THE AUSTRALASIAN

Radio World

PRICE, 1/-

VOL. 4 . . . . . NO. 4

SEPTEMBER 1, ... 1939

Registered at the G.P.O., Sydney, for transmission by post as a periodical

- FALCON DUAL-WAVE 4: 1.4-VOLT BATTERY SET
- FREQUENCY METER: CATHODE RAY OSCILLOGRAPH
- SKY-CHIEF DUAL-WAVE FIVE: ATLAS ALL-WAVER
- LATEST LIST OF AUST. BROADCAST STATIONS

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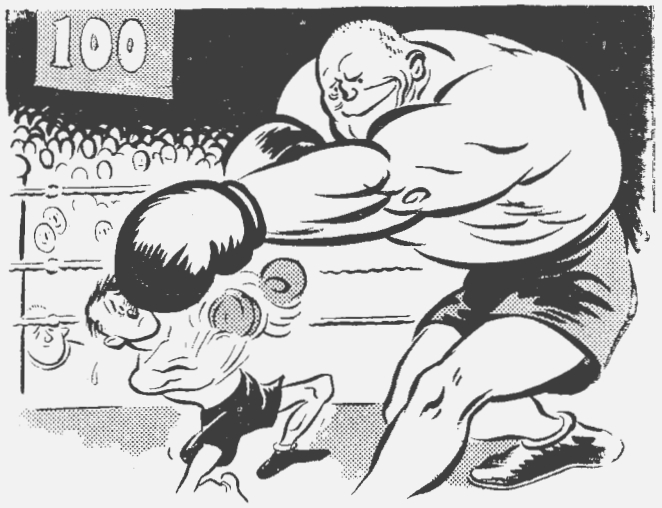

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The Australasian

RADIO WORLD

Incorporating the

ALL-WAVE ALL-WORLD DX NEWS

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

Vol. 4. SEPTEMBER, 1939. No. 4.

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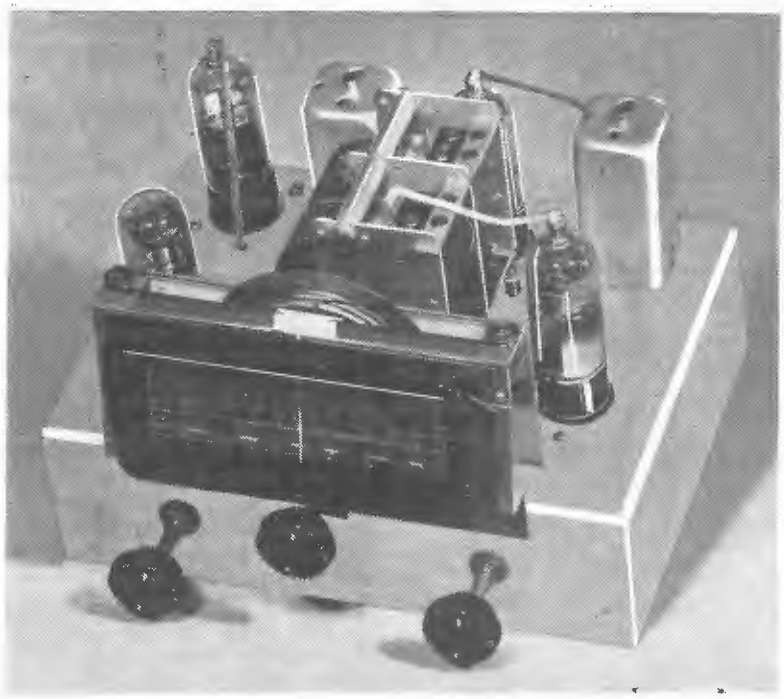
A view of the completed receiver, which is built on a frosted aluminium chassis measuring 10" x 7" x 2¾."



Falcon Dual-Wave Four

Excellent all-round performance coupled with low initial and running costs, are features of this latest 1.4-volt dual-wave superhet.

MOST notable advance in battery valve technique during the past few years, the new 1.4-volt valves represent an important step forward towards the ideal in battery reeciver design. Years ago 6 and 4-volt filaments gave way to 2-volt, and now designers have available a highly successful series of valves requiring only 1.4 volts across the filaments.

More important still, filament current has decreased in proportion, so that it is now possible to design a 4-valve receiver drawing a total filament current equal to that taken by a single valve several years ago, and with a total filament wattage only a fraction of that of earlier sets.

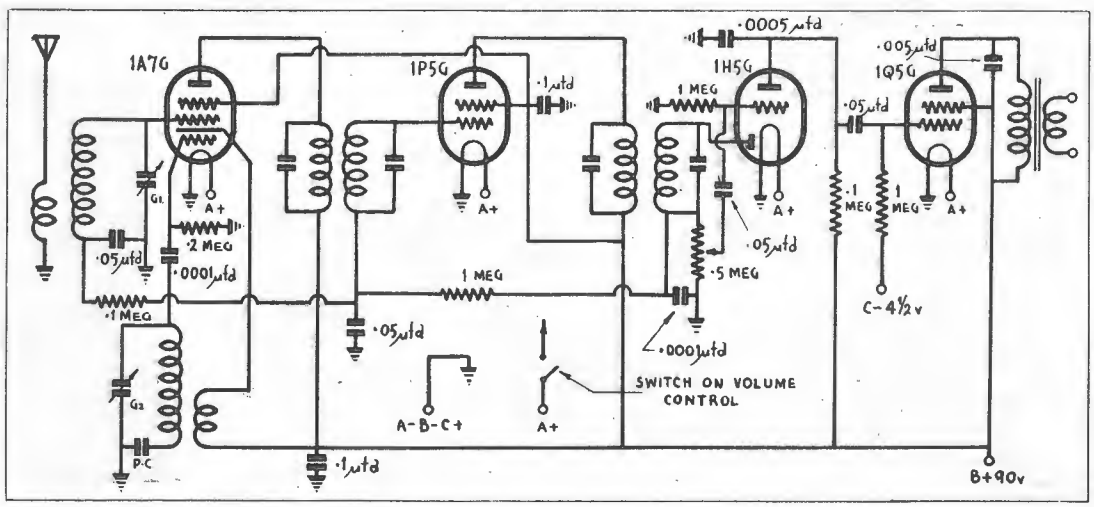
"B" Consumption Correspondingly Improved.

An equivalent advance has also been made on the "B" supply side. Receivers drawing up to 20 or 24 mills. "B" current at 135 volts were the order of the day a few years ago. To-day, corresponding performance can be obtained from a set drawing only 10 to 12 mills. at 90 volts.

While this remarkable improvement in economy is largely due to advances made in valve design, part of the credit must also go to the new type permanent magnet speakers. Sensitivity has been increased considerably, or in other words, using a latest type permanent magnet dynamic speaker, considerably more volume is obtainable with a given output than from an equivalent type speaker of several years ago.

"Falcon Dual-Wave Four."

The "Falcon Dual-Wave Four" illustrated above is an example of what can be achieved with the new 1.4-volt valves, high-gain coils and latest high-sensitivity speaker. A four-valve dual-wave receiver drawing .25 ampere "A" current at 1.4 volts, and approximately 10 mills "B" current at 90 volts, it gives a performance comparable with that of earlier receivers



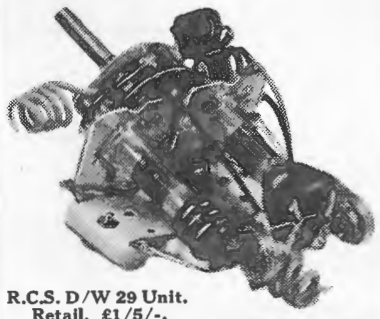
Circuit of the "Falcon Dual-Wave Four," with all constants. Coil unit used is the latest Radiokes type DAU-1B.

R.C.S.

The Coil People.

1939 Trolitul Coil Kits.

For the Falcon Dual-Wave Four use the RCS Trolitul D/W unit illustrated and obtain the same peak performance as the original receiver. This unit, combined with our Trolitul intermediates specially wound for this set, is the reason for its high sensitivity, selectivity and extremely low noise level. Be a satisfied owner of the Falcon by using Coil Kit, Cat. No. K111.
Retail Price £1/17/6



R.C.S. D/W 29 Unit.
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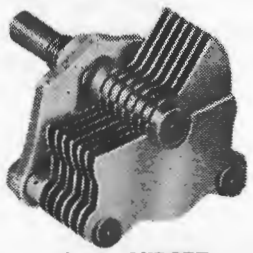
For the Sky Chief D.W. Five, the new D/W unit containing the necessary B/C and S/W trimmers, two section wave, change switch and padder, mounted together as illustrated, coupled with our high Q Trolitul intermediates, provides the maximum gain, selectivity, and that stability so essential to perfect reception.
Coil Kit with Air Core I.F.'s, Cat. No. K 109. Retail Price .. £1/17/6
Coil Kit with Iron Core I.F.'s, Cat. No. K 110. Retail Price .. £2/7/6



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with approximately double these "A" and "B" wattage requirements.

New Radiokes Coil Unit.

The receiver uses the latest Radiokes type DAU-1B dual-wave coil unit and a pair of high-gain i.f. transformers (either air or iron-cored types can be used). A 1A7G is used as mixer-oscillator, and while this valve was designed primarily for broadcast operation, it operates splendidly on the short waves as well.

Next follows one of the new 1P5G multi-mu pentodes as i.f. amplifier, followed by a 1H5G as diode detector and triode audio amplifier driving a 1Q5G beam output pentode. This valve has characteristics broadly resembling those of the 1C5G output pentode, but it operates with considerably smaller grid bias, and is therefore more sensitive. For those particularly interested in "B" economy, the 1Q5G also has a further important advantage, in that it may be operated satisfactorily under over-biassed conditions, giving an appreciable reduction in "B" battery drain without serious increase in distortion.

Brief Characteristics Of 1Q5G.

The 1Q5G has a 1.4-volt filament drawing .1 ampere. With 90 volts on both plate and screen, and a bias voltage of –4.5 volts, the plate and screen currents are 9.15 and 1.6 mills., respectively. Load resistance is 8,000 ohms, total harmonic distortion 7.5%, power output .27 watt.

More than ample volume for domestic requirements can be obtained by using a modern speaker such as the Rola 6-15, while those prepared to pay more can obtain even greater output from a larger model, such as the Rola 10-42, which has a 42-ounce magnet giving exceptionally high sensitivity.

The circuit of the "Falcon Dual-Wave Four" is perhaps the simplest possible that could be developed while still incorporating every worthwhile modern feature. A simple and effective a.v.c. system has been included, operating on the 1A7G and 1P5G. A fixed tone control, consisting of a .005 mfd. condenser from the plate to screen of the 1Q5G, has been provided, though it would be a simple matter to incorporate a variable control if desired. However, as reproduction is very well balanced, the fixed control is actually all that is necessary.

Wiring Diagram Next Month.

A list of parts required for the receiver is given in this article, and together with the illustrations, will enable those experienced in set building to complete the receiver without further assistance. However, for beginners a further article will be published next month outlining the

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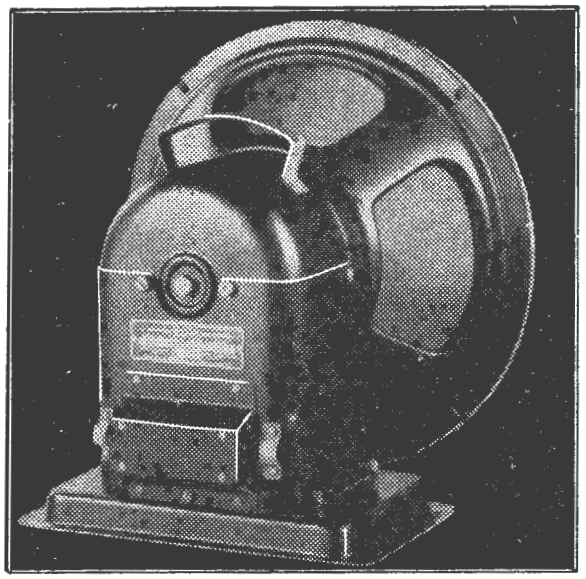

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The Aristocrat of Sound Reproducers

Here is a truly high-fidelity twelve-inch sound reproducer, ideally suited to well-designed radio receivers, power amplifiers and theatre equipment—a speaker that will reproduce smoothly and effortlessly, notes from 50 to 7500 cycles and volume from a whisper to auditorium level.

G12 is a sound reproducer in a class all by itself, a quality unit far in advance of any other speaker manufactured anywhere. Of massive construction, this remarkable speaker has a field coil of three and a half pounds (maximum) and requires eighteen watts for normal excitation. Even the transformer has been specially designed for maximum efficiency.

G12 is the ideal speaker for use with high quality radio receivers and amplifiers.

PRICES:—

G12, COMPLETE WITH BASE . . . . . £8 0 0.
G12 PERMANENT MAGNET MODEL . . . . £11 0 0.

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Rola is strictly independent of all affiliations with radio set manufacturers or the personnel thereof.

construction in detail, and an under-chassis wiring diagram will be included.

Falcon Dual-Wave Four

List Of Parts.

1 aluminium or steel chassis stamped and drilled as shown.
1 dual-wave coil unit (Radiokes DAU-1B).
2 Trolitul iron-core i.f. transformers (Radiokes I.F.I.).
1 2-gang condenser (Stromberg-Carlson).
1 50,000 ohm potentiometer, with switch (I.R.C.).
4 octal, 1 6-pin, 1 4-pin valve sockets.
3 knobs.
1 slide rule type dial (Efco).
2 terminals, 1 red, 1 black.
1 len. 6-wire battery cable.
1 4-pin speaker plug, 1 6-pin battery plug.
FIXED RESISTORS:
2 .1 megohm carbon (I.R.C.).
1 .2 megohm carbon (I.R.C.).
3 .1 magohm carbon (I.R.C.).
3 1 megohm carbon (I.R.C.).
FIXED CONDENSERS:
2 .0001 mfd. fixed (T.C.C.).
1 .0005 mfd. fixed (T.C.C.).
1 .005 mfd. fixed (T.C.C.).
3 .05 mfd. tubular (T.C.C.).
2 .1 mfd. tubular.
VALVES:
1 1A7G. 1 1P5G, 1 1H5G, 1 1Q5G.
SPEAKER:
1 8 inch permanent magnet dynamic speaker, input transformer to match single 1Q5G.
BATTERIES:
1 X250 1.5-volt "A" unit (Eveready).
2 45-volt "B" units (Eveready Superdyne).
1 4½-volt "C" battery (Eveready).
MISCELLANEOUS:
3 grid clips, solder lugs, nuts and bolts, hook-up wire.

Has Built Nine "R.W." Sets.

I have built the following sets from your magazine—two models of the "Companionette Three," one model of the "Fidelity Broadcast Five," three models of the "Outdoor Portable Four" (all in cabinets), two dual-wave and one broadcast versions of the "Comet," and needless to say I have found them all up to your recommendations and very difficult to beat by the commercial receivers.

Recently I have had enquiries regarding an amplifier, and after due consideration have decided that the 7-watt fidelity model using push-pull 2A3's in the output as described in August, 1937, issue would fit the bill. —M. Elliott, Bendigo, Victoria.

★

"On Its Own"

Kindly supply me with copies of the "Radio World" from March, 1937, to September, 1937. I have all the others before that date and am continuing to get same each month. My club intends to do the A.O.C.P. and would like all the articles which you have published. I personally think your paper great. I have been reading radio books since before war days in 1914 and think it is on its own for technical items.—C. T. Noble, Whyalla, S.A.

Six-Band Frequency Meter

The completed instrument, with special scale covering all amateur bands (block-maker's proofs on heavy art paper are available from "Radio World," price 1/- each, post free).

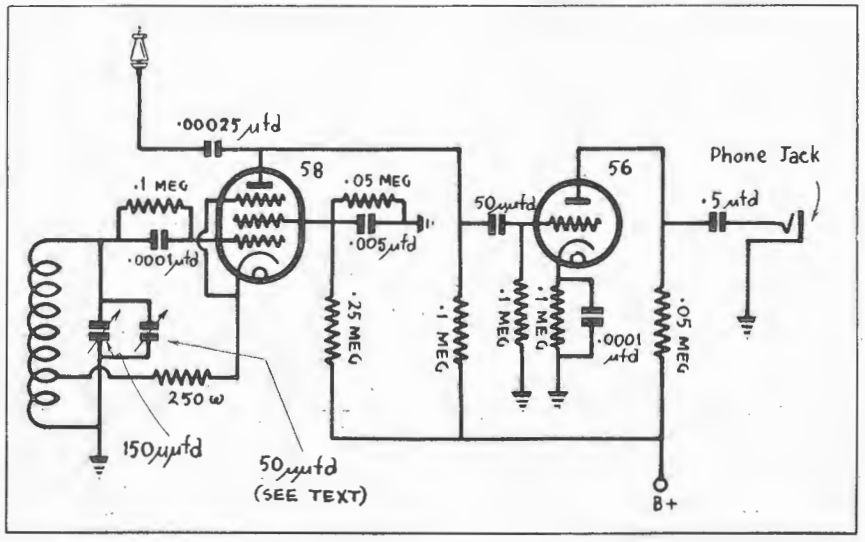
This simple but accurate frequency meter for amateur use is provided with a special scale, directly calibrated to cover all amateur frequency bands.

THE recent trend in amateur radio towards using electron-coupled oscillators indicates that the popular demand is for a transmitter which is not tied to one frequency.

This demand brings with it a need for frequency measurement, for a frequency meter sets out one's own frequency and indicates per medium of the receiver where to look for others.

It is the purpose of this article to describe the details and construction of a heterodyne type frequency meter that will suit the demands of the average amateur within reasonably accurate limits.

The unit is comprised of a 58 electron-coupled oscillator coupled (very lightly) to a detector for the monitoring of one's own signal, and the fundamental covers the 160-metre band with harmonics falling to indicate the other bands.



Circuit of the six-band frequency meter, with all constants.

Two Main Essentials.

There are two requirements for an accurate frequency meter. One is the precision in frequency control with the ability to read, set, and re-read the dial to any pre-determined frequency.

The other is stability in the oscillatory circuit so that the actual frequency at later times and under differ- conditions will not stray from the calibrated value.

The cumulative effects of filament, plate, and screen voltages on the frequency must also be taken into consideration, but the source of each is the a.c. supply line and the cause of any variation lies in the line voltage.

To guard against this factor a resistor is included in the cathode cir-

(Continued on page 47)

Alongside is shown the new Ultimate Royal console, a de luxe eight-valve receiver designed for all-wave operation.

Latest Model Ultimate On Test

New eight-valve all-wave receiver has host of exclusive features ★ Gives exceptionally fine performance on all bands.

LAST month one of the recently-released 1939-40 Ultimate eight-valve all-wave consoles was submitted to "Radio World" for test by the Australian representatives, Messrs. Geo. Brown & Co. Pty. Ltd., 267 Clarence St., Sydney.

During the past eight years or so Ultimate receivers have built up an enviable reputation throughout Australasia for quality and performance, and have held pride of place in many DX contests. That the latest a.c. all-wave model is a worthy successor to previous Ultimates is amply proved by the test report given below.

A thorough examination of the chassis showed that it has been engineered throughout for maximum possible performance from the valves used, which comprise a selection of metal and metal-glass types. According to the manufacturers, each valve used is the best possible type available for its particular purpose. (Actual valve types used appear in the specifications below).

Many Exclusive Features.

Included among many attractive features not found in any other commercial receiver are the following:—Six-gang tuning condenser (giving unusual ease of tuning on the short waves, coupled with exceptionally high shortwave efficiency); new large multi-colour slide-rule dial with vernier logging pointer and incorporating "spinner" tuning; calibrated volume control scale with pointer; new "fan" type Magic Eye; improved a.v.c. system, superb tonal quality.

A noteworthy feature of the receiver is the obvious care that has been taken in the chassis construction to ensure rigidity of assembly throughout, particularly in the r.f. and mixer circuits.

Smooth-Action "Spinner" Dial.

All controls are smooth and positive in operation, the dial "spinner" in particular being so well balanced that a flick of the tuning knob sends the pointer travelling slowly and smoothly right across the scale. This effectively obviates laborious knob turning, at the same time giving a tuning ratio of 30 : 1 for shortwave work. This feature, coupled with the special low capacity condenser gang used on the short waves, gives what amounts to bandspread tuning. Actually, on this receiver shortwave stations tune almost as broadly as those at the high frequency end of the broadcast band.

Two features that become apparent immediately the receiver is put into operation are the excellent tonal quality, and the tremendous reserve of sensitivity. On the broadcast band, stations in all parts of the Commonwealth and New Zealand, and after 11 p.m. a dozen or so of the better-known stations in the Far East were brought in at excellent volume and surprising clarity.

On the short waves, results were equally impressive. The main broadcast transmissions from countries throughout the world could, of course, be brought in at terrific strength, while literally hundreds of 'phone and c.w. stations were heard at different times during the week-end the receiver was being tested. No effort was made to compile a log, partly because only a fraction of the stations heard could have been identified in the time available, but mainly because an up-to-date list of 400 shortwave stations as logged on a latest model Ultimate is available on request from the Australian representatives (this is supplied free, together with a copy of the new Ultimate catalogue featuring the complete range of 1939-40 models).

The a.v.c. system is very effective in its action, not only on the broadcast band but on the short waves as well. The Magic Eye affords striking proof of this in that, though it fluctuates on a distant signal in accordance with surges and fades, corresponding changes in volume are rarely perceptible. Except on very bad fades, output is rock steady.

Readers interested in technical details will find further information in the following specification data.

1939-40 Eight-Valve All-Wave Ultimate—Brief Specifications.

Brief specifications of the 1939-40 Ultimate 8-valve all-wave a.c. model are given below:—

Valves—comprise a selection of metal and metal glass types chosen to suit the particular requirements of each valve. Line up is as follows:—A 6K7 r.f., 6K8 mixer, 6K7 i.f., 6H6 diode second detector and a.v.c. rectifier, 6J7G first audio, 6F6G power output, 80 rectifier, 6U5 magic eye.

Controls—are four in number (see illustration on opposite page). Left-hand knob tone control, lower left combination volume control and on/off switch, upper right waveband switch and illuminated band indicator, lower right main tuning knob operating the dial mechanism and spinner.

Band Coverage—There are three bands, shortwave, from 13 to 33 metres; medium wave, from 40 to 100 metres; and broadcast band, from 200 to 550 metres.

Iron Core Transformers—Iron core r.f. and high-gain i.f. transformers provide greatly increased efficiency. All coils have been designed for maximum gain coupled with high selectivity, and to give perfect tracking.

Six-Gang Condenser—In this exclusive Ultimate feature, three of the gangs tune the shortwave coils separately, while for broadcast band operation the other three gangs are paralleled to the first three. In this way efficiency on the short waves has been made considerably higher than in conventional receivers using a standard three-gang condenser, and far greater accuracy in tracking is obtainable.

Spinner Tuning—This consists of a die-cast fly wheel in combination with a planetary drive attached to the rear of the tuning knob. In effect, the spinner allows a tuning ratio of approximately 30 : 1, while at the same time no laborious turning of the control is necessary to tune from, say, 550 to 1500 k.c., as one spin of the knob will do this.

Slide-Rule Dial—A new and improved slide-rule type dial, particularly smooth in action, easy to read, and very attractive in appearance, has been developed for this latest Ultimate.

Logging Pointer—This enables vernier readings to be taken, in particu-

(Continued on page 48)

GET OVERSEAS NEWS
as clearly as local Broadcasts on the ULTIMATE !

DID YOU KNOW ?

. . . that Germany broadcasts 5 news sessions in English every day. Listen for them on the following stations:
DJD—25.49 metres —5 a.m. and 7.10 a.m.
DJQ—19.63 metres —5 p.m., 10 p.m. and 12 p.m.
DJB—19.74 metres —10 p.m. and 12 p.m.

Never has European history been stepped up to such a high tempo. News to-day is entirely changed to-morrow. **Keep in direct touch with overseas situations, with 'ULTIMATE' Champion Radio.**

'Ultimate' Champion Radio is custom-built to give matchless performance. Every ultra-modern radio luxury is incorporated. Overseas stations can be perfectly tuned, even by a child. Overseas reception strength is equal to that obtained in ordinary sets from local stations.

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free ! Log Chart giving positive identification of over 400 overseas stations, and details of 'Ultimate' Champion Radio.

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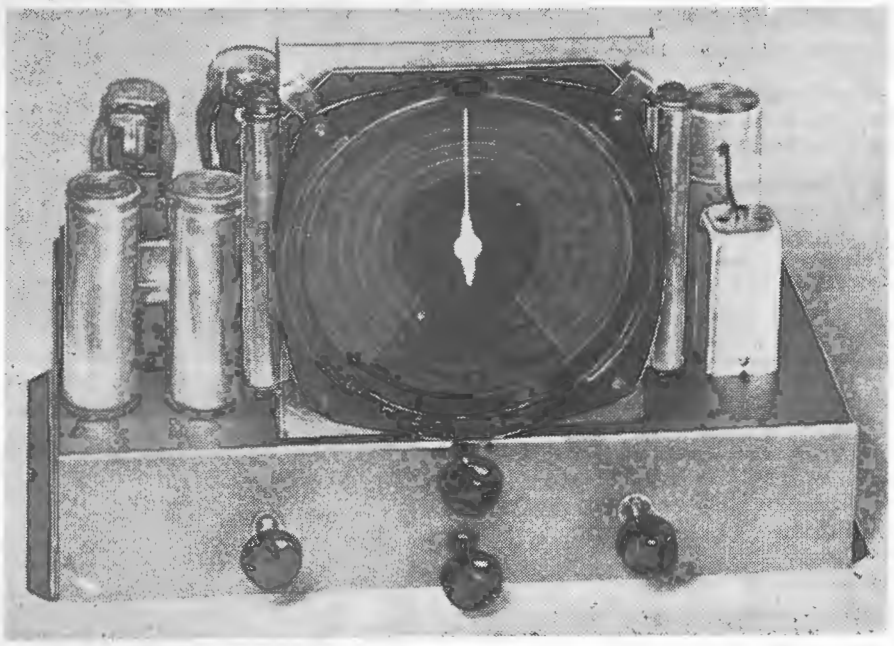
Using a high fidelity audio section with a single 6A3 in the output, together with the latest Radiokes high-gain dual-wave coil unit and i.f.'s, the "Sky-Chief" is an exceptionally fine all-round performer.

