

Amateur Wireless

3d



No. 443. Vol. XVII

Saturday, December 6, 1930

Registered at the G.P.O. as a newspaper

Christmas double number

EDISWAN RADIO



The Ediswan Pentogram.
Price 35 guineas.

The Ediswan All-Electric
Power Pentode Three.
Price 20 guineas.

The Ediswan All-Electric
Power Pentode Two.
Price £14.19.6.

The Ediswan 3-Valve
Receiver (Battery Model).
Price £9.18.6.

Your radio dealer has
particulars of Ediswan
H. P. terms.



ALL USING THE AMAZING MAZDA VALVES

W.112

Advt. of The Edison Swan Electric Co., Ltd.



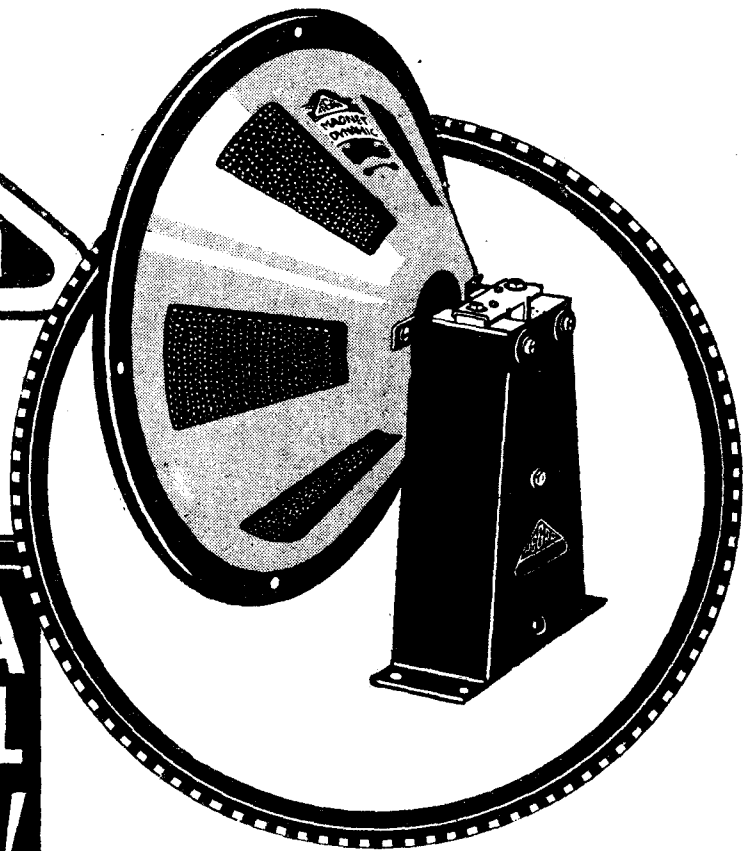
AS GOOD AS A MOVING COIL SPEAKER

THE HEGRA MAGNET-DYNAMIC

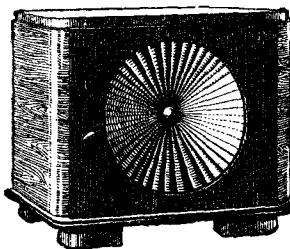
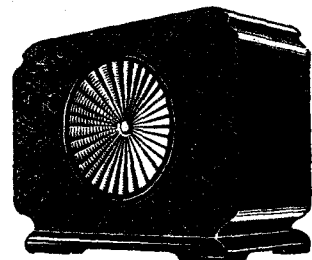
56!

Leading Radio critics agree that the Hegra Magnet Dynamic Speaker gives an astonishingly good performance. The special magnet system, enabling a very small air gap to be employed, gives strict uniformity of response; the speaker can comfortably handle an input up to 4 watts. For Christmas Radio, for a present—to yourself or a friend—you cannot do better than buy a Hegra Speaker.

Note. Both the Magnet Dynamic and the Cabinet Speakers illustrated, are fitted with a triple lead giving different impedance values according to the output valves used.

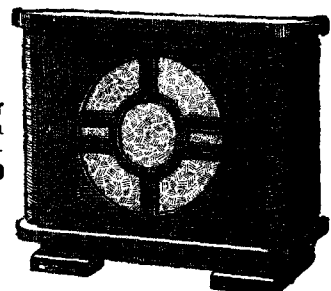


The "S" type speaker incorporates Hegra E unit in handsome walnut cabinet £3 : 5 : 0



The "T" type speaker similar to above, but with different cabinet design - £2 : 12 : 0

The "V" type speaker similar to above, in beautiful walnut cabinet - £3 : 5 : 0



● **HEGRA SPEAKERS ARE STOCKED BY ALL REPUTABLE DEALERS.**

M.C.21.

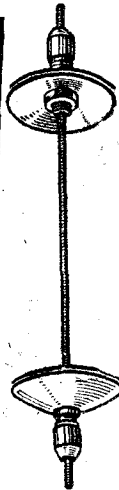
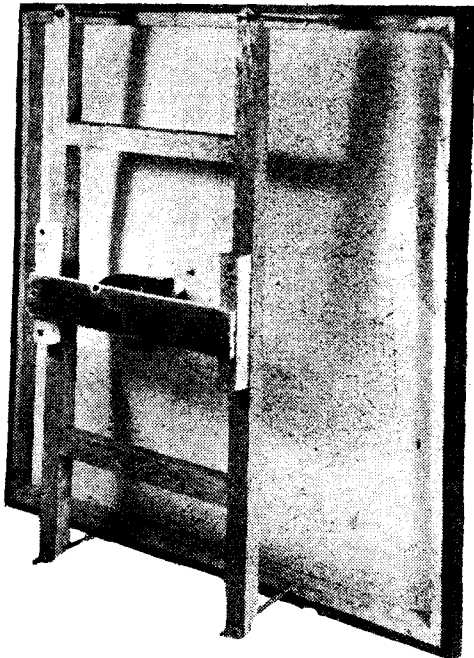
XMAS RADIO BARGAINS

The new "A.W." Linen Diaphragm Loud-speaker below is equal to, if not better than the majority of M.C. speakers.

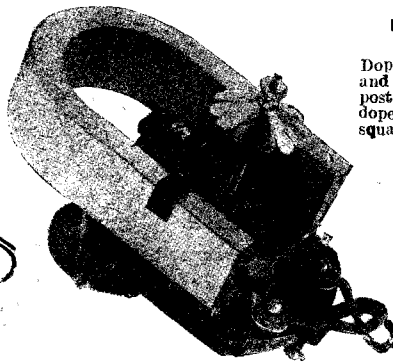
Complete Speakers:

Size 14 in. x 14 in.	17/6, post free.
Size 15 in. x 16 in.	18/6, post free.
Size 16 in. x 16 in.	19/6, post free.
Size 16 in. octagonal	22/6, post free.
Size 24 in. x 24 in.	25/-, post free.
For constructors, kits of parts can be obtained immediately:	
Size 14 in. x 14 in.	15/6, post free.
Size 16 in. x 16 in.	17/6, post free.

Other sizes made to customers' requirements.



The Double-Cluck extension Rod illustrated above is an important accessory for a linen diaphragm loud-speaker. Flexible but strong. 1/-, post free.



Above is Junior K.D. 4-pole Loud-speaker Unit specially designed for linen diaphragm Loud-speakers. A remarkable unit for only 9/6, post free. There is also a *de luxe* model—the K.D. Double Magnet 8-pole Unit. For power and sweetness of tone is unsurpassed. Price 15/6, post free.

Here is the finest example of double diaphragm loud-speakers yet designed. Supplied complete by special request. Kit of parts ready for assembly consisting of parchment to size, 5-ply baffle, metal bars, unit holder, screws, etc. All finished in black. Size 12 in., 4/6, post free. 15 in., 7/6. Parchment paper for making cones, sizes 15 in. and 7 in., 1/-, post free.

Write for free illustrated folder and improve your radio this Christmas.

KONE-DOPE COMPANY, 54 Edmiston Road, Stratford, E.15.

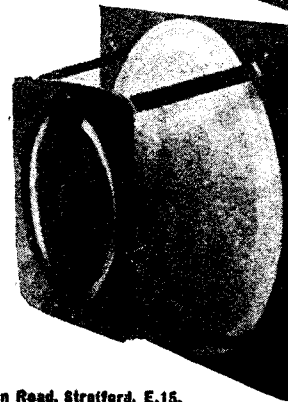
OTHER KONE-DOPE PRODUCTS.

Dope for linen. 6d. and 1/- per bottle, post 3d. Specially doped linen. 6/- per square yard, post 3d.

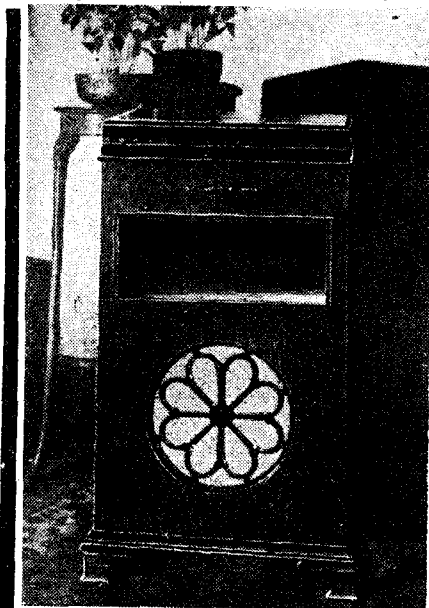


THE "GIPSY" FIVE PORTABLE

Here is a real portable, size 12 in. x 12 in. x 8 in., weight 19 lbs. Imitation crocodile finish, assorted colours. Beautiful tone, brings in Continentals at fine loud-speaker strength. Complete with valves, batteries, accumulators ready to switch on. 8 guineas, carriage paid.



A Welcome Christmas Gift

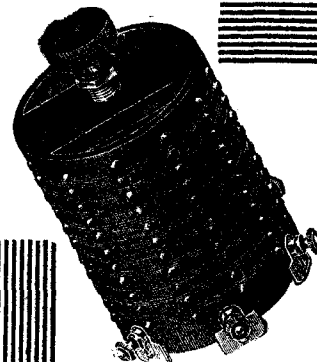


The
CAMCO
WAVERLEY
Radio-Gram Cabinet

PUT it in this magnificent Radio-Gram Cabinet and it will become a handsome piece of furniture. The Camco "Waverley" is a beautifully-finished and soundly-constructed cabinet. Yet its cost is remarkably low—£5 10s. in Oak and £6 15s. in Mahogany, with 15" baseboard. Used for the "Orgola" and other well-known circuits. See it and be convinced—at our Showrooms. Also send coupon for 24-pp. Catalogue FREE

CARRINGTON MFG. CO., LTD.
24 Hatton Garden, Holborn
E.C.1
(Factory: S. CROYDON)

Name _____
Address _____
A.W.



A DUAL RANGE COIL WITH A PUSH-PULL SWITCH

WIRELESS CONSTRUCTORS have in the Sovereign Dual Range Coil a further Sovereign Component upon which to rely. Wound upon a slotted former of moulded Bakelite for baseboard or one-hole panel fixing, it is supplied complete with good Push-Pull Switch, 6 Terminals with marked tabs and instructions. A component to give better results on both broadcast bands.

PRICES:—For Baseboard Mounting, 9/-; for Panel Mounting, 8/6. Type W.S. without Switch (Baseboard Model only), 8/-.

OTHER NOTABLE SOVEREIGN PRODUCTS . . . Wire-wound Resistances; Volume Controls; Potentiometers; Rheostats; Wave Traps; Screen-grid Coils; H.F. Chokes; Compression-type Condensers, etc. Each famous for reliability and efficiency.

Tell us if your dealer does not stock what you want. We will gladly give you the name of the nearest stockist



SOVEREIGN PRODUCTS, LTD.
52-54 Rosebery Avenue . London, E.C.1

Watch next week's announcement for Two New Sovereign Lines

Don't Forget to Say That You Saw it in "A.W."

— A Better thought — Buy an 'Atlas' this Xmas!

This year's Olympia winner, and the most comprehensive range in Mains Units

Chosen by experts as the finest Mains Units at Olympia, "ATLAS" Units are the ideal Xmas presents for yourself and friends. They are the acme of perfection in service, reliability, and economy, and are fully guaranteed for twelve months.

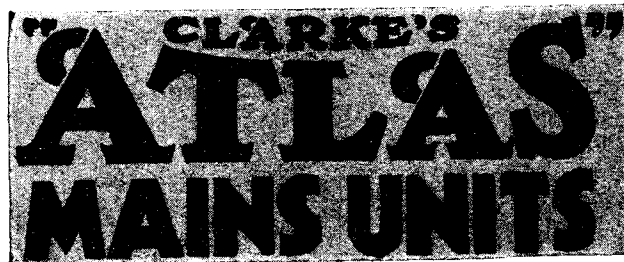
No matter what the set is, or whether A.C. or D.C. is in the home, the "ATLAS" Range provides a model to meet them



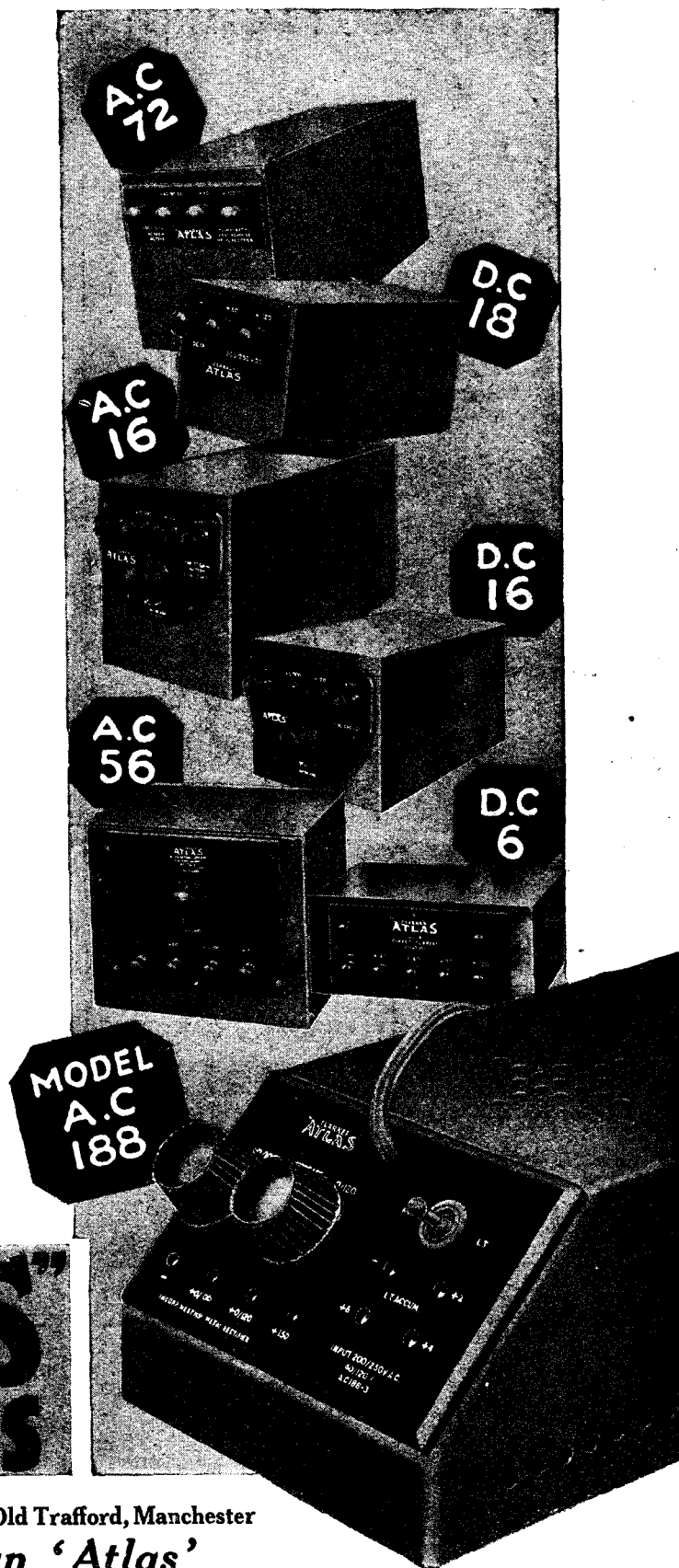
ALL-MAINS UNIT, MODEL A.C.188.—This is the model which was placed first in the "Wireless World" Olympia Competition. A combined H.T. Battery Eliminator and L.T. Accumulator Trickle Charger, it provides the ideal All-Mains facilities for any set—Standard or Portable—from one to five valves. Two variable tapings 0-100 and 0-120 volts, one fixed 150 volts. Output, 150 volts at 25 m.a. L.T. Trickle Charger caters for 2-, 4- and 6-volt accumulators.

Cash price, £6; or 10/- down, and balance in easy monthly instalments.

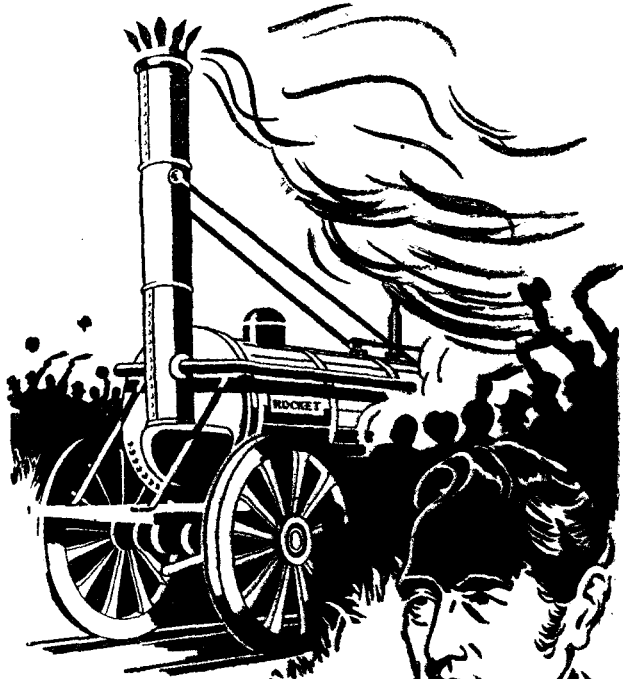
Ask your dealer for Folder No. 55, or write direct to the sole makers of—



H. CLARKE & CO. (M/cr), LTD., Atlas Works, Old Trafford, Manchester
Have the best—get an 'Atlas'



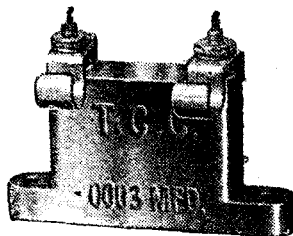
LITTLE STORIES OF GREAT MOMENTS



"Look!
It's going—it's going!"

There was gladness in some hearts and consternation in many when Stephenson's Rocket started on its first perilous journey. Long embittered critics were confounded and the habits of a nation transformed. It was the complete triumph of a lifetime spent in doing one thing and doing it well.

It is this same spirit of "doing one thing and doing it well" which has, for years, been behind all T.C.C. endeavour. That is why T.C.C. have never made anything but Condensers, and that is why T.C.C. Condensers are unmatched—for accuracy and for dependability.



One of the many types is shown here. It is the T.C.C. .0003 mfd. Upright Mica Condenser. Price 1/6.

T.C.C.
CONDENSERS

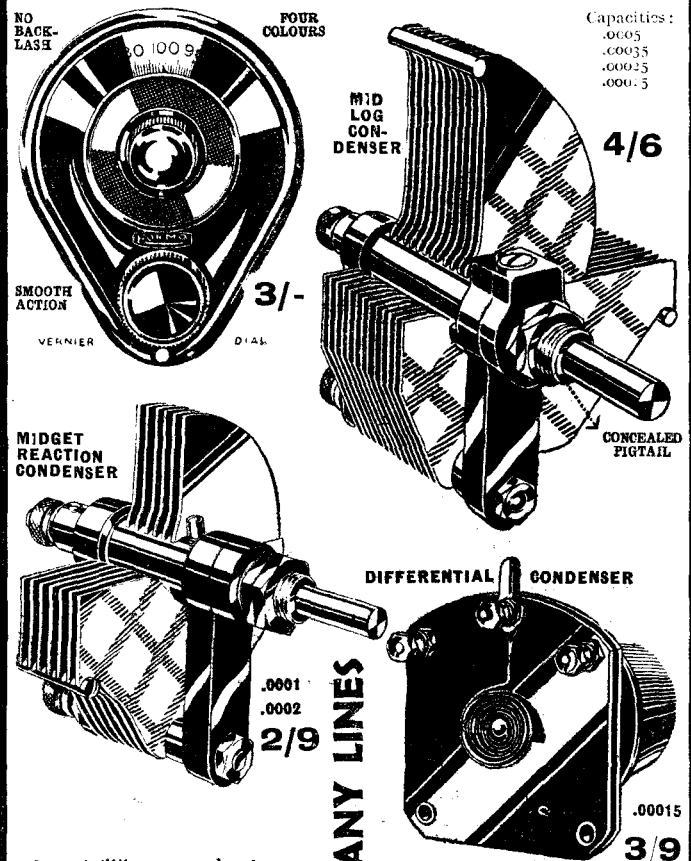
TELEGRAPH CONDENSER CO., LTD., N. ACTON, W.3.

♡7039



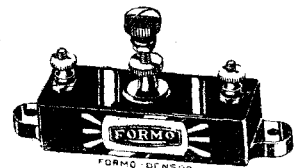
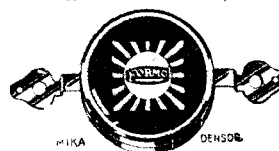
A CHRISTMAS GIFT

That Your Friends will Appreciate
IT'S CHEAP. EASY TO BUILD
and Wonderfully Efficient—
THE CHALLENGE "2"



A great little compression type Condenser.

F	.0001	-	16
J	.0003	-	16
G	.001	-	16
H	.002	-	23



1,000 volt test. Bakelite and Mica.	
.0001	.0005 7d.
.0002	.001 8d.
.0003	.002 10d.

BRITISH LEADERSHIP

**SUPPLIERS TO THE
LEADING SET MAKERS
OF THE COUNTRY**

CATALOGUE FREE. GOLDEN SQUARE, PICCADILLY CIRCUS, LONDON. GERRARD 1863.

Advertisers Appreciate Mention of "A.W." with Your Order



THE ORIGINAL Jelly Acid Non-Spillable Cell

TYPES and PRICES.

Type	Volts	Cap at 20 hour rate	Weight Charged	Dimensions (in inches)			Price
				L.	W.	H.	
2NS9	2	10	2 lbs	1 1/2	3 1/2	4 7/16	12/-
2NS13	2	15	2 1/2 lbs	2 1/2	3 1/2	4 7/16	14/6
2NS17	2	20	3 1/2 lbs	3 1/2	3 1/2	4 7/16	16/-
2NS21	2	25	4 1/2 lbs	3 1/2	3 1/2	4 7/16	18/-
2AN7	2	30	5 1/2 lbs	2 1/2	4 1/2	7	16/-

The popularity of the C.A.V. Jelly Acid Battery is not explained by the mere fact that it contains jelly electrolyte—there are other jelly electrolyte batteries! There are three reasons why the C.A.V. is the most effective non-spillable yet produced.

THE JELLY ACID. Its composition is unknown outside our own laboratories. It maintains perfect contact with the whole of the plate surfaces, yet allows unrestricted gassing when on charge. It is chemically pure, and allows maximum conductivity.

THE CONTAINER. Of special construction, contains a baffle plate and moistening pad, which serves the triple purpose of arresting acid spray during charge, feeding the electrolyte with moisture to maintain an even consistency, and definitely confines the jelly to the plate chamber.

THE PLATES. These have been specially developed to give the utmost possible capacity when used with C.A.V. Jelly acid.

THE WHOLE. The C.A.V. is the lightest, cleanest, and most compact non-spillable on the market. By avoiding cumbersome acid traps, the greatest possible capacity for bulk is obtained.

Obtainable from our Depots and Battery Agents throughout the country and from all Radio Dealers.

- AND BEST

May we send you copy of our latest Catalogue giving particulars of all types of C.A.V., H.T. and L.T. Accumulators. Write to Dept. C.4

C.A.V. Vandervell & Co. Ltd.
ACTON, LONDON, W.3.

ALL POSITION
NON-SPILLABLE



Perfect for Portables

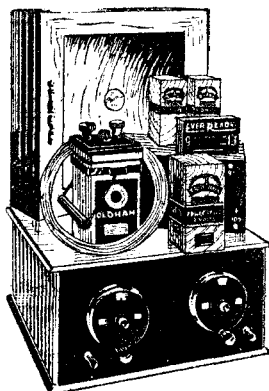
Don't Forget to Say That You Saw it in "A.W."

K. RAYMOND LTD.

27 & 28A, LISLE ST., LONDON, W.C.2
Nearest Station, Leicester Square Tube Station. Back of Daly's Theatre

RAYMOND'S "STRAIGHT THREE"

Now available on
EASY PAYMENT TERMS

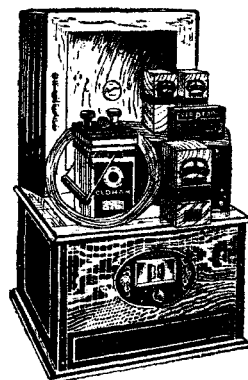


Comprising COMPLETE KIT with Three TRIOTRON New Process Valves, OLDHAM 45 amp. Accumulator, 100 v. High Tension and EVER READY Grid Bias Battery, CLIFTOPHONE £3 : 3 : 0 Loud-speaker and Aerial Equipment. Carriage Paid

CASH PRICE £4:5:0
DELIVERED IMMEDIATELY for 9'

and 12 monthly payments of 9/-

"RED STAR" 3-VALVE WONDER SET

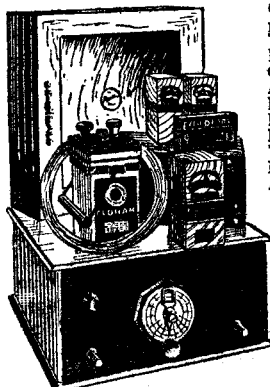


As illustrated, COMPLETE with Three TRIOTRON New Process Valves, OLDHAM 45-amp. Accumulator, 100 v. High Tension, and EVER READY Grid Bias Battery, CLIFTOPHONE £3:3:0 Loud-speaker and Aerial Equipment. Carriage Paid.

CASH PRICE £6:6:0
Ready for Use. NOTHING ELSE TO BUY
DELIVERED IMMEDIATELY for 12'9

and 12 monthly payments of 12/9

RAYMOND'S "SCREENED GRID 3"



Comprising Complete S.G. Kit with Three TRIOTRON New Process Valves, OLDHAM 45 amp. Accumulator, 100 v. High Tension and EVER READY Grid Bias Battery, CLIFTOPHONE £3 : 3 : 0 Loud-speaker and Aerial Equipment.

CASH PRICE
£5:10:0
Carriage Paid

DELIVERED IMMEDIATELY for 10'6
and 12 monthly payments of 10/6

100 SPECIAL BARGAINS ON VIEW IN OUR WINDOWS
Part of Large Bankrupt Stock Purchase—**EVERY ARTICLE GUARANTEED—NOW IS YOUR OPPORTUNITY.**

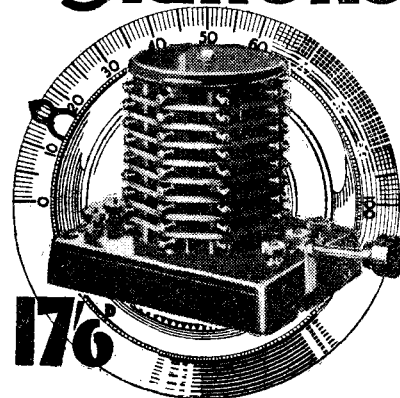
See no Money—PAY THE POSTMAN

NOTE.—We are open all day Thursday and Saturday and every day from 9 a.m. till 6 p.m.

Pye 110 Henries Chokes, 12/6 List. Our price	4/11
Undy Pick-up and Tone Arm complete, 57/6 List. Our price	35/-
Peto-Radford 20/40 Non-spillable Portable Accumulators. Our price	5/11
Oak Loud-speaker Cabinets, 13 in. by 13 in.	4/11
Oak Loud-speaker Cabinets, to fit Blue Spot R. or P.	10/6
Chassis to fit Blue Spot R. or P., Large Type, 16 in.	6/11
Dual Range Coils, Panel Mounting	4/11
Dual Range Coils, Baseboard	4/11
Differential Condensers, .00015	2/6
Reaction Condensers, .0001	1/11
Baseboard Neutralising	1/11
S.L.F. Variable Condensers, .0005	2/6
S.L.F. Variable Condensers, .0003	2/6
Valve Holders with Terminals	each 5d.
Triotron Cone Units, latest model	8/6
Triotron T.D. 2 valves	4/6
Triotron Z.D. 2 valves	5/6
Fuller 2-volt 60 Accumulators	6/11
12 in. Cone Chassis, take any unit	1/11
15 in. Cone Chassis, take any unit	2/11
12 in. by 7 in. Oak Cabinet, complete with polished panel	8/11
14 in. by 7 in. Oak Cabinet, complete with polished panel	9/11
18 in. by 7 in. Oak Cabinet, complete with polished panel	10/11
Dual Range 6-pin Coils	4/6
200-700 metres 6-pin Coils	3/6
Sovereign Dual Range Panel Mounting Coils	6/11
Titan Coils, Dual Range	9/11
New Ormond Geared Dial	2/6
New Ormond Log Condenser	4/-
Undy 8-pole Units	6/-
Undy 8-pole Units and Chassis	16/9
Pico All-in-One Volt Meter	32/6
Dead Beat Volt Meters	12/6
Accurate Hydrometers, Float or Ball Reading	3/9
Gramophone Pick-ups, guaranteed, British made	2/6
Panel Brackets	7/6
H.F. Chokes, reliable	pair 6d.
Fully guaranteed 5-1 or 3-1 Transformers	1/11
Set of S.W. Coils, No. 2, 4, 6, 9	4/9
Plug-in Coils, Nos. 25, 35, 50, 60, 75	set 6/6
Plug-in Coils, Nos. 100, 150, 200, 250	each 1/3
60x Coils, 1/8 each: 60 C.T.	each 2/3
250x Coils, 3/6: 250 C.T.	each 1/4
Wall Plugs, complete	each 2/9
Linen Double Chassis Solid Oak Frame, Linen fixed and stretched, complete with dope and brush, etc.	8d.
10 in. by 6 in. Aluminium, with 1/2-in. bend	5/11
	1/3

IMPORTANT.—All letters and communications must be addressed to **K. RAYMOND LTD.**
27 and 28A LISLE STREET, LONDON, W.C.2
The name of the street is not sufficient.

Separate those Stations



This is a Wave Trap as well as a Tuner. It gives sharp tuning and eliminates interference. Its special winding, designed to give loose aperiodic coupling, explains the life and definition which it gives to the tuning of any circuit in which it is incorporated.

THE WATMEL UNIVERSAL DUAL RANGE TUNER beautifully finished in mottled Walnut (Bakelite) and incorporating wavelength switch.

17/6 complete.

THE WATMEL BINOCULAR H.F. CHOKE

gives maximum efficiency, very low self-capacity and an extremely restricted field.

TYPE DX3

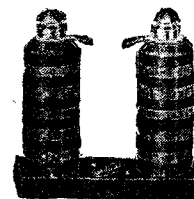
Inductance - 200,000 m.h.
Self Capacity - 1.6 m.mfd.
D.C. Resistance - 1,400 ohms

Price 6/-

TYPE DX2

Inductance - 40,000 m.h.
Self Capacity - 1.2 m.mfd.
D.C. Resistance - 450 ohms

Price 4/-



If you cannot get these Watmel products at your dealers, send remittance and order direct to us, and the article will be dispatched by return.

WatMel

WATMEL WIRELESS CO., LTD.,
Imperial Works, High Street, Edgware
Telephone: EDGWARE 0323.

M.C.12

TWO WONDERFUL VALVES

Highest efficiency :: Lowest price!

SUPER-DETECTOR

Slope - - 2 Ma/V
Mag. Factor - 15
Fil. Current - 0.15

6/6



HYPER-POWER (2-volt)

Slope - - 2.3 Ma/V
Mag. Factor - 5
Fil. Current - 0.3

Steep slope, low impedance, splendid volume, beautiful tone. Wonderful reproduction of the bass notes.

8/-

*Ask your dealer or write
for free folder to :—*

IMPEX ELECTRICAL LTD.

Dept. J.

538, HIGH ROAD,
LEYTONSTONE, E.11



Best way to all Stations

EPOCH AGAIN!

Epoch was the first to bring out a practically perfect energised moving-coil speaker—three years ago.

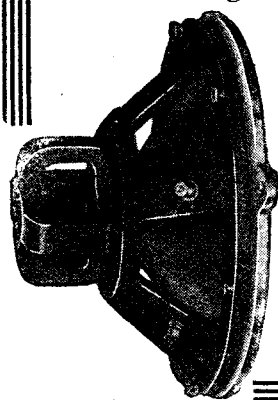
Epoch was the first to bring out a perfect permanent magnet moving-coil speaker—two years ago.

Epoch was the first to bring out the "new" cross magnet type of moving-coil speaker—one year ago.

Epoch has always been 25 to 75 per cent. cheaper than any other make of the same apparent cost of manufacture.

Now. — The new permanent magnet moving-coil speaker, type A.1.

