

THE
AUSTRALASIAN

PRICE, 1/-

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

Radio World

VOL. 5 NO. 10

MARCH 1941

THE CLUB
SPECIAL

COMPENSATED
ACOUSTICS

ACOUSTIC COMPEN-
SATED SUPERHET

LATEST S.W. NEWS
FULL SCHEDULE



BRITANNIC.
"RULES THE RADIO WAVES"

COILS AND
COMPONENT
PARTS, KITS,
TRANSFORMERS

AFTER 18 MONTHS'

PAINSTAKING LABORATORY RESEARCH

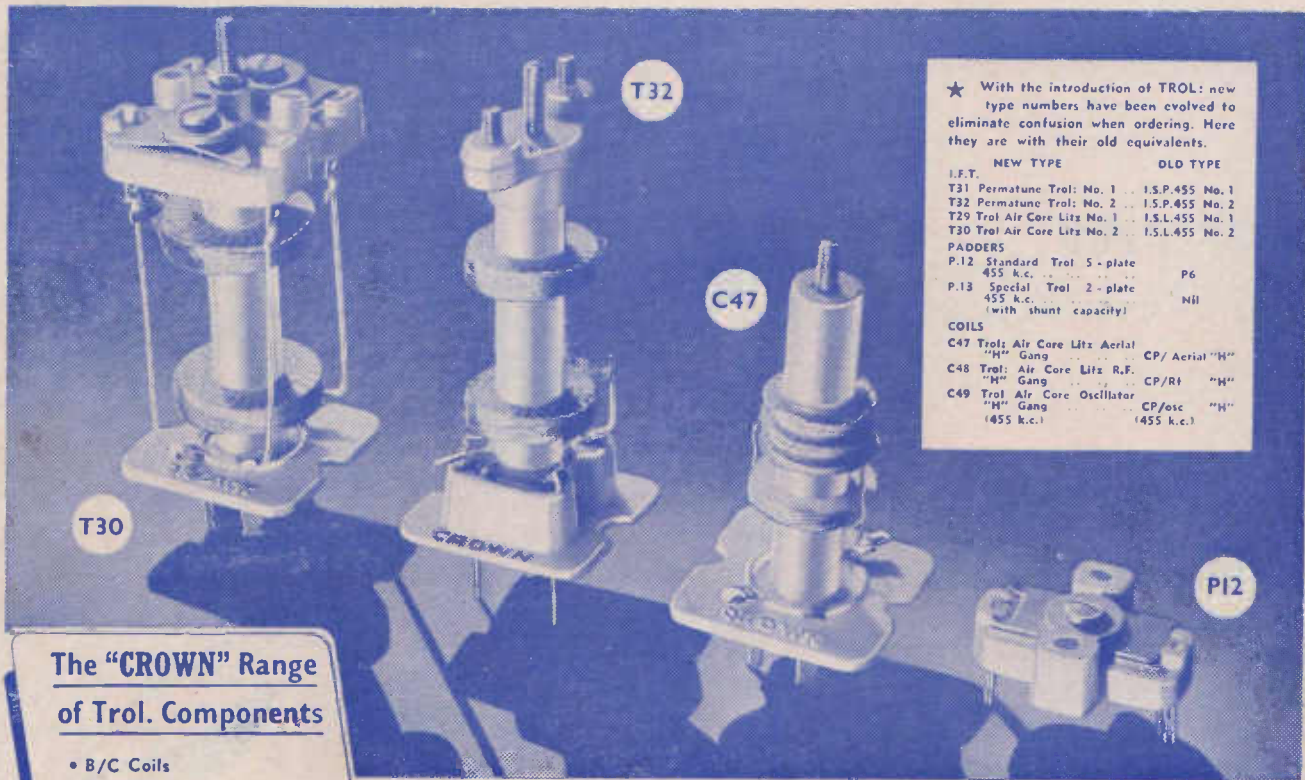


CROWN *Switch* TO TROLITUL

Here are the 1941 Crown Trolitul components — improved in performance and in range. All coils, I.F.'s, etc. in the Crown range will in future incorporate Trolitul as a base, because we have definitely proved the superiority of this type of insulation. Read these facts —

The specific gravity of Trolitul is approximately 1.05, so that it will almost float in water, to which, incidentally,

it is impervious. Mechanically it is very strong, while electrically its internal and surface resistances are both listed as being infinite. Electric break-down resistance is 50 kilo-volts per millimetre. Thus it is strong, light, an excellent insulator, and is easily moulded, properties that make it ideal for use in radio components. The use of Trolitul also guarantees the highest possible "Q."



★ With the introduction of TROL: new type numbers have been evolved to eliminate confusion when ordering. Here they are with their old equivalents.

NEW TYPE		OLD TYPE
I.F.T.		
T31 Permature Trol: No. 1	...	I.S.P.455 No. 1
T32 Permature Trol: No. 2	...	I.S.P.455 No. 2
T29 Trol Air Core Litz No. 1	...	I.S.L.455 No. 1
T30 Trol Air Core Litz No. 2	...	I.S.L.455 No. 2
PADDERS		
P.12 Standard Trol 5-plate	455 k.c.	P6
P.13 Special Trol 2-plate	455 k.c. (with shunt capacity)	Nil
COILS		
C47 Trol: Air Core Litz Aerial	"H" Gang	CP/Aerial "H"
C48 Trol: Air Core Litz R.F.	"H" Gang	CP/Rf "H"
C49 Trol Air Core Oscillator	"H" Gang	CP/osc "H"
(455 k.c.)		(455 k.c.)

The "CROWN" Range of Trol. Components

- B/C Coils
- S/W Coils
- D/W Coils
- I.F. Transformers
- Other Lines Include:
- Tuning units (with and without R.F. stage)
- Dials (Edge-lit)
- Trimmers
- Padders
- Voltage Dividers
- W/W Resistors

Crown

RADIO PRODUCTS LTD.
 51-53 MURRAY STREET
 PURMONT - SYDNEY
 Telephone, MW 2628
 (2 Lines)

The
"RELIABLE"
 LINE

AVAILABLE FROM OUR AUTHORISED DISTRIBUTORS



The Australasian

RADIO WORLD

Incorporating the
ALL-WAVE ALL-WORLD DX NEWS

Vol. 5 MARCH, 1941 No. 10

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BRITANNIC DUAL WAVE UNIT

IS FEATURED IN THE JONMAR KIT SET

for the Acoustic Compensated SUPERHET

"Radio World's" latest and greatest triumph was specially designed to incorporate the new Britannic Coils. You can duplicate the superb performance of the original laboratory model if you specify a JONMAR Kitset — featuring the Britannic Dual-wave Unit. JONMAR Kitsets are complete and compact — carefully tested and perfectly matched. You'll have no misfits, no missing parts, no worries, with the "Acoustic Compensated Superhet" if you specify a JONMAR Kitset. BK-1. D.W. Unit 27/6

EVERYTHING RADIO AND ELECTRICAL FROM JOHN MARTIN

- RING-GRIP Radio and Electrical Accessories
- CROWN Radio Products
- R.C.S. Radio Products
- EFCO Dials
- AIRZONE Filters
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- E.T.C. Solar Capacitors
- E.T.C. Yaxley Switches and Potentiometers
- I.R.C. Resistors, metallised and power types
- KEN-RAD — "The Fine Valves of Radio"

Rola

The World's Finest Sound Reproducer

Unrivalled for tonal brilliance, efficient performance and dependability, Rola Speakers lead the way with every new development. For the "Acoustic Compensated Superhet" use Rola K12, 52/6, or Rola K12 De-Luxe, 56/-. For the "Club Special" use Rola K5, 26/3.

RAYMART

CRAFT A CREED

For Short-wave and Ultra-short-wave Work, Raymart Geor is universally acclaimed as supreme. Write to John Martin for Price List.

Telegrams: "Jonmar, Sydney" Telephone: BW 3109 (3 lines)



116-118 CLARENCE STREET, SYDNEY

Run like mad to MARTIN DE LAUNAY'S



FOR A BETTER DEAL!

SEE that apparition up top? We call it "BROKEN PROMISES." Last time it tried to creep into our business, we gave it such a hiding it hasn't shown its face here again. But we hear it is pretty busy elsewhere around town. If "BROKEN PROMISES" is frightening the growth out of YOUR business, call on MARTIN DE LAUNAY'S for help. Enormous stock . . . keen prices . . . good products . . . service as slick as greased lightning — you'd like doing business with this enterprising electrical and radio supplies organisation. You'll find PLEASURE as well as PROFIT in dealing with —

MARTIN de LAUNAY PTY. LTD.

Cr. DRUITT and CLARENCE STREETS, SYDNEY

M 2691 (5 lines) - - - And at Newcastle and Wallongong

PERSONAL

From the papers we learn of the terrible bombing of London; in the news reels we see the awful destruction of the incendiaries; we get an impression of complete ruin and utter desolation.

But then, we are fortunate enough to get hold of a copy of an English technical radio monthly, such as the "Wireless World", and it all seems so incredible.

We feel that we must pay tribute to this publication, which is maintaining a high standard in spite of the difficulties which abound. That technicians in England should spend their time worrying out the theoretical effects of inverse feedback applications to quiescent push-pull circuits is a certain indication that, in spite of everything, England carries on.

The latest issue of "Wireless World" carries a strong support of advertising, and, strangely enough, little of it deals directly, or even indirectly, with war activity.

Perhaps it carries a lesson to us in Australia.

Australia is playing a big part in this war. Australian troops are participating in spectacular victories abroad. Not so spectacular, but equally effective, is the home effort of the Australian factories, which are really producing war materials.

Not all of us can take an active part in either of these activities, and it is plain that our duty is to conserve the normal business and economic life.

All of which is an introduction to express our policy of maintaining our editorial standard. We are most fortunate in having the fullest support of our advertisers and as you will notice from this issue, there is no shortage of up-and-coming ideas for technical articles. Our only difficulty is in regard to paper supplies. At the worst, a further shortage may mean that copies will be available only to subscribers and those who have placed regular orders. Already about 90 per cent. of our circulation is ordered in this way, and the effect would be merely to eliminate the wastage of copies which have to lie about on counters on the off-chance of meeting the eye of someone interested in technical radio.

Fortunately the "Radio World" has been established for many years and there are few radio enthusiasts who do not appreciate its regular monthly appearance without having to be reminded of the fact.

This statement, by the way, is not a reply to those of our readers who have asked us why we have discontinued our own advertising in "Radio and Hobbies". The position is simply that Associated Newspapers refuse to accept it.

A. G. HULL

The CLUB SPECIAL

Build this dandy short-wave receiver, described in full in this article.

CLOSELY associated with the "Australasian Radio World" is the All-wave All-world DX Club, formed several years ago and making steady progress.

From the correspondence received from members, it became very evident that it would be a grand idea to design a special receiver for club members. Running through a few letters we gained the impression that most were interested in short-wave reception, and wanted a quiet little receiver with tons of gain, but a low noise level, rather than anything gigantic in the way of the usual super-powered set.

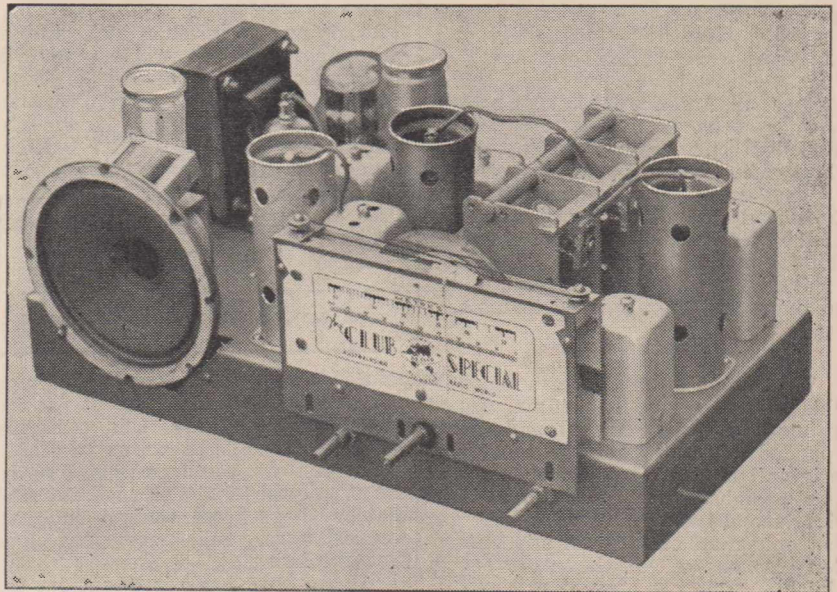
It was also evident that quite a few members were not in a position to put out a lot of money for a receiver, the purse usually stretching up to about ten pounds, but no further.

At first it seemed pretty hopeless to attempt to develop a receiver which would fill all requirements and yet be available as a kit at a price below a tenner.

Mantel Model Practice

Thinking along the lines of modern midget and mantel model design, we ran over several of the ideas embodied in sets of that kind and found that one or two of them were ideally suited for application to the type of set we had in mind.

First big step in the direction of



Above: A chassis photo of the Club Special. Note special diol.

economy is the use of a low-powered output valve, with its low current drain which permits the use of one of the smallest (and cheapest) types of power transformer. The low-powered output valve is only capable of delivering half a watt of power, as against three watts from the modern "big" receivers, but even this little half-watt provides plenty of signal when it is handled by one of the efficient 5-inch speakers which are now available to suit an output valve of this type. These speakers have input transformers with an effective load of 20,000 ohms, matching the

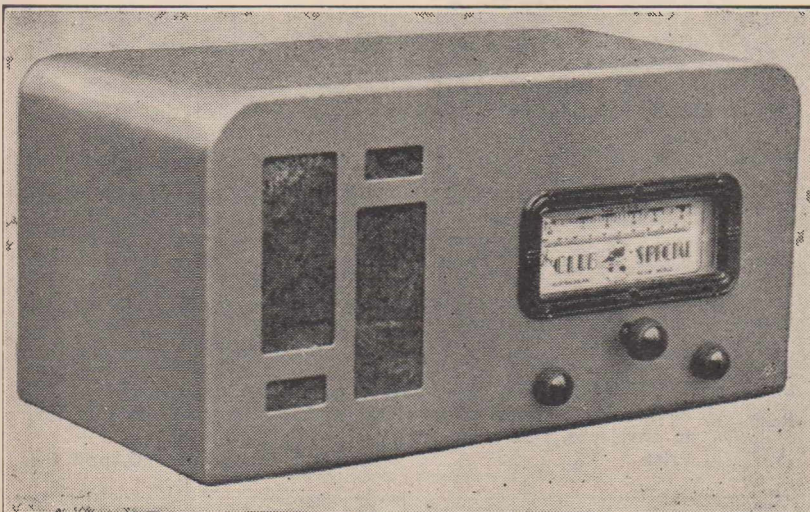
comparatively high impedance of the valve and giving good power transference.

Ways to Economy

The next big step in the direction of economy was to design the set as a short-wave receiver only, thereby avoiding the use of costly dual-wave coil assemblies. Tuning boxes and brackets for dual-wavers without an r.f. stage are fairly reasonable in price, but when you want the luxury of having an r.f. stage to give you increased range without increased noise level, well, that's where you feel the purse lightened to the tune of an extra pound or two.

But that is not the position with this set.

Left: Another view of this receiver complete in an attractive cabinet. The third knob is for tone control, not shown in the circuit.



Special arrangements have been made with the coil manufacturers to have individual short-wave coils made available as separate units, and at a much cheaper cost. It becomes possible to have the r.f. stage and yet keep the coil cost down to a moderate figure.

Pride in Appearance

Every DX Club member takes a pride in making his receiving station attractive, and so we had to give

(Continued overleaf)

CLUB SPECIAL

(continued)

thought to appearance, firstly, in regard to the cabinet and, secondly, in regard to a suitable dial to show only the short-wave calibrations.

Most enthusiasts have seen photographs of American communications and amateur receivers, and so we modelled our cabinet design along those lines, but with regard to cost, of course. In this matter we were fortunate in having the co-operation of the cabinet designers at the Arcadian factory, where steel chassis and cabinets are stamped out and folded to shape and then finished to taste.

The Cabinet

We think they made a grand job of this cabinet, a low, long affair, shaped to match up with the dial, and snugly rounded off at the corners. The original cabinet, as shown in our photographs, was finished off in a flat duco of battleship grey, which was not only most effective in appearance, but also one of the cheaper types of finish.

Those who are prepared to pay a little more can have a similar cabinet, finished off in a black satin crackle or in a special imitation mahogany



Forget That Soap-box
Complex

Your "Club Special" will
LOOK BETTER
WORK BETTER
BE BETTER

on an Arcadian Chassis and in an Arcadian modern steel Cabinet

Leading set manufacturers and Government Departments use Arcadian Chassis and metalwork because they are designed and made by technicians trained in radio as well as steel fabrication.

Build your set on a firm foundation

Use an Arcadian Chassis — there's one for every circuit

Arcadian Radio Pty. Ltd.

"wood" grain, applied to the steel by the latest photo-litho process.

We still like the battleship grey!

Dial and Scale

Obtaining a suitable dial was a rather more difficult problem, for the dial people scorned the idea of turning out a special dial for the DX Club, until we had the good fortune to mention the subject to Mr. Cranch, manager of the Crown factory. He

**SEE PAGE 11
FOR THE
SPECIAL SCALE**

pointed out that the Crown dial type ST1 was just the dial, except for the actual scale, but that this could be easily replaced by a suitably printed one which we could publish for the use of all those who wanted it. And that is the scheme worked out, and we feel sure you'll agree that it is just the thing.

All you have to do is to cut out the scale as indicated, punch the screw holes through the paper and then you'll find that it will replace the original scale on the Crown ST1 dial, and give you a dial that you'll be proud to have on your own special short-wave receiver.

The Circuit

Apart from the use of the low-powered output valve, the circuit follows the usual tried and tested style, with

THE CLUB SPECIAL

Parts List

- 1—Base as specified (Arcadian)
- 1—Power transformer 40 m.a. type.
- 1—Coil kit—aerial, R.F. and oscillator—2 I.F.'s (R.C.S., Radiokes, Crown)
- 1—3-gang (Stromberg-Carlson "H")
- 1—Dial (Crown S.T.1)
- 3—Trimmers (R.C.S., Radiokes)

RESISTORS:

- 1—50 ohm wire-wound 2-watt (I.R.C.)
- 1—100 ohm wire-wound 2-watt (I.R.C.)
- 1—.05 meg. 1-watt carbon (I.R.C.)
- 1—.1 meg. 1-watt carbon (I.R.C.)
- 1—.25 meg. 1-watt carbon (I.R.C.)
- 3—.1 meg. 1-watt carbon (I.R.C.)
- 1—2 meg. 1-watt carbon (I.R.C.)
- 1—.5 meg. potentiometer (I.R.C.)
- 1—15,000 ohm voltage divider (R.C.S., Radiokes)

CONDENSERS:

- 2—.0001 mfd. mica (T.C.C.)
- 1—.0005 mfd. mica (T.C.C.)
- 1—.002 mfd. mica (T.C.C.)
- 2—.01 mfd. tubular (T.C.C.)
- 1—.05 mfd. tubular (T.C.C.)
- 2—.1 mfd. tubular (T.C.C.)
- 1—.5 mfd. tubular (T.C.C.)
- 1—25 mfd. electrolytics, 40v. (T.C.C.)
- 2—8 mfd. electrolytics, 500v. (T.C.C.)

SPEAKER:

- 1—5" 2,500 ohm (Rola, Amplion)

VALVES:

- 1—6U7G, 2—6J8G's, 1—6B8G, 1—5Y3B (Mullard, Brimar, Philips, Radiatron)

SUNDRIES:

- Power flex, 4 midget grid clips, 5 ectal sockets, solder lugs, nuts and bolts, dial lights, etc.

back bias and a few other refinements to make reliability and performance a certainty.

There are only a few parts used, and they will be found to fit in readily, as the layout has been arranged to make it easy enough to have all the components fit in position according to the circuit. What we mean is, that if you notice on the circuit that there

NOTICE TO DX CLUB MEMBERS

Owing to shortage of paper, we have been forced to discontinue the printing of "Log Sheets."

We have a limited quantity of other DX stationery, and members wishing to obtain some are strongly advised to write as soon as possible. Although paper prices have risen sharply, while stocks last the following stationery is available at the prices shown.

- ★ **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

OFTEN COPIED · IMITATED · NEVER DUPLICATED ···

R.C.S. TROLITUL COMPONENTS

"ACOUSTIC COMPENSATED SUPERHET"

The use of Trolitul components alone will ensure the highest standard of results from this set. Make no mistake — use R.C.S. and get the best!

R.C.S. Coil Kit Code K172	£1 7 6
Permeability I.F.'s for above —	
I.F. 162	13 9
I.F. 164	13 9
R.C.S. Dial, type DA5	£1 2 6

"CLUB SPECIAL"

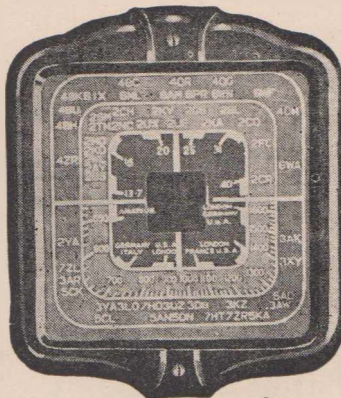
To duplicate the outstanding performance of the original laboratory model, specify R.C.S. Coil Kit K170. R.C.S. have perfected specially-designed coils for the "Club Special"—insulated throughout with Trolitul, designed for easy mounting, the last word in sensitivity and selectivity.

Specify Coil Kit Code K170	£1 14 6
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R.C.S. KIT DIAL — DA7

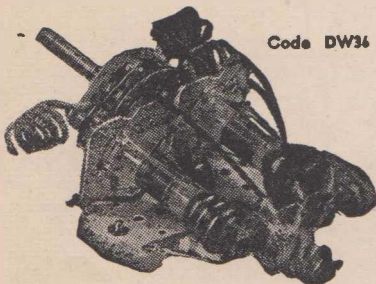
The new D.W. Portable Kit Dial, Code DA7, has all parts supplied ready to assemble, and it has a glass scale with both B.C. and S.W. bands clearly marked, finished in white with green background. The special walnut escutcheon is easy to fit and requires an aperture of 3" x 3." It is the only portable dial which can be edge-lit. Available for use with "H" type gang condenser on 1600 and 550 k.c. and 13.7 to 40 metres S.W. bands.

Code DA7	Price 9/-
----------------	-----------



Code DA-7

R.C.S. DUAL-WAVE UNIT



Code DW36

Type DW36, as illustrated, consists of Aerial and Oscillator Coils, Wave Change Switch, the necessary B.C. and S.W. Trimmers and Padders mounted together, wired up, ready to assemble in a set utilising 465 k.c. Bands are: S.W., 13.7 to 40 metres, and B.C., 1600 to 550 k.c. For "H" gang.

Code DW36	Price £1/7/6
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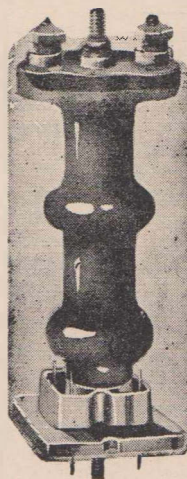
Obtainable from your local dealer

R. C. S.

RADIO Pty. Ltd.

50 GLEBE STREET, GLEBE
Telephone: MW 2405

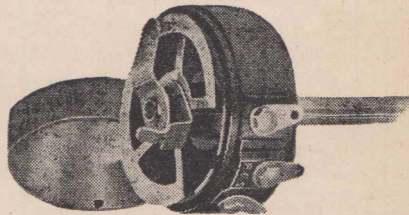
R.C.S. PERM. TUNED I.F.'S



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

Code	Price
465 k.c. I.F.'s	
When two I.F.'s are used:	
IF162 1st I.F.	13/9
IF163 2nd I.F.	13/9
When three I.F.'s are used:	
IF164 1st I.F.	13/9
IF164 2nd I.F.	13/9
IF163 3rd I.F.	13/9
AIR CORE 465 K.C. I.F.'s	
IF107, 1st I.F.	7/6
IF108, 2nd I.F.	7/6
AIR CORE 175 K.C.	
1E68	7/6
1E69	7/6

R.C.S. POTENTIOMETERS AND RHEOSTATS



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

	Code	Price
6 ohm Rheostat .25 Amp.	PT40	5/-
10 " " .25 Amp.	PT38	5/-
20 " " .25 Amp.	PT39	5/-
30 " " .25 Amp.	PT34	5/-
400 " Potentiom.	PT46	5/-
1000 " " 35 M/A	PT47	5/-
2500 " " 30 M/A	PT49	5/-
5000 " " 30 M/A	PT51	5/-
10000 " " 20 M/A	PT52	5/-
15000 " " 20 M/A	PT53	6/6
20000 " " 15 M/A	PT54	6/9

Radiokes

"The Name to Know
in Radio"

Guarantees High Fidelity Reception

★

"Acoustic Compensated Superhet"

Radiokes steps to the fore with a perfect Coil Kit for the "Acoustic Compensated Superhet! Trolitul throughout ensures maximum sensitivity and selectivity.

Radiokes Coil Kit CK1032	£1 7 6
Permeability I.F.'s for same	each 13 9
Radiokes Dial DWD-5	£1 2 6

★

Radiokes Coil Kit for the "Club Special"

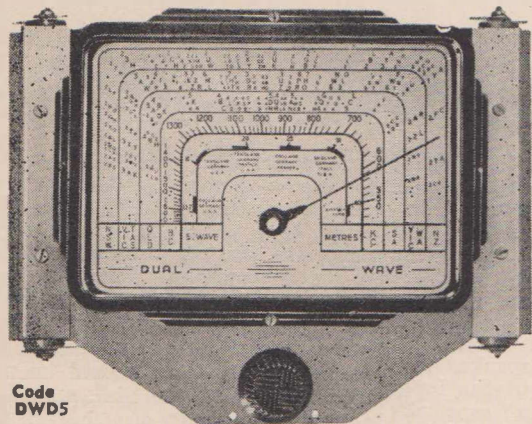
Perfectly made, Radiokes Coil Kit CK1029 will guarantee you the same outstanding results with the "Club Special" as the Editor achieved with the original set.

Radiokes Coil Kit CK1029	£1 14 6
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★

NEW RADIOKES DUAL-WAVE COIL (below at left). Litz wire windings; lugs already tinned. Short-wave range 16 to 50 metres. B.C. range 1500 to 550 k.c.

