

The

Wireless Weekly

Special

Given FREE With
WIRELESS WEEKLY

June 6, 1930

For Modern Battery Circuits Watch
Early Issues of the Journal.

A.C. CIRCUIT

Supplement



IN presenting this booklet of the circuits of successful a.c. operated radio receivers, developed by the "Wireless Weekly" technical department, under the direction of Ross A. Hull, M.I.R.E., we wish it to be understood clearly that circuits alone do not constitute complete information on the design of radio sets. The circuit is merely a diagram of the necessary components and wires in a receiver, and, while it is a very valuable and essential piece of information, it does not tell the whole story, except, possibly, to enthusiasts who have made a long and careful study of the whole subject. Receivers can be built to comply with the very best circuit, but even so it is possible for them to be a hopeless failure, unless the most careful attention is given to such matters as the values of the components, their arrangement on the base or chassis, the placement of the wiring, and the adjustment of the receiver after it is constructionally complete.

So, while these circuits have a certain value of their own, they cannot be considered as self-contained and complete designs for radio receivers. Unless the enthusiast making use of them has both a theoretical and practical knowledge of the elements of set design, he is urged to make use of the circuits in conjunction with the detailed instructions which have appeared in "Wireless Weekly."



THE A.C.

PUNCH

RADIOTRON

Valves for all-electric receivers, are the choice of leading set manufacturers; they are used in A.W.A. All-

Electric Radiolas, and are recommended for use with the various circuits described in this A.C. Receiver Booklet.

Look for this Seal



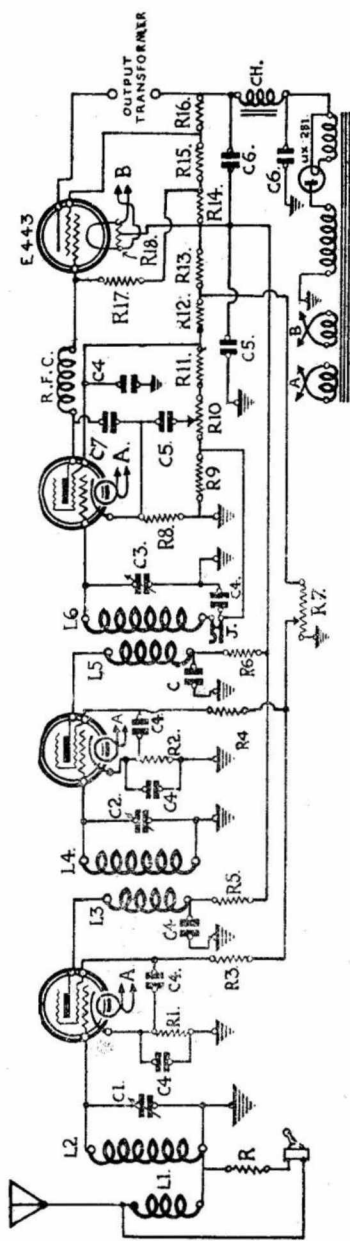
CHARACTERISTICS OF A.C. RADIOTRONS

Model	Use	Beam	PL. T.M.S.	PL. Amps.	D.C. "B" Full Value	ACD. "B" Full Value	AMP. "C" Full Value	PLATE FILAMENT (VOLTAGE)	PLATE (VOLTAGE)	MAX. D.C. OUTPUT (WATTS)	MAX. A.C. OUTPUT (WATTS)
UT-227	Dist. A.C. Radiat.	5-Prong UV	2.5	1.75	43	—	—	11-00	13,000	8	—
UX-53A	Power Amp.	Large UX	7.5	5.25	—	550	—45	41	1500	2.8	3,500
UX-545	Power Amp.	UX	2.5 A.C. or D.C.	1.5	—	378	—30	22	2500	5.5	1,000
UT-224	Screen Grid Amp.	UV 5-Prong	2.5 A.C. or D.C.	1.75	—	180	—3.5	6	695,000	400	—

Model	Desc.	Use	Beam	PL. T.M.S.	PL. Amps.	D.C. "B" Full Value	ACD. "B" Full Value	AMP. "C" Full Value	PLATE FILAMENT (VOLTAGE)	PLATE (VOLTAGE)	MAX. D.C. OUTPUT (WATTS)	MAX. A.C. OUTPUT (WATTS)
UX-290	Full-wave Rectifier	Large UX	7.5	5.25	—	550	—45	41	1500	2.8	3,500	
UX-281	Half-wave Rectifier	Large UX	7.5	5.25	—	550	—45	41	1500	2.8	3,500	

Amalgamated Wireless
Australia Ltd.