NOW
£3:7:6!



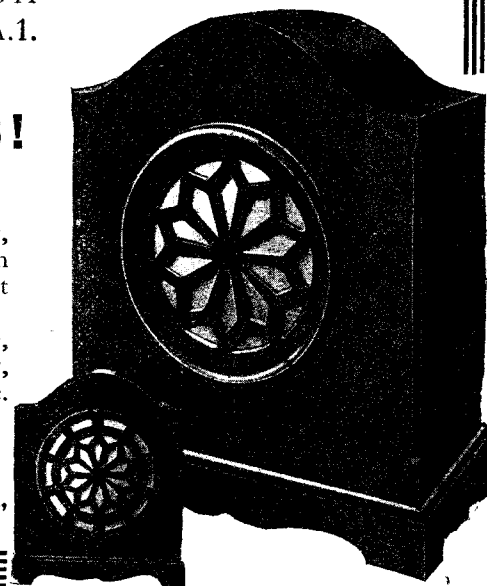
Guaranteed delivery for Xmas if ordered immediately.
Remember, no batteries, no mains, no gadgets, light, strong, powerful enough for a hall and sensitive enough to work from any set. The magnet is made of cobalt steel. **Quality? Epoch!**

Made up as a cabinet model, from £5 5s. complete, ready for use. Supplied also with output transformer, which immediately matches any valve, including pentode.

Get the new catalogue giving particulars of the most comprehensive range of moving-coil speakers, energised and permanent, in the world.

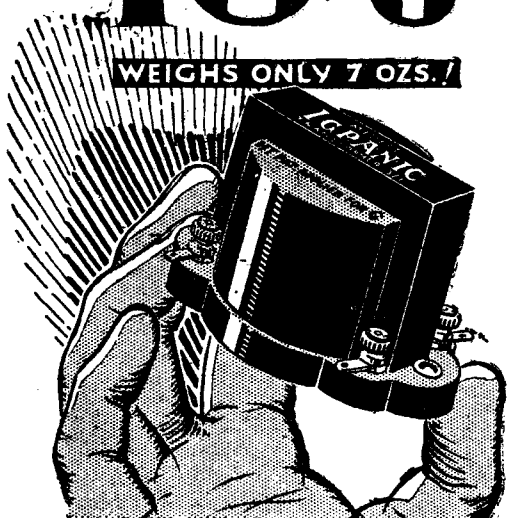
CALL AND HEAR THEM.

The EPOCH RADIO MANUFACTURING CO., LTD.,
Farringdon Avenue, London, E.C.4



Price
10/6

WEIGHS ONLY 7 OZS.!



IGRANIC MIDGET TRANSFORMER

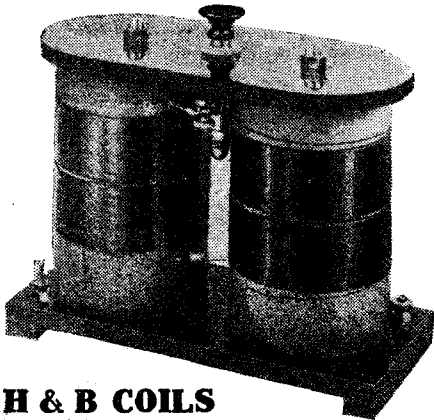
Specified for the
"CHALLENGE TWO" RECEIVER

Although only $2\frac{7}{8}$ " \times $1\frac{7}{8}$ " \times $1\frac{3}{4}$ " in size, this Transformer may be termed a "Masterpiece in Miniature." This "Midget" Transformer has a high primary inductance of over 60 henries, and the patented core embodying a new nickel alloy permits overload without ill effect. Ratio 3:1.

Have you a copy of our new Radio Catalogue? If not may we send you one? Write to Dept. D. 152.



H & B



H & B COILS

Made exactly to Specification, carefully Matched and Guaranteed.

"CHALLENGE TWO," with reaction winding	£ 10 6
"CHALLENGE THREE," carefully matched, per pair	1 1 0
"CHALLENGE FOUR," three Coils exactly as specified and carefully matched	1 11 6
"MUSIC MONITOR," "W.M." September	7 6
"SEARCHER TWO," "A.W." August 23, per pair	9 6
"A.B.C. TWO," "W.M." August	5 0
"BROOKMANS BY-PASS"	3 0
"MUSIC LEADER," "A.W."	10 6
"JAMES' S.G. PORTABLE 3," "W.M." July	9 6

NOTE.—We supply Coils for any set described in "A.W." "W.M." etc. Any Coil built to your specification. Prices on application.

SOME POPULAR H & B KITS OF THE YEAR

"ETHER SEARCHER," "A.W." December 14, 21, January 11.

The most popular receiver designed, we sold in two months 240 kits and have received enormous number of letters from constructors giving marvellous reports. H. & B., the only specified kit (read "A.W." review, January 11), complete in every detail, special aluminium panel and new type fast and slow drum dial. Kit contains also wire, screws. CASH PRICE, £5 5 0

"INCEPTORDYNE," "W.M." February, 1930.

The first all-wave receiver of 1930. We have sold this set to customers in every part of the world, including U.S.A., and the reports on long-distance reception are astounding. Complete kit, exact in every detail to the original, together with one pair dual-range coils, wire, screws. CASH PRICE, £5 5 0

"NO-BATTERY MAINS TWO," "A.W."

A two with a four-valve voice. Splendid set for those who have A.C. mains. It requires no batteries or accumulators; running cost extremely low. Simple to construct, extremely easy to operate. Complete kit of all components necessary to construct this receiver, together with panel, strips, wire, and screws. CASH PRICE, £7 13 0

Two Marconi or Mullard valves, £1 6 extra. One rectifying valve, D.W.2, 17 6 extra.

"MUSIC MONITOR," "W.M." September.

A wonderful two-valve; gives pure and good volume on numerous stations. Simple to construct. Can be built in two hours. Complete kit of specified parts, together with H. & B. specified coil ready wound. CASH PRICE, £2 17 0

"SHORT WAVE TWO."

This set, described in "A.W." November 29 issue, opens up new fields for those who enjoy getting far-distant stations. H. & B. Special Kit. CASH PRICE, £3 18 10

"THE REYNER HYPERDYNE."

You should read all about this set in the December issue of "W.M." It is unique in many ways. H. & B. Kit. CASH PRICE, £7 16 10

THE H. & B. HYPERDYNE INTERMEDIATE AMPLIFIER.

Built exactly to Mr. Reyners' specifications. Supplied complete in copper screen box with ebonite lid. Ready for immediate use. CASH PRICE, complete, post paid, £3 3 0

Coils.—Set of three Special Intermediate Amplifier Coils, wound exactly to specification, 17 8 the set. Post paid. Copper Box and Ebonite Lid, with necessary earthing screws, 15/-, post paid.

See "W.M." for December.

THE "FIVE POINT TWO."

Here is a first-class set that is cheap to build and gives very fine results. (See "W.M." December.) H. & B. Special Kit. CASH PRICE, £3 13 5

Two Mullard or Marconi valves, 19/- extra.

"THE 45/- TWO."

This set has the following important features: Low first cost, simple construction, and economical working. It is a receiver which may be relied upon to give excellent results. (See "A.W." October 11 issue.) H. & B. Special Kit. CASH PRICE, £2 9 4

Two valves, Mullard or Mazda, det. and power, 19/- extra.

A "CHALLENGE" for YOU

"Amateur Wireless" has done something specially good in these "Challenge" sets. There's a 2-, 3-, and 4-valve H & B KIT for you to select from.

THE "CHALLENGE TWO"

Ebonite Panel, 9 by 6 in. (Trelleborg)	8. d. 2 3
Two Variable Condensers, .0005 (Formo)	9 0
Push-pull Filament Switch (Pioneer)	1 3
Two Slow-motion Dials (Brownie)	5 0
"Challenge" Coil, with reaction winding (H. and B.), exactly as specified	10 6
TWO VALVE HOLDERS (TELSEN)	2 0
0002-MFD. AND .0001-MFD. FIXED CONDENSER (TELSEN)	2 0
Grid-leak Holder (Lissen)	1 0
2-megohm Grid Leak (Lissen)	1 0
Pre-set Condenser, .0001 mfd. to .000005 mfd. (Sovereign)	1 6
L.F. TRANSFORMER (TELSEN)	8 6
Two Terminal Blocks (H. & B.)	8 9
Four Terminals, marked: Aerial, Earth, L.S., L.S.—(Belling-Lee)	1 6
Five Wander Plugs, marked: H.T.—, H.T.1—, H.T.2—, G.B.—, G.B.— (Belling-Lee)	1 3
Two Spade Terminals, marked: L.T.—, L.T.— (Belling-Lee)	8
(SEE IMPORTANT NOTICES)	
CASH PRICE	£2 7 8

Two Mullard or Mazda Valves, 19/- extra.

THE "CHALLENGE THREE"

Receives twenty or thirty foreigners at loud-speaker volume on any evening. See "A.W." November 15 issue. H. & B. Special Kit.

CASH PRICE, £5 13 1

Three valves, Mullard or Mazda, £1 19 0 extra.

THE "CHALLENGE FOUR"

This receiver employs two S.G., detector, and pentode valves, as against one S.G., detector, and pentode for the "Challenge Three." Similar circuit. Excellent for great loud-speaker volume on numerous stations. H. & B. Special Kit. CASH PRICE, £6 15 9

Four Mullard or Mazda valves, £2 19 0 extra.

"CHALLENGE FOUR" MAINS MODEL

The additional components required for this cost £5 18 11

See our advertisement, page 556, "A.W." October 8 issue.

"A.W." STANDARD H.T. UNIT

(H & B KIT)	£ s. d.
Power Transformer, with 135-volt secondary winding (Varley)	1 5 0
Metal Rectifier (Westinghouse, style H.T.—7)	1 1 0
L.F. Smoothing Choke (Herman)	15 6
Three 4-mfd. Fixed Condensers, 500-volt test (Mullard or Lissen)	15 9
Five 2-mfd. Fixed Condensers (Mullard or Lissen)	7 0
120,000-ohm Variable Resistance (Regentstat)	9 6
One 25,000, one 15,000, and one 2,000-ohm Spaghetti Resistance (Bulgin or Magnum)	4 6
Ebonite Strip, 8 1/2 by 2 in. (Trelleborg)	8
Six Terminals, marked: H.T.—, H.T.1, H.T.2, H.T.3, H.T.4, H.T.5 (Belling-Lee)	2 3
Twin Fuse, baseboard mounting (Bulgin)	2 6
Length of Mains Flex (Lewcos)	1 6
CASH PRICE	£5 5 8

Price of Kit includes Wire, and Screws.

IMPORTANT NOTICES

The Cash Prices for ALL Kits include Panel already drilled, all Wire and Screws needed.

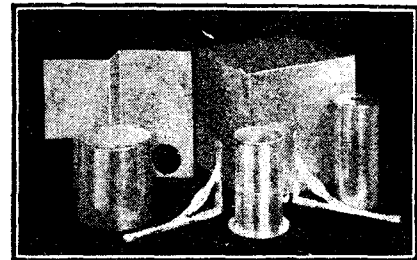
SETS BUILT FREE

If desired, we will build your set from any Kit. You must please notify us at the time you send Cash with Order.

Any kit made up to your specification if desired. Quotation by return.

Carriage Paid on All Orders accompanied by Cash. C.O.D. Charges Paid on orders over £1.

SCREENS



"CHALLENGE THREE"

Set with foil, earthing terminals, and screws, 2/6, post free.

"CHALLENGE FOUR"

Set complete, with foil, base, and screws, 3/9, post free.

Standard, 10 by 6 in., with two terminals	£ s. d. 1 9
"Lodestone 3 and 4"	1 9
"James S.G. Quality 5," set	5 6
"Brookmans 3"	2 0
"Brookmans 4," set	5 6
"Sunshine Portable"	1 6
"Clarion 1930 3"	1 9
"Inceptordyne" and foil	5 6
"Ether Searcher" Panel, Screen, and Base	11 6
"Music Leader" Box	5 0
"Horizon Four"	2 6
"Continental Portable"	1 9
"James S.G. Portable" Chassis	9 6

"D.C. FOREIGN LISTENERS' FOUR"

See "Wireless World," July 16, 1930.

SCREENS AND SHIELDS (H & B SPECIFIED)

Each	
Tabular Valve Shields	3 0
Cylindrical Coil Shields	2 10
Copper Screening-Boxes, for H.F. chokes, with anode tube	2 9
Ditto, without tube	2 6
Aluminium Brass Plate, 15 by 11 in.	2 6
14-in. Hard Brass Strip for coil-changing switch 1 by 3/32	0 6
NOTE.—We supply Kits and Components for all "Wireless World" Sets.	

SCREENING BOXES

Aluminium, 6 by 6 by 5 1/2 in., with lid	£ s. d. 5 0
6 1/2 by 6 1/2 in. with lid and screws	5 6

TRADE SUPPLIED

H & B CABINETS FOR ALL RECEIVERS

Hand-Polished Oak Cabinet, easily assembled, with 8 screws supplied. See report on page 773.	PRICES: Sizes
	14 x 14 17/6
	CABT. 1/3
	14 x 16 20/-
	CABT. 1/3
	16 x 16 23/-
	CABT. 1/3
	24 x 24 35/-
	CABT. 2/6

H & B COLLAPSIBLE CABINET

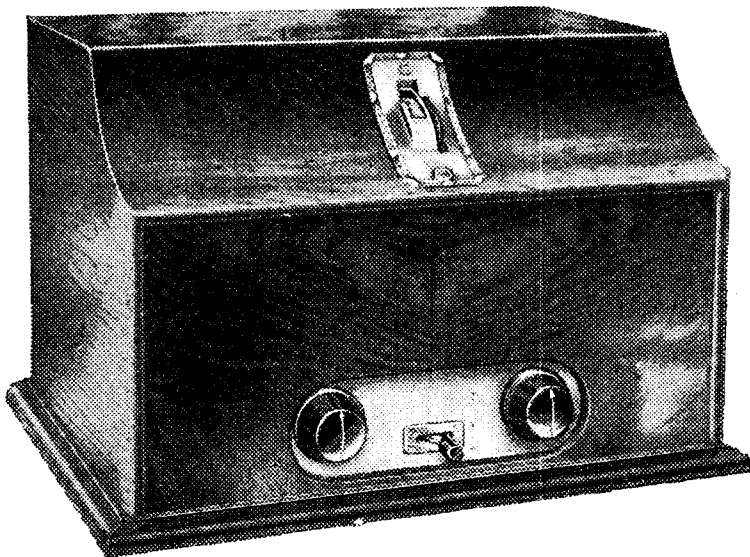
For "A.W." New Linen Speaker, described in issue dated November 15.

"Foursome Portable" Cabinets, with all fittings in oak.	£ s. d.
Special Show Price	1 10 0
Reyners' Special Show Price	1 12 6
"Merry Maker" and "Continental Portable," with turntables fitted	1 15 0
"Sunshine Portable" Cabinets, in oak, with all fittings and turntable. Special Price	1 7 6
"Music Leader Portable" Cabinets, with frame aerial and turntable	1 15 0
American-type Cabinets, in oak, best finish:	
14 by 7 by 10 in.	14 6
16 by 8 by 10 in.	18 6
18 by 7 by 10 in.	17 6
21 by 7 by 10 in.	1 9 0
24 by 8 by 12 in.	1 10 0
Mahogany, 3/- extra in each case.	
We carry a stock of 300 Cabinets and can make any special cabinet at 3 days' notice.	

H & B RADIO CO.

34, 36, 38 BEAK ST., REGENT STREET, LONDON, W.1

GERRARD 2834.



Ask your
dealer for a
demonstration

THE BURTON SCREEN GRID THREE Battery model.

A highly selective set giving adequate volume without use of a Pentode. Brings in a large number of distant stations at good loud-speaker strength. Beautiful veneered Walnut Cabinet.

PRICE **£8:12:6**
Without valves

THE *All-British*

ALL-MAINS TWO, A.C. £10:10:0
ALL-MAINS THREE, A.C. £14:0:0

BURTON

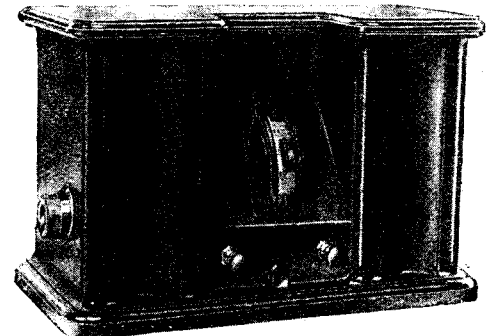
MADE BY—G. F. & H. BURTON, PROGRESS WORKS, WALSALL, ENG.

Sets that exceed all expectations

You will be more than pleased with the results obtainable by a BURTON RECEIVER.

We guarantee the performance of all our sets because they are built of Components of our own registered design and manufacture.

For volume, quality of tone, simplicity of operation and unfailing reliability BurTon receivers leave nothing to be desired. Fully illustrated lists free on request.



THE BURTON EMPIRE TWO Battery model.

A compact little receiver of very attractive appearance. Gives astonishingly good reception of all local station programmes and numerous foreign ones, too. Contained in Moulded Bakelite Cabinet. The sensation of the season.

PRICE **57/6**
Without valves

A FREE XMAS DRAW!

The famous 1931 Osram Music Magnet 4, complete with valves, can now be supplied for the remarkably low initial deposit of **£1 3s. 6d.**, and twelve monthly payments of **18 6.** These easy terms place this wonderful four-valver within the reach of all and another great point is that we will take your old set in part exchange.

Readers of "Amateur Wireless" purchasing radio goods to the value of **5/-** from any of our branches mentioned below during the next three weeks will receive a free voucher enabling them to participate in a Christmas draw for a complete Osram Music Magnet receiver. Call now and have a look over the largest variety of radio sets and components in Great Britain.

WARNERS

BRITAIN'S BIGGEST RADIO DEALERS

12, Norton Folgate, Bishopsgate, E.1.
252, Lavender Hill, Clapham, S.W.
73-75, High Road, Kilburn.
502, High Road, Tottenham.

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

"THE PERFORMANCE FRANKLY SURPRISED US!"

See the "Wireless Magazine" in their test report in the November issue.

THE ELECTROCE T TABLE RADIO GRAMOPHONE

18 gns. Complete. Deferred Terms 50/- down.



An all-electric 2-valve radio receiver, combined with an electrically reproduced gramophone, the tone of which has been described as superb. The Regionals and many foreigners can be received with ease.

NO BATTERIES. NO ACCUMULATORS.
(Immediate Delivery).
Other Models up to 31 gns.

We have an agent in your district who will install the complete instrument for you.

Shall we send you the "Wireless Magazine" full test report, and our illustrated brochure? Post Free.

**THE ELECTROCE T
RADIO COMPANY.**
Showrooms
Poplar Road,
Solithull,
Birmingham

MAKE SURE OF PERFECT RECEPTION OF XMAS PROGRAMMES GREAT ADVERTISING OFFER

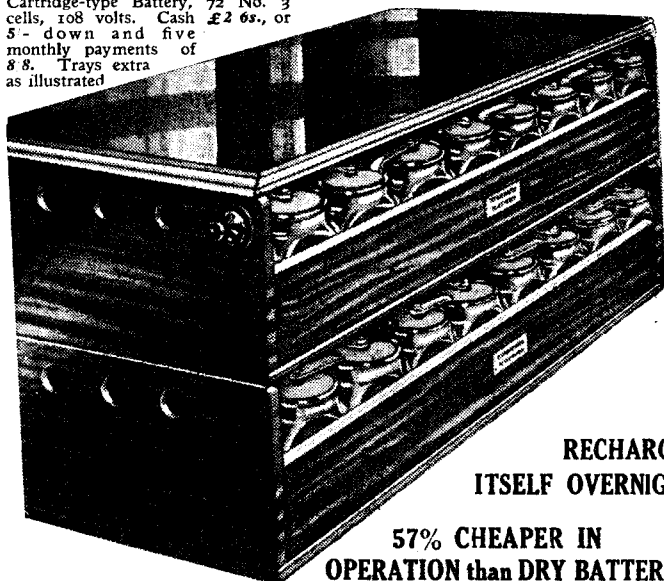
To "Amateur Wireless" Readers.

5!

DOWN

SECURES THIS FINE
10,000 M.A.
108 VOLT., REGENERATIVE
"STANDARD" Cartridge type
BATTERY COMPLETE

Cartridge-type Battery, 72 No. 3 cells, 108 volts. Cash £2 6s., or 5/- down and five monthly payments of 8 8s. Trays extra as illustrated



RECHARGES
ITSELF OVERNIGHT

57% CHEAPER IN
OPERATION than DRY BATTERIES

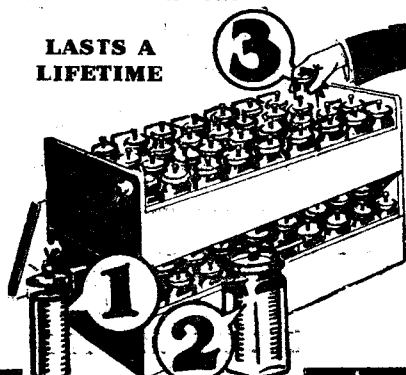
IMMEDIATELY IMPROVES RESULTS 50%
ABSOLUTELY NO BACKGROUND

Do not risk the disappointment of battery failure during the Xmas festivities. Install a Standard Regenerative Battery and enjoy the amazingly improved quality, tone, and volume of reception that this self-generating battery provides. Millions of cells are in constant daily use and hundreds of glowing testimonials reach us, extolling the trouble-free, unfailing smooth and unfluctuating service of this high-capacity battery. Send 5/- now and secure perfect reception for many months. Balance can be paid in small monthly payments. Fully illustrated literature of all Batteries sent on request. Any voltage supplied.

THE STANDARD BATTERY CO
Dept. A.W.,
184-188 Shaftesbury Avenue,
London, W.C.2

AFTER MONTHS OF TROUBLE-FREE
SERVICE EASILY REFILED BY 3
SIMPLE OPERATIONS

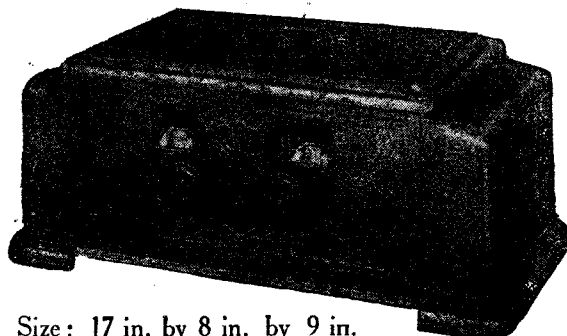
LASTS A
LIFETIME



The "NIGHTINGALE" Straight Three

(Battery Operated)

BAKELITE, MAHOGANY or WALNUT CABINETS



Size: 17 in. by 8 in. by 9 in.
Less Valves and Batteries: Dual
range 250-2,000 M.

£4:15:0

BULLPHONE ELIMINATORS

Incorporating Westinghouse Metal Rectifiers

A.C.4 ELIMINATOR (In Bakelite case)

30 milliamperes output at
150 volts.

4 Tappings, 2 Fixed, 2
Variable with Grid Bias.
1½ to 15
volts .. £5:15:0

With Trickle Charger

£6:17:6

A.C.1 ELIMINATOR (In Bakelite case)

3 Tappings, 2 Variable,
1 Fixed. Output 120
volts at 20
milliamps £4:12:6

With Trickle Charger

£5:15:0

Model A.C.1.

Easy Terms 10/- deposit and
balance in monthly payments.
Ask your local dealer for
particulars or write direct.

The Original BULLPHONE NIGHTINGALE LOUDSPEAKER

Reduced to 19/6
As a special Xmas offer only
(Installments not available.)

Send for our Free Lists and Circuits.

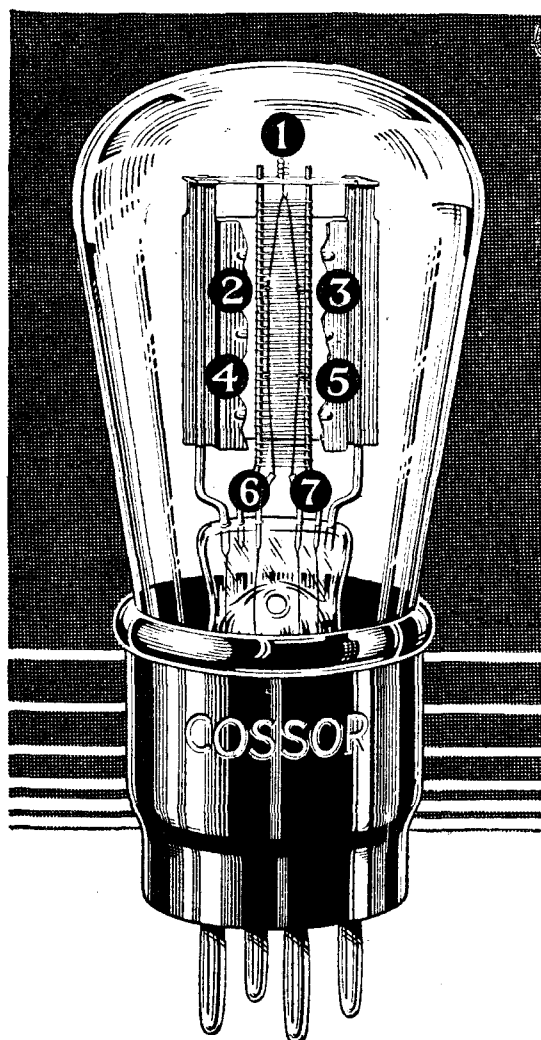


BULLPHONE LTD.
(Dept. A.W.) 38 HOLYWELL LANE, LONDON, E.C.2

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

Seven point suspension *definitely prevents* microphonic noises

*—by eliminating
filament vibration*



Microphonic noises in a Receiving Set are usually traceable to the Detector Valve. Nine times out of ten the cause is filament vibration. Look at the illustration alongside. This shows the internal construction of the new Cossor Detector Valve. See how the filament is held—not only top and bottom—but also by four insulated hooks spaced at intervals throughout its length. The purpose of these hooks is to damp out any tendency for filament vibration. Therefore by using this “steep slope” Cossor Detector Valve in your Receiver the possibility of microphonic noises is definitely eliminated and you are assured of greater volume with absolute tonal purity.

We have just issued a novel, circular Station Chart which gives identification details of nearly 50 stations and space is provided for entering your own dial readings. Price 2d. each they are obtainable from any Wireless Shop. In case of difficulty write us, enclose 2d. stamp and head your letter “Station Chart A.W.”

Cossor 210 DET., 2 volts, .1 amp.
Impedance 13,000. Amplification Factor 15. Mutual Conductance 1.15 m.a./v.
Normal working Anode Voltage 90-150. Price **8/6**

THE NEW
COSSOR
DETECTOR VALVE

DEFINITELY FREE FROM MICROPHONIC NOISES

Don't Forget to Say That You Saw it in "A.W."



EDITOR:
BERNARD E. JONES.

TECHNICAL EDITOR:
J.H. REYNER B.Sc., A.M.I.E.E.

THE LEADING RADIO WEEKLY FOR THE
CONSTRUCTOR, LISTENER & EXPERIMENTER.

RESEARCH CONSULTANT:
W. JAMES.

ASSISTANT EDITOR:
H. CORBISHLEY.

NEWS & GOSSIP OF THE WEEK

APOLOGY!

IN last week's AMATEUR WIRELESS we announced that our Christmas Number would contain 76 pages. Unintelligent anticipation! Now it is in your hands, you will find it contains 84 pages.

AMOS'N ANDY

THE news that this pair of back-chat radio comedians will be relayed by B.B.C. stations from America via the trans-

NATIONAL FIGURES

NO English listener can realise how much is made of Amos'n Andy by American listeners. Many of the big cinemas cut off their programmes at 7 p.m. in the evening to relay these laughter-makers through the loud-speakers of the talking-film equipment. The telephone companies state that during the period when Amos'n Andy are broadcasting there is a perceptible drop in the number of telephone calls, the assumption being that nearly everybody is listening to the broadcast! On Broadway, in New York, the biggest electrical sign in the world advertises Amos'n Andy, who, by the way, are featured in a film entitled "Check and Double Check," to be shown in this country before the end of the year. They are such an institution in America that appointments are made in this fashion: "See you after Amos'n Andy!"

CHRISTMAS GREETINGS

FINAL arrangements between the National Broadcasting Company of America and the B.B.C. are not yet completed, but it is hoped that Christmas greetings will be exchanged by radio on Christmas Day. The Columbia organisation has decided to relay our Christmas Day service to be given in the Savoy Hill studio at 6.30 p.m. The transatlantic telephone link will be used.

FAMOUS STARS

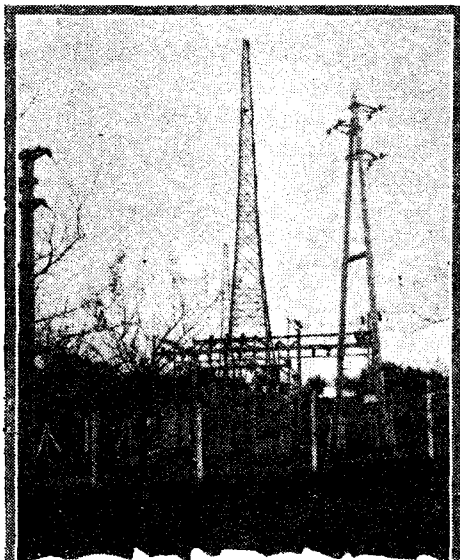
IN a gala matinée in aid of Denville Hall to be broadcast from the London Hippodrome on Monday, December 8, we understand many theatrical stars will be heard. These will include Henry Ainley, Balliol Holloway, Noel Coward, Gertrude Lawrence, Jack and Claude Hulbert and Evelyn Laye. Listeners should make a point of tuning in these stars, who are giving their services in aid of Denville Hall, Northwood, a place of retirement for old actors and actresses.

SCHÖNBERG AGAIN

WE hear that in the week beginning December 7, the big noise music will be by Schönberg, whose "Pelleas and Melisande" will be performed by the Symphony Orchestra on Wednesday under the direction of Hermann Scherchen. Although looked upon as one of the exponents of modern music, Schönberg has been writing for over thirty years. In 1898 the performance of some of his songs created a great disturbance in Vienna. "Since

To the Reader

This Christmas Number is 12. Biggest we have ever had! And the Best! Its contents are of a special character and have been prepared to meet many tastes and needs. Its Advertisement Pages, which will carry into your home a most valuable and remarkable collection of up-to-date information, contain the announcements of no less than 106 different firms representing very nearly all that is best in British Radio. You will read this Christmas issue from cover to cover.
The Editor, P.S.P.



Where the waves start. A new glimpse of the huge masts at the German regional station which opened last week. This station, Muhlacker, is near Stuttgart, and uses Stuttgart's wavelength of 360.1 metres.

atlantic telephone link is not very significant to the average English listener. But in America Amos'n Andy are very well known; better known than the President himself! Every evening at 7 o'clock they are "on the air" for 15 minutes, sponsored by the Pepsodent tooth-paste firm. Every listener should make a point of hearing this relay in order to see how very different is the American idea of radio entertainment from ours. As the relay will be carried out on the transatlantic telephone, there is every chance of good reproduction.

when," says Schönberg, "people have never ceased to be shocked at me."

GERMAN INTERFERENCE

THE new high-power German Regional station at Muhlacker has made a very bad beginning so far as British listeners are concerned. Transmitting on 360 metres, this high-power German station is only

NEWS & GOSSIP OF THE WEEK —Continued

9 kilocycles apart from the London Regional frequency. We have picked up Muhlacker in broad daylight at 3 o'clock in the afternoon, the strength being really terrific. The average listener in the Brookmans Park Regional area would find it difficult to separate Muhlacker from the local, but a great deal of interference is reported from various listeners. The B.B.C. has received complaints that Muhlacker is heard as a background to the London Regional. There is no suggestion that Muhlacker is heterodyning the Regional since the two stations have the necessary separation of nine kilocycles.

ETHER CHAOS GROWING

THE starting up of Muhlacker on high power, on a wavelength adjacent to that of the high-power London Regional, reveals quite clearly that the International Union at Geneva's losing its hold on the European ethersituation. It seems obvious that interference will be caused if two 60-kilowatt stations are allocated to adjacent frequencies. Similar trouble occurs with Rome and Stockholm, stations the average three-valver is unable to separate. We imagine that when sufficient complaints have been received of the interference between Muhlacker and the London Regional, some other wavelength will be allotted to the German station. Why it was ever given its present position is a mystery.

SUBSIDISING OPERA

IF only to avoid a most undesirable precedent, we hope that, when the subsidising of opera is discussed in Parliament, the Government's proposal to refund some of the Treasury's share of licence revenue will be defeated. It may be argued that the B.B.C. and its listeners are gaining by some £17,000, the sum proposed for the

subsidising of opera. But in our opinion it is undesirable that the Government should assume control of the manner in which licence revenue is spent.