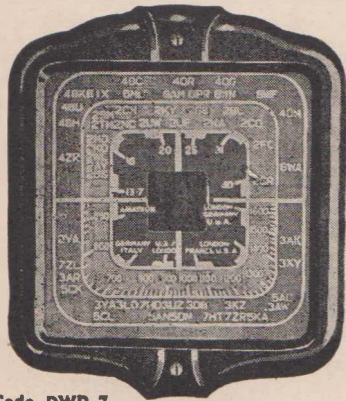
Type	List Price
D.W.C.	14/-



Code
DWD5

NEW RADIOKES DIALS

Radiokes Dials DWD-1, DWD-2, DWD-5, are edge lit and wedge driven, and dial apertures required are 7" x 4 7/8".
DWD-1 Standard D.W., "F" Type Condenser 22/6
DWD-2 Communications Dial, "H" Type Condenser 22/6
DWD-5 13.7 to 40 metres D.W. Dial, "H" Condenser 22/6



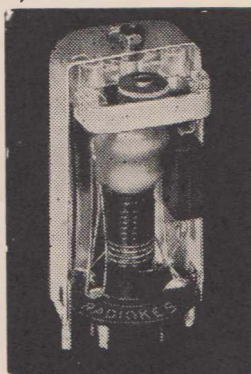
Code DWD-7

**RADIOKES
"H" TYPE
COILS WILL
TRACK
ONLY
WITH
RADIOKES
"H" TYPE
DIALS**

**RADIOKES DIAL
DWD-7**

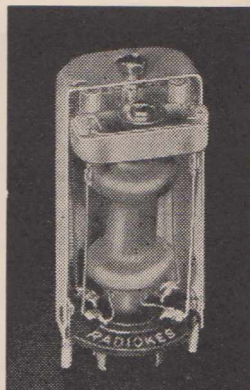
- Dial shows broadcast and dual-wave stations clearly marked in white and green.
- This dial can be edge-lit!
- Neatly finished walnut escutcheon of attractive design.
- The aperture required for the dial is 3" x 3"
- For "H" Gang, B.C. 1600 to 550 k.c., and S.W. 13.7 to 40 metres.

Radiokes Dial, Type DWD-7 9/-



NEW RADIOKES INTERMEDIATE TRANSFORMER (at right)

One - piece mechanically sound Trolitul formers and base — the highest standard I.F.'s available. A special feature is the round base suitable for round or square cans.
Type List Price
A.I.F. (air core) 7/6
I.I.F. (iron core) 11/-
P.I.F. (Perm.) .. 13/9



- | | | |
|---|--|---|
| <ul style="list-style-type: none"> ■ Radio Transformers ■ Audio Chokes ■ Bakelite Stampings ■ Coils of all types ■ Coil Units ■ Dials | <ul style="list-style-type: none"> ■ I.F. Transformers ■ Line Filters ■ Laminations ■ Midget Condensers ■ Power Chokes ■ Solder Lugs | <ul style="list-style-type: none"> ■ Terminals ■ Trimmers ■ Volume Controls ■ "Trolitul" Mouldings ■ Formers, etc. |
|---|--|---|

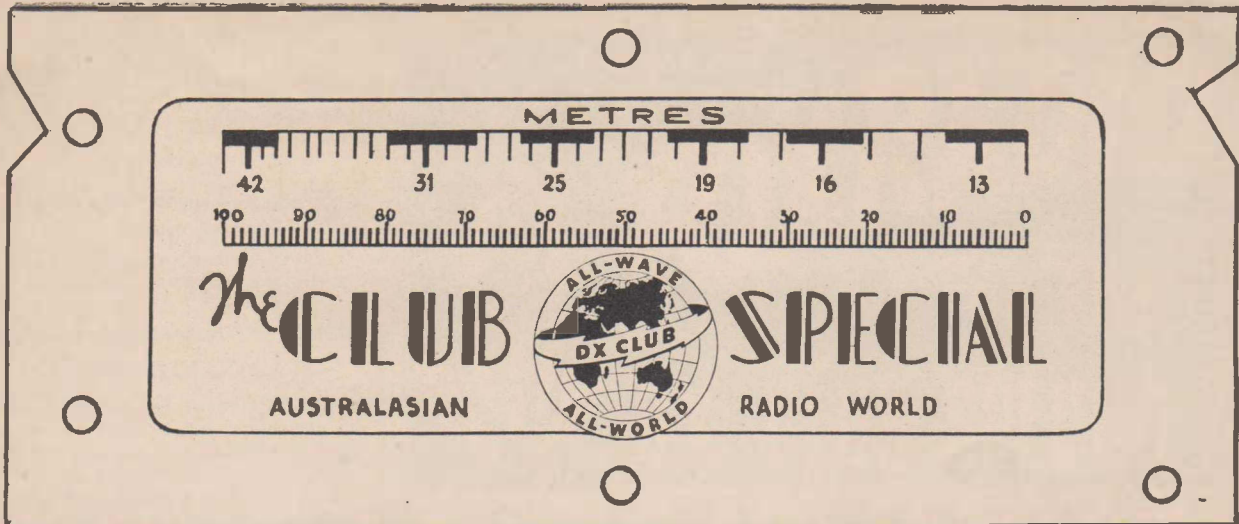
RADIO SUPPLIERS PTY. LTD.

Sole Agents for Radiokes Products,
Wingello House, Angel Place, Sydney. 'Phone B 4586.

If you have difficulty in obtaining any of these lines, let us have your name and address. Our new Radiokes Leaflet is available post free.

NAME:

ADDRESS:



CLUB SPECIAL

(continued)

turn" to earth. Any long leads or distributed capacity at this point would throw the tuning out of alignment and upset the dial calibrations, and so the point needs to be watched carefully. For preference the trimmers should be soldered in position to support on their own lugs.

Minor Components

All the minor components should be selected with particular care, as a set of this kind should last a lifetime if the best of components are used. While on this subject we would like to point out that, although short leads are desirable, it is not sound practice to cut the pigtailed on resistors and condensers in order to shorten them up too much. Leave the pigtailed at least half an inch to an inch long, as otherwise the heat from the soldering iron will stand a chance of melting the internal connections of the condensers, resistors or what have you.

Speaking of heat from the soldering iron again brings up the thought that great care is needed when soldering leads to coil terminals. The terminals are mounted in a trolitul base. This trolitul material is a most efficient substance when it comes to handling radio frequency currents, but when it comes to heat, well, it just melts like butter. This is no drawback if reasonable care is taken, the terminals being first scraped and carefully tinned without too much heat, and then the lead also tinned before the actual connection is attempted.

Should the trolitul become melted, however, the main thing is to avoid jogging the terminal until the trolitul

Cut this scale out along the outside line and punch holes as indicated.

has had time to cool down and set again. If the terminal is held steady until the trolitul sets, no harm should result. On the other hand, if the terminal is pulled and pushed about while the trolitul is soft, then there is every chance of breaking off an internal connection.

Such a fault may put the set right out of action and prove quite difficult to trace.

At all times it is a good plan to practice soldering with as little heat as will allow an efficient joint to be

(Continued overleaf)

All-Wave All-World DX Club New Members

AW646DX	J. Sydney Smith	128 Murrivierie Road, North Bondi
647	B. T. Kelly	Burrowes Street, Gold Square, Bendigo, Vic.
648	M. Stevens	25 Queen Victoria Road, Bexley
649	H. S. Phillips	53 Cabramatta Road, Mosman
650	C. Roseler	12 James Street, Cairns, N.Q.
651	K. W. Parker	113 Hampton Street, Hampton, Vic.
652	J. A. Grant	C/- Post Office, Dea Why
653	D. L. Dunn	3 Monanore Street, Alphington
654	Roy Hallett	36 Baker Street, Enfield
655	A. T. Johnson	20 Ferguson Street, Maryland, W.A.
656	R. C. Bate	Malanda, North Queensland
657	I. D. Revel	5 The Strand, Baywater, W.A.
658	C. Reese	Green Gables, Appel Street, Brisbane South
659	D. L. Overdeu	Donnybrook, W.A.
660	R. F. Hambridge	"Oakleigh," Yerrinbool, N.S.W.
661	L. G. McPherson	801 Sebastopol Street, Ballarat, Vic.
662	W. Chadwick	Farrawonga, Yerrinbool, N.S.W.
663	A. T. Craig	Nawar, Perak, Federal Malay States
664	R. Suleau	28 William Street, Roseville
665	R. S. Young	9 Hill Street, Campsie, N.S.W.
666	J. Cottee	28 Uralla Street, Lismore
667	D. R. Garrett	Mocultra, S.A.
668	Selwyn Handcock	Port Hacking Road, Sylvania
669	H. A. Angee	"Continental House," Hepburn Springs, Vic.
670	S. Hunt	413 Murray Street, Perth, W.A.
671	L. H. Livingston	Wau, Territory of New Guinea
672	J. S. Woodburn	Wamdobah, Dunkeld, Vic.
673	P. Byard	76 John Street, Launceston, Tas.
674	E. G. Brunskill	49 Walker Street, City, Townsville, Q.
675	J. Kearney	Quairading, via York, W.A.
676	J. Waugh	Newington College, Stanmore Road, Stanmore
677	S. N. Burford	68 Hurtle Street, Croydon Park, S.A.

CLUB SPECIAL

(continued)

made. We notice many sets coming into our laboratory looking as though they have been just about cooked in the wiring process.

Mounting the Power Transformer

The power transformer is mounted

on the top side of the base and has several leads running through to the underside of the base. Some care is necessary at this point, as otherwise there is a chance of the insulation being scraped from the wires as they pass through the rough edge of the hole in the metal base. This is particularly true of the leads which are insulated only with a length of spaggetti sleeving. If this is allowed to

bend over sharply on the edge of the hole in the base it is almost certain to be damaged. A short-circuit of the high tension then becomes possible, which can be a most serious fault, causing irreparable damage to the power transformer and blowing out the rectifier valve.

Once the danger of a short-circuit is appreciated it can be dealt with by means of a rubber bushing for the

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hole or a special wrapping of insulation tape around the wires.

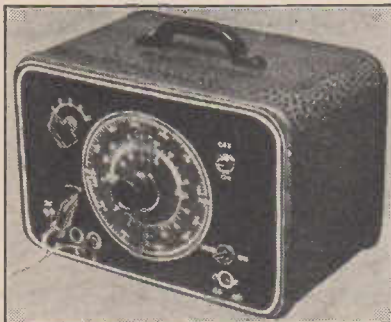
Similar care is necessary with the main power flex, which runs through a hole in the rear of the base and is joined up to the two leads provided from the transformer.

Danger High Voltage

The whole of this wiring is dangerous and needs careful attention. It is also desirable to make sure that a

ALL-WAVE OSCILLATOR

The attention of readers is drawn to an error in prices appearing in Slade's Radio advertisement on page 4 of last month's issue. The prices of the Foundation Kit and Complete Kit for the "Radio World" All-Wave Oscillator, shown as £7/17/6 and



£4/17/6, respectively, have been transposed. The Foundation Kit is of course £4/17/6, and the Complete Kit £7/17/6.

The Calstan Model 223 Multi-Tester illustrated on the same page sells at £16/2/6, plus sales tax (A.C. operation only), Model 223A at £17/17/-, plus sales tax (A.C. vibrator operation).

pull on the flex cannot affect the joint. The best way of achieving this is to tie a knot in the flex on the inside. This will take the strain. The actual joint should be soldered, each joint then covered with at least two thicknesses of insulation tape and a couple of thicknesses also wrapped around the outside of the whole.

Insulating Electrolytic

While on the question of insulation be very careful when insulating the 8 mfd. electrolytic as shown in the picture diagram on page 7.

Make sure the hole in the chassis is large enough to prevent the negative side of the condenser shorting to earth.

Special FOXRADIO Kit For The DX CLUB SPECIAL!



With the co-operation of the Editor of "Radio World," we are making available to readers a special kit of parts for the "Club Special" AT A SPECIAL PRICE.

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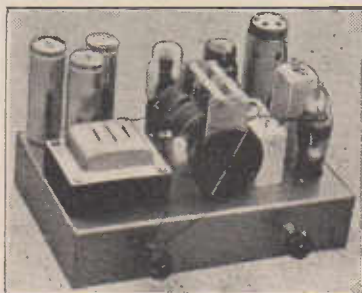


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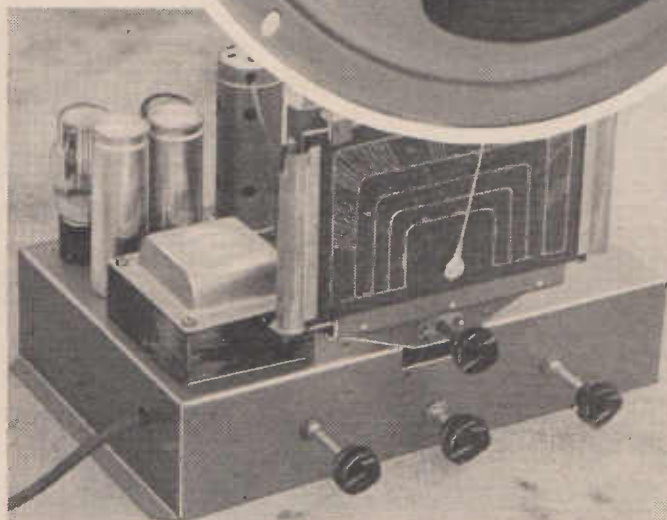
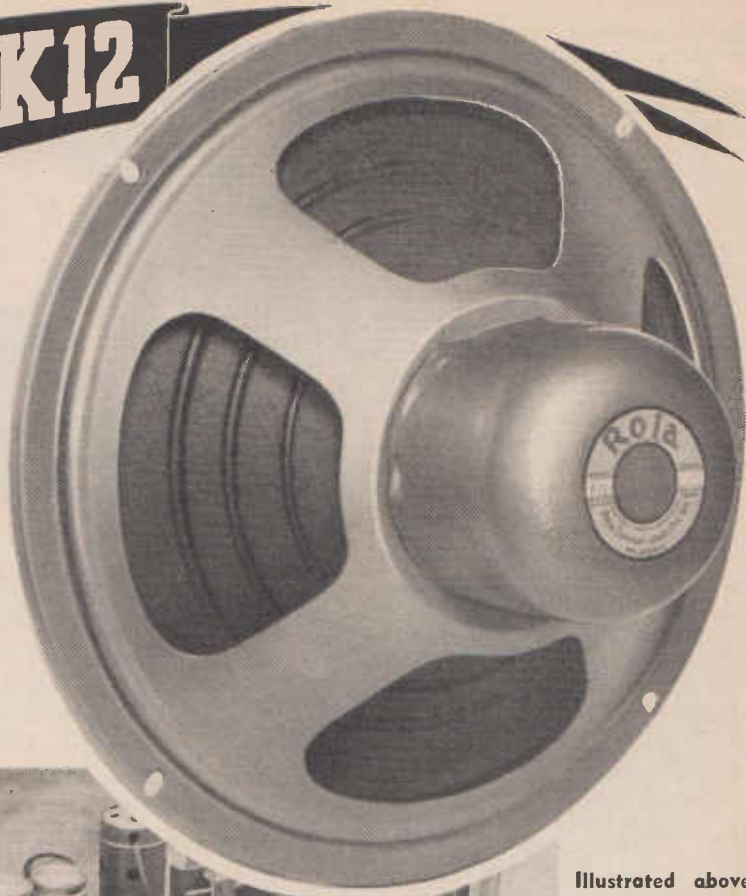
- Entirely dust and grit proof.
- Kappa core and Permaflox spider.
- High efficiency magnetic system with large field coil (max. weight, 2 lbs.).
- Large isocore transformer (specially supplied detached with De Luxe model for chassis mounting on your "Acoustic Compensated Superhet").
- Ability to handle large outputs without distortion and objectionable resonances.

RETAIL PRICES:

- Standard model, suitable for standard circuits 52/6
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K12 DE LUXE MODEL: Especially produced for use with wide-range amplifiers and radio sets where due attention has been paid in their design to preserve — in its proper perspective — the upper register of the audio frequency

spectrum. This de luxe model provides for a smooth response and will reproduce an exceptionally high signal free from any spurious resonances.



Illustrated above is the Rola K12 De Luxe model chosen for the "Acoustic Compensated Superhet." The isocore speaker transformer is supplied separately for under-chassis mounting.

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New Aspects of

COMPENSATED ACOUSTICS

A revolutionary circuit development of vital interest to all set designers.

By C. PARRY, A.M.I.R.E.

Developmental Engineer

(Continued from February issue)

Now, let us sum up all that this control does:

1. When R_2 is 0 and $R_3 = 1000$ ohms, there is no feedback and the response is due to the normal circuit constants (considering measurements from the diode to voice coil for the moment, this means that, in our amplifier, the response is flat above 100 cycles and drops off slightly below this).

2. When R_2 is 300-500 ohms, fair percentage of feedback is applied, the low register is up, and the high frequencies somewhat lower than mid-frequencies due to slightly more feedback.

3. As R_2 is gradually increased, the low register rises very slowly, and as R_2 becomes smaller, the high frequencies rise rapidly. Eventually, the low and high frequencies are about the same level above that at 400 cycles. Up to this, the low register is still about the same as it was in position two.

4. As R_2 rapidly approaches zero, the feedback factor increases slightly at the mid-frequencies, but remains about the same at each end. The result is that the low and high end are raised slightly together.

In addition, as the control reaches maximum the low frequency range is slightly extended. As mentioned before, the particular frequency at which electrical resonance occurs will depend on R_2 (Fig. 10). Thus, the dotted graph of Fig. 8 shows the effect of a lowered value of R_2 from the optimum.

Thus, with R_2 nearly zero, and good low frequency response in the amplifier, the speaker resonance will predominate. This is not serious, as the

the bass amplification increases so does the low frequency range widen (though only a few cycles, it is pleasantly perceptible), giving the impression of increasing depth to a recording. The speaker resonance is thus "withheld" before the level at this end of the register is raised to a point where such resonance would cause boom or cabinet noise.

Resonance Point

The resonance point is, due to design considerations, quite broad.

Now, it will be realised that we have a single control capable of varying the low or high register or both over a wide range of levels.

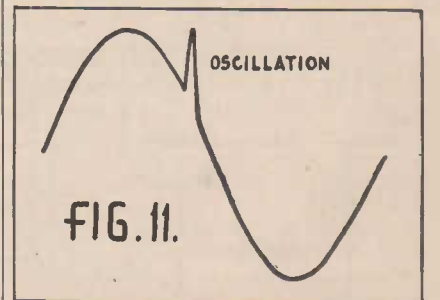
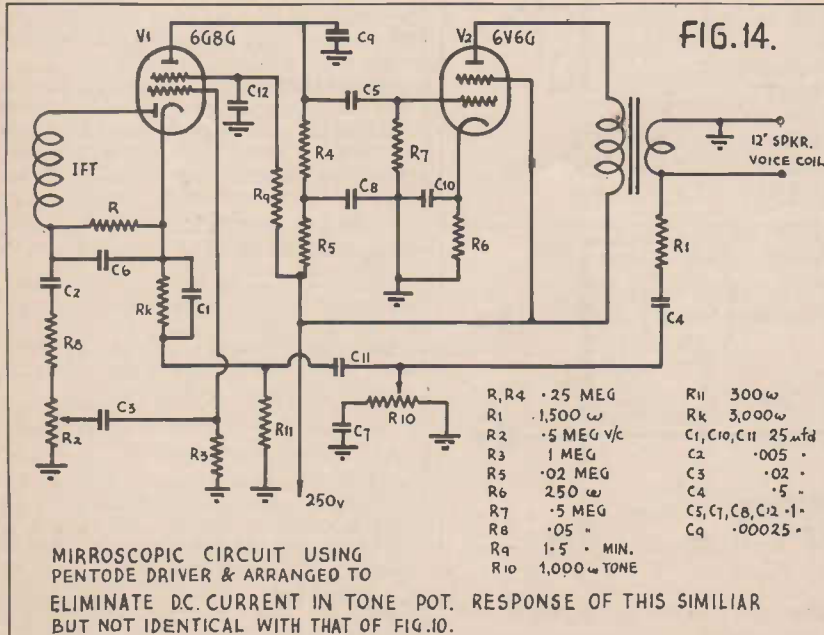
As may be expected, each end of the straight potentiometer varies the factors concerned too rapidly for normal operation, and much smoother action will be obtained if it is tapered at each end. This taper should use about half-inch of the strip for 300 ohms.

Also, as this control is carrying cathode current, it may contribute noise to the circuit. While in the triode stage this is quite in order, in higher gain or current circuits means must be taken to eliminate this. A simple method of doing this will be seen in the screen grid circuit drawn above.

Oscillation

Now, as will be realised, spurious oscillations may set up, due to a number of causes. Oscillation which only

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occurs at some definite point in the cycle of an actuating signal (Fig. 11) will cause a low pitched buzz, easily mistaken for hum. As like as not, the operator will seek to eliminate hum to overcome this.

(Continued on next page)

ACOUSTICS (continued)

This buzz is produced by the speaker trying to follow the rapid change in voltage due to this oscillation, and is actually the effect of the speaker due to a transient. Consequently, the sound bears no real relation to the oscillation, since it is really a "shocked" vibration.

High Frequency Oscillation

Constant supersonic high frequency oscillation will develop a bias across R7 (Fig. 5—see last month's issue) and so may be readily observed. If trouble is experienced, it is advisable to observe the output on an oscillograph connected to the voice coil. If the values shown are not greatly departed from, no trouble will result. For straight gramophone operation, make up the same circuit but leave the diode disconnected, and connect the pick-up to the point so marked.

It must be understood that sound pressure measurements will not coincide with respective levels measured

as above; the figures above have been determined as satisfactory by a series of listening tests, made on a conventional receiver to-day, without the use of extravagant baffling or multiple speakers. Although no baffle is required, it is as well to have a sturdy cabinet.

While this latter may be of value, readers are warned that to use more than one speaker will introduce complications which may completely upset the whole operation. Nothing less than a 10-inch speaker should be used, however, for wide range results.

It will be noticed in this circuit that variation of the tone control will vary the cathode resistance of V1. It may be thought this would affect operation by changing bias or a.v.c. delay voltages. Actually, there is only about ¼-volt developed across it at its maximum position, so that this variation has no appreciable effect on the rest of the valve elements. The value of the tone control + RK should equal the normal value of bias resistance used for the operating conditions shown.

An important point must be realized here, too. R₂ (Fig. 10) will have an A.C. voltage developed across it by virtue of the rectified signal across the diode load.

Consequently, this will be expressed as a signal between control grid and cathode, even with the grid at earth potential, i.e., with the volume control at minimum. Thus a "minimum" signal will be heard depending on the value of R₂ (Fig. 5). This will naturally be very distorted.

The solution is to keep R₂ so small that what little voltage may appear is practically eliminated by its own feedback voltage. If R₂ is kept below 1000 ohms in the valve concerned, these effects will be quite satisfactory and not deter the performance.

This helps to serve a limitation on the maximum size of R₂, and must be kept in mind when the other factors are being considered.

In valves or circuits of higher amplification, lower values will be possible for the same feedback factor, and consequently will not have greater "minimum volume" because of greater amplification.

Some Points of Interest

Some points will be of interest in connection with the components in Fig. 10 (see last month's issue).

The low frequency peak may be brought to about 40 cycles, with good response at 25 if C₄ is raised to about 1½ mfd. R₁ does not play a great part in determining this peak provided it does not exceed a certain value at which it is comparable with the reactance of C₄ at the particular frequency concerned. It should be kept in this circuit below 2000 ohms.

Raising C₂ (Fig. 4) to about .1 mfd. for pick-up work will lift the low frequency scale (below 100 cycles) from 4 to 6 db.

C₅ will also naturally determine the low frequency peak to some extent, but has an optimum non-critical value of about .1 mfd. With the rest of the constants shown, this should not be exceeded for the results mentioned.

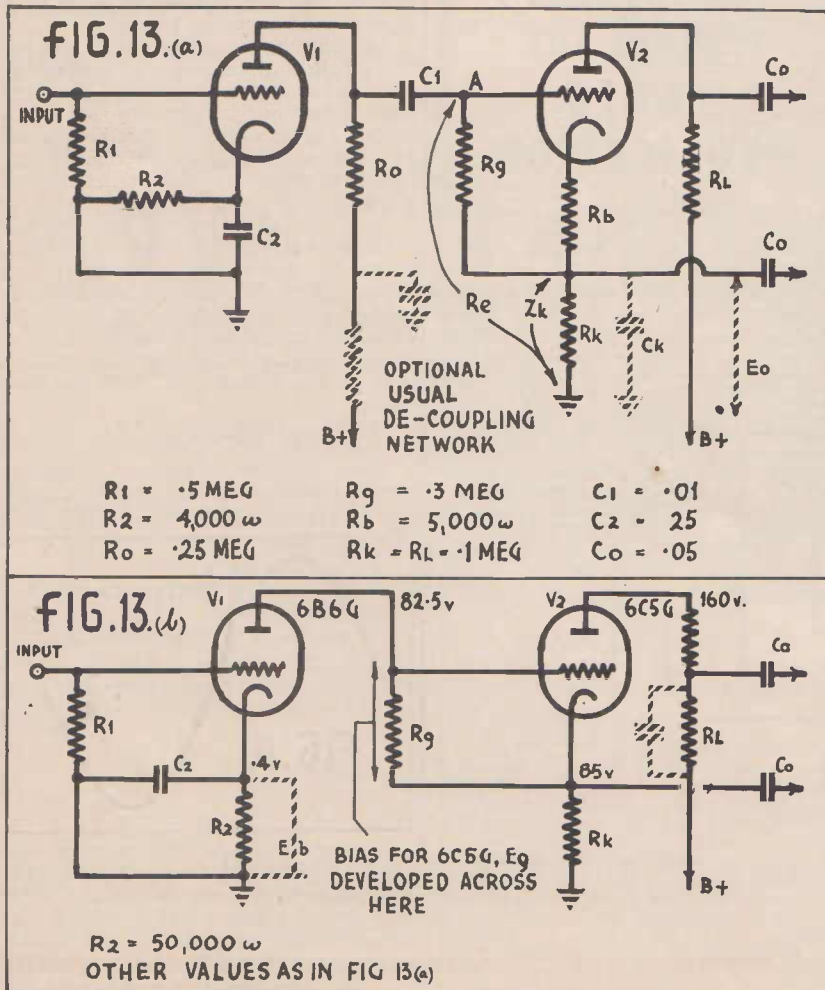
Note: In Fig. 13(b) the 85v. line does not join to B+.