THE 1930 FOUR—Single-control, Four Valve Circuit



HERE is the circuit of what we believe to be the most modern and most effective four-valve receiver which has ever been described for home construction. It consists of two screen-grid radio-frequency stages, feeding a direct-coupled screen-grid detector and pentode output amplifier. The original receiver was described in "Wireless Weekly" of March 28 and April 4, but further suggestions and amendments were given in the issue of April 11 and May 9.

The complete list of apparatus necessary for the construction of the set follows:

Three UX-224 or Philips F242 s.g. valves. One UX-281 or 1562. One E-443 Philips pentode (UY base). Four Pilot UY type valve sockets. One Pilot UX type socket. Kit of three coils described below. Three gang A.W.A. condenser unit, .0005 (C1, C2, C3). One Radiolux 5-plate midset condenser. Eight Chanex .5 mfd. fixed condensers, 500 volt rating (C4). One Chanex 1 mid. fixed condenser, 500 volt rating (C5). Two Chanex 4 mid. fixed condensers, 1000 volt rating (C6). One Sanganio .00025 mid. fixed condenser (C7). One Pilot 900-ohm centre-tapped resistor, No. 989 (R1, R2). Three Pilot

10,000-ohm fixed resistors (R5, R6, and R16). Six Carborundum 100,000-ohm resistors (R3, R4, R14, R15). R15 has three in series. One Carborundum fixed resistor, 50,000 ohms (R8). One Pilot 200-ohm potentiometer (R10). One Radiolux special resistor (R9, R11, R12, R13). One .5 megohm gridleak (R17). One Pilot 20-ohm centre-tapped resistor (R18). One Pilot voltmeter, 0 to 100,000 ohms (No. 941) (R21). One Radiolux radio-frequency choke. Special power transformer and choke unit to supply chassis ground and coil shields. Pilot drum dial. Advance toggle switches for "local dis-

ance and power switches. L2, L4, and L6 have 90 turns of 28-gauge wire on 1 3/4 in. formers. L1 is 30 turns, tapped at the 15th, of 34-gauge wire, wound on a lin. former and placed inside L2 at the grounded end. L3 and L5 are of similar construction, but have 65 turns. The second condenser marked C5, which connects between ground and R14, is 4 mfd., rated at 800 volts. R consists of 10 or 15 turns of 28-gauge wire, wound in a bunch. It serves to short the aerial coil for reception of nearby stations.

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 ONE OF THESE "ROSS HULL" A.C. SETS!

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CAN ONLY BE MADE FROM GOOD PARTS.

We stock practically every radio article of good value that can be obtained in Sydney, and specialise in quality parts and accessories for Electric Sets.

A.C. VALVES.

Philips E442	32/6
Philips C443	30/-
Philips E438	30/-
Philips E424	27/6
Philips E415	27/6
Radiotron UX227	22/-
Radiotron UX224	29/6
Radiotron UX248	28/6
Radiotron UX171A	17/-
Radiotron UX226	14/-

All other Standard Valves in Stock.

RECTIFYING VALVES.

Radiotron UX281, half wave	45/-
Radiotron UX280, full wave	25/-
Philips 560, full wave	25/-
Philips 373, half wave	17/6
Mullard DU2, full wave	25/-
Mullard DU10, half wave	17/6

TRANSFORMERS AND CHOKES.

Heavy Transformer for 1930-4, 1930-3, and Direct Coupled Amplifier	40/-
Heavy Duty Twin 30 Henry Choke	22/6
A.B.C. Transformer, for American A.C. Valves	40/-
A.B.C. Transformer, for Philips A.C. Valves	27/6 and 35/-
Heavy B Transformer	25/-
30 Henry Eliminator Choke	7/6

POWER PACKS.

Southern Radio Pack, for 1930-4 and 1930-3	£5/10/-
Southern Radio Pack, for Direct Coupled Amplifier	£4/3/-
Heavy Pack, for American A.C. Valves	£3/2/6
Heavy Pack for Philips A.C. Valves	£2/17/6

FOR FURTHER INFORMATION, SEE OUR OTHER ADVERTISEMENT IN "WIRELESS WEEKLY."

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That's the Slogan at Miss Wallace's—and, of Course,
Quality, Service and Low Prices.