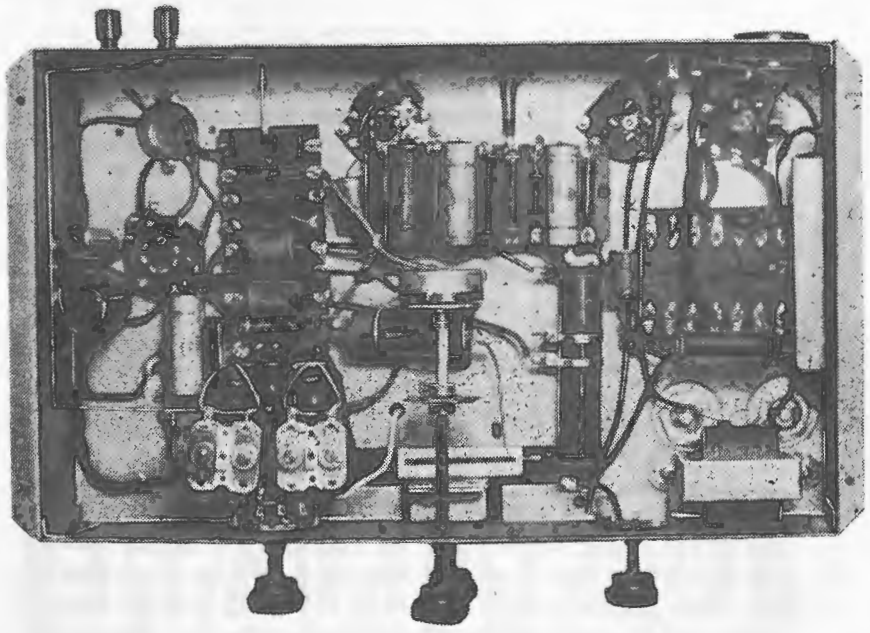


Wiring And Aligning The

Sky-Chief Dual-Wave Five

Detailed instructions covering the assembly, wiring, and alignment of this de luxe 4/5 superhet are given below.

THE assembly of the "Sky Chief Dual-Wave Five" is commenced by mounting the five valve sockets, speaker and power sockets, aerial and earth terminals and power transformer. The heaters lugs on the valve sockets can now be wired, the 6.3-volt 3 amp. winding being used for the first three valves and the dial lights, and the 6.3-volt 2 amp. winding to supply the filament of the 6A3. Next, the rectifier socket can be wired by connecting the two 385-volt lugs on the power transformer to the plates, and the 5-volt 2 amp. lugs to the filaments.



Details of the under-chassis assembly are shown in this view.

Next, mount the i.f. transformers, the voltage divider, volume and tone controls, 30-henry choke, two wet electrolytics and the condenser gang, which should have a 6-inch length of flexible push-back soldered to each fixed plates lug before it is bolted in position.

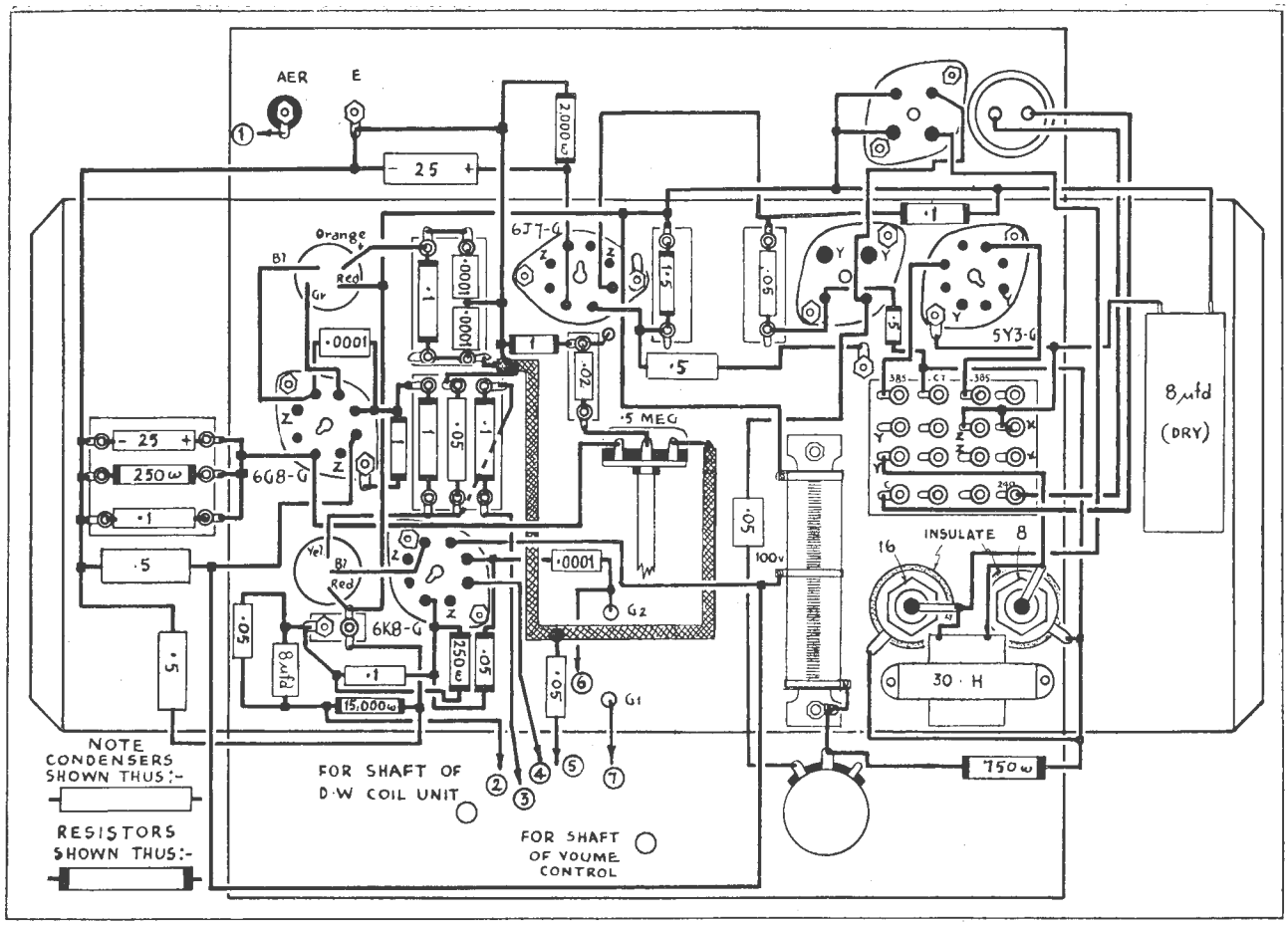
Wire From 6K8G Plate Onward.

Then, commencing at the plate of the 6K6G, wire the first i.f. transformer in circuit, then the pentode section of the 6G8G, second i.f. transformer, 6G8G diodes, and so on until the 6A3 socket has been wired.

The wiring of the smoothing filter, which comprises three electrolytics (two wet and one dry), 30-henry smoothing choke, and speaker field can now be completed. Following this, the wiring should be given a thorough check to make sure everything is in order.

Mounting And Wiring The Coil Unit.

If the wiring completed at this stage checks fully with the circuit, the



The sketch on this page shows the under-chassis wiring of the "Sky-Chief," connections to the coil unit being numbered correspondingly on both this and the coil unit diagram.

dual-wave coil unit can be mounted in place and wired.

The colour code of the Radiokes type DAU-1 unit supplied with the kit is as follows:—

Aerial Grid	White
Oscillator Grid	Yellow
Oscillator Plate	Red
Oscillator B+	Green
Aerial	Black
Two Copper Braids	Earth

(The manufacturer recommends that these braids should not be connected to the one earth point).

When used in receivers incorporating a.v.c. (as in the "Sky Chief"), the shorting bus-bar on the terminal strip should be removed. The four trimmers (looking from front of unit, left to right), are broadcast padder, broadcast oscillator, shortwave aerial and broadcast aerial.

Sketch Shows All Connections.

After the unit has been bolted in position in the receiver, it can be wired in accordance with the above colour code. Accompanying this article is a separate sketch of the coil unit, each lead from it being numbered. Corresponding numbers appear on the under-chassis wiring diagram. By referring to them, builders will find the mounting and wiring of the coil unit a simple job. Connections for the dial lights are also shown.

Well-Spaced Aerial Lead Essential.

An important point to bear in mind is that the lead from the aerial terminal to the coil unit should be kept well spaced from the i.f. transformers. The coil unit is a high-gain type, and any unwanted coupling here would cause instability.

An excellent scheme that will ensure there will be no trouble from this source is to drill a hole in the top of the chassis, in the corner nearest the aerial terminal. A corresponding hole is drilled in the front corner of the chassis on the same side. The aerial lead is then taken from the aerial terminal, up through the chassis and along the top, down through the second hole and from thence to the coil unit.

The last step in the construction is to mount the dial and wire the dial lights in circuit, and to fit the control knobs, grid clips and valve shields.

Next, connect the aerial and earth leads, plug in speaker and power plugs, and switch on. At the same time watch the rectifier closely for any signs of sparking or of a blue glow, both of which denote overload. If everything is in order, however, the volume control can be turned up and the tuning dial rotated to bring in a station.

Alignment Instructions.

The set is now ready for alignment. Tune in a station on approximately 1400 k.c. and adjust the broadcast aerial trimmer on the coil unit for greatest response. Keep the volume turned well down while this is being done, because at low volume levels small changes can be more readily noted, and as well the a.v.c. system

(Continued on page 48)

This Radiotron type 906 three-inch cathode ray tube, is a high-vacuum type containing two sets of interconnected electro-static plates for deflection of the electron beam.

The Cathode Ray Oscillograph . (2)

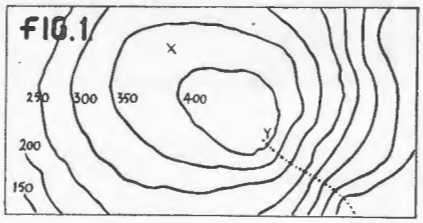
In this instalment the author describes the influence of the deflecting plates on the electron stream, and analyses the construction of a typical general purpose cathode ray tube.

By - - - - - "ENGINEER"

IF an observer stands on sloping ground and drops a golf ball, it will roll. Every particle in that ball has an affinity for every particle of the earth, and the total pull between the ball and the earth is the **weight** which the force of gravity, the **"affinity,"** gives the ball. Naturally, the ball rolls down the steepest grade.

While the ball falls directly downward, it has the full force of gravity working upon it, but as soon as it strikes the earth, some of the force is offset by the earth itself. The nett force on the ball is thus reduced. On flat ground the gravitational force is counteracted completely by the earth, and the ball remains in a condition of rest. The steeper the slope, the greater the force.

A **contour** map of the slope shows lines joining points of equal altitude. Any point off the lines may be said to lie between two limits of altitude. Thus the point "X" in Figure 1 lies between 350 and 400 feet above sea level. Contour maps, however, do not exhaust their possibilities at points. It is possible to read further between the lines. Toward the right-hand bottom corner the lines bunch together. In that area, a small horizontal movement is accompanied by a large drop —the **slope** or **gradient** is great.



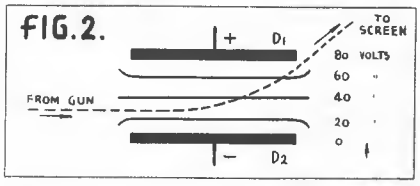
If one had enough lines, each representing a very small difference in level, any adjacent pair would be so very nearly parallel that it would not matter. Now, the shortest distance between parallel lines is at right angles to both of them, and it follows that the most sloping path is at right angles to the contour lines. The line of gradient from the point "Y" shown on the map is the path that the golf ball would follow if dropped at "Y."

All of this seems to be miles away from cathode ray tubes, but the two can be co-related. Figure 2 is another kind of contour map. The two lines, D_1, D_2, are cross-sections of deflecting plates in a cathode ray tube. The "contour" lines are rather inaccurately drawn to connect all points of equal **potential** between the two plates. The dotted line is supposed to be the path of an electron through the intervening (charged) space.

If an electron were to fall off the plate D_2 it would just "roll" straight across to D_1 at right angles to the "contour" lines. However, the electrons shot through the anode have a

velocity from left to right, and the result is rather like putting a golf ball on a sloping green—it moves forward and downward, and follows a curved path like the one shown for the electron. The harder the putt, the less the curvature, and, likewise, the greater the electron velocity the less the deflection.

Figure 3 is a different map again. It is the cross-section of the electron gun of a modern cathode ray tube. K is the cathode, G the grid, and A_1 and A_2 the two respective anodes (cylinders). The curved lines are the potential contours, and the two broken lines are the paths of two electrons, released by the cathode. Their paths, at right angles to the contours, meet at the point S, beyond A_2.



By careful consideration of dimensions of cylinders, and intelligent adjustment of voltages, all electrons leaving the gun may be concentrated into a very small zone. If a portion of the screen lies within that zone, the spot will be very small, and have great intensity of fluorescence. Thus the modern cathode ray tube is made to provide very clear and sharp images.

The Modern Cathode Ray Tube.

The modern cathode ray tube takes many different forms and types. Some are very small—6E5 and other indicators, for instance, besides the 913—and others are quite large, big enough to have full plate pictures on their screens. Some have magnetic fields, instead of electric fields, for focussing and deflection. Some are pumped as free from air and other gas as possible, and others have a small pressure of gas purposely admitted.

There are two main classifications —general purpose types, most useful for oscillographs, and specialised types used specifically for such purposes as television, examining heartbeats, studying the structure of the atom, etc.

Construction Of General Purpose Tube.

At the moment we are only concerned with the general purpose class

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The "PALEC" ALL-WAVE [Switchless] MULTI-VIBRATOR
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The PALEC Model VIB eliminates skill, gang rocking, tediousness; cuts time by a quarter and ensures a correct padder setting on all bands.

The operation is simple: (1) Turn to any point on the high frequency end of the receiver dial and adjust the Oscillator trimmer for maximum gain. (2) Turn back to the low frequency end adjust the padder for maximum gain.

This may have to be repeated, nevertheless the Operator is constantly aware of the effectiveness of each setting. As the dial is turned from end to end, the Output meter indicates perfect tracking by an unfluctuating gain — free of valleys and dead spots—all over the band.

The PALEC Model VIB (A.C. operated) has but one control—the attenuator output and consists of a specially designed multi-vibrator with compensated amplifier (to boost the higher harmonics) to ensure a continuous workable signal from the 1,000 cycles to 22 megacycles (22,000th harmonic). NOTE: The VIB supplements but does not displace the Palec All-Wave Oscillator. TRADE PRICE, complete, £6/18/6, plus sales tax.

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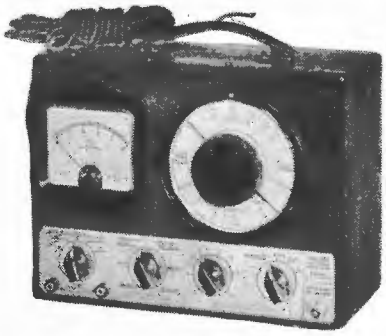

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FREQUENCY RANGE: 160 KC. to 24 MC in 6 bands as follows, 160-320, 400-800, 800-1600 kilocycles and 3-6, 6-12, and 12-24 megacycles. ACCURACY: The frequency accuracy on all six direct reading bands is exceptional, 0.5% may be expected with a guarantee of 1%. ATTENUATOR: Low Impedance (45 ohms) four step pad attenuator, continuously variable in conjunction with perfect attenuation and accuracy of repeat readings. R.F. AMPLIFIER: A special R-F Amplifier stage is employed resulting in maximum frequency stability and greatly improved amplitude level on all bands. MODULATION: 400 cycle modulation at a mean value of 30%—can be switched in or out. TUBE STAGES: R-F Oscillator—R-F Amplifier, A.F Modulator—Rectifier. BATTERY VALVES: On the battery model, 1.4 V. tubes are used with a drain of 6 M.A. on the B and 200 M.A. on the A Battery (batteries enclosed). DUMMY ANTENNA: An external standard I.R.E. Dummy Antenna is supplied. OUTPUT METER: The built in Output Meter when supplied, consists of our large square type Meter with three ranges, 10, 25, and 100 volts A.C.

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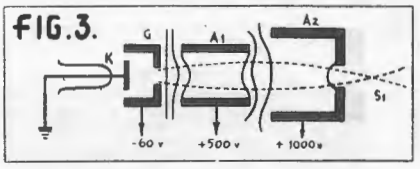
of tube, and its construction will now be discussed.

The bulb must have a transparent end for viewing the screen, though the difficulties of making the rest of metal are rather more mechanical than optical or electrical. The cylindrical steel envelope of the 913 is an example of one solution to what problems there may be, but glass is the usual material.

Cathode ray tube bulbs must be almost flat at one end, and the rest of the structure must be designed around that idea. In a small tube, the difficulties are not great, as the total weight of air on the end is small, and because the distance across the flat part is small, there is not much "bending force" or "moment" at its circumference—the weakest part of any glass work, where the sharpest bend occurs.

Large tubes, consequently, are seldom magnified editions of their little brothers, for the thickness of the walls may not be increased in proportion. If it were, the bulb would probably break during the heating of the electrodes while it was being exhausted. So the writer does not anticipate overgrown 913's, and we must all note with interest the shape, more bulbous than conical, of some of the very large tubes.

The gun is in the "neck" of the tube. Its sole purpose is to shoot an adequate and controllable supply of electrons fairly and squarely along the axis of the tube and concentrate



them on a very small spot on the end of the tube.

Focussing Considerations.

If the cylindrical anodes are not exactly in alignment, focussing becomes practically impossible. Some of the American 5" tubes used to fail badly in this respect, and it was often easier to make a line or a cross on the screen than to focus a sharp round spot. However, this defect has now been rectified.

Large tubes require larger guns than small ones, for the spot has to cover and to illuminate a larger area of screen. The spot has to be more intense because the line or "trace" which it draws on the screen is longer, and requires more energy to be as bright as a shorter one. That is the reason for the higher voltage requirements of big tubes.

The gun itself consists of a heater, a flat cathode—usually connected internally to one end of the heater so that some careless individual won't put 2000 volts between "H" and "K" by mistake—a grid, to control the intensity and protect the cathode, and two or more anodes. The anode closest to the grid is usually fed from a variable tap in the power supply for focussing.

The third anode (if any) often consists of a carbon or metal inner coating of the bulb, and its purpose is to collect the electrons knocked out of atoms in the screen by the cathode ray.

The Deflecting System.

The deflecting system makes the C.R. tube work for us. The idea of the two pairs of plates should be understood from the first of this series of articles. There are, how-

RADIOKES

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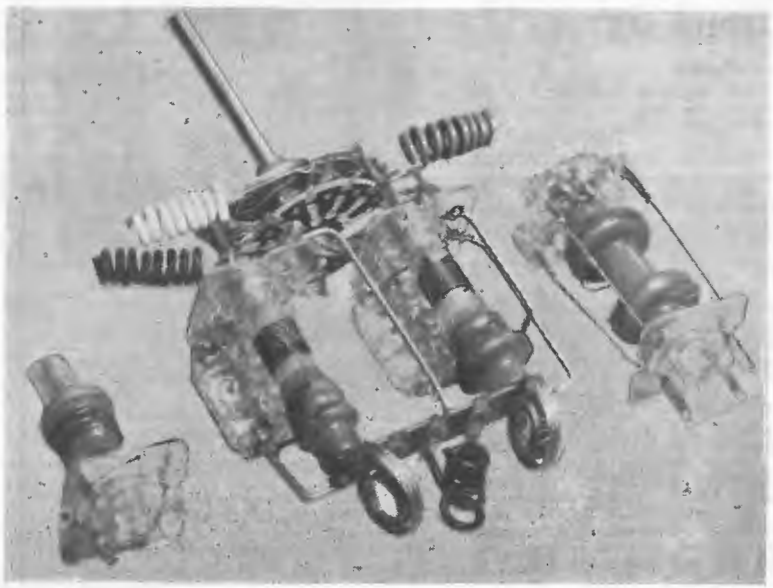

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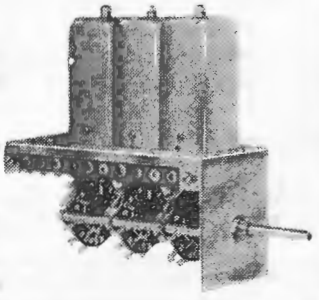

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ever, some finer points worth discussion.

Unless a tube is made inconveniently long, there is always some small capacity between the deflecting plates and the gun. Where there is a charged condenser, there is an electric field. Remember—it was the arrangement of fields in the gun that focussed the electron stream. If the deflectors share that field, or contribute towards it, they can have a serious effect on focussing.

It is desirable then to keep their potential as near to that of anode No. 2 as possible. But we must vary the potential between the deflectors to swing the stream. The means of keeping the de-focussing to a minimum is to allow the potential of one deflector to increase as the other is reduced, and vice-versa. In a word—push-pull. Now, push-pull deflection is only possible when each plate has an individual external connection. Consequently, some of the American 3" tubes used to show indistinct extremities of their images, because one plate from each pair was tied internally to anode No. 2.

In smaller tubes the fault is less pronounced, and not important.

As it is the duty of the deflectors to swing the direction of rapidly moving particles (1/10th the velocity of light, in some cases), the speed of those particles has an influence on their power to deflect. The faster they go, the harder it is to shift them from their courses, and we find that where high voltages are applied to the gun, the plates are less sensitive than they are in the smaller tubes, i.e., we have less deflection for a given voltage between the plates.

The Fluorescent Screen.

Inside the end of the tube is the screen. Its colour does not matter much in the general purpose type of tube, and many of them are green when fluorescent. Its most important characteristic is its property to glow after the supply of electrons has left the spot.

Investigators have shown that all fluorescent materials have some "after-glow," and how long it lasts depends very largely on the particular use of the tube. For observation of vibratory or oscillatory phenomena that recur less than fifty times per second, a "long persistence" screen is desirable, because the spot leaves a long luminous "tail" which does not die before it is re-traced. For certain work where cameras are used, it is better to have no "tail" at all, and very "short persistence" screens are used.

The three types of screens used by the American manufacturers are characterised by their colours—greenish white for long persistence, green for medium persistence, blue for short persistence. Green screens are most popular because they cost less.

Life Of A C.R. Tube.

Whereas the writer has handled over a hundred tubes, and has seen

(Continued on page 48)

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EVERYWHERE you go out-doors this season you will see one of the sensational new 1.4 volt Portable Radios. Equipped with the wonderful new economy valves and operated entirely from specially designed dry batteries they are lighter and more compact than any other set you have ever seen—require no power point, aerial or accumulator, cost as little as 1d. per hour to run, and can be carried and used *anywhere*. Just put it down and switch it on to skim the cream of radio entertainment.

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P19A-947

Portable Gear For Bush Radio Tests

Vince Bennett (2VA) operating the base station at Glenbrook during a recent bush search test.

Details of equipment used by Lakemba Radio Club members during field days with the Bushwalkers' Club are given below . . . .

By W.J.P.

IN view of the outstanding success of recent tests held in conjunction with the Bushwalkers' Club and the Lakemba Radio Club, the Bushwalkers' Federation have requested that another field test be conducted in September. This will coincide with their annual Spring outing, which is held at the same time each year.

It is anticipated that this will be the occasion of an extra large gathering, and it is hoped to have at least five or six inland parties equipped with radio, to search for other parties who have become "lost."

The photograph below shows the transmitter used by Geo. Choules (2BH) for portable operation. It is crystal-controlled, using a 1F5G linked to the antenna coil. The aerial is a ½-wave voltage fed, and is wound on a reel when being transported. The maximum input to the transmitter is .9 of a watt, using 180 volts of "B" batteries. The receiver is an electron-coupled IC4 detector and 1H4G audio.

In the photograph also is Mrs. Choules, whose first experience in portable amateur radio was a rough trip down the Glenbrook gullies on a cold winter day!

The other photograph on this page was also taken on the recent bush search test. It shows 2VA operating the base station situated in an old shed at The Bluff, Glenbrook. The day was bitterly cold, hence the towel around Vince Bennett's neck, the overcoat and the miserable look!

"1.4's" Excellent For Portable Equipment.

At the meeting of the above club on Tuesday, August 1, Mr. L. T. Martin had on view one of the latest 1.4-volt portables. Mr. Cole enquired as to whether the valves used were going to stand up to rough treatment as is encountered in portable work, in view of their apparently fragile filaments. Mr. Martin replied that for the purpose of test he had placed a set on a milk cart, and had it bumped around the district for a few weeks. At the end of that period the set did not show the slightest defect.

An important point to watch, however, was that the valves were not mounted in a horizontal position, and furthermore to make sure that the "A" supply is connected the right way, as otherwise the "B" current would become excessive, with possible damage to the valves.

Mr. Martin stated that in his opinion these valves should be greatly suited for low-power portable transmitters or receivers, as they operate at quite good efficiency even at 45 volts "B" supply.

This photo shows Geo. Choules (2BH) operating the crystal-controlled transmitter designed by him for portable operation.

Waverley Radio Club Notes.

By F.A.B.

These winter nights one would expect attendances at meetings to fall off, but on the contrary, during the last month many members, including several new ones, could have been seen emerging from mufflers and coats and fighting for the spot nearest to the radiator!