The value of R₂ may actually vary up to 3000 ohms without seriously affecting distortion factor in the triode, but should not exceed 1000 ohms for best "minimum" volume results on radio reception.

Raising High Frequency Level

The raising of the high frequency level will be impossible in this circuit if large bypasses, etc., are used in the high impedance circuits. Thus C₉ and C₆ should not be exceeded, and, where possible, C₉ should be eliminated.

These general remarks may be applied to any similar microscopic system.



A "flat" amplifier characteristic results in this circuit when R_2 is about 250 ohms.

The graphs shown depict more clearly than words how the various frequencies may be varied.

In Fig. 12 the graph shows the phase and amplitude of feedback with different settings of control at different frequencies.

One final word: As the voice coil has definite polarity, uncontrollable squealing will indicate that it has been wired up incorrectly. The remedy is obvious.

Having considered the simple circuit shown, we pass to a suitable version for push-pull operation.

Naturally, before we include any feedback at all we must finalise on our general circuit. In striving for better circuits and lower phase shifts the conventional triode — phase splitter — push-pull arrangement was used (Fig. 13A).

Now, a close study of the driver phase splitter circuit led us to some rather novel conclusions, so out came the slide rule and a lot of paper, and it seemed maybe it would work — and it did.

NOTE

For all Figs. 1 to 12 mentioned in this article, see February issue.

Let us use the circuit of 13A as a basis for our work. For numerical values of formula it will be quite satisfactory to use those values of components arrived at in practice. Actually to solve them firstly requires in the case of Fig. 13B a series of differential functions.

Also for ease we will consider a mid-frequency of operation at about 400 c.p.s. If R_{p2} is the plate resistance of the phase splitter V_2 , we may show the input impedance R_e presented to V_1 is given by:

$$R_e = \left(1 + \frac{n R_k}{R_L + R_k + R_{p2}} \right) R_g \dots 1$$

let n = amplification factor V_2 ,

The cathode resistance R_k serves to contribute a value of impedance:

$$R_e - R_g \dots \dots \dots 2$$

If m = amplification factor of V_1 , and R_{p1} = plate resistance, then its amplification is:

$$m R_o \dots \dots \dots 3$$

Since the value of R_e is very high, this voltage is wholly applied between point A and earth.

Now, the voltage E_o applied to the grid of the next stage is equal to that developed across R_k and R_L , which are equal.

(Continued on next page)



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Advertisement of Amalgamated Wireless Valve Co. Pty. Ltd.

ACOUSTICS

(continued)

The voltage across R_k is not equal to that developed across R_o , but a fraction given by:

$$1 - \frac{R_g}{R_e} \dots\dots\dots 4$$

Thus the overall amplification is:

$$G = \frac{m R_o}{R_o + R_{p1}} \left(1 - \frac{R_g}{R_e} \right) \dots\dots 5$$

Now, substituting values in Fig. 13A, this gives us:

$$R_e = 3,150,000 \text{ ohms}$$

$$G = 70$$

Now, inspection of this circuit reveals that R_k produces a voltage about 100v. above earth. The plate of V_1

The operating point is the point O on this graph.

Now, to get the correct bias, we must consider the grid current of the 6B6. It will be realised that we must get very close to actual required bias, as a small change here will result in a complete change of bias in V_2 .

In Fig. 19B, grid current grid voltage curves are depicted. Now, the bias developed across R_1 (Fig. 13B) may be easily determined by drawing a load line at an angle to the X axis given by $\cot^{-1} R_1$, and its point of intersection with the curve gives the bias developed. If we take the point representing 1.5v. bias and draw a line through here parallel to the first, it will intersect the X axis at the point seen. This point represents the bias which must be developed across

R_2 so that the grid voltage will be the determined value. In this case it gives a value of $-4v$.

Therefore, this must be developed across R_2 .

$$\text{Since } I_p = 8 \text{ mA.}$$

$$R_2 = \frac{E_g}{I_p} = 50,000 \text{ ohms}$$

The above point is fairly broad, as the two currents are somewhat compensatory and R_2 may vary quite considerably without affecting operation or bias.

Now, in this case, the input impedance of V_2 is presented to the plate of V_1 without the limiting value of R_o , or V_1 works into the load R_e .

Thus the overall amplification is given by:

$$\left(\frac{m R_e}{R_e + R_{p1}} \right) \left(1 - \frac{R_g}{R_e} \right) = 92$$

The gain is therefore increased over 25 per cent.

Now, to determine plate swing, on Fig. 19A draw the dynamic load line as shown. In order to swing the 6V6's which we couple on to the phase splitter, a peak of about 11v. A.C. is required.

In understanding this graph we must realise that E_k is, in this case, the voltage developed across the cathode. We cannot use normal methods for dynamic determination because this cathode voltage varies with signal.

is operating at something like 160. Could we utilise the drop across R_k to provide plate voltage for V_1 and so use direct coupling as in Fig. 13B? Let us continue our calculations and determine the requirements. The whole series of currents will interlock, since any change in one will affect all the rest. The whole operation becomes a function of the plate cathode voltage of the phase splitter. In our normal circuit, this is usually about 75 volts for a supply of 250 volts, so let us use this as a basis.

The requisite grid voltage given by:

$$V_g = F E_p$$

$$\text{becomes: } 8 \times \frac{1}{3.3} = 2.4v.$$

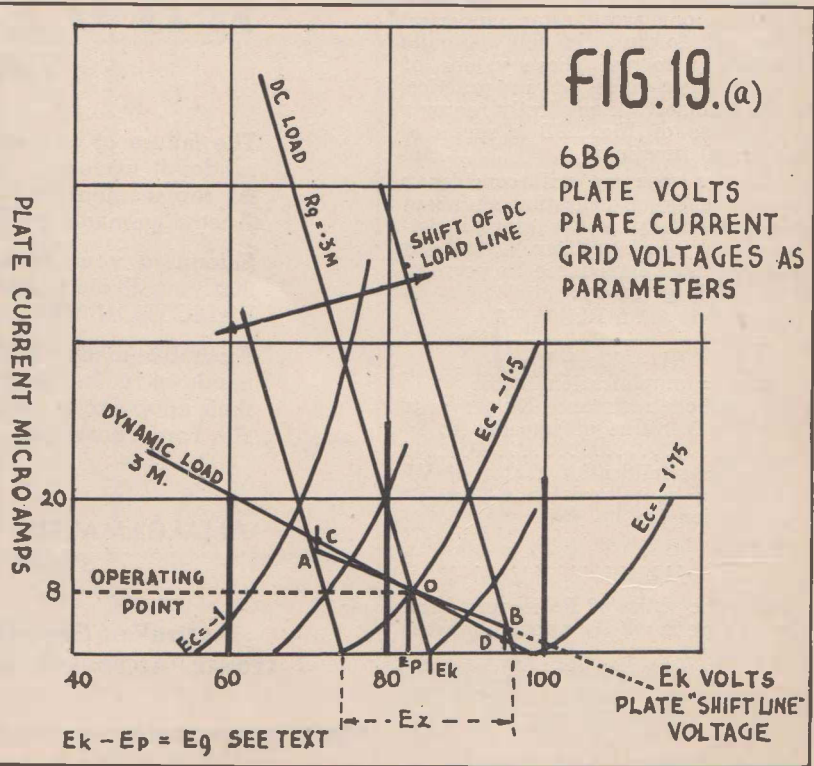
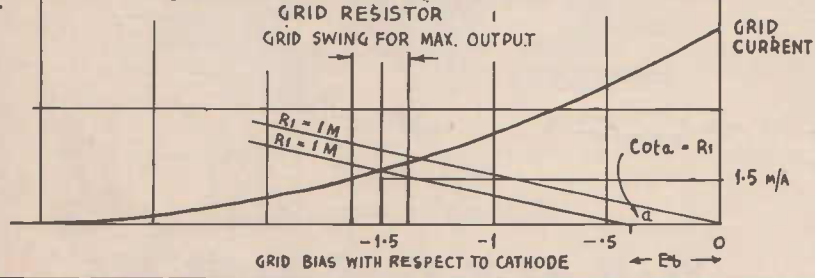
This must be produced across R_g by virtue of the drop due to plate current of V_1 . Therefore, this current:

$$I_p = \frac{2.4}{R_g} = 8 \text{ mA}$$

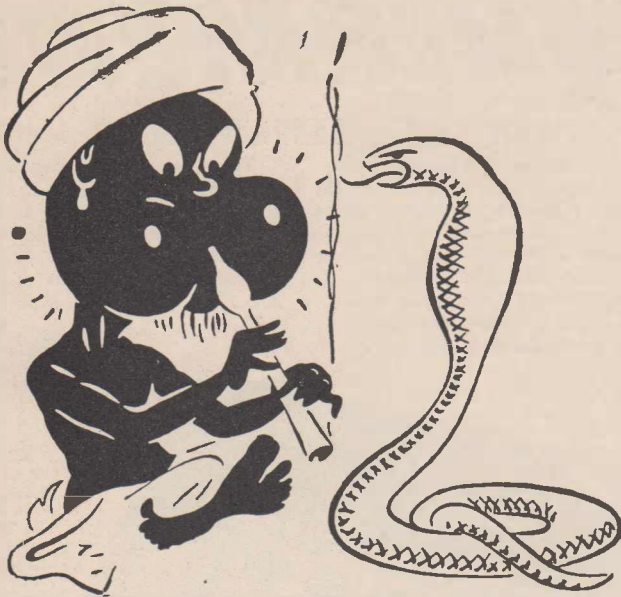
Now, we go to the characteristic curves of the 6B6 (Fig. 19A). Take R_k as about 85 volts above earth, which is about average. To obtain the D.C. conditions, draw the load line of .3 meg. (R_g) from 85v. Taking the plate current intersection of 8 mA., we get: Bias (E_c) voltage = -1.5 approx. plate volts $83\frac{1}{2}$

FIG. 19.(b)

6B6 GRID VOLTAGE CURRENT CURVE SHOWING BIAS DEVELOPED DUE TO GRID RESISTOR



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

Victoria: Noyes Bros. (Melbourne) Ltd., 597-603 Lonsdale St., Melbourne.

Standard Telephones & Cables Pty. Ltd., Bourke Street, Melbourne.

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

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

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

Thus we have the peculiar case of a valve producing a variation in its supply voltage — which is the actuating voltage for the next stage. Hence, a simple load line does not depict events correctly, because both the supply and the plate vary. What we must use, however, is that portion of the dynamic load that is used to produce the necessary change in cathode voltages. This is obtained by plotting the points of operation of the plate and its supply.

The slope of the line giving supply V_1 plate voltages will always be the same because it is determined by the constant resistor R_g . Thus the supply voltage for any particular plate voltage is obtained by running a line parallel to the D.C. load line, through the plate voltage (on the "shift line") concerned and noting its point of intersection on the X axis.

The shift is plotted thus:

If E_p is plate volts of V_1 ;
 E_g is A.C. volts developed across R_g ;
 E_b is D.C. volts developed across $R_g = 2.4v$;
 E_k is initial D.C. across $R_k = 85v$.
 E_z is A.C. volts across R_k ;
 G_m is mutual conductance V_s .

Then, at any instant, remembering an increase in E_g will decrease E_k :

$$E_p = \frac{E_k - (E_b + E_g) - E_z}{E_k - (E_b - E_g) + E_z}$$

depending on the sign of E_g .

Now, E_z is given by:

$$E_g \left(\frac{E_g R_L R_{P_2} G_m}{R_k + R_L + R_{P_2}} \right) = E_g B$$

$B = 9.5$

$$\text{Thus, } E_p = \frac{E_k - E_b - E_g(1 + B)}{E_k - E_b + E_g(1 + B)}$$

By taking equal increments of E_g , we may plot a line from which, as above, we may determine our plate volts shift.

The plate current at any time will be given by:

$$\frac{E_b + E_g}{R_g - R_g}$$

while the supply volts (having found E_p) will be equal to:

$$E_k = E_p + (E_b \pm E_g)$$

Obviously, the points represented by E_k , E_p and plate current must lie on a line parallel to D.C. load $R_g = .3$.

This will be found to be so. If we take a number of grid increments of voltage we may thus draw a line representing these points of intersection, or the path of plate opera-

(Continued on page 21)

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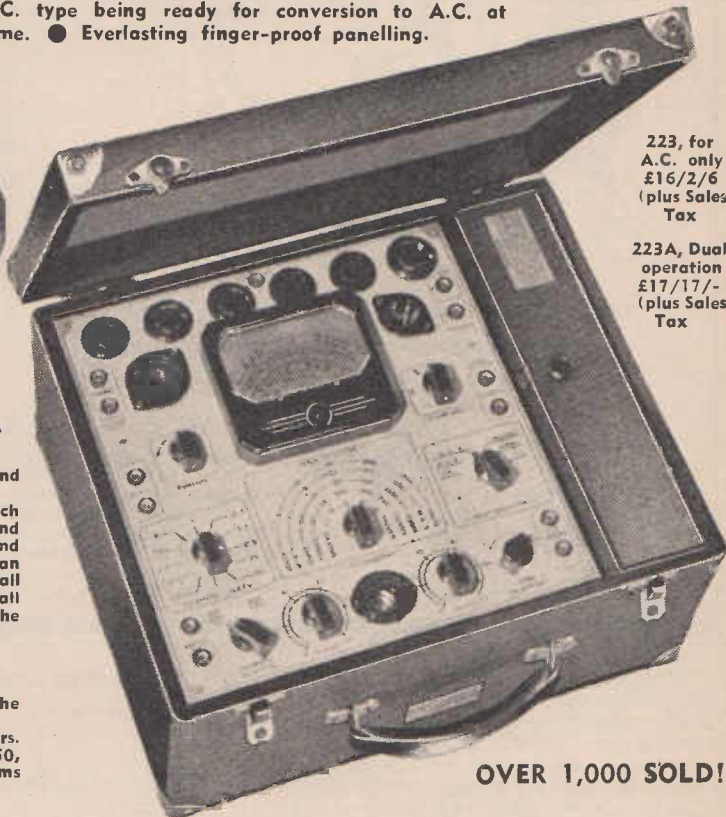
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ACOUSTICS

(continued)

tion. Now, all we do is shift the load line as seen in the graph, and it will intersect both the X axis and the line drawn from the above data—the “shift line.” This will then give us (on the shift line) the plate volts, and (on the X axis) the cathode volts.

As we need ± 11 volts swing, and the value of E_k is 85 volts, we have drawn the two lines parallel to D.C. load line, for 74 and 96 volts. These intersect the shift line at A and B. The dynamic line of 3.15 megs. is drawn through 0 as shown.

Although we might suspect that this should coincide with AB, it must be realised that the slope of AB depends on the D.C. value of R_g , and the slope of the dynamic line depends on the input impedance which is also determined by R_g . But altering one also alters the other.

Plate

The dynamic operation of the plate may therefore best be represented by the portion of the dynamic load cut off by the points CD.

Thus, examination shows that a total of about ± 17 volts swing is available, though probably only about 14-15 would be available without distortion due to the low current cut off; and this would occupy the full available swing of the dynamic load.

The A.C. current variation due to the plate shift virtually moves the operational path along CD. But, as will be seen, the slope is such that very little distortion can be determined graphically, and this is borne out by experimental results.

Distortion

Distortion due to E_z on the cathode voltage variation will, of course, be found from the 6C5 plate current family in the normal manner. Over the range concerned this is very low.

Distortion might be possible in the V1 grid circuit owing to current, but we require only 11/92v. for complete output. This is only .12 volts peak, which extends on either side of normal grid voltage along an essentially straight part of the grid volts current characteristic, and therefore is not likely to contribute greatly. See Fig. 19B.

In the same way, the grid of V_2 does not contribute distortions.

In practice, the circuit bore out the figures very well.

Compared to the conventional circuit, it gave:

- (a) more gain;
- (b) less distortion for the same output voltage;

(c) more output voltage for the same distortion.

In addition, it has several valuable features.

It uses less components; its plate supply is free of hum content; there is instantaneous transient response and marvellous frequency response.

It has the very advantageous feature that, since it is virtually a complete circuit, back-coupling does not exist in the usual manner and an extra high gain preamp stage may be added without the risk of motor-boating.

It was found in practice that the most critical component was R_g . This was critical with respect to distortion rather than gain, and should not exceed ± 8 per cent. variation from the stipulated value, or the performance at high levels will be impaired.

It was mentioned earlier that R_c was not critical. This may, in fact,

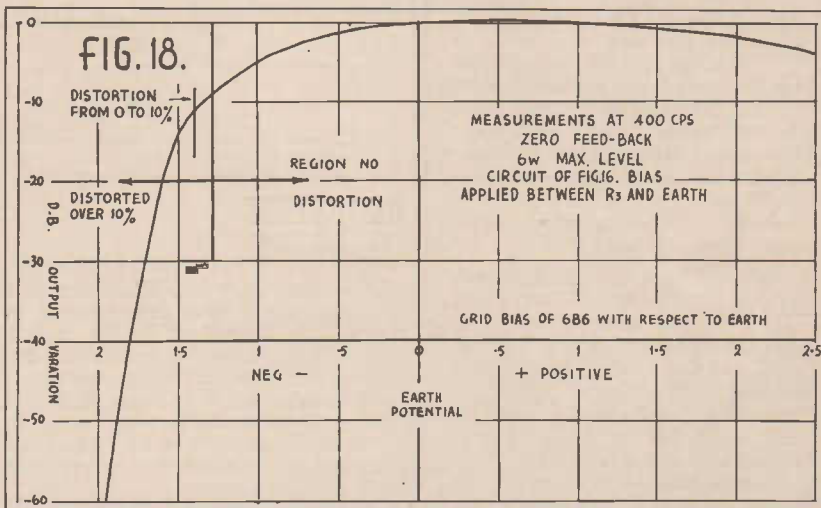
capacity will produce a phase shift, since this is now part of the plate load.

This will be roughly proportional to:

$$\left(1 - \frac{R_g}{R_e}\right) C_k \text{ (see Fig. 13A)}$$

It must, therefore, be corrected if we are to use feedback, as it causes oscillations at high frequencies. The above disadvantage, of course, only occurs above about 8,000 cycles. It may be corrected by splitting RL (Fig. 13B) as shown, or, as in our final circuit (Fig. 16), by the inclusion of the small condenser C_9 . This serves only as a phase shifter, and consequently does not affect response.

Also, the effect of the capacity C_k does not affect the response of the phase splitter as might be at first thought, because it shifts the phase, but the overall impedance still re-



vary more than ± 50 per cent. without much change. This we would expect, for the valve settles down to a current and bias, giving itself the optimum conditions. A change at this point merely sets up a compensatory action and so tends to iron itself out. This state of affairs is typical of valves using both grid and plate current to determine operating conditions.

It might be thought that the addition of this valve (V_1) current to that of V_2 would drop the plate voltage of V_2 . However, the increased current is only a few microamps—under 20, in fact—and only produces a very slight voltage change to the plate of V_2 —actually less than 1 per cent. variation.

Consequently, this aspect is of no importance.

Now, there is one disadvantage. As in Egn 4, the effective impedance across R_k is about 2,850,000 ohms, although its D.C. resistance is low.

This means that the cathode heater

mains high, because the shunting effect of C_k depends, itself, on the absolute value of Z_k .

It will be realised that this new circuit is a worthy contribution to amplifier design. However, it has one other very important possibility.

In Fig. 18 is shown the variation of amplification with variation of a D.C. potential to the grid of V_1 (Fig. 13B), and the distortion points marked.

Volume Expansion

If volume expansion is required, there is available about 10 d.b. variation on level. There is no appreciable delay factor in this variation, by the way.

If, however, muting is desired, it will be seen that the tremendous drop of 60 d.b. in level is possible for only 2v. bias. Thus, even a weak signal could be made to discriminate.

The peculiar curve and intense cut-off is probably due to the control

(Continued overleaf)

serious. It should be kept below .00005 for good results (a value of .00025 will drop the level at 10,000 c.p.s. by 20 d.b.).

The values shown were arrived at experimentally for best results and found to agree very closely with the calculated values above.

The above formulae serve to show the method by which these calculations were made, and their interpretation is made easy by substituting the values found in practice to give optimum results.

Anyway, so much for this.

Having developed our new circuit, let us now apply "mirroscopic" to it.

In this case, we are able to get much better inductance values in the speaker transformer as the plate currents cancel.

Thus our low frequency end is very easily raised. This enables us to use a lower time constant in the grids of the 6V6's, and a lower grid resistor results. This helps to protect the tube and still further lower distortion.

As the gain in this is higher, and the normal response much better than in our first simple circuit, we would expect some modifications in the feedback line. This is the case, although the same requirements as before were kept in mind.

Feedback was quite readily applicable to the new circuit (Fig. 16), and the V1 bias variation due to the change in tone control cannot be detected. The current, too, is so low

that we have no fear of noise being generated in this control.

The small amplifier phase shifts in this enable us to get an exceptionally large variation in high frequency response with this amplifier, as well as a low frequency variation. No difficulty was experienced in bringing aural response down to 20 cycles, but this is, of course, unnecessarily low.

The frequency curves of an experimental set-up and the feedback line employed is shown in Fig. 15.

The variation in frequency response can be clearly seen from this, and the way this is changed by the control. Thus, 15 d.b. at 10,000 cycles is possible, while the response at 60 cycles only changes 3 d.b.

The response at 50 c.p.s. may be varied with respect to 400 c.p.s. by about 13 d.b. without affecting the high frequency response.

The possibilities of this control are here again clearly demonstrated.

Although the low frequency variation in level is great, it is seen to be too peaky. This we deduce to be due to low damping and too high values of resistance in the feedback line.

Consequently, it is necessary to revise this, and the final result is seen in Fig. 16.

(Continued on page 46)

PLEASE NOTE

I very much regret any inconvenience caused by the formula given for the dynamic diode impedance in last issue. This was apparently mistakenly included due to similar nomenclature with the actual approximation, which should read as follows:

$$\sqrt{\frac{1}{R^2 + \frac{1}{(R_1 WC_2)^2 + 1} + \frac{R_3^2(1 + \{R_3 WC_3\}^2)}{(WC_2)^2 (R_3^2 + R_1^2) + 1}}$$

while in cases where the reactance of C3 may be neglected, this may be simplified to —

$$\sqrt{\frac{1}{R^2 + \left\{ \frac{R_2 R_3}{R_2 + R_3} + R_1 \right\}^2 + \left\{ \frac{1}{WC_2} \right\}^2}}$$

C. PARRY.

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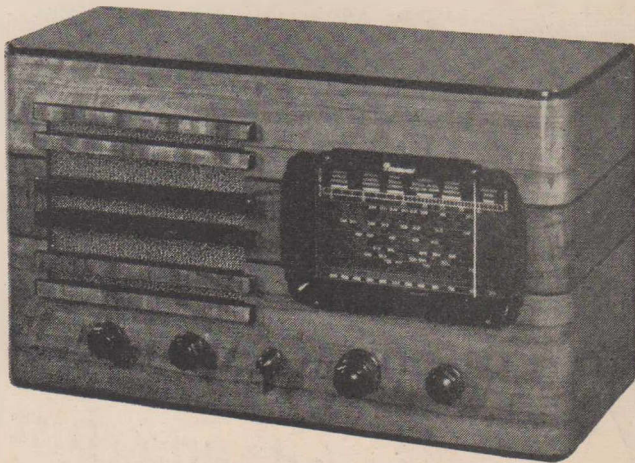
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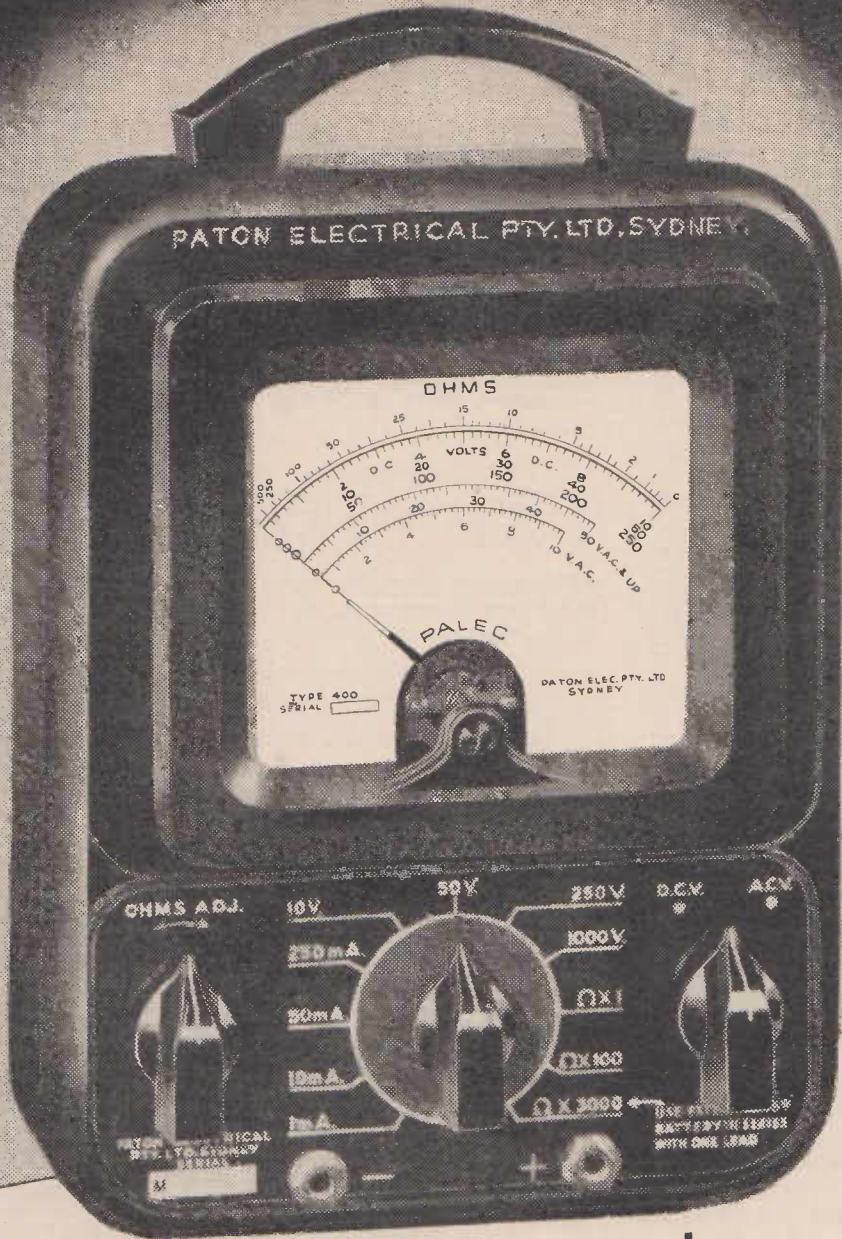
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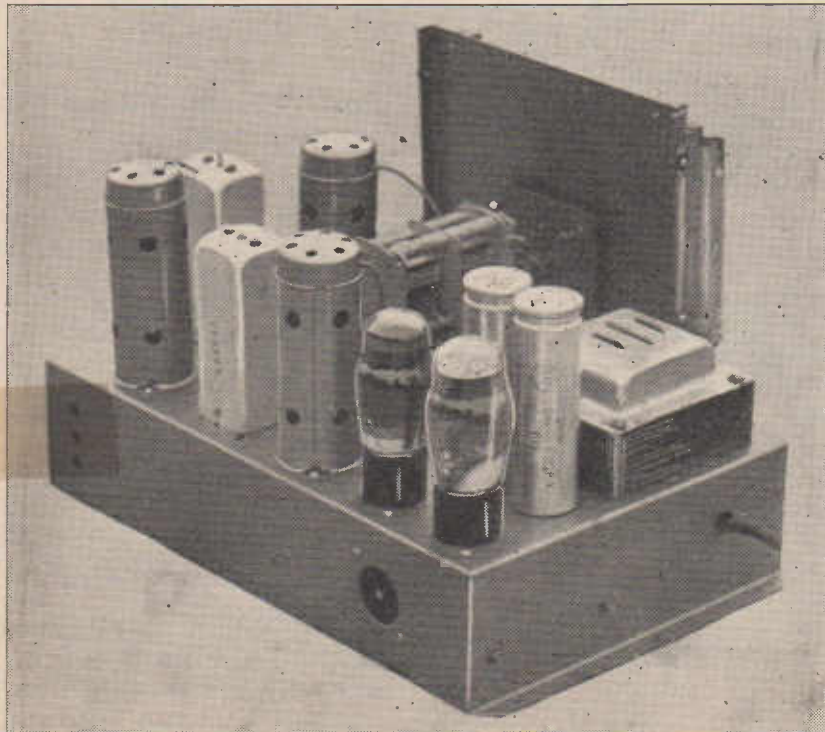
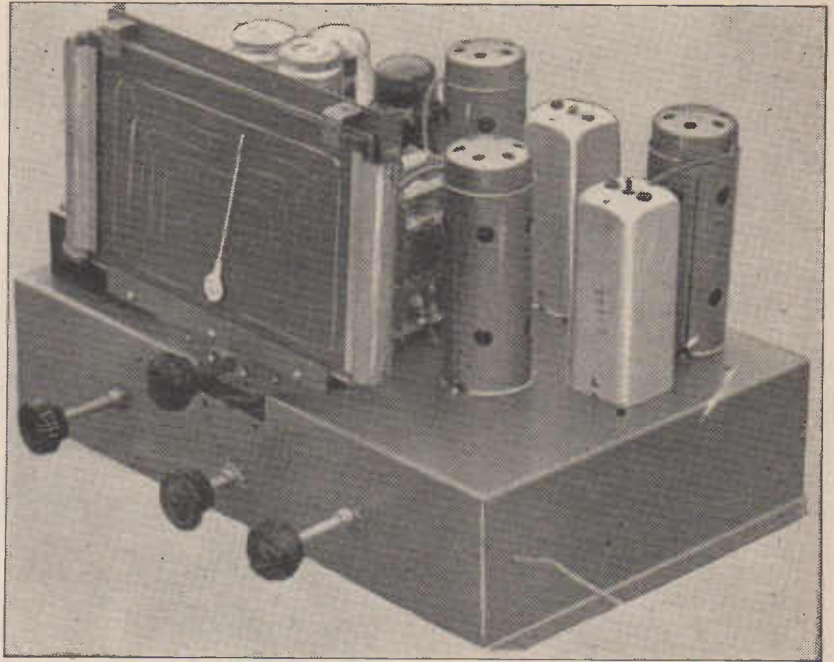
EVER since radio broadcasting began there has been a constant pursuit of fidelity of reproduction. Step by step improvements were made, until by about 1930 it was possible to obtain excellent tonal quality from the more expensive receivers. The audio system used in such sets consisted of a pair of triode valves in