TWO AMAZING OFFERS

THE WALLACE 1930 FOUR KIT.

Phillips and Radiotron Valves, as specified.

Four U.Y. and 1 U.X. Sockets.

Assembled Kit of Coils (Pollock).

Three-gang A.W.A. Condenser.

Radiokes' Midget Condenser, 5-plate.

Hydra Condensers, 4, 1, and .5mfd., as

specified.

Fixed Condenser, .00025mfd.

Resistances of Specified Values (see opposite

page).

Wallace Guaranteed Power Pack and Choke.

Pilot Drum Dial.

Prima Donna Chassis and Shields,

Switches, Screws, Flex, etc.

£18/-/-

THE WALLACE 1930 THREE KIT.

Phillips and Radiotron Valves, as specified.

Two U.Y. and two U.X. Sockets.

Assembled Kit of Coils (Pollock).

Two-gang A.W.A. Condenser.

Hydra Condensers, 4, 1, and .5mfd., as

specified.

Radiokes' Midget Condenser, 5-plate.

Resistances of Specified Values (as described

opposite).

Wallace 1930 Three Guaranteed Power Pack.

Pilot Drum Dial.

Prima Donna Chassis and Shields,

Jacks, Switches, Screws, Flex, etc.

£15/-/-

(See Opposite Page for Detailed Specifications.)

The purchase of either of these kits, complete or in part, carries with it the guarantee to give personal service to the extent of making the set work, if necessary, entirely to your satisfaction, without further charge.

And Every Part is Guaranteed.

These Power Transformers Will Interest You

FOR POWER AMPLIFIERS.

700 volt, for UX280, with a.c. filament windings, for UX227's, UX345's and UX171's, 40/-.

CHOKES.

30 Henry, 75 mil. 7/6
30 Henry, 100 mil. 12/6
60 Henry, special double choke, 125 mils., centre tapped—will filter anything 22/6

FOR FULL WAVE POWER PACKS.

600 volt, for UX280, 30/-.
With four volt a.c. filament winding, 4 amp., 35/-.

HALF WAVE JOBS.

300 volt, with four or five volt winding for rectifying valve 25/-
With additional four volt winding for a.c. valves 27/6

Transformer and Choke Units, 1930 Four £3/5/-, 1930 Three £3.

YOU SHOULD INSPECT THE "COMPACT" ELIMINATOR AND A UNIT CHASSIS.

Heavy 350 volt Transformer—tapped primary for varying line voltages—special double, 60 Henry choke—1000 volt. 4mfd. condensers—all wired and wax-impregnated in solid metal container, requiring only voltage divider, valve, and socket to complete. Four volt, centre-tapped filament winding for a.c. valves. Will suit Philips 373, 505, or Mullard DU10 rectifying valves.
45/-.

A SNAP FOR THE HOME BUILDER.

Compact Eliminator and A Unit, complete, tested ready for operation, with Mullard DU10 valve. Will deliver 200 volts on load, with intermediate taps.
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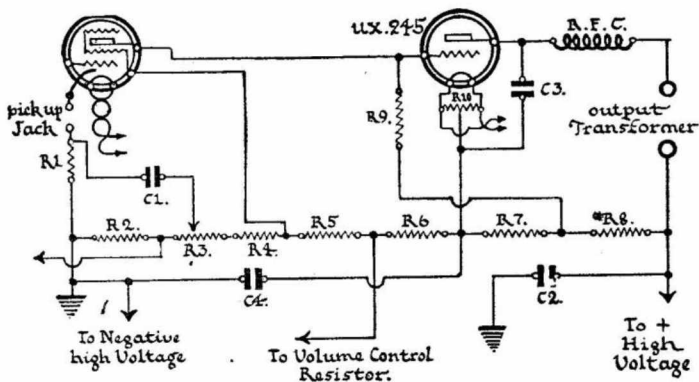
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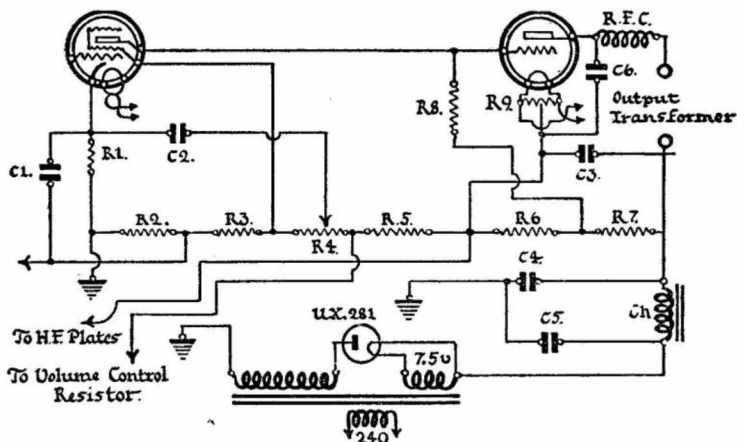
PHONE, MA5543. TWO DOORS FROM GEORGE ST., OPP. Q.V. MARKETS.