ANOTHER METHOD

A MORE straightforward method would be for the Government to agree quite

broadcasting. Quite recently he gave two broadcast speeches within one week, one on Poppy Day at the Albert Hall, and the other at Savoy Hill. He has quite a good broadcasting voice, being quite clear and devoid of undue accentuation. It is rather interesting to note that the Prince has his manuscripts specially typed when he

SPECIAL FEATURES IN THIS ISSUE

	Page		Page
News and Gossip	869	Daventry Calling on the Train ...	900
Our H.T. Unit for A.C. Mains ...	871	More Gift Suggestions	902
For the Newcomer	872	Christmas Dancing to Radio ...	904
Making Your Own Gramophone		The "Red Star" Three-valver ...	906
Records	873	Christmas and the Short Waves ...	908
How to Use Your Loud-speaker ...	874	Five Good Sets	910
On Your Wavelength	879	A B C of B.B.C.	912
Christmas Day at the B.B.C. ...	881	Your New Set—and How to Make	
In My Wireless Den	882	the Most of It	914
Seasonable Gifts	887	The B.B.C. Christmas Programmes ...	916
"O.K. for Sound"	889	A New Receiver	918
Without Fear or Favour	895	Light Waves from the Stars ...	922
The "Challenge Two"	896	We Test for You	924
Progress at Broadcasting House ...	898	Readers' Questions	926

frankly that the present Treasury percentage of licence revenue is excessive, to return as much as possible to the B.B.C., and to suggest to it that it might help the cause of opera in this country in the same way that it has helped Promenade concerts and other musical activities. If the present proposals go through, there is no knowing what next the B.B.C. will be called upon to subsidise. For example, Granville Barker's National Theatre scheme!

THE PRINCE AGAIN

THE PRINCE OF WALES will be heard again on December 16 when he speaks at a Guildhall banquet. The Prince is beginning to be quite an "old hand" at

intends to broadcast, the typing being arranged to show the long and short sentences, so that he will know which sentences are to be spoken in one breath. This is an idea which many other broadcast speakers might follow, for many of them appear out of breath before the end of a long sentence.

NO SPECIAL MICROPHONE

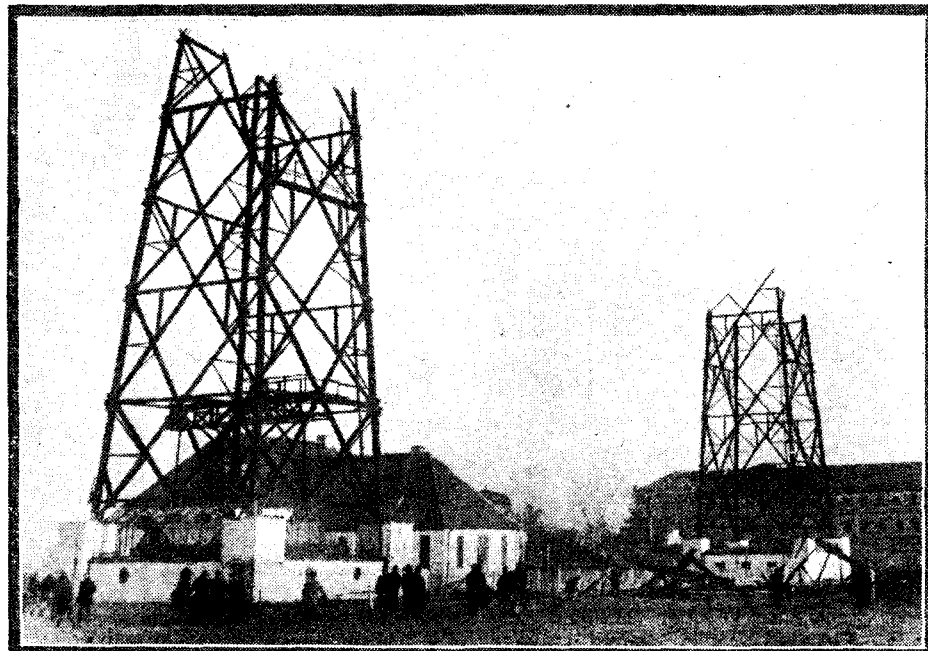
THE PRINCE is treated at Savoy Hill in no different manner from other broadcasters. Usually he speaks from the small talks studio, where the gramophone broadcasts are also sometimes carried out. Unlike the King, who has a special microphone prepared for his use by the Marconi-phonograph Co., the Prince has no microphone of his own.

THAT INTERVAL SIGNAL

BY the time this appears in print the B.B.C. may have its interval signal in operation. At first it was thought that this would be simply a clicking metronome as used at many Continental stations, but now it appears that the note will be a little more distinctive. It will not be used for short breaks between the programmes but only to avoid an excess of piano music to fill in gaps lasting longer than five minutes or so.

"DON R'S," PLEASE NOTE!

THERE must be many wireless enthusiasts who were dispatch riders during the War and who are wondering how their old time companions are progressing. They cannot fail to be interested in the possibility of an ex-dispatch riders' reunion dinner, for it is felt that many of them would like to renew the comradeship of the war years. The difficulty is to discover names and addresses. It is suggested that all who are interested in the possibility of a reunion dinner should communicate with Mr. Ernest R. Gilbert, 14-18 Holborn, London, E.C.1. Envelopes should be marked "D.R."



In the severe gale which swept across Europe on November 22 the Munich station was put out of action, the two high towers supporting the aerial being blown down. A temporary aerial has been erected, pending re-construction, but transmissions are carried out only at low power. It should be borne in mind that Munich is relayed through Nürnberg on 239 metres



OUR H.T. UNIT FOR A.C. MAINS

Here is a mains unit that is quite standard ; that is, it may be used in conjunction with any receiver to provide the high tension where A.C. mains are available

IF you are changing over from battery to mains operation, then the best advice you can take is to make, or buy, a really good eliminator. Nothing is so fatal in mains working as false economy.

Now, here is a standard eliminator which anyone can make up, which is low in cost and yet which is capable of delivering sufficient voltage and current to supply sets up to four and even five valves.

Low Cost

Consider cost first. In the panel on the next page is a list of the parts required and you will see that the total cost is very low, consistent with the choice of good components. Safety is covered by the fitting of two fuses, one in each mains lead.

To prevent any chance of a mistake in the wiring or layout you are advised to get the full size blueprint, price 1s. post free, from AMATEUR WIRELESS, Blueprint Department, 58-61 Fetter lane, London, E.C.4.

The construction of this eliminator is

simplicity itself because there is no panel or extensive drilling to be done. There is only a small terminal strip, and all the main parts are screwed to the baseboard. These parts include the rectifier, the fuse block, transformer, choke and fixed condensers.

You will see that the voltage is cut down for the high-tension tapplings by means of the new "spaghetti" flexible resistances and that variation of voltage on the screen-grid tapping is provided by means of a variable wire-wound resistance.

There are, in all, five tapplings. H.T. plus 5 gives approximately 200 volts at 28 milliamperes and this tapping will be suitable for large power valves.

The next high-tension tapping, H.T. plus 4, will, with the flexible resistance fitted as standard, give about 170 volts at between 15 and 20 milliamperes. This will be suitable for smaller power valves. The H.T. plus 2 and H.T. plus 3 tapplings give intermediate voltage tapplings, suitable for low-frequency or detector tapplings, while the H.T. plus 1 tapping is for the screening grid of screen-grid valves.

You will find the flexible resistances specified suitable for most purposes, but if you have need for any special value of voltage, you can quite easily obtain this by fitting a special value of resistance.

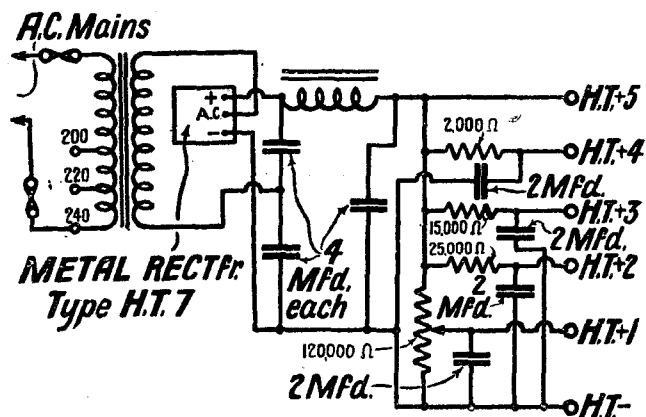
This value can be calculated by subtracting the required voltage from 200 (that is, the maximum voltage delivered by the eliminator), multiplying this by 1,000 and dividing this result by the anode current which will flow.

Expressed as a formula the process is

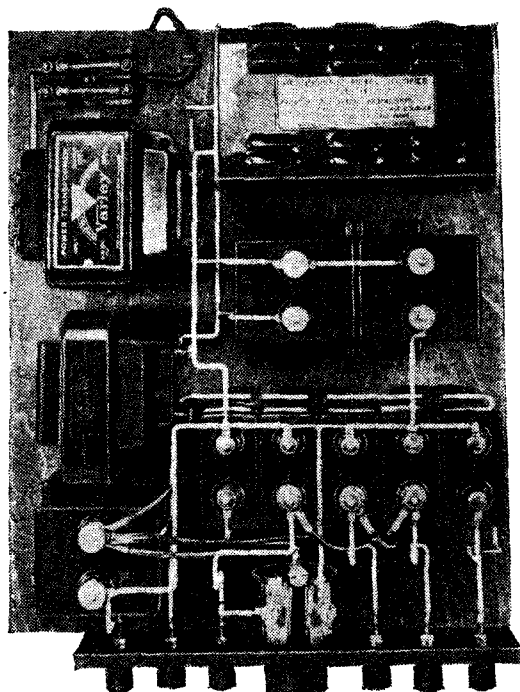
$$\text{Value of spaghetti resistance needed} = \frac{200 - (\text{voltage required}) \times 1000}{(\text{anode current})}$$

The circuit used is of the type known as the voltage doubler, and the Westinghouse type H.T.7 rectifier must be used. This is matched up with the power transformer which is provided with tapplings for 200-220-, and 240-volt mains. The tapping approximating to your mains voltage should be chosen when making connections.

The internal wiring of the eliminator should be carried out with insulated wire, and great care should be taken to have all the connections firmly soldered, because a loose wire might result in the blowing of a fuse.



The circuit of the unit. The actual layout is given on the next page



This is a plan view of the unit which can be made up by anyone, so simple is the construction

The flexible resistances have spade tags at the ends and connection is made simply by clamping under the terminal heads. There is no reason why all the parts should not be mounted on the baseboard before anything is commenced, because there is ample room in which to wield a soldering iron bit without fouling other parts.

You will see that one of the fuses (it does not matter which) is connected to terminal O and the other to the most suitable input terminal depending on the voltage of the local mains supply.

The input to the fuse block is made by means of a length of flex connecting up with the mains point. Do not use cheap flex for this. It is simply asking for trouble. Near the fuse block, the flex should be bound for the distance of 2 inches or so with insulating tape and then clamped down to the baseboard.

(Continued at foot of next page)

For the Newcomer to Wireless: THIS BATTERY BUSINESS

I USE dry high-tension batteries, as you know, and I am always hearing and reading the advice to purchase those of large capacity. Would you please tell me exactly what is the truth of the matter?

It comes to this. The man-in-the-street knows well enough that you cannot put a quart into a pint pot, but where batteries are concerned it is difficult to make him believe that you cannot take a quart out of a pint pot.

Please explain.

The dry high-tension battery consists of a number of cells wired in series. A Léclanché cell, no matter what its size, has always an initial E.M.F. of about 1½ volts. Do you know how these cells produce current?

I don't know that I do.

I am not going into details; I will just say that they do it by burning up zinc. The energy that they give out comes from the burning of zinc just as the energy of a steam boiler comes from the burning of coal.

I follow that.

Clearly, a given amount of zinc can result in the production of only a certain amount of energy.

That seems obvious.

In what is known as the standard-capacity high-tension battery you have cells of the same size as those used in ordinary flashlamp refills. You have only to examine one of these to realise that the amount of zinc is small.

About the size of one's thumb!

Cells of this size cannot stand up economically—no matter what some makers may claim for them—to a load much exceeding 5 milliamperes. In other words, they are excellent for single-valve sets and you can work a two-valve set from them, though really they are not big enough even for that job.

What's the average consumption of a two-valve set?

With a leaky-grid condenser detector and a power valve in the output, two-valve sets intended to give good quality from a loud-speaker generally require from 7 to 12 milliamperes.

Then that's far too much for the standard-capacity battery?

It is, and if you try to use it you will find that you have to make renewals five or six times a year.

Then what do you recommend?

There is a double-capacity battery made of cells measuring 1 in. by 2¼ in., though for some reason this particular size is not very successful. I would certainly recommend the treble capacity, with 1¼ in. by 2¼ in. cells, for any two- or three-valve set. It costs only about 30 per cent. more than the standard and it gives at least three times the number of working hours.

And for bigger sets?

The largest high-tension battery made is the super-capacity, with cells measuring 1¼ in. by 3½ in. This will stand up economically to a load of 25 milliamperes. Be careful, though, of one thing.

What is that?

Some makers apply the term "super-power" to batteries made up of 1¼ in. by 2½ in. cells.

"OUR H.T. UNIT FOR A.C. MAINS"

(Continued from preceding page)

Connect up the unit to your set just as you would a high-tension battery. It is not advisable to use the H.T. plus 5 tapping unless a large power valve is in the last socket because the full voltage of 200 may overload a small valve. If your set has a screen-grid valve then adjust the H.T. plus 1 tapping until a suitable value is found.

The voltages at the output terminals can be tested with a voltmeter in the ordinary way, but an unreliable reading will be given unless the voltmeter is of a very good type having a high internal resistance. There is no necessity to alter any of the internal connections of your receiver in order to make it work in conjunction with this eliminator.

COMPONENTS FOR H.T. UNIT

Baseboard, 10 in. by 12 in. (Cameo, Pickett, Clarion)

Power transformer, with 135-volt secondary winding (Varley, Parmeko, Ferranti, R.I., Regentone)

Metal rectifier (Westinghouse H.T.7)

Low-frequency smoothing choke (Lissen, R.I., Igranite, Varley, Parmeko, Atlas)

Three 4-microfarad and five 2-microfarad fixed condensers (T.C.C., Lissen, Dubilier, Igranite)

120,000-ohm variable resistance (Regentstat).

One 25,000, one 15,000, and one 2,000-ohm spaghetti resistances (Bulgin, Magnum)

Ebonite strip, 8½ in. by 2 in. (Becol, Keystone, Trelleborg)

Six terminals, marked; H.T.—H.T.—1, H.T.—2, H.T.—3, H.T.—4, and H.T.—5 (Belling-Lee, Clix, Ealex, Burton, Igranite)

Baseboard-mounting twin fuse (Bulgin, Read-Rad)

Connecting wire (Glazite)

Length of mains flex (Lewcoos)

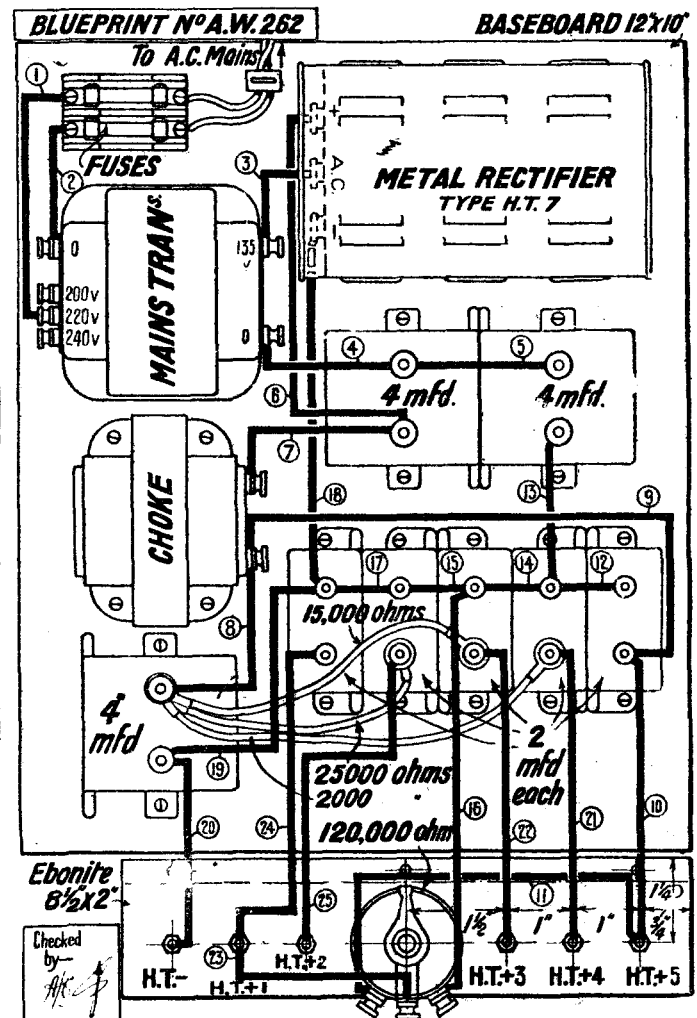
If you find that the set tends to hum, then you will probably find that it is because the set itself is placed too close to the eliminator and there is induction from the power transformer or choke to some component in the set.

Another possible trouble is motor-boating. It will probably be found that the cause is the higher voltage used, and in that event you should drop down to a lower tapping.

Do not forget to switch off the eliminator when the set is not in use, and preferably switch on the set before turning on the mains.

NEXT WEEK:

A NOVEL TWO-VALVE MAINS SET



The layout and wiring diagram of the mains unit. A full-size blueprint is available, price 1/-



MAKING YOUR OWN GRAMOPHONE RECORDS

J. H. Reyner explains how, with the aid of your wireless set and simple apparatus, gramophone records can be made at home

IT is not to be wondered at that the possibility of making one's own gramophone records should attract the attention of experimenters. As a result, there are one or two systems to-day available to the public by which records can be made at home with relatively small expenditure.

There is probably a feeling that these home-recording outfits are merely toys. There have been such devices on the market in the past and the results obtainable have not been of a very high standard. The possibility of using electrical methods, however, has made a great deal of difference, and we may say at the outset that if sufficient precautions are taken, a record can be made of as good a quality as the average cheap record of to-day. I must admit that this requires a good amplifier and care in the setting up and the adjustment of the apparatus, but even with ordinary precautions it is possible to obtain a tolerably good record.

A Simple Process

The principle adopted for this home-recording is exactly the same as that used in making commercial records. First of all there is an electrical cutter, which is merely a gramophone pick-up used backwards. Instead of a needle one uses a stylus fitted with a sapphire or diamond point, and currents are supplied to this device which cause the needle to move from side to side, the process being the exact reverse of that taking place in an ordinary pick-up, where the movement of the needle

generates the currents which are subsequently applied to the amplifier.

If we allow such a cutter to rest on a disc of suitable material and cause the disc to revolve in the ordinary way, it will cut a groove on the disc which will deviate from side to side according to the current supplied to the cutter, and so record the music on the disc. It is clearly necessary, however, to have some means of moving the cutter gradually in towards the centre of the record, so that the successive grooves do not foul one another. The equipment, therefore, includes some form of tracking attachment, as it is called. This point will be discussed in a moment.

There remains, finally, the disc on which the record is to be made. When making a normal record, wax is used for this purpose, as this is easily cut, and thus responds to very fine impulses. Wax, however, has no lasting properties and if it is played once through it loses much of its quality. For home-recording it is clear that we must find some material on which the record may be made direct with reasonable permanency.

At present a metal disc is used, made of an aluminium alloy which is sufficiently soft to take a cut satisfactorily and yet which will not be damaged when being replayed. In order to minimise wear on these records, fibre needles should be used, and I have found the Burmese Colour needles the most satisfactory for the purpose.

Tracking Devices

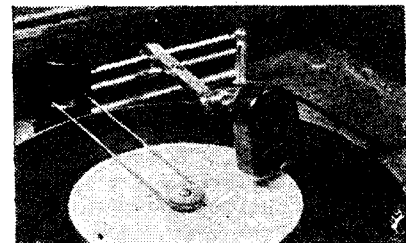
It is in the actual mechanism that the various systems differ. The Hillman system, illustrated with this article (made by the Home-Recorder Co., of Bradford), is provided with a complete tracking device which consists of an arm on the end of which is carried the electrical cutter. This is screwed down at the back of the cabinet, just clear of the turntable, and is connected up to the turn-table by means of a small spring belt. The metal disc is placed on the record, and a pulley placed over the centre pin, and locked up. This serves both to hold the record tight and prevent slip, and also to obtain a drive for the tracking device.

With this system a diamond cutter is provided and somewhat hard discs are employed. The disc is lightly lubricated before the cut is taken, a few drops of oil being sprinkled over the disc and distributed with a rag. This is just sufficient to

reduce the friction, though too much oil should not be used. After the record is made the cutter is lifted off, and the record can be replayed by using the ordinary tone-arm or pick-up.

The Cairns Morrison system is somewhat different. The electrical cutter provided is designed to fit on the existing tone-arm of one's gramophone in place of the usual sound-box or pick-up. Over the centre pin of the gramophone is fitted a small gearbox from which the tracking screw projects. The tracking screw engages with a clip on the electrical cutter and the motion from the outside to the inside of the record is obtained in this way. The device is quite simple to fit. Somewhat softer discs are employed with this system and a sapphire needle is used in the cutter.

As regards the actual recording I must go into more detail in further articles. It



This is a "close-up" of the Hillman tracking device for home recording

will suffice to say for the present that an ordinary loud-speaker volume is sufficient. One can, for example, record a broadcast item by tuning up the loud-speaker to give good volume, disconnecting the leads from the loud-speaker and connecting them on to the cutter.

As I said earlier, it is desirable to use a fibre needle for replaying to avoid damaging the record, and for the first two or three playings the oil in the grooves may give a slightly muffled speech. It is a good plan to wipe off any superfluous oil before the record is replayed.

For making one's own records, i.e., not making use of a broadcast programme, a microphone must be used. This is connected in place of the gramophone pick up of one's set. I will say more about this in future articles, however, and also give further particulars on some of the finer points of this home-recording scheme. I have been experimenting with it for some months, and I must confess that I have found it a fascinating hobby.



THE HOW AND WHY OF RADIO

XII—HOW TO USE YOUR LOUD-SPEAKER

If you are a beginner in wireless, now is your chance to gain a clear conception of its theory and practice. In this series of articles, specially prepared for the beginner, no previous knowledge of wireless is assumed. It is intended to deal with every aspect of the subject and the whole series will endow the beginner with sufficient knowledge to enable him to derive the greatest possible interest from the fascinating hobby of wireless

AT this time of the year, when every listener wants his set to do its very best, some notes on the right way to use loud-speakers are appropriate, particularly to readers of this beginners' series. I am assuming that some sort of loud-speaker is already installed, working from a two- or three-valver.

If the loud-speaker has been in use for a long time, it is quite possible that the unit has become partly demagnetised,

valve impedance does not match the impedance of the moving-coil itself. Most low-resistance moving-coil loud-speakers need an output transformer. A choke-filter circuit is no use, because the object of the transformer is to match the primary winding to the power valve and the secondary winding to the moving-coil.

Another point about moving-coil loud-speakers should be remembered. They give such an even response to musical

frequencies that any defect in the amplification of the set is much more appreciable than on an ordinary cone. Many sets that provide quite good reproduction on a balanced-armature cone sound very poor with a good moving-coil.

At holiday times, such as Christmas, loud-speakers are often wanted for dancing and entertaining, in rooms distant from the location of the set. On

no account should the

aerial wire be extended and the set moved bodily into the required room. For if this is done, a considerable amount of aerial energy will be wasted. The correct method is to extend the loud-speaker leads, which carry only low-frequency current. With good quality flex there is no loss of energy with an extension from the loud-speaker terminals to a loud-speaker in a distant room.

In well-designed sets, the anode current of the power valve passes through a low-frequency choke or through the primary winding of an output transformer. In this way no direct current flows through the loud-speaker windings, as only the low-frequency signal currents are by-passed. But in many cheap sets the anode current flows directly through the loud-speaker winding, due to the omission of an output circuit.

To such sets it is desirable to fit an external filter, if an extension is contemplated. Otherwise the high-tension current from the battery or mains unit will be led right round the house. The

simplest possible output is a 1-to-1 ratio output transformer, costing about a guinea. The primary winding is connected across the loud-speaker terminals of the set. The secondary winding is connected to the twin flexible lead used for the extension, which, at the distant point, can terminate in a suitable wall socket, as shown by the picture.

Extension Connections

The connections for this simple extension circuit are shown at A in the diagram. At B is shown an alternative method. This consists of a low-frequency choke coil connected across the loud-speaker terminals; and in series with one of the extension leads and the negative loud-speaker terminal is fitted a 1-microfarad fixed condenser; the other extension lead goes to the positive loud-speaker terminal.

With this circuit the anode current from the high-tension supply passes through the low-frequency choke, but is prevented from passing along the extension to the loud-speaker by the fixed condenser. The low-frequency signal variations are barred from passing through the low-frequency choke, but flow with great ease through the fixed condenser and so through the loud-speaker windings.

To obtain a better distribution of volume



A pictorial representation of a simple loud-speaker extension

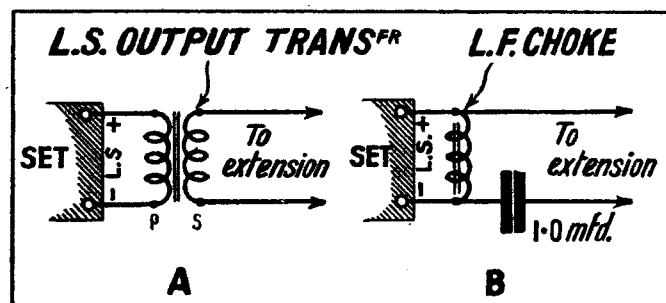
either through hard knocks or through incorrect connection to the set. Demagnetisation produces a deterioration in quality and a loss of volume. Most makers are prepared to remagnetise loud-speakers for a moderate cost.

The Right Valve

One of the first things to get right is the valve preceding the loud-speaker. This will, of course, be a power valve, but it may not be the best power valve for the particular loud-speaker in use. A cabinet cone loud-speaker, driven by a balanced-armature movement, usually works best with a fairly low-impedance power valve, say 5,000 ohms, or less. With such a power valve good quality reproduction is possible, provided that only moderate volume is wanted. For greater volume a power valve of 2,000 ohms with an anode voltage of 200 volts or more is preferable.

The large types of cone loud-speaker cannot deliver good quality unless a low-impedance valve is used. The inclusion of a super-power valve enables greater volume without distortion to be obtained and results in a much better reproduction of bass notes.

If, in a search for better reproduction, the listener has purchased a moving-coil loud-speaker, some disappointment may be caused owing to the fact that the power



The connections for the extension shown in the picture are detailed at A in this diagram. At B is shown an alternative method

in order to entertain a party, it is a good plan to use two or more loud-speakers together, provided that the set is capable of delivering sufficient power to work them. The several loud-speakers should be connected in parallel. In other words, each set of loud-speaker leads should be connected to the loud-speaker terminals of the set.

HOTSPOT.

Next Week:
Making the most of
Reaction.

AN OUTSTANDING RANGE OF A.C. SCREENED GRID VALVES

Mullard A.C. Screened Grid Valves (types S.4V, S.4VA and S.4VB) have a really impressive performance. The stage gain obtainable in conjunction with correct circuits is enormously high, making long distance reception really practicable. As with all Mullard A.C. Valves, the electrode system is mechanically compact and rigid, and of high electrical efficiency. The different impedances of the three types offer a choice of valves to suit every circuit. A Mullard Screened Grid A.C. Valve will noticeably improve your radio.

PRICE 25/- each,

Mullard

THE MASTER VALVE

CHARACTERISTICS

S.4V.

Max. Heater Voltage ... 4.0 volts
Heater Current ... 1.0 amp.
Max. Anode Voltage ... 200 volts
Positive Screen Voltage 75 volts
*Anode Impedance ... 909,000 ohms
*Amplification Factor ... 1,000
*Mutual Conductance ... 1.1mA/volt

* At Anode Volts 100. Screen Volts 75.
Grid Volts Zero.

S.4VA.

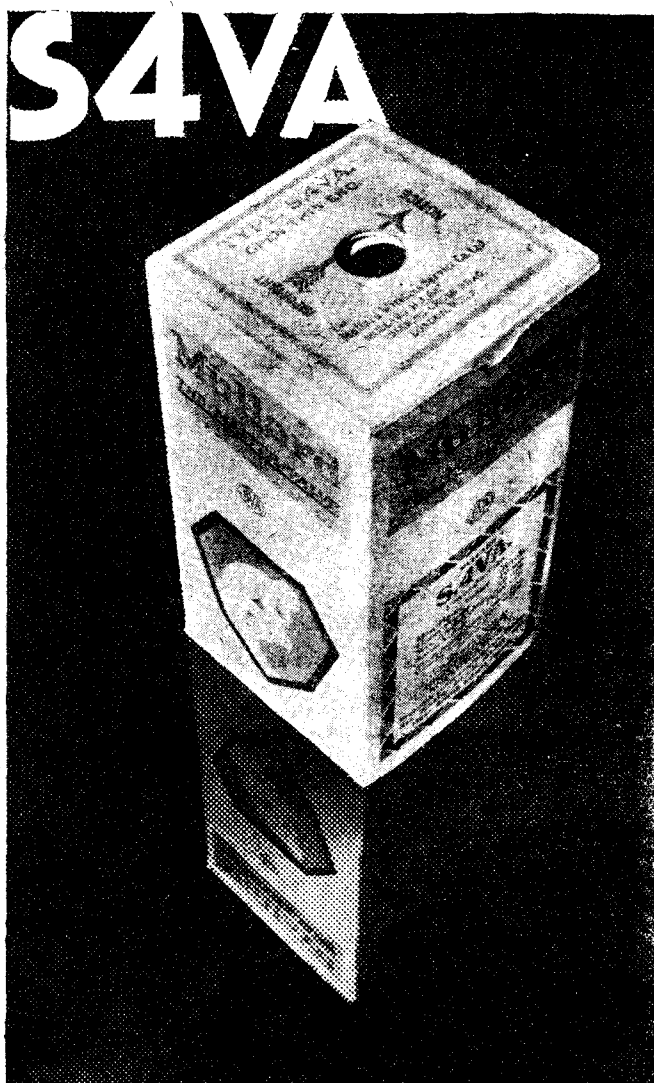
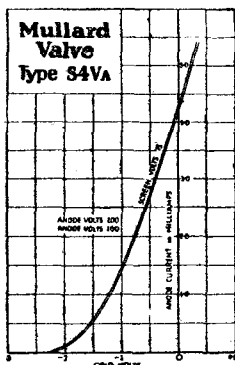
Max. Heater Voltage ... 4.0 volts
Heater Current ... 1.0 amp.
Max. Anode Voltage ... 200 volts
Positive Screen Voltage 75-100 volts
*Anode Impedance ... 430,000 ohms
*Amplification Factor ... 1,500
*Mutual Conductance ... 3.5mA/volt

* At Anode Volts 100. Screen Volts 75.
Grid Volts Zero.

S.4VB.

Max. Heater Voltage 4.0 volts
Heater Current ... 1.0 amp.
Max. Anode Voltage ... 200 volts
Positive Screen Voltage 75-100 volts
*Anode Impedance ... 257,000 ohms
*Amplification Factor ... 900
*Mutual Conductance ... 3.5mA/volt

* At Anode Volts 150. Screen Volts 75.
Grid Volts -1.



Advt. The Mullard Wireless Service Co., Ltd.,
Mullard House, Charing Cross Road, London, W.C.2

A/k:

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

TUNEWELL COILS

for the CHALLENGE TWO
with Bakelite moulded top
and bottom plates.

10/6



**FOR THE
"CHALLENGE TWO"**
Made to the Specification of
Mr. W. James

TUNEWELL Coils have built up a reputation for reliability and the finest workmanship. They are the choice of experts.

Careful positioning of the windings and materials of the highest insulation give TUNEWELL Coils their very low self-capacity. That is why they are more selective than others, why they give louder signals, why they will tune down to such low wavelengths.

Always choose TUNEWELL — for maximum efficiency.

New "Popular Wireless" Dual Range Coil. 10/6	Tunewell Transformer. Ratios 3 to 1 and 5 to 1. 12/6	Two-pin coils. Plain, Centre-tapped and X type. BRITAIN'S FAVOURITE. Prices from 1/6
New dual range coil for Reinartz circuits. X-tapped on both high and low waves. Super-selective. 10/6	Tunewell range of Speakers, including plaque types from 28/6 to 42/-	Condensers, .0005, .0003 and .00015. 3/11 each H.F. Chokes — 97% efficient. Price 6/6

TURNER & CO.
54 STATION ROAD, LONDON, N.11
Write for Lists

A PRESENT FOR YOURSELF

that will bring pleasure to all
who enter your home.

THE CLARION "BUREAU-GRAM."

Radio and Gramophone each placed at the correct height for ease of handling. Takes any commercial equipment. Ample room for all accessories and loud-speaker. This original design is registered. Supplied only in

Oak £5.19.6

THE "MUSIC LOVER'S DE LUXE."

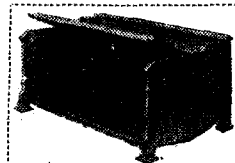
This is the Gram-Radio Cabinet chosen by "A.W." as their Show model. A high-class piece of furniture worthy of the finest combination of radio and gramophone.

Oak £7. Mahogany £8.2.6

THE "CLARADIOGRAM"

Harmonises with any style of home furnishing. Absolutely non-resonant. Suitable for all types of standard receivers or constructors kits.

Oak £5.7.6
Mahogany £6.12.6



This Cabinet was specially designed for "A.W." Ample room for 2, 3, or 4 valve set with H.T. and L.T. Batteries. Solid Oak. Artistic design.