RIGHT: A front view of the Acoustic Compensated Superhet, built on the same chassis as was used for the Mystery Dual-waver.

push-pull with a couple of audio driving stages and an audio transformer. Such an audio system is still to be considered as good, but has the great drawbacks of expense and lack of sensitivity.

Pentode and Beam Power Valves

The introduction of pentode and



beam power valves allowed the use of simpler, cheaper and more sensitive audio systems, but really good quality reproduction has not been one of their strong points. The introduction of inverse feedback about two years ago did quite a bit to improve their quality but cut down the gain, and there was some doubt about the comparative merits of a triode as compared to a beam power valve with inverse feedback.

Constant research work, however, often reveals factors which are not at first appreciated. The latest example of just such a case is shown by a new development of inverse feedback which appears certain to have the most far-reaching effect upon fu-

LEFT: Layout shown here should be strictly adhered to, otherwise feedback difficulties may be encountered.

ture set design. The whole theory of this new circuit arrangement has been covered in a most comprehensive way in the feature article by Parry which started in last month's issue and is concluded in this one. Getting down to practical facts, we find that this scheme works out like a miracle in

(Continued on page 28)

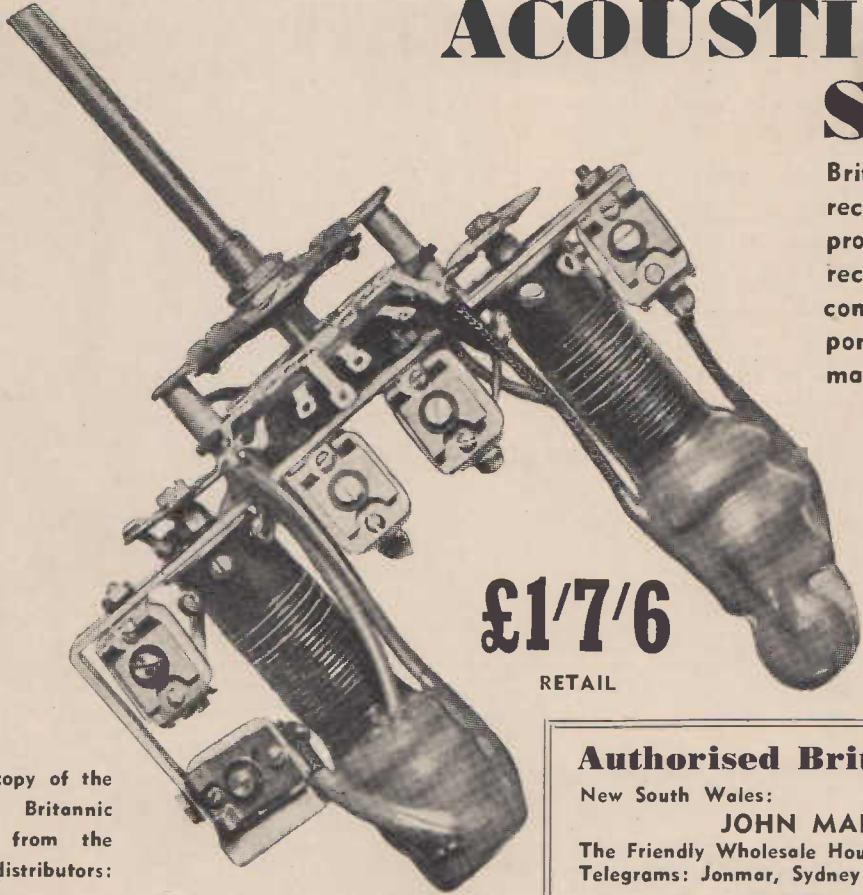
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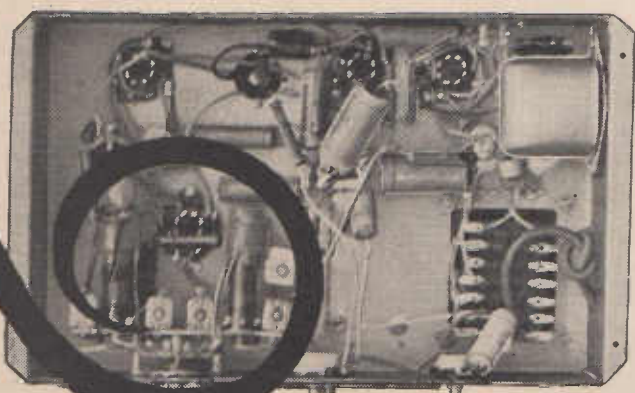
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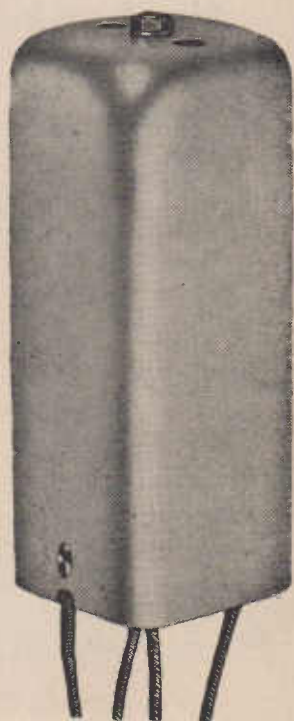
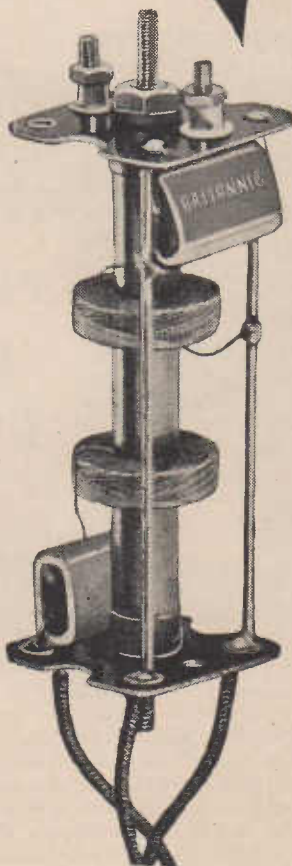
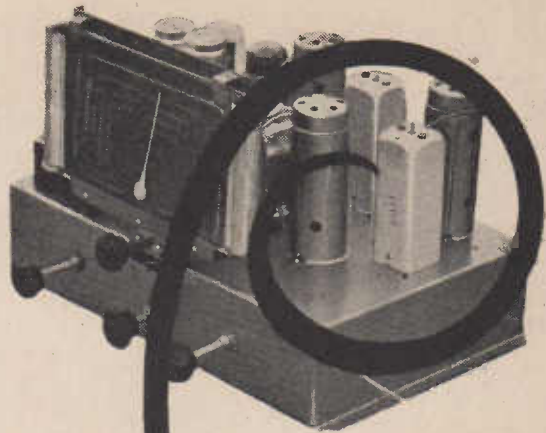
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ACOUSTIC SUPERHET

(continued)

practice, allowing an almost infinite control of the audio response and making it possible to compensate for the characteristics of the original transmission, the cutting of the response by the selectivity of the set, the response of the speaker and even the acoustic features of the room in which the set is operating. At the same time the harmonic distortion is practically eliminated. Truly the full answer to any technician's dream of perfection.

Attractive Proposition

To make the proposition even more

attractive, all this is obtained at a cost of a shilling or two, only three or four extra components being required.

New Technical Ideas

Sometimes new technical ideas come along and appear to be fine and dandy, yet they fail to stand up to the acid test of mass production. Acoustic compensation by controlled feedback, however, has already been proved to be completely practical, a prominent factory having produced hundreds of sets using this idea. They have been given a couple of months' trial under all sorts of service conditions and have been entirely satisfactory in every way.

We are, therefore, proud to be able

to give this feature article, which will guide even a novice to the construction of a most effective application of compensated acoustics to the most popular type of modern receiver, the four-five dual-waver.

Another interesting feature of this set is the use, for the first time in any Australian publication, of the new Britannic coils, which have just been released. Any type of dual-wave bracket can be used, but the actual

ACOUSTIC COMPENSATED SUPERHET

Parts List

- 1—Base 14" x 8 $\frac{1}{2}$ " x 3" (Arcadian).
- 1—Coil kit, with intermediates and padder (Britannic).
- 1—Gang condenser (Stromberg).
- 1—Dial to suit (R.C.S., Radiokes, Crown).
- 1—Power transformer, 80 m.a. (Radiokes).

CONDENSERS:

- 1—.0005 mfd. mica (T.C.C.)
- 2—.00025 mfd. mica (T.C.C.)
- 1—.0001 mfd. mica (T.C.C.)
- 1—.005 mfd. mica (T.C.C.)
- 1—.02 mfd. tubular (T.C.C.)
- 4—.1 mfd. tubular (T.C.C.)
- 3—.5 mfd. tubular (T.C.C.)
- 2—.25 mfd. electrolytic, 25v. (T.C.C.)

RESISTORS:

- 1—1,000 ohm potentiometer (I.R.C.)
- 1—.5 meg. potentiometer (I.R.C.)
- 2—250 ohm 1-watt (I.R.C.)
- 1—2,000 ohm 1-watt (I.R.C.)
- 1—3,000 ohm 1-watt (I.R.C.)
- 1—.02 meg. 1-watt (I.R.C.)
- 1—40,000 ohm 1-watt (I.R.C.)
- 2—.05 meg. 1-watt (I.R.C.)
- 2—.25 meg. 1-watt (I.R.C.)
- 2—.5 meg. 1-watt (I.R.C.)
- 2—1 meg. 1-watt (I.R.C.)

VALVES:

- 1—6J8G, 1—6U7G, 1—6B6G, 1—6V6G, 1—80 (Mullard, Brimar, Philips, Radiotron).

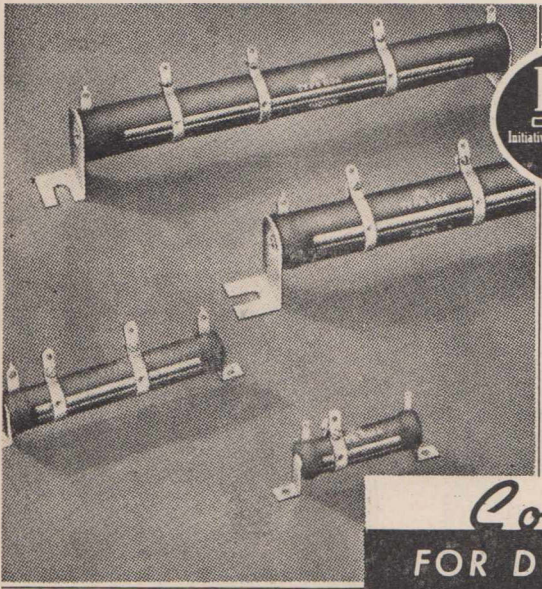
SPEAKER:

- 1—12" 1,500 ohm with separate input transformer to suit single 6V6G (Rola)

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coil kit used in the original receiver shown in our photographs was the first of the new Britannic coils to come out of that factory.

Construction

The actual construction of the set is no more difficult than any ordinary dual-waver, and with our complete diagrams and photographs it becomes almost impossible to go wrong anywhere. All the component parts used and specified are stock lines readily available from all radio dealers, with the possible exception of the 1,000 ohm potentiometer, which is used as the feedback control. This item has a specially-tapered resistance strip to give a more uniform control.

An ordinary potentiometer can be used, but we strongly advise the use of the special one. If not available

from your local dealer, at least you should have no trouble in getting one from any of our advertisers. The special potentiometer is another new release by Britannic.

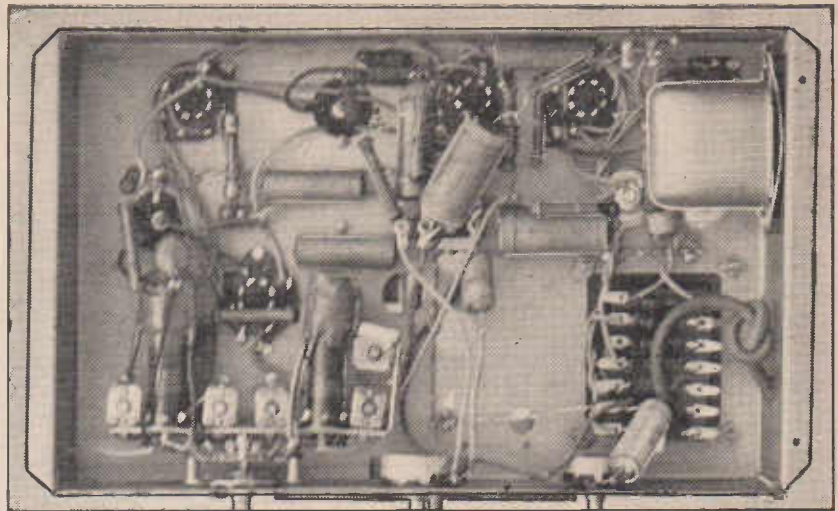
The chassis required does not need to be a special one, and almost any of the more or less standard four-five dual-wave bases will serve nicely. Our

RIGHT: Underneath the Acoustic Super. This photo shows how the input transformer is mounted beneath the chassis.

original was build up on a base which was used for the "Mystery Dual-Waver" some months ago.

A Point to Watch

The only point to watch is in regard to the depth of the base. If the base is fairly deep it becomes a simple matter to mount the speaker input transformer close to the output valve. With ordinary sets it is customary to have the input transformer mounted on the framework of the loudspeaker itself. When acoustic compensation is required, however, it becomes necessary to earth one side of the secondary of the input transformer and take a lead back from the other. It is, therefore, convenient and desirable to mount the input trans-



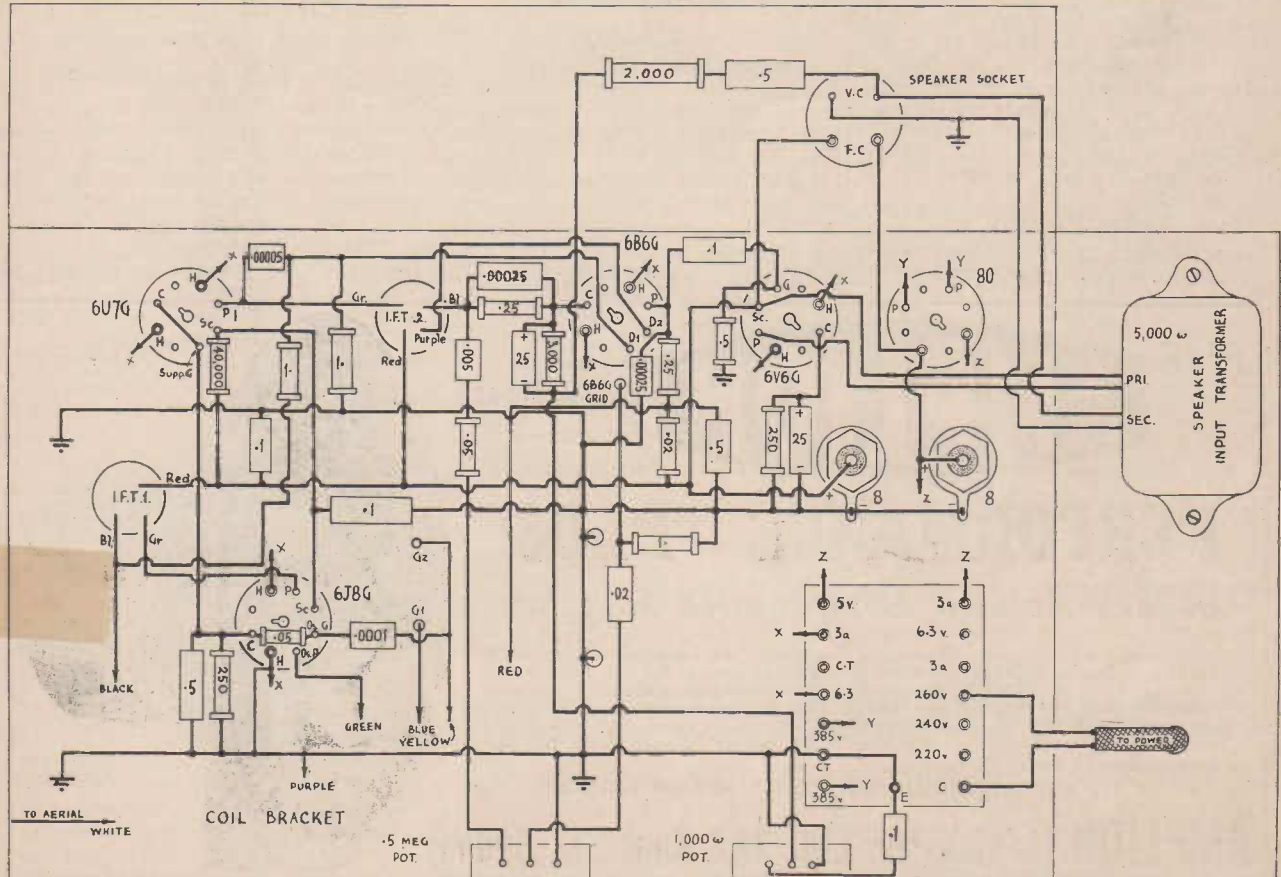
former on the chassis.

Whilst on the subject we must point out that the whole of the development work in connection with acoustic compensation was carried out with the new de-luxe model Rola K12 speaker and the special "Permacore"

input transformer, which is supplied with it. Arrangements have been made to have this special Rola speaker available with a suitable four-cable cord to allow the input transformer to be mounted as shown in our photographs and diagrams.

BELOW. The picture diagram. This can be compared with the photo of the wiring (above). See circuit on page 30.

Other Types of Speaker
Other types of speakers can be
(Continued overleaf)

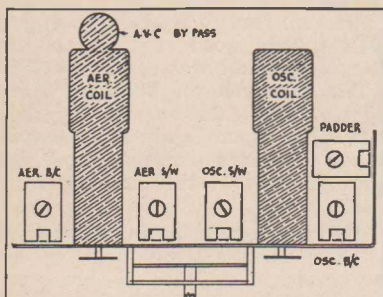


the wires hooked up. Then the intermediates can be fitted and wired up. This leaves only the smaller parts to be fitted according to taste, small insulated terminals or terminal strips being used to ensure rigidity.

Special Britannic Features

The Britannic coil unit shown in the photographs embodies one or two features which need special explanation. As is usual, the padder is built into the bracket, together with a shunt capacity in the shape of a small fixed condenser which ensures that the padder cannot be very far out of adjustment, and the adjustable condenser is therefore not at all critical. Good results should be obtained irrespective of the padder setting, and only a turn or two should be necessary as a final adjustment to ensure one hundred per cent. efficiency.

A minor point about the Britannic unit is in regard to the by-pass for the a.v.c. lead of the aerial coil. In order to ensure uniformity of align-



ment, irrespective of the way in which the unit is wired, this condenser is fitted to the coil unit and is covered with the sealing wax with which the coils are impregnated. This is a rather unusual arrangement, and we draw special attention to it, as otherwise there might be a little confusion, as the condenser is shown on the circuit and yet does not need to be fitted to a Britannic coil is used. If other types or brands of coil brackets are used, the condenser will need to be fitted as a separate unit, according to the circuit diagram.

The positions of the various trimmers on the Britannic unit are also a little different from those of other units and so we show a special diagram covering this point.

Operation

The operation of the receiver follows the usual style, except in regard to the special tone control which operates upon the inverse feedback. This control, a specially tapered 10,000 ohm potentiometer, does not respond in the usual way at all, but its movement produces a series of different tonal effects, affecting the frequency response of the receiver in an extraordinary manner.

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are specified for these outstanding "Radio World" receivers . . . follow the designer's lead and ensure maximum results.

There never has been for any purpose a better Valve than MULLARD

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6U7G — Secret of the "Club Special's" extreme sensitivity and freedom from double spotting is Mullard's 6U7G variable mu r.f. pentode.

6J8G — Best all-round mixer oscillator for dual-wave use. Mullard 6J8G is specified for the mixer socket of the "Acoustic Superhet."

6J8G — Excellent conversion gain right down to 13 metres is the reason for the designer's choice of a Mullard 6J8G for the mixer stage.

6U7G — Next in the valve line-up is Mullard 6U7G variable mu r.f. pentode, used as high-gain i.f. amplifier.

6J8G — The pentode section of a Mullard 6J8G is used as i.f. amplifier and the triode section as audio driver in a special high-gain hook-up.

6B6G — Mullard 6B6G duo diode high mu triode performs the multiple functions of second detector, a.v.c. voltage generator, and triode high gain audio driver.

6B8G — The multiple functions of diode detector, a.v.c. voltage generator, and final audio stage are performed by a Mullard 6B8G.

6V6G — Used in conjunction with a special feed-back arrangement, Mullard 6V6G beam output pentode ensures magnificent tone, coupled with high output.

5Y3G — Full wave vacuum rectifier for the "Club Special" is the standard Mullard 5Y3G.

5Y3G — Rectifier chosen for the "Acoustic Superhet" is the Mullard 5Y3G, actual equivalent of the well-known 80.

For the CLUB SPECIAL



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The latest Mullard Valve Characteristics Chart contains full data on over 300 valve types, including those shown above. Send 6d. in stamps NOW for your copy, to the address given.

Shortwave Review

CONDUCTED BY

L. J. KEAST

German Freedom Station Again ★ Japanese National Anthem
News from France ★ WPIT Goes to Boston ★ Girth Control

NOTES FROM MY DIARY —

German Freedom Station Again

According to the B.B.C., the German Freedom station is on the air again. Remember, we used to hear them on 29.8 metres round about 6 a.m., and sometimes on 40.9, 40.8 and often on 40.6 metres. Just about this time last year the signal on 40.6 metres was equal to anything on the air at that time.

Now they have shown up on another wave-length; this time it is 30.6 metres and from 6 a.m. are coming through at fair strength. I am indebted for the advice to my old friend, Gus Muller, who by the way was, I think, the first man in this country to report the German Freedom Station way back in the early part of 1939. The station being heard now opens with the familiar "Actung! Actung!" and continuing in German, "Here is Germany on 30.6 metres. We are on the air at 8 p.m., 3.30 a.m. and 12, 19.30 and 22 o'clock Central European Summer time." (8 p.m., 3.30 a.m. and 6 a.m. Sydney time). Session generally lasts about forty-five minutes.

Japanese National Anthem

Mr. Schooth, of Brisbane, a good, reliable reporter to this magazine, considers JZK must use both sides of a 12-inch record for the Japanese National Anthem. Well, Kimigayo may take some time to play, but at commercial broadcasting rates, I guess "The Internationale" would cost "Moscow Calling" a pretty penny.