1930 FOUR WITH A UX-245



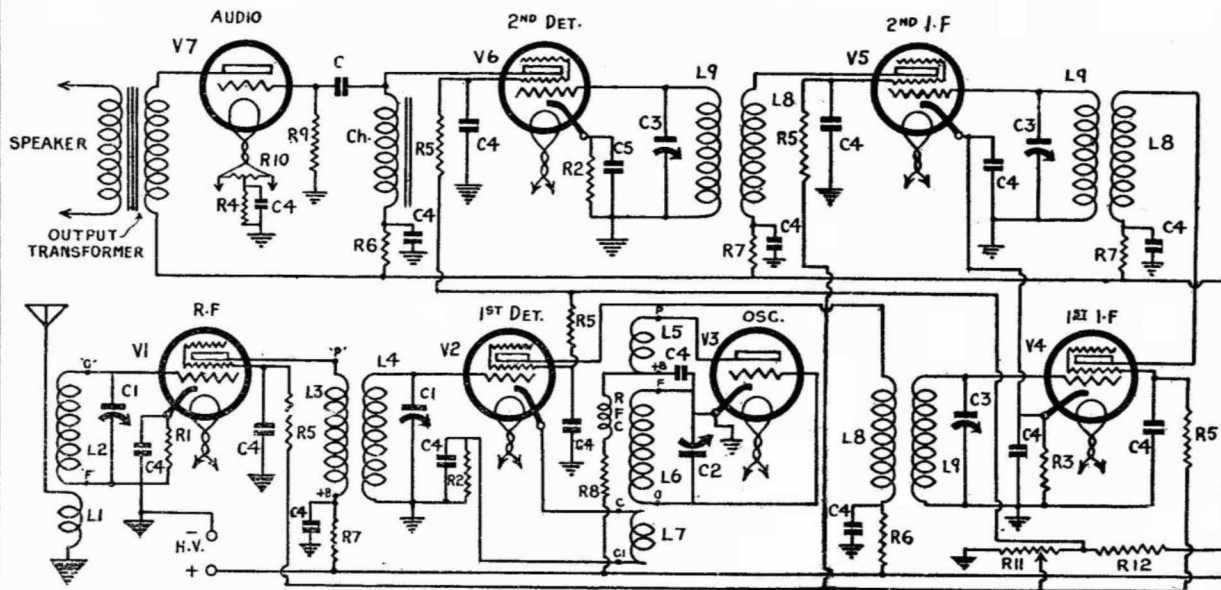
THIS diagram indicates how a UX-245 or F203 is operated as the output valve for the "1930 Four." Such a valve reduces the cost of the receiver, and yet still permits it to give excellent reproduction where very loud volume is not necessary. R2, R4, R5, and R8 are sections of a special Radioket resistor. The values of the other resistors are: R1, 50,000 ohms; R7, 25,000 ohms; R8, 100,000 ohms; R9, .5 megohms; R10, 20 ohms, centre-tapped. C1 is a 1-mfd fixed condenser rated at 500 volts. C2 is of 4 mfd., rated at 1900 volts. C4 is of 4 mfd., rated at 500 volts. C3 is a fixed r.f. by-pass condenser of .0005 mfd. The output voltage from the filter in this case should be 450 volts. With this valve the condenser C7 and r.f. choke of the original circuit are omitted.

