA and CR7BH. Reports to Box 594.

TI2XD, "La Voz del Radio Pilot," operates on 11,920 k.c., 25.19 m. Schedule, 8 a.m.-2 p.m. QRA, Box 1729, San Jose.

★

Amateur Review.

The amateur bands continue to be the DX-ers' stand-by. It is little short of amazing how 20 metres maintains its high standard of DX—for there has been very little, if

any, falling-off noticeable during recent months. From Observers in all States come reports of further good reception.

On 10 metres, too, conditions are good. Observer Ferrier again forwards details of some real DX on this band. Watch for W's and K6's in the mornings and early afternoons, and Europeans after 8 p.m.

From Here And There.

VR6AY requests that SWL's do not enclose International Reply Coupons with their reports, as these cannot be redeemed. In place of these send either United States or New Zealand stamps.

KA1JM is located on board the yacht "Jen" in Manila harbour. QRA is Box 817.

PK6WF is operated by a geological expedition in the wilds of Dutch New Guinea and Papua.

QRA's:—

CN1AF: Sr. Jose M. Sierra, rue des Sources, Tangier, International Zone, North Africa.

VP7NC: Box 703, Nassau, Bahamas.

K7CNJ: Charles B. Michael, Quin-haqak, Alaska.

(Incidentally, the QRA's of all recently licensed W's are available to readers. If any Y station is not listed in your call-sign book, just drop a line to the Short-wave Editor.)

OFFICIAL S.W. OBSERVERS.

N.S.W.: V. D. Kemmis (AW301DX), "Brampton Hall," 49 Kurraba Road, Neutral Bay, Sydney; A. R. Payten (AW352-DX), High Street, Coff's Harbour.

SOUTH AUSTRALIA: J. C. Linehan (AW323DX), 181 South Terrace, Adelaide; A. E. Bruce (AW171DX), C/- 54 Currie Street, Adelaide; R. S. Coggins, 8 Glen Rowan Road, Woodville.

QUEENSLAND: J. K. Sorensen (AW316DX), "Fairholme," Station Road, Gympie; E. Neill (AW64DX), 26 Canning Street, Nth Ipswich.

WEST AUSTRALIA: G. O. La Roche (AW155DX), 62 Gladstone Avenue, South Perth; W. H. Pepin (AW402DX), Seventh Avenue, Maylands; C. J. Anderson (AW417DX), Dumbleyung.

TASMANIA: H. A. Callander (AW304DX), 1 Franklin Street, West Hobart.

VICTORIA: J. Ferrier (AW129DX), "Winninburn," Coleraine.

NEW ZEALAND: H. I. Johns (AW407DX), Mount Pleasant Avenue, Nelson, N.Z.

Amateur Frequencies.

10 Metres.

Europeans: G6DT, 28,200; G2KU, 28,590; G6BH, 28,230; G2MI, 28,270; G5BM, 28,348; G5VM, 28,185; G5LJ, 28,180; G5SI, 28,150; G2ZV, 28,190; G2VM, 28,190; G8SA, 28,105; G6BW, 28,268; GM6RG, 28,430; PAOFB, 28,180; EI2L, 28,200; F8UE, 28,390.
Americans: TI3AD, 28,290; HI7G, 28,310; K4EZL, 28,210; K4FKC, 28,200; K4EJG, 28,075; K6LB, 28,262; YV1AQ, 28,276.

20 metres.

Africans: ZS1AX, 14,080; ZS1BL, 14,360; ZS1CN, 14,070; ZS1B, 14,060; ZS2AZ, 14,120; ZS2AH, 14,020; ZS2BB, 14,050; ZS2N, 14,030; ZS4H, 14,270; ZS5AW, 14,090; ZS5AD, 14,100; ZS5BZ, 14,030; ZS5BH, 14,400; ZS5BS, 14,140; ZS5T, 14,050; ZS6AJ, 14,130; ZS6BA, 14,350; ZS6DJ, 14,040; ZS6AD, 14,080; ZS6DM, 14,090; ZS6DW, 14,040; and 14,070; ZS6W, 14,030 and 14,370; ZS6EF, 14,370; ZS6EY, 14,080; ZS6ED, 14,040; ZS6FB, 14,140; ZE1JX, 14,020; VQ2HC, 14,310; CN1AF, 14,280; FB8AB, 14,375.

Europeans: G5ML, 14,090; G2PU, 14,090; F3HM, 14,080; EI7M, 14,015; ZB1R, 14,200; ZBIL, 14,340.

Asiatics: VS7GJ, 14,080; VU2LL, 14,100; VU2FZ, 14,270; VU2CA, 14,200; VU2FU, 14,280; VU2EU, 14,380; VU2DR, 14,140; VU2FS, 14,330; XU8CM, 14,310; XZ2EX, 14,340; XZ2DY, 14,100; XZ2PB, 14,040; XZ2EZ, 14,200; VS6AG, 14,080; VS3AF, 14,350; F18AC, 14,070; KA1BH, 14,110; KA7EF, 14,140; KA1HS, 14,280; KA1CS, 14,310; KA1JM, 14,260; KA1FT, 14,100; KA3KK, 14,320; K61LW, 14,210; K6QJL, 14,170; K6OQW, 14,230; K6BNR, 14,230; J5AH, 14,330; J5CC, 14,405; J2MI, 14,080; J2CR, 14,035; J2KG, 14,390; PK1GL, 14,270; PK1VY, 14,270; PK2WL, 14,185; PK4JD, 14,090.