Dr. Gaden tells me a very fine series, "Cameos of New Orleans," is put over every Monday morning at 6.30 through WLWO, 19.67 metres.

Mr. Nelson, of Cairns, writes that he logged my stranger on 41 metres, but, like myself, was unable to catch the final announcement which would have given us the station's identity.

In last issue I erroneously stated that the verification from YV5RM was Mr. Cushen's first from South America. This should have read, of course, "on the 60 metre band."

News From France

The French delegates are asking that another powerful station, Radio Paris, be allowed to broadcast news. Before the armistice, various stations in North Africa were under different Ministries. Radio Tunis was controlled by the Metropolitan Radio Com-

mission, Radio Algiers by the Ministry of the Interior, and Radio Rabat by the Ministry of Foreign Affairs. They will now be all under the authority of the Vice-President of the Cabinet. So listen for Paris Mondial and Radio Paris.

Mr. Cushen says he has been hearing a station on 12,862kc — "Station — Press Wireless." This is W9XHD, Elgin, Illinois, U.S.A., 23.32m. They give Press wireless tests from 5 to 8 a.m.

WPIT Goes to Boston

According to the N.Y. "Times," to improve transmission to South America, short-wave station, WPIT, Pittsburgh, will be moved to Boston to gain the advantages of the salt-water route to the Southern Hemisphere.

Using six channels, the station is expected to be on the air from the new location this Fall with its beam trained on Latin America during thirteen hours of its present sixteen-hour broadcasting day.

Engineering tests are said to have indicated that inland transmitters are not as effective in reaching down to Rio as are those which flash their waves over the ocean.

Had the above been printed in February issue as was intended, reporters would not have become confused with the Boston broadcasts.

Several have written in that WBOS is being heard on 25.27m, but actually this is WPIT. However, WBOS is on the air, but has been opening at 7 a.m. on 9570kc, 31.35m in Spanish.

Probably WPIT will later on use the WBOS call-sign, as it would certainly localise it, but at present they announce "WPIT —, with studios in Boston."

* * *

I am concerned at not hearing Herbert Hodge, London motor-cab driver 3306, who used to be a regular broadcaster in the series, "London Log." When this was discontinued, he was often heard in various references to the bombing of London. In fact, he "appeared" at the mike so often that it makes his absence, without any explanation, conjure up unhappy thoughts. There must be many like myself who enjoyed his session on alternate weeks with Howard Marshall in "London Log." Therefore, if anyone can offer any explanation as to why he is missing, I would be grateful.

Favour Winter

While I love the summer and the surf and all that goes with this time of the year, I'm inclined to believe I favour the winter, for it brings us the daytime stations. One feels kind of lonely when turning on the set and finding silence, which is the case for a long period at the present time. But I have a faint suspicion that "just around the corner" our old pals or at least some of them are likely to show up pretty soon.

As I write these notes (it is just on 6 p.m. and a Sunday), KGEI are as loud and clear as a local. Thinking back, I remember this morning at 7.30 there were something like eight or nine stations on the 41-metre band at splendid strength. Later in the morning, after 10 to be exact, I listened to a church service from Bandoeng on YDC at very good strength and the same programme was coming through at fair strength on YDB, 15,315kc, 19.59m. These stations usually close at 10.30 to open again at 1.30 p.m., but on Sundays continue the first morning session till 12.30 p.m., I think.

Talking of good morning stations, one must include GRW, who at 6.45 give news intended for the home service. What a signal! Then you have Belgrade, Moscow, Berlin, Schwarzenburg and several others that all seem to make, for me at any rate, a pleasing diversion from our regular night stations; even if they are the same cities, the different country for which the transmission is intended makes them sound new.

Well, after all these months my 41-metre stranger has been run to earth. The South African suggestion (prompted by the hour mentioned) turned out a help. It is the Post Office Station, Salisbury. There are many towns of this name. One quickly thinks of Salisbury Cathedral; being South Australian-born, my thoughts run back to the beautiful Salisbury oranges, while some of our American readers will think of Maryland. But our concern at the moment is in the capital of Rhodesia, with a white population of 9,625. Down she goes in the Book of Records and like good DX-ers we're off on another hike.

Girth Control

Can't help but notice the number of S.W. stations putting over physical jerks, so if that bay window is assuming XOS proportions you can tune into: JVV-3, 25.60m, at 7.30 a.m.,

while at 9 a.m. VLW, 25.36m, will tell you the story in language you might understand. During the afternoon you can touch your toes the Russian way. (Explained explicitly through RNE, 25m.). If this isn't enough you will find YDC, 19.80m, at 8 p.m. will recommend ways of keeping that schoolboy figure. Quite likely the Cubans or Europeans include the same thing in their schedules, but already my new suit looks like a farmer's smock, so that is sufficient for me.

Radio Sales

Here are the figures regarding sales of radio sets in America, taken from "Radio To-day" (New York):—

Sets in use —	
1939	45,200,000
1940	50,000,000
Car Radios —	
1939	6,500,000
1940	7,500,000
Portables —	
1939	900,000
1940	1,800,000
Sold by Retailers —	
1939	9,000,000
1940	11,200,000

While war news has probably been credited with the reason for the great increase in sales, it is still quite likely your own "Australasian Radio World" has contributed also. The number of occasions on which, in America, it is referred to as the Australian authority on short-waves is very pleasing.

SVM, Athens

SVM; Athens (9935kc, 30.19m), just before closing the other morning announced that they had been informed by Cairo, Egypt, that news in Italian would be broadcast by Cairo at 7.50 p.m. Athens time (3.50 a.m. Sydney), on 10,055kc, 29.83m, and 7865kc, 38.15m. This is interesting, because advice from Egypt a little while ago said that only the 38.15m and 44.24m outlets were being used, and simultaneously. The transmitters referred to by Athens are of course, SUV and SUX.

London Changes

Listeners have doubtless been concerned with the suddenness in which London transmitters, particularly at night, would without a word of warning go Dutch, German or perhaps French. Evidently more venturesome souls than myself have put into words what has only been a bad thought with me, and London during the second week in February recommended that we listen over the week-end and hear how this state of affairs was to be overcome as and from Monday, February 17. I copied what I could, and under Great Britain in "Loggings" I have shown the changes in times and frequencies that particularly affect us. However, so many of the Home,

European and Central transmitters are heard here, I will as opportunity permits try and get these. Reporters will please me if when writing they give details of any schedules they hear between 1 and 4.30 a.m., a period in which my set seems to practice "black-outs."

New London Transmitters

Several, like myself, have been puzzled with a Daventry transmitter right off the beaten track, viz., 24.92m. Heard at various times, the signal was exceptionally good; in fact, I chose it one Saturday afternoon to get the B.B.C. news at 2.30. No call-sign was heard and even in the mornings B.B.C. simply said, "—and on four transmitters in the 25-metre band." (These would, of course, be GSE, 25.29m, GSN, 25.38m, GSD, 25.53m and our little stranger.) However, the secret is out, and down he

goes in the book of words as GRV, 24.92m.

Mr. Muller's find on 42.06m is GRT, and the correct call-sign for 49.34m, so I am told, is GRR. Apparently GRW, 48.82m, has gone silent.

Good Morning Signals

Trying again the other morning to run to earth my 30.77m Frenchman, I ran over the bands and found some very good signals, amongst which I remember: SVM, Athens, 30.196m, at 5.45 (he actually opens at 5.40). GRR, London, 49.34m: Gives Home news at 6 — and what a signal! 2RO-11, Rome, 41.55m: News at 6.35; splendid (signal, I mean). GRY, London, 31.25m: News at 6.45. WCBX, New York, 31.09m: Very fair at 6.55 with news. WRUL, Boston, 25.45m: "Friendship Bridge," very good, concludes at 7.30. WGEQ, New York, 31.48m: Very good; news at 7.55.

STATION PARTICULARS

(Under this heading, as space permits, we will give brief details of stations.)
(See October, December, January and February issues for previous notes.)

AMERICA (Central)

Costa Rica

Costa Rica is a republic of 23,000 sq. miles in Central America, with a population of 525,000. Agriculture, coffee and banana culture. San Jose, capital, with a population of 52,000, is noted for its many fine buildings.

T14NRH, Heredia (9690kc, 30.96m): This 500-watt station is owned by Amando Cespedes Marin, Apartado 40. Present schedule is: Wed., Fri. and Sun., noon to 1 p.m., and consequently logging may be difficult, but for a correct report, and it MUST be correct, a beautiful card is sent, providing the report was accompanied by an International Reply Coupon. "The Voice of Costa Rica" was founded on May 4, 1928, and in May, 1938, the writer of these notes reported the station and received a beautiful diploma from friend Marin. Situated in Heredia, the city of flowers and coffee trees, **T14NRH** is one of the original five short-wave stations of the world. Plenty of English is spoken, and the interval signal is often a train puffing or bells. N.R.H. means New Radio Home. Truly an interesting station.

T1PG, San Jose (9620kc, 31.19m): "La Voz de la Victor" is owned by Perry Girtton, Apartado 225. Interval signal is chime, and signs off with march, "Mi Teniente." Power is 1000 watts, and it is probably the loudest of the Central Americans. Schedule: 10 a.m. to 2.30 p.m.; 10 p.m. to 12.30 a.m.; 3 to 5 a.m. Is generally excellent from 10 p.m.

T1EP, San Jose (6690kc, 44.82m): "La Voz del Tropica" is owned by Eduardo Pinto Hernandez, Apartado 257. Power is 500 watts, and station is on air from 10 a.m. to 3 p.m. Reception here is only fair, and best time is just before they close. Signs off with "Under Hawaiian Skies."

T1LS, San Jose (6165kc, 48.68m): "Radio-emisora Para Ti." Power unknown. Owned by Luis J. Saens, Apartado 3. Opens with "Washington and Lee Swing," and signs off with "Adios mi Chaparrite" ("Farewell My Friends"). Schedule: 3 to 5 a.m., 9 a.m. to 2 p.m. Has been reported heard at 10 p.m.

TIG-PH/TIX-GP3, San Jose (5824kc, 51.50 m): Both owned by Gonzalo Pinto Hernandez, Apartado 800. **TIG-PH**, "Alma Tica," has a power of 1500 watts, while **TIX** is only 1000 watts. The change-over may be noticed at 1 p.m. **TIX-GP3**, which actually relays the broadcast station, **TIX**, has for a slogan, "Estacion 'X' La Reina del Aire." Signs off with "Good Night Melody." Schedule: 10 p.m. to midnight; 3 a.m. to 5 a.m.; 7 a.m. to 3 p.m. Has been reported in N.S.W. from 10 p.m., but often spoilt by morse. Is heard in New Zealand in afternoons, but not here. On looking at above carefully, readers will note the call-sign after international Prefix, **TI**, is built up around the owner. This list does not cover by any means the complete line-up of stations in Costa Rica, but refers to those more often heard.

El Salvador

A republic on the Pacific coast of Central America, adjoining Honduras and Guatemala. Area, 13,183 sq. miles. Agriculture and minerals. Population, 1,437,611. Capital, San Salvador, 90,000.

YSPA, San Salvador (10,400kc, 28.55m): "La Voz de Cuscatlan," owned and operated by Fernando Albayeros-Sosa. Schedule: 11.10 p.m. to midnight; 4 a.m. to 6 a.m.; 9.30 a.m. to 2.30 p.m. Opens with march and chimes. Interval signal is 10-note chime. Has been heard in N.S.W. from just after 11 p.m., but is reported heard in afternoon in N.Z.

YSPB, San Salvador (6575kc, 45.63m): This is shown in some magazines as **YSP**, and schedules vary. Have no particulars except that I understand it is conducted by owner of **YSPA**.

YSM, San Salvador (11,710kc, 25.62m): "Alma Cuscatleca," Radiodifusora Nacional, with transmitters at Cuscatlan. This is a Government station. Address: Director-General de Telegrafos, Telefonos y Radio Nacionales. Opens with march, "Gerado Barrios." Interval is bird call. Schedule: 4 to 5 a.m.; 10 a.m. to 12.30 p.m.

YSD, San Salvador (7894kc, 37.98m): Same remarks as **YSM**, exception schedule is: 10 a.m. to 1.30 p.m.

The MONTH'S LOGGINGS

ALL TIMES ARE AUSTRALIAN EASTERN STANDARD

Several have written in appreciative terms regarding my attempt to give schedules, so more have been added. But, as I am continually reminded by the proprietor, space is limited. Therefore, reporters must not take umbrage if names do not appear after each station. Where unusual happenings are mentioned, the one responsible for the advice will be credited.

AUSTRALIA AND OCEANIA

Unchanged from last month.

- Fiji:**
VPD-2, Suva 9535kc, 31.46m
 Schedule: 7-8 p.m. except Sunday.
 Most likely spoilt by **JZI**, who open at 6 also. Heard nicely on closing at 3.30 p.m. (Gaden).
- New Caledonia:**
FK8AA, Noumea 6130kc, 48.94m
 Schedule: 5.30 to 6.30 p.m.
 Consistently good (Gaden).

AFRICA

- Algeria:**
TPZ, Algiers 12,120kc, 24.76m
 Schedule: 4 a.m. to 9 a.m.; 5.30 p.m. to 6.15 p.m.
 Fairly good about 6 p.m. (Fitzgerald, Gaden).
- TPZ-2**, Algiers 8960kc, 33.48m
 As **TPZ**. R5 at 5.20 a.m. (Byard). Now quite good (Fitzgerald). Better in afternoons (Schooth, Gaden).
- Belgian Congo:**
OPM, Leopoldville 10,140kc, 29.59m
 Opens about 4.55 a.m. Good till closing, which may be 5.45 or 6.15. Said operating simultaneously on 19.67, 25.58, 31.40 and 49.42m.
- Egypt:**
SUX, Cairo 7865kc, 38.15m
 Heard regularly when opening at 4.30 a.m. Still good signal 6.30 a.m. (Schooth, Byard).
- French Equatorial Africa:**
FZI, Brazzaville 11,965kc, 25.06m
 Schedule: 6-7 a.m., 4-4.30 p.m.
 Weak at 6.30 a.m. (Byard). Fair at 4 p.m., very weak at 11 p.m. (Muller). English session from 5.45 a.m. direct to U.S.A.
- French Morocco:**
CNR, Rabat 12,831kc, 23.38m
 Schedule: 4 a.m. to 7 a.m.
 Heard announcement on Saturday, February 15. Refers to **RADIO MAROC**.
- CNR-2**, Rabat 11,940kc, 25.13m
 Appears to have gone silent.—Ed.
- French West Africa:**
Senegal:
FGA, Dakar 9405kc, 31.90m
 Very weak at 5.15 a.m. Suffers from morse interference.
- Gold Coast:**
British West Africa:
ZOY, Accra 4915kc, 61.04m
 See particulars under "New Stations" in February issue.
- South Africa:**
Kenya:
VQ7LO, Nairobi 6083kc, 49.31m
 Schedule: 2.15 a.m. to 5.15 a.m. News at 2.30 and 4.
 Fair at 5 a.m. Not often heard (Gaden).
- ZRH**, Pretoria 6007kc, 49.94m
 Very good at 3.30 a.m., but just heard at 6 a.m. (Gaden).
- ZNB**, Mafeking 5900kc, 50.95m
 Very good at 3.30 a.m., but only heard once at 5.15 a.m. Fair (Gaden).

Portuguese East Africa:

- Mozambique:**
CR7BE, Lourenco Marques 9710kc, 30.9m
 Schedule: 5 to 7 a.m. except Mondays.
 News 5.55.
- CR7AA**, Lourenco Marques 6035kc, 49.75m
- Natal:**
ZRO, Durban 9750kc, 30.75m
 Closes at 7 a.m. after B.B.C. News.
- Spanish Morocco:**
Radio Falange, Tangiers 7090kc, 42.31m
 Schedule: 6 to 8 a.m. All Spanish.
- Tunisia:**
Radio Tunis, Tunis 15,650kc, 19.17m
 May be heard between 2.30 and 6 a.m.
 See "Station Particulars" in February issue.

AMERICA

- Central:**
Costa Rica:
TIPG, San Jose 9620kc, 31.19m
 Probably the loudest of the Central Americans. Good at 2 p.m. and from 10 p.m.
- TIEP**, San Jose 6695kc, 44.82m
 Not so good at 10 p.m. (Gaden).
- El Salvador:**
YSPA, San Salvador 10,400kc, 28.55m
 Schedule: 11.10 p.m. to midnight; 4-6 a.m.; 9.30 a.m. to 2.30 p.m.
 R2 at 11.15 p.m. (Byard).
 Note change in call-sign.—Ed.
- YSPB**, San Salvador 6575kc, 45.63m
- Guatemala:**
TGWA, Guatemala City 15,170kc, 19.79m
 Monday mornings till about 8.15.
- TG5JG**, Guatemala City 11,440kc, 26.22m
 Has been reported heard in late afternoon.
- TGWA**, Guatemala City 9658kc, 30.98m
 Heard at 3 p.m.
- TGQA**, Quezaltenango 6400kc, 46.88m
 Excellent Sunday afternoons at 4.30 p.m.

NEW STATIONS

THE POST OFFICE STATION, Salisbury, Rhodesia (7317kc, 41m): No particulars except plays modern records and announces title and number of same. Speaks in perfect English and, when giving final announcement at 6 a.m., is more often than not overshadowed by morse (VJR, Rockhampton, I think). American mail just to hand gives frequency as 7210kc (41.60m).

RADIO CANADA, Quebec (6160kc, 48.70m): Frequently says "Ici, Radio Canada." Only French spoken. Does not appear to be on every night and schedule varies. Generally heard from about 9.30.

CS2WD, Lisbon (6200kc, 48.38m): This is not actually a new station as it is shown in American files, and until this last month on 5.97m.c. But it has not been logged in Australia for ages as far as I know. Slogan is, "Emisora Catholica Portuguesa." Schedule appears to be 6 to 9 a.m. However, while heard at good strength at 6, the signal is noisy by 7. Only Portuguese spoken.

YNOW, Managua 6850kc, 43.80m
 "La Voz de America Central Managua."
 10 a.m. to 1 p.m. This Nicaragua station appears to have replaced **YNOP**.

TG-2, Guatemala City 6200kc, 48.39m
 R7 at 5 p.m. (Cushen).

Honduras:

- HRN**, Tegucigalpa 5875kc, 51.11m
 "La Voz de Honduras." R5 at 9 p.m. (Taylor).
- HRPI**, San Pedro, Sula 6350kc, 47.26m
 Schedule: 9 a.m. to 1.30 p.m. and 9 to 10.30 p.m.
 "El Eco de Honduras." Identified by marimba music.
 Received at terrific strength in Kansas, U.S.A. (Olthoff).

British Honduras:

- ZIK-3**, Belize 5300kc, 56.6m
 R4 at 9.15 p.m. (Taylor). I have no particulars of this station.—Ed.

Nicaragua:

- YNOW**, Managua 6850kc, 43.80m
 Schedule: 10 a.m. to 1 p.m.
 See "New Stations."

Panama:

- HP5G**, Panama City 11,780kc, 25.47m
HP5A, Panama City 11,700kc, 25.64m
 Schedule: 10 p.m. to midnight.
 Only heard weakly now after 10 p.m.
- HP5J**, Panama City 9607kc, 31.22m
 Schedule: 10 p.m. till midnight.
 Weak after 10 p.m.
- HP5K**, Colon 6005kc, 49.97m

North:

- WCBX**, New York 21,570kc, 13.91m
 Not audible at Randwick.
- WCBX**, New York 17,830kc, 16.81m
 Schedule: 11 p.m. to 4 a.m. News, midnight, 1.15 and 2.30 a.m.
- WNBI**, Boundbrook 17,780kc, 16.87m
 Schedule: Midnight to 10.45 a.m. News 1 and 3 a.m.
 Fair to good at 7 a.m.
- WRUW**, Boston 15,350kc, 19.54m
 Schedule: 5 to 8.35 a.m. News at 6.30 and 7.30 a.m.
- KGEI**, Frisco 15,330kc, 19.56m
 Heard from 1.30 p.m. with fair signals.
- WGEA**, Schenectady 15,330kc, 19.56m
 Schedule: 2.15 a.m. to 9 a.m. News, 4.45 and 7.55 a.m.
 Good at 7 a.m.
- WCBX**, New York 15,270kc, 19.63m
 Weak at 7.30 a.m.
- WLWO**, Cincinnati 15,250kc, 19.67m
 Schedule: 11 p.m. to 7.45 a.m. News 11 p.m. and 4.45 a.m.
 Excellent in mornings.
- WPIT**, Boston 15,210kc, 19.72m
 Note new location.
 Heard occasionally at 11 p.m.
- KKZ**, Bolinas 13,690kc, 21.93m
 Sundays at 2 p.m. (Taylor, Keats).
- WPIT**, Boston 11,870kc, 25.26m
 Opens at 7 a.m. News 9 a.m.
- WCBX**, New York 11,830kc, 25.36m
 Schedule: 4.30 to 6.30 a.m.
 Opens at 4.30 a.m. with News.
- WRUL**, Boston 11,790kc, 25.45m
 Schedule: 1 a.m. to 3 a.m. (News 2.45 a.m.); 5 a.m. to 8.35 a.m. (News 6.30 and 7.30).
- WRUW**, Boston 11,730kc, 25.58m
 Schedule: 9 a.m.-1.50 p.m. News 10 a.m. (Gaden).
- WLWO**, Cincinnati 11,710kc, 25.62m
 Schedule: 8 a.m. to 10.45 a.m.
- KGEI**, Frisco 9670kc, 31.02m
 Schedule: 4 to 6 p.m. (News 5.55 p.m.); 10 p.m. to 3.10 a.m. (News 10.30 p.m., 12.30 a.m., 1.30 a.m., 3 a.m.)
- WRCA**, Boundbrook 9670kc, 31.02m
 Very good from 3-4 p.m.
- WCBX**, New York 9650kc, 31.09m
 Schedule: 10.30 to 9 a.m. News at 6.55 and 8.45.
- WLWO**, Cincinnati 9590kc, 31.28m
 Heard closing at 4 p.m. Weak signal.—Ed.
- WBOS**, Boston 9570kc, 31.36m
 Opens at 7 a.m.
- WGEO**, Schenectady 9530kc, 31.48m
 Schedule: 6 a.m. to 8.45 a.m. News 7.55.
- KEL**, Bolinas 9490kc, 31.61m
 Good when on.
- WCBX**, New York 6170kc, 48.62m
 Good some afternoons (Schooth).

WCAB, Philadelphia 6060kc, 49.5m
R5 at 4 p.m. (Cushen).
Mexico:
XEQQ, Mexico City 9680kc, 30.99m
Can be heard if sorted out (Keats).
XEWV, Mexico City 9503kc, 31.57m
Good from 3.30 p.m. (Keats).
XEXA, Mexico City 6180kc, 48.54m
South:
Brazil:
PSE, Rio de Janeiro 14,935kc, 20.08m
PSF, Rio de Janeiro 14,690kc, 20.42m
PSH, Rio de Janeiro 10,220kc, 29.35m
The best Brazilian (Gaden).
PYA-2, Rio de Janeiro 9205kc, 32.59m
Not heard for many months (Gaden).
PRA-8, Pernambuco 6010kc, 49.92m
Not heard for a long time (Gaden).
British Guiana:
VP3BG, Georgetown 6130kc, 48.94m
This country is in the news again.
Ecuador:
HCJB, Quito 12,460kc, 24.08m
Fair signal 10 p.m.
HCQR, Quito 5975kc, 50.21m
R6 at 10 p.m. (Taylor).
Chile:
CB-1180, Santiago 11,945kc, 25.12m
Bugle notes when closing at 3 p.m.
(Cushen). Good at 9.45 p.m. (Gaden).
CD-1190, Valdivia 11,910kc, 25.19m
American mail says "Now off the air," as
also CB-1185.
CB-1170, Santiago 11,700kc, 25.64m
Can still be heard after 7 a.m. (Gaden).
CB-970, Valparaiso 9730kc, 30.83m
Reliable Chilean. Good 10 p.m.
Colombia:
HJFK, Pereira, Caldas 6095kc, 49.22m
Note new frequency.—Ed. Heard signing
off at 1.30 p.m. (Olthoff, Kansas, U.S.A.).
"La Voz Amiga" ("The Friendly Voice"),

2,500 watts. Apartado 99. This is a good
station and should be heard in Australia
(Shields, Boulder Creek, U.S.A.).
HJBB, Cucuta, Santander del Norte
4815kc, 62.31m
Signs off at 2 p.m. with an R10, Q5A5
signal (Olthoff, Kansas, U.S.A.).
Peru:
OAX4R, Lima 15,150kc, 19.81m
R5 at 7.40 p.m. (Byard). Good and clear
on last two Sundays near 5 p.m. (Gaden).
(These two reports are very interesting, as
previously have only been noted in a.m.—
Ed.)
OAX5C, Ica 9430kc, 31.82m
Very good in afternoon (Schooth, Taylor).
OAX4J, Lima 9340kc, 32.12m
Heard near 4 p.m. Think he re-opens about
11 p.m. (Gaden).
Uruguay:
CXA-8, Montevideo 9640kc, 31.12m
R7 at 4 p.m. Sundays (Taylor).
CXA-19, Montevideo 11,705kc, 25.63m
Quite good at 7 a.m. (Keats). (This is the
earliest this station has been reported.—
Ed.)
Venezuela:
YV5RM, Caracas 4890kc, 61.35m
Relays YV5RB of the long-wave. Try it
Sunday nights about 11.30 p.m.—Ed. Re-
ported by Olthoff, Kansas, U.S.A.
Note change in frequency—a habit with
South Americans. Mr. Cushen got a veri-
fication when they were an 5010kc,
59.88m.—Ed.

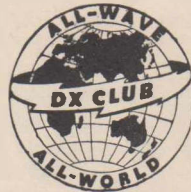
THE EAST

Burma:
XYZ, Rangoon 6007kc, 49.94m
Schedule: 9.45 p.m. to 1 a.m., except Sun-
days. News at 12.30 a.m.
Very good at 10 p.m. and 12.30 a.m.
(Gaden, Bantow).