1930 FOUR WITH A UX-250



THIS circuit shows the manner in which a UX-250 or F704 is used in the "1930 Four." The values of the resistors are: R1, 25,000 ohms; R2, 450 ohms; R3, 450 ohms; R4, 400-ohm potentiometer; R5, 3500 ohms; R6, 100,000 ohms; R7, 300,000 ohms; R8, .5 megohms; R9, 20 ohms centre-tapped. The resistors R2, R3, R4, and R5 must all be capable of carrying 50 m.a. without undue heating; but the others, with the exception of R9, may be of the grid-leak type. The condensers are: C1, 1mfd. 500 volts; C3, 1 mfd. 1000 volts; C4 and C5, 2 mfd. 1500 volts; C2, .1 mfd. 500 volts; C6, .0005 mfd. The output voltage from the filter should be of the order of 650 volts. When this type of valve is used the condenser C7 and the r.f. choke in the plate circuit of the detector of the original "1930 Four" circuit are omitted.

THE 1930 SUPER-HETERODYNE—King of All Circuits



THE modern screen-grid a.c. super-heterodyne which employs this circuit was originally described in the September 27 and October 4 issues of "Wireless Weekly" for 1929. It has been built successfully by enthusiasts all over Australia and New Zealand, and has given the most extraordinary results. When correctly built and adjusted it has an overall voltage amplification of more than 16,000,000. In other words, it is approximately thirty times as sensitive as the usual six or seven valve receiver using three-electrode valves. The receiver is expensive and fairly difficult to build, but it certainly provides all the amplification that even the most enthusiastic long-distance fan could ever wish for. Quite the most important items in the set are the various coils. The greatest care must be taken to see that all windings are in accordance with the specifications. The intermediate frequency transformers are made up from honeycomb coils, and we strongly advise their use. The power supply necessary for the set can be obtained from the usual type of B eliminator and filament transformer; 250 volts at 45 milliamperes will be necessary for the plates, while two filament windings will be required. One will have to supply 4 volts at 6 amperes, and the other 2.5 volts at 1.5 amperes.

The apparatus required for the set includes:—

Six UY type Valve sockets, Pilot. One UX type socket, Emmeo. Three .0003 mfd. Formodensers. V1, V2, V4, V5, V6—Five Philips E442 valves. V3—One Philips E415 valve. V7—One UX-245 Radiotron. Pilot double drum dial. C1, C2—Three Pilot .0005 variable condensers. L1 to L7—Coil kit (see below). R.F.C.—One Radiokes radio-frequency choke. R5—Five Pilot small 10,000-ohm fixed resistors (No. 953). R1—

450 ohms. R3—225 or 250 ohms. R4—One 1200-ohm fixed resistor. R6—Two Ferranti 25,000-ohm fixed resistors. R2—Two Ferranti 40,000-ohm fixed resistors. R7—Three Ferranti 10,000-ohm fixed resistors. R8—One Ferranti 40,000 ohm fixed resistor. R9—One 2-megohm grid-leak. R11, R12—Two 50,000-ohm Pilot volumgrads. C—1 mfd. 500 volt condenser. C4—Sixteen Hydra .5-mfd. fixed condensers (500 volt d.c.). C5—One Hydra 2 mfd. fixed condenser (500 volt d.c.). One metal base (Prima Donna Cabinet Co.), 24in. x 14in. Six metal shields from same people, 3½in. dia., 5½in. high. Three-ply panel, 5-16in. thick, 24in. x 3in.

The details of the coils follow:—L1, 25 turns of 26-gauge d.s.c. wire wound in a bunch inside ground end of L2. L2, 85 turns of same wire on 2in. former. L3, 40 turns of same wire wound in a bunch at bottom end of L4. L4, 85 turns of same wire on 2in. former. L6, 55 turns of same wire on 2in. former. L5, 30 turns on same former. L7, 30 turns of same wire in bunch inside L6. L8, 280 turns of 30-gauge wire wound in a bunch, one inch inside diameter. L9, 300 turn honeycomb coil. The arrangement of these coils and their tuning condensers is shown in Fig. 5.

Figure 3 shows the fundamental arrangement of each amplifier stage while Figure 4 shows the general arrangement of by-pass condensers located near the terminals to which they connect. Figure 2 shows an alternative method of bypassing to the cathode instead of the ground. Unless the enthusiast is widely experienced, he should not attempt this set without first reading the articles which have treated it in "Wireless Weekly."

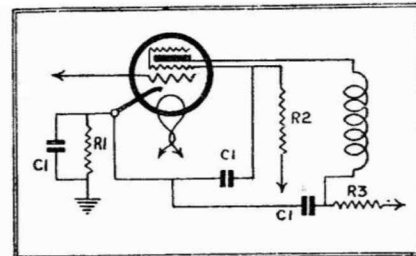


Fig. 2.