During the month a "junk" sale—"junk" in name only—was held. The unsought position of auctioneer fell on the shoulders of the president (Leo Walters) and such was his persuasive power that the pile of valves, etc., was transferred from him to the members, their cash travelling in the reverse direction.

The following Tuesday Jack Howes (2ABS) enlightened us on the intricacies of Ohm's Law and gave us model answers to questions from old

A.O.C.P. papers. We hear that more are to follow, so will be on the lookout.

The remaining meeting nights were spent in discussing the details of the field day which was held at National Park on July 30. Blessed with such a perfect day, it couldn't have been other than a success. 2BV, powered as at the last outing, received an R8 report from 2YL at Cessnock, and also contacted 2AFZ and 2TN—the other two transmitters on the field.

2AFZ, located on the cliffs overlooking Garie Bay, worked a station 400 miles away.

Problems arising out of the field day were discussed at the last meeting, and a portable super. has been decided on for the Club's station at the next field day, which will be held at the same location on September 3. 2AFZ will no doubt rest on his laurels and leave things as they are—for a few weeks at least!

I will now conclude, hoping that anyone interested in radio will come along and see us at the Club, rear of "Almont," 13 Macpherson St., Waverley. Meetings are held every Tuesday night.

★

U.H.F. Section, W.I.A.

(N.S.W. Division)

THE third meeting of the ultra-high-frequency section of the Wireless Institute of Australia, N.S.W. Division, was held at the Y.M.C.A., Pitt Street, Sydney, on August 3. The chair was taken by the President (VK2NO), those present being VK's 2IQ, 2HZ, 2VN, 2MQ, 2AIK, 2NG, 2BJ, 2EM, 2TI, 2PX, 2PF, 2AFJ, 2JU, 2HS, 2AJO and R. Rutherford. Visitors included W. Zech (VK-2ACP), C. Wilson and C. Clark (R.A.N.).

Correspondence dealt with included a letter from ZL4HM, operator on the Union Company's S.S. Kairanga, offering to co-operate with the section in any forthcoming sea-going 56 m.c. tests between VK and ZL. This matter will be taken up in the summer.

The secretary was instructed to write Philips Lamps thanking that company for the donation of a special 500-watt projector lamp for use in the epidiascope recently made for the section by Ron Rutherford. VK2TI emphasised the importance of W.I.A. members attending the monthly general meeting of the Division as well as the U.H.F. section meetings.

The forthcoming Newcastle Convention was also discussed by VK2TI. This Convention takes place on September 9 and 10, and promises to be the largest get-together of N.S.W. amateurs yet arranged. There will be many interesting events and contests for which prizes will be awarded.

A suggestion made by the Vice-President (VK2HZ) dealt with the need for the establishment of a relay chain of 56 m.c. stations covering an area from Newcastle to Wollongong. Experience shows that such a chain would be practical possibility if stations will co-operate, and the chain could be extended much further, taking in the Blue Mountains, Bathurst, Orange and Singleton.

An announcement of general importance to N.S.W. experimenters is that the Radio Inspector's Office is now prepared to give frequency checks from the receiving station at Middle Head. Times during which this service can be given are on Wednesdays between 4 and 5 p.m., and Thursdays between 12.15 and 1 p.m.

In view of the success in relays of 56 m.c. transmissions recently as undertaken by VK's 2NO and 2IQ, it was decided to communicate with the Victorian U.H.F. section, suggesting that by the use of 80, 40 or 20 metres, round-table conferences could be arranged between the two States, with two key stations relaying local 56 m.c. transmissions. Such communication would arouse considerable interest for u.h.f. men and observers on the other bands.

The important business of the evening was a most informative lecture by the guest speaker, Eric Panker (VK2HS), Chief Engineer of Tasma Radio, who dealt at length with important points in the design and construction of u.h.f. superheterodyne receivers. All present were unanimous in the opinion that this lecture was one of the most interesting ever delivered before any W.I.A. meeting, and it is hoped to secure the services of the lecturer in the near future to deal with transmitter design.

The weekly roster of Sydney 56 m.c. stations for nightly transmission is maintained, with the exception that VK2NO and VK2VN have changed nights, the former operating on VK-2VN's previous Tuesday night schedule and 2VN on Wednesday nights.—**W. McGowan (VK2MQ), Asst. Sec. U.H.F. Section.**

City, Beach or Bush . .

Anywhere, at any time, a flick of a switch will bring you a wealth of radio entertainment with the sensational new . . . .

"Little Wanderer"
PORTABLE RADIO

MAIN FEATURES INCLUDE:

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

WANT A RECEIVER BUILT, LINED UP, OR SERVICED ?

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

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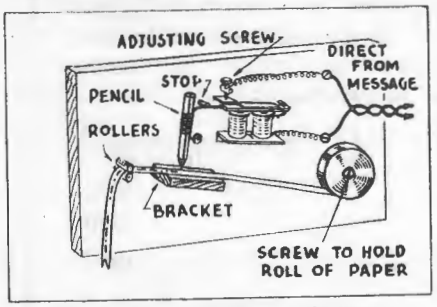
Radio Ramblings

A page for letters from readers. A prize of 2 6 is awarded for every technical contribution published.

A Simple Morse Code Recorder.

Anyone who has an old bell in the junk box can make this code recorder. Bend the hammer rod down (see



sketch), and to this firmly tie a pencil about 2½" to 3" long. This completes the main part of the apparatus.

In the original recorder two small rollers were used to guide the paper strip, which can be controlled either by a handle or an electric motor. A point to watch is that the paper is drawn steadily past the pencil; if this is not done, the result is often distorted so much that it cannot be understood. A small adjusting screw limits the movement of the pencil.

The best grade of pencil to use is either 2B or 3B. These are very soft, and are ideal for the job.—H. C. Reeves, Napier, N.Z.

★

Shack Photo From Roumania.

I am enclosing a photograph of my transmitting station and think it will prove interesting for the VK-ZL "hams," and would like it published in "Australasian Radio World" if possible. I enclose some reports and QSL cards. I don't know what reports interest you, Europeans or VK's, but I hear European "hams" 24 hours a day, 365 days per year, but the VK reports are not DX for you.

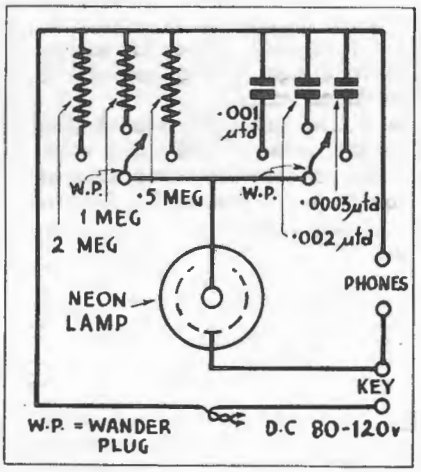
My station has a 35T final and works on 7, 14, 28 m.c.'s, with 300 watts. Two receivers are used, O-V-1 metal tubes, and 7-tube s.s. superhet. My best DX is VK6SA on 7 m.c. I have verifications from 67 countries and about 30 on 'phones.—V. Vasilescu (AW449DX-YR5VV), Str. Gr. Alexandrescu 93, Bucuresti, Roumania.

★

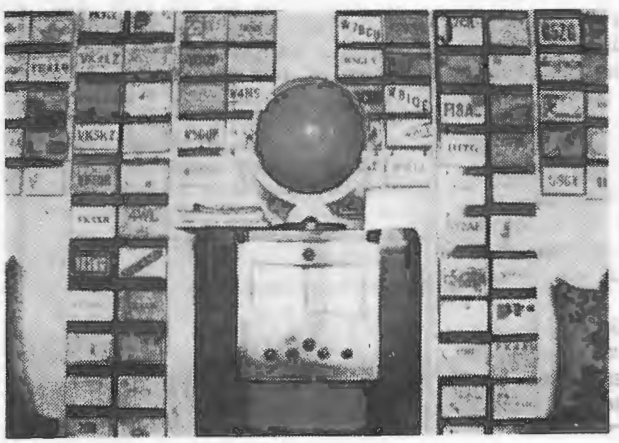
A Cheap Oscillator.

The accompanying circuit diagram is for an efficient and cheap neon bulb oscillator. The applied voltage must be direct, either from batteries or power supply. Variation in the voltages will cause a corresponding variation in the frequency of the note. The circuit arrangement shown gives a wide range of tones.

In fact, it is possible to make the valve oscillate from one oscillation every 15 seconds to several thousands



per second. The dots and dashes are clear and crisp at all speeds of the sender.—A. F. Hallett, Lithgow, N.S.W.



Left: Listening post of DX Club member Carl Broel, of Marrickville, N.S.W. The receiver is a five-valve H.M.V. Right: This photo was sent to Club headquarters by Club member V. Vesilu, of Bucharest, Roumania, who operates an amateur transmitting station under the call-sign YR5VV.

More NEW CALSTAN RELEASES

The makers of CALSTAN TEST EQUIPMENT are pleased to announce the release of a new series of push button operated multimeters. These, with other available lines such as the Calstan 609 Analyser Unit and other units which will be released from time to time, present to the Radio Service Man, a portable testing laboratory, which is not only unique in design and appearance, but above all, LOW in cost. The following outstanding features are typical of all models . . .

MODEL No. 140

- NEW FULL SIZE RECTANGULAR METER
- UNIT CONSTRUCTION THROUGHOUT
- FOOLPROOF PUSH BUTTON OPERATION
- EVERLASTING FINGERPROOF PANELLING
- AVAILABLE IN SINGLE OR DOUBLE UNITS
- AVAILABLE WITHOUT CASE, if desired, FOR RACK AND PANEL MOUNTING
- D.C. Model may be converted to A.C. at later date if desired.

Unit Construction enables the purchaser to build up a very complete and comprehensive test kit, without the inconvenience, and sometimes impossibility of an expensive initial outlay. Uniformity of construction and appearance, enables the later additions to harmonise perfectly with the earlier purchases.

CALSTAN
(CALibrated to STANdard)
TEST EQUIPMENT

MODEL No. 140
(as illustrated)
A high grade push button operated multitester for the measurement of D.C. Volts, D.C. Milliamps and Ohms. RANGES: 1, 10, 100, 500 mA. 10, 50, 250, 500 Volts. 2 Ranges Ohms for internal battery, and extra high range available from external 45 Volt battery. Price, complete with test prods and instructions. In carrying case . . . £5/15/-. Without case . . . £5/6/- — 140 and 609 in case . . . £9/5/-. Prices plus Sales Tax.

MODEL No. D141
A high grade instrument with similar specifications to 140. Wired for D.C. measurements only, but all necessary provision made for the inclusion of A.C. components at a later date. Price, with test prods and full operating instructions. In carrying case . . . £6/2/6 — Without case . . . £5/13/6 — With 609 in carrying case . . . £9/12/6. Prices plus Sales Tax.

MODEL No. 141
This instrument has similar specifications to 140 and D141, and is suitable for all A.C. and D.C. measurements. Price, with test prods, alligator clips and full operating instructions. In carrying case . . . £7/15/- — Without case . . . £7/6/- — With 609 in carrying case . . . £11/ 5/-. Prices plus Sales Tax.

MODEL No. 609 (as illustrated)
A high grade Analyser Selector Unit, which enables the 140 series of multimeters to be used to best advantage. Incorporates these features . . . All R.M.A. numbering permanently etched in the Finger Proof panelling. This being a great time saver for it enables the operator to cope with the ever-increasing types of valves and subsequent alterations to the base designations. Rapid selection of the circuit under test is accomplished by means of a rotary switch, thus eliminating the necessity for shifting the numerous wires with every test made. Price, with all necessary wires, adapters and instructions. In carrying case . . . £3/5/- — Without case . . . £2/15/-. For prices with multimeters . . . see prices on multimeters. Prices plus Sales Tax.

MODEL No. 609

SLADE'S RADIO PTY. LTD.
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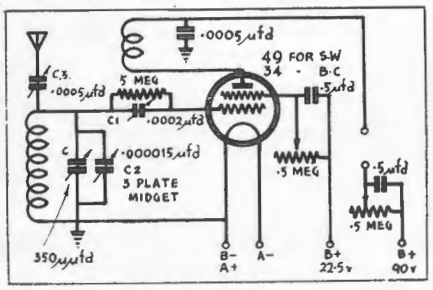
N.S.W.: Radio Equipment Pty. Ltd., Martin de Launay Ltd., Blooh & Gerber Ltd., United Radio Distributors, John Martin Ltd., Electric Service Co., Newcastle. QUEENSLAND: J. B. Chandler & Co. SOUTH AUSTRALIA: Radio Wholesalers Ltd., Adelaide. WEST. AUSTRALIA: Norman L. Burnell & Co., 13 Queen Street, Perth. VICTORIA: Australian General Electric Ltd., Melbourne; Arthur J. Veall Pty. Ltd.; Hartley's Ltd., Flinders Street, Melbourne. TASMANIA: Noyes Bros. (Melbourne) Ltd., Launceston. NEW ZEALAND: New Zealand Electrical Equipment Co. Stocks also available from Turnbull and Jones, all branches.

One-Valver Uses 49 For S.W. And 34 For B.C.

Since the publication of an s.w. version of the single-valve 49 set printed in "Radio Ramblings," I have continued to experiment with the circuit. To obtain the remarkable results of which this receiver is capable the circuit has to be operated in a very sensitive condition, and therein lies a hitch.

Sometimes when C1 is being detuned to bring the set up to the point of maximum sensitivity, just after oscillation ceases, a low hum can be heard which turns into a loud howl as the condenser is further de-tuned. This is caused by feedback from the plate or screen to the control grid and is due to poor construction or insufficient shielding.

When building the set, keep any leads carrying "B+" as far away



from the control grid lead, aerial condenser, grid winding, grid leak, and grid condenser, as possible, while the 'phone leads must not run anywhere within 4" of the aerial, and if they have to cross it then make the crossing at right angles.

For those who wish DX on the b.c. band, build the same circuit exactly, only use a type 34 r.f. pentode. Owing to its characteristics this tube will not amplify the more powerful stations up to speaker strength without an additional audio stage as will the 49 tube, but for sensitivity on b.c. or weak stations it is easily three times better than a 49, and will pick up low power stations at good 'phone strength that the 49 could never do. I am at Paraparumu, about 25 miles north of 2ZB, (5 k.w.), Wellington, and yet when using the 34 I get 2WL, 600 w., just as loud and clear although it is something like 1400 miles away. The "B" class Australian stations just roll in. So I advise anyone who is contemplating building this receiver to obtain a 34 tube for b.c. work, and a 49 for s.w. (80 metres down to 13 m.) at the same time, and equip the receiver with easily detachable tube sockets so the tubes may be interchanged easily.

Using the 49, I have heard over 200 shortwave stations on 20 metres, including the following:—**W1OM, W2IKW, W3FJU, W4BCR, W5ESV, W6OI, W7BVO, W8BWC, W9IYW, 25 K6's, K1JZ, KA1DX, KA1BH, KA4KK, KA1JP, LU4BC, LU7BJ, PY2A, VE4ABD, K7MBE, 27 VK3's, 60 VK2's, 16 VK4's,** also many stations on 16, 19, 25 (31-35), 40 and 80-metre bands.

My location for DX is most unsuitable, in that it lies in a valley between two ranges of hills composed of iron stone and manganese, with my antenna running parellel to six 11 kilovolt lines about 150 yards away. When it is not raining here there is a gale blowing, so altogether I do not consider that I have over-rated the value and power of this little receiver.—P. A. G. Howell, Paraparaumu, N.Z.

★

Cutting A Thread.

The average "ham," not being blessed with a complete workshop, is often caught without the means of running a thread. The method outlined hereunder should see him through the difficulty.

Take a bolt having a thread of the required pitch and file the end on three sides, so as to leave three small parts of the thread. These act as the cutting edges.

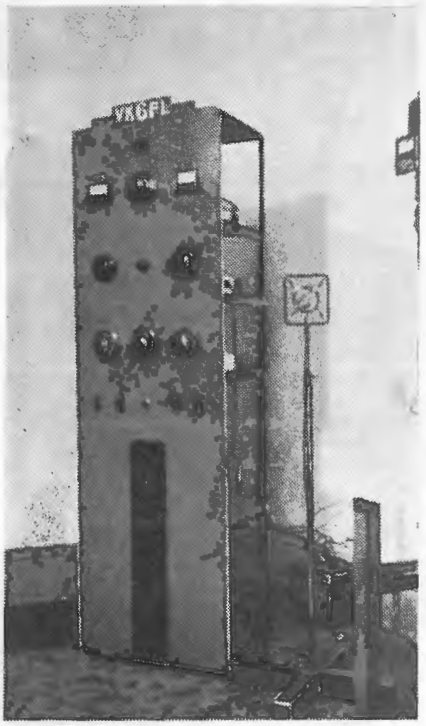
When the bolt is screwed through a hole slightly smaller in diameter, it leaves behind a clean thread. I have found this device effective for all soft materials such as aluminium and bakelite.—F. A. Burke, 1 Seaview Street, Waverley.

★

Amateur Band Observers Wanted.

I notice in the May issue of your interesting and valuable publication ("A.R.W.") that you contemplate appointing an Amateur Band Observer for each State.

DX-er R. G. Cook, of Wellington, N.Z., with his fine collection of verifications from all parts of the world.



The rack and panel rig at VK6FL.

May I say I heartily endorse this idea. I have been reading "A.R.W." for several months now and I like it, particularly "Experimenters Get Down to Ultra Shorts" in the current issue. But to return to the above, I feel that a page devoted to amateur activities would be a worthy addition to an already splendid publication.

It is not my intention to apply for the position of observer in this State, as I consider that being away in the country I do not come into personal contact with the local VK6 boys. However, should you not have any applications from VK6 I shall be pleased to send you a report each month on the amateur bands in this State until such time as you appoint someone in Perth.

I am on the air every night, operating chiefly on 28 and 14 m.c. and 7 m.c. on Sundays, and have worked 87 countries on air, 25 on phone.

The transmitter (photo enclosed) has 6A6 oscillator doubler, 6P6 2nd. doubler, RK39 buffer and a pair of 46's P.P. final, modulated by 6L6G's Class AB1. Receiver is 6 tube super and aerial two half waves in phase Rack and panels are metal done in battleship grey duco. Receiver is 6L7 Regen. 1st detector, 6J7 oscillator. 6K7 i.f., 6C5 2nd det., 6F6 audio, 6C5 B.F.O.

In conclusion, birthday greetings and further success to "Aust. Radio World."—F. C. Lambert (VK6FL)

Australian Broadcasting Stations

★

Below is published the latest official list, issued by the Postmaster-General's Department, Melbourne, of national and commercial broadcasting stations in Australia, as at August 1, 1939. Stations are arranged in order of frequencies.

Call Sign	Licensee.	Location of Station	Frequency (k.c.)	Wave-Length (m.)	Aerial Power (Watts)
2BS	Bathurst Broadcasters Pty. Ltd., 16 Fitzmaurice St., Wagga.	Bathurst	1500	200	100
3AK	Melbourne Broadcasters Pty. Ltd., 480 Bourke St., Melbourne, C.1.	Balwyn, Melbourne	1500	200	200
2BE	Bega & Far South Coast Broadcasters Ltd., Carp St., Bega.	Bega	1490	201	100
4ZR	Maranoa Broadcasting Co. Ltd., Bowen St., Roma.	Roma	1490	201	100
2AY	Amalgamated Wireless (A'sia) Ltd., Dean St., Albury.	Albury	1480	203	200
2MW	Tweed Radio & Broadcasting Co. Pty. Ltd., Austral Buildings, Commercial Rd., Murwillumbah.	Murwillumbah	1470	204	100
3CV	Central Victoria Broadcasters Pty. Ltd., Broadcasting House, Bendigo.	Charlton	1470	204	200
2CK	Coalfields Broadcasting Co. Pty. Ltd., 97 Vincent St., Cessnock.	Cessnock	1460	205	300
2MG	Mudgee Broadcasting Co. Pty. Ltd., 100 Church St., Mudgee.	Mudgee	1450	207	100
5MU	Murray Bridge Broadcasting Co. Ltd., Waymouth St., Adelaide.	Murray Bridge	1450	207	100
2QN	Deniliquin Broadcasting Co. Ltd., End St., Deniliquin.	Deniliquin	1440	208	100
4IP	Ipswich Broadcasting Co. Pty. Ltd., Brisbane St., Ipswich.	Ipswich	1440	208	100
2WL	Wollongong Broadcasting Pty. Ltd., Edward St., Wollongong.	Wollongong	1430	210	500
3XY	Station 3XY Pty. Ltd., 4 Bank Place, Melbourne, C.1.	Melbourne City	1420	211	600
2KO	Newcastle Broadcasting Co. Pty. Ltd., 72 Hunter St., Newcastle.	Sandgate, near Newcastle	1410	213	500
5AU	Port Augusta Broadcasting Co. Ltd., Port Augusta.	Port Augusta	1400	214	200
7DY	North-East Tasmanian Radio Broadcasters Pty. Ltd., 67 Brisbane St., Launceston.	Derby	1400	214	200
2PK	Parkes Broadcasting Co. Pty. Ltd., 283 Clarinda St., Parkes.	Parkes	1400	214	200
4MB	Maryborough Broadcasting Co. Pty. Ltd., T. & G. Bldg., Queen St., Brisbane.	Maryborough	1400	214	200
2GN	Goulburn Broadcasting Co. Pty. Ltd., 47 York St., Sydney.	Goulburn	1390	216	200
4MK	Mackay Broadcasting Service Pty. Ltd., 64 Nelson St., Mackay.	Mackay	1390	216	100
6PM	6PM Broadcasters Ltd., St. George's Terrace, Perth.	Fremantle	1390	216	500
4BH	Broadcasters (Aust.) Pty. Ltd., Albert & Charlotte Sts., Brisbane.	Bald Hill, Brisbane	1380	217	1000

Call Sign.	Licensee.	Location of Station	Frequency (k.c.)	Wave-Length (m.)	Aerial Power (Watts)
2MO	2MO Gunnedah Ltd., Marquis St., Gunnedah.	Gunnedah	1370	219	100
5SE	South-Eastern Broadcasting Co. Ltd., Waymouth St., Adelaide.	Mt. Gambier	1370	219	100
6GE	Great Northern Broadcasters Ltd., E.S. & A. Bank Bldgs., Geraldton.	Geraldton	1370	219	500
4PM	Amalgamated Wireless (A'sia) Ltd., 47 York St., Sydney.	Port Moresby, Papua	1360	221	100
3MA	Sunraysia Broadcasters Pty. Ltd., Deakin Ave., Mildura.	Mildura	1360	221	200
3GL	Geelong Broadcasters Pty. Ltd., James St., Geelong.	Geelong	1350	222	500
2LF	Young Broadcasters Pty. Ltd., Watson House, 9 Bligh St., Sydney.	Young	1340	224	300
4BU	Bundaberg Broadcasters Pty. Ltd., 117 Bourbong St., Bundaberg.	Bundaberg	1330	226	500
3SH	Swan Hill Broadcasting Co. Pty. Ltd., Campbell St., Swan Hill, W.A.	Swan Hill	1330	226	200
3BA	Ballarat Broadcasters Pty. Ltd., 56 Lydiard St., Ballarat.	Near Ballarat	1320	227	500
5AD	Advertiser Newspapers Ltd., Waymouth St., Adelaide, S.A.	Adelaide City	1310	229	500
2TM	Tamworth Radio Development Co. Ltd., Peel St., Tamworth.	Dura, near Tamworth	1300	231	2000
4BK	Brisbane Broadcasting Pty. Ltd., 288 Queen St., Brisbane.	Brisbane City	1290	233	500
3AW	3AW Broadcasting Co. Pty. Ltd., 382 Latrobe St., Melbourne, C.1.	Melbourne City	1280	234	600
2SM	Catholic Broadcasting Co. Pty. Ltd., 60 Hunter St., Sydney.	Pennant Hills	1270	236	1000
3SR	The Argus Broadcasting Services Pty. Ltd., 365 Elizabeth St., Melbourne, C.1.	Near Shepparton	1260	238	2000
7UV	Northern Tasmania Broadcasters Pty. Ltd., Reibey St., Ulverstone. (7UV operating on 1250 k.c.'s channel temporarily).	Ulverstone	1250	240	300
6IX	West Australian Newspapers Ltd., St. George's Terrace, Perth.	Perth City	1240	242	500
3TR	Broadcast Entertainments Pty. Ltd., Raymond St., Sale.	Near Sale	1240	242	1000
2NC	Hunter River Regional.	Newcastle	1230	244	2000
4AK	Brisbane Broadcasting Pty. Ltd., 283 Queen St., Brisbane, Queensland.	Oakey	1220	246	2000
3YB	The Argus Broadcasting Services Pty. Ltd., 365 Elizabeth St., Melbourne, C.1.	Warrnambool	1210	248	200
6KG	Goldfields Broadcasters (1933) Ltd., 209 Hannan St., Kalgoorlie.	Kalgoorlie	1210	248	500
2GF	Grafton Broadcasting Co. Pty. Ltd., 47 York St., Sydney.	Grafton	1210	248	200
5KA	Sport Radio Broadcasting Co. Ltd., Richards Bldgs., 99 Currie St., Adelaide.	Adelaide City	1200	250	500
2CH	New South Wales Council of Churches' Services, 77 York St., Sydney.	Dundas, Sydney	1190	252	1000
3KZ	Industrial Printing & Publicity Co., 24-30 Victoria St., Carlton, N.3.	Melbourne	1180	254	600
2NZ	Northern Broadcasters Pty. Ltd., 84½ Pitt St., Sydney.	Little Plain	1170	256	2000
7ZR	Hobart.	Launceston	1160	259	500
2WG	Riverina Broadcasting Pty. Ltd., 16 Fitzmaurice St., Wagga.	Near Wagga	1150	261	2000
2HD	Airsales Broadcasting Co. Pty. Ltd., Maitland Rd., Sandgate.	Sandgate, near Newcastle	1140	263	500
6ML	W.A. Broadcasters Ltd., Lyric House, Murray St., Perth.	Perth	1130	265	500
2AD	New England Broadcasters, 113 Faulkiner St., Armidale, N.S.W.	Armidale	1130	265	200
4BC	Commonwealth Broadcasting Corporation (Q'land) Ltd., Adelaide St., Brisbane.	Oxley, Brisbane	1120	268	1000