XZZ, 3490kc, 86.00m
In parallel with XYZ.
China:
XGOX, Chungking 15,200kc, 19.74m
Schedule: 10-11.5 a.m.; 2.30-6.5 p.m. Eng-
lish news at 5.20 p.m.
FFZ, Shanghai 12,090kc, 24.83m
Schedule: 8 p.m.-1 a.m. News 11 p.m.
Fair at 10 p.m.
XGRS, Shanghai 12,015kc, 24.97m
Schedule: 7 p.m. to 1 a.m.
"The Voice of Europe." News 10.30 p.m.
and 12.15 a.m., good
XGOY, Shanghai 11,900kc, 25.21m
7.30-8.30 a.m.; 8 p.m.-2.50 a.m. (News at
8.15 p.m.); 3-4.35 a.m.
XMHA, Shanghai 11,885kc, 25.24m
Schedule: 7 p.m. to 1 a.m. News, 10 p.m.,
12.15 a.m. Children's session 7 to 7.15
p.m.
XGOK, Canton 11,605kc, 25.75m
Strong each night. News at 10.30 p.m.
XOZS, 10,040kc, 29.88m
R4 at 10.30 p.m. This is a new one re-
ported by Mr. Byard and Mr. Keats, of
Launceston.
XGOX/XGOY, Chungking 9720kc, 30.85m
10-10.20 p.m.; midnight to 12.10 a.m.; 1-2
a.m.; 5-7.20 a.m.
XGOY, Chungking 9635kc, 31.14m
Schedule: Midnight to 12.55 a.m. News at
midnight.
XGOY, Chungking 9500kc, 31.58m
5 a.m. to 7.20 a.m. in Chinese.
XPSA, Kweiyang 8484kc, 35.36m
Note change in frequency. Terrific signal
8.30 p.m. to 2.10 a.m. Good 12.15 a.m.
(Keats).
XGOY, Chungking 9,500kc, 31.58m
Often heard at 6.30 a.m. (Gaden).
XHHB, Shanghai 7970kc, 37.6m
Heard regularly at 11 p.m. (Keats).
Portuguese China:
CRY-9, Macao 6080kc, 49.34m
Schedule: 10.30 p.m. to 1 a.m. Mondays
only.
Quality is invariably poor.
Thai:
H56PJ, Bangkok 19,020kc, 15.72m
Monday nights from 11 p.m. till 1 a.m.
H5P5, Bangkok 11,715kc, 25.61m
Schedule: 10.50 p.m. to 1 a.m. except Mon-
days. News, 11.45 p.m.
Dutch East Indies:
PMA, Bandoeng 19,380kc, 15.48m
Schedule: 10.15 to 11.15 p.m. News, 10.45.
Good from 10.15 p.m.
YDB, Soerabaya 15,315kc, 19.59m
Stronger than YDC at 2 p.m. (Nelson).
Really good till closing at 5 p.m. (Deppeler,
Schooth). (This is seldom reported. Schedule
is 1.30 to 5 p.m., and on Sundays from
10.30—Ed.)
YDC, Bandoeng 15,150kc, 19.80m
Schedule: 8.30 to 10.30 a.m., 1.30 to 5
p.m., 7.30 p.m. to 1.30 a.m.
Opens at 8.30 a.m. Excellent in exercises
at 8.45 a.m. Marvellous improvement
(Fitzgerald). Good from 7.30 p.m.
PLJ, Bandoeng 14,630kc, 20.51m
Schedule: 7.30 p.m. to 3 a.m.
Fairly good after 7.30 p.m. (Schooth). Good
at 10 a.m. (Gaden).
PLS, Java 11,650kc, 25.75m
Mr. Perkins, of Malanda, Queensland, heard
this one at good strength one night at
10.10. (I have no particulars; perhaps it
was on test the same as PLM, PLQ and
PLT.—Ed.)
PLN, Bandoeng 11,600kc, 25.86m
Tipped off by Mr. Gus Muller that Java was
testing here, I heard the announcement at
10.50 p.m.: "Hullo, Manila. Hullo Hong
Kong. This is Java. PLN, Bandoeng, Java."
More music, and repeated once or twice
till 11, when they appear to close without
any further announcement.
PLP, Bandoeng 11,000kc, 27.27m
Schedule: Same as YDC.

ALL-WAVE ALL-WORLD DX CLUB

Application for Membership



The Secretary,
All-Wave All-World DX Club,
117 Reservoir 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).

(Continued on page 36)

LOGGINGS (continued)

Now high-class till after 10 a.m. (Gaden). Only fair at night.
 Not up to standard of **YDC** (Fitzgerald).
PLQ, _____ 10,680kc, 28.09m
 Same remarks as **PLN**.
PMN, Bandoeng 10,260kc, 29.24m
 Schedule: Same as **YDC**.
 Good every night.
YDB, Bandoeng 9550kc, 31.41m
 Schedule: 7.30 p.m. to 1.30 a.m.
 Fairly strong late evenings (Bantow).
PLT, _____ 9419kc, 31.85m
 Same remarks as **PLN** and **PLQ**.
YDA, Tandjongpriok 7250kc, 41.38m
 Fair at night (Nelson).
YDX, Medan 7220kc, 41.55m
 Strong 10 p.m. (Hastings, Rogers).
PMY, Bandoeng 5145kc, 58.3m
 Good, but noisy (Hastings).
YDF, Soerabaya 4960kc, 60.48m
 Loud but noisy (Hastings).
YDE-2, Solo 4810kc, 62.37m
 Good, when QRM not too bad (Taylor).
YDH-4, _____ 3320kc, 90.36m
 R5 at 12.30 a.m. (Taylor). This is the 30-watt station mentioned by Mr. Cushen in Xmas issue.—Ed.)
YDA, Tandjongpriok 3040kc, 98.68m
 A really good, clear signal (Gaden, Taylor).
French Indo-China:
Radio Saigon, Saigon 11,780kc, 25.47m
 Schedule: 8.40 p.m. to 2 a.m. News, 8.45 p.m., 1.45 p.m.
 "The Voice of France in the Far East" is mentioned by all reporters as good. At 9 o'clock one night **Radio Saigon** were telling (in English) **Radio Bangkok** what they thought of them and suggesting that telegraphic services be restored without delay or else — It took them seven minutes to warn Bangkok; and then, what I thought was priceless, the lady announcer said, "And to brighten us up, Jack Hylton and his Band will now play 'Fancy Meeting You.'"—Ed)
Radio Saigon, Saigon 6180kc, 48.54m

Good (Bantow, Cushen, Deppeler, Knewstubb).
Hong Kong:
ZBW 9525kc, 31.49m
 Schedule: 8 p.m. to 1 a.m. Relays B.B.C. News at 11 p.m.
 Mr. Beattie is finding it difficult to hear B.B.C. at 11 p.m., probably getting a side wave of **JZ1**.—Ed.
India:
VUD-3, Delhi 15,290kc, 19.62m
 Fair signal in afternoon (Nelson, Schooth, Byard). News at 1.20 p.m. and 6 p.m. (Beattie).
VUD-4, Delhi 11,830kc, 25.36m
 Nightly from 9.30 p.m. Closes 3.20 a.m. News, 10.30 p.m., 1.50 a.m., 3.15 a.m.
VUD-2, Delhi 9590kc, 31.28m

QSL EXCHANGE

An enthusiastic dxer who wishes to exchange his card with other club members is:

MAX STEVENS (AW648DX),
270 Bulwara Raad,
Broadway,
Sydney.

Schedule: 9.30 to 2 a.m. News, 10.30 p.m., 1.50 a.m.
VUC, Calcutta 6110kc, 49.1m
 Heard between 2.15 and 2.45 a.m. (Hallett).
VUE, Delhi 6085kc, 49.30m
 Opens at 11.30 p.m. (Rogers).
VUD-2, Delhi 4960kc, 60.48m
 Old schedule was: 8.30 p.m. to 2.30 a.m., but Mr. Cushen advises they move to 87 metres at 11.45.
VUB, Bombay 4880kc, 61.48m
 Not as good as two months ago (Hastings).
VUC-2, Calcutta 4840kc, 61.98m
 Weakening (Hastings).
VUD, _____ 3450kc, 87.00m

Opens at 11.45 p.m.; good signals but noisy (Cushen).

Japan:
 (Tokyo considered source of supply unless otherwise mentioned)
JZK 15,160kc, 19.79m
 Opens up fairly well at 11 a.m. (Schooth, Gaden). R4 at 4.20 p.m. (Byard).
JLG-4, _____ 15,105kc, 19.86m
 Very good between 7 and 8 p.m. (Fitzgerald). Fair from 11 a.m. (Schooth, Byard, Gaden).
JVH 14,600kc, 20.55m
 Heard calling at 8 p.m. on January 5 what sounded like **HJAA**. Very loud signal (Schooth). Heard calling **KHE** (Gaden). Weak at 10 p.m. (Flegg). Weak midnight; better 1 a.m. (Flegg, Keats).
JVZ-2 11,815kc, 25.39m
 News at 11 a.m. (Gaden).
JZJ 11,800kc, 25.42m
 Weak at 10 a.m., but powerful at night. News at 8.30 (all reporters).
JVW-3 11,720kc, 25.6m
 Very loud from 7.30 p.m. (all reporters). Heard at 10 a.m. (Gaden). Good as early as 4.15 p.m. (Schooth). Also heard from 7.15 a.m. Physical exercises to accompaniment of piano at 7.30 a.m.—Ed.
JDY 9920kc, 30.23m
 Fair signal, poor quality.
JIE-2, _____ 9695kc, 30.96m
 Heard from 7 p.m. in parallel with **JVW-3** (Schooth, Byard).
JZI 9535kc, 31.46m
 Good from 4.30 p.m. with News (Beattie). Excellent 5 to 6 p.m. (Mitchellhill). Opens at 6 p.m. and puts **VPD-2**, Suva, out of business.—Ed.
JIE, Tyureki 7290kc, 41.15m
 Good at 8.30 a.m., but weak by 10 a.m. (Gaden).
JVW 7257kc, 41.34m
 Loud around 5.30 a.m.
JLT 6190kc, 48.47m
 Fair around 5 a.m. (Hastings, Taylor).
MTCY, Hsinking 11,775kc, 25.48m
 Poor at 7 a.m. (Gaden).
MTCY, Hsinking 9545kc, 31.43m
 Good around 7.30 a.m. (Deppeler, Taylor, Schooth).


Malaya:
ZHP-1, Singapore 9700kc, 30.92m
 Good from 9 p.m.
ZHP-3, Singapore 7250kc, 41.38m
 Good signal around 10 p.m.
ZHJ, Penang 6090kc, 49.26m
 Fair signal at night; relays B.B.C. at 11.
Philippines:
 (Manila, unless otherwise stated)

KZRH 11,890kc, 25.23m
 Apparently abandoned for time being. Mr. Hallett reports hearing announcement on January 6 that, unless listeners wished the session continued, it would be dispensed with. (Session referred to, 2 to 3 a.m.—Ed.)
KZRH 9640kc, 31.12m
 Acclaimed by all reporters as the strongest of the Manila stations. (6 p.m. to 2 a.m.; News at 11.45 p.m.—Ed.)
KZRM 9570kc, 31.35m
 Generally spoilt by Russian.
KZIB 9500kc, 31.58m
 Not up to standard (Schooth). 1 concur.—Ed.)
KZRF 6140kc, 48.86m
 Classed as a champion.
KZRC, Cebu 6100kc, 49.18m
 Very strong at 11 p.m.
KZIB 6055kc, 49.54m
 Noise spoils this otherwise loud signal.

GREAT BRITAIN

E.T., Eastern Transmission; P.T., Pacific Transmission; A.T., American Transmission.
 "This is London calling. Here is the News."
GST 21,550kc, 13.92m
 E.T., 8.55 p.m. to 2.30 a.m.
GSJ 21,530kc, 13.93m
 E.T., 11.45 p.m. to 2.30 a.m.
GSH 21,470kc, 13.97m
 No particulars.
GSV 17,810kc, 16.84m
 E.T., 8.55 p.m. to 2.30 a.m.; P.T., 5.30 to 8 p.m.

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NAME

STREET and NUMBER

CITY STATE

THE AUSTRALASIAN RADIO WORLD
 117 RESERVOIR STREET, SYDNEY

GSG 17,790kc, 16.86m
 E.T., 8.55 p.m. to 11.30 p.m.
GSP 15,310kc, 19.60m
 P.T., 5.30 to 8 p.m.
GSI 15,260kc, 19.66m
 P.T., 4.10 p.m. to 8 p.m.; 2.55 a.m. to 8 a.m.
GSO 15,180kc, 19.76m
GSF 15,140kc, 19.82m
 E.T., 8.55 p.m. to 11.30 p.m.; P.T., 5.30 to 8 p.m. 2.55 a.m. to 8 a.m.
GRV 12,039kc, 24.92m
GSE 11,860kc, 25.29m
 8.55 p.m. to 2.30 a.m.
GSN 11,820kc, 25.38m
 8.55 p.m. to 2.30 a.m.; 2.55 a.m. to 8 a.m.
GSD 11,750kc, 25.53m
 E.T., 8.55 p.m. to 2.30 a.m.; P.T., 5.30 to 8 p.m.
 A.T., 8.20 a.m. to 2.45 p.m.; 2.55 a.m.-8 a.m.

WITH THE REPORTERS

Twenty-eight gentlemen have helped me compile our loggings this month.

They are:—

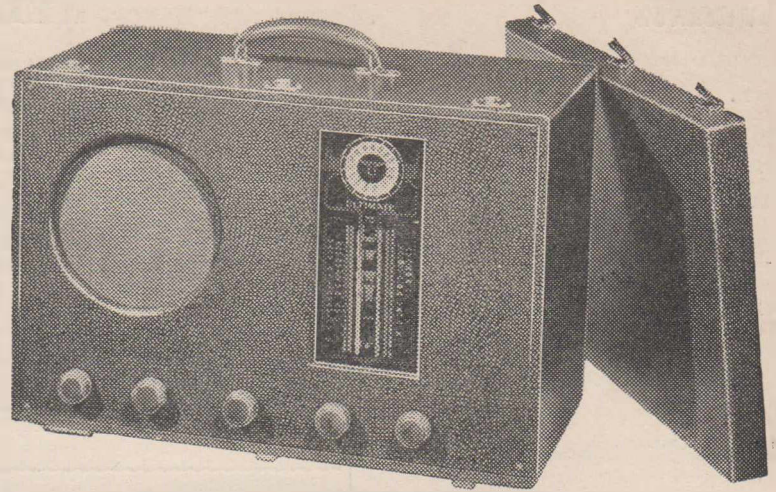
- Wm. Bantow, Edithvale, Vic.
- A. Beattie, New Lambton, N.S.W.
- P. Byard, Launceston, Tas.
- H. A. Callender, Hobart, Tas.
- A. T. Cushen, Invercargill, N.Z.
- A. Deppeler, Edmonton, Q.
- J. J. Fitzgerald, Randwick, N.S.W.
- A. L. Flegg, Melbourne, Vic.
- Dr. K. B. Gaden, Wallumbilla, Q.
- N. E. Gandy, Wellington, N.Z.
- R. Hallett, Enfield, Sydney.
- D. J. Hastings, Ashgrove, Q.
- J. Horn, Hurlstone Park, Sydney.
- B. W. Keats, Launceston, Tas.
- E. Knewstubb, Lyttleton, N.Z.
- K. B. Mitchelhill, Muswellbrook, N.S.W.
- G. Muller, Newtown, Sydney.
- S. I. Nelson, Cairns, Q.
- Martin J. Olthoff, Independence, Kansas, U.S.A.
- W. H. Pepin, Maylands, W.A.
- H. Perkins, Malanda, Q.
- M. Rogers, Hunter's Hill, Sydney.
- C. Schodel, Brisbane, Q.
- E. J. Shields, Boulder Creek, California, U.S.A.
- R. C. Schooth, Deagon, Q.
- P. L. Smith, Dunsborough, W.A.
- E. J. Stanke, Mt. Gambier, S.A.
- R. Taylor, Mosman, Sydney.

Gentlemen, I thank you.

Send in reports as fast as you hear anything unusual; also items for "Help Wanted."

GRX 9690kc, 30.96m
 2.55 a.m. to 9 a.m., 3.30 p.m. to 8 p.m.
GRY 9600kc, 31.25m
 A.T., 8.20 a.m. to 2.45 p.m.; P.T., 4.10 to 5 p.m.; E.T., 8.55 to 10 p.m.; 2.55 a.m. to 8 a.m.
GSC 9580kc, 31.32m
 P.T., 4.10 to 5.30 p.m.; A.T., 8.20 a.m. to 2.45 p.m., 5.30 a.m. to 8 a.m.
GSB 9510kc, 31.55m
 E.T., 11.45 p.m. to 2.30 a.m.; P.T., 4.10 p.m. to 8 p.m.
GRU 9450kc, 31.75m
 E.T., 11.45 p.m. to 2.30 a.m.
GSW 7230kc, 41.49m

(Continued on next page)



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NAME

ADDRESS

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Champion Radio

GEORGE BROWN & CO. PTY. LTD., 267 Clarence St., Sydney

LOGGINGS

(continued)

GRT 7132kc, 42.06m
2.55 a.m. to 4.15 a.m.

GRW 6140kc, 48.82m
Appears to be silent.

GSL 6110kc, 49.10m
A.T., 8.20 a.m. to 2.45 p.m.

GRR 6080kc, 49.34m
1 a.m. to 9 a.m. News, 3 a.m. and 6 a.m.
Excellent signal, too.—Ed.

GSA 6050kc, 49.59m
3.30 p.m. to 8 p.m.; 8.55 p.m. to 2.30 a.m.;
2.55 a.m. to 9 a.m.
Morning session is generally spoilt by noise.

STATION ANANIAS
Reported by Byard, Stanke, Nelson, Beattie,
Flegg, Keats, Taylor, Gaden, Schooth, Dep-
peler, Gandy, and nearly all refer to swirling
noise.

Holland:

PCV, Amsterdam 18,070kc, 16.6m
Can be logged when noise abates.

PCJ-2, Huizen 15,220kc, 19.71m
Opens at 9.30 p.m. (Subject to the swirling
noise on **PCV**.—Ed.)

Vatican City:

HVJ 15,120kc, 19.84m
Tuesdays: 11.30 to 11.55 p.m. (English).

HVJ 6190kc, 48.47m
(English session is: 5.15 to 5.30.—Ed.)

Portugal:

CTV-2, Monsanto 11,148kc, 26.91m
Reported last month by Dr. Gaden as heard
at 3 a.m.

CSW-6, Lisbon 11,040kc, 27.17m
Schedule: 3 a.m. to 6.45 a.m.
Very good at 5 a.m. Best at 6 a.m.

CSW-7, Lisbon 9740kc, 30.8m
Schedule: 6.50 to 9 a.m. Talks: On Wed-
nesday, Friday and Sunday from 6.50 a.m.
to 7.30 a.m.

CSW-8, Lisbon 7260kc, 41.32m
Schedule: Wed., Fri. and Sun., 7.05 to 8
a.m. Reports, please.—Ed.

CS2WD, Portugal 6200kc, 48.38m
See "New Stations."

Roumania:

Radio Bucharest 9245kc, 32.45m
R5 at 5.45 a.m. (Byard).

Russia:
("This is Radio Centre, Moscow, calling")

RW-96 9520kc, 31.51m
Strong from 7 p.m. Kremlin bells at 7 a.m.
(Schooth).

..... Moscow 6110kc, 49.10m
Heard late at night and early morning.
Physical jerks at 7 a.m.

RW-96 6061kc, 49.5m
Midnight to 8 a.m.

RV-59 6030kc, 49.75m
Great signal in morning (Schooth, Muller).
(In this I most certainly agree.—Ed.)

RV-15, Khabarovsk 4250kc, 70.59m
R7 at 9.30 p.m. (Taylor, Fitzgerald).

Spain:

EAQ, Madrid 9860kc, 30.43m
Good in mornings.

EAJ-9, Malaga 7170kc, 41.75m
Radio Espagna, San Sebastian, 7210kc, 41.6m
Fair at 6.30 a.m.

Radio Malaga, Malaga 7120kc, 42.1m
Heard at fair strength at 6.30 a.m.

Switzerland:

HBH, Geneva 18,480kc, 16.23m
Schedule: 11.45 p.m. Fridays to 1.10
a.m. Saturdays. News at 12.5 a.m.

HBJ, Geneva 14,535kc, 20.65m
First Sunday in the month. 3.45 p.m. to
5.10 p.m.

Radio Suisse, Schwarzenburg, 11,870kc, 25.28m
Not heard lately. Spoilt by **VLQ-2**.

HBO, Genoa 11,402kc, 26.31m
Same remarks as **HBJ**. Fair signal.

Radio Suisse, Schwarzenburg, 6165kc, 48.56m
Schedule: 4.30 to 7.30 a.m.

Yugoslavia:

YUF, Belgrade 15,240kc, 19.68m

HELP WANTED

Stations reported but not identified.

This column contains stations reported but not actually identified. Readers will show a fine co-operative spirit if, where they can, they help us to establish their identity.

On 48.4m (just below Jap): From 6 a.m. Sounds like a South American (Gaden). (This may be CS2WD — see "New Stations."—Ed.)

On 50.2m: About 10 p.m. Sounds like South American (Gaden). This is most likely **HC2RX**, Quito, 5970kc, 50.2m.—Ed.

Call-signs for the following Russians: 18.38m, 18.61m, 19.23m, 30.97m.

Some of these we have mentioned several times, but Mr. Byard is hearing them again.

On 30.77m, closing at 6 a.m., is a station that uses all French and is Free French. No call-sign or destination has been heard, despite a constant vigil by Mr. Muller and myself since he first drew my attention to it. Signal strength is invariably good, but may be considered only fair compared with **Radio Roma** just nearby on 30.72m. Unfortunately, the station is irregular, but is certainly worth logging.

Schedule: 5 to 6 p.m.
YUB, Belgrade 6110kc, 49.18m
Schedule: 2 to 7 a.m.

SCANDINAVIA

Norway:
LKQ, Oslo 11,735kc, 25.57m
No reports.

Sweden:
SBT, Stockholm 15,150kc, 19.8m
Schedule: 6 p.m. Sundays to 3 a.m.
Mondays.

SBP, Stockholm 11,710kc, 25.63m
Same schedule as **SBT**.

MISCELLANEOUS

Arabia:
ZNR, Aden 12,110kc, 24.76m
Very poor at 3.30 a.m. (Gaden).

Canada:
CKFX, Vancouver 6080kc, 49.34m
Heard at 6 p.m. (Fitzgerald).

CJCX, Sydney, Nova Scotia 6010kc, 49.92m
Heard for first time at 10 p.m. (Gaden).

RADIO CANADA, Quebec 6160kc, 48.70m
See "New Stations."

Greece:
SVJ, Athens 9825kc, 30.54m
SVM, Athens 9935kc, 30.196m
Schedule: 5.40 to 6 a.m. News 5.45.
Twenty minutes in English directed to United Kingdom. Splendid signal.

SVM, Athens 7075kc, 42.4m
Schedule: 4.45 to 8.50 a.m. Hardly audible at Randwick.—Ed.

Iran (Persia):
EPB, Teheran 15,100kc, 19.85m
Schedule is supposed to be: 6 to 8.30 p.m.

Iraq:
HNF, Baghdad 9820kc, 30.55m
EQC, Teheran 9680kc, 30.99m
Schedule is: 11.45 p.m. to 2.45 p.m.

EQB, Teheran 6155kc, 48.74m
Schedule is: 11.45 p.m. to 6 a.m. News 4.30 a.m.
Fair in early mornings.

Turkey:
TAQ, Ankara 15,190kc, 19.74m
Schedule: 3 p.m. to 4 p.m., 7 p.m. to 9.30 p.m. News 9.15 p.m.

TAP, Ankara 9465kc, 31.70m
Schedule is: Midnight to 6.30 a.m. News at 4.15, and on Sundays a talk in English at 5.50.

Location Unknown:
"Christian Peace Movement," 9440kc, 31.76m
or 9530kc, 31.46m or 9228kc, 32.51m
May be any of these, between 5.45 and 6 a.m. (Muller).

German Freedom Station 9804kc, 30.6m
Opens at 6 a.m. with familiar "Achtung! Achtung!" Irregular.

WEST INDIES

Cuba:
Havana unless otherwise mentioned

COCY 11,470kc, 26.00m
Schedule: 11 a.m.-2.55 p.m.; 9.45 p.m. to midnight.

COHI, Santa Clara 11,500kc, 26.09m
Schedule: 5.30 a.m. to 9.30 a.m., 3 to 4 p.m., 9.45 p.m. to midnight.
Good at 9.45 p.m. (Fitzgerald). R4 at 7 a.m. (Byard).

COCM 9835kc, 30.51m
Schedule: 11 p.m. to 3 p.m. Heard well in mornings.
Strong at 7.30 a.m. (Fitzgerald). R6 at 11 p.m. (Byard).

COCB 9360kc, 32.04m
"El Progreso Cubano." Fair at 11.10 p.m. (Byard).

COCH 9437kc, 31.82m
Note change in frequency. This is from **Radio-Guia**, the Cuban magazine. Is anyone hearing this station?

COBY 9215kc, 32.55m
This is no longer shown on Cuban lists.

COCK 9200kc, 32.61m
R6 at 10 p.m. (Byard, Keats, Taylor).

COBZ 9030kc, 33.32m
Weak at 2 p.m. (Keats, Byard).

COCQ 8850kc, 33.90m
Gives religious service at 11 p.m., English and Spanish (Nelson, Gaden, Byard, Flegg, Schooth, Callender, Fitzgerald).

COCO 8700kc, 34.48m
Schedule: 10.30 p.m. to 3 p.m. next day.
Good till 6 p.m. some days (Schooth, Cushen). Good 1.15 p.m. (Byard).

COHI, Santa Clara 6455kc, 46.48m
9.45 p.m. to midnight. Good programme (Fitzgerald, Schooth, Cushen).

COCQ 6365kc, 47.14m
I think this chap has moved to 6350kc, 47.26m. Would welcome reports.—Ed.

COCW 6324kc, 47.47m
Sometimes very good, but appears to be irregular in transmissions.—Ed.

Haiti:
HH3W, Port-au-Prince 9883kc, 30.35m
R7 at 5.45 a.m. (Byard).

Dominican Republic:
HIIN, Trujillo City 12,486kc, 24.03m
R4 at 11.20 p.m. (Byard, Nelson).

HI2G, Trujillo City 9295kc, 32.28m
Think this is only on from 2.30-3.30 p.m. (Gaden).

HI1J, San Pedro de Macoris 5970kc, 50.25m
Closes at 3 p.m. with march (Cushen). R3 at 9.15 p.m. (Taylor).