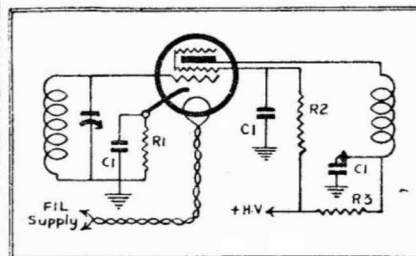


Fig. 3.

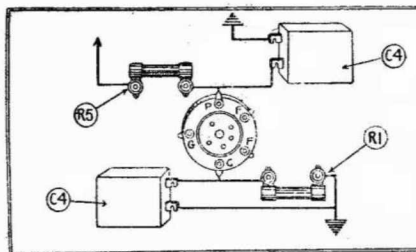


Fig. 4: Showing the fundamental wiring arrangement.

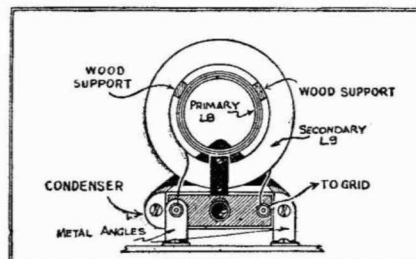


Fig. 5: Constructional detail of the intermediate frequency transformers.

"1930 A.C. FOUR"

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Below is a list of parts suitable for building the "1930 A.C. FOUR" described in this Booklet.

	£	s	d
1 Radiotron 280 Valve	1	5	0
3 UX224 Radiotron Valves—29/6	4	8	6
1 E443 Philips' Valve	2	0	0
3 UX Sub-panel Sockets, Pilot	0	7	6
2 UX Sub-panel Sockets, Pilot	0	4	6
Kit of Three Coils, Radiokes	1	17	6
Or Kit of Three Coils, Pollock	0	19	6
1 —3 Gang A.W.A. Condenser, with Couplings	2	1	0
1 Radiokes 5-plate Midget Condenser	0	4	9
8 Hydra .5 Mfd. 500 Volt Test Condensers	1	0	0
2 Hydra 1 Mfd. 500 volt Test Condensers	0	6	0
2 Hydra 4 Mfd. 1000 volt Test Condensers	1	7	0
1 Sangamo .00025 Mfd. Condenser	0	2	3
1 Pilot 900 ohm Centre-tapped Resistor	0	5	0
2 Pilot 10,000 ohm Fixed Resistor	0	14	0
5 Mullard 100,000 ohm. Fixed Resistors (Carborundum Unprocurable)	0	15	0
2 Carborundum 50,000 ohm Fixed Resistors	0	6	0
1 Pilot 200 ohm Potentiometer	0	5	6
1 Radiokes Special Tapped Resistor	0	8	6
1 Carborundum .5 Meg. Resistor	0	3	0
1 Pilot 20 ohm Centre-tapped	0	3	0
1 Pilot Volungrad 0-100,000 ohm	0	12	6
1 Radiokes R.F. Choke	0	8	6
1 Southern Radio Special Transformer and Choke Unit	5	10	0
1 Aluminium Panel for Set	0	12	6
3 Aluminium Cans	0	6	0
1 Pilot Drum Dial	1	2	6
1 Closed Circuit Jack	0	1	6

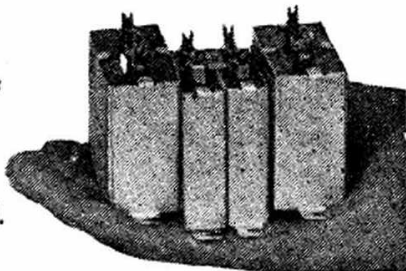
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DESCRIBED IN THIS BOOKLET

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**Chanex
Condensers**
are reliable,
they are
double tested.



**Chanex
Variable
Resistances**
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With
**CHANEX
CONDENSERS**

**You Can Place Your Power Pack in the
Hollow of Your Hand**

The compact size of these handy little CHANEX Condensers makes them ideal for use in the modern receiver, where conservation of space is of paramount importance.

Their proved efficiency—their ability to handle power and to ensure any volume of undistorted reproduction from the receiver, make them the considered choice of every set manufacturer. That is why CHANEX Condensers are chosen for the special type of receiver described in this issue of "Wireless Weekly."

DOUBLE TESTED 1500 VOLTS D.C.