Call Sign.	Licensee.	Location of Station	Frequency (k.c.)	Wave-Length (m.)	Aerial Power (Watts)
2UW	Commonwealth Broadcasting Corporation Pty. Ltd., 49 Market St., Sydney.	Sydney City	1110	270	750
7LA	Findlay & Willis Broadcasters Pty. Ltd., 67 Brisbane St., Launceston.	Launceston	1100	273	500
4LG	Central-Western Broadcasting Co. Pty. Ltd., Longreach.	Longreach	1100	273	500
3LK	Herald & Weekly Times Ltd., 36 Flinders St., Melbourne, C.1.	Lubeck	1090	275	2000
2LT	Lithgow Broadcasters Pty. Ltd., Watson House, 9 Bligh St., Sydney.	Near Lithgow	1080	278	100
4RO	Rockhampton Broadcasting Co. Pty. Ltd., T. & G. Bldg., Queen St., Brisbane.	Rockhampton	1080	278	100
7HT	Metropolitan Broadcasters Pty. Ltd., 44 Elizabeth St. Hobart.	Hobart	1080	278	500
6WB	W.A. Broadcasters Ltd., Lyric House, Murray St., Perth.	Katanning	1070	280	2000
2RG	Irrigation Area Newspapers Pty. Ltd., Ulong St., Griffith.	Griffith	1070	280	100
4SB	South Burnett Broadcasting Co. Ltd., Alford St., Kingaroy.	Near Kingaroy	1060	283	2000
2CA	Canberra Broadcasters Ltd., Civic Centre, Canberra.	Canberra	1050	286	2000
5PI	Midlands Broadcasting Services Ltd., Waymouth St., Adelaide.	Crystal Brook	1040	288	2000
3DB	Herald & Weekly Times Ltd., 36 Flinders St., Melbourne, C.1.	Melbourne	1030	291	600
2KY	The Trustees & Secretary of Brookvale, the Labour Council of New South Wales, 424 George St., Sydney.	Sydney	1020	294	1000
3HA	Western Province Radio Pty. Ltd., 37 Gray St., Hamilton.	Near Hamilton	1010	297	750
4CA	Amalgamated Wireless (A'sia) Ltd., 47 York St., Sydney.	Cairns	1000	300	300
7EX	7EX Pty. Ltd., 74 Charles St., Launceston.	Launceston	1000	300	500
4GR	Gold Radio Service Pty. Ltd., T. & G. Bldg., Queen St., Brisbane, Queensland.	Toowoomba	1000	300	600
2GZ	Country Broadcasting Services Ltd., 84½ Pitt St., Sydney.	Near Orange	990	303	2000
2KM	Radio Kempsey Ltd., A.P.A. Chambers, 53 Martin Place, Sydney.	Kempsey	980	306	300
6AM	6AM Broadcasters Ltd., St. George's House, St. George's Terrace, Perth.	Northam	980	306	2000
3BO	Amalgamated Wireless (A'sia) Ltd., 47 York St., Sydney.	Near Bendigo	970	309	300
5DN	Hume Broadcasters Ltd., C.M.L. Bldg., 45 King William Street, Adelaide, S.A.	Adelaide City	960	313	500
2UE	Radio 2UE Sydney Pty. Ltd., 29 Bligh St., Sydney.	Lilli Pilli, Sydney	950	316	1000
4QR	Brisbane.	Brisbane	940	319	500
3UZ	Nilsen's Broadcasting Service Pty. Ltd., 45 Bourke St., Melbourne, C.1.	Melbourne City	930	323	600
4RK	Rockhampton Regional.	Rockhampton	910	330	2000
2LM	Richmond River Broadcasters Pty. Ltd., Molesworth St., Lismore.	Near Lismore	900	333	500
3UL	The Argus Broadcasting Services Pty. Ltd., 365 Elizabeth St., Melbourne, C.1.	Warragul	900	333	200
5AN	Adelaide.	Adelaide	890	337	500
6PR	Nicholson's Ltd., 86-90 Barrack St., Perth.	Applecross, near Fremantle	880	341	500
4WK	Warwick Broadcasting Co. Pty. Ltd., Cnr. King & Albion Sts., Warwick.	Warwick	880	341	100
2XL	Cooma Broadcasters Pty. Ltd., Cromwell St., Cooma, N.S.W.	Cooma	880	341	100
2GB	Broadcasting Station 2GB Pty. Ltd., 29 Bligh St., Sydney.	Homebush Point, Sydney	870	345	1000

Call Sign.	Licensee.	Location of Station	Frequency (k.c.)	Wave-Length (m.)	Aerial Power (Watts)
7HO	Commercial Broadcasters Pty. Ltd., 82 Elizabeth St., Hobart.	Hobart	860	349	500
4AY	Ayr Broadcasters Pty. Ltd., Airdmillan Rd., Ayr, Queensland.	Ayr	860	349	500
2BH	Radio Silver City Pty. Ltd., Cnr. Blende & Sulphide Sts., Broken Hill, N.S.W.	Broken Hill	860	349	100
2CY	Canberra, F.C.T.	Canberra	850	353	10,000
3GI	Gippsland Regional.	Longford, near Sale	830	361	7000
5RM	River Murray Broadcasters Ltd., C.M.L. Bldg., 45 King William St., Adelaide, S.A.	Renmark	810	370	2000
4QG	Brisbane, Queensland.	Brisbane	800	375	2500
6WN	Perth, Western Australia.	Perth	790	380	500
4TO	Amalgamated Wireless (A'sia) Ltd., 47 York St., Sydney.	Townsville	780	385	200
2KA	2KA Ltd., A.P.A. Chambers, 53 Martin Place, Sydney.	Wentworth Falls, near Katoomba	780	385	1000
3LO	Melbourne, Victoria.	Melbourne	770	390	10,000
2BL	Sydney, N.S.W.	Sydney	740	405	3000
5CL	Adelaide, South Australia.	Adelaide	730	411	4000
6GF	Goldfields Regional.	Kalgoorlie	720	417	2000
7NT	North Regional.	Kelso, near Launceston	710	423	7000
2NR	Northern Rivers Regional.	Lawrence, near Grafton	700	429	7000
6WF	Perth, Western Australia.	Perth	690	435	3500
2HR	Hunter River Broadcasters Pty. Ltd., High St., West Maitland.	Kaludah, near Singleton	680	441	300
7QT	West Coast Broadcasters Pty. Ltd., 21 Paterson St., Launceston.	Queenstown	680	441	300
4AT	Atherton Tableland Broadcasters Pty. Ltd., Main St., Atherton.	Near Atherton	680	441	500
2CO	Riverina Regional.	Corowa	670	448	7500
7BU	Burnie Broadcasting Service Pty. Ltd., Wilson St., Burnie.	Burnie	660	455	200
2DU	Western Broadcasters Pty. Ltd., Macquarie St., Dubbo, N.S.W.	Dubbo	660	455	100
5CK	North Regional.	Crystal Brook	640	469	7500
4QN	North Regional.	Clevedon, near Townsville	630	476	7000
3AR	Melbourne, Victoria.	Melbourne	620	484	10,000
2FC	Sydney, N.S.W.	Sydney	610	492	10,000
7ZL	Hobart, Tasmania.	Hobart	600	500	2000
3WV	Western Regional (Victoria).	Dooen, near Horsham	580	517	10,000
4VL	Edward Gold, P.O. Box 163, Toowoomba, Queensland.	Charleville	570	526	100
6WA	South-West Regional (W.A.).	Minding, near Wagin	560	536	10,000
2CR	Central Regional (N.S.W.).	Cumnock	550	545	10,000

National Short Wave Service.

VLR	Lyndhurst, Victoria.	9,580	31.32	2000
VLR3	Lyndhurst, Victoria.	11,880	25.25	2000

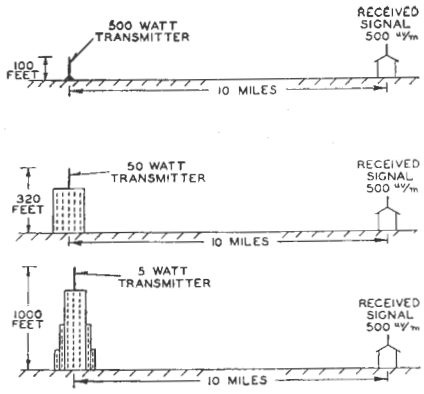
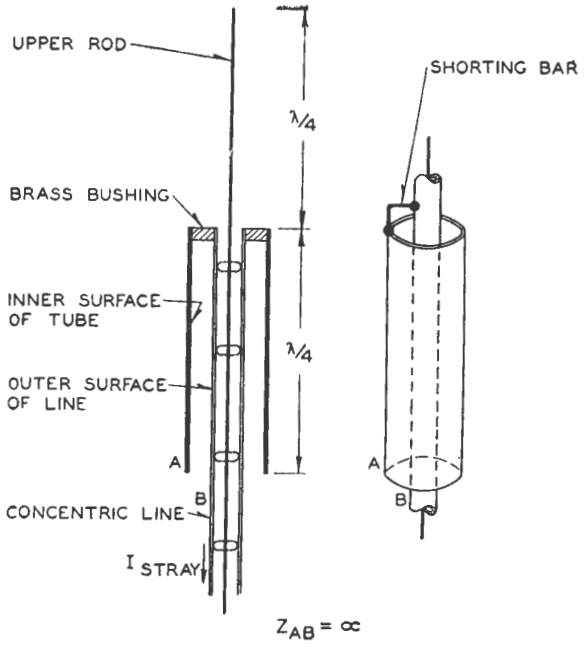


Fig. 1 (left): The vital importance of height is revealed in these three sketches, which show how height, power and coverage are inter-related in three typical cases.

Fig. 2 (right): This sketch shows cross-sectional details of the coaxial antenna.



High-Gain Antenna For The Ultra-Highs

A new antenna design that solves the amateur's problem of obtaining greatest possible coverage with limited power.

By W. McGOWAN (VK2MQ)

THE ideal radio antenna for u.h.f. application is one which radiates uniformly the strongest signal along the surface of the earth.

To attain this, it must be designed for mounting as high as possible to take full advantage of height, and further it must be designed to radiate most effectively in horizontal directions for the greatest use of power available. For the purpose it seems that the coaxial antenna designed by A. Bailey, of U.S.A., represents the most practical, as it uses certain new principles which enable it to obtain the objectives outlined.

It is light in weight, and has slender proportions which makes its resistance in a high wind a negligible quantity. Its vastly superior radiating capabilities, resulting from the new principles and features to be described in subsequent paragraphs, make it the ideal omni-directional antenna for 56 m.c. work.

Before the aerial and its principles of operation are described in detail, the importance of utilising height to increase coverage and signal strength will be briefly discussed.

Fig. 1 shows how height, power and coverage are inter-related in three typical cases. The transmitter power is adjusted to give equal signals at a fixed distance for three heights of 100ft., 320ft. and 1,000ft. In each case the transmitter power required is 5 watts, 50 watts and 500 watts, respectively. So far as the listener is concerned, the signal output is the same, although there is a considerable variation in power input.

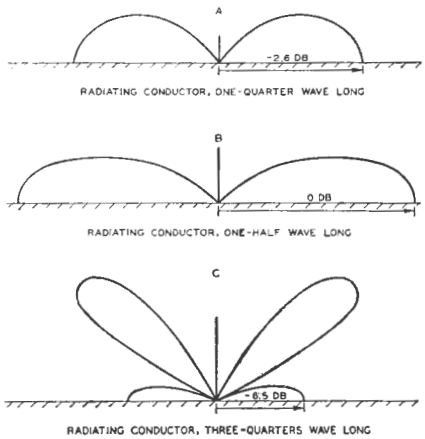


Fig. 3: These sketches show the difference in angle of radiation of ¼, ½ and ¾-wave antennas. Thus the most useful horizontal signal is radiated from the ¼ and ½-wave types. The vertical directivity pattern for the ¾-wave antenna shows that if any part of the feeder is radiating, a high angle lobe results with consequent loss of power in the useful direction. This holds true particularly for a "J" type antenna with its ¼-wave matching stub.

It is therefore shown that the effective power is proportional to the square of the height. This clearly proves that height is definitely of the first importance, and that without it, most of the advantages of the aerial are nullified.

In most every case the transmitter is located at ground level, and is connected to the antenna by means of a transmission line. In this case the transmission line is Bassett concentric cable, which is now obtainable in Australia.

In this type of transmission line the current at ultra high frequencies is carried by two conducting surfaces, one the skin surface of the inner conductor, which is 12/36 stranded tinned

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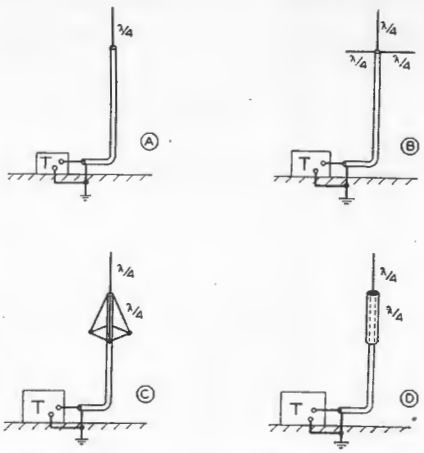


Fig. 4: Illustrating the evolution of the coaxial antenna. ("A") shows the standard ¼-wave type in which stray currents in the feeder tend to radiate. Most of the stray currents can be prevented from passing down the line by terminating the ¼-wave at its feed point by two ¼-wave sections as shown in Fig. ("B"). Fig. ("C") shows a still further improvement, with four ¼-wave sections in a triangular arrangement separated from one another at the base, and with the apex at the feed point. Fig. ("D") shows the final form of the evolution of this antenna.

copper, and which may be considered the outgoing conductor, and the inside skin surface of the ¼-inch copper sheath, which may be considered the return conductor.

Fig. 2 shows a cross-section of the aerial. It is essentially a length of concentric line which has had the sheath turned back on itself for a quarter-wavelength, leaving the inner conductor uncovered by a similar amount (quarter-wave). The enclosed sheath of the transmission line

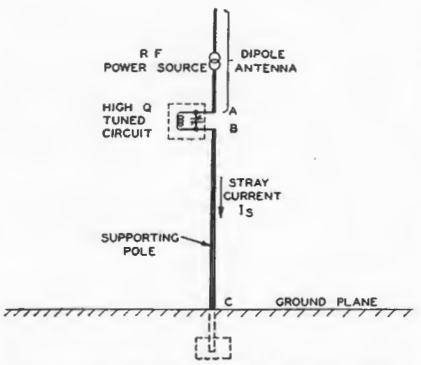


Fig. 5: The high "Q" tuned circuit at the lower end of this centre-fed vertical dipole antenna isolates stray currents, preventing them from returning down the feeders and thus reducing stray radiation.

acts in conjunction with the inner surface of the larger surrounding tube to form a short-circuited quarter-wave concentric line. The characteristics of this shorted section of line causes an extremely high impedance to be created across points "A" and "B." This is equivalent to a high "Q" anti-resonant circuit, which isolates the stray currents.

When the antenna is fed with power, the centre is at minimum potential, and the top and bottom are at high potential.

Electrically the antenna is a centre-fed doublet (and consequently closely matches the impedance of standard coaxial cable). It consists of the quarter-wave radiator at the top and the outer surface of the ⅞-inch brass tube, making a total radiator length of one half-wave.

The lower portion of the antenna is ⅞" outside diameter 24-gauge brass tubing, and is four feet long. The top section is either ⅛" hand-drawn brass tubing or 12-gauge enamel wire. These lengths are only approximate, and will have to be shorter as the wavelength is decreased.

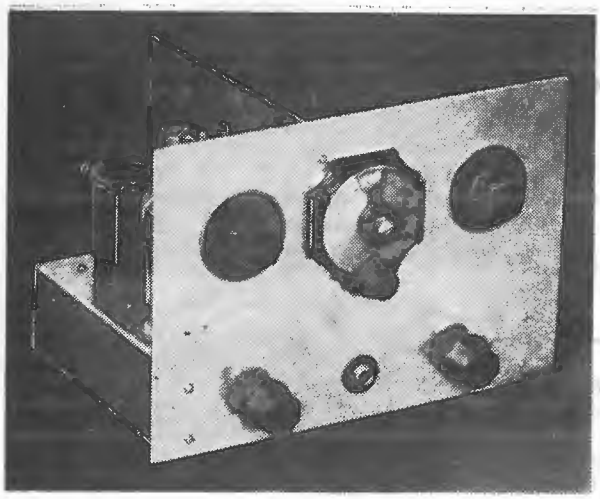
If a coaxial antenna other than ¼" diameter is used, the optimum ratio between the diameters of coaxial cable and the brass tubing around it is 1 : 3.6.

The Bassett cable is drawn up the centre of the ⅞" brass tubing, and is insulated from it with WT22 circular spreaders every foot. The outside of the sheath is sweated to the top of the ⅞" brass tubing, with the centre of the cable continuing on and joining the top half of the radiator.

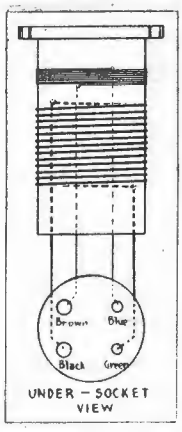
The actual power gain of the antenna is 8 db., which is equivalent to a transmitting power increase transmitter from 50 to 300 watts, which represents quite an appreciable gain. Taken all round, this new aerial offers an excellent solution to the amateur's problem of obtaining greatest possible coverage with limited power.

—With acknowledgments to the Western Electric Co., U.S.A.

Trimming the aerial for a frequency of 56,240 k.c., it was found that the optimum length for each side was 3'8¼." The method of determining the optimum length was to fit sliding sleeves on both ends of the quarter-wave sections, and adjust for maximum deflection in field strength meter situated at least two full wavelengths from the antenna.



The completed receiver is shown on the left, while details of coil windings, pin connections, etc., are given in the sketch on the right. Note that both windings are put on in the same direction, with a distance of approximately ⅛" separating the two.



1939 Atlas All-wave Three

In the article below are given further hints on the assembly and wiring of the "1939 Atlas All-wave Three" described last month, together with coil winding data.

FOR those who have difficulty in completing a receiver from a circuit diagram, a sketch showing the complete under-chassis wiring of the "Atlas All-Wave Three," featured in last month's issue, is published below, under-socket connections of the three 1.4-volt valves used being given as well.

In addition, for those who prefer to wind their own coils, a table is given overleaf showing waveband, number of turns, wire gauge, etc. To tune from 12 to 600 metres, two sets of coils (five coils per set) are required, one being for the r.f. stage and the other for the detector.

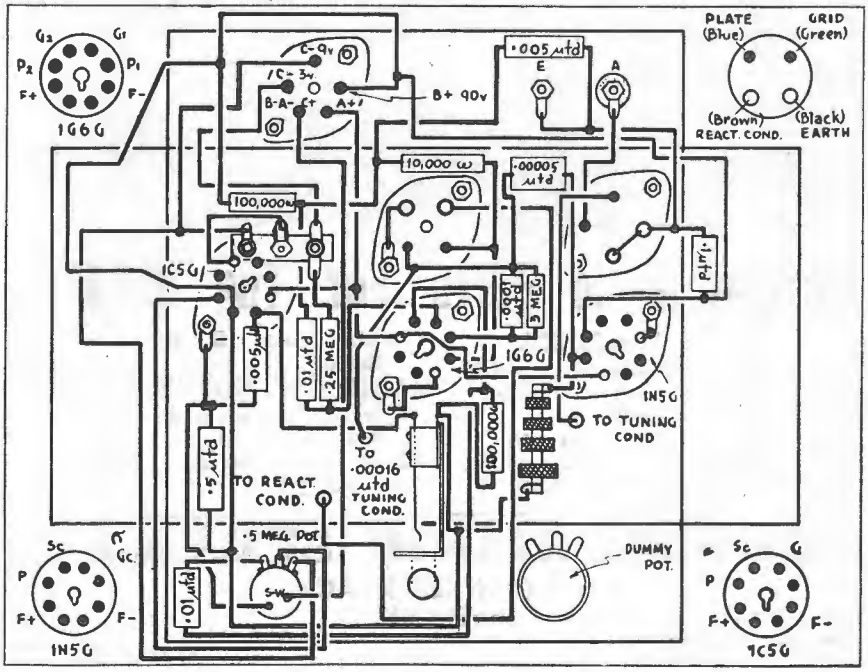
Both sets of coils are identical, the receiver being designed so that the primary on any coil becomes the aerial winding when the coil is used in the r.f. stage, or the reaction winding when the coil is used in the detector tuned circuit.

All coils are wound on 1¼" plug-in formers, enamelled wire being used throughout.

"A" And "B" Batteries Required.

Both "A" and "B" current drains taken by the "1939 Atlas" are light, and very good service could be obtained from the new Eveready portable batteries (one type PR8 "A" unit and two type PR45 "B" units). However, for greatest economy, the heavier duty type X250 "A" unit is recommended, with a pair of 45-volt Superdynes.

An excellent "L" type aerial for this receiver would be one about 60 feet long, with a 25-foot flat top approximately 35 feet high. To obtain greatest selectivity on the broadcast band, a .0001 mfd. midget variable condenser could be switched in in series with the lead-in, and adjusted for best results.



This sketch shows the under-chassis wiring. The three leads shown passing through holes in the chassis connect to the fixed plates lugs of the three variable condensers (r.f. and detector tuning and reaction).

1939 Atlas All-Wave Three—Coil Data.

BAND (approx.)	Primary (or react.)	Wire Gauge	Turns per Inch	Secondary	Wire Gauge	Turns per Inch
14-30m.	7	28	close-wound, ⅛" above sec.	6	20	6
25-57	12	28	do.	13	20	12
44-107	16	28	do.	26	20	24
150-300	32	32	do.	82	28	close-wound
250-600	42	36	do.	156	32	do.

All coils are wound on 1¼" four-pin formers, enamelled wire being used throughout. Both windings on each coil are put on in the same direction. For the "1939 Atlas," two sets of the above coils will be required, one set for the r.f. stage and the other for the detector.

Jottings From Readers.

"R.W. Communications Eight" On Trial.

I have received my Communications receiver and am giving it a good test. As for information on its performance, I have noted these facts up to date:—Careful tuning is essential, the velvet-action vernier dial being absolutely necessary. The r.f. and oscillator controls on the side are very critical, and I find it easier to tune with an ordinary round knob than the bar type specified. I intend to fit a 6 : 1 planetary drive to each of these, having tried one on the r.f.

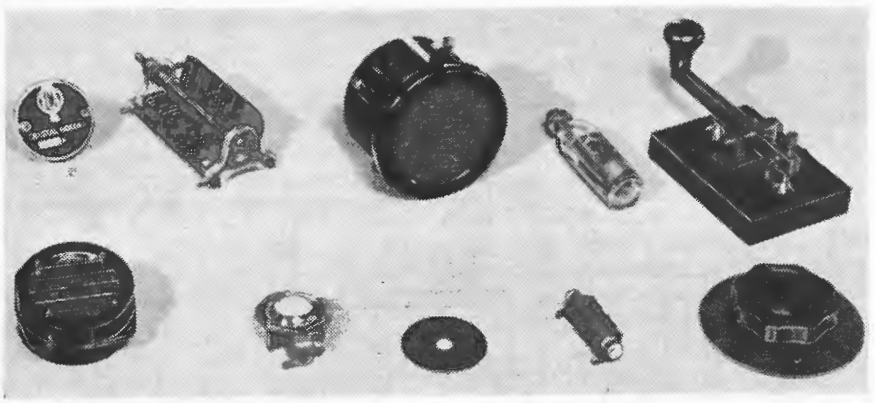
In tuning the set, the gain control cannot be brought right up with the speaker in the panel, as there is a certain amount of feedback. I have mine in an 18" square ½" Celotex baffle board now and the results are much better. I cannot give a very complete report as yet, because I haven't become used to it myself. However, I have jotted down some of the stations heard during the last two weeks:—

Radio Saigon, Indo-China, 49.05m., 6511.6 k.c. VK's were 3HI, 5RK, 3VP, 3IK, 2IQ, 2AKW, 2AIP, 2AEY, 3BH, 3XQ, 3TE, 5LG, 5NK and 4KS. The W's were 1KIB, 1JXP, 1JFG, 1JSG, 2BYM, 2HLF, 2DRX, 3GKM, 4EEV, 6BEK, 5HBK, 5GER, 6OGI, 6EGS, 6LFD, 6FJ, 6MGZ, 6CCB, 6LY, 6MXB, 6CQI, 6HYF, 6AH, 8GAH, 8CUO, 8RAT, 8DLD, 8LSA, 8CUE, 9EOZ, 9WJJ, 9CVN, 9ARA, 9IAS and 9WJS. Also KRLL on 12390 k.c., K6OES, KA1JP, KA1BW, K6MVA and KG3-QK. PCJ, Holland, DJL, Berlin, ZLT, Wellington, Daventry and EI7BA.

That is the lot to date, and I am sorry I cannot supply metres and k.c.'s to the list, but will start logging them properly from now on. I sent away for a QSL card to DJL, Berlin, and found the Club report form very handy.—Ross H. Switzer (AW509-DX), Hurstville, N.S.W.

"All The Best" To "R.W."