Write for Lists

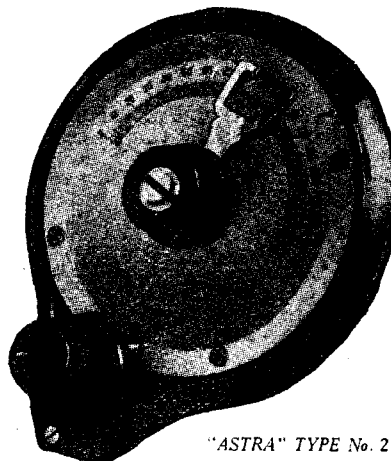
**CLARION RADIO
Furniture**

28-38 Mansford St., London,
Telephone: Bishopsgate 6371 E.2



"ASTRALITE" the LUMINOUS DIAL

The only dial that you can read in the dark. Luminous like a watch. It has the famous "Astra" Geared Movement and Fast or Slow Motion. Smooth as silk. Most attractive. Scale easily read in daylight or dark. Ask your dealer to show you one. 3" diam. 4/-. 4" diam. 5/6.



No backlash. Noiseless action. Both slow motion and direct drive available by simply switching up the lower knob. The "Astra" is adjustable to fit any condenser spindle and is easily mounted.

"ASTRA" Type No. 2

Finish: Black or brown moulding with aluminium scale or all black. Diam. 4 in. Price 5/-.

"ASTRA" Type No. 1

3 in. diameter. Finish: Black or brown moulding with aluminium scale or brown with gilt scale. Price 3/6

"ASTRA" TYPE No. 2

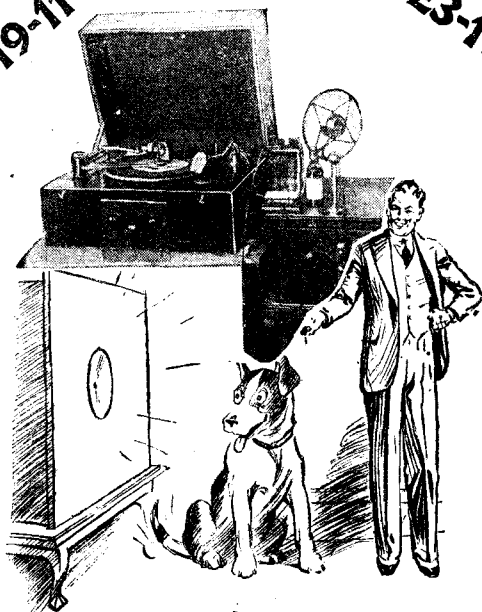
"Astra" are the only dials manufactured under Ormond licence.

ASK YOUR DEALER TO SHOW YOU THE FULL
RANGE OF "ASTRA" DIALS AND CONDENSERS.

**EMKABE RADIO CO., LTD., 47 FARRINGTON ROAD,
LONDON, E.C.1**

£10.0.0FOR THE BEST
HOME-MADE
RECORDSWRITE FOR
PARTICULARS
OF OUR FREE
COMPETITIONS**SUCCESS AT LAST
HOME RECORDERS**

SOUND SERVICE

£3-19-11**£3-19-11**

Reproduced from the "Wireless World." With apologies to H.M.V.

"TRYING IT ON THE DOG"**EXTRACT FROM THE "WIRELESS TRADER"
Test Report**

We found this outfit extremely effective and it definitely enables quite satisfactory recording at home. The tone of musical and radio recordings was extremely good; altogether, we found this a fascinating outfit and considering the price the results obtainable are extremely commendable.

"FREE GRID" says**"WIRELESS WORLD"**

I did not expect much owing to the low price of the outfit and was all the more surprised at the clarity with which my voice was reproduced. My voice was clearly recognisable and, indeed, I tested this by literally trying it upon the dog.

**EXTRACT FROM "AMATEUR WIRELESS"
Test Report**

The Sound Service Home Recorder has been given an extended trial and has proved very satisfactory. The tracking is quite even and there is no trouble with one groove fouling the next. The reproduction is surprisingly good and only a small power is necessary. A simple two-valve set will produce quite a good record.

WIRELESS RECORDER (Complete) .. £3:19:11
DE LUXE RECORDER (Less Pick-up) .. £5:5:0
SUPER RECORDER (Complete Installation) .. £6:6:0

A Booklet and 6 Blue drawings showing you electrical recording and how to make a Traverse Groover for 4/6, which will record on any spring-driven gramophone, 2/6, post free.

All accessories sold separate.

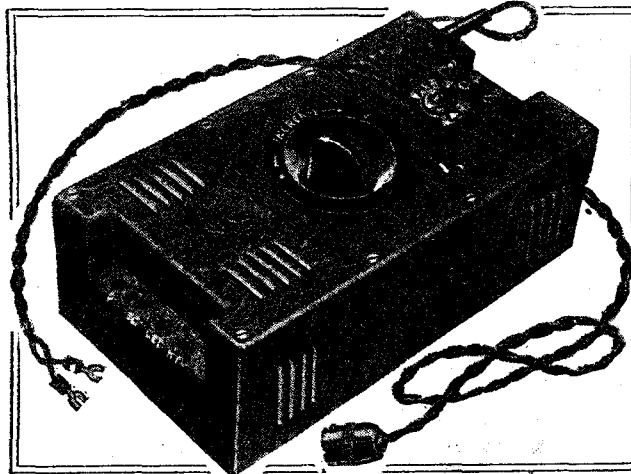
Traverse Groover, **£1 15/0**; Cutting Diamonds, **21/-**; Electric Cutter, **27/6**; Cutting Solution, **1/-** per bottle; Stand Microphone, **30/-**; Discs, **3d., 6d., 7½d., 9d., 1/-**.

Our Traverse Groover has now been modified and will operate on ordinary Gramophone spring motor. No powerful motor is required.

SUPPLIED TO ALL THE LEADING FIRMS IN THE WORLD.
SEVEN YEARS OF RESEARCH BEHIND OUR PRODUCTS.
THE ONLY WAY TO SUCCESS: DON'T BE MISLED BY IMITATIONS
WRITE FOR PARTICULARS.

Trade Enquiries: HILLMAN BROS., LEEDS

C.O.D and P.O. Orders:—

HOME RECORDER CO., 1 Bower Street, BRADFORDConvert your set into "All Electric"
with the**ALL-MAINS
COMPLETELY INSULATED
UNIT****Super-Reliable
—Most Efficient**

Although only as big as the smallest H.T. battery, 9×5×3 in., the R.I. combined L.T. and H.T. Unit supersedes all in efficiency.

The Reason Why—

SUPER-RELIABILITY is assured by the employment of especially large and robust components, the necessary space for which is alone made possible by the employment of small, but marvellously efficient chokes in which are incorporated cores of that amazing metallurgical discovery—**NIKALLOY**.

McMichael's, by recommendation, have testified to the pre-eminent suitability of this new all-mains unit for use with portables. Also, many users of popular receivers, including the Osram "Music Magnet Four," have been lavish in their praise of the R.I. Unit, and have declared that it marvellously improves their set performance and standard of reproduction.

Dispense at once with all battery inconveniences and high costs. Purchase this unit and make your portable, kit or standard set into an "all-electric" receiver and enjoy radio in the modern way. **FITS ALL PORTABLES.**

ALL-MAINS MODEL.

3 tapings, output 120/150 volts, 20 milliamps. Charges 2, 4 or 6 volts at ½ amp.

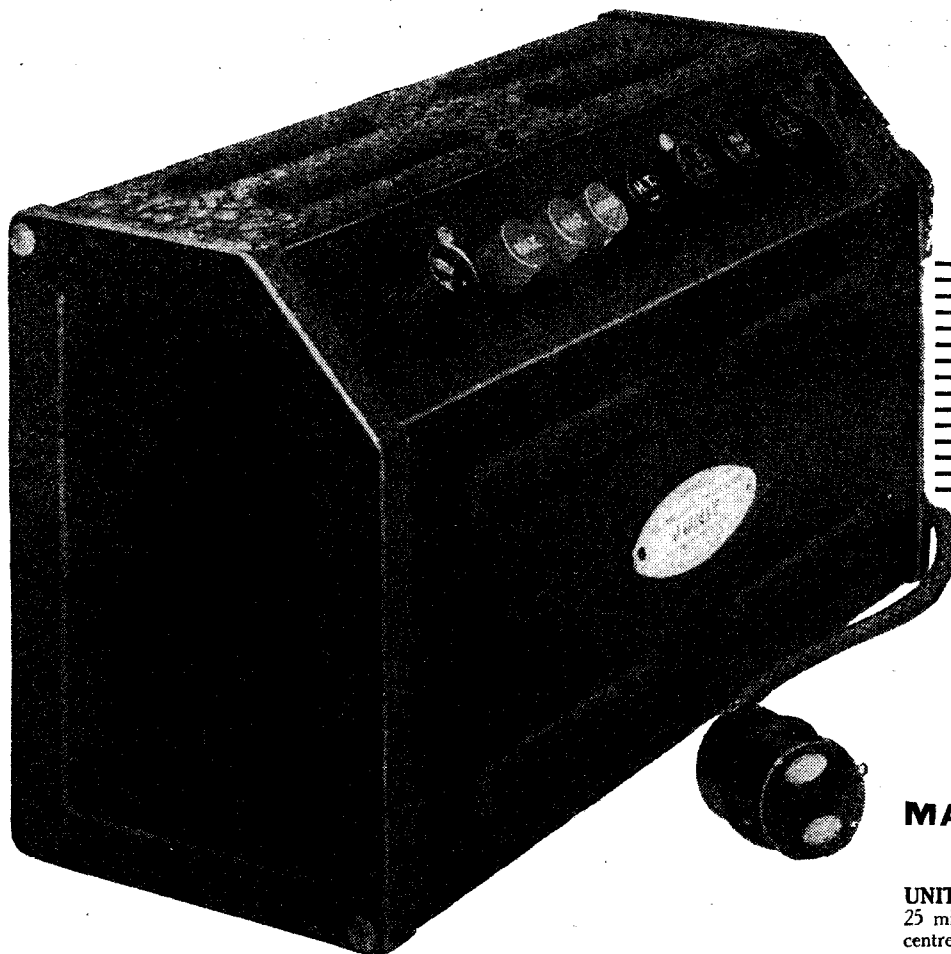
C20/3 for A.C. Supply. **£6.0.0****H.T. MODELS.**

Both types have 3 tapings, output 140 volts, 20 milliamps.

D20/3 for A.C. Supply. **£2.12.6**A20/3 for A.C. Supply. **£4.15.0****ACCEPT NO UNIT
THAT DOES NOT BEAR THIS MARK**

R.I. Ltd., MADRIGAL WORKS, PURLEY WAY, CROYDON.

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention



MASTER OF THE MAINS— SERVANT OF THE SET

JUNIT MAINS UNITS

*Junit Manufacturing Co., Ltd.
2 Ravenscourt Square, London, W.6*

MAKE YOUR SET ALL-ELECTRIC

UNIT TYPE 150, 4 A.C. Giving 150 volts at 25 milliamperes load, and incorporating 4-volt centre tapped winding for supplying filament current for indirectly-heated valves.
Size 9" × 5" × 3½". For use on mains 200-250 volts.

Tappings: One variable 0-150
One fixed 150
One fixed S.G.

Price £5 - 0 - 0

SAVE H.T. BATTERY COSTS

UNIT TYPE 120. Giving 120 volts at 20 milliamperes load.
Size 9" × 5" × 3½". For use on mains 200-250 volts.

Tappings: One variable 0-120
One fixed 120
One fixed S.G.

Price £4 - 7 - 6

ENSURE CONSTANT H.T. & L.T. SUPPLY

UNIT TYPE 120T/C. Giving 120 volts output at 20 milliamperes load, and also containing trickle charger for 2-4- or 6-volt accumulators.
Size 9" × 5" × 3½". For use on mains 200-250 volts.

Tappings: One variable 0-120
One fixed 120
One fixed S.G.

Price £5 - 17 - 6

Ask your dealer for full particulars

Don't Forget to Say That You Saw it in "A.W."

On Your Wavelength!

A COMPARISON

I WAS thinking the other day how much radio reproduction has progressed. I had occasion to use a cheap portable gramophone, and I was positively amazed at the acoustic arrangements.

There was the ordinary tone-arm, perhaps a foot long, if that. Over the end of this was a curved piece of metal about fifteen inches long, and three inches wide. This acted as a reflector and pushed out the sound into the room.

Now, without being nasty, I venture to suggest that anyone offering for sale a loud-speaker so crudely constructed as this would be received with a howl of execration. The system is obviously incapable of reproducing anything below about 200 cycles—in point of fact, I checked this with a frequency record—and yet here is the article being sold, and apparently accepted, as an up-to-date musical instrument.

Even the cheapest loud-speakers provide a reasonable length of horn, or, if they are of the cone type, introduce sufficient box resonance to boost up the lower frequencies; and I feel fairly confident that any of the wireless public would have refused point blank to buy a loud-speaker which gave so poor quality as this gramophone. It is an interesting example of the way public opinion has forced manufacturers of even the cheapest commodities to attain a certain minimum standard. It means, of course, that our loud-speakers cost us a little more; but surely, when one comes to examine it, this is worth putting up with.

HARD LINES

THE Munich station had very bad luck in having its aerial masts blown down in the recent big gale. So far as I can remember, this is the first broadcasting station to suffer in this way, which says a good deal for the care and skill of the engineers responsible for erecting the towering masts that are used nowadays. The wind pressure even on a lattice steel mast is terrific if it is a high one and is facing the full force of the gale. Curiously enough, I tried for Munich the other night before I had seen the news, and couldn't think why he didn't appear to be on the air. However, we are lucky in having a first-rate relay of Munich in Nürnberg down towards the bottom of the medium band. Actually, the relay station usually comes in more strongly than the parent, though it is apt to be more affected by fading.

A FADING PROBLEM

SPEAKING of fading reminds me of an interesting discovery that I made the other day. Having a large and powerful set in the house, I thought that I would see whether any of the medium-wave stations could possibly be picked up in broad daylight. The time was

actually 1.30 p.m., and it was a bright day, with the sun shining in a clear sky. I was surprised to find that I could receive at quite respectable loud-speaker strength a very fair number of stations, including Hörby, Leipzig, Breslau, Hilversum, and Rome. They did not, of course, give anything like so much volume as they do normally after dark; still, they were there right enough, though not really worth listening to from an entertainment point of view, since the ratio of signal strength to mush strength was insufficient for first-rate reception. And now comes a rather curious and interesting point. Every one of these stations was showing a certain amount of rhythmic fading, such as we frequently experience shortly after dusk. The fading, too, was of exactly the same kind, with swings occupying several seconds from maximum to minimum and back again.

IS IT CORRECT?

IF you look at the explanations generally given of the phenomenon of fading you will find it stated that during the daytime we have to rely on the ground wave, since the Heaviside layer is not in a condition to turn the reflected wave back to earth. Hence distant reception is weak. After darkness has set in the Heaviside layer becomes a good reflector and sends us along the waves that previously didn't reach us. The cause of fading is said to be due partly to changes occurring in the Heaviside layer and partly to the fact that the ground wave and the reflected wave may reach our aerials, now exactly in step (in which case we get a maximum), and now just out of step, when a minimum period of signal strength occurs. All that seems very convincing, but, in view of my experience of reception of medium-wave stations at the brightest time of the day, I am beginning to wonder if the explanation is complete.

PUZZLING

YOU see, it would be quite impossible, one would think, for the ground wave to reach my aerial from stations so distant as Breslau and Rome. In both cases these waves would have to travel over land, and not across water, for the greater part of their journey. Reception, remember, took place during bright sunshine and with a clear sky. Despite this, the Heaviside layer must have been at work, though the influence of darkness or even dusk certainly was not there to produce any changes in its lower surface or in its height above the earth. It must, of course, have happened that on that particular day, despite its bright sunny nature, the Heaviside layer was lower for some mysterious reason. And the fading may, of course, have been due entirely to undulations in the earthward surface. All

the same, I must confess that I am a little puzzled. I have not had the opportunity of making further daylight attempts yet, but I hope to do so before long, and it will be interesting to see whether the same thing happens. What will be still more interesting will be to discover whether daylight reception is possible on the medium band at the height of summer if one has sufficient magnification at command. And if it is, will fading still take place?

TAKE THE HINT

GOOD though many charging stations are, I am coming to the conclusion that those that can be so classed are not nearly so common as they ought to be. In fact, I will go farther and say that those who have to use accumulators will be very well advised to run a hydrometer over their cells when they come back from the charging station. A case in point occurred the other day when a friend asked if I could take the gravity of his cells next time I was in his direction. Dropping in for a chat on the following evening, I took a hydrometer with me and measured each cell of his six-volter. There were differences between the cells, and none of them showed more than half charge. "Just as I suspected," said my friend. "Now, if you'll believe me, that battery came back only three days ago from the charging station, and I purposely haven't used it until the gravity had been measured." To make customers pay for half a charge is every bit as dishonest as selling short weight bread or coal. But I fear that the practice is rather widely prevalent. It is no unusual thing, if one visits the small charging station, to find that it is not equipped with a proper hydrometer, or, if there is one, that it is not used. The hydrometer is absolutely the only reliable method of testing the condition of accumulator cells.

DANGEROUS FELLOWS

IT is a pity that the wireless business has attracted so many young fellows who went into it chiefly because they saw, or thought they saw, easy money. Many of them were mildly interested in wireless in the early days of broadcasting and, knowing just a little more than their friends, obtained local reputations as experts. Unhappily, many of the fellows who advertise themselves as radio experts do not go far beyond the ability to distinguish a grid-leak from a transformer. And the worst of it is that they will tackle anything that comes along.

Some months ago a friend asked me if he could add a note-magnifying valve to his existing three-valver. I strongly advised him not to attempt anything of the kind, for if you start tinkering with a design the result is not infrequently disaster. My counsel was that if he wanted a four-valve

On Your Wavelength! (continued)

set he had better rebuild entirely, using such of his old parts as he could and following one of the AMATEUR WIRELESS designs. However, he went along to one of these expert chappies, who forthwith told him that the job was an easy one and quoted a price for carrying it out. It was not successful; in fact, a perfectly good set was completely ruined, though a good deal of money was spent by my friend in the process, for the expert recommended that all kinds of "improvements" should be made here, there, and everywhere. The wise man makes sure, before accepting his advice, that the expert consulted really does know something about wireless.

DELAYS ARE DANGEROUS

THERE is another point about charging stations which needs watching. Not a few of them will tell you if you leave, say, a 50-ampere hour battery on a Monday that it will be ready on the following Friday or Saturday. If it is charged at 3 amperes such a battery will actually require something under 20 hours on the charger. But you are asked to leave it for 100 hours more than this. And you can jolly well bet your boots that, if you agree, your battery will be standing in a run-down or nearly run-down condition for the best part of those hundred hours before it comes near the charger. There is, as you probably know, nothing worse for a battery than to remain in a run-down condition, for sulphating sets in remarkably quickly. It is sound, therefore, to stipulate, if possible, that the battery handed in for recharging shall be returned within a reasonable time. By far the best tip really is to arrange with a reliable station to give you regular monthly service. Mine sends round on the last Wednesday in each month and collects both my H.T. and my L.T. accumulators. Each of these is capable of more than a month's working, but by having them charged regularly in this way one ensures that the gravity never drops down to near the danger limit.

A QUEER NOISE-MAKER

I WAS much puzzled the other day by an outburst of noisiness in a bigish set which employed a good deal of careful screening on the high-frequency side. There certainly was not a loose lead outside or inside it, all the valves were in good condition, and the valve-holders were guiltless. Yet the slightest jarring of the cabinet produced a terrific response from the loud-speaker. Even if one walked across the room there was a volley of "atmospherics" at every step. It took me quite a while to discover just where the source of the trouble was located.

UNUSUAL

YOU wouldn't guess if I gave you a hundred shots; so I had better tell you right away. The wave-change switch, which was of the barrel type, was supported on a little metal angle bracket fixed by screws to the bottom of the

screening box of the first high-frequency valve. These screws had worked loose, though all connections to the switch were in perfect order and the contacts themselves were as good as good can be. But if that switch was rocked the crackles were instantly produced. I tightened down the screws and had no further trouble. When a set is pretty sensitive and employs a good deal of high-frequency amplification, noisiness can be caused in funny little ways like this. The explanation here is, I suppose, that, owing to the chance contact between the metal contact and the screening box, the body of the switch was sometimes properly earthed and sometimes not.

WHERE ARE THEY?

CONDITIONS for listening to European stations have been so good lately that I have sat up until the small hours once or twice to see whether anything was to be heard of the Americans. I quite expected to find one or two of them, for there are giants over there in these days. But not a sign have I been able to obtain of the 50-kilowatt WGY or any other. Conditions for listening seemed to be practically perfect on each night when I made an attempt, for there were no atmospherics; so that one could use the set in a very sensitive condition. Spark signals, too, were conspicuous by their absence, though in the days when the American medium-wave stations came over so well our pleasure was often spoiled by the morse pings of ships and shore stations. I firmly believe that we shall receive the American medium wavers this winter once more, but I expect that we shall have to wait until the weather decides to become a little more settled. My experience is that on all wavelengths you get the best results when the glass is high and steady, and the weather not chopping and changing.

UNDER DIFFICULTIES

A LETTER which came the other day from a Colonial reader is rather an eye-opener as regards the difficulties under which some people carry on their favourite hobby. His abode is in a part of Africa where atmospherics are pretty filthy, but he carries on, despite them having, so he tells me, developed cast-iron eardrums as a result of long practice. His great complaint is that, owing to the dampness of the climate, any wire-wound components that he uses have a very short life. Coils, chokes, transformers, and resistances all succumb, for the damp makes its way into their innards, sets up corrosion, and causes breakdowns. Still, he is quite undaunted, and he writes to me to ask if I can find any maker of damp-proof compon-

ents. I am not sure that his best way would not be to fit every component with a wooden containing box and, after making all connections, to fill this with melted paraffin wax.

REMEMBER THE POTENTIOMETER

TO add a potentiometer to the receiving set in order to smooth out reaction is an excellent tip. I have described it before; you take the grid-leak return not to L.T. positive, but to the sliding contact of the "pot-meter," and you can then adjust your grid potential to a nicety. But do remember to connect your potentiometer in such a way that the battery switch throws it out of action when it is turned to the "off" position. I have been surprised to find how often, when looking round friends' sets, the grid bias potentiometer so wired that it isn't cut out when the switch is turned to the "off" position. A 300-ohm potentiometer across a six-volt battery passes 20 milliamperes continuously. The drain is small, but it runs the battery down in time. Matters are still worse if you use a high-resistance potentiometer across the H.T. battery for adjusting screen-grid potentials, for milliamperes are of vast importance to the H.T.B. Yet I found a set the other day whose potentiometer drew 3 milliamperes, day and night, though the owner did not know it until my milliammeter proved it conclusively.

SEEKING SECRECY

ACCORDING to Sir Basil Blackett, the most effective method of ensuring secrecy for wireless messages of a confidential nature is to send them through the ether in "facsimile"; that is, in autograph or typewritten form by a process similar to that used in transmitting photographs. Judging by the kind of sounds one hears when picking-up television signals, I should say that anyone who went to the trouble of trying to intercept a facsimile message on an ordinary broadcast receiver would find it highly unintelligible. The time may, however, come when television receivers will make it possible to capture even the written message, in visible form. Not that one wants to do this kind of thing, but it does show the difficulty of frustrating a determined eavesdropper.

As Sir Basil point out, even the submarine cable is not immune in this respect. The current impulses, as they travel through the wire, send out a spreading field of force, which with a sufficiently sensitive receiver can be picked up a considerable distance away. This method of picking up low-frequency fields of force (as distinct from true radiation) is, in fact, now being used for guiding aircraft when landing in the dark. The aerodrome ground is surrounded by a cable fed with A.C. currents, the inductive "field" from which energizes a receiver on the plane, so as to indicate the outline of the landing field.

THERMION.

**"WIRELESS
MAGAZINE"
THE BEST MONTHLY**



Below, "Savoy Hill" gives a word picture of the happenings at the London station on Christmas Day

"EIGHT o'clock, sir; here's your tea, and a merry Christmas to you."

The announcer rolled over with a grunt. Mary Ann was standing over him with a bright smile on her rosy features.

"Umph!" he said. "Thank you, Mary. Oh! and a merry Christmas to you also."

"Thank you, sir," answered Mary, setting down the cup. "It do seem a shame you've got to go to work to-day, sir."

"Well, well; so have a good many more, Mary. We can't *all* have a merry Christmas."

An hour and a half later the announcer was on his way to Savoy Hill. "It's a good thing I've got a car," he said to himself. "They're packing up all the tubes and buses at four."

He passed along deserted Piccadilly and the Strand, and it was not until he turned down Savoy Hill that things looked normal again.

The doors of the great building were already open, and at the reception desk sat the janitor.

"Good morning, sir, and a merry Christmas," he began.

"Oh, good morning, Smith," answered the announcer.

He was beginning to dislike the phrase, "a merry Christmas."

Passing up the stairs, he arrived at the announcer's room. Sitting at a desk was the chief announcer.

"Morning, old boy, and a merry Christmas to you," he said. "You're on first. Your announcements are on your desk. Better look 'em through."

Our friend was becoming Scrooge-like. "A merry Christmas," he muttered, and a moment later could have shouted. The beginning sentence of his first announcement commenced:

"This is the National programme from London. Good morning, everybody, and a merry Christmas to you all."

And all over the country the

luckless announcers who had "clicked" for duty were simultaneously cursing their luck.

But, of course, things aren't really so bad as all that, for announcing on Christmas Day is generally done in relays, and our friend of the morning will probably be able to get home by four.

In the control room the same atmosphere of Christmas pervades the rather severe portals. Engineers are bustling about, testing, adjusting, and generally preparing for the day's broadcast.

This section of the community is world-famed for its repartee, and there is many a "new one" to be heard, before the red light gives the signal to commence transmitting.

Christmas morning usually starts with a church service, and if Christmas Day comes on a Sunday the service is "taken" from outside. Engineers are, therefore, hard at work testing microphones in the church,

and here, again, the spirit of *bonhomie* prevails.

There are only three offices, besides that of the announcers, open on Christmas Day: that of the house superintendent (who also controls the reception office), the news rooms, and the cashier.

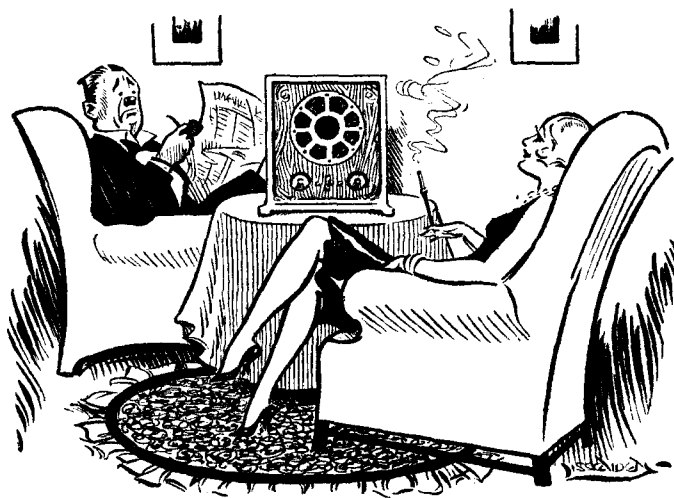
The news section, of course, has to make up the bulletin, and the cashier must be present to hand cheques or cash to the artistes performing.

Later in the afternoon the uncles and the aunts of the children's hour put in an appearance. They are in festive mood, having just had their Christmas dinner at home, and many of them arrive in paper caps, which contrast in an amusing manner with the rather drab and gloomy passages at Savoy Hill.

Then, later on, an evening programme with, perhaps, a pantomime or a vaudeville transmission. Then it is that the fun gets fast and furious. Everyone is in a happy mood, imbued with the Christmas spirit.

The comedians are funnier than ever; the singers seem in specially good form; the actors act as they never have before.

Only the announcer must keep his head. He must do his job, just like he would on any other day. There must be no deviation from the strict rule. And then, at last, the "good night." The announcer is alone in the studio. Everyone else has hurried off to their parties and dances, and now there is only dance music from some hotel. The control room is almost deserted, two engineers only are operating; the lights are out in the offices; the sleepy janitor is nodding at his desk. Savoy Hill has come to the end of Christmas Day.



SHE: "Broadcasting has passed the infant stage!"

HE: "Yes, but there are a lot of infants who have not passed the broadcasting stage."

It is probable that a beam wireless service will be established next year between India and Japan.



IN MY WIRELESS DEN

WEEKLY TIPS—
CONSTRUCTIONAL AND THEORETICAL

By W. JAMES.

Flexible Resistances

I NOTICE that the packets containing flexible resistances have marked upon them the current-carrying capacity of the various sizes.

This is a feature which appeals to me. How often do we use a part not knowing quite how much current it will carry?

Flexible resistances comprise a core having a resistance wire wound round it. The ends are gripped by tags and a covering of systoflex is used. These resistances are likely to be used pretty extensively, for they are cheap and effective.

Those Valve Pins

A good many solid-pin valves are now being issued. Some types of holders are not very satisfactory for these new valves and loose contacts may be expected.

It is especially necessary that mains valves should fit well. A loose grid connection may result in hum and with a really bad contact or perhaps a disconnection in the grid circuit, damage may be caused.

When the grid circuit is broken the grid bias is removed and in the case of a power valve, a heavy current will flow and perhaps damage the valve and the anode supply unit.

Silk or Enamel?

Is silk- or enamel-covered wire better for tuning coils? Sometimes you see one, and another time the other recommended.

The point is, I think, that a wire having a good coating of enamel is likely to be satisfactory and is cheap. A little more care may be needed than when winding a silk-covered wire, but the expense of this wire does not seem to be justified on many occasions.

A good many set manufacturers use coils of enamelled wire and there seems to be no reason why amateurs should stick to the silk covered.

Shielding that Set

To arrange shielding in a satisfactory manner is not quite so easy as it looks, particularly in sets having ganged tuning.

Both the inductance and the capacity of circuits are likely to be affected.

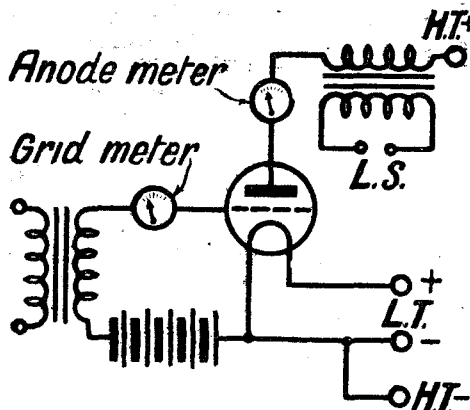
An earthed plate near a coil will tend to raise the wavelength because of the capacity effect of the coil to earth. At the same time the inductance of a coil will nearly always be altered by metal standing near it. Coils ought therefore to be symmetrically placed with regard to all shielding or the tuning may be greatly affected.

When Testing

When adjusting a set having a really powerful output stage it is just as well to include a grid meter as well as a plate circuit milliammeter.

The meters are joined as indicated in the accompanying diagram. Grid current kicks cannot always be avoided and the fact is that the amount of the distortion introduced depends largely upon the design of the last stage. If the transformer has overloaded characteristics, for example, the effect of the grid current will not be as noticeable as when the more usual type of transformer is used.

As a rule, however, grid current is to be avoided so far as is economically possible. The anode circuit meter is usually bound to show kicks on occasions, but the point in



When testing your new set it is advisable to use meters, which may be connected as shown. This method of testing is described in the accompanying paragraph

having two meters is that overloading may be avoided by making adjustments which result in both meters behaving normally.

That is, the grid circuit meter should show little or no current (normally), while the anode circuit meter ought to show a practically steady reading.

Permanent-magnet M.C.'s

Permanent-magnet moving coil speakers are almost bound not to be as sensitive as the best coil excited types unless really good magnets are used. There are several sizes, of course, and the best and most expensive are really good.

When a cheap magnet is used the sensitivity will be down and my point is that the size of the magnet is some indication of the probable sensitivity. Do not expect too much when a small magnet is fitted. There are different qualities of magnets, naturally, so that size is not the only factor.

"Power" Detectors

A point made against the so-called "power" detector, which has a grid condenser of about .0001 microfarad and a grid leak of from .1 to .5 megohm, is that the circuit connected to it is damped.

Thus the selectivity of this circuit is not very great and the actual signal strength developed across the circuit is somewhat less than when a larger grid leak resistance is used.

I believe the damping effect is rather less than is commonly thought. The power detector is not quite as sensitive to weak signals as the ordinary grid detector and this may be responsible for the feeling that the power type tends to damp the circuit rather heavily.

In a power detector the grid leak should be made as low in value as possible, a value of .25 megohm being reasonable. Use also a valve of low impedance and give it plenty of power.

"SPLIT" IMAGES

IN a television receiver the scanning-disc must not only be driven at the same speed, but must also run "in phase" with the disc used at the transmitting station. For instance, although the hour-hand of a clock in New York rotates at the same speed, it is roughly 180 degrees out of phase with the hour-hand of Big Ben, owing to the difference in local time between the two countries. If the transmitting and receiving discs used in television are 180 degrees out of phase, the received picture is "split," so that one half is seen on the right-hand margin of the screen and the other half on the left-hand side, the centre of the screen being left blank. This kind of distortion is corrected by adjusting the dial knob on the television so as to speed up the motor until it is running in phase, i.e., in correct "step" with the motor at the transmitting end.