Americans and West Indians:
CE2BX, 14,200; TI1AF, 14,080; TI2FG, 14,050; HC1FG, 14,130; HC1JW, 14,155; HH2B, 14,100; LU4BC, 14,070; PY2AK, 14,050; VP1AA, 14,040; VP1BA, 14,125; HK1EF, 14,110; TG9BA, 14,010; K4EJF, 4,240; K4FAY, 14,210; YV1AQ, 14,000; YV4AE, 14,080; YV5ABQ, 14,060; YV5ABY, 14,160; VP7NC, 14,252.

Calls Heard.

Compiled from information supplied by observers in all States. All on 20 metre 'phone.

Europe:

Holland: PAOWL, PAOMX, PAOMZ.

Portugal: CT1RA, CT1ZA.

British Isles: GM6MD, G5ZG, G2ML, G2TR.

Africa.

Morocco: CN8CA, CN8AV.
 Madagascar: FB8AH.
 Kenya: VQ4KTB.
 Northern Rhodesia: VQ2HC.
 Southern Rhodesia: ZE1JX.
 Egypt: SU1AM.
 South Africa: ZS3F, ZS4H, ZS5AW,
 ZS6ED, ZS6DJ, ZS6H, ZS5BK, ZS2X,
 ZS6A, ZS2AF, ZS5CO, ZS6CZ, ZS6AJ
 (La Roche, Anderson).

Asia.

Hawaii: K6LGH, K6ODN, K6DTT,
 K6PLZ, K6WID, G6NZQ, K6BNR,
 K6BAZ, K6LEJ, K6LKM, K6OQE,
 K6GAS, K6KKP, K6OTH, K6KGA,
 K6OJL, W6NYD (portable).

Pitcairn Is.: VR6AY.

Japan: J2MC, J2NF.

Malaya: VS2AS, VS2AR, VS2AB,
 VS2AJ.

India: VU2CA, VU2DG, VU2FU,
 VU2AG, VU2CQ, VU2BC, VU2LK,
 VU2AC, VU2DR, VU2HQ, VU2FQ,
 VU2BG, VU2FS, VU2JK.

Philippine Is.: KA1CH, KA1CS,
 KA1ME, KA1AP, KA1AF, KA1JM,
 KA1BH, KA1FE, KA7EF, KA2OV,
 KA4LH, KA7HB, KA1CW.

Burma: XZ2DY, XZ2EZ, XZ2EX,
 XZ2JB.

D.E.I.: PK3WI, PK1RL, PK1MJ,
 PH4HU, PK4CB, PK4KL, PK4BD,
 PK4KS, PK4JD, PK1LD, PK1RE,
 PK2AY, PK4KT, PK1JR, PK2DF,
 PK1VY, PK1VX, PK2WL, PK6XX.

China: XU8ET, XU8RB.

Ceylon: VS7GJ, VS7RA, VS7RF.

Indo-China: FI8AC.

Hong Kong: VS6AQ.

South America.

Argentina: LU4BC.

Brazil: PY2JC, PY2AK.

Ecuador: HC1JW, HC1FG.

Venezuela: YV4AE, YV1AP.

North America:

Porto Rico: K4RJ.

Bermuda: VP9L.

Canal Zone: K5AF.

Costa Rica: TI2RW.

Cuba: CO7CX, CO7AY, CO2CC,
 CO2WM.

British Honduras: VP1BA.



SWL Card Exchangers' Section

Once again we publish a list of overseas SWL's interested in the exchange of cards. All of the following guarantee 100% QSL.

F. E. Massey, 58 St. Annes Road, Cornmeadow, Worcester, England;
 George Mills, 13 Critchley St., Ilkington, Derbyshire, England; Meredith M. Stroh, 172 Queen St., N. Kitchener, Ontario, Canada; C. H. Johnson, 1539 West 12th St., Casper, Wyoming, U.S.A.; Raymond Benton, Route 4, Plymouth, New Hampshire, U.S.A.;

Jim Harrison, 29 Blake St., Asheville, North Carolina, U.S.A.; Clarence O. Schwengel, 811 Oakland Av., Port Washington, Wis., U.S.A.; Russel Short, Jerome, Idaho, U.S.A.; J. Shields, 712 Wallace, Clovis, New Mexico, U.S.A.; William A. Weiss, 220 North Birchwood, Louisville, Kentucky, U.S.A.; Walter E. Crane, 247 South Cambridge St., Orange, Calif., U.S.A.; Robert Hampton, 136 North Madison Av., Pasadena, Calif., U.S.A.; J. Doyle, 319 East 2nd St., Florence, Colorado, U.S.A.; Merlin N. Steen, Route 6, Decorah, Iowa, U.S.A.; Spencer E. Lawton, 15 Hillside Av., Westerly, Rhode Is., U.S.A.



Latest Schedules

Below are set out the latest available schedules for the "regular" overseas short-wave transmitters.

Daventry:

Transmission 1.—From 6 to 8.15 p.m.: GSI, GSO, GSF, GSE and GSD.

Transmission 2.—From 8.45 p.m. to midnight: GSJ, GSH, GSG, GSF and GSE.

Transmission 3.—From midnight to 3 a.m.: GSJ, GSH, GSG, GSO, GSF, GSE and GSD.

Transmission 4.—From 3.20 to 7.07 a.m.: GSG, GSP, GSA, GSD, GSB, GSI; from 7.15 to 9 a.m., GSO, GSD.

Transmission 5.—From 9.20 to 11.30 a.m.: GSO, GSD, GSC, GSB and GSL.