.1 mf. 15 x 45 x 50 m/m at	2/3
.25 mf. 15 x 45 x 50 m/m at	2/6
.5 mf. 15 x 45 x 50 m/m at	2/9
1 mf. 15 x 45 x 50 m/m at	3/-
2 mf. 25 x 45 x 50 m/m at	4/9
4 mf. 45 x 45 x 50 m/m at	8/3

Obtainable
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"CHANEX"
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Reliability.

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H. HECHT & CO.,

We can Quote
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All Capacities,
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D.C. to 10,000
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RADIOKES

NATIONALLY FAMED AUSTRALIAN MADE PRODUCTS
SPECIFIED FOR MODERN A.C. SETS

1930/3 A.C. SET.

Shielded Coil Kit ..	48/-
Bakelite Coil Kit ..	25/-
Alum. Base, 18 x 11 x 2	16/-
450 ohm. Resistor ..	3/3
2000 ohm Resistor ..	4/6
1930/3 Special Resistor	8/6
25,000 ohm Resistor ..	10/6
20 ohm C.T. Resistor	2/6
5-plate Midget Cond.	4/9
Radiokes Power Trans-	former & Choke Unit.

The name of **RADIOKES** is a definite assurance that you are buying the best and most efficient equipment obtainable anywhere.



1930 SUPER HET. A.C.
Radiokes Shielded Super
Het. Kit R.F. units and
Intermediate transfor-
mers £2/10/-
R.F. Choke 8/6
10,000 ohm Resistor .. 6/
15,000 ohm Resistor .. 8/6
25,000 ohm Resistor .. 12/6
900 ohm C.T. Resistor 4/-
Radiokes Power Com-
pact £12
TF225 Filament Trans-
former £1/15/-

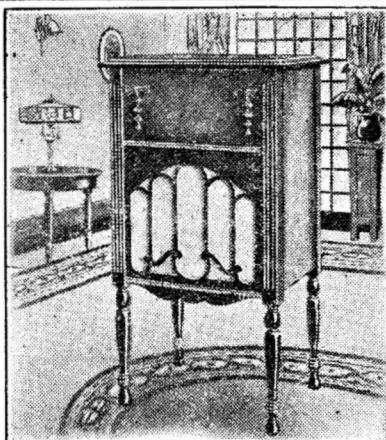
1930/4 A.C. SET.

Shielded Coil Kit ...	72/-
Bakelite Coil Kit ...	37/6
Alum. Base 23 x 10 1/4	x 2in. 17/6
5-Plate Midget Cond.	4/9
900 ohm C.T. Resistor	4/-
10,000 ohm Resistor ..	6/-
1930/4 Special Resistor	8/6
20 ohm C.T. Resistor ..	2/6
R.F. Choke ..	8/6
Power Transformer and	Choke Unit.

FROM YOUR
RADIO DEALER,
OR DIRECT.

METROPOLITAN ELECTRIC CO., LTD.,

126-130 Sussex St., Sydney, All States, and New Zealand.



INSTALL YOUR SET INTO A BEAUTIFUL
PRIMA DONNA ART CABINET.
Handsome Upright Model, as illustrated,
£3/10/. Size, 3ft. 3in. high, 22in. wide,
17in. deep. Finished in attractive two
tone Walnut Lacquer.

WE MANUFACTURE
Dynamic Speaker Baffles... 5/6 to 39/6
Polished Figured Maple Panels 5/6
Gold Lacquered Power Pack Covers .. 5/6

PRIMA DONNA RADIO & CABINET CO.,
264 Oxford Street, Woollahra. 'Phone FW2328

Catch Bond tram, get off Denison St., directly opposite Denison Hotel.

ROSS HULL

1930 Three, Four, and Five.

ALL SUBPANELS and COIL SHIELDS for
these wonderful sets were supplied by us.

SUBPANELS

Plain Heavy Gauge Aluminium, 12/6 each.
Beautifully lacquered in Ripple Gold, 15/
each.

COIL SHIELDS

Lacquered in gold to match, 3/ each.
Plain Aluminium, 2/ each.
Complete set posted to any part of Australia,
2/6 extra.

POWER PACKS

Designed and manufactured to the specifica-
tion of Ross Hull's 1930, Three-Four, and
Five, mounted in beautiful nickel-plated
pack covers. Mounted on complete chassis.
Guaranteed.

COILS PERFECTLY MATCHED.