I am happy to announce that this will be my third year in taking the "Radio World," and will still say, as I have in the past, that it is the best radio publication I have read so far. This last year the "Radio World" has been greatly enlarged, with more news items that I am pleased to see printed. I know that it will continue to be the outstanding publication in Australia devoted exclusively to radio, and again I wish it every success for the coming year.—Harold L. Christine (AW523DX), Parsons, Kansas, U.S.A.



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Leaves From A Serviceman's Diary . . . . . (5)

Faults due to defective house wiring and electrical interference generally are discussed in this instalment.

By "SERVICEMAN"

This latest Model 609 Slade set analyser incorporates many up-to-date features that will appeal strongly to all servicemen.

AT this stage it would be well to leave the "trouble-shooting" section and discuss briefly a few of the most common troubles encountered in radio reception through faulty house wiring and electrical interference. It must be remembered, however, that in each of these instalments the most common faults have just been touched upon, as entire volumes could be filled with possible defects in radio receivers.

In the modern radio set, the overall sensitivity leaves little to be desired, good reception being obtainable with a few feet of wire around the room. However, despite the great advancements made in circuit design, valves, etc., it is certain that no matter how well a set performs with a makeshift aerial, it will always give far superior results with a correctly-designed aerial and earth system.

In numerous cases, troubles such as cross modulation, electrical interference, noisy operation, fading, etc., have been eliminated or minimised by the fitting of an outside aerial and/or earth. For the purpose of more definite explanation, perhaps it would be better to quote a number of actual cases encountered, and the methods adopted to attempt to effect a cure.

Cross Modulation.

A service call was made to a client near Port Hacking, N.S.W., at a location within sight of 2UE's aerial. The set was a standard 4/5 "super.," and on certain Sydney stations the cross modulation from 2UE was unbearable and even louder than the other tuned station. The aerial consisted of a few feet of wire, which had been gradually cut shorter by the owner with a view to eliminating the interference as he had done with earlier t.r.f. sets.

The serviceman connected a good earth to the set, which considerably reduced but did not eliminate the trouble. The electrical installation was in perfect order, as it was only recently installed. An outside aerial was then fitted, about 60 feet long, connected between two trees. Protests were forthcoming from the customer on the grounds that this would only increase the interference due to the proximity of the station. However, when the aerial was attached to the set, the interference entirely disappeared.

Many similar cases have been cured by the same method, but of course failures have also resulted, especially in areas where it is not possible to erect a really efficient aerial system due to surrounding flats, buildings and power wires. Probably Coogee is the worst district in Sydney for this trouble. Here we have the case of a powerful "A" class station radiating its energy in the midst of a thickly populated area. Numerous residents are just longing for the day when the station will be moved, as in hundreds of cases servicemen and technical experts have failed to effect a cure. In fact, it was reported several years ago that a household bath-heater used to emit speech and music from 2BL!

Faulty House Wiring.

Faulty house wiring may also be the direct cause of cross modulation or modulation hum in a radio receiver. (Note: This type of modulation hum is distinct from that encountered in the earlier type of a.c. receiver, which trouble was in the set itself).

Many complaints have been cured by making sure that the electric light earth is making proper connection. This wire is the one which connects the house conduit to earth. In many cases it will be found that it has become disconnected altogether.

Strictly speaking, this should be attended to by a licensed electrician, but if reasonable care is taken the serviceman may make the necessary repair. It is safer to switch off at the meter board before hand, as a severe shock was recently suffered by a service-

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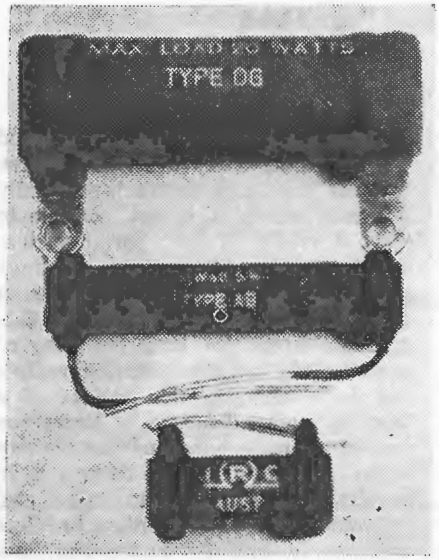

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Ohms	Max. M.A.	List Price
100	173	1/3
150	141	1/3
200	122	1/3
250	110	1/3
300	100	1/3
500	78	1/3
600	71	1/3
750	63	1/3
1,000	55	1/3
2,500	35	1/3
3,000	31	1/3
3,500	29	1/3

5 WATT TYPE AB.

1¾in. x 5-16in. at 160 degrees Centigrade.

Ohms	Max. M.A.	List Price
100	225	1/6
150	182	1/6
200	158	1/6
250	142	1/6
300	129	1/6
500	100	1/6
600	91	1/6
750	82	1/6
1,000	71	1/6
5,000	32	1/6
10,000	22	1/6

20 WATT TYPE DG.

2in. x 9-16in.

Ohms	Max. M.A.	List Price
100	447	3/6
150	365	3/6
200	316	3/6
250	282	3/6
350	238	3/6
500	200	3/6
750	163	3/6
1,000	141	3/6
5,000	63	3/6
7,500	51	3/6
10 000	43	3/6
15,000	36	3/6
18,000	30	3/6

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man gripping this broken wire while standing on wet ground.

It had so happened that a leak had occurred in the house wiring system, and the full 240 volts potential was in evidence between this wire and earth. Had it been connected to the water pipe, the fuses would have blown when the internal breakdown occurred, but as it was, the entire house conduit became "alive," with the "earth" wire (also alive) dangling in mid-air.

Faulty or loose conduit connections are also another source of considerable trouble. Loose joints are the cause of fading (in sets not fitted with a.v.c.), noisy operation, modulation hum, etc.

An outstanding case recently encountered in this regard was a set which had all of these faults at once. The building in which the set was being operated was fairly old, and when the people in the upstairs flat would walk around, the set underneath would hum, roar, fade out and crackle. The fault was obviously in the house wiring, as when the walls were bumped, the same thing would occur. The landlord refused to have the wiring system attended to, as it would have proved an expensive job. The owners of the radio were desperate, as they could only get satisfactory reception when the family upstairs had either gone out or gone to bed. The set had been bought for cash but was still under guarantee. The agent, however, did not seem keen to even try and effect a repair, as he informed them that nothing further could be done.

An outside serviceman was called in, but it took about four hours before an almost complete cure was effected. The first thing tried was an earth from the set to a waterpipe directly entering the ground. The only effect this had was to increase the pick up of the set. the noises still persisting. A search was made for the electric light earth, but it could not be located.

A line filter was then tried between the power point and set, the filter in turn being connected to earth. This made a considerable improvement, and eliminated altogether the fluctuation in volume, but still left modulation hum on certain stations, also noises.

An outside aerial was next erected on top of the building. This entirely eliminated the modulation hum, and practically eliminated the noises. Only a faint scratching sound was audible on two of the weaker local stations, all of the others being perfectly satisfactory irrespective of how the family upstairs moved around.

Space will not permit the discussion of numerous other faults of this nature which have been encountered, but it should be clear from what has been stated, that where it is not always possible to rectify the defect at its source, the next best method should be tried.

The idea of making a good aerial earth installation to overcome house wiring defects is to permit the received signal to enter the receiver in such a manner as to be least affected by nearby A.C. radiation or capacity variation effects.

It will be obvious that the signal picked up on an antenna erected clear of wires and buildings will be less affected than one strung up in the vicinity and fields of A.C. circuits. In the former case the percentage of station signal pick-up will be greater than that of the interfering signal, and consequently reception will be less likely to be affected.

Even better results are obtainable with special shielded aerials and doublets, especially in the matter of interference created by electrical appliances, machinery ,etc., which subject will be discussed in the following instalment.

Congratulations From China On Club Form.

I am in receipt of a verification from XU8NR, Shanghai, China, and his remarks show the value of the Club's report forms. He writes: "It is seldom I answer SWL's, but your report is so well carried out that I appreciate it immensely. Congratulations on your splendid form which you have to send your reports on. I am returning your reply coupon. If I can afford to have a station and cards—I can afford a stamp! Hoping to hear from you again."—Gene Goss, Box 685, Shanghai.

I think the above speaks well of the report forms, and other listeners might get those few extra cards by using them.—D. J. Hastings (AW-471DX), Bardon, Brisbane, Queensland.

What's New In Radio

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

Electro-Voice Dynamic Microphone.

Amateur transmitters and those engaged in public address work will be interested in the following details of the Electro-Voice Model 620 dynamic microphone, supplied by the Australian representatives, Messrs. Amplion (Aust.) Ltd., 382 Kent St., Sydney. Main features are wide range response and extreme flexibility of operation, coupled with attractive appearance. In addition, output is unusually high for a microphone of this type.

Frequency response is both wide and flat, middle register resonance being entirely eliminated, giving completely natural reproduction of both music and speech. The mechanical construction is unique, and combines smart styling with practicability in use. The head is reversible in position, swinging through a 180-degree arc. It can be operated vertically for non-directional pick-up, or tilted toward the sound source for directional work.

The "620" is of the pressure type, using a parabolic duralumin diaphragm. Inherent construction makes it impervious to moisture, extremes of temperature or mechanical shock. In addition, it is resistant to wind noise to a degree rarely equalled by other types.

For further convenience of the operator, the microphone is removable from the stand and cable by merely unscrewing the locking nut. It can be removed from or attached to the stand and cable stud in less than 15 seconds.

Detailed Specifications.

Frequency Response: 40-10,000 c.p.s. with slightly rising characteristic.

Output: 55 db. open line.

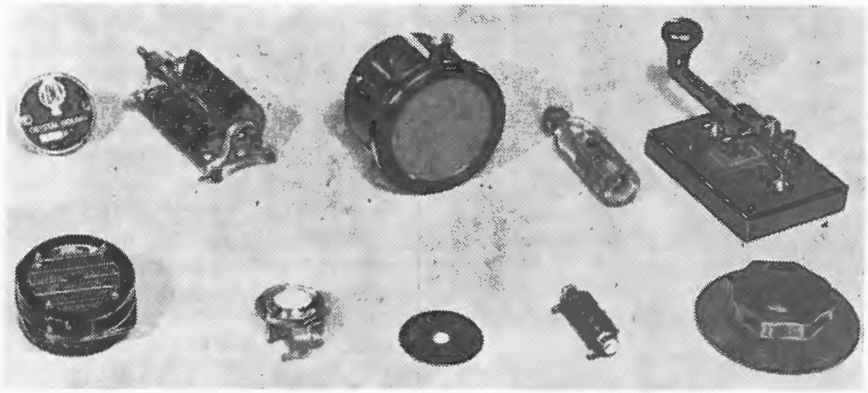
Cable: Each instrument is furnished with 20' of rubber covered shielded cable of special low capacity type (.00066 mfd.). Inner conductor made of copper and phosphor bronze strands to prevent breakage.

Plug: Built as an integral part of the stand mounting stud. Cable easily replaceable. Microphone head removable from stand and cable. Securely locked when in place.

Internal Transformer: Built by Electro-Voice, mounted in case. Special low capacity windings. Core is high permeability, hydrogen annealed, nickel alloy.

Working Distance Range: The "620" is designed for general purpose work and may be used for close or distant pick-up.

Readers are invited to write the address given above for further details.



Price's Radio Parts For Set-Builders And Amateurs.

The selection of radio components shown above is from Price's Radio Service, of 5 Angel Place, Sydney.

The I.C.A. crystal holder (top right) is of ceramic construction with ground plates, and will take crystals up to 1⅛" square. Notable features include a special tensioning spring, and the inter-changeable pins that are supplied with each holder to permit of use with either a valve socket or banana sockets.

The Radiomac transmitting condenser shown is insulated with clear Trolitul, and is fitted with ball bearings. Special wiping contacts built inside the front bearing ensure noise-free operation. These condensers are available in capacities of 15, 40 and 160 mmfd. (as illustrated), while the single-spaced type can be obtained in capacities of 15, 40, 100, 160 and 250 mmfd.

The microphone (top centre) is of the permanent magnet moving coil type and thus requires no energising current or polarising voltage. Reasonably sensitive, and giving good quality without background noise, this microphone has an impedance of 30 ohms, a 60 : 1 radio matching transformer being recommended.

The bottle shown contains a new development in coil "dope." It consists of clear Trolitul dissolved in a solvent that evaporates after application, leaving a thin film of clear Trolitul on the surface treated. Unlike some other coil "dopes," it is non-hygroscopic, and has a negligible effect on "Q."

The morse key on the right is the latest Radiomac, and represents excellent value at 17/6. Of solid brass construction throughout, it is fitted with nickel silver contacts and is fully adjustable. A feature of the construction is the tapered bearing that is used to eliminate play. This is the newest model in an extensive range of Radiomac morse keys, ranging in price from 25/- to 2/6.

The microphone in the front row is a WB carbon type, which gives excellent output with reasonable quality. An energising voltage of 4 to 8 volts is required, together with a suitable matching transformer.

BIRNBACH STANDOFF INSULATORS
Designed to the same high standard that characterises the extensive line of Birnbach wet process Insulators.
4450, 4½in. high, 6/- 766 Beehive Type 2/-
4275, 2⅝in. high, 4/- 4450, Jack Type, 12/6
866, 1⅝in. high, 1/9 4275, Jack Type, 10/-
966, 1in. high, 1/3 866, Jack Type, 2/-
405, ⅝in. high .. 1/- 966J, Jack Type, 1/6

BIRNBACH CERAMIC CONE STANDOFF INSULATORS.
For easy mounting of Condensers, Coils, Table Sockets and High Frequency apparatus by virtue of having a threaded hole and screw in the base.
430, ⅝in. high .. 1/3 432, 1½in. high .. 2/6
431, 1in. high .. 2/- 433, 2⅜in. high .. 3/6

BIRNBACH FEED THRU INSULATORS.
4234, 2⅜in. high, 7/6 4234J Jack Type 12/6
4125, 1½in. high, 3/- 4125J Jack Type 3/6
478, ⅞in. high .. 2/6
458, ⅝in. high .. 1/9 478J Jack Type 3/-

Birnbach Transmitting Tube Sockets.
Available in 10 and 50w. with side wiping contacts.
10w., No. 435 ..... 8/6 Net
50w., No. 434 ..... 9/6 Net

Wm. J. McLELLAN & Co.
55 YORK STREET, SYDNEY

To the right is a Bulgin nickel-finished panel indicator, which is fitted with a bracket to hold a standard pilot lamp. These indicators are available in two sizes, 1" and ⅜," with cut glasses in four colours, red, green, blue and opal.

The indicator plate is a 2" Radiomac in nickel silver with 100 divisions over 180 degrees. An oblong type is also available for volume controls, etc., divided into 10 divisions over 270 degrees.

The Radiomac r.f. choke shown is a heavy-duty type for transmitters, and will carry up to 250 mills. Designed for use on bands between 8 and 200 metres, this choke has an inductance of 1.5 mh. and a resistance of 10 ohms.

The Radiomac precision dial to the right has a highly-polished machine-engraved nickel-silver scale with black markings. Diameters of the scale and black bakelite knob are 3¾" and 2¼," respectively. This dial can also be supplied with a 6 : 1 planetary vernier action, and with vernier scale to suit.

★

New Velco 1.4-Volt Portable.

Designed along the lines of the latest 1.4-volt portables that have achieved such remarkable popularity in America, the Velco Midget Portable Four, marketed in Melbourne by A. J. Veall's, and in Sydney by Veall's Agencies, is one of the lightest, smallest and most attractive models yet released in Australia.

Measuring only 11⅜" long x 7⅛" high and 6½" deep, special midget batteries are used to ensure lightness and portability, total weight being only 11 pounds.

Four valves are used—a 1A7G mixer, 1N5G i.f. amplifier, 1H5G diode second detector and first audio amplifier, and a 1A5G output pentode driving a small Rola speaker. Filament consumption is .25 ampere, while the "B" drain is approximately 7.6 mills.

A built-in aerial is employed, but for added distance and volume, an external aerial and earth may be attached.

★

Clearance Lines From Foxradio.

Messrs. Fox & MacGillycuddy Ltd., of 57 York St., Sydney, wish to draw the attention of readers to their current sale of clearance lines. As detailed in their advertisement elsewhere in this issue, these lines include coil kits, headphones, gramophone motors and turn-tables, pick-ups, genemotors and microphones, at prices that in many instances are actually below cost. As there are only small quantities of each line, readers are advised to write immediately and reserve their requirements.

★

Review Of Mullard 61 Next Month.

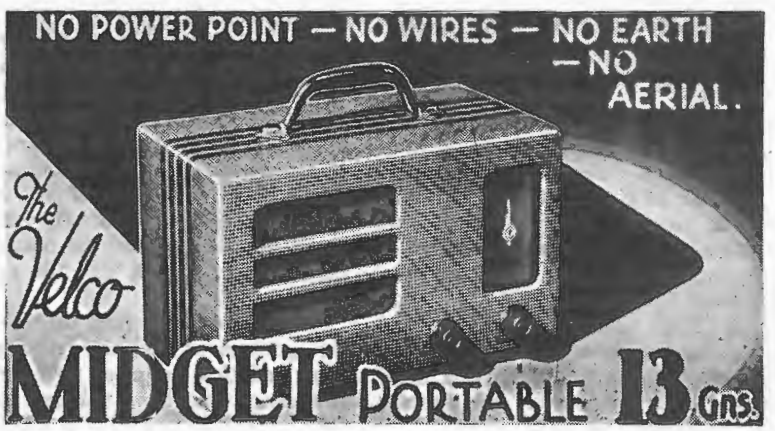
In last month's issue it was announced that a detailed review of the Mullard Model 61 dual-wave mantel receiver would be featured in this issue of "Radio World." Unfortunately, the test report could not be completed in time, and its publication will be postponed until next month.

★

Radio Troubles And Cures.

"101 Radio Troubles And Their Cures" is the title of a booklet containing some valuable service information, collated and edited by the Ranger-Examiner engineers of the Readrite Meter Works of Ohio, U.S.A.

As the title indicates, contents comprise a list of 101 faults commonly encountered in radio receivers, a brief description of each being given, followed by an outline of the best method of detection and of the appropriate cure.



Copies of this booklet are available free to "Radio World" readers writing Messrs. W. G. Watson Co. Pty. Ltd., 279 Clarence St., Sydney, distributors of Triplett test equipment.

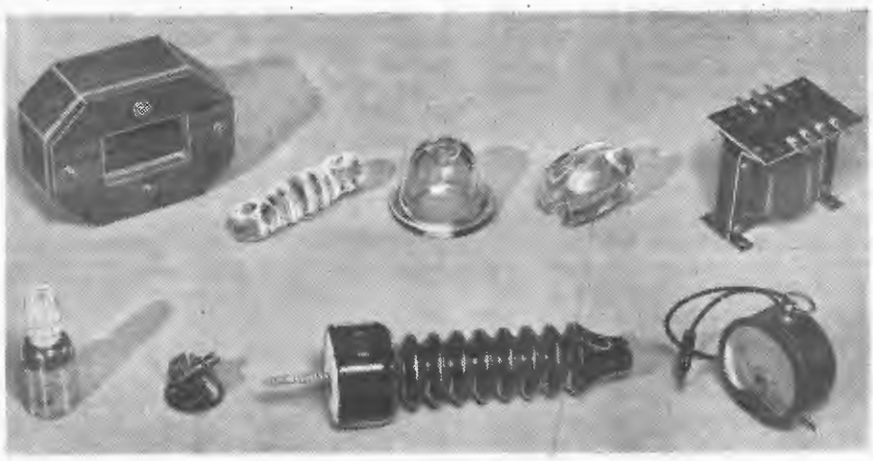
★

Radio Parts For Experimenters From Murdoch's Ltd.

Of interest to every radio experimenter is the range of components illustrated (right), from the radio department of Murdoch's Ltd. (George & Park Sts., Sydney).

On the left (top row) is a high-quality Reiss carbon microphone, assembled in a teak case. Described in "Radio World" in December, 1937, it is still enjoying a steady demand among experimenters. The bottle in the foreground contains finest grade imported carbon granules for the microphone, while on the extreme right (top row) is the matching transformer which has a primary providing ratios of 20, 30 and 40 : 1, and a centre-tapped secondary.

Reprints of the article describing the construction of this microphone are still available from Murdoch's Ltd., a copy being supplied free with each kit of parts (retailing at 29/6, inclusive of everything required).



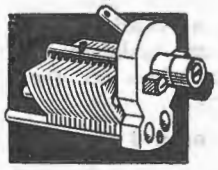
This range of radio components for set-builders is from the radio department of Murdoch's Ltd., Sydney.

The second component from the left (front row) is a midget air trimmer, placed on a penny to indicate its size. An eleven-plate condenser, it has maximum and minimum capacities of 40 and 1.5 mmfd., respectively. Features include brass plates and trolitul insulation (price 2/-).

In the foreground is a giant stand-off insulator of American make, measuring 6" long. It is deeply corrugated to give a long leakage path (price 1/9).

On the right is an English-made Franklin two-range voltmeter, ranges being 0-6 and 0-120 volts. Total drain of the meter at full scale deflection is 30 mills., which means that it can be used to provide a reliable check

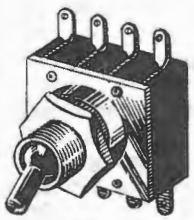
RADIO ACCESSORIES *by* MURDOCH'S



A

MIDGET AIR TRIMMERS

As illus. A. Trolitul insulation. Capacity 40 MMF. Dimensions, 1" x 1". Each, 2/-.



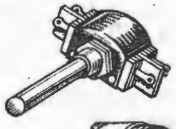
B

TOGGLE SWITCHES

As illus. B. Midget size.
Double pole, double throw, 3/3.
Double pole, single throw, 2/3.
Single pole, double throw, 2/6.

ROTARY SWITCHES

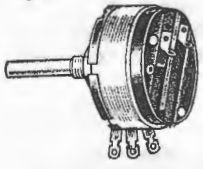
As illus. C. Midget size.
Double pole, double throw, 4/-.
Double pole, single throw, 2/6.
2-way change-over, 2/6.



C

POTENTIOMETERS

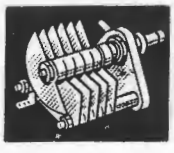
As illus. D. Silent carbon element, shielded. 500,000; 250,000; 100,000; 50,000 ohms. Each, 3/-.
Wire-wound element, 10,000; 5,000; 2,500; 1,000; 400 ohms. Each, 2/6.
500,000 ohms with switch, 5/-.



D

MIDGET CONDENSERS

Premier midget condensers as "E"; 1 hole fixing, ball-bearing, extended shaft for ganging. Trolitul insulation, all brass vanes.
250 MMF., 7/11; 160 MMF., 7/6; 100 MMF., 5/11; 40 MMF., 5/6; 15 MMF., 4/11.
Double spaced condensers.
40 MMF., 9/6; 15 MMF., 7/6.



E

PICK-UPS

32/6

The cream of the acknowledged best makes. B.T.H. new model, built-in volume control, long curved tone arm, shielded lead, 32/6.
B.T.H. PIEZO CRYSTAL, long curved tone arm, wonderful reproduction, 77/6.
COLUMBIA—made by the famous record manufacturers. Bakelite long curved arm, 37/6.

"Collaro" Electric PHONO-MOTORS

Automatically switches off when record is finished. Mounted on a steel sub-panel. Needs 3 screws only to fix. Steady power, silent motor, 47/6.

WE PAY FREIGHT on all goods in this advertisement. Kindly write to Desk "C52."

MURDOCH'S Ltd., Park Street, Sydney

on "B" batteries without the need for connecting an external load. This instrument, which battery set experimenters will find very handy, retails at 9/6.

The three glass insulators at the rear of the photograph are imported English Pyrex types, priced (left to right) at 1/9, 2/6 and 1/9.

Murdoch's Ltd. advise that a selection of complete kits of parts for crystal and small valve sets is also available, detailed assembly instructions being supplied with each kit. Enquiries are invited from readers.

★

Amplion Electrically-Welded Speakers.

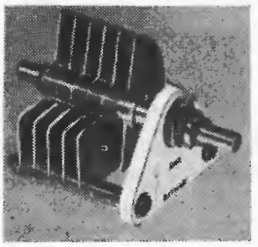
The Amplion electrically-welded 12-inch "V" series loud-speakers are specially designed to handle large outputs without distress. The Amplion model "V," retailing at 29/- (a lower cost than previous standard 8" types) is rated by the manufacturers at 10 watts undistorted power output, with a maximum of 15 watts.

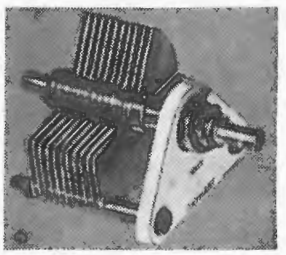
The Amplion type "VL" is a heavier 12" model than the "V," and is capable of power outputs of 13 watts undistorted and 20 watts maximum. Still greater outputs are claimed for the "VP3," a similar-sized speaker with a 64-ounce permanent magnet; this will handle 20 watts undistorted and 30 watts maximum. The electrodynamic type "VL" is listed at 47/6 and the "VP3" permag. at 110/-.

All "V" series speakers are similar in mechanical construction; most notable is the complete lack of bolts or rivets to clamp pole-plates or magnet yokes to the cone housing. The cone housing, outer pole-plate and yoke are butt welded into one homogeneous unit. The inner pole is removable for the purpose of inserting different resistance field coils should they be desired, and this can be done without removal or damage to the cone.

The general result of this new welded assembly is that the Amplion "V" series speakers have improved and brilliant "highs," together with "lows" which lack boomy resonances. The overall characteristic is unusually flat. The "VL" and "VP3" types have a high-fidelity response extending over a range which permits coverage greater than 40 to 7500 cycles per second.