Transmission 6.—From 12.20 to 2.20 p.m.: GSD, GSC, GSB and GSL.

Transmitters listed above:—

GSA, 6050 k.c., 49.59 m.
 GSB, 9510 k.c., 31.55 m.
 GSC, 9580 k.c., 31.32 m.
 GSD, 11,750 k.c., 25.53 m.
 GSE, 11,860 k.c., 25.29 m.
 GSF, 15,140 k.c., 19.82 m.
 GSG, 17,709 k.c., 16.86 m.
 GSH, 21,470 k.c., 13.97 m.
 GSI, 15,260 k.c., 19.66 m.
 GSJ, 21,530 k.c., 13.93 m.
 GSL, 6110 k.c., 49.1 m.
 GSO, 15,180 k.c., 19.76 m.
 GSP, 15,310 k.c., 19.62 m.

Berlin.

Transmissions for Asia and Australia:

From 3.05 p.m. to 2 a.m.: DJA, DJR, DJN and DJQ.

From 3.05 p.m. to 8.50 p.m.: DJE.

From 3.05 p.m. to 8.30 p.m.: DJS.

Transmissions for Africa:

From 1.40 to 7.25 a.m.: DJX.

From 2.30 to 7.25 a.m.: DJD.

From 4 to 7.25 a.m.: DJC.

From 3.05 to 5 p.m.: DJL.

Transmissions for South America:

From 2.10 to 3.25 a.m. (Mondays only): DJQ.

From 7.50 a.m. to 1.50 p.m.: DJN and DJQ.

From 9 to 11.50 p.m.: DJJ and DJE.

Transmissions for North America:

From 2.10 to 3.25 a.m. (Mondays only): DJB.

From 7.50 a.m. to 1.50 p.m.: DJB, DJD, DJZ and DJM.

From 11 p.m. to midnight: DJL.

Transmissions for Central America:

From 7.50 to 11.50 a.m.: DJA.

From 11 p.m. to midnight: DJB.

Transmitters listed above:

DJA, 9560 k.c., 31.38 m.

DJB, 15,200 k.c., 19.74 m.

DJC, 6020 k.c., 49.83.

DJD, 11,700 k.c., 25.49 m.

DJE, 17,760 k.c., 16.89 m.

DJJ, 21,565 k.c., 13.92 m.

DJL, 15,110 k.c., 19.85 m.

DJM, 6079 k.c., 49.35 m.

DJN, 9540 k.c., 31.45 m.

DJQ, 15,280 k.c., 19.63 m.

DJR, 15,340 k.c., 19.56 m.

DJS, 21,450 k.c., 13.99 m.

DJX, 9675 k.c., 31.01 m.

DJZ, 11,801 k.c., 25.42 m.

Paris:

From 12.30 to 2 a.m.: TPB-3.

From 2.15 to 9 a.m.: TPA-3.

From 10 a.m. to 12.15 p.m.: TPA-4.

From 12.30 to 3 p.m.: TPB-7.

From 2.15 to 9 p.m.: TPB-11.

From 5 to 8 p.m.: TPB-6 and

TPA-3.

From 9 p.m. to 2 a.m.: TPA-2.

Transmitters:—

TPA-2, 15,243 k.c., 19.68 m.

TPA-3, 11,885 k.c., 25.24 m.

TPA-4, 11,718 k.c., 25.6 m.

TPB-3, 17,810 k.c., 16.84 m.

TPB-6, 15,130 k.c., 19.83 m.

TPB-7, 11,885 k.c., 25.24 m.

TPB-11, 9550 k.c., 31.41 m.

Tokyo:

Transmission for Europe.—From 5.30 to 7 a.m.: JZJ or JZI.

Transmission for South America.—From 7.30 to 8.30 a.m.: JZJ or JZI.

Transmission for North America (Eastern districts).—From 11 to 11.30 a.m.: JZJ.

From 10 to 10.30 p.m.: JZJ.

Transmission for North America (Pacific coast), Canada and Hawaii.—From 3.30 to 4.30 p.m.: JZJ.

Transmission for China and South Seas.—From 11 p.m. to 12.30 a.m.: JZJ and JVP.

Transmitters listed above:—

JZI, 9535 k.c., 31.46 m.

JZJ, 11,800 k.c., 25.42 m.

JVP, 7510 k.c., 39.95 m.

Rome.

From 7.40 p.m. to 3.05 a.m.: 2RO-4, 11,810 k.c., 25.4 m.

From 3.05 a.m. to noon: 2RO-3, 9630 k.c., 31.13 m.

2RO is relayed by the following transmitters:—

IRF, 9840 k.c., 30.52 m., from 6 to 6.30 a.m., from 9 to 10.25 a.m., and from 10.30 p.m. to midnight.

IQY, 11,670 k.c., 25.7 m., from 3.10 to 5.35 a.m., from 6 to 6.30 a.m., from 9 to 10.25 a.m., and from 10.30 p.m. to midnight.

ICC, 6350 k.c., 47.2 m., from 6 to 6.30 a.m.

Prague :

From 4.55 to 8.10 a.m.: OLR4A and OLR4B.

(N.B.—At 7.40 a.m. a frequency change is announced, the new transmitter coming on at 7.45 a.m. OLR3A is used on Tuesdays, OLR5A on Wednesdays, OLR2A on Thursdays and Fridays, and OK1MPT on Saturdays.)

From 8.55 to 11.55 a.m. (Mondays only): OLR4A and OLR4B or OLR5A and OLR5B.

From 10.55 to 1.55 p.m. (daily exc. Mondays): OLR4A and OLR4B or OLR5A and OLR5B.