M. A. L.

Contrary to recent reports published in the Press, the Gdingen 5-kilowatt transmitter opened by the Polish authorities is not to be used for broadcasting purposes, but as a coastal station at the disposal of the Posts and Telegraphs administration.

To compete with the coming Prague and Warsaw high-power transmitters, the new German stations at Muelacker, Heilsberg, Langenberg, and Konigswusterhausen have been so planned that, although primarily of 74 kilowatts, the energy can be doubled within a few weeks.

Marconi Valves

are used by most
Ocean Vessels
and most
important
Land & Air
Services



MHL4

A model of EFFICIENCY!

Public Testimony

A letter typical of many regarding the splendid service given by Marconi Valves.

"I have enclosed for examination four of your valves that I purchased about 6 years ago—they have been in use every day since I bought them for at least 6 hours per day, that is over 13,000 hours—truly a wonderful performance

After this marvellous performance, there is no other valve for me but a Marconi."—C. C. T., Brighton.

Buy

A VALVE OF NOTE FOR THE MODERN ALL-ELECTRIC A.C. RECEIVER—with four volt indirectly heated filament—amplification factor 20, impedance only 8,000 ohms—mutual conductance 2.5 MA/volt!

MHL4 will satisfy the demands of the most exacting set; as a detector it is both sensitive and stable, as low frequency amplifier it provides good stage magnification, while in each case its low impedance ensures highest quality reproduction with either transformer or resistance coupling. MHL4 utilises all the essential features of Marconi A.C. valves—high conductance, mesh anode, constant emission and exceptional vacuum.

ITS DEPENDABLE EFFICIENCY HAS BEEN PROVED BEYOND DOUBT—IT IS ALL BRITISH—AND COSTS ONLY 15/-.

CHARACTERISTICS: Amp. Factor 20; Impedance 8,000 ohms; Mut. conductance 2.5 MA/V; Fil. volts 4.0; Fil. Amps. 1.0.

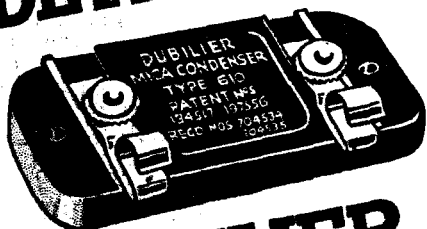
Marconi MHL4, the foremost medium magnification valve for A.C. mains Receivers. **15/-**

MARCONI VALVES

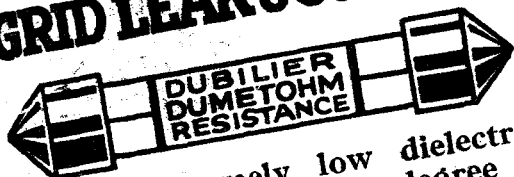
THE VALVES THE EXPERTS USE

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

**YOU'LL GET
MORE EFFICIENT
DETECTION WITH A**

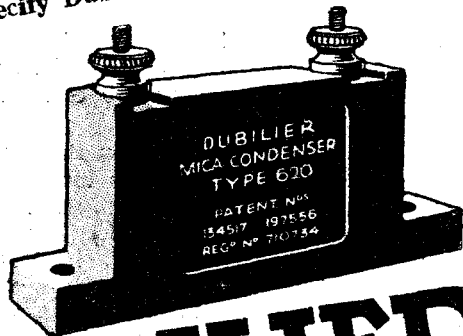


**DUBILIER
GRID LEAK & CONDENSER!**



THE extremely low dielectric losses and the high degree of accuracy of Dubilier Mica Condensers are well known.

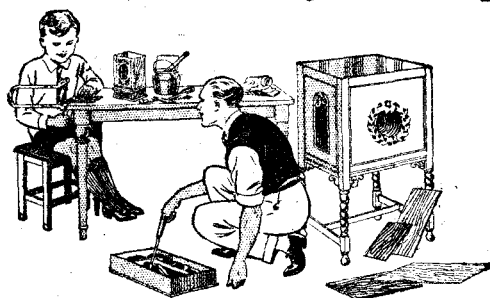
These qualities make them invaluable in any radio frequency circuit and especially so in the grid circuit of a cumulative grid detector where very minute high-frequency currents are dealt with and where even small losses have an appreciable effect. Specify Dubilier for your next set.



**DUBILIER
CONDENSERS**

Dubilier Condenser Co. (1925) Ltd.,
Ducon Works, Victoria Road, N. Acton, W.3.

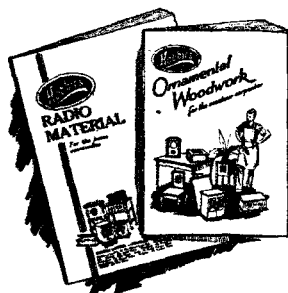
Let the boy help!



Make your own

**CABINETS, SPEAKERS,
CARRIERS, TABLES**

It's Quite Simple



Read about it in
these **FREE** Books

Booklets specially prepared for the home constructor with chapters on how to make cabinets, speakers, etc. for any set. Equal to shop furniture at half the price. Booklets will be sent free if you write to Hobbies Ltd., Dept. 76, Dereham, Norfolk.

PULL DOWN THAT UNSIGHTLY OUTDOOR

**NO DANGER FROM STORMS
NO TROUBLE TO FIX
NO WAVE TRAPS
REQUIRED**

AERIAL AND MAST!

**GREATER SELECTIVITY
VOLUME
EFFICIENCY**

The New R.C. Regional Aerial.
Pat. No. 284571. An **ADMIRALTY PATTERN AERIAL**. Made of special Rubber-covered Flexible wire being weather proof and non-corrosive. Suitable for erecting indoors, under eaves, or any outside position. Size 14 ft. long, 4 in. dia. Rapid shortening device for smaller span. A permanent Aerial giving high conductivity, selectivity, and maximum volume. Price 6/-

The R.C. Collapsible Aerial.
Pat. No. 284963. An ingenious aerial invention containing 55 ft. in one length of high conductive wire in 130 turns spirally wound and made to run along support cords. Can be erected and re-erected in a moment. Adaptable to any span up to 14 ft. Capacity can be altered at a touch thereby increasing selectivity. For indoor use. Price 2/-

The R.C. Popular Super.
An extra efficient indoor aerial made of special stranded tinsel wire in 8 twelve foot lengths threaded side by side to form a flat aerial. Price 4/-

The R.C. Super Silk.
For those requiring efficiency with elegance. In Old Gold, Silver Grey, Maroon, and Red. Price 8/-

ALL AERIALS SUPPLIED WITH INSULATORS ATTACHED.

MAKE UP YOUR MIND TO GET THE "R.C." AERIAL AND ENSURE UNINTERRUPTED RECEPTION

Obtainable of all dealers or Post Free from
R.C. RADIO-ELECTRIC Limited
YORK HOUSE, SOUTH-AMPTON ROW, W.C.1



MAKING IT CERTAIN

Not once did the set fail them again after they had installed an Ever Ready Battery. The exclusive process by which the Ever Ready is made gives it not only a long life but a *powerful* life. The prime of its life is practically the whole of its life. That is why the tone of the loud speaker remains constantly pure and clear. That is why there is no crackle or fading or distortion. Month after month the Ever Ready discharges a strong even flow of current and, indeed, a wireless set with an Ever Ready Battery is as certain as a numbered and reserved seat.

Ever Ready batteries are guaranteed to give satisfactory service by a company that has been making reliable batteries for 28 years.

They are made for all wireless sets. If you own a portable you can obtain an Ever

Ready of the right size to fit it. Write for free list

which gives all particulars, including exact dimensions in inches.

**BRITISH MADE
HIGH TENSION
BATTERIES**

**EVER
READY**

The batteries that give unwavering power

The Ever Ready Co. (Gt. Britain) Ltd., Hercules Place, Holloway, London, N.7

HERE ARE THE RADIO CABINETS YOU ARE LOOKING FOR

INSTALL A
"LANGMORE"
AND BE PROUD OF YOUR SET

THE "LANGMORE"

**RADIO - GRAMOPHONE
CABINET** has accommodation
for Gramophone, Wireless Set,
Loud-speaker and Batteries all
in one cabinet.

These cabinets are very strongly constructed of selected Oak and Plywood. Size overall, 3 ft. 2 in. high by 21 in. wide by 15 in. deep.

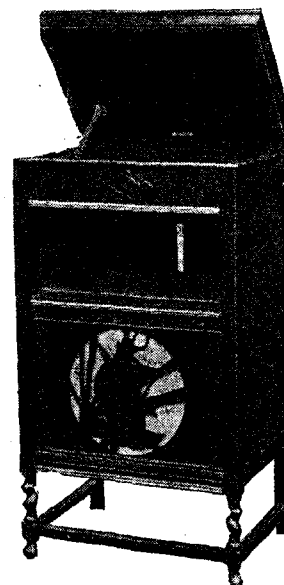
THE TOP SECTION. Size 4½ in. high by 18 in. wide by 14 in. deep, gives ample accommodation for gramophone and pick-up.

THE CENTRE SECTION. Size 10 in. high by 18 in. wide by 14 in. deep, is for the Wireless Set, to take a panel either 18 in. by 7 in. or 18 in. by 8 in.

THE BOTTOM SECTION. Size 14 in. high by 18 in. wide by 13½ in. deep, gives accommodation for Loud-speaker and Batteries.

The whole of the back is enclosed by double doors so that all parts are easily accessible. ALL are fitted with hinged top, heavy platform to take a 12" turntable for the Gramophone and a Substantial baseboard for the Wireless Set.

**BEAUTIFULLY FINISHED
" JACOBAN OAK "**



Price **49/6** each

**PACKED FREE AND SENT
CARRIAGE PAID TO ANY
ADDRESS IN GREAT
BRITAIN.**

The following is a copy of a letter received from one of our customers:—"The Cabinet received on Saturday last. I put the set in and it has only taken me 20 minutes to do so. The Cabinet does you great credit. I could not obtain a similar one for three times the money. The finish is beyond criticism and I feel I must write and thank you for such wonderful value, and for your promptness in the dispatch of it."

THE "LANGMORE"

No. 7 has open Back and Sides to **SPEAKER DEPARTMENT** as recommended by the B.B.C., and is very strongly constructed of Oak and Plywood.

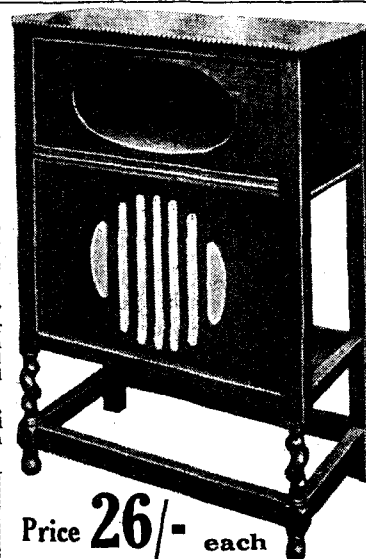
Size overall 30" high x 21" wide x 14½" deep.

THE TOP COMPARTMENT which measures 8" high x 18" wide x 10½" deep inside, is for the set and takes a Panel 18" x 7". The Oval Aperture is 12" x 5".

THE BOTTOM COMPARTMENT to accommodate Loud-speaker and Batteries, measures 13½" high x 18" wide x 9" deep inside, and has well designed Silk Covered Baffle.

All are fitted with Hinged Top, Heavy Baseboard, etc., and beautifully finished in Jacobean Oak.

**PACKED FREE AND SENT
CARRIAGE PAID TO ANY
ADDRESS IN GREAT
BRITAIN.**



Price **26/-** each

Trade Inquiries Invited.

THE MISCELLANEOUS TRADING CO., LTD.

13 & 17 NEW OXFORD STREET

LONDON, W.C.1

Phone: Holborn 4891

Please Mention "A.W." When Corresponding with Advertisers

Scrap batteries
& accumulators forever
by running your radio from
your Electric Supply with an
"EKCO" Power Supply Unit

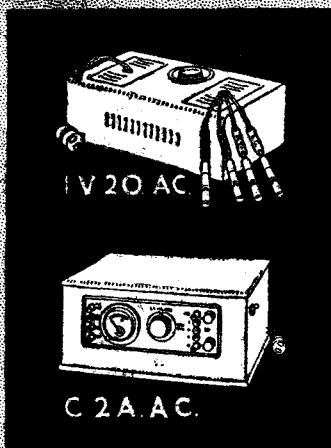
There is
an **"EKCO" Unit**
for every make of
BATTERY OPERATED SET

There is
an **"EKCO" Unit**
for every type of
PORTABLE RECEIVER

There is
an **"EKCO" Unit**
for every design of
CONSTRUCTOR KIT

"EKCO" H.T. UNITS				
MODEL	CURRENT OUTPUT	VOLTAGE TAPPINGS	D.C.	A.C.
27.20	10 MILLIAMPERES. For 1-3-valve sets, or those not requiring more than 10 m/amps.	60 and 120.	£ s. d. 1 9 6	£ s. d. —
2A.10			—	3 10 0
3F.20	20 MILLIAMPERES. For 1-5-valve sets or those not requiring more than 20 m/amps.	S.G.; 60; 120/150.	1 17 6	3 19 6
IV.20 (Port- able)		S.G.; 0-120 var.; 120/150	2 10 0	4 12 6
IV.30	30 MILLIAMPERES. For multi-valve sets or those not requiring more than 30 m/amps.	S.G.; 0-120 var.; 120/150; 150/170.	19 6	5 15 0
4T.60	60 MILLIAMPERES. For multi-valve sets or those not requiring more than 60 m/amps.	S.G.; 0-120 var.; 120/150; Power.	3 15 0	—
4A.60			—	8 10 0

"EKCO" ALL-POWER UNITS FOR A.C. MAINS					
MODEL	OUTPUT				
	H.T.	L.T.	G.B.		
CLA	60 m/a., 4 tappings S.G.; 0-120 var.; 120/150 volt. and Power.	3 to 1 amp. max. at 2, 4, or 6 volts.	7 tappings up to 21 volts.	Completely electrify your radio set with no alterations whatsoever to set, wiring, or valves. Westinghouse rec- tifier.	£ s. d. 17 15 0
C2A	20 m/a., 3 tappings S.G.; 60 and 120/150 v.	2 to .5 amp. max. at 2, 4, or 6 volts.	5 tappings up to 12 volts.		10 17 6
CP.1	20 m/a., 3 tappings S.G.; 0-120 var. and 120/ 150 volts.	.25 amp. at 2, 4, or 6 volts (Trickle Charger).	—	Fits quickly and snuggly into any portable set.	6 0 0
ACV	30 m/a., S.G.; and 150 volts	(Raw A.C.) 4 v. from 2 to 4 amps. 6 v. from .25 to 1 amp.	5 tappings up to 15 volts.	Can be built in any set to make it "all electric."	6 0 0
CONTROL UNIT					Accessory to ACV 1 5 0
OTHER UNITS					
T.500 Trickle Charger		Charges 2-, 4-, or 6-volt Acc. from A.C. mains			2 12 6
RA.20 Rectifier Unit		For D.C. Units used on A.C. mains			3 10 6
I.Tr. Isolating Trans.		For isolating speaker, etc., from set			0 15 0



EKCO
DESIGNED BY THE
**RADIO POWER
SUPPLY UNITS**

To : E. K. COLE, Ltd.,
(Dept. K), "Ekco" Works,
Southend-on-Sea.

Please send me

(a) Particulars of how I can
electrify my present battery
set or portable with, an
"EKCO" Unit.

(b) Illustrated literature of
"EKCO" Sets, Speakers and
details of Easy Payments.

(Strike out whichever is not required)

Address _____

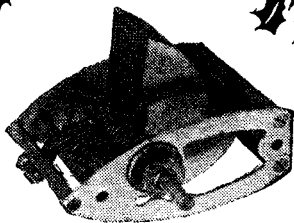
Name _____

Seasonable Gifts

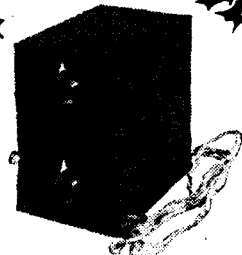
WE MAKE SOME
PRACTICAL
SUGGESTIONS



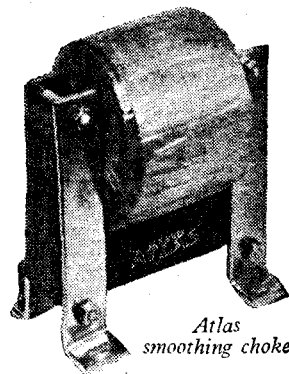
"WHAT can I possibly give him for Christmas this year?" This hardy-annual question is not necessarily best settled by a personal gift. Personal presents are not always easy to choose, but if you happen to know that the recipient is a wireless enthusiast, or even just an ordinary listener, then
(Continued on next page)



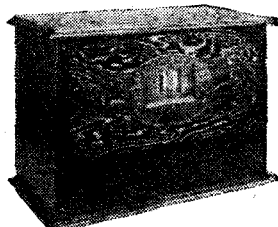
Lissen variable condenser



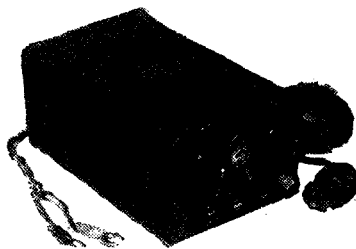
Hustler "Double-two" receiver



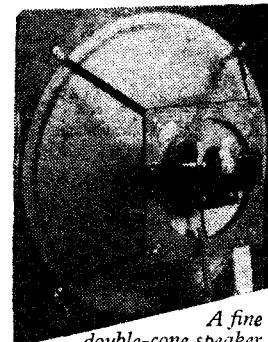
Atlas smoothing choke



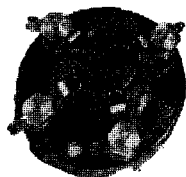
The Red Star three-valve



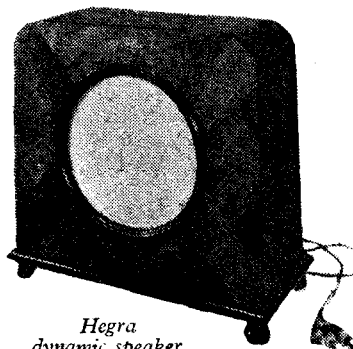
The Tannoy eliminator for portables



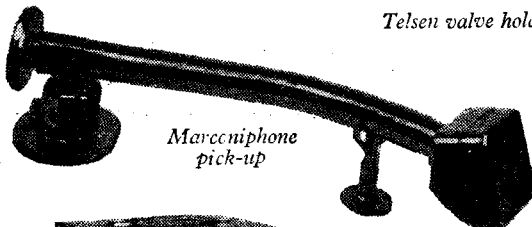
A fine double-cone speaker made by Wates



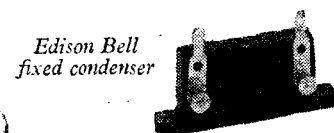
Telsen valve holder



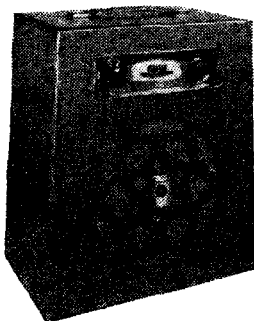
Hegra dynamic speaker



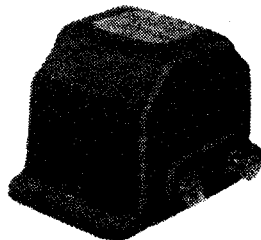
Microphone pick-up



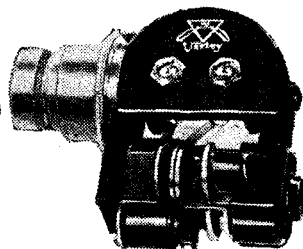
Edison Bell fixed condenser



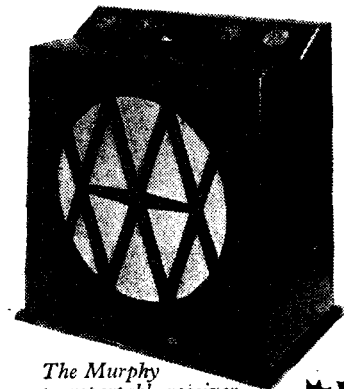
A well-known portable, the Columbia



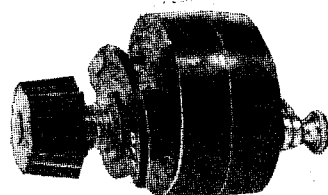
Cossor L.F. transformer



The Varley pick-up



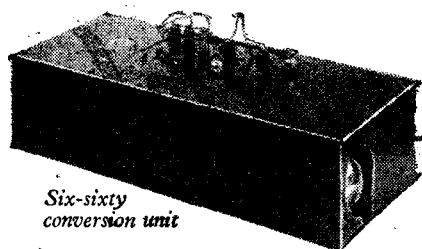
The Murphy transportable receiver



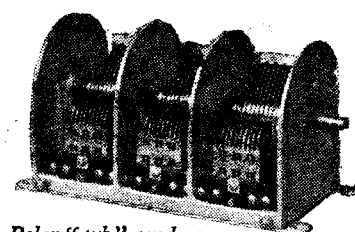
Bulgin rotary switch



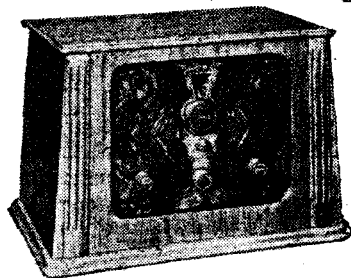
A handsome Tannoy table-type set



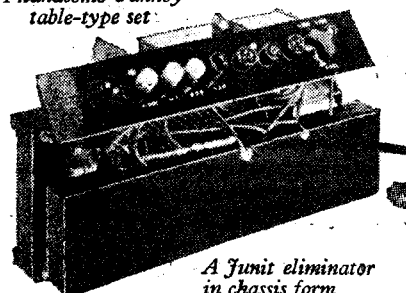
Six-sixty conversion unit



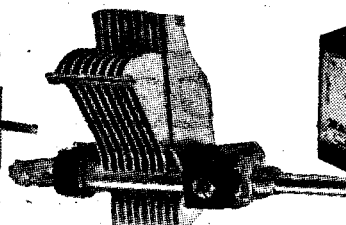
Polar "tub" condenser



A fine Varley table-model set



A Junit eliminator in chassis form



A compact condenser, the Formo



Pertrix high-tension battery

you can be sure of choosing something which will please.

You have a choice of giving a small component which needs incorporation in the set itself, a speaker or a mains unit which can be added by a non-technical set user; or you can make a wireless enthusiast out of a present non-listener by giving him a kit of parts with which to make up a set.

There is no need for you to be an expert in order to choose a piece of radio gear. Provided you know the type of set which the gift must suit, wireless dealers will give advice.

Dual-range coils which will make for better tuning, new condensers which will assist control and improve the panel appearance, transformers or resistance amplifiers which will improve purity and amplification, output choke or volume controls; each might be suitable.

A new valve is always a safe gift, provided, and it is a very important "provided," that you get one of the right type. It is no use buying an A.C. valve for a friend who uses a 2-volt

accumulator and has no mains.

There are other ways of improving a set's performance, and where a Christmas radio gift may be opportune. If your friend has complained during the past few weeks of lack of selectivity, then you can safely buy a wavetrap. Dual wavetraps are available which can be pre-set to cut out either one or other of the local stations.

If the recipient is a wireless man who has a gramophone, then you might do him a good turn by giving him a pick-up. Most sets are adaptable to gramophone working.

A loud-speaker always makes an acceptable gift and it is really surprising how many sets are improved by fitting a new speaker. If you do not wish to go to the expense of buying a cabinet instrument, then you might purchase a unit or even a double-cone, or linen-diaphragm chassis, which can be used with an existing unit.

If the recipient has a portable set which works from batteries, then he is fairly sure to appreciate the gift of a grid-bias or high-tension battery, for

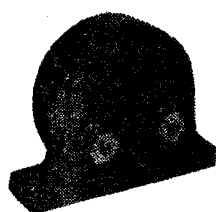
even though his own may not be run down, it will be a safe standby at Christmas time and will prevent him from worrying whether the "juice" will give out at a crucial moment during the holiday programmes.

Here, again, it is wise to make some preliminary inquiries, because with some portable and transportable sets there is only a limited space available for the battery, and only certain types may fit.

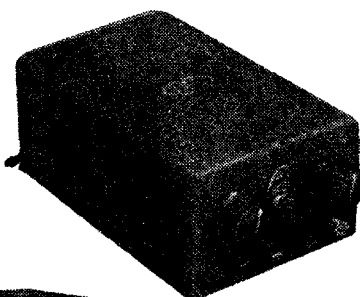
Mains apparatus is very popular nowadays and is easy to select as a present. Make sure when purchasing an eliminator that it will suit the mains supply for which it is intended and that it is capable of giving a suitable output for the set with which it will work.

If you intend purchasing a complete set, you will find so wide a range on the market, that your choice will be governed largely by the depth of your pocket, for there are suitable receivers in every price category. There are several kits of parts on the market, too, and if you know that your friend

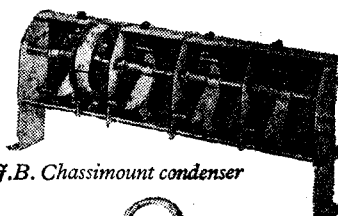
(Continued on page 902)



Telsen H.F. choke



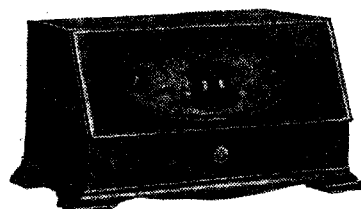
For mains users—a Tannoy H.T. unit and charger



J.B. Chassimount condenser



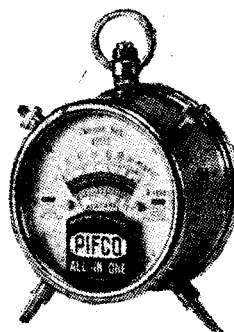
A new Marconi power valve



One of the range of Lotus table-type sets



Ediswan grid leak



A Pifco testing meter

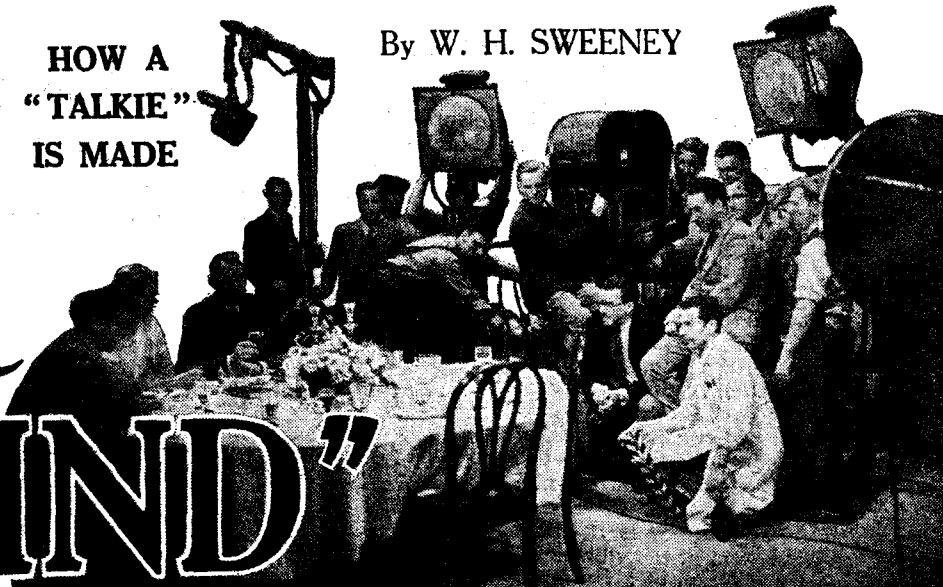


A good high-tension battery, the Ever Ready

"OK FOR SOUND"

HOW A
"TALKIE"
IS MADE

By W. H. SWEENEY



By permission of Associated Talking Pictures, Ltd.

"LIGHT 'em up!—Start your recorder!—Mark it!" . . . There is a strange silence—red lights flash all round us, a very faint whirr is noticeable, so faint as to be almost imperceptible: our eyes are dazzled by a blinding glare, nerves strung to breaking point by the unearthliness of it all. What are we waiting for—why can't someone do something? Then, just as we feel we must scream—"Crack!"—A noise like a pistol shot—and before our fascinated eyes the hitherto motionless figures come to life, their voices now low and vibrant, now sharp and passionate. We are fascinated by the reality of it, by our nearness to the drama being unfolded before us. . . . Then silence again—a staccato "Mark it!" and another "Crack!" The red lights go out, and an indescribable confusion reigns everywhere.

"That," says our guide, "was Scene 115a, Take 4, of *Fast and Furious*, our latest super production, hundred per cent. talking, hundred per cent. singing, hundred

per—sorry," he broke off apologetically, "these catch phrases do stick. Anyway, now you have seen an actual scene 'shot,' perhaps you would like to know just how a sound picture is made. It's quite simple, really. You see, this is how it is done. A microphone is suspended over, or concealed near to the actors. Obviously it must not show in the picture, and there are many dodges for concealing it. Generally, it is just suspended out of range of the camera, over the players' heads. As they may be moving about while they are speaking, it is essential that the microphone shall move with them. With that end in view, we use what is known as a 'boom.' That is a sort of derrick, which can be moved about the 'floor.' In it is incorporated a device for raising or lowering the microphone, and for moving it forwards, backwards, or from side to side. Needless to say, its action is quite silent.

"Well, this microphone (in this case of the condenser variety), which includes a

transmitter and associated amplifier, picks up the speech and music, which, after being converted into electrical impulses, is taken via a cable to a second amplifier. This amplifier is housed in a portable sound-proof booth, which can be moved to any suitable position from which the action on



Track showing approximately 130~/sec. wave, assuming 95% modulation

Frequency may be calculated by dividing 18,000 by the distance between peaks, measured in mils. The width of a 100% modulated track is 70 mils. If the above track was fully modulated the valleys would come right down to the base-line



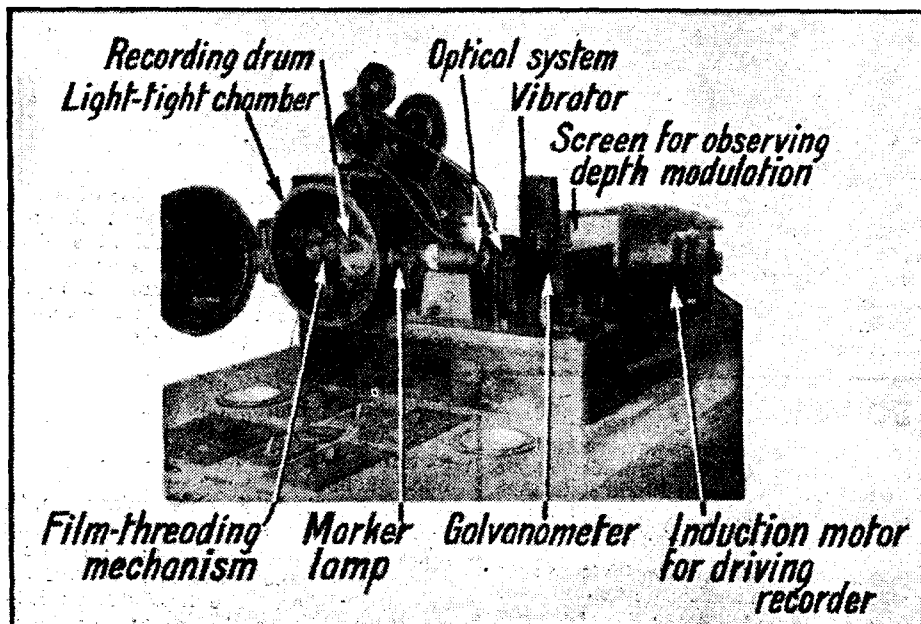
Typical sound-track for speech or music

Note the fundamentals and upper frequencies or harmonics

the 'set' may be observed. In the amplifier is incorporated a 'fader,' by means of which the outputs of several microphones may be mixed by the recording engineer. There is a control for varying at will the final output. In the booth is also a checking or 'monitoring' amplifier and loud-speaker, in order that the recordist may keep a check on the quality of the sound.

"The output of the main amplifier in the booth is taken to the apparatus which actually records the sound, that is, the sound camera. As the input to this must be very finely regulated, a meter is used to measure the quantity, or 'modulation level.' This may be either a modulation meter, or 'slide-back,' such as is used by the B.B.C., or it may be a replica of the light-recording device used on the recorder.

"Let us have a look at the recorder, and you will see what I mean. In its simplest form this is a device which converts the amplified electrical vibrations to light vibrations, which are allowed to make a photographic record on a strip of cinematograph film. There is also a method by which the electrical vibrations may be made to actuate a disc-record-cutting stylus, but this method, although perhaps better



By permission of Associated Talking Pictures, Ltd.

Here is an explanatory photograph of the sound-recording apparatus and the camera

known—as it is used to make all the electrically recorded discs in the gramophone industry—is not used very much for talking pictures, as recording sound on to film is more of a commercial proposition. If discs are required, they are re-recorded direct from the film sound-track.