All "V" series Amplion speakers are 100% dustproofed, with external concentric spider, and fitted with isolated core tropically sealed transformers. Plug and cord is supplied and all standard fields and input transformers are available. "VL," "VP2" and "VP3" input transformers have 65 m.a. continuous current rating. The "V" and "VP1" transformers are rated at 50 m.a.





LATEST RAYMART SHORT-WAVE COMPONENTS FROM JOHN MARTIN'S

THE accompanying illustrations show a selection of shortwave components from the extensive Raymart range, available in Australia from John Martin Pty. Ltd., of 116 Clarence St., Sydney.

The two condensers above are the latest Raymart ceramic short-wave micro-variables, using the new RMX insulation that at all frequencies has a particularly low-dielectric loss factor (approaching that of quartz). These condensers are all of brass construction, and are fitted with ball bearings for smooth operation, the ball race being electrically shorted, ensuring freedom from noise. Both the double-spaced transmitting and single-spaced receiving type condensers (latter have provision for ganging) are available in a wide range of capacities.

On the right (above) is a Raymart r.f. bushing, which has an air-spaced conductor heavy enough to obviate losses or danger in carrying voltages up to 10,000 and current up to 20 amps.

Also available are single and double cone type lead-in insulators in glazed vitreous porcelain.

In the illustration below (left) are three Raymart American type stand-off insulators. Manufactured of high-glazed vitreous porcelain, they are fitted with nickel-plated terminals.

In the centre (below) is a Raymart ceramic transposition block, which is extremely light and is provided with a highly-glazed surface resistant to atmospheric corrosion, while on the extreme right is the Raymart epicyclic reduction drive. Giving a 6 : 1 ratio, it fits all ¼" shafts and is ideal for vernier tuning, fierce reaction, etc.

Raymart Lines Just Landed.

Latest Raymart lines that have just been landed include the type ATC midget variable air trimming condenser, type NCJ neutralising condenser and type TXJ 2¾" direct drive precision instrument dial. Complete data on these new lines will be published next month.

In the meantime, readers wanting details of these and other Raymart shortwave components are invited to write for free literature at the address given above.

New Palec Multi-Vibrator Ensures Accurate Alignment.

An investment for service work that will pay big dividends as a time-saver and as a means of ensuring high accuracy in receiver alignment, is the new Palec all wave switchless multi-band generator illustrated above.

Known as the Model VIB, the instrument is actually a multi-vibrator that generates upwards of 20,000 harmonics, the output level over any waveband being substantially constant. This has been achieved by the use of a compensating amplifier to boost the output level of the higher harmonics.

The attenuator knob is the only control, and it can be adjusted to any frequency between 550 k.c. and 22 megacycles.

The sensitivity and selectivity of any receiver is directly dependent on the accuracy of adjustment of the padder condenser. The present method of simultaneous adjustment of the tuning dial and padder for highest output is not particularly accurate, and as well the operation takes considerable time. Using this new Palec multi-vibrator, high accuracy of padder settings for all bands is ensured, and as well, time of operation is only a quarter of that occupied by the older method. In addition, a positive check on performance right across every waveband is afforded.

In operation, the receiver is tuned to any point at the high frequency end of the dial, and the oscillator trimmer adjusted for maximum gain. The set is then tuned to the low frequency end, and the padder adjusted for maximum gain. Following alignment, the set can be tuned from one end of the band to the other, and the output meter will provide a positive check on tracking. With the receiver correctly aligned, the gain should be flat all over the band, free from "valleys" and "dead spots."

With a signal at constant input level thus present wherever the receiver happens to be tuned, it becomes a simple matter to check overall response. No indication of frequency is provided, of course, and so this instrument, invaluable as it is in obtaining perfect tracking, supplements rather than replaces the all-wave oscillator.

Measures Only 6" x 5" x 4½."

The instrument which is housed in a steel case measuring 6" high x 5" wide x 4½" deep, employs a 6N7G twin triode as 1000-cycle harmonic generator and a 6F8G as harmonic amplifier and power supply rectifier.

Further details are available free on request from Paton Electrical Pty. Ltd., 90 Victoria St., Ashfield, N.S.W.

★

Vertical-Mounting I.R.C. Wirewounds.

A new release by W. J. McLellan & Co., of 55 York St., Sydney, distributors for I.R.C. resistors, is the special vertical mounting type of wirewound resistor illustrated alongside.

Designed for above-chassis mounting, this new type of wirewound thus operates vertically in open air, permitting excellent heat dissipation that results in cooler running and longer life.

A 2BA screw passes through the core, holes being drilled in each of the chromium-plated end-pieces to permit air to circulate through the centre. Each resistor, which is finished with the standard I.R.C. coating, is supplied with two nuts and lock washers, prices being the same as for the conventional horizontal mounting types.

★

Aluminium Solder From Foxradio.

Included among the special clearance lines now being offered by Messrs. Fox & MacGillycuddy Ltd., of

A new HIGH FIDELITY DYNAMIC MIKE

The Electro-Voice "620"

Here's the "mike" everyone in Australia has been waiting for — an Electro-Voice Dynamic at a popular price!

Careful design ensures 100 per cent. natural reproduction — frequency response is uniform throughout the audio range, 40 to 10,000 c.p.s. with slightly rising characteristic, output is—55 d.b. The reversible head swings through a 180° arc, giving non-directional pick-up when operated vertically, or for directional work it may be tilted towards the sound source.

Sturdily constructed, attractively designed, amazingly efficient over an extremely long life, the "620" is IMPERVIOUS TO MOISTURE, EXTREMES OF TEMPERATURE OR MECHANICAL SHOCK.

The enthusiastic reception given the "620" and "610" by studio, public address, and communication engineers throughout the world is a guarantee of their quality of response and overall efficiency.

Model 620G: £11/5/-. Model 610: £9/5/-.

Clip the coupon attached and post NOW for further details.

Amplion (A/sia) Pty. Ltd.,
382 Kent St., Sydney.

Please send me leaflet describing the Electro-Voice "620" and "610" and containing all specifications.

Name.....

Address.....

Sydney, are two types of Kester solder, ordinary resin core and aluminium solder.

The latter type has very successfully overcome the problem of soldering together two aluminium surfaces, and has endless radio and household applications.

Both types of solder are available in 2 oz. tins, at the special price of 1/- each, post free.

★

In "Radiotronics" No. 99.

The circuit and constructional data of a simple five-valve broadcast receiver designed to use a minimum of components are featured in the latest issue of "Radiotronics" (Bulletin No. 99), issued by A.W. Valve Co. Pty. Ltd.

A possible cause of parasitics in amplifiers using negative feedback applied over three stages is the subject of a second article, which also outlines an effective cure. Tentative characteristics are also given of Radiotrons types 2050 and 2051 hot cathode gas tetrodes, which are designed for grid-controlled rectifier circuits.

A new 1.4-volt valve that should find wide application in portable receivers is the Radiotron 1Q5-GT Bantam beam power tetrode. Its characteristics somewhat resemble those of the 1C5G, but the 1Q5-GT operates with a considerably smaller grid bias, and is therefore more sensitive. As well, it may be operated satisfactorily with over-biased conditions, giving an appreciable reduction in "B" current drain without serious increase in distortion. Brief characteristics (Class "A" operation) are given below:—

Filament Voltage	1.4 volts
Filament Current	0.1 ampere
Plate Voltage	90 max. volts
Screen Voltage	90 max. volts
Grid Voltage	—4.5 volts
Plate Current	9.5 milliamperes
Screen Current	1.6 milliamperes
Transconductance	2100 micromhos
Load Resistance	8000 ohms
Total Harmonic Distortion	7.5%
Power Output	0.27 watt

Included with this latest issue of "Radiotronics" are characteristic data sheets on the 6J7, 6N5 and 6U7G, together with the Radiotron Comparative Valve Chart for Radiotron transmitting power and rectifier valves. In passing, it is interesting to note that types 866, 807, 805 and 802 are now being made in Australia by A.W. Valve Co. At least four further types will be in production within the next six months.

★

Australian Engineer's Paper Accepted By American I.R.E.

Mr. F. Langford Smith, of Amalgamated Wireless Valve Co. Pty., who presented a paper to the World Radio Convention last year, was recently honoured by having his paper published in England.

The same paper was also accepted by the American Institute of Radio Engineers for publication in the "Proceedings." Unfortunately, however, due to the policy of the I.R.E. not to publish any paper which has appeared elsewhere in English, the publication of this paper has been withheld.

So far as is known, this paper is the first paper by an Australian engineer dealing with the subject of radio receiver design which has been accepted for publication by the American I.R.E.

Special credit is due to Mr. Langford Smith on account of the acceptance of his paper, the standard of which was high enough to merit publication in such an outstanding journal. His misfortune in not seeing his paper in print in America does not in any way detract from the value of the paper itself.

★

Philips Release EL3N: New High-Mu Power Pentode.

Now available for equipment and replacement purposes is the new high-mu power pentode EL3N, latest product of the Philips Australian valve works. One of its most interesting features is the oval shaping of the cathode and grid windings. The cathode coating, incidentally, is applied only to the curved surfaces and not to the "sharp sides." This construction results in practically uniform spacing between grid and cathode, and makes possible the use of more of the cathode area than in the original EL3.

Moreover, the grid dimensions have been so arranged that the upper curvature of the dynamic characteristics is improved. As a result the plate voltage can swing to relatively low values, thus increasing the undistorted power output.

The electrical ratings for the new valve are practically identical with published data issued for EL3 and EL3G. An exception, however, is the heater current, which has been reduced to 0.9 amps.

Self bias using a cathode resistance of 150 ohms is recommended, and, in view of the high mutual conductance, a suppressor resistance should be used in the control grid circuit.

This valve can also be used to advantage in Class AB (w/o grid current) push-pull amplifiers, and an output of 8.2 watts with 3.1% total distortion may be realised with a grid-to-grid drive of 13.4 volts r.m.s.

The EL3N may be operated as a power triode with a screen tied to plate. Under triode conditions a cathode resistor of 425 ohms is required, and an output of 1.1 watts of 5% distortion can be obtained with an input signal of 5.9 volts r.m.s. applied to the control grid. To avoid self-oscillation, the screen grid should be connected to the plate through a resistance of 100 ohms without de-coupling.

This new Philips high-mu pentode is offered in two types:—EL3N, for replacing the existing EL3, has a "P" base; EL3NG, for equipment purposes, has an octal 8-pin base.

The new Philips type EL3N high-mu output pentode reviewed above.

Shortwave Review

CONDUCTED BY
ALAN H. GRAHAM

Latest station changes and schedules ★ Ultra-high-frequency conditions poor ★ The month on shortwave ★ Amateur bands review ★ Broadcast band DX notes.

Station Changes And Schedules.

Angola.

CR6AA, Lobito, recently reported on 7614kc., 39.39m., are now understood to be carrying out test transmissions on 15200kc., 19.74m. (Universalite).

Bahamas.

ZNS, Nassau, is an interesting new station on the 49-metre band. Using a power of 200 watts, ZNS transmits on 6090kc., 49.26m. Schedule is 4.30-5 a.m., and 11 a.m.-noon. Identification signals are the chimes of St. Margaret's of London and a relay of Big Ben and the Westminster chimes. On occasions ZNS relays the B.B.C. Daventry transmissions. Reports should be sent to Box 48, Nassau, Island of New Providence, Bahamas. (QSA-5).

Bohemia.

Once again several of the Czech shortwave transmitters in Prague are being heard. The schedules for their present transmissions are:—

I. To North America: **OLR4A**, 11840 kc., 25.35m.: 10.55 a.m.-1.20 p.m.

II. To Central America: **OLR4A**, 11840kc., 25 35m.: 1.20-2.20 p.m.

III. To the Far East: **OLR5A**, 15230kc , 19.7m.: 7.55-11.15 p.m.

IV. To the Near East: **OLR4B**, 11760kc., 25.51m.: 11.25 p.m.-1 a.m. (N.B. On Sundays **OLR4A** is used).

V. To Europe and Africa: **OLR4A**, 11840kc., 25.35m.: 3 45 a.m.-8 a.m.

VI. To South America: **OLR4A**, 11840kc., 25.35m.: 7.55-9.30 a.m.

Dominican Republic.

The latest Dominican transmitter is **HI4X**, Ciudad Trujillo, operating on 17410kc., 17.23m.

French West Indies.

Radio Guadeloupe, **FG8AH**, on 7440kc., 40.32m., intend to increase their power to 1 kilowatt. When this is done the station will operate on a new schedule—12.30-2a.m. and 9-10 p.m., with announcements in English. (QSA-5).

Japan.

JLK, Tokyo, on 6182kc., 48.51m., is the latest Japanese station on the air. Transmissions are from midnight-1.30 a.m. for Java and the South Seas.

Macao.

CRY-9, Macao, the successor of the old-timer, **CQN**, transmit between 6080 and 6100kc., 49.34 to 49.18m. Transmissions are on Mondays only, from 11.30 p.m.-1 a.m. (Universalite).

Mozambique.

CR7BB, a new station in Lourenco Marques, are reported as testing on 15240kc., 19.68m., from 4-7 a.m. QRA is Box 594.

Newfoundland.

VOFB, St. John's, is reported on the air daily from 8.30 till 10.30 a.m. on 12310kc., 24.37m.

Roumania.

Radio Bucuresti, Bucharest, is now testing on 9190kc., 32.6m., using a power of 50 kilowatts. Hours of transmission are from noon-1.15 p.m.; no English announcements are given. (Universalite).

Sunday Is.

ZMEF on Sunday Is. in the South Pacific, is understood to contact New Zealand irregularly between 4.45 and 5.15 p.m.

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Ultra-High-Frequency Notes.

During the past month conditions on the U.H.F. bands have been poor, the only stations noted being several of the higher powered 11-metre transmitters, which were occasionally logged at fair strength between 8.30 a m. and 2 p.m. Even the 10-metre amateur band has fallen away badly, and on several occasions not even W's were audible.

11-Metre Loggings.

W4XA, 26150kc., 11.47m., Nashville:

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.]

At times fairly good; usually around noon.

W8XNU, 25950kc., 11.56m., Cincinnati: Always badly interfered with by **W6XKG**, but can sometimes be copied in the early morning.

W6XKG, 25950kc., 11.56m., Los Angeles: Now very variable; heard between 8.30 a.m. and 2 p.m. Also marred by QRM (from **W8XNU**).

Station Changes.

Information is to hand regarding changes of frequency and hours of transmission of a number of the American U.H.F. stations, together with details of several new stations recently licensed, but in view of the poor conditions at present such information is of little value at the present juncture and will be held over for subsequent issues.

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This Month's Loggings.

Again we present a list of stations reported logged by Observers or readers during the past month. In order to save space the regular London, Berlin, Rome, Moscow, Paris and Tokyo transmitters are not listed, except where reception was of particular interest.

SOUTH AMERICA.

Argentine.

"Radio Splendid," Buenos Aires: New station reported in New Zealand on approx. 17825kc., 16.82m. Heard with musical programme till 9 a.m. Announces as **"Radio Splendid,"** Buenos Aires (Johns).

LRX, 9660kc., 31.06m., Buenos Aires: Fairly strong signal around 8 a.m.; in the early afternoon, and around 9.45 p.m. (Anderson, Crowley).

LRA-1, 9690kc., 30.96m., Buenos Aires. Fairly strong at times, opening between 7 and 9 a.m.

Paraguay.

ZP-14, 11720kc., 25.6m., Villarica. One of rarest South Americans, now being heard very well between 8.25-11 a.m. Easily identified by frequent repetition of "Villarica."

ZP-8, 9280kc., 32.33m., Asuncion: Another rare catch; best on Sunday afernoons around 4 p.m. (Johns, Keen).

Brazil.

PSH, 10220kc., 29.35m., Rio de Janeiro: Quite strong when opening at 9 a.m.; usually fades out before closing an hour later, but on one or two occasions signals were strong during whole of transmission.

PRA-8, 6015kc., 49.87m., Pernambuco: Another new station; heard opening at 7 a.m., just above **DJC**, with a vocal rendition of "Ave Maria."

Uruguay.

CXA-8, 9640kc., 31.12m., Colonia: Still heard mornings (8 a.m.), afternoons (Sundays till 4 p.m.) and at night (10 p.m.). (Anderson, Crowley).

CXA-6, 9620kc., 31.19m., Montevideo: Still very weak; best around 7.30 a.m.

Ecuador.

HC2CW, 9135kc., 32.84m., Guayaquil: Another unusual station, seldom if ever heard in this country. Heard one Sunday from 3 till 10.30 p.m. Identifies as "Ondas del Pacifico," and gives QRA as Box 1166.

HC2JB, 12460kc., 24.08m., Quito. Heard well at 1.30 p.m. daily, except Tuesday, in English session. (Crowley, Johns).

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.

Peru.

OAX4J, 9340kc., 32.12m., Lima. One of best South Americans, especially on Sunday afternoons. (Crowley, Anderson).

OAX5C, 9350kc., 31.95m., Ica. Best in the afternoon, till 2.30 p.m., and later on Sundays.

OAX4T, 9566kc., 31.38m., Lima. Strong signal on opening at night.

Chile.

CB-970, 9730kc., 30.83m., Valparaiso: Very weak signal in the afternoons; heard better in N.Z. (Keen, Anderson).

CB-1180, 11970kc., 25.06m., Santiago: Fairly strong signal at times from about 8 a.m. (Keen).

CB-1170, 11700kc., 25.65m., Santiago: Heard with fair signal around 8 a.m. and just before closing at 2.30 p.m. (Keen).

Venezuela.

YV5RM, 5010kc., 59.88m., Caracas: Reported in the West at 8 a.m., Perth time, with rather weak signal. (Anderson).

YV5RN (?), 5040kc., 59.52m., Caracas: Heard weakly at same time as **YV5RM** (Anderson).

CENTRAL AMERICA AND WEST INDIES.

Guatemala.

TGWA, 9685kc., 30.96m., Guatemala City: Splendid signals at present. DX programmes till 6.30 p.m. on Sundays. Also till about 2.45 p.m. daily. (Cushen, La Roche, Anderson).

TGWB, 6490kc., 46.2m., Guatemala City: DX programmes, as **TGWA**, on Sunday afternoons; good signal. (Cushen, Anderson).

TG-2, 6190kc., 48.47m., Guatemala City: Another station heard best on Sunday afternoons; till 6 p.m. (Cushen).

Costa Rica.

TIPG, 9620kc., 31.19m., San Jose: Very strong 31m. signal, one of best on band on opening at 10 p.m., but fades out fairly rapidly. (Crowley, Anderson).

TILS, 6165kc., 48.66m., San Jose: New station; puts in good signal from 10 p.m. Announces as "Radio Parati." News session till about 10.30 p.m.

Mexico.

XEWW, 9500kc., 31.58m., Mexico City. Good strong signal from 2 p.m. till closing. (Anderson).

Panama.

HP5A, 11700kc., 25.65m., Panama City: Opens at 10 p.m.; not very strong. Also heard in the late mornings in the West. (Anderson).

HP5K, 6005kc., 49.96m., Panama City: Regular evening station, opening at 10 p.m. (Crowley).

HP5J, 9590kc., 31.28m., Panama City: Opens at 10 p.m.

Dominican Republic.

HI1N, 12486kc., 24.03m., Ciudad Trujillo: Heard occasionally at night, around 10 p.m.

Cuba.

COCW, 6324kc., 47.4m., Habana: Reported in the West at 8 a.m., Perth time; weak signal. (Anderson).

COJK, 8665kc., 34.64m., Camaguey: Good signal, opening just before 10 p.m.; also heard strongly in the mornings in the West. (Anderson).

COBZ, 9028kc., 33.32m. Habana: Good signal, opening at 10.45 p.m. Also heard occasionally in the West at 8 a.m., Perth time. (Anderson, Crowley).

COCA, 9100kc., 32.95m., Habana: Heard in West. (Anderson).

COBX, 9200kc., 32.59m., Habana: Heard weakly in West. (Anderson).

COCX, 11735kc., 25 5m., Habana: Heard quite well at times from 7.30 a.m.; also reported during mornings in West. (Anderson).

COCH, 9437kc., 31.8m., Habana: Nightly at 10 p.m. (Johns, La Roche, Anderson).

COCM, 9850kc., 30.46m., Habana: Not very loud, but there almost every night at 11 p.m.; also in mornings in West. (Anderson, La Roche, Crowley).

COBC, 9995kc., 30.02m., Habana: Best of Cuban stations at present; good signal at 10 p.m.; also heard during morning and early afternoon. (La Roche, Anderson).

United States.

W1XAR, 11730kc., 25.58m., Boston: Same management as W1XAL. Now heard from midday till close at 1 p.m. (Johns).

W1XK, 9570kc., 31.35m., Boston. Afternoons till 3 p.m. (Cushen, La Roche, Anderson).

W1XAL, 6040kc., 49.65m., Boston: Reported during July, but believed off the air temporarily till September 5. (Pepin).

W1XAL, 11790kc., 25.45m., Boston: Fairly good from 8 a.m.

W2XE, 11830kc., 25.36m., New York: Mornings. (Coggins).

W8XK, 11870kc., 25.27m., Pittsburgh: Good signal during mornings; don't be misled by Spanish news at 8 a m. (Coggins).

W3XAU, 9590kc., 31.28m., Philadelphia: Now difficult to log, but heard at times in the early afternoon.

W3XAL, 9670kc., 31.03m., Bound Brook: Till 3 p.m. (Cushen, Coggins).

W3XL, 17780kc., 16.97m., Bound Brook: Fair signal around mid-day. (Cushen).

W6XBE, 9530kc., 31.48m., San Francisco: Very strong signals from 3-6 p.m. and again at 10 p.m. (Cushen, Pepin, La Roche, Johns, Coggins).

W2XAD, 9550kc., 31.41m., Schenectady: Very erratic; quite strong at times, opening at 8.15 a.m. (Coggins).

W8XAL, 6060kc., 49.5m., Cincinnati: Not so good at night now and just fair in the afternoons. (Anderson).

W4XB, 6040kc., 49.65m., Miami: Best on Sunday afternoon. (Cushen).

KKZ, 13690kc., 21.91m., Bolinas: Special relays; afternoons.

AFRICA.

Kenya.

VQ7LO, 6082kc., 49.31m., Nairobi: Regular early morning station; peak period around 4.30 a.m. (La Roche, Crowley).

Madagascar.

Radio Tananarive, 6063 and 9693kc., 49.48 and 30.95m.: Both open with the Marseillaise at 1 a.m. Weak.

Canary Is.

EAJ-43, 10370kc., 28.92m., Teneriffe: Regular morning station; best between 7.30 and 8 a.m. (Crowley).

Mozambique.

CR7AA, 6137kc., 48.88m., Lourenco Marques. Good early morning station. (Lo Roche).

Ethiopia.

IABA, 9650kc., 31.09m., Addis Ababa: Also heard in early mornings till 6 a.m.

OCEANIA.

New Caledonia.

FK8AA, 6122kc., 49m., Radio Noumea: Now a regular; opens with strong signal at 5.30 p.m. Opening number is Marseillaise.

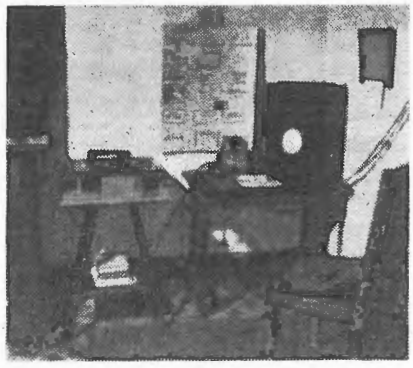
Hawaii.

KQH, 14290kc., 20.11m., Kahuku: On Saturday and Sunday afternoons, with relay to U.S.A. (Cushen).

THE EAST.

Philippine Is.

KZRH, 6110kc., 49.1m., Manila: New station, "The Voice of the Philippines." Good signal between 10 and 11 p.m. (Cushen, Crowley).



This listening post belongs to dxer K. Deering, of Jamestown, S.A., who has an excellent collection of QSL's from all parts of the world.

KZRM/KZEG, 6140kc., 48.86m., Manila: Very strong signal, best from 9.30 p.m. Announce as "Radio Manila." (Coggins, Anderson, Johns).

KZIB, 6040kc., 49.65m., Manila: Another new P.I. station. Puts in a very strong signal at night, with same programme as 31m. station.

KZRF (?), approx. 48.8m., Manila: Still another new station. Good strong signal at night. Announces as "Radio Philippina"; call-sign not quite definite.

KZRM, 9570kc., 31.35m., Manila: Good signals both morning (8 a.m.) and night. (Cushen, La Roche, Coggins, Crowley).

KZIB, 9500kc., 31.68m., Manila: Regular at night. (Lo Roche, Crowley).

Dutch East Indies.

YDB, 15310kc., 19.61m., Soerabaia: Reported in the West in the late mornings; heard around 5 p.m. in East. (Lo Roche).

All other DEI stations (**YDC, PLP, PMN, PDA**, 98m., etc.) reported at good strength.

Malaya.

ZHP, 9690kc., 30.96m., Singapore: Regular night station; heard till close at 12.40 a.m. (La Roche, Johns, Crowley).

ZHJ, 6090kc., 49.25m., Penang: Excellent strength. (Johns).

India.

VUD-3, 15290kc., 19.62m., Delhi: Occasionally at good strength at midday till close at 1 p.m.; news service before closing.

VUD-2, 9590kc., 31.28m., Delhi: Opens at 10.30 p.m. Also reported in early mornings in West. (Pepin, La Roche).

VUD-2, VUM-2, VUB-2, VUC-2, 60-61m.: Heard very well in the West; not so good in eastern States. (La Roche).

French Indo-China.

Radio Saigon, 6116kc., 49.05m. Best station on 49m. band. English session at 9 p.m. (Cushen, Linehan, Coggins, Anderson, Johns).

Radio Saigon, 11780kc., 25.47m.: From 11.30 p.m., with good signal.

Hong Kong.

ZBW-2, 6090kc., 49.26m.: Irregular station; reported from South Australia. (Coggins).