From 9 to 11.10 p.m.: OLR5A.

From 11.25 p.m. to 1.25 a.m.: OLR4B.

Transmitters used:—

- OLR2A, 6010 k.c., 49.92 m.
- OLR3A, 9550 k.c., 31.41 m.
- OLR4A, 11,840 k.c., 25.34 m.
- OLR4B, 11,760 k.c., 25.51 m.
- OLR5A, 15,230 k.c., 19.7 m.
- OLR5B, 15,320 k.c., 19.58 m.
- OK1MPT, 5145 k.c., 58.31 m.

Holland :

Through PHI, 17,770 k.c., 16.88 m.: 10.40 to 11.40 p.m. (exc. Sundays); 9.25 p.m. to 12.40 a.m. (Sundays only).

Through PHI, 11,730 k.c., 25.57 m.: 9.15 to 9.45 a.m. (exc. Sunday and Monday); 10.15 to 10.45 a.m. (Sunday only).

Through PCJ, 15,220 k.c., 19.71 m.: 5 to 6.30 p.m. (Tuesdays only); 12.30 to 2.30 a.m. (Thursdays only).

Through PCJ, 9590 k.c., 31.28 m.: 4.20 to 4.35 a.m., 5 to 6 a.m., 10.15 to 11.15 a.m., 11.25 a.m.-12.25 p.m. (Mondays only); 4.45 to 6.40 a.m., 10.15 to 11.45 a.m., noon to 1.30 p.m. (Wednesdays only), 10.15 to 11.15 a.m., 11.35 to 11.50 a.m. (Thursdays only), 11 a.m. to noon (Saturdays only).

America—United States :

W9XF, 6100 k.c., 49.18 m.: Mondays, 4 to 8.50 a.m.; Tuesdays to Saturdays, 7 to 9.50 a.m., 4-5 p.m.; Sundays, 7 to 8.30 a.m.

W1XAL, 6040 k.c., 49.65 m.: Tuesdays to Saturdays, 10 a.m. to noon; 11,730 k.c., 25.57 m., Tuesdays to Saturdays, 12.15 to 2 p.m.; 11,790 k.c., 25.45 m., Tuesdays to Saturdays, 7.30 to 9.30 a.m.; Sundays, 4.30 to 9.30 a.m.; 15,250 k.c., 19.67 m., Tuesdays to Saturdays, 5 to 6.30 a.m.

W2XE, 6120 k.c., 49.02 m.: Daily, 2.30 to 3.30 p.m.; 11,830 k.c., 25.36 m., daily 9.30 a.m. to 2 p.m.; 15,270 k.c., 19.65 m., daily 4 to 9 a.m.; 17,760 k.c., 16.89 m., irregular; 21,515 k.c., 13.94 m., daily 10.30 p.m. to 1 a.m.

W8XK, 6140 k.c., 48.83 m., daily 2 to 4 p.m.; 11,870 k.c., 25.26 m., daily

10 a.m. to 2 p.m.; 15,210 k.c., 19.72 m., daily midnight to 10 a.m.; 21,540 k.c., 13.93 m., daily 9.45 p.m. to midnight (exc. Sunday).

W3XL, 17,780 k.c., 16.87 m., daily midnight to 11 a.m.

W2XAF, 9530 k.c., 31.48 m., daily 9 p.m. to 3 p.m. (next day).

W3XAL, 9670 k.c., 31.02 m., daily 8 a.m. to 4 p.m.

Manila :

Through KZRM, 9570 k.c., 31.33 m., and KZIB, 9510 k.c., 31.55 m.

From 7.30 to 8 a.m.; from 7 p.m. to midnight (occasionally till 1 a.m.).

Geneva :

Through HBJ, 14,535 k.c., 20.64 m.: 6 to 6.30 p.m. (Mondays only).

Through HBO, 11,402 k.c., 26.31 m.: 5.30 to 5.45 p.m. (Mondays and Fridays).

Fiji.

Through VPD-2, 9540 k.c., 31.45 m.: From 8.30 to 10 p.m. (exc. Sundays).

Dutch East Indies :

From 10 a.m. to 5 p.m.: YDB, 15,300 k.c., 19.61 m.

From 7.30 to 1 a.m.: YDB, 9550 k.c., 31.41 m.; YDC, 15,150 k.c., 19.8 m.; PLP, 11,000 k.c., 27.27 m.; PMN, 10,260 k.c., 29.24 m.

HOURLY TUNING GUIDE

When and Where To Search

Compiled by ALAN H. GRAHAM.

In order to assist beginners and less experienced dxers, it is intended to publish monthly a special tuning guide, setting out at what times to listen for the more easily logged stations. It should be noted that the guide is not intended to cover all stations audible; for full details as to when and where to look for the best catches are given elsewhere. Moreover, the fact that a station is shown as being on the air at a particular time is no guarantee that reception must follow as a matter of course.

All times are given in Australian Eastern Standard Time.

Key to abbreviations used: S, Sundays only; M, Mondays only; T, Tuesdays only; W, Wednesdays only; Th, Thursdays only; Sat, Saturdays only.