Two Recording Systems

“There are two methods of recording sound on film. One is the variable density method and the other is the variable area. In the first, the sound record takes the form of a track running the length of the film, and being composed of a number of horizontal strips, each strip having a different density. In the second, the track is composed of a number of horizontal bands, of varying length, but of the same density. These bands are so registered on the film that they form one long track, of varying width, which in appearance is a direct record of the wave-form of the vibrations. You know what a diagram of a pure sine wave looks like. Well, if the sinusoidal output of an oscillator were led to the recorder, the track would be an accurate copy of the sine wave. Similarly, if the sine wave were modulated, or had other frequencies superimposed, then the track would show the lowest frequency as a succession of widely-spaced peaks, each peak being split up into smaller ones representing the higher frequencies and harmonics.

Variable Area

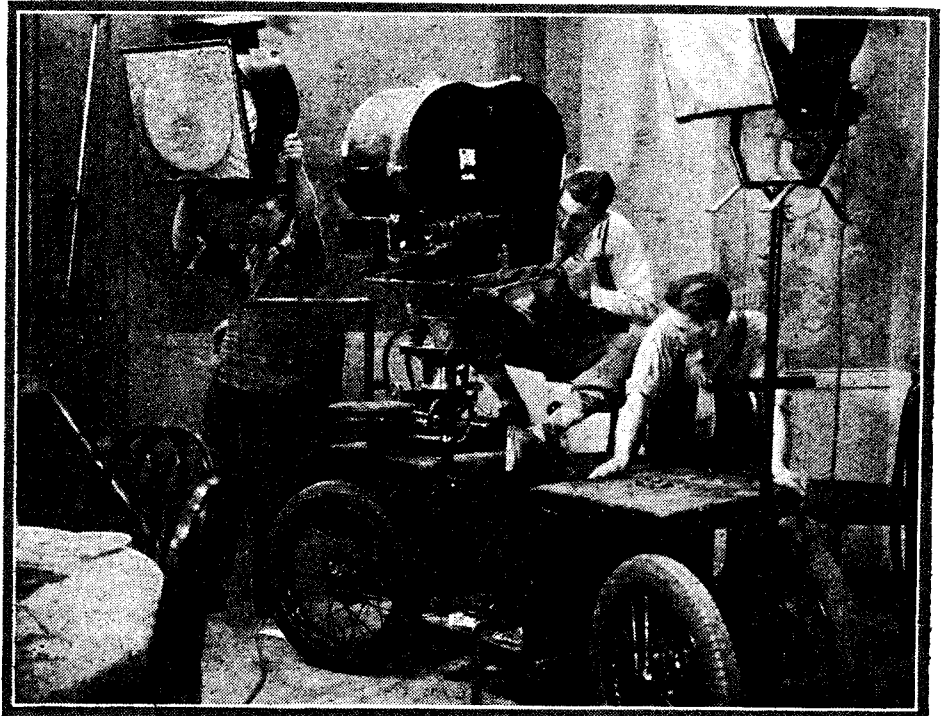
“This variable-area system is the most widely used method in this country, and is in use here at this studio. If you examine the recorder, you will see that it is fitted with a galvanometer of the Duddel Oscillograph variety. The vibrator, which is a small mirror, mounted on a wire loop, situated in a strong magnetic field, is used to convert the electrical vibrations to those of light. The speech currents are fed to the loop, which tends to twist in the magnetic field with the passage of a current through it. This twist becomes a vibration when the current is of an alternating or varying nature. The light from a lamp filament is focused on to the mirror, and reflected through a condensing and reducing system on to the film, which is moving through a light-tight chamber at a constant linear speed of 90 ft. a minute. It is interesting to note that the vibrator has to be immersed in a damping fluid of mineral oil, and the most convenient substance obtainable is a well-known medicinal aperient preparation. Incidentally, this same preparation is used in a spray for producing artificial fogs when required on the ‘set.’

“Needless to say, the film on which the sound is registered must move exactly in synchronism with the film in the picture-cameras, as afterwards the picture and the sound-track are printed on to one strip, copies of which are distributed to the different theatres. To attain this synchronism the recorder and camera mechanisms are driven by synchronous motors, which in turn are driven by a common source of A.C. supply—in this country usually 110 volts, 50 cycles, three-phase. Synchronous motors depend for their speed of rotation upon the periodicity of the supply, and if the latter be common to both motors, it follows that the speeds will be identical.

“In order that the picture and sound-track may be accurately matched up in the printing, a marking system is used. This may be either using ‘marker lamps,’ or ‘clappers.’ In the first method, the edge of each film, sound and picture, outside the sprocket holes, is exposed simultaneously to the light from two lamps, operated by one

The “Dolly”

“Now that you have seen how things work,” continues our guide, “let us go back to the floor and see what they are doing.” We accordingly troop back down thickly felted passages, bristling with “Silence!” and “No Smoking!” notices, and passing through a small door, find ourselves on the



By permission of Associated Talking Pictures, Ltd.

The “Dolly.” Note the “blimp,” or silencing cover on the camera

switch. The switch is closed momentarily at the beginning and end of a scene, and this results in two marks outside the picture and track, which can be made to register in the printing machine. Actually, in practice, they are separated by a distance of 19 ‘frames,’ or pictures, as in the projector, the film first passes through the ‘picture head,’ and then through the ‘sound head,’ thus making it imperative that the sound should be printed farther forward. The other method of marking is, as I said before, by ‘clappers,’ and is more generally used. At the beginning and end of a scene, an assistant stands before the camera with two brightly marked pieces of wood, hinged together. These pieces of wood are brought smartly together, the noise so produced giving a characteristic wave form on the sound track. This is synchronised afterwards, a distance of 19 ‘frames’ from the picture which shows the actual moment of impact. Of course, in the finished print all this is cut out.

floor. Here we see a number of technicians engaged in fitting a camera to a sort of trolley, running on pneumatic-tyred wheels. “These,” says our guide, “are the preparations for a ‘dolly shot.’ The ‘dolly,’ here, is a platform running on silent wheels, and on which are adjustable turntables for holding the camera and lights. On here is also mounted a microphone. This is to enable a shot to be taken of a moving figure, the camera and microphone moving with the figure. Notice how the camera is sound proofed. As putting the camera in a sound-proof booth is obviously limiting its scope, it has to be silenced *in situ*. This is achieved by using ‘a blimp.’ This is a cover which completely encloses the camera and driving motor. It is made of sponge rubber, and in conjunction with the new so-called silent cameras, enables the microphone to be placed quite near without detecting the noise. Of course, it is quite impossible to obtain absolute silence, and therefore a certain amount of care has to be taken in placing the microphone. Usually a ‘sound nigger’ or ‘gobo’ is placed between the microphone and camera. This is a large screen made of sound-proofing material, and deflects the sound from the microphone.”

As our guide finishes his explanation, the lights, which up till now have been switched off, suddenly blaze again, and we wait in silence while the scene is rehearsed and eventually shot. The final “Mark it!—Cut!—How’s that?” rings out, and as we leave the studio, a distant voice falls on our ears,—“O.K. for Sound!”

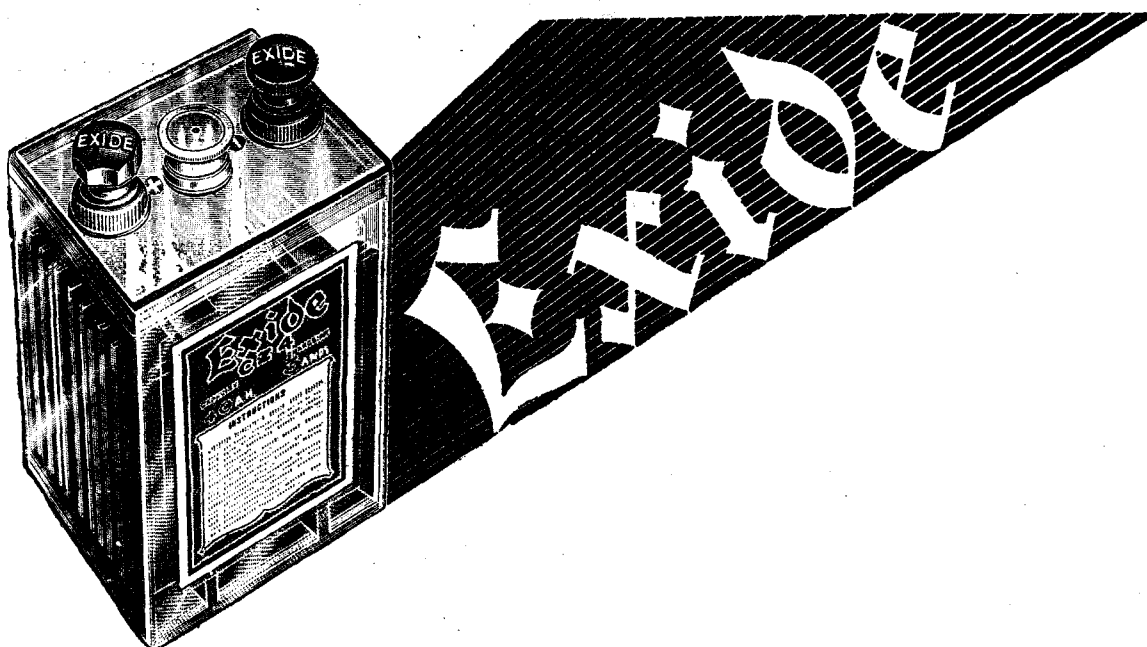
DO YOU KNOW—

that although our short-wave enthusiasts often grumble at 5SW’s transmission, an American correspondent listener states that it is now well received, although a few months ago it was rather weak?

that it is advisable occasionally to go over all the terminals and connections in a set, pulling each wire gently to make sure that it is firmly connected, and that there are no loose joints or dry soldered connections?

Here's power for greedy sets!... Sets that expect a lot of low-tension current get it from the Exide "C" Battery ... a generous battery ... gives all that is asked of it without failure and without flinching.

The Long Life Battery... famous Exide Long Life Plates ... patented separators that preserve the plates and prevent shorting ... differently coloured and shaped terminals distinguishable even in the dark ... strong, leak-proof celluloid or glass containers.



When your set demands a lot of current from the L.T. battery you need the one and only **Exide "C" Battery.**

Prices per 2-volt cell: C.Z. 2 20 amp. hours 9/6 • C.Z. 4 40 amp. hours 13/6 • C.Z. 6 60 amp. hours 17/6

Other sizes up to 120 ampere hours.

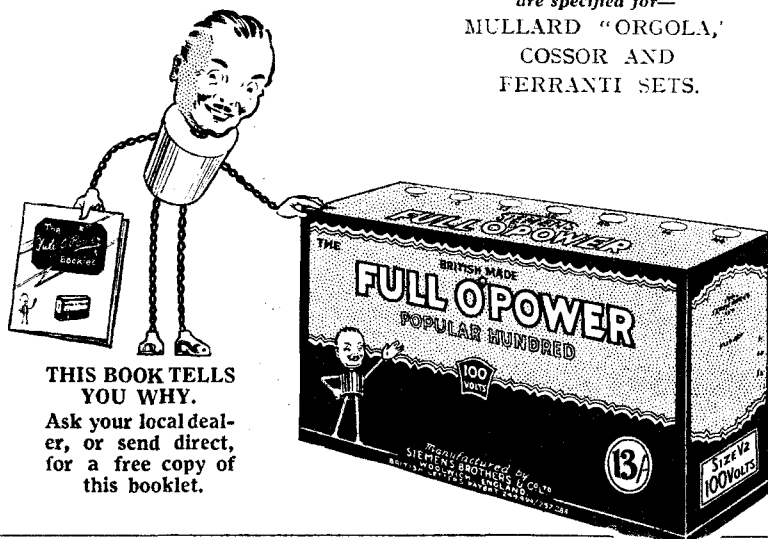
From Exide Service Stations and all reputable dealers. Exide Service Stations give service on every make of battery

Exide Batteries, Clifton Junction, near Manchester. Branches at London, Manchester, Birmingham, Bristol and Glasgow

L 39a

THE BATTERY THAT IS DEFINITELY SUPERIOR!

FULL O'POWER BATTERIES
are specified for—
MULLARD "ORGOLA,"
COSSOR AND
FERRANTI SETS.



THIS BOOK TELLS
YOU WHY.
Ask your local dealer,
or send direct,
for a free copy of
this booklet.

THE Full O'Power is not merely a good battery—it is far more than that—it represents a very definite advance in Radio Battery manufacture.

Modern machinery ensures that every battery produced is of identical efficiency; there can be no risk of buying a Full O'Power which is "not quite up to standard." What is more, this new method of manufacture has given the Full O'Power battery a far larger output of power and a far longer working life. You cannot appreciate the extent of this added power, this added life, until you have actually experienced it.

Buy a Full O'Power to-day, take it home and make the test yourself. Your radio reception will acquire a new strength and purity and, as the months slip by, you will realise what 'long life' means when you are using a Full O'Power—the battery that is "Definitely superior."

Buy one today & test it for yourself!

SIEMENS BROTHERS & CO., LTD., WOOLWICH, S.E.18

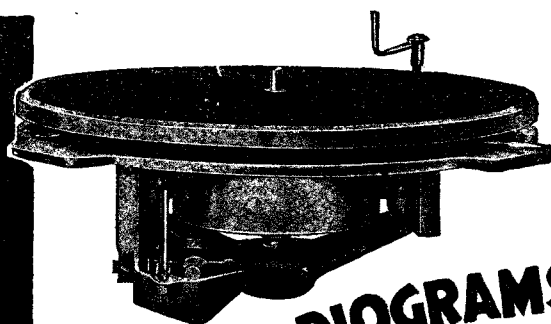


A
good item
on any
programme

*Player's
please*

*It's the
Tobacco that Counts*

N.C.C.899



IDEAL FOR RADIOGRAMS
NO
INTERFERENCE
if you fit a
PAILLARD
ELECTRIC INDUCTION MOTOR

No brushes or commutator to cause interference. No belt. The motor runs smoothly and silently, without variation in the revolution speed even with largely fluctuating mains current. 12" velvet-covered turntable, automatic brake and cut-out. For 100-130 and 200-250 v. A.C. 7 3/4" x 5 1/2" x 5 7/8".

£4/17/6 (without Unit Plate, £4.10.0).

Super Pick-up and Arm, £2.2.6.
Portable Gramophone Cabinet fitted
with Paillard Motor, Super Pick-up
and volume control, £8.15.0 complete.

APOLLO GRAMOPHONE CO., LTD.
4-5 Bunhill Row, London, E.C.1

THE FINEST RECEIVERS ARE BUILT WITH **WEARITE** COMPONENTS

The following Coils are specially recommended in
"Amateur Wireless" circuits:—

**"ARROW
TWO"
COILS**

3/6
Each

**"JAMES
SCREENED
GRID 3"
COILS**

7/6
Each

**"MUSIC
MONITOR"
COILS**

7/6
Each

**"CHALLENGE
FOUR"
COILS**
(Dual Range)

10/6
Each

Always use "Wearite"
Components for better results.

Illustrated Lists of new
Components Post Free.

WRIGHT & WEAIRE LTD.

740, High Road, Tottenham, London, N.17
Phone: Tottenham 3847/8.

**LOCAL STATIONS
REGIONAL STATIONS
FOREIGN STATIONS**

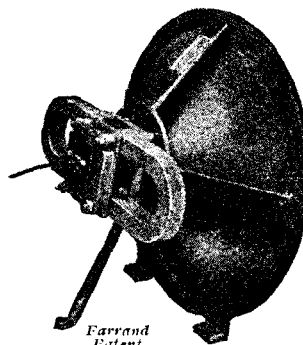
**PICK
THEM
OUT!**

Why worry about old fashioned plug-in coils when the new British General Aerial Tuning Unit covers the full tuning range of 200 to 2,000 metres by means of a single dial. Easy to fix, simple to tune and guaranteed effective.

From all dealers of repute
or direct from the
manufacturers.
PRICE 14/6

BRITISH GENERAL
MANUFACTURING CO., LTD.,
Brockley Works,
LONDON, S.E.4

IT'S NOT A MOVING COIL!



Farrand Patent

The new N & K electric pick-up is an example of the latest development in pick-ups. As a result of its extreme light weight, record wear is reduced to a minimum. The pick-up is supplied with or without tone arm. Considering the excellence of reproduction, the price of 3 guineas is a most reasonable one. Full details of this new pick-up will be sent you on request.

This is a statement that is hard to believe when you hear the original N & K Inductor Dynamic Speaker. It not only equals a moving-coil but improves on its sensitiveness, clarity and beauty of tone.

There are no running costs as no energising current is required. It is simple to operate and the price £3 10 brings this remarkable speaker within the reach of everybody. It is by far the greatest advancement ever made in loud-speaker design. The original N & K speaker can only be obtained from us.

Call for a demonstration or ask your dealer. Full details will be sent free on request on receipt of a P.C.



**PICK-UP ONLY
£1 : 17 : 6
PICK-UP WITH
TONE ARM AND
VOLUME CON-
TROL £3 : 3 : 0**

A. BRODERSEN,
11, Northampton Square, Goswell Road,
LONDON, E.C.1.



AMAZING REALISM

THE rolling chords of a mighty organ—sonorous bass, twinkling treble—mingled with the exquisite cadence of a singing voice, all reproduced with amazing realism through the 66R Blue Spot Unit. Nothing is lost, nothing gained—only the living music is heard.

And whatever the power, the 66R handles it with ease, without an overlapping note, or a suspicion of chatter or distortion—just brilliant clear cut volume.

Change over to a Blue Spot 66R and enjoy radio at its finest this winter. But first, hear one at your dealer's and you will agree when we say—"a Blue Spot cannot lie."

Blue Spot Power Unit Type 66R ... **35/-**
 Blue Spot " " Type 66P ... **27/6**
 Blue Spot " " Type 66K ... **25/-**
 Blue Spot Major Chassis Type 37R **15/-**
 Blue Spot Special " Type 31R **10/6**

66R A MASTERPIECE OF SOUND PRODUCTION

THE BRITISH BLUE SPOT COMPANY LTD

BLUE SPOT HOUSE · 94/96 ROSOMAN STREET · ROSEBERY AVENUE · LONDON · E C 1

'Phone: CLERKENWELL 3570.

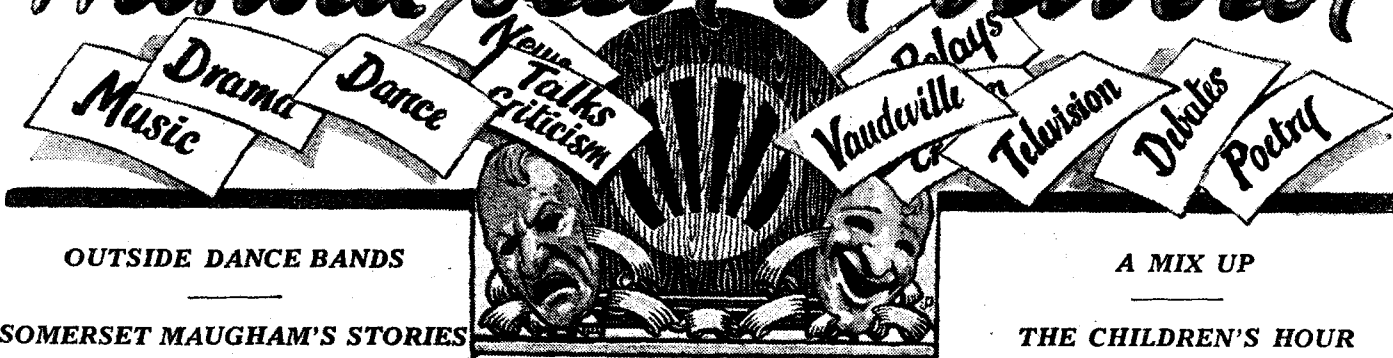
'Grams: "BLUOSPOD SMITH LONDON."

Distributors for Northern England, Scotland and North Wales: H. C. RAWSON (Sheffield and London), LTD., 100 London Road, Sheffield: 22 St. Mary's Parsonage, Manchester: 183 George Street, Glasgow.

Don't Forget to Say That You Saw it in "A.W."

A Weekly Programme Criticism—By SYDNEY A. MOSELEY.

Without Fear or Favour



OUTSIDE DANCE BANDS

SOMERSET MAUGHAM'S STORIES

I HAVE received an important official reply to my request for authoritative information regarding the arrangements between the B.B.C. and outside dance bands. It comes from Mr. Gerard Cock, Outside Broadcast Director of the British Broadcasting Corporation.

"All possible steps are taken to maintain, as far as possible, varied and suitable broadcast programmes by outside dance bands," Mr. Cock informs me. "Due to a state of affairs largely brought about by the attitude and actions of certain music-publishing firms, the degree of control varies. These outside bands are not paid by us, and we have good reasons for supposing that control would be no more effective if payments were made."

I am obliged for this information. It establishes the fact, once and for all, that outside bands are *not* paid and that the B.B.C. thinks that payment would not prevent plugging.

I am afraid I must contest these points, and I will do so in a future issue.

I made it a point to listen carefully to Mr. Francis Birrell on "The Cinema" the other evening. These are my impressions. Mr. Birrell is a young man—I should say a very young man—with ideals; ideals, let me say, which do him credit. He is—but let him speak for himself. "I am sure my talks are dull. My friends say so, as well as a number of listeners."

Now, this is charmingly modest, but again—rather young. Nevertheless, Mr Birrell has many qualities: downrightness (he doesn't mind boosting so-called Russian revolutionary films), sincerity (this is unquestioned), and a vision above the multitude.

On the other hand, he conveys rather too plainly a certain immaturity, a definite indistinctness, and an imperfect microphone manner. A trifle tactless, too. I agree with what he feels about film producers; but he could have conveyed this with a little more nicety. He must not come to the microphone to blackguard a body of listeners, however much superior one may feel towards them.

"Before the Party" is not one of Somerset Maugham's best short stories.

"The Letter" and "Rain" are miles ahead of it. But for broadcasting purposes the least interesting story makes the best material for the "mike." It is really a monologue, the four other characters having very little to say. Adapted by Michael Talbot and produced by Val Gielgud effectively.

By the way, I seem to see Miss Hermione Gingold's name a lot these days in the programmes. Who is the talented young lady?

Readers know I love opera, but subsidies at this period of trade depression seems strange to me. I have described it as "Rome burns—but let us sing."

It is a victory for the redoubtable Mrs. Snowden.

I switched on early on Saturday morning and heard, unexpectedly, some well-varied gramophone records. It was, if you please, "5GB testing." I suggest to Programmes and Mr. Stone to engage as advisor the fellow who arranged this programme. Good stuff!

What "Au Lapin Qui Sautte" meant few listeners knew, and it may well have

put off a number. More's the pity. It was a better production than any I have heard for weeks. Firstly, our old friend Leonard Henry was in great form, and the *ingenue*, whoever she was, acted a fine foil to him. The singing was excellent, there being some very fine songs, including an exquisite duet.

John Watts was the producer, and the cast included Leonard Henry, Greta Keller, Lenghi Cellini, Peggy Ross-Smith, Guy Pelham Bolton, Ross and Sargent, and Jack Padbury.

A MIX UP

THE CHILDREN'S HOUR

The stations got rather mixed up when I switched on to *Pelleas and Melisande*, so that I heard part of the beautiful poetry of Maeterlinck with something about "eating peas with a knife" and "the value of vitamins." A trifle mixed—what!

However, the delightful music of Debussy prevailed, because I don't eat peas and I have no need for much vitamins at fourteen stone!

The operatic cycle, *The Belle of the Ball*, is not Herbert Oliver's best. Nevertheless these cycles are worth doing.

I wonder whether it would be possible to give *Omar* with music by Liza Lehmann?

I had the choice between listening to someone in Jack Payne's band singing about "a flea's she" and a robust story of the sea in the Children's Hour.

The sea won hands down—or ears up—and I am sorry I did not listen to the earlier episodes in the *Southward Ho!* drama. How thrilling they must have been and how the kiddies must have delighted in them.

I didn't think there was much poetry in sport—ancient or modern, but Mr. Marshall admirably showed that there is.



COLLECTOR: "You're seven payments behind on your set."

PURCHASER: "Well, your Company advertises 'Pay as you listen,' and I've heard nothing worth listening to."

A GOOD many people find they can receive sufficient with a simple and inexpensive two-valve set. They have the local stations, of course, and are able to enjoy a volume of sound which is as much as can be obtained from sets having more valves but fitted with a similar output stage.

The point is that the volume to be obtained from a strong signal such as we are now considering depends entirely upon the size of the power valve and the anode supply to it. If this happens to be the same in this two-valve set as in a four-valve receiver, then the local station will be heard at precisely the same strength with both sets.

Owing to the relatively small amplification provided by the two-valve set, distant stations will normally not be heard at worth-while strength. But for those who need a set cheap to build and costing but little to maintain, the "Challenge Two" is just the thing.

Medium and Long Waves

It works very well, receives on both wavebands, is easily operated and the quality of the reproduction from a good loud-speaker will be acceptable to most listeners.

There is, in fact, no technical reason at all why the quality should not be as good as that obtained from any other set having a similar power stage.

A glance at the photographs will show how simple and straightforward it is. There is in the aerial circuit a pre-set condenser, with which you can adjust the effective selectivity of the set. Then there is the Challenge coil with its long- and medium-wave windings and a further one for reaction. This coil has its switch fitted to the top ebonite cap, where it can be easily



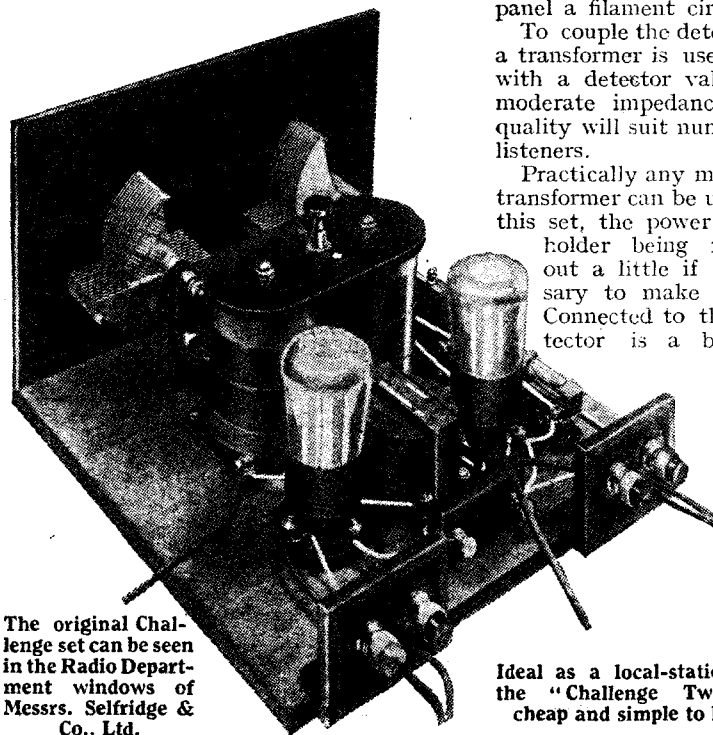
reached. Both long- and medium-wave coils are astatically wound and the switch connects them in parallel and leaves the long wave coil in circuit by itself when it is "down." With its single reaction winding the coil is most effective.

Tuning

The reaction is controlled by an adjustable condenser, having a slow-motion dial like the aerial tuning condenser. This is perhaps not needed, except for the sake of appearance. There is also on the front panel a filament circuit switch.

To couple the detector and power stages a transformer is used and with a detector valve of moderate impedance the quality will suit numerous listeners.

Practically any make of transformer can be used in this set, the power valve holder being moved out a little if necessary to make room. Connected to the detector is a by-pass



The original Challenge set can be seen in the Radio Department windows of Messrs. Selfridge & Co., Ltd.

Ideal as a local-station set, the "Challenge Two" is cheap and simple to build

A TWO-VALVER FOR

condenser of .0001 microfarad. This improves the working of the receiver.

There are two terminal blocks carrying the aerial and earth and the loud-speaker terminals respectively. Battery leads are used and it is

advisable to fit spade-type connectors for the low tension in order to avoid mistakes. The grid battery can stand on the baseboard of the set, short connecting wires being used.

The construction is so straightforward that little need be said. For wiring, a covered wire or wire and systoflex should be used and it is advisable to secure the high- and low-tension wires with small clips or staples so as to prevent them being jerked off the connecting points if they are accidentally pulled.

There are two positive high-tension wires, one being for the detector stage. This

COMPONENTS FOR THE "CHALLENGE TWO"

Ebonite panel, 9 in. by 6 in. (Becol, Trelleborg, Lissen).

Baseboard, 9 in. by 9 in. (Camco, Clarion, Pickett).

Two .0005-mfd. variable condensers (Formo, J.B., Lissen, Burton, Polar, Lotus, Ormond).

Push-pull filament switch (Readi-Rad, Bulgin, Benjamin, Lotus, Wearite).

Two slow-motion dials (Brownie, Formo, Lissen, Igranice, Readi-Rad, Burton, Lotus, Ormond).

Challenge coil, with reaction winding (Readi-Rad, Wearite, H. & B., Tunewell).

Two valve holders (Telsen, Lissen, Burton, Lotus, Benjamin, W.B., Igranice).

.0002-mfd. and .0001-mfd. fixed condensers (Lissen, Telsen, T.C.C., Igranice, Dubilier, Watmel, Atlas, Graham Farish).

Grid-leak holder (Lissen, Wearite, Readi-Rad).

2-megohm grid leak (Lissen, Dubilier, Graham Farish, Igranice).

Pra-set condenser, .0001-mfd. .000005-mfd. (Sovereign, Polar, mo, R.I.).

Low-frequency transformer (Ig "Midget," Telsen, R.I., L Varley, Ferranti, Lotus, Brownie).

Two terminal blocks (Junit, L Belling-Lee).

Four terminals marked: A Earth, L.S., L.S. (Belling-Lee, Eelex, Clix, Burton, Igranice).

Four yards of thin flex (Lewco).

Five wander plugs marked: H.T.+1, H.T.+2, G.B., G.B.—ing-Lee, Clix, Eelex, Igranice, Bu

Two spade terminals marked L.T.— (Belling-Lee, Clix, Eelex)

CHALLENGE TWO

OF GUARANTEED EFFICIENCY, SPECIALLY DESIGNED
FOR "AMATEUR WIRELESS" BY W. JAMES

stage does not always need the full voltage of the high-tension supply and it is best adjusted to suit the particular valve used.

Valves

Any valve of medium impedance will be suitable for the detector stage and I should not go much above 20,000 ohms. For the power stage the biggest power valve that you can afford to run should be used. The grid bias will be adjusted to suit it and the high tension applied. Use at least 120 volts high tension if possible, as the amount of the volume will depend largely upon this.

In a set of this description, where the reaction is applied directly to the aerial circuit, care must be taken that too much reaction is not used. I will not stress the point so often made that too much reaction spoils the quality, but will remind users that interference can easily be produced. This is to be avoided and for this reason I do not recommend a set of this type for listening to foreign stations.

I know that a few will normally be heard,

but the set is intended as a local-station one that can be used with an indoor or outdoor aerial.