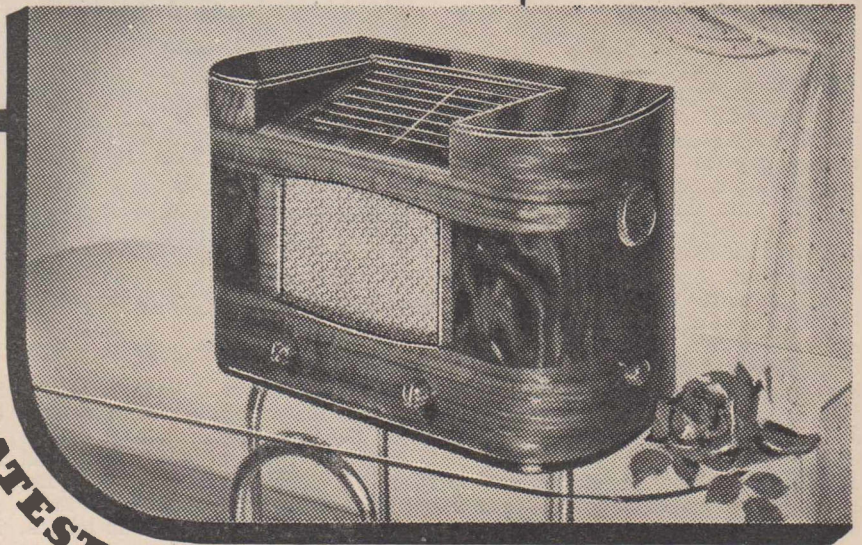
Guadeloupe:
FG8AH, Point-a-Pitre 7440kc, 40.32m
"The Voice of Colonial France" broadcast pro-Vichy programmes from 9 to 10 a.m. Reports please!

Martinique:
RADIO MARTINIQUE, Forte-de-France
9705kc, 30.92m
Can be heard weakly at 8.30 a.m. (Gaden).

*Bandspreading..
plus All-Wave
... has arrived!*



THE GREATEST



RADIOLA ACHIEVEMENT !

WORLD RECEPTION MADE EASY

A.W.A. announces a big advance in receiver design. For the first time, international short-wave reception is on a basis comparable with that from local stations. Tuning difficulties have been swept away, while a continuous tuning range from 13.35 to 550 metres enables reception of stations not previously heard. The introduction of these magnificent 6-valve instruments represents a triumph for the A.W.A. radio research laboratories.

Special Features: Six A.W.A. Valves ★ Seven Wave Ranges covering ALL wavelengths from 13.35 to 550 metres ★ Bandspreading. Overseas stations may be tuned in as easily as local medium-wave stations ★ Micrometer right-hand tuning control ★ Magnificent table and console cabinets.

PRICES: Model 276 Console £39 10 0 including Sales Tax
Model 701 Table £29 10 0 including Sales Tax

THE FISK

Radiola

MANUFACTURED & GUARANTEED BY

R4/41

AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED

Calstan

CODE PRACTICE OSCILLATOR

Build this code practice oscillator and practise the morse code in your spare time.

The code practice oscillator described here is ideal for anyone wishing to learn the morse code at home, or perhaps in the lunch hour.

Being very compact, measuring only 6" x 4½" x 4," it can be carried to work with ease.

Getting Started

Having the audio oscillator equipment all ready for use, one should familiarise oneself with the action of the key and the sounds from the oscillator. If the tone doesn't suit the ear, then adjust the pitch until the note may be considered pleasant to listen to. That is a matter for individual liking.

Put in some time getting accustomed to the feel of the key, repeating each letter several times until satisfied that the spacing of "longs" and "shorts" is correct. Once the code is fairly well memorised, a good plan is to send to oneself for considerable periods whilst reading from a book. Don't worry about punctuation until thoroughly conversant with letters and figures.

There are some people to whom the mental acquisition of the morse code in perfect rhythmic sense appears to be a real obstacle, but the root of such failure invariably lies with the method of learning. It is not enough

to study the morse alphabet with the idea that the letter "A" is represented by a dot and a dash, that "B" is a dash and three successive dots, and so on. The sense that must be acquired is the rhythmic sound of those symbols which go to make up letters, figures, etc. Once the learner has memorised the complete alphabetical and numerical symbols, he should cease to think of them as dots and dashes.

Once a fair amount of confidence

is gained, then is the time to enlist the help of a good operator to send copy to you. A good instructor will not try to hurry things along, but will send deliberately and slowly, gradually raising the speed as proficiency in reception improves. Above all, remember that the all-important thing is "correct spacing." A medium-speed operator with perfect spacing is a far better man than a speed merchant with a stumbling "fist."

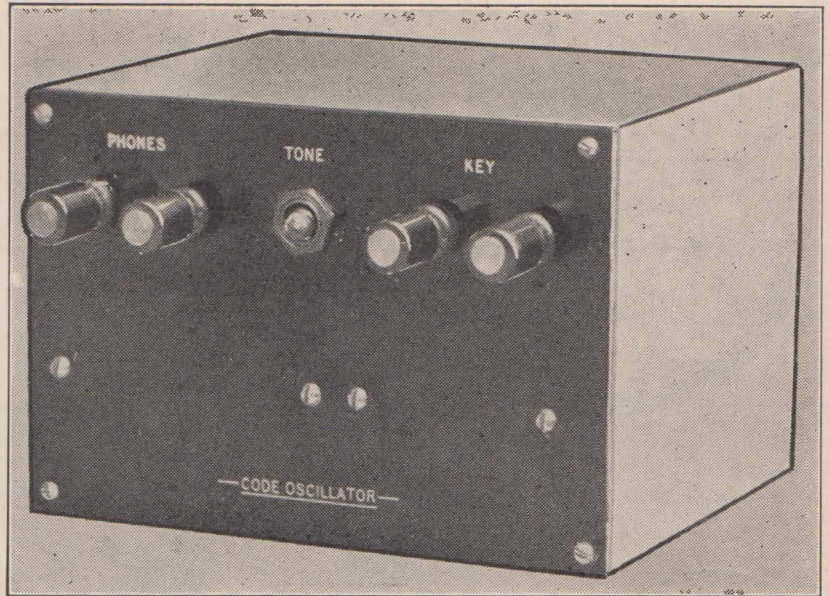
Once the code is fairly well established in the mind, get the habit of reading shop signs and the like to yourself in morse. Again, never think of dots and dashes, but always of the "dits" and "dahs" of the morse code as it appears to the ear.

It will be obvious to all that at the present time the demand for good morse operators is a large one, and the lot of the wireless operator in any of the fighting services is an interesting one. The operator on active ser-

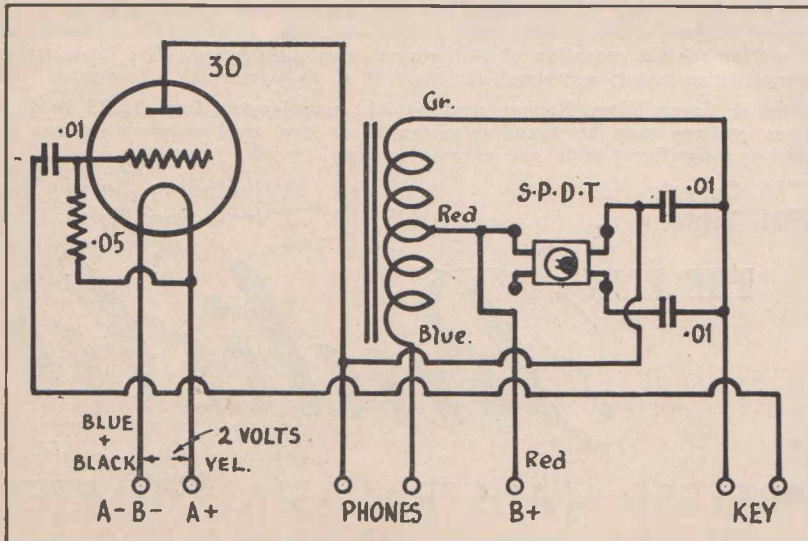
Left: The circuit. Note how a S.P.D.T. switch is used to change the tone.

vice has a sense of knowing that he is a valuable item in the machinery of communication, and communications are the heart of the fighting services. An army cut off from all communication is an army lost.

(Continued on page 42)



The code practice oscillator fitted into a compact case.



Air Test of RADIOLA MULTI-BAND MANTEL MODEL

A review of the latest Radiola models 701 and 276, just released.

DESIGNED with a view to giving the most effective short-wave reception, the new Radiola models 701 and 276 are easily the most advanced receivers released in Australia, covering six short-wave bands, as well as broadcast.

With a true appreciation of the requirements of the keen listener, the designers of these sets have provided a complete coverage from 13 metres to the top of the broadcast band, yet, by a remarkably effective application of the band-spread principle, the main short-wave broadcasting wave-bands have been opened up to make half a megacycle cover about an inch on the dial scale.

Due to this feature the tuning of the short-wave stations is just as simple as tuning in the broadcast stations and not in the least critical.

It is a vast help in the way in which it allows the position of a station to be noted, so that when again heard it can be readily identified by its wave-length.

A Practical Advantage

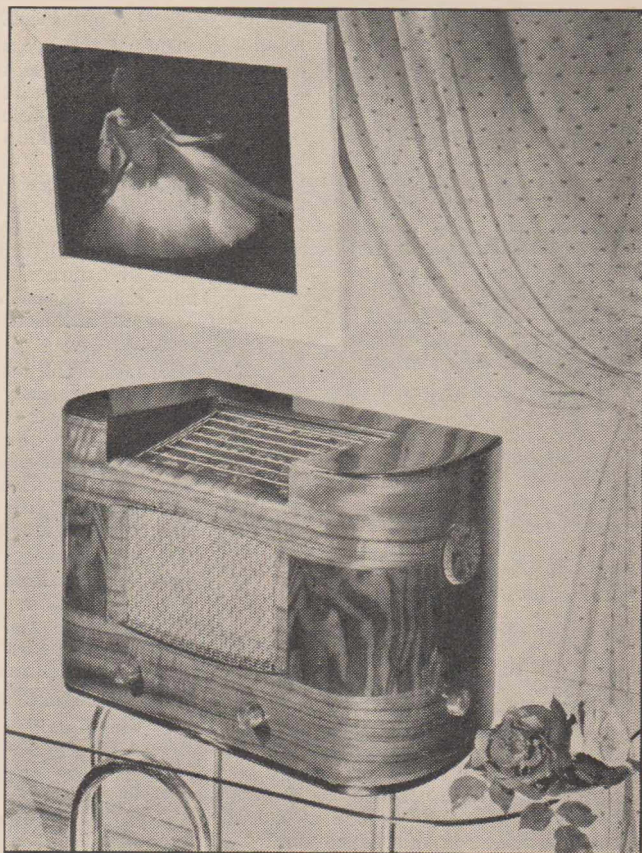
Handling the new Radiola makes it immediately evident that this attention to the matter of band-spread is a truly practical advantage and makes the set infinitely more effective, no matter whether in the hands of a novice or a keen short-wave listener.

Brilliant Performance

Quite apart from this "electrical" improvement, the inherent performance of the set from a radio point of view is extremely high, with intense sensitivity, yet an extremely low level of hiss and receiver noise. This has been obtained by keen attention to the efficiency of even the smallest component, and an inspection of the underside of the chassis reveals a degree of finish which is of a high order. In some receivers, noticeably those produced in America, the parts which are not seen are not so well finished and their ability to do the job is their only qualification. With this Radiola we notice that the parts not only perform well, but also look well.



Right: This photo. shows the attractive cabinet of the latest Radiola multi-band mantel radio. Note the large easy-to-read dial.



It is a thoroughly well-finished mechanical job from start to finish.

Tested on the Air

Putting one of the new Radiolas on the air for a test was a pleasure on a recent week-end, and it was with considerable regret that the receiver had to be returned on the Monday morning. Owing to an immediate demand for this new model, there was not a spare one available for an extended test. Even during the brief period the set was in our hands, however, we got to like it a lot. The large spin-control dial knob on the right-hand end of the cabinet proved to be particularly convenient. At a glance we thought it might be awkward to operate a knob without seeing it, but, after actually spinning the dial pointer along and picking up station after station, we found it suited us to perfection.

Handy Tone Control

Due to the application of inverse

feedback, in conjunction with an effective tone control, the quality of reproduction is excellent on the broadcast band, and yet the "highs" can be readily cut when tuning-in distant short-wave stations, so that the intensity of the static is eliminated, whilst the main body of the far-away signal is preserved to give good audibility, even under the most unfavourable reception conditions.

Easily the Best

Some months ago we wrote a favourable report about the first Radiola to be fitted with truly effective band-spread, but that model has been completely eclipsed by this latest six-band model with extended band-spread.

Splendid Value

Considering the performance and finish, the price of £29/10/- for the mantel model and £39/10/- for the console (with magic eye) appears to be most attractive.

... TRADE PARADE ...

LEVENSON'S NEW LINES

Something that is sure to create much interest at Levenson's radio is their large range of rough brass castings of scale model aeroplanes. When filed and generally cleaned up, with emery paper to your own discretion, the model may be sent to any chrome-plating works, and the finished product is something "out of the bag." Sleek in appearance, they are just the thing to show off that new radio receiver, bookstand and the like. When mounted on a smoker's stand assembly, available at Levenson's at a reasonable price, they make a handsome piece of furniture that would adorn any lounge room.

A large range of models is available and Levenson's staff will be only too pleased to let you inspect them. Chrome propellers suitable for attaching to the models are also available. Prices range from 2/6 to 5/- for the rough castings, an hour or so of home labour, plus the cost of chroming, still keeps the model at a very low minimum of price.

Morse Equipment

Still popular amongst the radio-minded public of Sydney is the Levenson's range of morse units. Complete sets, keys, buzzers, lights, etc., are available at Levenson's low prices.

Retailers! Call at, or write to, Levenson's Radio Store, 226 Pitt Street, Sydney, and secure a special quantity price for this equipment.

* * *

PARTS REQUIRED?

Intending "Radio World" kitset constructors can with confidence place their order in the hands of the Davis Radio Co., of 841 George Street, Sydney. Mr. Davis, manager of Davis Radio Co., personally attends to each and every kitset order received. The order is guaranteed to be 100 per cent. correct and, of course, the prices are at the lowest minimum. The firm's policy is that all goods to be despatched are sent with utmost haste. Mr. Davis says, "People who want parts generally don't want to wait a week before they get started with the construction."

This is a very good plan to follow, and we feel sure that many home constructors will appreciate it. Open on Friday nights till 8.30, the Davis Radio Co. carries a full stock of replacement parts for all radio receivers. Call in and see Mr. Davis personally. He will be only too pleased to attend to your requirements.

SOUND SYSTEMS BECOMING POPULAR

130 SPEAKERS IN DUNLOP FACTORY

One of the largest industrial plants in Australia has been equipped with Rola loud-speakers by Steane's Sound Systems of Melbourne. The huge works of Dunlop Perdriau Rubber Company Ltd., of Montague, cover very many acres of floor space and the equipment required is claimed by Steane's Sound Systems to be even more powerful than that recently supplied to Yarra Falls Ltd., which was then claimed as the most powerful sound installation of its kind in the world.

Although the sound system was installed essentially for paging, the management permits electrical gramophone records and radio programmes to be broadcast at certain times of the day. In this direction Dunlops are making use of the A.B.C. daily broadcast to factories.

This vast works employs 130 of the latest type of Rola permanent magnet loud-speakers, and the same speaker is used in all sections of the works, adjustment of power level being made by transformer ratio.

The speakers are mounted upon large baffle boards at strategic points throughout the plant and wired to the telephonist's switchboard, where they join the power amplifier.

Amplifying Unit

The amplifier utilises Australian-made transmitting valves, which develop an undistorted output of 1200 watts. From the transmitter, two channels are used in distribution to No. 1 and No. 2 works on either side of Normanby Road and there are two other rebate or relay units operating the engineering, stores, Latex and

raw material departments. Several miles of wire were used to connect up the Rola loud-speakers, each one being given a different voice and music power, correlated with the noise and area of the particular section. For instance, in the office area, the speakers are reduced in volume to that of an ordinary speaker voice, whereas in the masticating department each speaker dissipates several times the power of a good radio receiver.

Music While You Work

The providing of music for employees during fatigue periods has been given careful consideration, and both an automatic record-changer and radio-tuning devices are provided. A large record library has been installed in the telephonist's office, where hundreds of tabulated records are available for daily broadcasts. The automatic record-changer is arranged to play a selected programme for half an hour, after which it switches off.

Saving of Telephonist's Time

Although Dunlops have an extensive automatic house 'phone system with nearly a hundred lines, they find the microphone paging system an invaluable time saver. The needless waste of energy and time taken by a girl ringing various departments to locate executives or other wanted persons, has been eliminated, and contact can be made with any person in the works in a matter of seconds. In Dunlops' case, the telephonist makes upwards of a hundred calls daily. The saving in time in this direction alone runs into hours daily. In this way is internal efficiency increased and better service given to outside trade.

OSCILLATOR

(continued)

The British Empire is at war, and good telegraphists are needs. Better to present oneself for any signals unit with the knowledge that all you need to be coached in is service procedure, than to expect consideration for enlistment without any previous morse code knowledge.

Kit Available from Slade's Radio

A complete kit of parts for this code practice oscillator, complete with valve, batteries and housed in a grey

=====

NEXT MONTH —

A NEW AMPLIFIER

Brilliant Performance

at Low Cost

=====

ducoed steel base, but less 'phones and key, is available from Slade's Radio Pty. Ltd., Lang Street, Croydon, N.S.W., price £4/10/-, plus sales tax. The special centre-tapped modulation choke is also available separately at 7/6, plus sales tax.

CQ - CALLING ALL AMATEURS

Here is an excellent opportunity for amateur telegraphists to help in the National War Effort and get some good sending practice at the same time.

THE Voluntary Emergency National Training Schools — V.E.N.T.S.— are in need of more morse code instructors at their school for R.A.A.F. reservists. This, of course, only applies to amateurs who are not liable for military training.

Strict R.A.A.F. Lines

V.E.N.T.S. instruction is carried out on strict R.A.A.F. lines, and booklets for the guidance of instructors are available. They have a fine set of equipment, including a number of oscillators and a Wheatstone Automatic Transmitter for the faster classes.

Distinguished Visitors

On Wednesday, February 12, the V.E.N.T.S. School was visited by Sir

Right : V. E. N. T. S. morse instructor, A. S. Patterson, "Senior Radio Officer on Qantas Flying Boats," coaching Reservist Brain, a former world champion ice skater.



of physical fitness and how this should be maintained while waiting for their call-up.

Congratulations For V.E.N.T.S.

Sir Donald then went on to congratulate the reservists on the keen-

ness displayed in their studies, and the instructors for the fine work they were doing.

V.E.N.T.S. Progress

In the last few months the V.E.N.T.S. have turned out some hundreds of men and have been complimented by the R.A.A.F. officers on the high standard of their trainees. The V.E.N.T.S. effort is purely voluntary and the V.E.N.T.S. organisation has no connection with any particular firm.

To all interested parties, V.E.N.T.S. extends a cordial invitation to visit the school on the ground floor of Shell House, at the corner of Carrington and Margaret Streets, Sydney, any Monday, Wednesday or Friday evening between six and nine o'clock.

Where To Apply

Men willing to help in this good work are invited to write to the Chief Instructor, Box 1031 H, G.P.O., Sydney, or phone L 3688.

V.E.N.T.S. Personnel

Hon. secretary, G. E. C. Brown; Chief Theory Instructor, F. C. N. Smith; Theory Instructor, F. Dickson; Chief Morse Instructor, W. J. O'Brien.

Morse Instructors: Messrs. R. E. Haddock, G. M. Cutts, T. D. Brownlee, A. S. Patterson, T. J. Phillips, J. Millar, H. S. Young, D. W. Wall, A. J. Barnes and W. G. Hesson.

Messrs. J. P. Moore, V. Tuxford, H. R. G. Smith, L. J. Webster, L. P. Byrnes, J. B. Stephenson, W. V. T. Sutton, J. F. Hickey, F. J. Karnaghan, E. J. Kerr and D. Thomas, all telegraphists at the Chief Telegraph Office, G.P.O., Sydney, assist in morse instruction.

ness displayed in their studies, and the instructors for the fine work they were doing.

Visit from Air Chief

On the Friday following, February 12, Air Chief Marshal Sir Charles Burnett, Chief of the Air Staff in Australia, visited the reservists in training at the school. He inspected the classes, showing great interest in what was being done. He congratulated both the recruits and the V.E.N.T.S. officials on the excellent work they were doing and the wonderful opportunity they had been given for pre-call-up training.

Provides Excellent Opportunities

This pre-call-up training is very important to every reservist. It



Left : V. E. N. T. S. morse instructor Maxwell Cutts (in shirt sleeves, standing) initiating a class of beginners into morse code by singing the "Dit-dah" method.

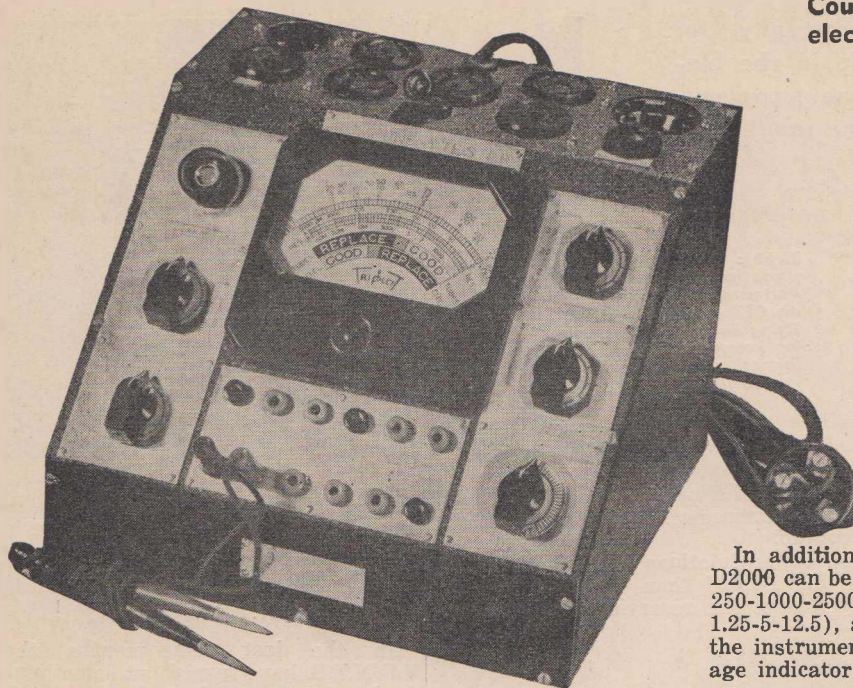


Donald Cameron, Chairman of the New South Wales R.A.A.F. Recruiting Drive Committee, Air Commodore Anderson, of R.A.A.F. Headquarters, Central Area, Point Piper, and a number of other Air Force officials. Sir Norman Nock, and representatives of the Shell Co., W. W. Campbell and Co. Ltd., Breville Radio Pty. Ltd. and other organisations which were responsible for the free supply of premises and materials used in the school, were also present.

After an inspection of the school with the classes in operation, Sir Norman Nock introduced Sir Donald Cameron, who addressed the reservists on the importance of the preliminary training they were undergoing. Sir Donald also stressed the importance

DELTA D1506 COMPONENT TESTER

Counter type checker tests valves, electros, resistors . . .



appliance tester, Model D2000, as illustrated.

This unit was fully described in last month's "Radio World." However, we repeat brief details of Model D2000 below for those who may not have seen the review last month:—

Model D2000 provides a quick and accurate means of testing power consumption of radios, refrigerators, fractional horse-power motors and household appliances generally under actual running conditions.

Power factor adjustment can be made when testing fractional horse-power motors, fans, etc., or any inductive loads, while another selector switch adjusts the line voltage from 200/250 to correspond with the operating voltage.

In addition to the above applications, the Model D2000 can be used as a wattmeter (ranges, 0-25-100-250-1000-2500), as an ammeter (ranges 0-0.1-0.5-1.25-5-12.5), and as a voltmeter (ranges 0-125-250). The instrument also incorporates a neon earth leakage indicator and continuity tester.

SPECIALLY designed for servicemen, the Delta component tester, Model D1506 is indeed a sound investment these days, an investment that's sure to bring big returns in increased profits. This model has been designed to provide a quick and accurate means of testing radio components, including valves, in view of prospective purchasers in shops and warehouses.

Tests provided for include those for:—

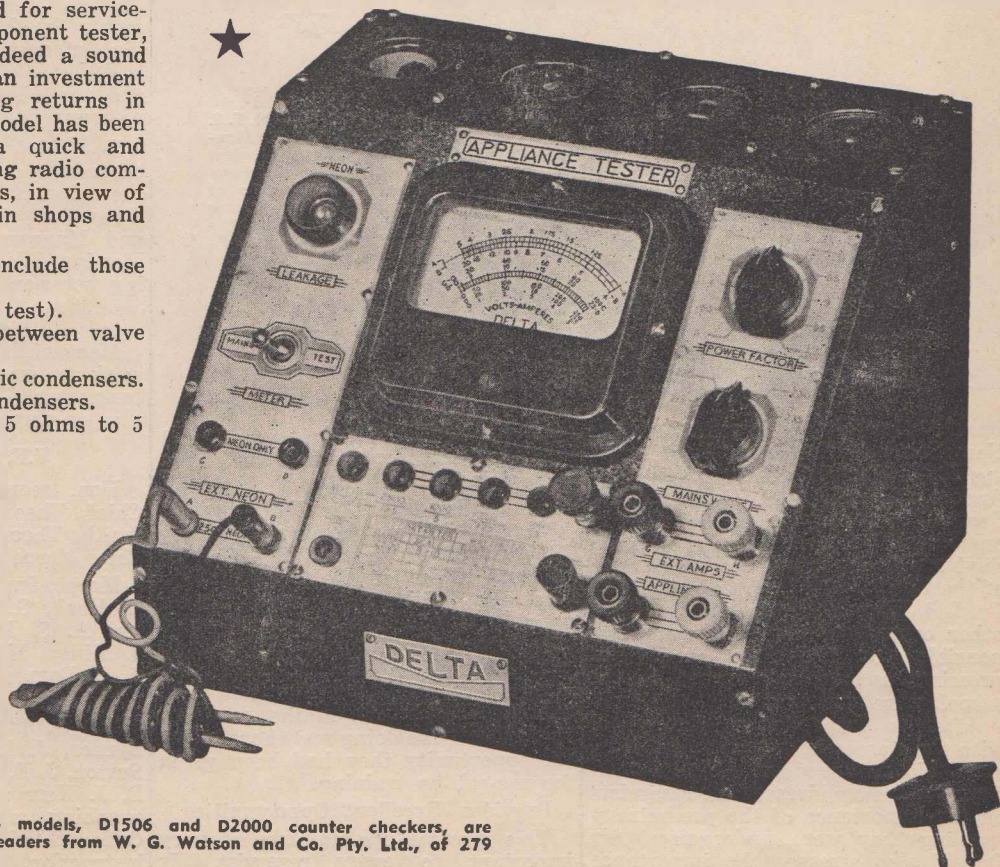
- Valve Merit (emission test).
- Shorts and Leakages between valve elements.
- Efficiency of electrolytic condensers.
- Condition of paper condensers.
- Resistance tests from 5 ohms to 5 megohms.