Midnight-1 a.m.	31.28	VK2ME (M)
13.93	GSJ	31.28 VUD
13.97	GSH	31.38 DJA
16.84	TPB-3	31.45 DJN
16.86	GSG	31.49 ZBW-3
16.88	PHI (S)	31.55 HS8PJ (F)
19.35	W2XAD	31.58 XEWW
19.56	DJR	31.8 COCH
19.63	DJQ	32.59 COBX
19.68	TPA-2	32.95 COCA
19.7	OLR5A (ex. M, S)	33.32 COBZ
19.71	PCJ (Th)	39.95 JVP
19.74	DJB	48.7 VPB
19.76	GSO	49.9 COCO
19.8	YDC	49.98 Rangoon
19.82	GSF	58.3 PMY
25.29	GSE	60.0 VUD
25.34	OLR4A (ex. M, S)	60.61 VUM
25.4	2RO-4	61.46 VUC
25.42	JZJ	70.2 RV-15
25.53	GSD	98.6 YDA
27.27	PLP	
28.48	JIB	1-2 a.m.
29.24	PMN	13.93 GSJ
30.96	ZHP	13.97 GSH

16.84	TPB-3	25.53	GSD
16.86	GSG	31.01	DJX
19.35	W2XAD	31.28	VUD
19.56	DJR	48.70	VPB
19.63	DJQ	49.31	VQ7LO
19.68	TPA-2	60.06	VUD
19.7	OLR5A (ex. S, M)	60.61	VUM
19.71	PCJ (Th)	61.46	VUC
19.74	DJB		3-4 a.m.
19.76	GSO	16.86	GSG
19.8	YDC	19.62	GSP
19.82	GSF	19.63	DJQ (M)
19.84	HVJ	19.66	GSI
25.00	RNE	19.74	DJB (M)
25.24	TPA-3	25.24	TPA-3
25.29	GSE	25.49	DJD
25.34	OLR4A (ex. S, M)	25.53	GSD
25.4	2RO-4	25.71	IQY
25.53	GSD	31.01	DJX
27.27	PLP	31.13	2RO-3
28.48	JIB	31.55	GSB
29.24	PMN	49.31	VQ7LO
31.28	VUD	49.59	GSA
31.35	TPB-11	60.06	VUD
31.38	DJA	61.46	VUM
31.45	DJN	61.16	VUC
48.7	VPB		4-5 a.m.
49.9	COCO	16.86	GSG
58.3	PMY	19.65	W2XE
60.06	VUD	19.66	GSI
60.61	VUM	24.52	TFJ
61.46	VUC	25.24	TPA-3
70.2	RV-15	25.49	DJD
		25.53	GSD
	2-3 a.m.	25.57	IQY
13.93	GSJ	31.01	DJX
13.97	GSH	31.13	2RO-3
16.86	GSG	31.28	PCJ (M)
19.35	W2XAD	31.28	VUD
19.63	DJQ (M)	31.55	GSB
19.74	DJB (M)	49.31	VQ7LO
19.76	GSO	49.59	GSA
19.82	GSF	49.83	DJC
25.24	TPA-3		5-6 a.m.
25.29	GSE		
25.4	2RO-4	16.86	GSG
25.49	DJD	19.62	GSP