China.

XGOY, 11900kc., 25.21m., Chungking: Heard well both night and in mornings from 8 a.m. (Linehan, La Roche, Coggins, Johns).

XGOX, 17800kc., 16.86m., Chungking: Daily around noon; weak.

XMHA, 11850kc., 25.32m., Shanghai: Announces as "The Voice of the Orient." Nightly, but not as good as formerly. (La Roche).

XGAP, 9560kc., 31.38m., Peking: Still heard in N.Z. (Johns).

XPSA, approx. 7000kc., Kweiyang: Very strong.

XOZ, 15510kc., 19.34m., Chengtu: New station. Heard only once, from noon till close at 1 p.m. English news at 12.45 p.m.

Japan.

JLG, 7285kc., 41.18m., Tokyo: Still heard in early mornings, around 6 a.m. Excellent signal. (Johns).

JZH, 6095kc., 49.22m., Tokyo: Strong signal at night.

Manchukuo.

MTCY, 6125kc., 48.98m., Hsinking: New station; opens after 11 p.m.; call in English around 11.15 p.m. (Coggins).

JDY, 9920kc., 30.24m., Dairen:

Strong signal nightly 10-11 p.m. (La Roche).

Siam.

HS8PJ, 9510kc., 31.55m., Bangkok: Excellent signal, four nights a week. Frequent English announcements. (Crowley).

EUROPE.

Hungary.

A new experimental station operating on 7321kc., 40.9m., is reported in New Zealand in the afternoons. Call is believed to be **HABQ-2,** Radiolabor.

Portugal.

CSW-8, 7260kc., 41.3m., Lisbon: One of best of early morning stations, from 7-8 a.m. English announcements rare. (Johns).

CSW-7, 9735kc., 30.82m., Lisbon: Also strong signal in mornings around 8-9 a.m. (La Roche).

CS2WD, 5977kc., 50.2m., Lisbon: Heard very weakly from 7 a.m.

Poland.

SP-19, 15120kc., 19.84m., Warsaw: Heard quite well on opening at 9 a.m. for a while, but very weak recently. (Anderson).

SPW, 13635kc., 22m., Warsaw: Also heard from 9 a.m.; weak here, but strong in the West.(Anderson, La Roche).

SPD, 11535kc., 26.01m., Warsaw: Heard in the West. (La Roche).

SP-25, 11740kc., 25.55m., Warsaw. From 9 a.m., but very weak.

SP-48, 6140kc., 48.86m., Warsaw: Opens at 6 a.m.; fairly strong.

Norway.

LKJ, 6130kc., 48.94m., Oslo: Fairly strong signal in early mornings.

Sweden.

SBP, 11705kc., 25.63m., Motala: Good signal in the mornings; English announcement on closing at 7.15 a.m.

SBU, 9535kc., 31.46m., Motala: Very erratic, but quite loud at times from 7.15-8 a.m. Often marred by QRM.

SBO, 6060kc., 49.46m., Motala: Good signal at same time as **SBU.**

Denmark.

OZF, 9520kc., 31.51m., Skamlebaek: Heard occasionally in the early afternoon. (Cushen).

Belgium.

ORK, 10330kc., 29.04m., Ruysselede: Good early morning station, closing at 6 a.m. (La Roche).

Spain.

EAQ, 9860kc., 30.4m., Madrid: Again on regular schedule. Best between 8 and 9 a.m. (La Roche, Coggins, Crowley).

U.S.S.R.

RV-96, 15400kc., 19.47m., Moscow: New frequency. Varies in strength in the mornings.

RKI, 7595kc., 39.9m., Moscow: Irregular at nights. (La Roche).

Turkey.

TAP, 9465kc., 31.7m.: One of best morning signals till 8 a.m. (La Roche).

Switzerland.

HBJ, 14535kc., 20.64m., Geneva: Special broadcasts; irregular. (La Roche, Keen).

HBO, 11400kc., 26.31m., Geneva: Mondays 3.45-4.15 p.m.; good strength. (Keen).

Holland.

PCJ-2, 15220kc., 19.7m., Huizen: Very entertaining programme on Tuesday afternoon session. (Coggins, La Roche, Cushen).

PCJ, 9590kc., 31.28m., Huizen: Till 6.30 a.m. on Wednesday mornings. (Cushen).

PHONE STATIONS.

Trans-Pacific Yacht Race.

Descriptions of the Trans-Pacific yacht race from San Francisco to Pearl Harbour, Hawaii, were heard through Station **W6XEJ,** on approx. 24m. One transmitter was on board the yacht "Contender," which was first across the line; the other in Los Angeles. Both stations used the call **W6XEJ.** (Cushen).

New Guinea.

VJZ, Rabaul, heard working Sydney around 3 p.m., on approx. 21.5m.

Unidentified.

Station on 11935kc., 25.14m., calling and working Buenos Aires at 8.30 a.m. Thought to be **YNA,** Managua, Nicaragua.

Information for the above list of stations was supplied by the following:—Messrs. La Roche, Pepin and Anderson (Observers for West Australia); Johns and Keen (Observers for New Zealand); Coggins and Linehan (Observers for South Australia); Crowley (Observer for Victoria); and Mr. A. T. Cushen, of Invercargill, N.Z.

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Amateur Bands Review.

Conditions Generally Disappointing.

Generally speaking, reception conditions on the amateur bands have been quite disappointing as far as real DX has been concerned.

On 10 metres conditions have been very poor indeed. On most days only a few W, K6 and ZL signals were audible, and these were never at really good strength. Apart from a few Africans reported by Mr. Linehan, real DX has been conspicuous by its absence. However, there is a possibility that the band may open up a trifle in the evenings from 7 p.m.; those DX-ers interested in 10-metre reception would be well advised to listen occasionally at this time.

On 20 metres conditions have been very variable. Although good results have been obtainable at times, taken as a whole the month's results have been disappointing. As previously the best period for DX reception has been from 3 till 6.30 p.m., although on a few mornings conditions have been fair around 7 a.m. Most of the best stations listed this month are Europeans, for South Americans and Asiatics have been pretty scarce. Outstanding has been the number of G's logged. The most interesting station reported this month is **ZA1JL,** Albania, logged by Mr. Wall, of Subiaco, West Australia. **EA7BA,** Cadiz, has been putting in a very strong signal, and has been reported from most States.

On 40 metres indications are that this band will improve during the next few months, and will probably provide some reasonable DX from Europe and South Africa (mornings) and America (evenings). An interesting logging on this band was **VK4KR,** Willis Is., heard on both phone and C.W.

New Prefixes.

The new prefix for the Tangier International Zone is **EK. LB** is now used for portable transmitters in Norway.

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Calls Heard.

The following list of calls heard on the amateur bands was compiled from information supplied by Messrs. Keen and Cushen (New Zealand); Pepin, Wall and La Roche (West Australia); Ferrier and Crowley (Victoria); Linehan and Coggins (South Australia) and Taylor (New South Wales).

10 Metres.

Africa.

South Rhodesia: **ZE1JR.**

South Africa: **ZS- 1AX, 5AW, 5H, 5T.**

Pacific.

Dutch East Indies: **PK- 1VM, 1VY.**

Hawaii: **K6- PAS, PIT, PLX, PTW.**

New Zealand: **ZL- 1BC, 1GI, 1MY, 1MR, 2BE, 2BN, 2BT, 2TI, 3IF.**

United States.

W- 2IKV, 4DEO, 4FT, 4EJQ, 5AKI, 5FPD, 5DYT, 5FZB, 5GKZ, 5HWJ, 6NQJ, 6FZC, 7GLX, 9CXU, 9BCX.

20 Metres.

Africa.

French Morocco: **CN8-AM.**

South Africa: **ZS- 2AV, 2AZ, 5TW, 5QM, 5AW, 5Q, 5T, 5DW, 5DA, 6EO, 6AD, 6EW, 6EG, 2AH.**

Spanish Morocco: **EA9-AH.**

Europe.

Wales: **GW- 3KY, 5PH, 8HI.**

Scotland: **GM- 2UU, 3OL, 6RG, 6VI,**

6WD, 8MN.
Northern Ireland: GI- 2CC, 5NJ.
Holland: PAO- AD, BE, EO, MZ, UN.
Albania: ZA-1JL.
Sweden: SM- 5BR, 6RF, 7YA.
Switzerland: HB- 9CL, 9BQ, 9J.
Denmark: OZ-5BW.
Italy: I-1LW.
Hungary: HA-2P.
Spain: EA-7BA.
Norway: LA-1F.
Belgium: ON4- OU, AR, AU, BG, BJ, VK, HS.
France: F- 3MN, 3OF, 8VP, 8TU, 8UE, 8DC, 8XP, 8PK, 8NT, 8PQ, 8MG, 3QT, 8VC.
England: G- 2AV, 2CU, 2TR, 2BG, 2PM, 2PU, 2IJ, 2MQ, 2OC, 2WD, 2XS, 2XV, 2WV, 3QO, 3DO, 3CP, 3DA, 3GQ, 3OT, 4HV, 4HY, 5QN, 5XA, 5NO, 5DT, 5LU, 5YV, 5JO, 5RV, 5BJ, 5PU, 6GL, 6VX, 6WT, 6BY, 6WX, 6GO, 6LO, 6ZJ, 6BW, 6KL, 6LK, 8UJ, 8SP, 8OO, 8SW, 8RP, 8CL, 8IL, 8MX, 8TX, 8GP, 8HN, 6DT, 6JL, 5ML, 5ZG.

South America.

Chile: CE- 1AM, 1AS, 3AT, 3EW, 3CG, 3CO, 3AG.
Argentine: LU- 4BC, 7BC, 7AG, 7BF, 8AB.
Brazil: PY-2EN.
Peru: OA4- AI, AG, AW.

Central America and West Indies.

Jamaica: VP5-PZ.
Guatemala: TG-9BA.
Costa Rica: TI- 2RC, 4AG.
Bermuda: VP9-G.
Porto Rico: K4- FAY, FKC.
Cuba: CO- 2LY, 2WM, 2EV, 2JJ, 2WJ, 2VK, 2AM, 8JK.

North America.

Alaska: K7-HCX.
Mexico: XE- 1AC, 1FY, 1AM, 1GK, 1CX, 1FF, 1Q, 1BG, 2FC.
Canada: VE- 1FL, 1EI, 3HI, 3AHN, 4NI, 4BT, 4ACP, 4KF, 4YR, 5HF, 5OT, 5PD, 5EF, 5FO, 4FR, 5ACN.

Asia.

Philippine Is.: KA-1PI, 1DL, 1FH, 1ME, 1ZL, 1AP, 1JM, 1BB, 1JP, 1CS, 7HB, 7EF.
Dutch East Indies: PK- 1MF, 1XZ, 1QE, 1VM, 1II, 1JL, 1PK, 1OG, 2AY, 2LZ, 2WL, 3AA, 3WI, 3RA, 3CI, 4KS, 4CT, 1AC, 1VX.
French India: FN- 1C, 6RF.
China: XU- 5GR, 8RB, 8AM, 8HB, 8ZM, 8EF, 8ET, 8MC, 8ZA.
India: VU- 2CG, 2CQ, 2BJ.
Ceylon: VS7- GJ.
Japan: J- 2NQ, 5CW.
Burma: XZ-2KB.
Malaya: VS- 2AL, 2AK.

Australasia and Oceania.

Dutch New Guinea: PK- 6XX, 6OM.
New Guinea: VK9-VG.
Hawaii: K6- LKN, BAZ, ATH, MVA, BNR, PIT, VA, OQE, QUJ, PRZ, BP, PCF, KKP, OES.

Broadcast Band DX Notes

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

The "Australasian Radio World" has much pleasure in presenting for the first time a section for the many members of the A.W.A.W. DX Club who are interested in B.C.B. D.X.

Your Support And Co-operation Needed.

Those interested in this new section will best show their appreciation by the manner in which they give their support and co-operation. Reports of reception conditions, together with suggestions for new features, will be greatly appreciated. Remember that the extent of this B.C.B. column will depend to a great extent on the support accorded it by readers.

Trophies Available For Competition.

Even at this early stage, we have received offers of several trophies for competition amongst B.C.B. DX-ers. At the present moment the form which these DX contests will take is under consideration. Further details will be announced as soon as possible.

★

Best Stations Of The Month.

The following list sets out those stations which are now reaching their maximum strength for reception in Australia. Any of them should be easily logged by even novice dxers.

Japan.

JOAK-1, 590kc., Tokyo: Heard well in Eastern Australia as early as 8 30 p.m. Closes at 11 p.m. with either musical chimes or announcement of call sign.

JOAK-2, 870kc., Tokvo: Opens at 11.30 p.m., after 2GB, Sydney, closes. English news around 11.45 p.m.

Philippines.

KZRM, 618.5kc., Manila. One of strongest stations heard this year. Closes at 1 a.m.

KZEG, 780kc., Manila. Reported in Eastern Australia between 1 and 2 a.m.

KZIB, 900kc., Manila: Also heard well around midnight.

China.

XGOA, 1180kc., location probably Chungking: Despite statements to contrary this has been their frequency for some weeks past.

ZBW, 845kc., Hong Kong: Also heard well around midnight, though sometimes subject to interference from JBCK.

FFZ, 1400kc., Shanghai: Slightly

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

more difficult to log than other stations listed here, but has often been reported by listeners in Eastern States.

India.

VUW, 1015kc., Lucknow: Good at 2.30 a.m.; audible in all parts of Eastern Australia.

VUC, 810kc., Calcutta: Audible from about 2 a.m.; very strong prior to closing at 3.30 a.m.

VUT, 758kc., Trichinopoly: Now much stronger than earlier in the year.

VUD, 882kc., Delhi: Strongest of the Indian stations.

Ceylon.

VPB, 705kc., Colombo: Reaches peak just before closing at 2.30 a.m.

Malaya.

ZHL, 1332kc., Singapore: Reported recently by South Australian listeners.

★

Around The Dial.

Other stations audible at reasonable strength at present include the following:—

MTCY, 560kc., Hsinking, Manchukuo: Best around midnight.

JFCK, 580kc., Taichu, Formosa: Listen for this from 10.30 p.m.

XMHA, 600kc., Shanghai, China: Heard best around 1.30 a.m.

MTFY, 675kc., Dairen, Manchukuo: Fairly strong between 11 p.m. and midnight.

JOBK-1, 690kc., Osaka, Japan: Easy logging on Sundays 10.30-11 p.m.

JODK-2, 710kc., Keijo, Japan: Difficult to separate from 6GF.

JFBK, 720kc., Tainan, Formosa: Sometimes at midnight; interference from 6GF.

JOCK-1, 730kc., Nagoya, Japan: Sundays at 10.45 p.m.

JOHK, 770kc., Sendai, Japan: Strong from 10.30-11 p.m.

JOGK, 790kc., Kumamoto, Japan: Hard to log; same frequency as 6WN.

JOFK, 830kc., Hiroshima, Japan: Sundays 10.30-11p.m.

JBCK, 850kc., Japan: One of strongest Japs. yet heard.

JOBK-2, 940kc., Osaka, Japan: Very strong after 10.30 p.m., but subject to interference from 5DN.

JODK-1, 970kc., Keijo, Japan: Strong, but interference from 6AM.

JOCK-2, 990kc., Nagoya, Japan: Scheduled to close at 11 p.m., but often heard as late as midnight.

Radio Saigon, French Indo-China, 1000kc.: Heard around midnight; programme of Eastern music at 12.20 a.m.

★

Stop-Press News.

Changes In American Call-Signs.

A number of the well-known American shortwave transmitters are now operating under different call-signs.

Changes noted at time of writing:—

W8XX now sign as WPIT.
W1XK now sign as WBOS.
W2XAF now sign as WGEO.
W6XBE now sign as KGEI.
W1XAL and W3XAL still use their old calls.

N.B.C. Station For Pacific.

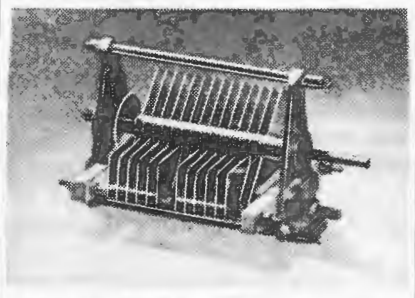
It is reported that the N.B.C. are sending radio engineers to investigate radio phenomena in the Pacific, and to make broadcasts from remote islands.

Additions To Amateur Calls Heard.

The following additions to the "Calls Heard" section of the Amateur Review were supplied by Mr. D. J. Hastings, of Brisbane:—

PY8AB, PY7AI, Brazil; ZB2B, Gibraltar; FB8AH, Madagascar; J6GU, J7CB, Japan; FA3FB, Algeria; XU-5HI, China; NY1AU, Canal Zone; D4-KPJ, Germany; and CN8BB, Morocco.

EVERYTHING FOR THE AMATEUR



Raymart Condenser, Type TCD 100x

Choose also REGAL MICROPHONES, TEFAG HEADPHONES, ROLA SPEAKERS, PREMIER SPEAKERS, RAYMART VALVE SOCKETS, TRANSMITTING DIALS and a multitude of other dependable ultra short-wave equipment.

New Transmittin g Condensers.

Raymart Ceramic Short-wave Micro-Variables employing exclusive new material RMX for highest efficiency. Ball races, electrically shorted, ensure freedom from noise.

Make a bee-line for "The Friendly Wholesale House" when you want the very best in gear at the keenest prices. John Martin specialises in amateur needs with—

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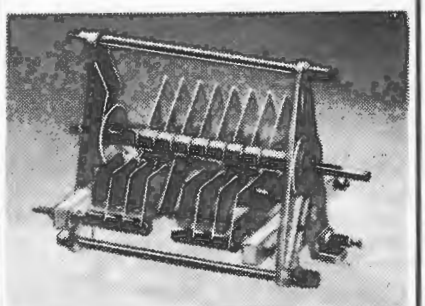
CRAFT A CREED

Exclusive Raymart features:
- Triangulated frame, giving extremely rigid construction with capacities constant.
- RMX Insulators with insulators and main frame out of the field of the condensers.
- Collector brushes with corona shield eliminating carriage of RF through the bearings.
- Long front bearing, giving absolute freedom from slackness and perfectly smooth action.
- Ball-bearing rear end.
- Maximum possible flash-over clearance everywhere.
- 10,000-volt peak model has all plates rounded and buffed edges.



Raymart Condenser, Type TX 40x

	List Price
VC15X 15mmfd.	6/9
VC40X 40mmfd.	7/6
VC100X 100mmfd.	7/9
VC160X 160mmfd.	9/9
VC250X 250mmfd. (.00025 mfd.)..	10/6
NC15 (Transmitting) Neutralising 15mmfd., spacing .07in. ..	8/-
TC40 (Transmitting) Tuning, 40mmfd., spacing .07in.	9/6

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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.

13.93 GSJ
13.97 GSH
16.81 DJH
16.84 GSV
16.86 GSG
16.87 W3XL
16.88 PHI (S)
19.63 DJQ
19.68 TPA-2
19.71 PCJ-2 (S)
19.74 DJB
19.79 JZK
19.8 YDC
19.82 GSF
19.82 JLU-3
25.0 RNE (M)
25.21 XGOY
25.32 XMHA
25.42 JZJ
25.47 Saigon
27.27 PLP
29.24 PMN
30.96 GRX
30.96 ZHP
31.28 VUD-2
31.35 KZRM
31.41 YDB
31.41 W6XBE
31.45 DJN
31.49 ZBW-3
31.55 HS8PJ (F)
31.58 XEWW
31.57 XEWW
31.80 COCH
32.28 XTC
33.98 COCQ
34.64 COJK
42.80 XPSA
44.64 PMH
48.98 MTCY
49.65 YDD
49.94 XYZ
58.31 PMY
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2

1-2 a.m.

13.93 GSJ
13.97 GSH
16.81 DJH
16.84 GSV
16.86 GSG
19.61 2RO-6
19.63 DJQ
19.74 DJB
19.82 GSF
19.85 DJL
25.0 RNE
25.21 XGOY
25.24 TPA-3
25.32 XMHA
25.4 2RO-4
27.27 PLP
29.24 PMN
30.96 GRX
31.01 DJX
31.28 VUD-2
31.41 YDB
31.45 DJN
31.58 XEWW
42.80 XPSA
44.64 PMH
48.98 MTCY
49.65 YDD
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2

2-3 a.m.

13.93 GSJ
13.97 GSH
16.84 GSV
16.86 GSG
16.89 DJE (M)
19.61 2RO-6
19.74 DJB (M)
19.82 GSF
19.85 DJL
25.21 XGOY
25.4 2RO-4
25.49 DJD
30.96 GRX
31.01 DJX
31.28 VK2ME (M)
31.28 VUD-2
31.7 TAP
41.21 TPB
49.83 DJC
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2

3-4 a.m.

16.86 GSG
16.89 DJE (M)
19.61 GSP
19.66 GSI
19.74 DJB (M)
19.85 DJL
25.24 TPA-3
25.4 2RO-4
25.49 DJD
25.53 GSD
25.7 IQY
29.04 ORK
30.52 IRF
31.01 DJX
31.02 2RO-9
31.13 2RO-3
31.28 VK2ME (M)
31.28 VUD-2
31.32 GSC
31.7 TAP
41.21 TPB
48.88 CR7AA
49.31 VQ7LO
49.59 GSA
49.83 DJC

4-5 a.m.

16.86 GSG
19.61 2RO-6
19.61 GSP
19.66 GSI
19.85 DJL
25.0 RNE
25.24 TPA-3
25.4 2RO-4
25.49 DJD
25.53 GSD
25.63 SBP
29.04 ORK
31.01 DJX
31.02 2RO-9
31.13 2RO-3
31.28 VK2ME (M)
31.28 PCJ (W)
31.32 GSC
31.51 RV-96
31.7 TAP
41.21 TPB
48.88 CR7AA
49.31 VQ7LO
49.59 GSA
49.75 RV-96
49.83 DJC

5-6 a.m.

16.86 GSG
19.61 GSP
19.61 2RO-6
19.66 GSI
19.79 JZK
19.85 DJL
25.0 RNE (M)
25.24 TPA-3
25.4 2RO-4
25.42 JZJ
25.49 DJD
25.63 JLG-3
25.63 SBP
25.7 IQY
27.17 CSW-2
29.04 ORK
30.52 IRF
31.01 DJX
31.02 2RO-9
31.10 JLT-2
31.13 2RO-3
31.28 PCJ (M, W)
31.32 GSC
31.51 RV-96
31.7 TAP
41.21 TPB
48.47 HVJ
49.59 GSA
49.75 RV-96
49.83 DJC

6-7 a.m.

16.86 GSG
16.87 W3XL
19.61 GSP
19.61 2RO-6
19.66 GSI
19.79 JZK
19.85 DJL
25.0 RNE
25.26 W8XK
25.4 2RO-4
25.42 JZJ
25.49 DJD
25.53 GSD
25.63 JLG-3
25.63 SBP
27.17 CSW-2
30.45 EAQ
31.01 DJX
31.02 2RO-9
31.10 JLT-2
31.13 2RO-3
31.32 VLR (ex. S)
31.32 GSC
31.48 W2XAF
31.51 RV-96
31.7 TAP
41.21 TPB
41.8 CR6AA
47.2 IAC
49.59 GSA
49.75 RV-96
49.83 DJC

7-8 a.m.

16.87 JZL
16.87 W3XL
19.61 2RO-6
19.61 GSP
19.76 GSO
19.82 GSF
25.0 RNE
25.21 XGOY
25.24 TPA-3
25.26 W8XK
25.40 2RO-4
25.45 W1XAL
25.49 DJD
25.53 GSD
25.60 JVW-3
25.63 SBP
30.45 EAQ
31.01 DJX
31.02 2RO-9
31.12 CXA-8
31.13 2RO-3
31.32 VLR (exc. S)
31.32 GSC
31.35 KZRM
31.46 JZI
31.46 SBU
31.48 W2XAF
31.51 RV-96
31.7 TAP
41.21 TPB
41.30 CSW-8
49.18 YUA
49.46 SBO
49.59 GSA
49.75 RV-96
49.83 DJC

8-9 a.m.

16.87 W3XL
16.87 JZL
16.89 DJE
19.56 DJR
19.61 GSP
19.61 2RO-6
19.63 DJQ
19.74 DJB
19.76 GSO
19.82 GSF
25.0 RNE
25.21 XGOY
25.26 W8XK
25.4 2RO-4
25.42 DJZ
25.45 W1XAL
25.49 DJD
25.53 GSD
25.6 ZP-14
30.45 EAQ
30.82 CSW-7
30.94 LRA-1
31.02 2RO-9
31.06 LRX
31.12 CXA-8
31.13 2RO-3
31.32 GSC
31.32 VLR
31.35 KZRM
31.45 DJN
31.46 JZI
31.48 W2XAF
31.51 RV-96
41.21 TPB
49.59 GSA
49.75 RV-96

9-10 a.m.

11m. stations

16.84 2RO-8
16.87 W3XL
16.89 DJE
19.56 DJR
19.57 W6XBE
19.61 2RO-6
19.63 DJQ
19.74 DJB
19.8 YDC
19.82 GSF
19.84 SP-19
22.0 SPW
25.21 XGOY
25.24 TPB-7
25.26 W8XK
25.4 2RO-4
25.42 DJZ
25.45 W1XAL
25.49 DJD
25.53 GSD
25.6 ZP-14
25.61 TPA-4
27.27 PLP
29.24 PMN
29.35 PSH
30.45 IRF
30.82 CSW-7
30.94 LRA-1
31.02 2RO-9
31.06 LRX
31.13 2RO-3
31.25 RAL
31.32 VLR
31.45 DJN
31.48 W2XAF
31.51 RV-96
31.55 GSB

10-11 a.m.