The tuning is reasonably selective and the volume is good for a two-valve set. Both will be varied by adjusting the pre-set condenser included in the aerial circuit. Thus when the spindle of this condenser is unscrewed, thus reducing the capacity of the condenser, the tuning will appear to be the sharpest and the volume will be below the maximum. As the spindle is screwed down the capacity increases. The selectivity is reduced and the volume will increase until a certain point is

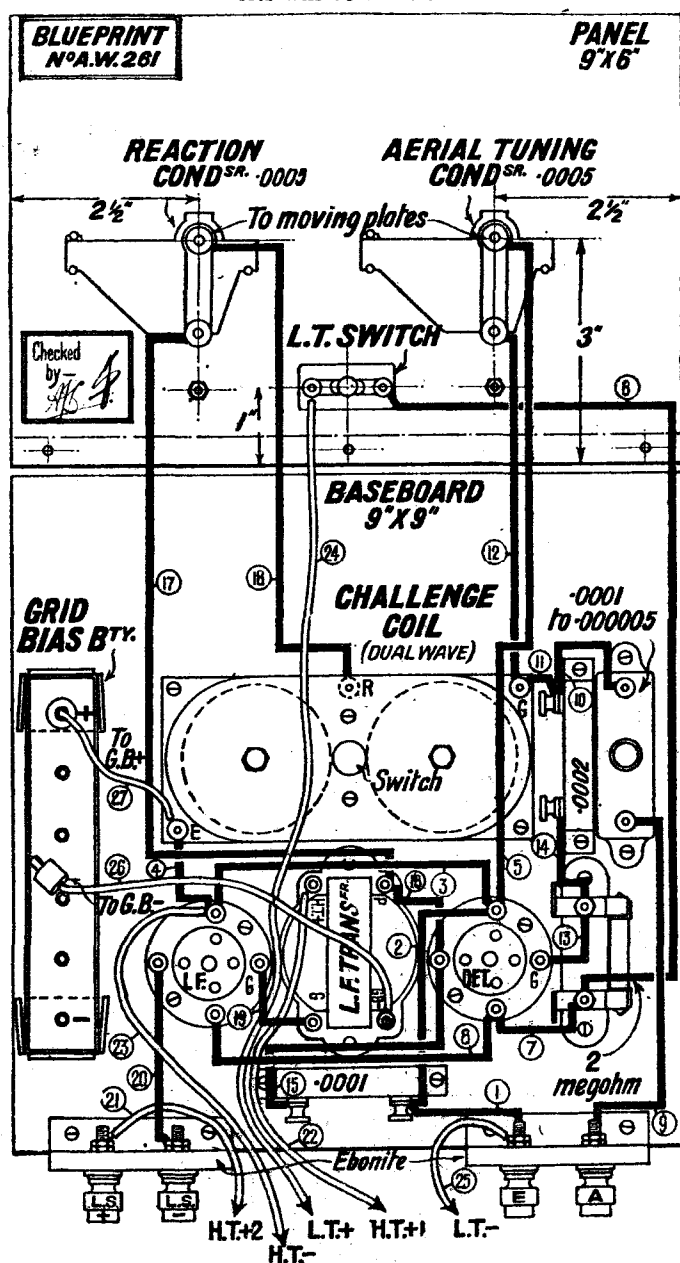
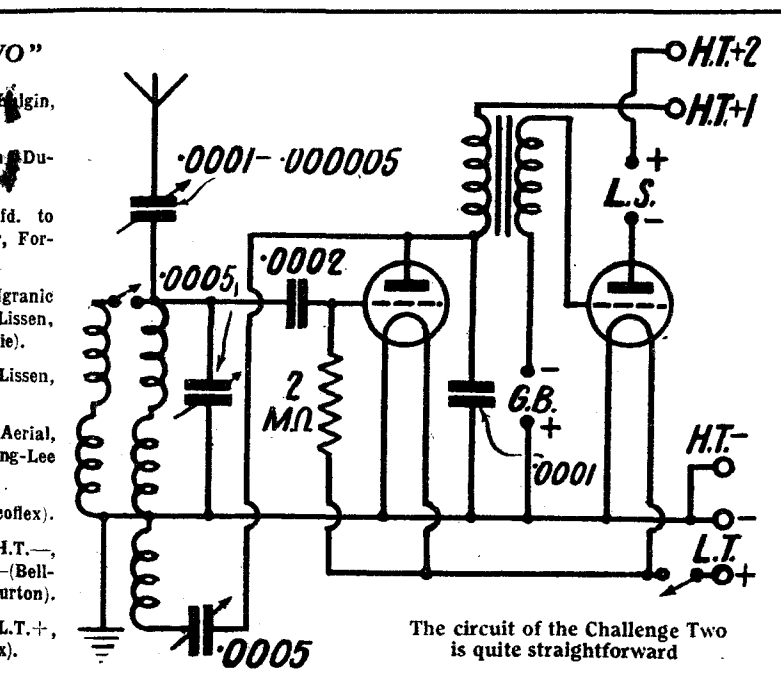
reached which will be satisfactory.

You will be able by experiment to find the best setting for the size of the aerial employed and the local conditions. In London there is no difficulty in separating the Brookmans Park stations, using an outdoor aerial, and the Midland Regional station is received very well. Daventry 5XX is also, of course, heard quite well, and also one or two others.

Using a Pentode

A pentode valve might be fitted by those who like the type, but a filter circuit is recommended in addition. The higher notes are usually unduly brought out with a pentode and a filter will lessen their relative strength and so improve the reproduction.

For most valves a grid battery of nine volts will be sufficient.



PROGRESS AT BROADCASTING HOUSE

By "A.W.'S" SPECIAL CORRESPONDENT

LONDONERS are watching with great interest the progress in the B.B.C.'s new "H.Q." in Portland Place.

The main part of the steelwork was com-

pleted some months ago and the concrete work on the front portions has now extended up to the fourth floor. The floors, which are concrete, are now complete up to the seventh. These floors embody a special sound-proof construction, the idea being to minimise disturbing noises in the studios.

Down below this studio (which occupies half of the basement) will be another studio

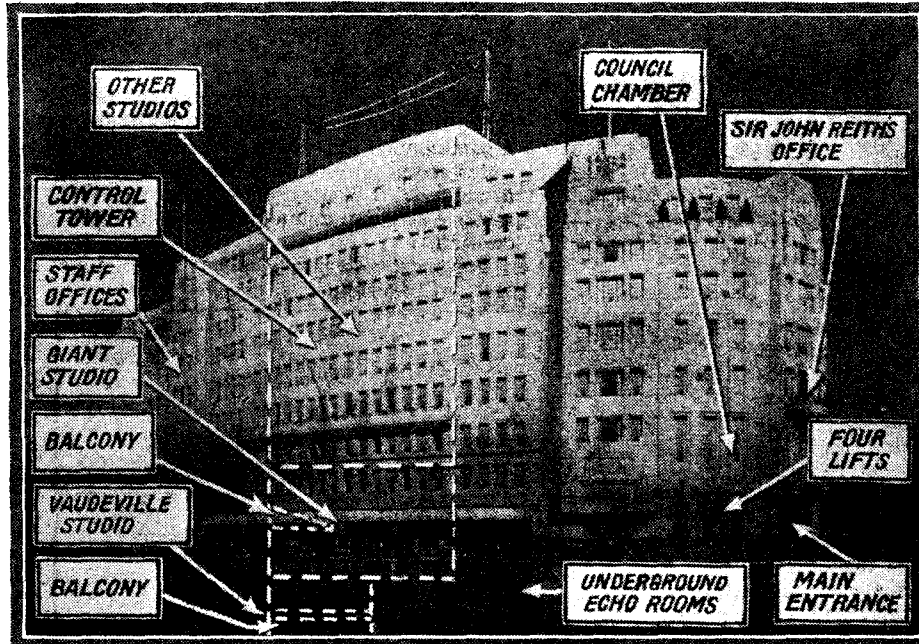
ground level are three huge 5,000-gallon tanks holding oil fuel for the water-heating arrangements. The boilers are already installed.

The efficient ventilation has been something of a problem because straightforward ventilating systems also provide good sound conduits and so the deadening effect of the sound-proof floors and central well construction would be nullified. However, a novel system of ventilation, making use of sound-proof air ducts, is being installed, and throughout Broadcasting House there are miles of huge tubes carrying fresh air to every part of the central tower and basement. There is a 600 ft. well now being drilled for the water supply, and many thousands of gallons of water will be utilised. This is an artesian well, of course.

Studio Location

At this stage it is possible to see how the various studios, offices, and entrances will be arranged? The main entrance is, as has been explained, at the prow of the building. This entrance hall leads into a vestibule where there will be four lifts reaching to the top of the building. Stairs will lead down to the main entrance of the public studio, and there will also be entrances on each side of Broadcasting House leading directly into this studio. Immediately above the main entrance is the B.B.C. Council Chamber, and above this again is Sir John Reith's suite of offices.

At present the inside of the building is a maze of girderwork and scaffolding, but the present rate of progress shows that the building will be complete, as was officially forecast, by 1932.



This picture shows what Broadcasting House will be like when completed, and gives some idea of the location of the principal offices and studios

pleted some months ago and the concrete work on the front portions has now extended up to the fourth floor. The floors, which are concrete, are now complete up to the seventh. These floors embody a special sound-proof construction, the idea being to minimise disturbing noises in the studios.

The control tower—the central portion of the building—containing the studios, can now be recognised, and an inspection of the inside of the building's framework, at the present stage of progress, clearly shows how this tower is arranged.

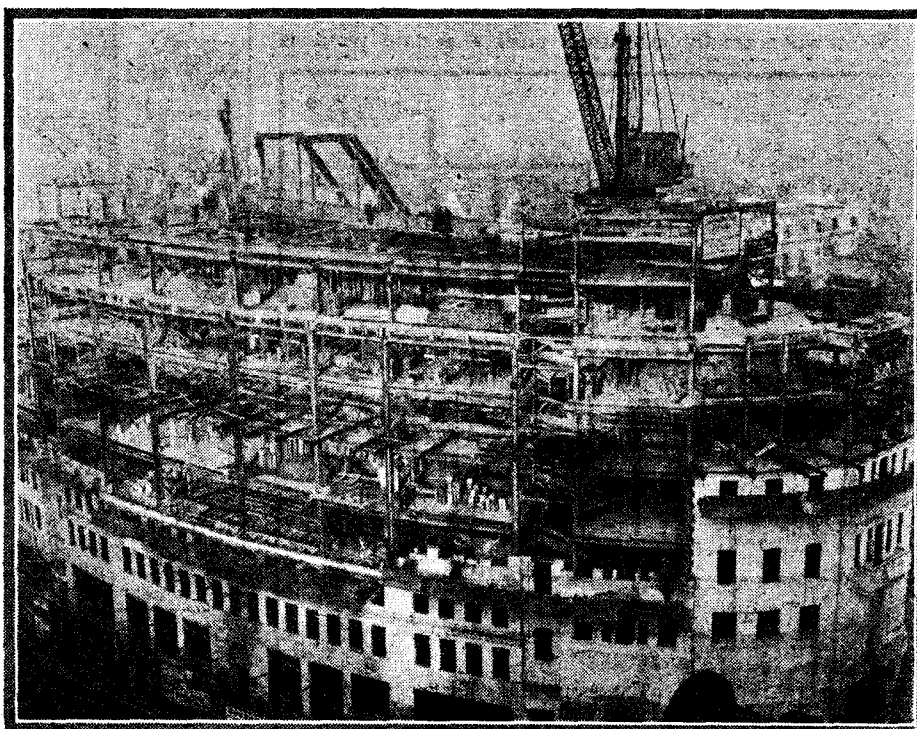
Like a Ship

A striking thing is the resemblance of Broadcasting House to a ship. The front part of the building, where the main entrance is situated, is curved like the prow of a ship. The foundations, including the concrete lining, bear an extraordinary resemblance to a ship's hull. The reason for this "rounding off" of the foundations is to overcome a difficulty which was experienced last year when the foundations were first started, in connection with an underground water strata.

So far as the average listener is concerned, one of the most impressive features of the building is the huge studio which will contain an organ and a concert platform and which will have seating accommodation for an audience of 1,000. It is understood that the public will be admitted to this studio. There will be a large gallery and the steel supports for this are already in position. As yet, the walls of this gigantic studio are only in the bare brick stage, but when the internal decorations are started special

used principally for vaudeville items, while in the sub-basement also will be test rooms, and two or three echo rooms.

Special arrangements are being made for heating and ventilating the whole of Broadcasting House and down below



An actual photograph of the new B.B.C. headquarters in their present state of construction. Comparison with the picture above will indicate the internal arrangements

USE READY RADIO APPROVED KITS FOR EVERY CIRCUIT

"CHALLENGE TWO"

	£	s.	d.
1 Drilled Ebonite Panel, 9 by 6 by $\frac{1}{8}$ in.	3 0
1 Solid Oak Cabinet with Baseboard 9 in. deep	16 0
2 Read-Rad .0005 variable condensers	9 6
2 Read-Rad Duograph Dials	13 0
1 Read-Rad Push-Pull Filament Switch	10
1 Read-Rad "Challenge" Coil with Reaction	10 6
2 Telsen 4-pin Valve Holders	2 0
1 Read-Rad .0001-mfd. Fixed Condenser	10
1 Read-Rad .0002-mfd. Fixed Condenser	10
1 Read-Rad 2-meg. grid leak and Hholder	1 4
1 Pre-set Condenser, type F	1 6
1 Telsen "Radiogrand" L.F. Transformer	12 6
2 Junit Terminal Blocks	1 4
4 Belling Lee "B" Terminals	2 0
1 Packet "Jiflinks" for Wiring	2 6
2 Valves, as specified, Detector and Power	19 0
4 Yards Single Flex; 5 Indicated Wander Plugs; 2 Spade terminals; Screws, etc.	2 7

£4:19:3

"A.W." STANDARD H.T. (A.C.) UNIT

	£	s.	d.
1 Baseboard, 10 in. by 12 in.	1	3	0
1 Varley Power Transformer, type EP2x	1	5	0
1 Westinghouse Metal Rectifier, HT7	1	1	0
1 Igranite, type "C30" Choke	15	6	0
3 Dubilier type BC 4-mfd. fixed condensers	18	0	0
5 Dubilier type BC 2-mfd. fixed condensers	18	4	0
1 Regentstat 120,000 ohms, type "A"	9	6	0
1 Bulgin Link Resistance, 25,000	1	6	0
1 Bulgin Link Resistance, 15,000	1	3	0
1 Bulgin Link Resistance, 2,000	1	0	0
1 Bulgin Twin Fuse Holder with Fuses (F11)	2	6	0
1 Ebonite strip, 8½ in. by 2 in.	1	1	0
6 Belling-Lee "D" Terminals	3	0	0
1 Packet "Jiflinks" for wiring	2	6	0
1 Length Twin Flex, Plug Adaptor, Screws, etc.	1	7	0

Total complete £6:3:0

Or 12 equal monthly
payments of **11/3**

**IMMEDIATE
DISPATCH**

**CASH OR EASY
PAYMENTS**

Advt. of READY RADIO (R.R. LTD.),
159, Borough High Street, London, S.E.1

KIT A less valves and cabinet **£3:3:9**

or 6 equal monthly payments of **11/3**

KIT B with valves less cabinet **£4:2:9**

or 6 equal monthly payments of **15/-**

KIT C with valves and cabinet **£4:19:3**

or 6 equal monthly payments of **18/-**

TO OVERSEAS CUSTOMERS.
Your goods are very carefully
packed for export and insured,
all charges forward.

TO INLAND CUSTOMERS.
Your goods are dispatched post
free or carriage paid.

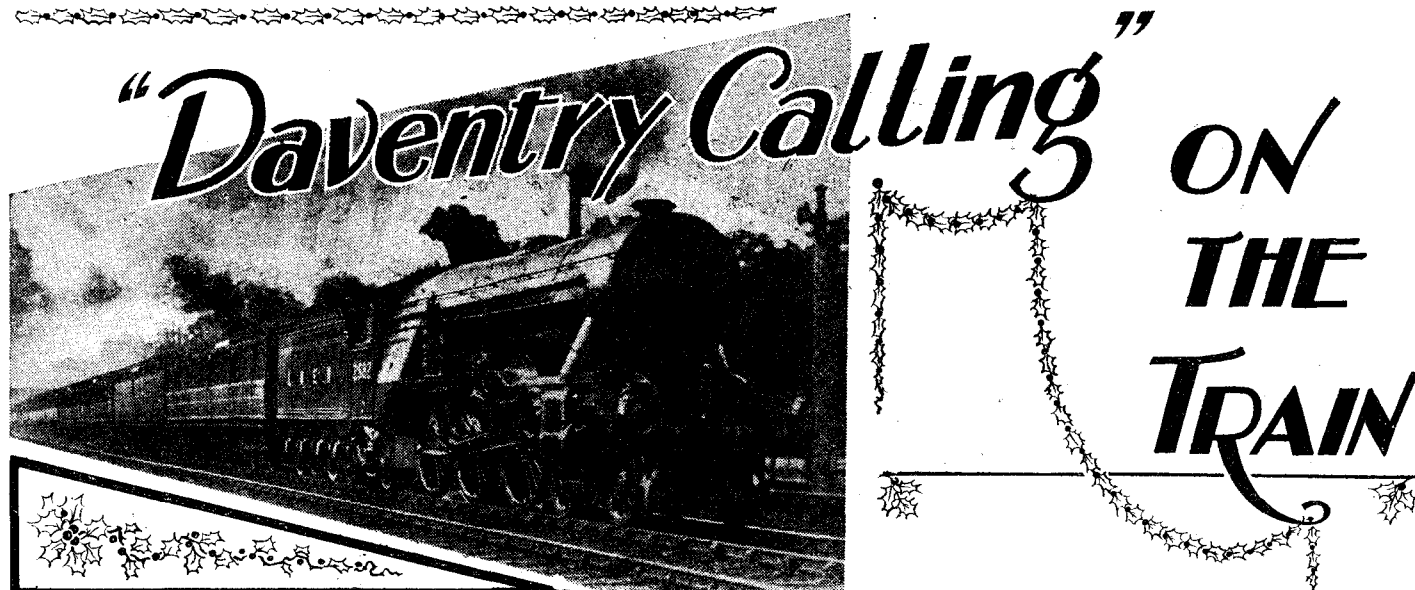
Ready Radio

159, BOROUGH HIGH STREET,
LONDON BRIDGE, S.E.1.

Telephone HOP 5555 Private Exchange

Telegrams: READIRAD, SEDIST.

To Ensure Speedy Delivery, Mention "A.W." to Advertisers



Our Special Commissioner records his impressions of the recent L.N.E.R. experimental run on the Leeds express, equipped with radio for the reception of broadcasting by the passengers en route.

ALTHOUGH various stunts have been carried out with radio on British trains, there has been no serious attempt to give passengers a regular broadcast reception service. But following a trial in the L.N.E.R. train that runs to and from Leeds, I am now able to give readers a personal account of reception *en route*. This reception is now available to all passengers travelling on the train I refer to.

In company with a large party of journalists, I was taken from King's Cross to Hertford and back, in order to hear how Davenport could be received. Soon after the train pulled out of the terminus, a dining-car attendant brought us each a pair of Brown's lightweight headphones, which we were invited to plug into a conveniently placed socket.

Excellent Reception

The first thing I heard was a crackling noise, followed by an obvious readjustment of the distant set; after that I was able to listen with comfort to Davenport broadcasting the service from Westminster Abbey. At this time the train was going fairly fast. The undercurrent of crackles continued. Then the train stopped for a minute or so. During that stop the crackles disappeared entirely, the music and singing coming through with great clarity. When the train started I carefully listened for the return of the crackles, but none was heard. The train went slowly on, doing less than twenty miles an hour. The excellent reception continued, and was only marred by crackles when the train had gathered speed.

Effect of Tunnels

As we went under a tunnel the signals disappeared entirely, but the crackles continued. On the return journey I think the reception was better than on the outward journey. The crackles were much less irritating.

Looking in the guard's van, where the

receiver was installed, I asked the engineers in charge whether the crackles could be stopped. But it seems that this particular train has all manner of electrical machines in the vicinity of the set. Where possible, the interfering machines have been screened. Perhaps a little more experimenting may result in the total elimination of the crackles. This man-made static interference must be overcome before the reception can be called one hundred per cent. satisfactory.

Radio Paris

Personally, I must confess that the reception was much better than I had expected. Both volume and quality were very satisfactory. As an indication of future possibilities, I ought to record the fact that on the return journey the set picked up Radio

along the roof of the van, outside the train.

As the set has a screened-grid high-frequency valve followed by a detector transformer coupled to a power valve, the reserve of volume must be considerable. The headphones fitted throughout the train are connected to the output of the set through an external transformer.

Simple Operation

To reduce vibration the set is housed in a thickly-padded wooden case. So far as I could see the set was not screened. To bring it into action the railwayman in charge simply closes a switch, which brings the rotary converter into action and so starts up the set already tuned to Davenport's wavelength.

The next few months will show whether



A typical scene in the dining-car. Notice how the phones are plugged in the backs of the seats

Paris at excellent strength.

The apparatus on the train was installed under the direction of Mr. H. N. Gresley and Mr. Leslie McMichael, by Messrs. L. McMichael, Ltd., of Slough.

The Receiver

In the guard's brake van a standard McMichael three-valve all-mains set is fitted. It derives its power from a rotary converter coupled to the train lighting set. The aerial is a thirty-foot wire stretched

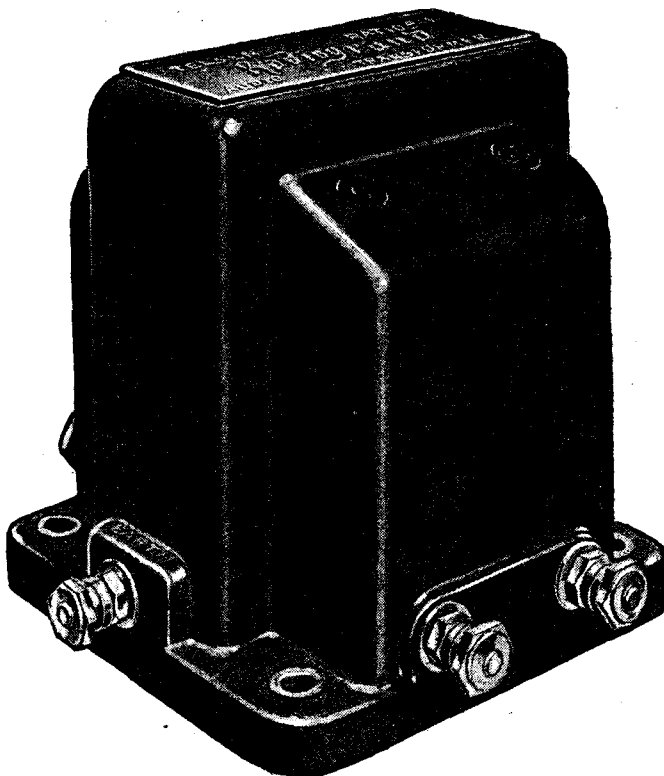
the travelling public is prepared to support the idea of radio on the train. If it does, then very probably other L.N.E.R. long-distance expresses will be fitted.

The construction of the powerful radio station at Chenju, near Shanghai, has been completed, states the Chinese Ministry of Communications. The station is to be used for the dispatch of messages to and from Europe and America, and should be in full operation this month.

Telsen Transformers SUPREME

The "ACE" TRANSFORMER has been specially designed for inclusion in all Portable Sets and where space is limited. Similar finish to the "Radiogrand." Price each **8/6**. Made in ratios 3-1 and 5-1.

TELSEN "RADIOGRAND" TRANSFORMER. Note new Earth Terminal, invaluable in two-transformer-coupled sets. Built for permanent efficiency. Ratios 3-1 and 5-1. Price each **12/6**. Super Ratio 7-1. Price **17/6**.



TELSEN

TRANSFORMERS

LASTING EFFICIENCY

In the Telsen range of Transformers, you have a "key" component that stands supreme, not only in the minds of the radio public, but by the foremost Radio Technical Set Designers.

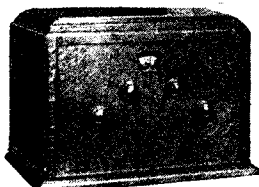
No greater testimony to the high efficiency and supreme position of Telsen Transformers can be found than in the fact that they are specified and incorporated in the leading sets published in the leading Radio journals. For Reproduction—which is realism—for permanent efficiency—Telsen Transformers stand supreme.

Advt. of The Telsen Electric Co., Ltd., Birmingham.

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers



MORE CHRISTMAS RADIO GIFTS *(Continued from page 888)*



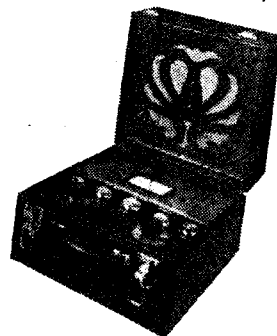
One of Radio Instrument's new cabinet receivers



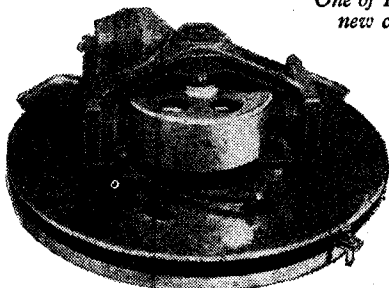
A fine Kolster-Brandes receiver



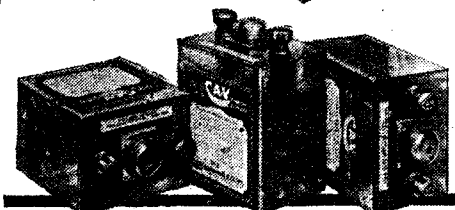
A useful Letwos component—a low-frequency choke



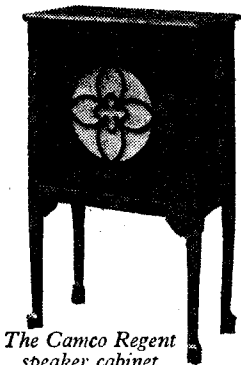
A handy portable set, made by Kone-Dope



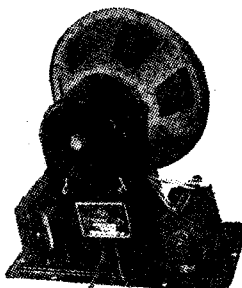
The Apollo gramophone induction motor



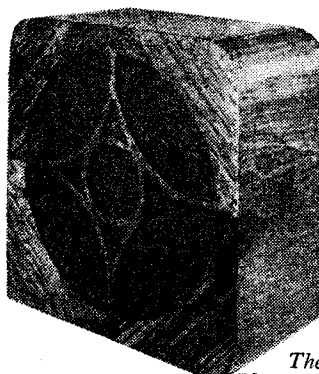
The C.A.V. non-spill accumulator in three positions. This accumulator is ideal for portable sets



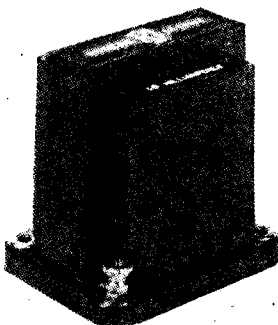
The Camco Regent speaker cabinet



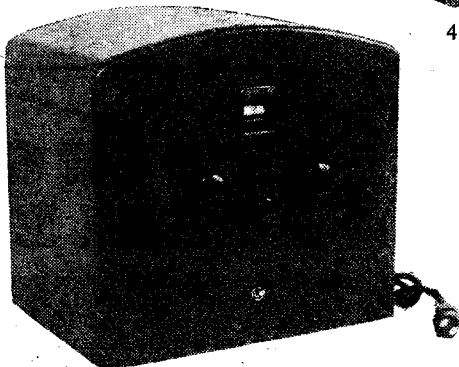
A Hegra moving-coil speaker in chassis form



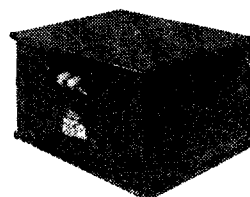
The Blue Spot 41K speaker



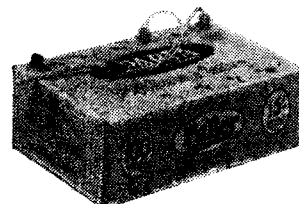
A useful R.I. gadget, an L.F. choke



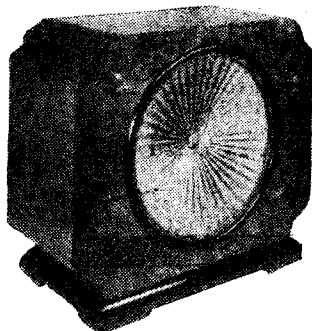
A striking new Ferranti receiver. This is mains-operated



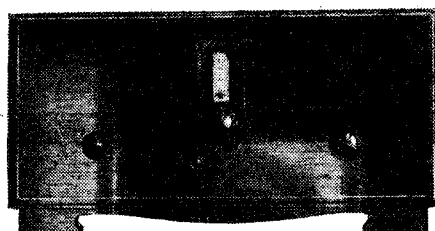
An Ekco mains unit



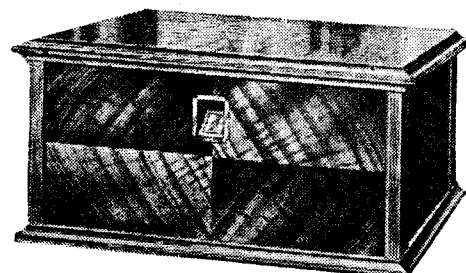
A Fuller high-tension battery



A handsome Hegra cabinet instrument



The Mullard Orgola "Four"



The new Regentone four-valve receiver, which works from the mains

(Continued from page 888)
is keen on "tinkering," then you are quite safe in giving him a set of parts with which to make his own receiver. Alternatively, if price is the difficulty and yet you want to make a present of a complete set, you might care to buy a kit and construct it yourself. This will make a very acceptable gift.

Another suggestion is that you should make up a small unit as a gift for a friend whose set needs improving. "A.W." blueprints are available for units of all kinds: high-frequency distance-getters, short-wave adaptors, gramophone amplifiers, volume controls, wavetraps, output choke filters, and so on. Even home-made mains units are available.

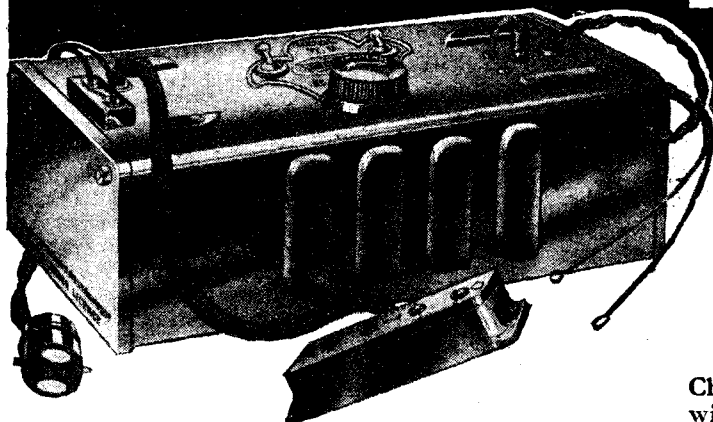
A "safe" present for any acquaintance is a Letts's Quickref AMATEUR WIRELESS Diary—a very seasonable present and one acceptable to any wireless enthusiast. Another novel gift (you might also try giving it to yourself) is a year's subscription to "A.W."

FOR CHRISTMAS —

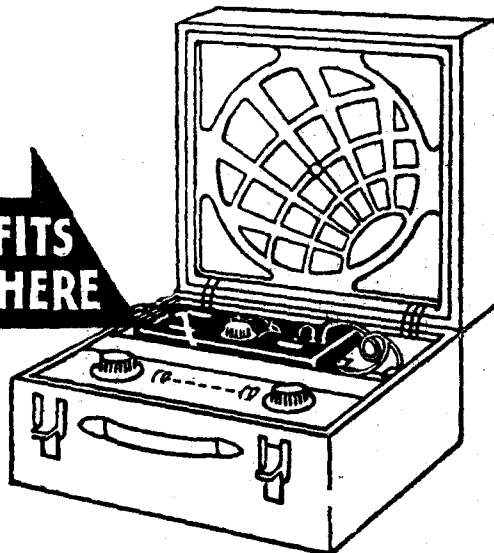
ELECTRIFY YOUR SET— ANY SET, ANY PORTABLE

WITH

REGENTONE



IT FITS
IN HERE



COMBINED MAINS UNITS A.C. and D.C.

for any set, even a portable. Regentone Combined Units are suitable for all the well-known sets of to-day—McMichael, K.B., Pye, Selectors, Rees-Mace, Marconiphone, Amplion, Mullard Orgola, Cossor Empire 3, Osram Music Magnet 4, and in fact, all popular 2-, 3- and 4-valve Receivers.

Many of Britain's leading Set Manufacturers are recommending Regentone for use in their own sets.

MODEL W.5. A.C. Combined Unit (illustrated)
(H.T. with L.T. Charger) £5 : 17 : 6

D.C. Combined Unit
(H.T. with L.T. Charger) £3 : 19 : 6

Write for our **FREE Art Booklet**—
“The Simple Way to All-Electric
Radio”—giving full particulars of
the Regentone range.

Christmas brings the necessity for radio at its best, with no fear of failing batteries. Electrify your set—any set, even a portable—with a Regentone Combined Unit. In the Regentone range there is a Unit to suit any set—*your friends' sets as well as your own*—and no Christmas gift is more acceptable. It takes but two minutes, and from the moment you plug into the light or power point, you are assured of better, more convenient radio, more economical and more reliable. Leading British Set Manufacturers recommend Regentone Combined Mains Units for these reasons: they are absolutely safe and silent in operation; they are so effectively screened that they can be used *inside* Portable Receivers without trace of hum; they have a special plug and socket arrangement connecting *externally* the mains leads to the unit, enabling you to attach any length of flex in place of the standard lengths supplied, with no dangerous connections—an exclusive Regentone feature; they incorporate the Regentostat—the only totally wire-wound radio resistance capable of carrying current with values as high as 180,000 ohms.

REGENTONE

REGENT RADIO SUPPLY CO., 21, BARTLETT'S BLDGS., HOLBORN CIRCUS, LONDON, E.C.4
Tel: Central 8745, 5 lines. Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin.



Christmas DANCING to RADIO

Why not make use of wireless music for dancing during the Christmas festivities? There will be plenty of broadcast dance music

Here is some first-hand information, written by JACK PAYNE himself, on the Christmas dancing programmes

"ON with the dance!"

I have just been glancing through the advance programmes of the dance music and lighter material which will be broadcast at Christmas time, and it certainly does seem that listeners should have no cause to grumble about the amount of syncopation which will be broadcast.

Being at the wrong end of the loud-speaker, as it were, for Christmas dancing, I can only trust that listeners who are dancers will make the best use of it. Naturally, my time being mostly occupied with the broadcasting of dance music I have not the same opportunities as have many other listeners to dance to radio music; but it is my experience that there is something very fascinating about dancing to music from the loud-speaker. While I know that a large proportion of listeners regularly makes use of radio dance music and arranges times to suit the broadcasting, there are a few who are constantly grumbling that dance music is never broadcast at the times when dancers might reasonably need it.

They make me think that by constant grumbling they hope to establish a new Brookmans Park devoted solely to the dissemination of syncopation!

My own view is that for dancing in the home the best way to get the most enjoy-

ment is with a judicious use of radio music in conjunction with the radio-gramophone. I shall not be giving away a secret if I say that I am as anxious as the keenest dancer for the most dance music to be broadcast; but one must take a logical view and realise that each phase of broadcasting must be allotted a proportionate time; and when you come to think of the number of nights when dance music is carried on till midnight I think you will agree that dance music times are not disproportionate.