19.65	W2XE	31.46	JZI	31.32	GSC	25.42	DJZ	F).	31.38	KZRM	
19.66	GSI	31.48	W2XAF	31.35	W1XK	25.49	DJD	31.28	VK2ME	31.38	DJA
19.72	W8XK	31.55	KZIB	31.38	DJA	25.26	W8XK		(S)	31.41	TPB-11
22.0	SPW	43.1	ZL2GB	31.45	DJN	25.53	GSD	31.41	TPB-11	31.45	DJN
	(T, Th, Sat)	49.83	DJC	31.48	W2XAF	31.02	W3XAL	31.38	DJA	31.45	VPD-2
		49.92	OLR2A	31.49	LKJ-1	31.28	PCJ (W)	31.45	DJN	31.49	ZBW-3
24.52	TFJ		(Th, F)	31.55	GSB	31.32	GSC			31.50	VK3ME
25.24	TPA-3	58.31	OK1MPT	49.1	GSL	31.38	DJA	6-7 p.m.		(ex. S).	
25.34	OLR4A			49.35	DJM	31.41	W2XAD	13.99	DJS	31.55	KZIB
25.42	JZJ	8-9 a.m.				31.45	DJN	16.89	DJE	43.1	ZL2GB
25.49	DJD	16.87	W3XL	10-11 a.m.		31.48	W2XAF	19.56	DJR	44.64	PMH
25.53	GSD	19.63	DJQ	16.87	W3XL	31.55	GSB	19.63	DJQ	70.2	RV-15
25.57	IQY	19.65	W2XE	19.63	DJQ	49.1	GSL	19.71	PCJ (T)		
27.17	CSW	19.71	OLR5A	19.71	OLR5A	49.35	DJM	19.76	GSO	9-10 p.m.	
28.93	EAJ43		(S, M)	19.74	DJB			19.82	GSF	13.92	DJJ
31.01	DJX	19.72	W8XK	19.76	GSO	1-2 p.m.		19.83	TPB-6	13.93	GSJ
31.13	2RO-3	19.74	DJR	19.8	YDC	19.63	DJQ	20.64	HBJ (M)	13.97	GSH
31.28	PCJ	19.76	GSO	25.23	W8XK	19.74	DJB	25.23	TPA-3	16.86	GSG
	(M, W)	25.00	RNE	25.27	PHI (S)	25.24	TPB-7	25.29	GSE	16.88	PHI (S)
31.46	JZI	25.24	TPA-3	25.34	OLR4A	25.42	DJZ	25.53	GSD	19.56	DJR
31.55	GSB	25.34	OLR4A	25.36	W2XE	25.49	DJD	28.14	JVN	19.58	OLR5B
39.95	JVP		(S, M)	25.42	DJZ	25.53	GSD	31.28	VK2ME	19.63	DJQ
49.59	GSA	25.42	DJZ	25.49	DJD	31.28	PCJ (W)		(S).	19.68	TPA-2
49.83	DJC	25.42	JZJ	25.53	GSD	31.32	GSC	31.38	DJA	19.71	OLR5A
		25.45	W1XAL	25.57	IQY	31.38	DJA	31.41	TPB-11	19.76	GSO
		25.49	DJD	25.61	TPA-4	31.45	DJN	31.45	DJN	19.8	YDC
6-7 a.m.		25.53	GSD	29.15	DZC	31.48	W2XAF			19.82	GSF
16.86	GSG	25.60	TPA-4	30.52	IRF	31.55	GSB	7-8 p.m.		25.00	RNE
19.62	GSP	28.93	EAJ43	31.02	W3XAL	49.1	GSL	13.99	DJS	25.4	2RO-4
19.65	W2XE	30.04	COBC	31.13	2RO-3	49.35	DJM	16.89	DJE	25.29	GSE
19.66	GSI	30.31	CSW	31.25	RAN			19.56	DJR	25.57	Saigon
19.72	W8XK	30.43	EAQ	31.28	PCJ	2-3 p.m.		19.63	DJQ	27.27	PLP
22.0	SPW	30.51	COCM		(M, W, Th)	25.24	TPB-7	19.66	GSI	28.14	JVN
	(T, Th, Sat)	31.02	W3XAL	31.32	GSC	31.32	GSC	19.76	GSO	29.24	PMN
25.0	RNE	31.06	LRX	31.38	DJA	31.41	TPB-11	19.82	GSF	30.23	JDY
25.24	TPA-3	31.09	CS2WA	31.41	W2XAD	31.48	W2XAF	25.24	TPA-3	30.96	ZHP
25.34	OLR4A	31.13	2RO-3	31.45	DJN	31.55	GSB	25.29	GSE	31.28	VK2ME
25.49	DJD	31.28	W3XAU	31.48	W2XAF	49.1	GSL	25.53	GSD		(S).
25.53	GSD	31.33	KZRM	31.49	LKJ-1			25.57	Saigon	31.28	VK6ME
25.57	IQY	31.35	W1XK	31.55	GSB	3-4 p.m.		28.14	JVN	(ex. S).	
27.17	CSW	31.38	DJA	49.1	GSL	13.99	DJS	31.33	KZRM	31.33	KZRM
30.4	EAQ	31.45	DJN	49.35	DJM	16.88	DJE	31.38	DJA	31.38	DJA
30.52	IRF	31.46	JZI			19.56	DJR	31.41	TPB-11	31.45	DJN
31.01	DJX	31.48	W2XAF	11 a.m.-noon.		19.63	DJQ	31.45	DJN	31.45	VPD-2
31.13	2RO-3	31.49	LKJ-1	16.87	W3XL	19.79	JZK	31.45	ZBW-3	31.48	W2XAF
31.28	PCJ (W)	31.55	KZIB	19.63	DJQ	19.85	DJL	31.49	VK3ME	31.49	ZBW-3
31.28	W3XAU	31.58	XEWV	19.71	OLR5A	31.28	VK2ME	31.50	VK3ME	31.50	VK3ME
31.35	W1XK	31.8	COCH	19.74	DJB			(ex. S).		(ex. S).	
31.48	W2XAF	49.35	DJM	19.76	GSO	31.38	DJA	31.55	KZIB		
31.55	GSB			19.76	GSO	31.41	TPB-11			31.55	KZIB
43.1	ZL2GB	9-10 a.m.		25.26	W8XK	31.45	DJN	8-9 p.m.		43.1	ZL2GB
47.2	ICC	16.87	W3XL	25.34	OLR4A	32.15	OAX4J	13.93	GSJ	44.64	PMH
49.59	GSA	19.56	W2XAD	25.42	DJZ	49.02	W2XE	13.97	GSH	48.7	VPB
49.83	DJC	19.63	DJQ	25.42	JZJ	49.5	W8XAL	13.99	DJS	49.5	W8XAL
		19.71	OLR5A	25.49	DJD			16.86	GSG	58.3	PMY
		19.72	W8XK	25.53	GSD	4-5 p.m.		16.89	DJE	70.2	RV-15
7-8 a.m.		19.74	DJB	25.61	TPA-4	13.99	DJS	19.56	DJR		
19.65	W2XAD	19.74	DJB	31.03	W3XAL	16.89	DJE	19.63	DJQ		
19.72	W8XK	19.76	GSO	31.13	2RO-3	19.56	DJR	19.8	YDC	10-11 p.m.	
19.72	OLR5A	19.8	YDC	31.25	RAN	19.63	DJQ	19.82	GSF	13.93	GSJ
	(W)	22.0	SPW	31.28	PCJ (M, W, Th Sat).	19.79	JZK	25.29	GSE	13.97	GSH
19.76	GSO	25.27	PHI		(ex. S, M)	19.85	DJL	25.4	2RO-4	16.86	GSG
25.00	RNE	25.34	OLR4A	31.32	GSC	31.28	VK2ME	25.57	Saigon	16.88	PHI
25.24	TPA-3	25.36	W2XE	31.38	DJA	(S)		27.27	PLP	16.89	DJE
25.34	OLR4A	25.42	JZJ	31.41	W2XAD	31.41	TPB-11	28.14	JVN	19.56	DJR
25.42	JZJ	25.42	DJZ	31.45	DJN	31.38	DJA	29.24	PMN	19.58	OLR5B
25.45	W1XAL	25.45	W1XAL	31.48	W2XAF	31.45	DJN	30.96	ZHP	19.63	DJQ
25.49	DJD	25.49	DJD	31.55	GSB	49.5	W8XAL	31.28	VK2ME	19.68	TPA-2
25.53	GSD	25.51	OLR4B	49.1	GSL			(S).		19.71	OLR5A
27.17	CSW	25.53	GSD	49.35	DJM						
30.40	EAQ	25.57	IQY			5-6 p.m.					
31.01	DJX	30.31	CSW	Noon-1 p.m.		13.99	DJS				
31.09	CS2WA	30.52	IRF	16.87	W3XL	16.89	DJE				
31.13	2RO-3	31.02	W3XAL	19.63	DJQ	19.56	DJR				
31.28	W3XAU	31.06	LRX	19.71	PCJ (W)	19.63	DJQ				
31.33	KZRM	31.09	CS2WA	19.74	DJB	19.71	PCJ (T)				
31.35	W1XK	31.13	2RO-3	25.24	TPB-7	19.83	TPB-6				
31.41	OLR3A					25.23	TPA-3				
	(T)					26.31	HBO (M,				