The condition of dry batteries by voltage tests.

Pilot lamp tests.

Counter Checkers

A similar type of counter instrument of particular interest to dealers in electrical appliances such as — Irons, toasters, fans, grillers, vacuum cleaners, etc. — is the Delta



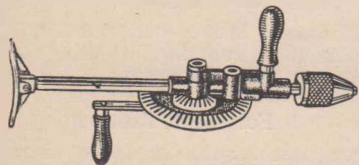
Further information on these models, D1506 and D2000 counter checkers, are available to "Radio World" readers from W. G. Watson and Co. Pty. Ltd., of 279 Clarence Street, Sydney.

Selecting

TOOLS FOR RADIO WORK

THE almost incredible present and planned expansion of our manufacturing industries is calling for more and still more technicians. Yes, the chap who can use hands as well as his brain—that fellow of nimble wit and finger has a future assured—he is the man of the hour.

What a fascinating business it is, this making and mending of things, as a hobby as well as a trade! The many different avenues we may follow—the pride of accomplishment we en-



joy when we see things that we make doing things that we planned!

Simple Tools

We need tools for making and mending, but even for the best of work our equipment need not by any means be expensive or elaborate.

I once watched a blacksmith fashion from a bar of iron the likeness of the most exquisitely detailed spray of fern. He used a hammer, a chisel and an anvil.

If you are a newcomer to the fine hobby of radio and electrical making



and mending, you will find it the best plan to start with a few simple tools and add to them as you find it necessary. In fact, the average fellow just HAS to do this, because pocket money usually doesn't go far! Perhaps it's a good thing, too, for it teaches us to use what we have to the best advantage and we learn to make much out of little.

Start a junk-box right now—save every single screw or fitting—every piece of wire, brass or copper, in fact anything that has even the remotest possible use. Meanwhile we can be putting our workshop in order.

The Bench

Of course, first of all we must find a place in which to work and this depends on just what kind of house we

live in. There may be a spare room, a cellar, space under the house, a garage or we can even rig up our bench in the bedroom. Dad will be sympathetic, I know; Mother will be doubtful about the appearance of such an unusual addition to the furniture. If, however, you explain how neat a



cheap chintz cover will look and how necessary it is to have a place to keep the pliers with which you intend to fix the clothesline—then I'm sure it will be all right!

A heavy packing case, a table or the lower section of an old sideboard will make a fine bench, to the back of which we nail a board about two feet

The tools illustrated on this page are available from Murdoch's Ltd., of Park Street, Sydney, who specialise in radio tools. Call or write for further details of their extensive range of work-bench bargains.

high. On this board we hang our tools—a place for everything and everything in its place. For instance, two screws or nails about half an inch apart will form a holder for a screwdriver hanging blade downwards. Other tools may call for hooks and so on.

Paint the bench brown or grey and the handles of the tools a bright contrasting colour.

Remember a good hobbyist keeps his gear tidy.

Vyce Important

A vyce is a most necessary item. With it you not only hold things whilst you drill, file or cut them, but as well you can use it as a press or an anvil



or a bending machine. A good choice of vyce is the three-inch engineer's type. Mount it on the bench where it is properly accessible, yet least likely to get in the way, remembering that the rear jaw should project slightly

over the edge of the bench; by so doing we can hold long rods, etc., in the vertical position. The vyce is the most expensive tool; it will cost about fifteen shillings. This same amount will easily cover the cost of the remaining tools listed below.

Hacksaw

Set of drills up to ¼-inch

Hand drill

Hammer

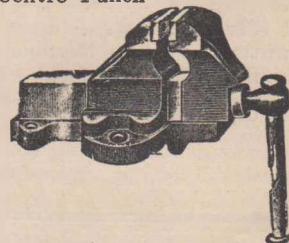
Pliers

Files—10-inch, flat and round

Rule

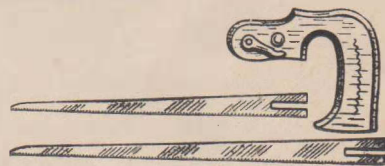
Screwdriver

Centre Punch



There are lots of useful tools that can be home-made in many cases, especially if we have the use of a grinding wheel. Centre punches, pin punches, chisels all can be fashioned from pieces of old round or square files. If you can possibly manage to get a small hand grinding wheel, by all means do so for it will keep drills, punches, screw-drivers, shears and so on in the best of trim.

By the way, our list didn't include a soldering kit. You simply must learn to solder.



Soon we find the need for at least three screwdrivers of different sizes—a small one with a blade ⅛" wide for manipulating the grub screws in knobs and dials, etc. The next size may have a blade ⅜" or ¼" wide to be used mostly for work with the common ⅛" metal thread screw in radio chassis construction. The third size of driver is advisedly a hefty one, with a man-sized blade and handle. Invaluable this fellow, when rusted woodscrews and the like are to be dealt with.

ACOUSTICS

(continued)

Actual sound pressure tests were made of this in an ordinary cabinet (Fig. 17).

These graphs do not extend beyond 3,000 cycles, because reflection effects above this destroy comparative values. But it may be said in practice that the perceptible levels follow the extended lines of the graph—something similar to the electrical response of Fig. 15.

The effect of the control variation is clearly seen. The smoothness of the low note peak and the way speaker resonance is damped will also be noted.

Output at 400 Cycles

As the output at 400 cycles naturally varies in each setting of the control, the volume control in each case is set to give the approximate same level at this frequency. A distortionless 6 watts is easily obtainable from this amplifier, while the figures previously mentioned regarding overall receiver results also apply.

Close examination of the action of the control and the appropriate curves

shows that the low frequency response may be varied about 15 d.b. without affecting the rest of the level; the high frequency may be varied 12 d.b. with respect to the response at 400 c.p.s. when the low frequency response is a maximum.

The exceptional flexibility of the control is at once apparent.

No doubt the novice will like to

Build the

ACOUSTIC COMPENSATED SUPERHET

described in this issue

See page 25

play around and vary a few things himself, so a word of warning.

Ears and emotions are very deceptive, and it is easy to fool yourself, especially where low notes are concerned. The amateur is well advised to use a good B.F.O. and oscillograph in extending his experiments, as a wide variety of frequency responses can result from a few simple changes. Raising the time constant of the grid circuit of the 6V6's will extend the

low frequency, while a small capacity from V1 to earth will limit the highs. (A .00025 mfd. will drop the output 20 d.b. at 10,000 c.p.s.)

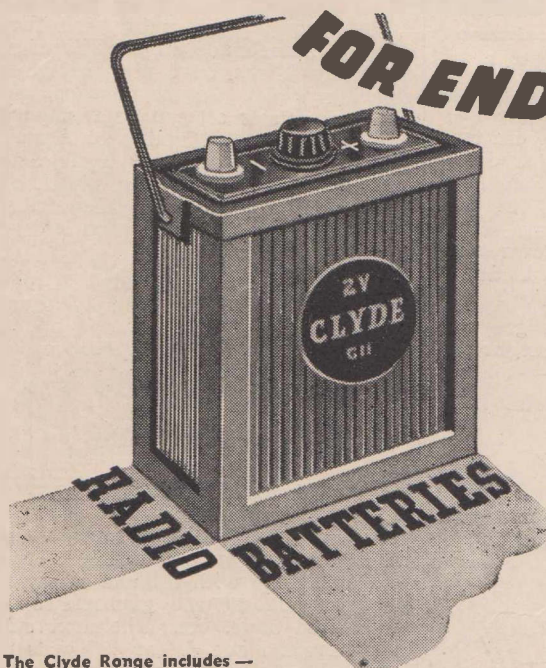
In Fig. 16, R1 and R12 serve primarily to determine the feedback voltage percentage, while the following filter C4 R13 determines phase compensation. If these first two resistors are raised, peaky bass and speaker resonance may result unless great care is taken. The low value of these make it necessary to use a very large value for C7 to obtain the requisite effect at high frequencies.

L8 R7 serve as the normal hum decoupling network. Even with bass boosting, the hum voltage from plate to plate of the output valves will be under .1 volt. The hum is less with this new circuit than it would be conventionally expected.

Automatic tone compensation is, similarly, a function of this circuit as it was with the others.

For Best Results

For best results in these circuits, the output condenser of the power supply filter system should not be less than 16 mfd. This ensures a good A.C. return path at low frequencies. Low capacities here will completely pre-



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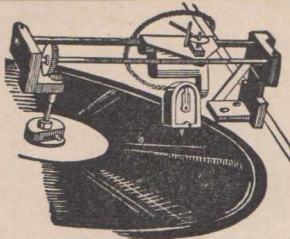
The Clyde Range includes —

Type 2V57 2v. Battery

Type 2VC11 2v. Battery

Type 4SR7 4v. Battery

Type 6CR7 6v. Battery



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MAKE YOUR OWN RECORDINGS. Cutting head and overhead cutting unit complete, 98/6. Plain Records, 2/11, 3/11, 4/11, 5/11. Cutting Needles, 2/-. Aluminium discs, 1/-. 1/6.

LIKE-A-FLASH Overhead Cutting Head and Cutting Gear £6/6/-.



6/6

The World's Best Pocket Knives. Sheffield make. Stainless razor edge Steel Blades. Opens in three positions. 1-finger push action.

Cone Speaker Units. Leading makes. Were up to 35/-. Now 7/6 and 10/6.

Five-cell Focussing Torches, 8/6.

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B.G.E. Table Type Microphone, highly recommended for amateur or professional use. Built-in Transformer and Battery, with volume control incorporated. Just plug into pick-up terminals of any set or amplifier. 39/6.



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

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



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"Presto"—the grandest, most alluring and outstanding little trick ever introduced. 2/9, post free. Money back if it's not the best yet. Special quantity price.



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

Three-inch Back Panel Illuminated Dial, 5/-.

VALVES — HALF AND LESS the ordinary price — for all purposes, each guaranteed. A valve for every radio purpose, electric or battery operation. Ask or write for quotes.

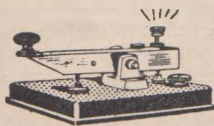
RADIO PUBLICATIONS

Learn Morse, 1/-; Radio Dictionary, 1/-; Beginners' Radio Book, 1/-; Everyman's Radio Book, 5/6; The Television and Short-wave Handbook, 5/6; Sixty Tested Wireless Circuits, 6/6; The Book of Practical Television, 8/6; The Wireless Constructor's Encyclopaedia, 7/6.



Headphones—12/6, 15/-, 17/6, 21/-; Ericsson's Professional 4,000-ohm 'phones, 47/6.

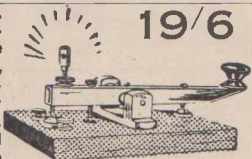
Pick-up Heads. Fit and suit all tone arms and gramophones. For operating gramophone through radio. 15/-, 19/6 each.



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

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

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

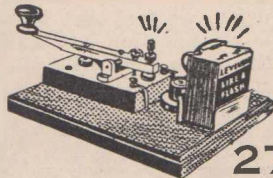


19/6

42/6



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



27/6

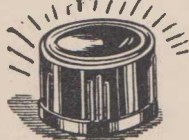
No. 5.—Outfit comprises the P.M.G. No. 2 Morse Code Key, with adjustable Morse and battery all mounted on a stained baseboard, ready for immediate operation. Battery included.



22/6

No. 6.—A real good little outfit which incorporates the No. 1 adjustable Morse Code Key, in moulded bakelite base, with a smart little adjustable buzzer all complete to operate. Junior model, 12/6.

No. 1. — "Like-a-Flash" adjustable Buzzer. 4/6. Bakelite Case High Pitched.



At left: PYREX TYPE INSULATORS. 3-inch barrel type, 1/-; Pyrex 4-inch, 3/6; 5½-inch, 6/6; 7½-inch, 30/-.



No. 2. Bakelite cased adjustable High-pitched BUZZER. Price, 5/6.

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

Brass Airplane Castings, 2/6, 2/9, 3/-; Write for full lists.



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P.M.G. type, sounders; heavy fittings, 35/-.



MICROPHONES, as illustrated. Hand-holding type, 22/6; or B.G.E. type, 39/6. Ready to plug into pick-up terminals of your radio or amplifier. Microphones Experimental Buttons, small, 3/9; large, 4/9; in housing, 7/6.

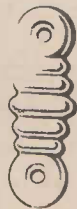
Breast drills, 4/11.

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SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

H.S. (Coogee) is having trouble with a hum, which occurs only on one station.

A.—This trouble appears to be in the transmission, rather than in the set. You can take the usual precautions against modulation hum trouble, such as earthing one side of the r.f. heater wiring, and fitting a .01 mfd. condenser from one side of the 240 power to earth. If, however, these fail to effect a cure, we cannot suggest anything likely to help you. From what we hear it is fairly common to find this hum trouble on this station in your locality, but it is seldom so bad as to really interfere with the reception. Perhaps your set, or the speaker, has a particularly strong low-note response at the particular frequency of the hum.

F.M.W. (Mosman) says that he proposes to build the "Fidelity Six" from the June issue, but would like to have push-pull output valves, and asks for the necessary amendments to the circuit.

A.—Frankly, we think that you are going about things in the wrong way when you want to take a thoroughly engineered circuit and amend it to another. As designed, the "Fidelity Six" is a splendid job, capable of excellent all-round performance within the limits of its power output. But if you want a push-pull job to give even greater power output, then we suggest that you work to the "De Luxe Fidelity 8" in the May issue. To attempt to amend either circuit in any direction is going to run into all sorts of difficulties. As a typical example, the power transformer needs to have correct secondary current rating, the field coil needs to be correctly energised and so on. Adding a valve will immediately upset all these design characteristics. Unless you are prepared to completely redesign the set we strongly advise you to follow out one of our recommended designs and stick to it to the finest detail. With regard to the query about the speaker, we don't think that there is any worthwhile advantage to get the PM model, and unless you particularly want to handle high power for long periods we doubt if you need to go beyond the lighter 12" models.

B.E. (Bogabri) wants to know if we will undertake to carry out a commission to buy him a kit of parts, testing the components thoroughly for him at the same time.

A.—No, we do not have any organisation to carry out a job of this kind, and it is a little beyond the scope of our laboratory service. The thought has something to it, however, and if a number of readers were to intimate that they would avail themselves of such a service if it were made available, then we would go into it further. In the meantime, we suggest that you write to any of our advertisers asking them to quote for a kit, mentioning that you want every item separately double tested.

W.S.S. (Goulburn) wants a full list of the short-wave stations of the world.

A.—It is our practice to publish a full list at fairly regular intervals. The last list, giving all the stations in order of frequency, was in the November, 1940, issue. Copies of this issue are still available from this office at the special back-date price of 6d. post free.

W.R. (Bondi) enquires about suitable aerials for short-wave reception.

A.—We agree that it is remarkable how results can be obtained with short indoor aerials, but we cannot agree that an outside aerial would not give even better results. Erected as high as possible and clear of the building, but not necessarily long as regards actual length, the outside aerial should help you to get a better signal-to-noise ratio, which is an important factor when trying to log a weak station with a powerful set working "flat out."

G.A.F. (Camperdown) is interested in the car radio circuit in the March issue.

A.—This is one case where we cannot advise you to stick closely to the original circuit, which was designed in America. You might run into trouble trying to get exactly the same valve types and suitable coils for the untuned coupling between the r.f. stage and the converter valve. The general principles of the circuit, however, should be a helpful guide to you, and with a little individual thought you should be able to build up a suitable circuit from it. The 6U7G would be O.K. to replace the 6SK7, and you could use a 6B6G as second detector.

N.H.K. (Newcastle) is thinking of fitting a new speaker to an old set.

A.—It seems quite a good scheme and we feel sure that you will find that you can get much better efficiency, in the shape of greater power output in actual noise (music) for a given electrical power output from the set. As regards tone you may be disappointed, for a good speaker will show up distortion which may not be so noticeable with a speaker which does not have a strong high-note response. The newer speakers are capable of giving better quality when used with a distortion-free amplifier, but if any distortion is present it may be revealed only too well by this characteristic. Similarly, the better low-note response of the new speaker might reproduce hum to a distressing degree if the filtering on the set is not 100% efficient.

R.T. (Chatswood) wants full instructions for installing a noise-reducing aerial system.

A.—We do not have space in these columns to answer your query fully, but we suggest that you send for the back issue, dated August last. In this issue we had a full article on the subject, and it should contain all the instructions you require. Copies are available at 6d., post free, direct from this office.

G.G. (Auckland, N.Z.) is in trouble about remitting money for a subscription.

A.—Naturally, at this distance we are not fully acquainted with the latest New Zealand regulations dealing with the remittance of money. We do notice, however, that there are still plenty of New Zealand money orders

coming through, and so it would appear that there is some solution to the problem if you know how to go about it. New Zealand postal notes are not negotiable in Australia, and so it is no use sending them to us. Hope you can fix it without difficulty.

G.M. (Moonee Ponds, Vic.) is building a simple two-valve set and is trying to use the latest style coils.

A.—Unfortunately the coil you mention is just a straight aerial coil, designed for modern superhets, and does not have any reaction winding. Consequently, it is quite unsuitable for the type of set you are building. We can only suggest that you have it changed, as it would be a rather difficult job to add a suitable reaction winding, owing to the modern construction of the existing windings, which are honeycomb coils set in wax. There would also be a bit of trouble about arranging suitable terminal lugs.

S.R. (Adelaide) wants to know what is wrong with his set.

A.—Sorry, but we can't help you without some clues or information of some kind. It would only be guessing if we said that we suspect that one or more of the valves is likely to be inefficient after two years' service. Likewise, the electrolytic condensers might be dried up, the by-pass condensers open-circuited or short-circuited, the resistors abnormal or sub-normal and so on. We can only suggest that you enlist the aid of a reliable service-man.

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MELBOURNE

QUERIES

(continued)

G.J. (Rockhampton) wants to know what service instruments are required for repairing, servicing and installing sets.

A.—You will not need any further equipment beyond the two items you list, the valve and circuit tester and the modulated oscillator. Even the output meter is not essential, as good alignment can be obtained by ear, and, if really wanted, the tester can be used as an output meter. As regards the valves, the 6L5G is equivalent to a 6J7G with plate and screen tied together. The 6S7G will be applicable in any circuit designed for the 6U7G. Dozens of circuits have been given for these valves and for the 42 and 80 types.

W.J. (Nowra) enquires about copies of the July number with details of the "Tip-Top" circuit.

A.—No, we are quite out of stock of the July issue with the details of this set, but the article was re-printed in the December issue, complete with all diagrams, and we still have a few of these available at the special back number price of 6d. each, post free. In reply to your query, we have no hesitation in saying that the "Tip-Top" should be easily the best performing four-valve a.c. set ever described. We cannot suggest anything likely to be better. There is only one difficulty and that is in regard to the use of the 6F7 valve, which is a type which is a little scarce at present, and not available from the average radio shop. We doubt if you would have any difficulty in getting one from any of our advertisers, however.

J.T.T. (Wahroonga) has a superhet which plays the local stations well, but has whistles on all interstate stations.

A.—We suspect that you have the aerial lead threading through the rest of the wiring in order to reach an aerial terminal mounted in the rear of the base. With such an arrangement it is easy to get a feed-back circuit to cause whistles of this kind. Best practice is to run the aerial lead straight out through the end of the base, and keep it well clear of all other wiring and components.

D.S.C. (Granville) enquires about earthing the r.f. filaments.

A.—Occasionally we may forget to indicate it, on the circuit, but it is always good practice to earth one side of the r.f. heater winding, for preference at the socket of the

r.f. valve. Even if the power transformer happens to have a centre-tapping, it is best to neglect the tapping and earth one side. If the heater wiring is not earthed in this way it is often found that there will be a tunable hum which comes in only when the set is tuned to stations. In some cases the trouble is more pronounced on one particular station, giving the impression that the hum is due to faulty transmission. In extremely obstinate cases it may be necessary to "earth" also the live side of the heater winding through a .1 mfd. condenser.

J.W.F. (Townsville) enquires for negative co-efficient condensers.

A.—From enquiries made it appears that these are quite unprocurable at present, but local factories have them in mind, and should be in production within three months.

L.S.R. (Kalgoorlie, W.A.) writes for a circuit for an A.C./D.C. receiver to use 6U7G, 25A6G, 6B8G and a 12Z3.

A.—We regret that we do not have a suitable circuit available. We would also point out that we are not in a position to design special circuits or supply same by mail, as this is quite beyond the scope of our query service. Such a job would entail hours of time. We can only afford to spend such an amount of time on the production of circuits suitable for publication, as they are then of interest to thousands of readers, and not just one individual.

PARAMOUNT REVIEW (continued)

proved short-wave performance have been made in most of the all-electric receivers produced during the past six months or so. Not so marked, however, has been the progress with battery-operated receivers. In fact, quite a few people have run into bother when attempting to get outstanding performance on short-waves from receivers using the 1.4-volt series of battery-operated valves.

A notable exception is the Paramount factory, one which has done an immense amount of work on portable receivers with dual-wave tuning. If we remember rightly, the first successful dual-wave portable we ever saw was a Paramount job.

Dual-wave Portable

It was not surprising to us, therefore, to get a ring from Managing-director Maskall, of the Paramount Company, to let us know that he had a new dual-wave portable ready for release, and something quite out of the box as regards performance.

We took the opportunity of borrowing a sample of this new model for testing over the week-end, and it proved to give performance of a truly outstanding nature. On the broadcast band, with the in-built loop aerial, the

CLASSIFIED ADVERTISEMENTS

FOR SALE — Oscillograph, complete with vertical and horizontal amplifiers, etc. £6. H. Davies, Box 300, Newcastle.

WANTED — Copies of "Radio-craft" (U.S.A.) containing details of the 30-valve Super-de-luxe receiver, August, September, October and November, 1937. Write to T. L. Mountjoy, Town Hall, Clunes, Victoria.

G.T.L. (Rockhampton) wants to know why we are not now advertising the features of our issues in "Radio and Hobbies."

A.—Our advertising contract with that paper was for twelve insertions, and when this contract expired it was not renewed. Owing to the paper rationing regulations, we have no difficulty in placing as many copies as we can print, and under such circumstances it is not much use advertising. If the paper shortage becomes more acute, it may be found necessary to restrict our circulation to subscriptions and orders. At the present time, however, there are ample copies to go around, and we cannot understand why your news-agent should try to put you off. He has only to mention it to our distributors, Gordon and Gotch, and they will see that he receives a regular supply.

general performance was splendid, but it was when an aerial was attached and the tuning switched to the short-waves, that the receiver really showed its superiority. We have not the slightest hesitation in saying that it proved to be the most effective battery-operated short-wave portable that we have ever handled.

Attention to detail

The improved performance has been obtained by close attention to minor details and to the overall efficiency of every individual component, for the circuit used is not freakish in any way, and the battery drain is no higher than normal; in fact, if anything, a little lower than usual. The new Paramount portable is a worthy addition to the many other popular models in their range of receivers, and should do much to assist in further strengthening the prestige and esteem which is appreciated by all who have handled them.

Further Details

Further details of this model and others in the Paramount range can be obtained direct from The Paramount Radio Manufacturing Company Ltd., 301 Castlereagh Street, Sydney.

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THE Delta MODEL D1506 Component Tester

PROVIDES TESTS FOR —

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- Shorts and leakages between valve elements.
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- The condition of electrolytic condensers.
- The condition of electrostatic (paper) condensers.
- Resistance tests from 5 ohms to 5 megohms.
- The condition of dry batteries by valtage test.
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★ Meet the Delta component tester — Model D1506 . . . The best investments for any serviceman these days — an investment that's certain to bring big returns in increased profits.

Glance to the panel above and see the tests the D1506 will do. With this versatile instrument the serviceman can make all the tests enumerated — and make them to a high degree of accuracy.

The D1506 is extremely simple to operate and will quickly pay for itself in new business.

The D1506 is equipped with three-core connecting cable and plug for connection to A.C. 200/260v. 50-cycle mains. External power is required for all tests other than battery volts, high and low ohms. PRICE, £14/10/-.

Why not call for a free demonstration of this versatile instrument to —

W. G. WATSON & Co. Pty. Ltd.

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We Have a Good Job, Mr. Graham, for one of your Keen A.R.C. Men

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Think of this — for a few pence each day — actually less than many fellows spend on tobacco — you can prepare yourself for a good pay position in Radio. You can, whilst learning make money. Many A.R.C. students earn £3 and up to £6 per week at SPARE TIME WORK.

Below: Outside Television



The DEMAND for TRAINED RADIO MEN exceeds the Supply

Whilst many other trades and professions are passing through difficult times owing to present conditions, Radio is booming. Unusual as this may seem, a little reflection will speedily enable you to see why this is so! People are news-hungry as never before — that means terrific activity on the part of the broadcasting organisations, with an inevitable sky-rocketing of radio receiver sales. Furthermore, many radio units and components previously imported must now, owing to dollar exchange and other restrictions, be made in Australia. Costly equipment for defence and other national needs is being produced in ever-increasing quantities.

WHAT DOES ALL THIS MEAN!

It means the Radio industry is crying out for trained men — the demand often exceeds the supply — day after day employers ring me up and say, "We have a good job open. Have you a trained man available?" Let me show you how to get into Radio NOW. I can train you in your spare time at home and speedily fit you for a man-sized job. Get busy NOW!

This Student says:—

"There must be a shortage of trained men all right. I get offers every so often. . . . One was a promise of a branch managership."

G.C., of Oatley, N.S.W., says:—

"Before turning to Radio professionally, I had found it impossible to obtain employment in the line for which I was qualified. Thanks to your aid, I was placed in a position within two weeks of my exams."

Below: Car Radio Man at Work



You, too, can do what these men have done. Write me personally. Address your letter to L. B. Graham, Principal, Australian Radio College, Sydney, and I will go out of my way to give you a helping hand.

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Sir,
Please send me your book, "Careers in Radio and Television." It is understood I am under no obligation in making this request.

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