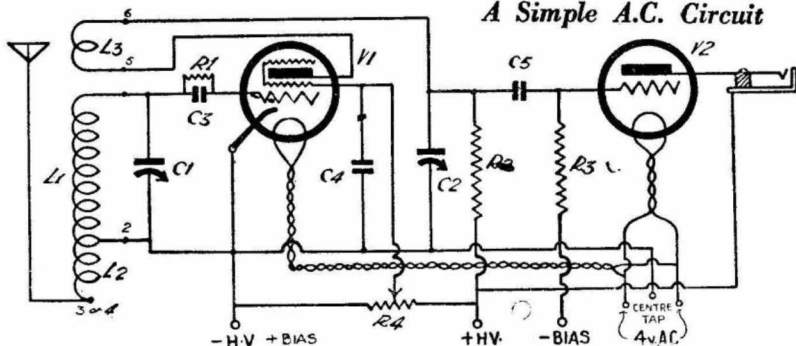
For Ross Hull's 1930 Three, Four, and Five,
perfectly matched and guaranteed true to
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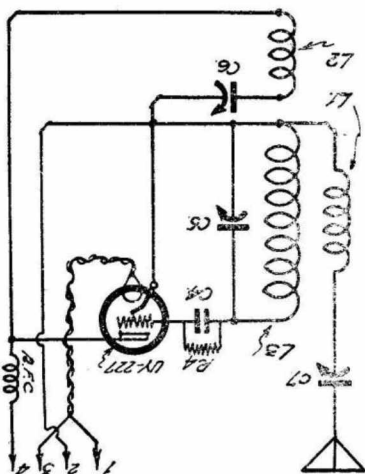
THE MODERN TWO

A Simple A.C. Circuit



HERE is the circuit of a simple two-valve a.c. operated set with a screen-grid detector. The parts required are:—L1, L2, L3, Lewcos AM5 coil unit and base; C1, .0005 Advance variable condenser; C2, .00025 variable condenser; C3, .00025 mfd. fixed condenser; C4, .5 mfd. fixed condenser; C5, .01 mfd. fixed condenser; R1, 2-megohm grid leak; R2, 250,000-ohm grid-leak; R3, 2-megohm grid-leak; R4, 100,000-ohm potentiometer. The first valve may be an E-442 or a UY-224, depending on the filament voltage available. The amplifier valve may be a B405 or some larger tube, such as the UX245. The former type would be used when the eliminator is capable of delivering about 150 or 180 volts. The earth lead is connected to the terminal "2" on the coil unit, which in turn connects to the centre-tap of the filament supply.

AN A.C. DETECTOR UNIT

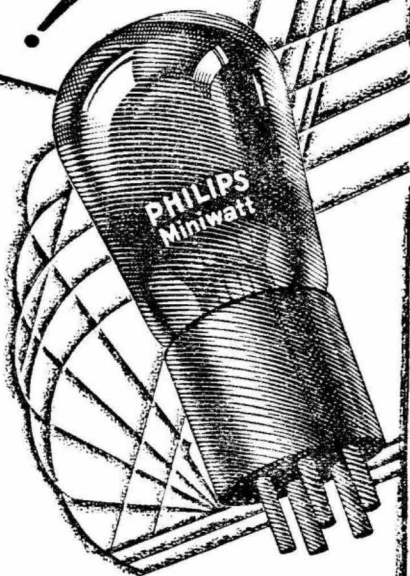


THIS simple arrangement of one valve is suited for operation into an audio amplifier, or it may be used with head-phones as a single-valve set. It was originally described in the January 3 issue of "Wireless Weekly" (to be operated in conjunction with the amplifier shown earlier in this booklet. The necessary apparatus includes: One UY-227 valve and socket. One .0005-mfd. variable condenser (C5). One 23-plate midget condenser (C6). One .00015-mfd. grid condenser (C4). One 7-plate midget condenser (C7). One r.f. choke. One 1-megohm grid-leak (R4) and the coil unit. L1 consists of 25 turns of 26-gauge wire wound in a bunch and placed inside the lower end of L3. L3 consists of 75 turns of 26-gauge wire wound on a 1 3/4 in. former. L2 is also a bunch-wound coil of 30 turns of the same wire, also mounted inside L3. The terminals 1 and 3 go to a 2.5-volt filament supply. This supply is marked as 1 and 2 on the diagram of the amplifier. Terminal 2 on this unit connects with terminal 3 on the amplifier, or with the centre-tap of the filament winding and ground if no amplifier is used. Terminal 4 goes to a positive tapping on the eliminator of about 40 or 50 volts.

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