Radio Aids Explorers.

The continuation of this article will be found on page 38.

19.76	GSO	19.56	DJR
19.8	YDC	19.63	DJQ
19.82	GSF	19.68	TPA-2
25.29	GSE	19.74	DJB
25.4	2RO-4	19.76	GSO
25.42	JZJ	19.79	JZK
25.57	Saigon	19.8	YDC
25.65	HP5A	19.82	GSF
27.27	PLP	19.85	DJL
28.14	JVN	25.29	GSE
29.24	PMN	25.4	2RO-4
30.23	JDY	25.42	JZJ
30.96	ZHP	25.57	IQY
31.28	VK6ME	27.27	PLP
	(ex. S).	29.24	PMN
31.28	VK2ME	30.52	IRF
	(S).	30.96	ZHP
31.28	VUD	31.28	VK2ME
31.33	KZRM		(S).
31.35	W1XK	31.28	VUD
31.38	DJA	31.33	KZRM
31.45	DJN	31.35	W1XK
31.48	W2XAF	31.38	DJA
31.49	ZBW-3	31.45	DJN
31.55	KZIB	31.48	W2XAF
31.8	COCH	31.49	ZBW-3
32.59	COBX	31.51	HS8PJ
33.32	COBZ		(Th).
44.64	PMH	31.55	KZIB
46.8	TIPG	31.8	COCH
48.7	VPB	32.59	COBX
49.5	W8XAL	33.32	COBZ
49.96	HP5K	39.95	JVP
49.98	Rangoon	44.64	PMH
58.3	PMY	48.7	VPB
60.06	VUD	49.5	W8XAL
60.6	VUM	49.9	COCO
61.46	VUC	49.96	HP5K
70.2	RV-15	49.98	Rangoon
		58.3	PMY
11 p.m.-midnight.		60.06	VUD
13.93	GSJ	60.6	VUM
13.97	GSH	61.46	VUC
16.86	GSG	70.2	RV-15
16.88	PHI		
19.35	W2XAD		

Readers Invited To Join Australian Corps Of Signals



Photograph by courtesy of 1st Divisional Signals, North Sydney, and Hal. Williamson (photographer).

Alongside is pictured a member of the Australian Corps of Signals, which is part of the Australian military forces and consists of militiamen who are interested in wireless and other means of communication.

The set shown in the illustration is the "Wireless Set No. 1," and while we may not disclose the details, it can be mentioned that it is a short-wave transceiver operating on both 'phone and C.W. and is battery powered.

The role of a signal unit in the field is to provide a means whereby a Commander may be kept in touch with his subordinates.

Units of the Australian Corps of Signals are raised in every State capital city of the Commonwealth, and enlistment in this Corps is recommended to all readers who are eligible to join.

Queensland Demonstration Of 1.4-Volt Valve Receiver.

(Continued from page 6.)

basement on an inside aerial, and pulled in stations which quite definitely could not be played with other receivers known to be good performers. The overall results are a tribute to Tasma's chief engineer, Eric Fanker,

better known to experimenters as VK2HS.

The story of this trip would not be complete without a tribute also to the unparalleled hospitality of the Brisbane radio people, who went out of their way to make the visit thoroughly enjoyable. Among these must be mentioned Messrs. Swan (Queensland Tasma representative), Taylor, Brayne, Hart, Barber and Percy.

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U.H.F. Transmitter.

It is regretted that due to unusually heavy pressure on space this month, the article planned for this issue describing the construction of VK2MQ's latest u.h.f. transmitter could not be published. However, it will definitely appear next month.

Not In Favour Of Return Postage.

I read with interest Mr. Graham's article on dxing, and agree with all except his views that return postage should be included with a report. Surely a good and carefully compiled report is worth a card and postage thereon. To make a practice of including postage is creating a precedent which must make it harder for impecunious dxers like myself to obtain QSL cards. Of course, reporting "hams" is quite another matter. In the first place, quite often the report may be valueless, as the "ham" has already obtained all the "dope" he requires immediately he QSO'd. Also, they are, as a rule, no better off than the majority of dxers.