11m. stations

16.84 2RO-8
16.87 W3XL
16.89 DJE
19.47 RV-96
19.56 DJR
19.57 W6XBE
19.61 2RO-6
19.63 DJQ
19.74 DJB
19.76 RV-96
19.76 RW-96
19.8 YDC
19.82 GSF

19.84 SP-19
19.95 RKI
22.0 SPW
25.24 TPB-7
25.26 W8XK
25.4 2RO-4
25.42 DJZ
25.49 DJD
25.53 GSD
25.60 ZP-14
25.61 TPA-4
27.27 PLP
29.24 PMN
30.52 IRF
30.94 LRA-1
31.25 RAL
31.32 VLR
31.28 PCJ (M, W, Th)
31.38 DJA
31.45 DJN
31.48 W2XAF
31.55 GSB

11 a.m.-noon

11m. stations
16.84 2RO-8
16.87 W3XL
16.87 JZL
16.89 DJE
19.47 RV-96
19.56 DJR
19.57 W6XBE
19.61 2RO-6
19.63 DJQ
19.74 DJB
19.76 RV-96
19.82 GSF
19.95 RKI
25.0 RNE
25.24 TPB-7
25.26 W8XK
25.4 2RO-4
25.42 DJZ
25.49 DJD
25.53 GSD
25.61 TPA-4
30.52 IRF
31.13 2RO-3
31.25 RAL
31.28 PCJ (M, W, Th, Sat)
31.32 VLR (S)
31.38 DJA
31.45 DJN
31.48 W2XAF
31.55 GSB

Noon-1 p.m.

11m. stations
16.85 XGOX
19.56 DJR
19.57 W6XBE
19.63 DJQ
19.66 GSI
19.74 DJB
25.0 RNE
25.24 TPB-7
25.26 W8XK
25.42 DJZ
25.49 DJD
25.53 GSD
31.25 RAL
31.28 PCJ (W)
31.32 VLR
31.38 DJA
31.45 DJN
31.48 W2XAF
31.55 GSB

1-2 p.m.

11m. stations
16.85 XGOX
19.56 DJR
19.57 W6XBE
19.63 DJQ
19.66 GSI
19.74 DJB
25.24 TPB-7
25.42 DJZ
25.49 DJD
25.53 GSD
25.61 TPA-4
31.03 W3XAL
31.32 VLR
31.35 W1XK
31.38 DJA
31.45 DJN
31.48 W2XAF
31.55 GSB
31.57 XEWW

2-3 p.m.

16.85 XGOX
19.66 GSI
25.53 GSD
31.03 W3XAL
31.32 VLR (exc. S)
31.35 W1XK
31.55 GSB
31.57 XEWW
32.15 OAX4J

3-4 p.m.

16.81 DJH
16.89 DJE
19.63 DJQ
19.66 GSI
19.74 DJB
19.79 JZK
19.85 DJL
25.53 GSD
30.96 TGWA (S)
31.28 VK2ME (S)
31.32 VLR
31.45 DJN
31.48 W6XBE
31.55 GSB
31.57 XEWW
32.15 OAX4J
46.2 TGWB (S)
49.5 W8XAL
49.65 W4XB

4-5 p.m.

16.81 DJH
16.89 DJE
19.63 DJQ
19.66 GSI
19.71 PCJ-2 (T)
19.74 DJB
19.76 RV-96
19.79 JZK
19.83 TPB-6
19.85 DJL
25.24 TPA-3
25.53 GSD
26.31 HBO (M)
30.96 TGWA (S)
31.28 VK2ME (S)
31.32 VLR
31.45 DJN
31.48 W6XBE
31.55 GSB
46.2 TGWB (S)
48.47 TG-2 (S)
49.5 W8XAL
49.64 W4XB

5-6 p.m.

16.81 DJH
16.89 DJE
19.63 DJQ
19.66 GSI
19.71 PCJ-2 (T)
19.74 DJB
19.83 TPB-6
25.24 TPA-3
25.53 GSD
26.31 HBO (M)
30.96 TGWA (S)
31.32 VLR
31.45 DJN
31.48 W6XBE
31.55 GSB
46.2 TGWB (S)
48.47 TG-2 (S)
49.0 FK8AA
49.57 9MI (W)

6-7 p.m.

16.81 DJH
16.89 DJE
19.63 DJQ
19.74 DJB
19.76 RV-96
19.83 TPB-6
25.24 TPA-3
25.6 JVW-3
30.96 TGWA (S)
31.32 VLR
46.20 TGWB (S)
49.0 FK8AA

7-8 p.m.

16.81 DJH
16.89 DJE
19.61 2RO-6
19.63 DJQ
19.74 DJB
20.28 IQA
25.4 2RO-4
25.6 JVW-3
27.27 PLP
29.24 PMN
31.13 JFO
31.28 VK2ME (S)
31.32 VLR
31.35 KZRM
31.49 ZBW-3
31.58 VK3ME (ex. S)

8-9 p.m.

13.93 GSJ
13.97 GSH
16.81 DJE
16.84 2RO-8
16.84 GSV
16.86 GSG
16.89 DJE
19.63 DJQ
19.68 TPA-2
19.74 DJB
19.82 GSF
25.21 XGOY
25.32 XMHA
25.4 2RO-4
25.6 JVW-3
25.7 IQY
27.27 PLP
29.24 PMN
30.52 IRF
30.96 GRX
30.96 ZHP
31.13 JFO
31.28 VK2ME (S)
31.32 VLR
31.35 KZRM
31.46 VPD-2
31.49 ZBW-3
31.58 VK3ME (exc. S)
42.8 XPSA
44.64 PMH
48.86 KZRM/ KZEG
49.65 KZIB
58.31 PMY

9-10 p.m.

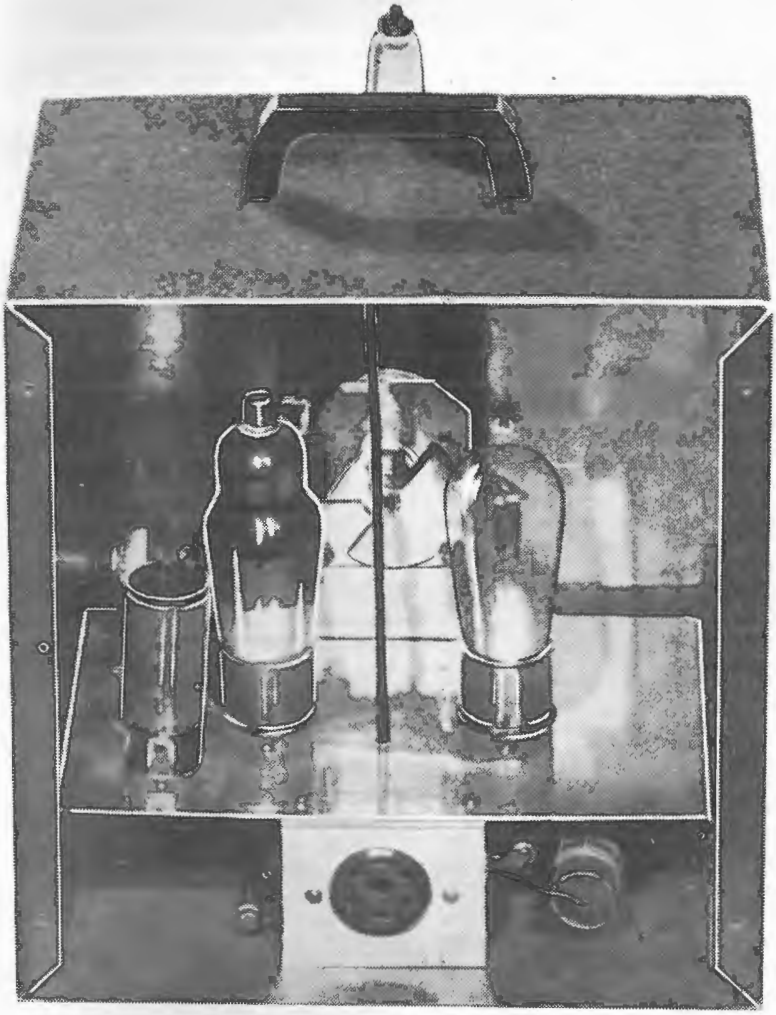
13.93 GSJ
13.97 GSH
16.81 DJH
16.84 2RO-8
16.84 GSV
16.86 GSG
16.88 PHI (S)
16.89 DJE
19.63 DJQ
19.68 TPA-2
19.71 PCJ-2 (S)
19.74 DJB
19.82 GSF
25.0 RNE
25.21 XGOY
25.32 XMHA
25.4 2RO-4
25.60 JVW-3
27.27 PLP
29.24 PMN
30.96 GRX
30.96 ZHP
31.13 JFO
31.28 VK2ME (S)
31.28 VK6ME (ex. S)
31.32 VLR
31.35 KZRM
31.41 YDB
31.58 VK3ME (exc. S)
31.58 KZIB
42.80 XPSA
44.64 PMH
48.86 KZRM/ KZEG
49.05 Saigon
49.1 KZRH
49.25 ZHJ
49.57 9MI (T, Sat)
49.65 KZIB
58.31 PMY
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2

10-11 p.m.

13.93 GSJ
13.97 GSH
16.81 DJH
16.84 2RO-8
16.84 GSV
16.86 GSG
16.88 PHI
16.89 DJE
19.63 DJQ
19.68 TPA-2
19.71 PCJ-2
19.74 DJB
19.79 JZK
19.82 GSF
25.0 RNE
25.21 XGOY
25.32 XMHA
25.4 2RO-4
25.60 JVW-3
27.27 PLP
29.24 PMN
30.02 COBC
30.24 JDY
30.96 ZHP
30.96 GRX
31.06 LRX
31.13 JFO
31.19 TIPG
31.25 CB-960
31.28 HP5J
31.28 VK2ME (S)
31.28 VK6ME (ex. S)
31.28 VUD-2
31.32 VLR
31.35 KZRM
31.41 YDB
31.48 W6XBE
31.49 ZBW-3
31.58 KZIB
42.80 XPSA
44.64 PMH
48.66 TILS
48.86 KZRM/ KZEG
49.05 Saigon
49.1 KZRH
49.25 ZHJ
49.5 W8XAL
49.57 9MI (S)
49.63 YDD
49.65 KZIB
49.94 XYZ
49.96 HP5K
58.31 PMY
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2

11 p.m.-midnight

13.93 GSJ
13.97 GSH
16.81 DJH
16.84 GSV
16.84 2RO-8
16.86 GSG
16.87 W3XL
19.63 DJQ
19.68 TPA-2
19.71 PCJ-2
19.74 DJB
19.79 JZK
19.82 JLU-3
19.82 GSF
19.85 DJL
25.4 RNE (S)
25.21 XGOY
25.32 XMHA
25.4 2RO-4
25.42 JZJ
25.47 Saigon
27.27 PLP
28.48 J1B
29.24 PMN
30.02 COBC
30.6 COCM
30.96 GRX
30.96 ZHP
31.06 LRX
31.13 JFO
31.25 CB-960
31.28 HP5J
31.28 VUD-2
31.28 VK2ME (S)
31.32 VLR (exc. S)
31.35 KZRM
31.38 OAX4T
31.41 YDB
31.48 W6XBE
31.49 ZBW-3
31.55 HS8PJ
31.57 XEWW
31.58 KZIB
31.8 COCH
32.28 XTC
33.98 COCQ
34.64 COJK
41.55 YDX
42.8 XPSA
44.64 PMH
48.66 TILS
48.86 KZRM/ KZEG
49.98 MTCY
49.10 KZRH
49.26 2HJ
49.5 W8XAL
49.63 YDD
49.65 KZIB
49.94 XYZ
49.96 HP5K
58.31 PMY
60.48 VUD-2
60.98 VUM-2
61.48 VUB-2
61.98 VUC-2



A rear view of the completed instrument. Note particularly the location of the coil, the centre of which should be exactly 2" from the steel back of the cabinet and 1¾" from the left-hand side.

Amateur Frequency Meter.

(Continued from page 7)

cuit which stabilises and reduces this fluctuation effect to within reasonable limits. In order to have a nearly permanent value of inductance the coil is wound on high-grade natural finish Dilecto 1" diameter. A liberal dosing of coil dope is necessary and a day or two should be allowed for ageing.

Using the coil and doping as indicated above most of the circuit ageing then takes place as a capacitive effect and can be corrected by a slight variation of the padder condenser.

The output loading and monitor loading has negligible effect on frequency. The circuit diagram is shown on page 7, and it is apparent that it follows conventional design.

The instrument case follows the size of the previous instruments and is 9" x 9" x 6," with chassis measuring 8" x 5" x 2." Strict adherence to layout detail is necessary if the true value of the calibrated dial is to be taken advantage of.

All wiring is done with very heavy tinned copper wire, more particularly in the oscillator section as permanence of calibration is the one virtue a frequency meter should have.

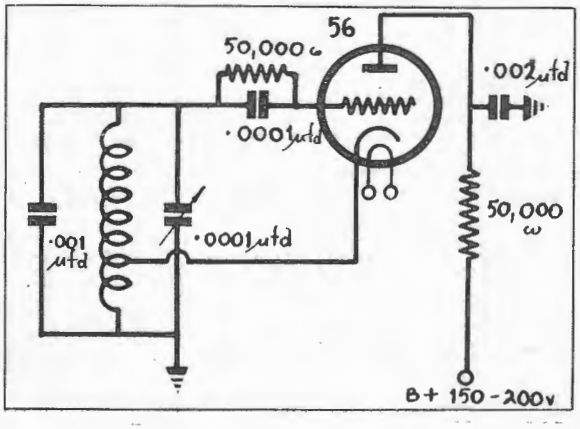
The actual calibration of this instrument was performed by Paton Electrical Pty. Ltd, makers of the well-known Palec test equipment, using their new Primary Frequency Standard described in the Feb., 1939, issue of "Radio World," giving an extreme accuracy of 1 part in 10 million. This instrument is available to the trade and to amateurs for calibrating equipment. In the case of the frequency meter described in this article, only a nominal charge is made and following calibration the amateur need have no fears regarding out of band operation.

An Alternative Method.

However, there is another alternative available to those who prefer to complete their own calibration. This is to build a simple 100 k.c. oscillator and calibrate it by beating its output with that from any broadcast station whose frequency ends with "00" (e.g., stations operating on 600, 700, 800 k.c., etc.).

The circuit of the oscillator is shown in the accompanying diagram and includes a Raymart 2.5 millihenry r.f. choke tapped at the first pie for the cathode feedback. With this oscillator placed in close proximity to a broadcast receiver, then a beat should be heard on all station carriers on frequencies ending in "00" when the oscillator is accurately tuned to 100 k.c. At least three separate station carriers should be used for checking purposes to ensure that the final signal from the 100 k.c. oscil- the trimmer varied until zero beat is obtained.

Next, this oscillator is placed in close proximity to the frequency meter, a pair of headphones being



The circuit of the 100 k.c. oscillator mentioned by the author as providing a reliable means of calibrating the frequency meter.

plugged into the latter. The frequency meter dial should then be set to a "00" reading (such as 1700), and the padder varied until zero beat is obtained. Zero beat should be obtained in at least three "00" positions to ensure the calibration is accurate.

A Raymart 150 mmfd. midget variable condenser is connected as a trimmer across the tuning coil, with a 50 mmfd. midget variable connected in parallel across it. This latter condenser was made up by taking a standard 40 mmfd. Raymart condenser and adding one moving plate, making two moving and three fixed plates in all. Alternatively, a condenser of 100 mmfd. capacity could be used with one moving and three fixed plates taken out.

Power Requirements.

The power supply used for the instrument was the special unit described in the "Radio World" for July, 1938, in the first of this series of articles on amateur test equipment. Power requirements are 2 amps. at 2.5 volts for the heaters, and approximately 10 mills. at 250 volts for "B" supply. Reasonably good regulation is essential if the calibration of the instrument is to remain constant.

Frequency Meter.

1 18 gauge aluminium chassis, 8x5x2 inches, stamped as shown.
2 aluminium brackets 1 for power socket, 1 for mounting tuning condenser (6x6 inches, with mounting flange).
1 18 gauge crackle-finished steel cabinet, 9x9x6 inches, with detachable back and carrying handle.
1 160 mfd. midget variable condenser (Raymart).
1 50 mfd. midget variable condenser (Raymart), (see text).
1 epicyclic reduction drive (Raymart)
1 4 inch G.E. type knob (Raymart)
1 special calibrated scale (available from "Radio World").
1 6x1 inch strip of celluloid, scored down centre, for mounting on epicyclic drive.
1 1½ inch feed through insulator (Birnbach).
1 2 inch len. Dilecto natural finish former, 1 inch diameter, with lugs, and 2 angle brackets for mounting.
3 sockets, 2 6-, 1 5-pin.
1 'phone jack and plug.
1 pair headphones (S.T.C.).
1 type 58 valve, 1 type 56.

FIXED CONDENSERS:
1 .00005 mfd. fixed condenser (T.C.C. silver ceramic).
2 .0001 mfd. fixed condenser (T.C.C. silver ceramic).
1 .00025 mfd. fixed condenser (T.C.C. silver ceramic).
1 .005 mfd. fixed condenser (T.C.C. silver ceramic).
1 .5 mfd. fixed condenser (T.C.C. silver ceramic).

FIXED RESISTORS:
1 250 ohm carbon (I.R.C.).
2 .05 megohm carbon (I.R.C.).
4 .1 megohm carbon (I.R.C.).
1 .25 megonm carbon (I.R.C.).

MISCELLANEOUS:
Small quantity of 24 gauge single silk-covered wire for winding coil (68 turns, closewound and doped, see text), hook-up wire, solder tags, grid clip, nuts and bolts.

Notice To N.Z. Readers

As New Zealand postal notes can no longer be accepted by Australian banks, New Zealand readers are asked to please forward all remittances in the form of Money Orders or Australian stamps.

Cathode Ray Oscillograph.

(Continued from page 16)

many die accidental deaths, he has seen only about five die through natural causes. In two cases the screens had become so badly lined that images were scarcely discernible. One of them gave about 2000 hours' service, and the other is uncertain. The other three just lost emission after about 1000 hours, probably due to some residual gas, as is the case with most receiving valves.

Accidents are frequent, however, unless due caution is exercised. It is never wise to place a tube on its side on a bench when the cathode (and neck of tube) is still warm. Large tubes thus treated often break off at the neck the second time this is done.

Ultimate Receiver On Test.

(Continued from page 9)

lar permitting accurate logging of shortwave stations for future reference.

Volume Indicator—This comprises a rotary pointer similar to the logging pointer and located at the opposite end of the dial to the latter. This control enables the volume to be preset to the desired level before tuning in, and also provides a comparison of the strengths of distant stations. For example, London may be listened to at Volume 10, Paris at Volume 8, and so on.

Electric Eye—The new type 6U5 electric eye, operating on the "fan" principle, is situated centrally in the dial itself. This new type is much more reliable than any used before, and provides very even illumination.

Band Indicator—This is situated immediately above the electric eye, and is separately illuminated from the rear. The broadcast, medium and shortwave bands are indicated by the letters, B.C., Med., and S.W., respectively.

Cabinet—The new Ultimate console cabinet is the finest yet produced in design, finish and tonal characteristics.

Speaker—A Rola 12" reproducer is fitted, providing high fidelity reproduction. Special attention has been paid to complete sealing of the speaker transformer to render it trouble-free when the receiver is used in humid localities.

DX Notes And News.

New Stations And Latest Loggings.

New stations on 49 metres are KZRH, KZGF and KZIB (the latter also operates on 31m.). Calls heard during the month include the following:—49m.: VJI (Cloncurry), Radio Saigon, KZGF, KZRH, KZEG, KZIB, VUC, ZHJ, 9MI, YDA. 40-44m.: VK-8SK, PMH, TPB, CSW-8. 30-31m.: TAP, RW-96, KZRM, KZIB, 2RO-3, LRX, ZHP. 25-29m.: PMN, XGOY, WPIP (recently W8KK), 2RO-4. 19-20m.: KQH, JZK, DJQ and YDC. Best 20m "hams" were HB9DQ and GSB:J.

Verifications have been received from ZL2BE, VK2ME, VK3ME, VK-6MW, PK1RK, ZX2DY, W2XE and Radio Saigon.—Wm. Bantow (AW-353DX), Edithvale, Vic.

Fifty 10-Metre Stations In An Hour!

Cards have been rolling in lately, and HC2CC congratulated me on the excellent type of report form. I have been getting some excellent loggings on the amateur bands (10-20 m.) lately, using a t.r.f. receiver with a half-wave 20m. doublet antenna. Some time ago I logged over fifty 10m. stations in an hour, and in the past year have got amazing results on the 20m. band, having logged several thousand stations. I have repeatedly logged every continent in a day, including up to two dozen Europeans, dozens of North Americans, some South Americans, West Indies, Asiatics, Africans and numerous Australians, etc.

Countries logged on 20m. are:—CE, CN, CO, CT1, F, G, GW, GM, HB, HC HH, HI, HJ-K, K4-5-6-7, KA, KF, LA, NY, OA, ON, XU, PA, UK, PY, EA, SM, SP, SU, SV, TG, TI, VE, VK, VP1-6-7-9, VQ8, VR4-6, VS1-2-3-6-7, VU, W, XE, X2, YR, YV, YU, ZL, ZS, FN1, E1 and numerous districts of most of them.—C. S. Donoghue (AW45aDX), Melbourne, Vic.

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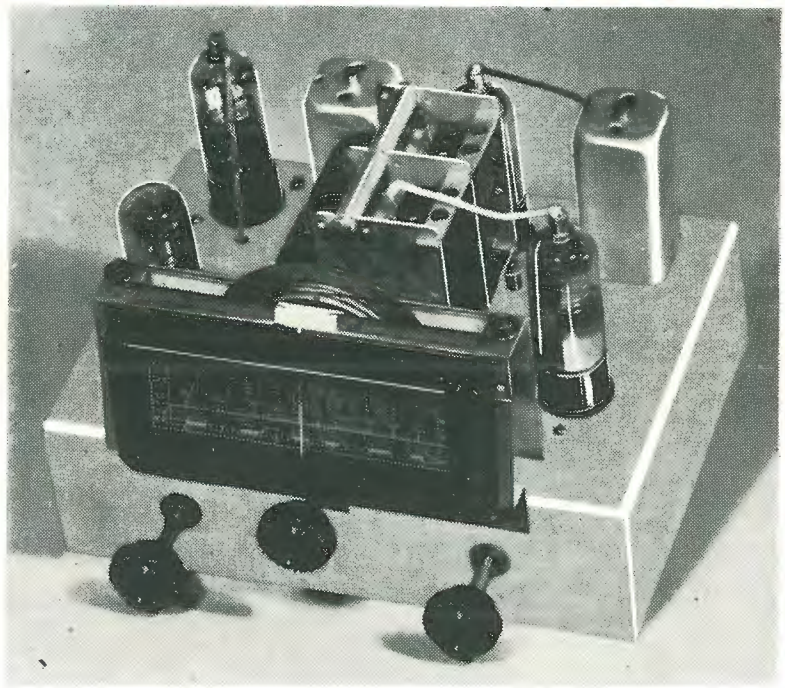

Builders wanting a battery set giving the utmost in dual-wave performance at the lowest cost cannot do better than build the "Falcon Dual-Wave Four" described this month. Using the latest 1.4-volt valves throughout, with beam pentode output, this little receiver is a magnificent performer, with remarkable economy of operation ("A" drain is only .25 amp., "B" drain, 9 mills.).

WRITE NOW FOR OUR COMPLETE KIT PRICE.

★

Calibrated Frequency Meter.

Hams! Don't run the risk of out-of-band operation—build the all-band calibrated frequency meter described this month and know exactly where you are operating.

WRITE FOR SPECIAL AMATEUR KIT PRICE.

★

World-wide DX On Three Feet Of Aerial!

. . . . . London, Berlin, Paris, Rome, Tokio . . . . . shortwave stations in all parts of the world can be played at full volume on the "1939 Atlas All-Waver." This sensational new 1.4-volt all-wave three-valver draws only .2 amp. "A" current and 9 mills. "B."

WRITE NOW FOR FREE QUOTE.

"Sky-Chief Dual-Wave Five."

Giving an exceptionally fine performance on both wavebands, coupled with the superb tone that only triode output can give, the "Sky-Chief Dual-Wave Five" is a receiver we can fully recommend. Write now for free details of our kit of parts.

★

"1939 Companionette Three."

One of the cheapest a.c. kits we have ever supplied to builders, the "1939 Companionette" nevertheless gives a magnificent performance out of all proportion to its low cost. Write for details of our special kit of parts.

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Now — a high-grade dynamic microphone for amateur or P.A. work. Frequency response 50 to 9000 cycles . . . . . £5/5/-.

ASTATIC, acorn model, T-3, crystal mike. Quality reproduction, ideal for dance band or studio work £6/10/-

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SHURE, model 70 SW, crystal, with modern desk-stand . . £6/10/-

Headphones.

FROST, definitely the most popular 'phones in N.Z. 15/-

MICRO, high-grade English 'phones, used extensively in British Government departments . . 18/6

British Post Office pattern, heavy brass morse keys. Here's the key you have tried hard to procure 52/6

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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.

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To their dependability was entrusted the welfare of this six million pound liner and its thousands of passengers.

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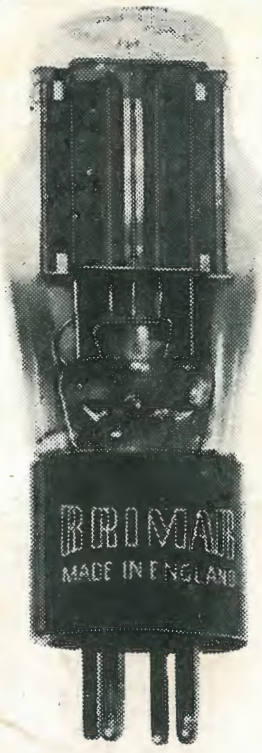

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