Now for some DX news. Reports are out to the following:—KGIG, RNE, TAQ, HVJ, TPB-7, ZMBJ, TPA2, COCQ, VUD2, OLR5A, ORK, RIM, W3XAL. Reception of HVJ may interest readers. I heard them twice in the last month testing in an attempt to determine a suitable wavelength for transmission to the British Isles. On the first occasion they had been on 49.75 m., 31.06 m., 25.55 m., and 19.84 m., but I heard them at R8 QSA4 at 5.20 a.m. on 19.84 m. only. Again on the 18th I heard "Radio Vaticano" on 25.55 m., at 5.15 a.m., R7, QSA4, and on 19.84 a few minutes later at R8 QSA4. They had been on 49.75 m. and on 48.47 m. also. If they were wanting a wavelength for Australia, then 19.84 m. would seem to be ideal.

Reception of ZMBJ, the "Awatea," was heard working VIS, La Perouse at 10.50 p.m. I already have their card back. It is a very good one, quiet and dignified. 2HP has also verified with a good card.—B. R. Ferris (AW439DX), Proston, Queensland.

Receiver Specially Designed For "20."

I have been altering my antenna from a $\frac{1}{2}$ -wave on 40 to $3\frac{1}{2}$ waves on 20, and I think it is an improvement. Among my DX, which is all on 20 metres, are 433 W1-9, 16 LU's, 14 ON's, 33 VE's, 5 TI's, 5 CO's, 25 F's, 9 OG's, 3 GW's, 3 GM's, 3 GI's, 3 EI's, 11 PA's, 4 LA's, 8 YV's, 11 CE's. G3BX used 10 watts and QSL'd.

The report forms are certainly a great help and a very fine job; if the log sheets are of the same high standard I must lay in a stock in the near future.—John Taylor (AW454DX), Hurstville, Sydney.

THE AUSTRALASIAN RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS.

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

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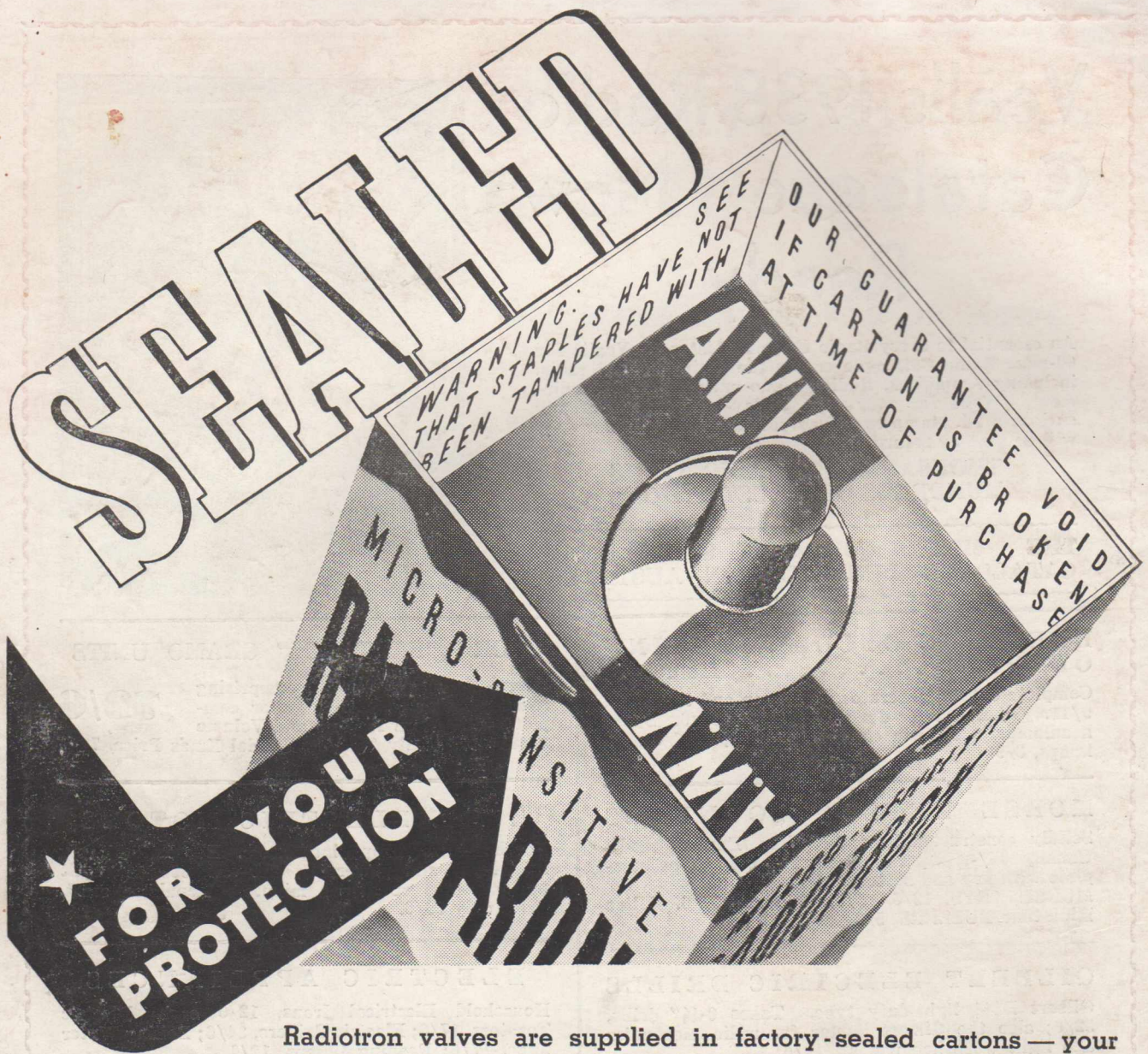
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