Those Non-dancers

There is, of course, the old vexed problem of Christmas dance music for non-dancers. I have never made any secret of the fact that the dance music which I broadcast is purposely designed for *listeners* as well as for *dancers*.

I cannot hope in every tune to please both sections of the listening public equally well. If listeners are sometimes bored with tunes in which the rhythm predominates, then they must think kindly of their dancing friends; but I pride myself that these instances do not often occur.

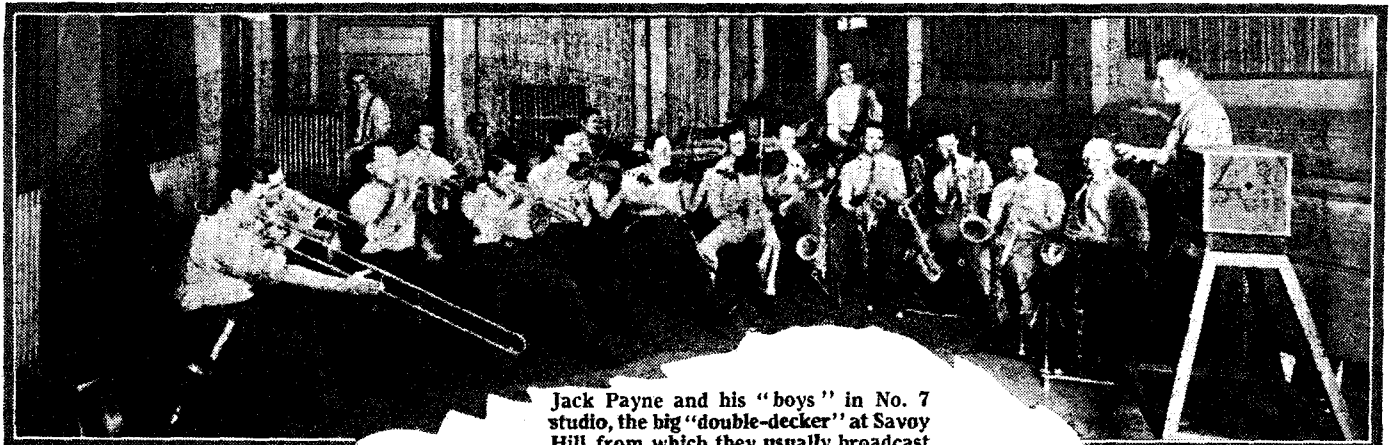
In any case, modern dance music and modern methods of orchestration make for easy listening and dancing alike. I have several elderly friends who had never progressed beyond the old-fashioned waltz stage and who are rather ashamed of airing this fact at public dances, but in the privacy of their own homes they often enjoy a hop in time with the loud-speaker. Although dance fashions change there is

still a large proportion of waltz-time music and even the old folks can dance to this.

And now may I say a word about my side of the microphone? I am making a special effort at Christmas time to give dance music of a popular character and patriotic people who view with alarm the influx of American "canned" music will be glad to know that the same proportion of British to competitive music will be given.

Looking up my record for five weeks, I find that I have broadcast 180 British tunes, 381 American and 12 Continental. As so many people think that *all* dance music is American, I think that speaks very well for British composers. I do claim that, having to review some hundred new dance tunes every week, I deal with more British dance music than any other orchestral leader.

The great call is for variety. Dance orchestras in big hotels and clubs play to dancers, even habitués, who come in, at the most, two or three times a week. On the other hand, my broadcast listeners are my constant friends and I have always to be on the look-out for something new.



Jack Payne and his "boys" in No. 7 studio, the big "double-decker" at Savoy Hill from which they usually broadcast

EVERYTHING **G.E.C.** ELECTRICAL

Xmas will be all the merrier with a

GECOPHONE

REGISTERED TRADE MARK

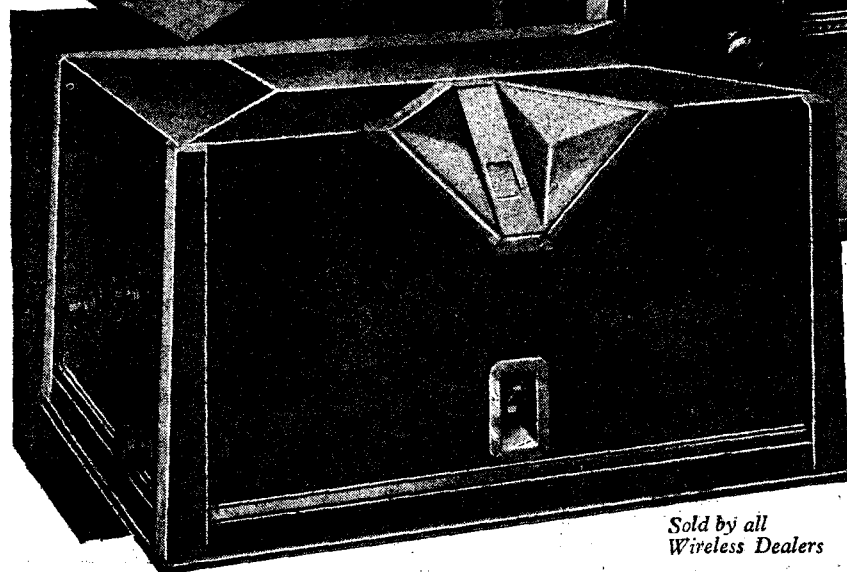
**ALL-ELECTRIC
RADIO RECEIVER
AND LOUD SPEAKER**

**"STORK"
CABINET
LOUD SPEAKER
£3.5.0**

**3 valve
ALL-ELECTRIC
RECEIVER
for A.C. MAINS
£18**

**4 valve
ALL-ELECTRIC
RECEIVER
for A.C. MAINS
£30**

MADE IN
ENGLAND



*Sold by all
Wireless Dealers*

You MUST have the BEST for Xmas!

WRITE for folder B.C. 5603 which gives full particulars of all GECOPHONE all-electric Receivers and Loud Speakers. Sent POST FREE on request.

GECOPHONE

**OTHER SUGGESTIONS FROM
THE COMPLETE RANGE —**

2-VALVE ALL-ELECTRIC RECEIVER for A.C. Mains **£15**

RADIO-GRAMOPHONE for A.C. Mains ... **£70**

FORTABLE RECEIVER. All-Electric and Battery Models ... **20 Gns.**

You can either buy your GECOPHONE for cash or Hire Purchase. Ask your dealer for particulars.

SETS OF DISTINCTION

The RED STAR

THREE-VALVER

Makers: Red Star Radio, Ltd.

Price: 4 guineas, without valves

AT the time of the Olympia Show we discerned a new star in the radio firmament. It was, in fact, the Red Star, makers of inexpensive radio sets. At present this newly-formed company markets two-valve and three-valve battery sets, at prices considerably below what is generally accepted as the standard.

Recently the makers gave me an opportunity to try the Red Star three-valve battery set, using valves and batteries of my own choice. When I received the set I was immediately impressed with its good appearance. There is nothing cheap-looking about it. In fact the brown wood and metal case is most attractive and neat.

Battery Arrangements

There is room at the bottom of the cabinet for a standard-capacity high-tension battery of 120 volts, together with a 9-volt grid-bias battery. Flexible leads coming from the baseboard of the set make connections to these batteries. There are three high-tension-positive plugs and two grid-bias-negative plugs. The accumulator has to be connected externally. Terminals at the back provide for this connection and for the aerial and earth and loud-speaker leads.

On the front of the set is mounted an oval-shaped escutcheon plate, carrying two drum dials, left for tuning and right for reaction. Both these dials read from zero to 100 degrees and have slow-motion movements. Below them is a small knob, which controls a combined master switch and wave-changer. To the left it gives long-wave tuning and to the right short-wave tuning.

Nothing could be more simple than the controls of this set. Before testing it, I selected three suitable valves in accordance with the makers' suggestions. The first valve was a Cossor 210DET, the second valve a Mullard PM1LF and the third valve a Mullard PM2. Medium-impedance valves were chosen for the first two stages, because these valves precede low-frequency transformers having only medium impedance primaries.

With these valves and H.T.+1 connected to 45 volts, H.T.+2 to 80 volts and H.T.+3 to 120 volts, I found the total anode-current consumption was only 9

milliamperes. The use of a standard-capacity battery is therefore justified, since this type can economically deliver 7 or 8 milliamperes. The total low-tension current was .4 ampere, so a 30-ampere-hour accumulator would last over 70 hours per charge.

The Circuit

The circuit, comprising a detector with reaction and two transformer-coupled low-frequency-amplifying valves, is undoubtedly the simplest possible combination of three valves. But unless great precautions are taken in the design of the set the great magnification after detection is liable to cause unselective tuning. Knowing this, the makers have adopted several methods of preventing broad tuning. The biggest

its maximum at 66 degrees on the tuning dial. It had disappeared again at 56 and 73 degrees, showing that the spreading effect was not serious, being only 17 degrees.

For some reason the National station was more broadly tuned. It was at its maximum at 33 degrees and had not disappeared until 23 and 46 degrees, showing a spread of 23 degrees. Even so, in view of the circuit, the selectivity is, in my opinion, quite satisfactory.

Most readers will judge the sensitivity of the set by the number of stations that can be picked up at loud-speaker strength. On this basis the Red Star three is very sensitive. I was able to tune in no less than twenty-three loud-speaker signals during an evening's tests on the medium waves.

Starting at the top end of the scale,

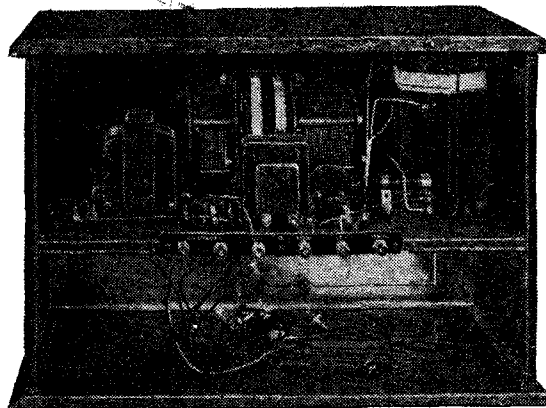
Milan was very strong at 97. Next came the Midland Regional at 93, causing a little interference with Langenberg at 92. Then came Paris 87, and much more strongly Rome, 85, then Stockholm, 83.

Katowice at 79 was very good, followed by Frankfurt at 75 and Toulouse, 73. Hamburg, 70, suffered from Regional at 65. Göteborg, 54, Bordeaux, 49, and Hilversum, 47, were fair. Bratislava, 41, was good. Turin, 38, was interfered with by National, 33, which also interrupted Leipzig, 30.

Nürnberg, 23, Kiel, 15, and Cologne, 8, were very strong. On the long waves the set was just as sensitive, bringing in Radio Paris at 100, Zeesen at 94, Daventry, 89, Eiffel Tower, 80, Warsaw, 73, Kalundborg, 50, and Oslo, 36.

As regards quality of reproduction, this is surprisingly good, in view of the fact that there are two stages of transformer coupling. It is necessary to use medium-impedance valves for the first two stages to ensure this very satisfactory state of affairs. Altogether, the Red Star "three" is fine value for money.

SET TESTER.



The internal arrangements allow of easy access: there is ample space for standard-capacity batteries

point in the design is the entire shielding of the interior components. When the back is removed one can see the back shield, which is also readily detachable.

Two alternative aerial coupling taps are provided on the dual-range tuning coil as a further aid to selectivity. In extreme cases the makers show how still further selectivity can be achieved by changing the detector from the leaky-grid-condenser system to a form of anode-bend detection.

A Practical Test

My tests were done with an aerial of 70 feet, utilising the aerial tap C, which is the less selective of the two available connections. The London Regional was at

Three people, a piano and a microphone will be responsible for the feature programme which is being broadcast from the Aberdeen studio on December 6 under the title "Fresh Farin"—New Drawn frae the North."

WIZARDS OF WIRELESS



This Xmas give your guests and members of your family a pleasant surprise—fit a Lewcos Transformer (Ref. L.F.T.3) or a Lewcos H.F. Choke in your set and let them listen to seasonable music which will “come through” with increased clarity and volume in place of that hitherto indifferent reproduction.

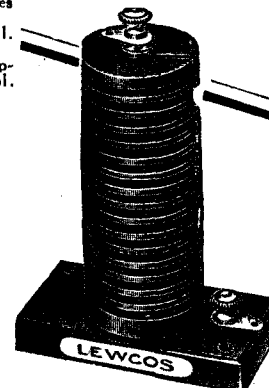
“Lewcos” can always be relied upon to produce components which, owing to their marvellous performance, appear to be the work of those old-time magicians of which we read.

LEWCOS LOW FREQUENCY TRANSFORMER (L.F.T.3)

THE LEWCOS L.F. TRANSFORMER (Ref. L.F.T.3)

has a constant inductance for different values of anode current.
Type 22. Ratio 3-1.
Price 20/-
Write for fully descriptive leaflet Ref. R.61.

Glazite Wiring is recommended for use in connection with the Mains Unit and the Two Valve Receivers described in this issue.



LEWCOS HIGH FREQUENCY CHOKE

LEWCOS H.F. CHOKE

The terminals are arranged one at the top and the other at the base of these Chokes to eliminate the risk of additional self-capacity in the wiring of the receiver.

Price 7/9
Write for fully descriptive leaflet Ref. R.33.



GLAZITE COLOURED CONNECTING WIRE

6d.

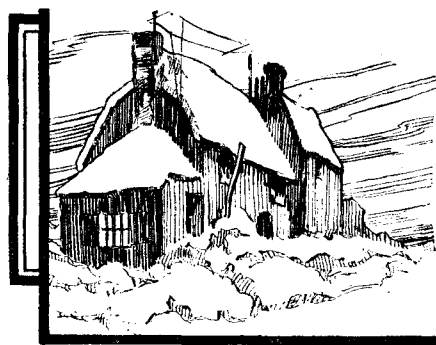
PER 10 FT. COIL

Stocks held at the following Branches:

BELFAST
BIRMINGHAM
CARDIFF
DUBLIN
GLASGOW
LEEDS
LIVERPOOL
LONDON
MANCHESTER
NEWCASTLE
NOTTINGHAM

THE LONDON
ELECTRIC WIRE
COMPANY AND
SMITHS LIMITED
Church Road
LEYTON, LONDON
E.10

WRITE FOR
LEWCOS FREE
SHEET OF
BLUEPRINT
OF FOUR
SUGGESTED
CIRCUITS
UTILISING
LEWCOS
COMPONENTS



Christmas and the Short Waves

By R. W. HALLOWS

Christmas-time is, as a rule, one of the best parts of the whole year for reception upon wavelengths between about 25 and 80 metres. And since these are particularly easy to receive, both the beginner and the old hand alike should be in for a good time.

WITH the Christmas holidays extending over four days this year, the short-wave enthusiast will have a real chance of enjoying himself to the top of his bent with his "wavelet" set.

A kindly providence seems to be watching over the short waves at Christmas-time. This is the season of the year when atmospheres are least likely to interrupt matters; the season, too, when fading is usually least in evidence.

When I mentioned that wavelengths above 25 metres were usually particularly good I had in mind the fact that most of us indulge in short-wave reception chiefly during the evening. Apart from European stations, the best short-wave telephony transmitters—those which always provide a thrill—are the high-power relays of the U.S.A. broadcasting stations. Eastern Standard Time, which prevails over a wide part of the nearer side of the United States, is five hours behind ours. At Christmas-time, therefore, it is dark in New York by 9.30 p.m. G.M.T. and transmissions on the wavelengths referred to travel best over great distances when the whole of their route is in darkness. We can therefore put in some short-wave reception quite early in the evening.

The Best Times

But we can hope for equally good things from the shorter wavelengths—those between 15 and 25 metres. To be at their best these demand quite different conditions. The strongest reception is obtained usually when the transmitting end is in daylight and the receiving aerial in darkness or vice versa. This means that we should obtain strong signals from a little before dusk onwards from stations to the east, whose time is ahead of our own.

Transmissions which are generally particularly good at Christmas-time are those from the two Dutch stations PLE and PLF, in Java. One or other of the Australian stations is almost sure to be transmitting at Christmas and ideal conditions should prevail.

Full-power Transmissions

Though it is not perhaps generally known, most of the American short-wave stations do not nowadays transmit on full power except upon special occasions. There are exceptions to this, but it holds good for many of the stations which are household words. You may have noticed that, though you have heard little of, say, W2XAD, W2XAF, the relays of KDKA, and so on, for a long while, they nearly always come up to the

scratch when the relay of such an event as a boxing match is taking place. Generally, the reason why you receive them so much better then is not that conditions have improved, but quite simply that they are using far more power than they were doing previously or will do on succeeding nights.

At Christmas-time every station wants to send out its programmes to citizens of its own country in the distant parts of the earth, and one can therefore be pretty sure that it will be using the very greatest amount of power that it is allowed to put into its aerial.

No matter if your short-wave set is not particularly up to date, spend one of your free days in bringing it out of its retirement and seeing that all its components are thoroughly up to the mark. If I may offer a word of advice, I would say suspect every joint in a set that has been out of use for some time. I don't mean that all are likely to be broken down or anything of that kind. The odds are, though, that one of them may be shaky, for even the most skillful solderers make a "dry" joint at times.

Getting the Knack

Should you be a newcomer to the fascinating pastime of short-wave reception, you will be well advised to spend one of your holiday evenings with a friend who is an old hand. Though there is nothing difficult about bringing in short-wave signals—the veriest beginner will be able to receive several stations if he turns his knobs slowly, searches with the set just oscillating, and slackens off reaction slightly when a carrier is picked up—it is surprising what a difference a single lesson from an expert can make to one's abilities in tuning the receiver.

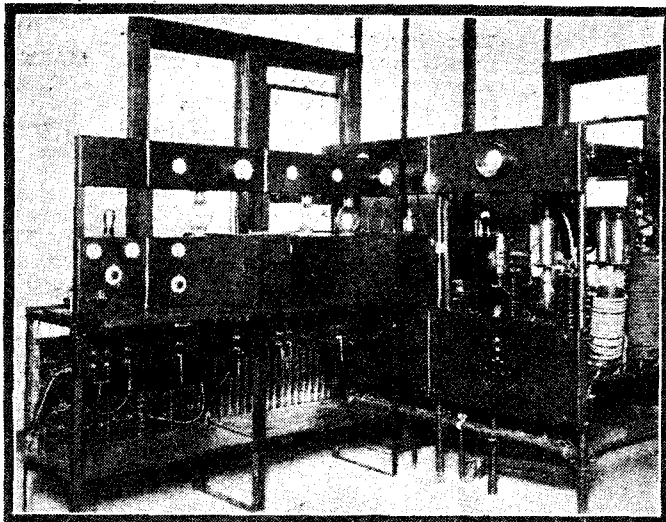
Watch an Expert

If you pay a visit to a friend who is a short-wave expert, take your telephones with you. Persuade him to connect them, as well as his own, to his set and listen as well as watch whilst he tunes. You will soon learn to recognize the very faint first signs that some stations give of their

presence and you will discover how it is that, though his set is no whit better than your own, he finds a score of transmissions where you previously found two or three.

A SPEAKER COMPARISON

IT has been estimated that the output power required to operate a loud-speaker in a room roughly fifteen feet square is 5 watts in the case of a cone diaphragm driven by an electro-magnet movement, and 12 watts in the case of the moving-coil speaker. This seems rather surprising in view of the fact that the mechanical inertia of the vibrating system is usually less in the case of the moving-coil than in the moving-iron type of speaker. On the other hand the amplitude of swing, and therefore the "electric" inertia is greater in a moving-coil system when it is reproducing the lower notes properly. What it amounts to is that the magnetically-driven speaker is capable of "giving its best" on a much smaller input than a moving-coil instrument. M. B.



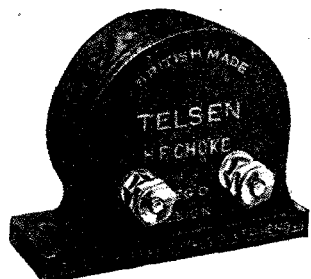
KDKA is one of the best heard short-wave stations in this country. This is the crystal-controlled transmitter of that station

From December 30 all Italian ships of more than 1,600 tons must be adequately equipped with radio transmitters and receivers.

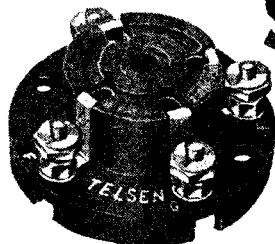
German wireless listeners are protesting against the proposal put forward by some members of the Reichstag to impose an extra tax on all classes of radio instruments.

AS WITH TELSEN TRANSFORMERS . . . SO ARE

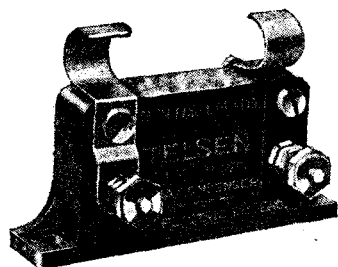
TELSER COMPONENTS SUPREME



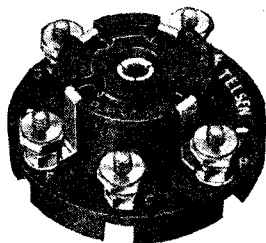
TELSER H.F. CHOKES. Designed to cover the whole wave-band range from 13 to 4,000 metres, extremely low self-capacity, shrouded in genuine Bakelite. Inductance 150,000 micro-henries. Resistance 400 ohms. Price 2/6 each.



TELSER VALVE HOLDERS. Pro. Pat. No. 20286/30. An entirely new design in Valve Holders, embodying patent metal spring contacts, which are designed to provide the most efficient contact with the valve less. Low-capacity, self-locating, supplied with patent soldering tags and hexagon terminal nuts. Fitted with nickel-silver shock-absorbing spring contacts. Price 1/- each.



TELSER FIXED (MICA) CONDENSERS. Shrouded in genuine Bakelite, made in capacities up to .002 mfd. Pro. Pat. No. 20287/30. .0003 supplied complete with Patent Grid Leak Clips to facilitate series or parallel connection. Can be mounted upright or flat. Tested on 500 volts. Price 1/- each.



TELSER FIVE-PIN VALVE HOLDERS Price 1/3 each

In the short time that Telsen Components have been placed upon the market they have won for themselves the most supreme position in the minds of the public, for being of sound and efficient radio component design.

This fact, together with their regular use and incorporation in the "STAR" Sets published in the various Radio journals, have rendered Telsen Components supreme.

Build your new set now—start right—specify

TELSER

COMPONENTS

Adopted by Telsen Electric Co., Ltd., Birmingham.

THERE'S ANOTHER NEW STATION

One after the other new programmes come crowding in as your dial revolves. Stations you could not get before—programmes coming to life in your home from every part of Europe. TUNGSRAM VALVES have made the difference. TUNGSRAM VALVES give longer range to your set, give better selectivity, too, and mighty volume. And though they cost less than any other valves of similar quality, yet they have longer life and economy in use. TUNGSRAM VALVES will give you better radio at less cost.



L.F., 5/6; H.F. 5/6; R.C., 5/6; Power, 7/3; Super-Power, 8/-; A.C. Indirectly Heated H.F. and L.F., 9/6 each; A.C. Directly Heated Power, 9/6 each; A.C. Directly Heated H.F. and L.F., 7/9; Rectifying Valves, 10/- each; 2 v. and 4 v. Screened Grid Valves, 13/-; 4 v. Screened Grid Valves, 16/-; Tungsram Photo-Electric Cell, Nava E., £2 17 6; Nava R., £3 3 0.

TUNGSRAM ELECTRIC LAMP WORKS (GT. BRITAIN), LTD.

Radio Dept., Commerce House, 72 Oxford Street, London, W.1
Factories: Austria, Czechoslovakia, Hungary, Italy and Poland

Branches: Belfast, Birmingham, Bristol, Cardiff, Glasgow, Leeds, Manchester, Newcastle, Nottingham, and Southampton.

TUNGSRAM BARIUM VALVES

***Designed, built and described by the Technical Staff of "Amateur Wireless" and "Wireless Magazine."
Full details in the issues mentioned. Full-size Blueprints of every set described.***

[illegible][illegible][illegible]

REACTION CONDENSER

TUNING CONDENSER

ON-OFF SWITCH

A black and white photograph of a vintage portable electronic device, possibly a radio or amplifier, with a wooden case and various knobs and switches. The device is shown from a high angle, tilted slightly to the right. It features a wooden cabinet with a hinged lid that is open, revealing internal components. On the left side, there are several knobs and switches, some of which are connected by wires. A large, dark, rectangular component, possibly a speaker or a transformer, is visible in the center. The overall appearance is that of a well-used, mid-20th-century piece of electronic equipment.

For short-wave reception, with interchangeable six-pin coils, this specially-screened two-valver is ideal. Its unconventional construction can be readily followed from blueprint A.W. 229, price 1s., post free. Due to the special construction of this set, world-wide reception is made easy. There is no hand-capacity effect when tuning.

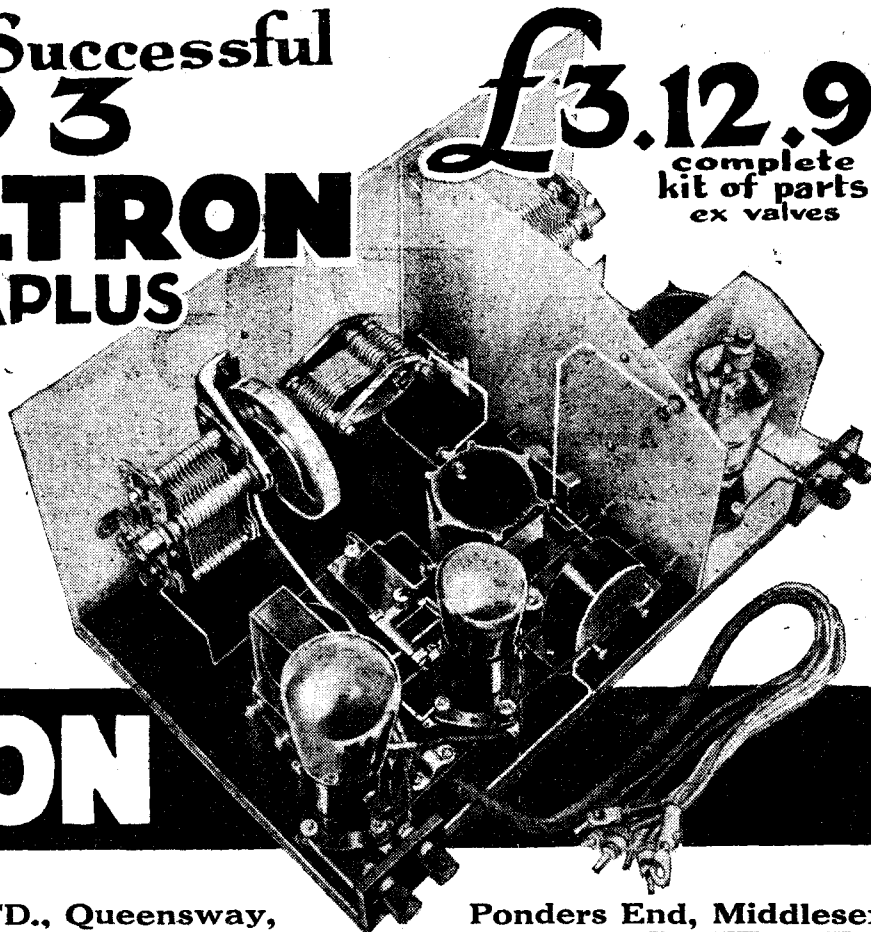
The Proved Successful SCREENED 3 VOLTTRON DYNAPLUS

£3.12.9
complete
kit of parts
ex valves

ALL-BRITISH
MADE

will give you the choice of twenty to thirty stations, is sufficiently selective to eliminate unwanted stations at will. Wonderfully economical to run, not overtaxing batteries, or can be made all-electric by fitting the Voltron mains unit. Can be assembled in a few hours with pliers and screw-driver.

Ask your dealer to show you the Voltron productions; also for details of hire purchase terms, or write direct to the Manufacturers for free Catalogues and Blue Prints.

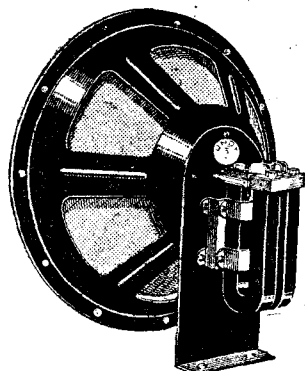


VOLTTRON

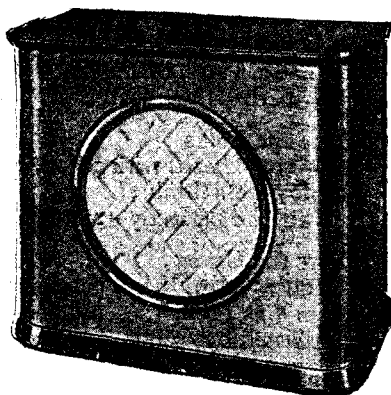
VOLTRON ELECTRIC, LTD., Queensway,

Ponders End, Middlesex.

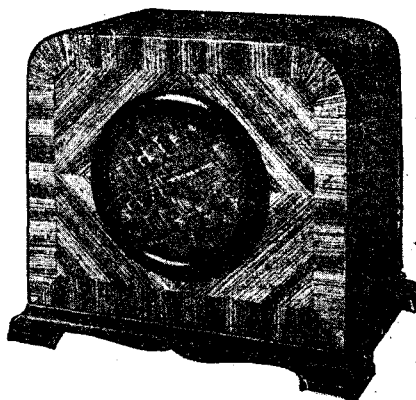
To render music faithfully IS THE AIM AND ACHIEVEMENT OF THE UNDY 8 POLE DYNAMIC SPEAKER



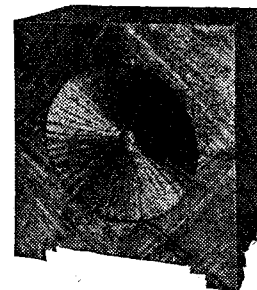
Complete 8-pole Unit
with Chassis ready for
building into Cabinet
or Baffle-
board - **50/-**



Undy 8-pole Dynamic Loud-
speaker in attractive
Mahogany Cabinet **70/-**



Undy 8-pole Dynamic Loud-
speaker in highly polished
Walnut Cabinet
de-Luxe - **90/-**



Undy 8-pole Dynamic
Loud-speaker in polish-
ed Walnut Cabinet.
The Loud-speaker for
the most exacting re-
quirements, at a
reasonable
price - **55/-**

CHOOSE FROM THESE FOUR TYPES

The Undy 8-pole Dynamic Loud-speaker is the turning point in Loud-speaker design. The best Loud-speaker for sensitivity, power and frequency range. You must hear it to-day!

"UNDY"

Obtainable from your usual dealer.

ASK FOR DEMONSTRATION



THE ABC OF BBC



A is the Announcer,
Whose voice is so charming,
And likewise his smile,
Is just as disarming.

B are the Birthdays,
And Uncle begins
With numerous greetings,
And, of course, "Hello Twins."

C are the Comedians,
Though stale they may be,
Thank Heaven their jokes,
Can't all be B. B.C.

D is the Director
Of Programmes, poor chap,
Will nobody give him
A pat on the back?

E are the Effects
(A galloping horse?
Two coconut shells
And a wall, of course).

F are the Furious
Letters received,
From non-licence holders
Whose feelings are peeved.

G are the Grundys,
Who also complain,
Why must we have more
Dance Music again?

H are the Hours
Devoted to Talks.
These hours by Listeners
Are devoted to walks.

I are the Items
Which make up the time.
We'll now take some music,
Then Big Ben will chime.

J stands for Jack,
The rest is quite plain,
I'll tell you no more,
And so save you Payne.

K is the Kindliness
Received at the station,
If to pay them a call
Is your contemplation.

L are the Listeners,
Three millions or so,
Land's End to John o' Groat's,
If stood in a row.

M is the Microphone,
That sensitive power,
That's caused the most blasé
Of persons to cower.

N is the News,
You hear it twice nightly,
Market Prices for Farmers,
Are told, oh! so brightly.

O is the O.B.
You've heard the assembly,
Cheering each run
In the Boat Race at Wembley!

P's the Professor
Who talks on "The Worm."
One day I suppose,
The Listener will turn.

Q is the Queen's Hall,
From whence come the Prom's,
Straight to the firesides
Of Harry's, Dick's, and Tom's.

R is the Red Lamp,
When showing, no noise,
Except that which is made,
By Jack Payne and his Boys!

S are the Studios,
So please take your fill
Of Talks, Plays, or Music,
Or perhaps Vaudeville.

T are the Talks,
By some heard with relish,
While others think
They are perfectly—rotten!

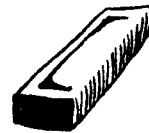
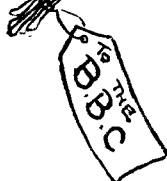
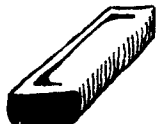
U are the Uncles,
You've heard them, perchance,
From 5.15 till 6,
Assisted by Aunts.

V are the Vaudeville
Programmes we hear,
Twice, perhaps thrice,
Throughout the whole year.

W's the Wavelength,
Of varying length,
That's why we receive
At varying strength.

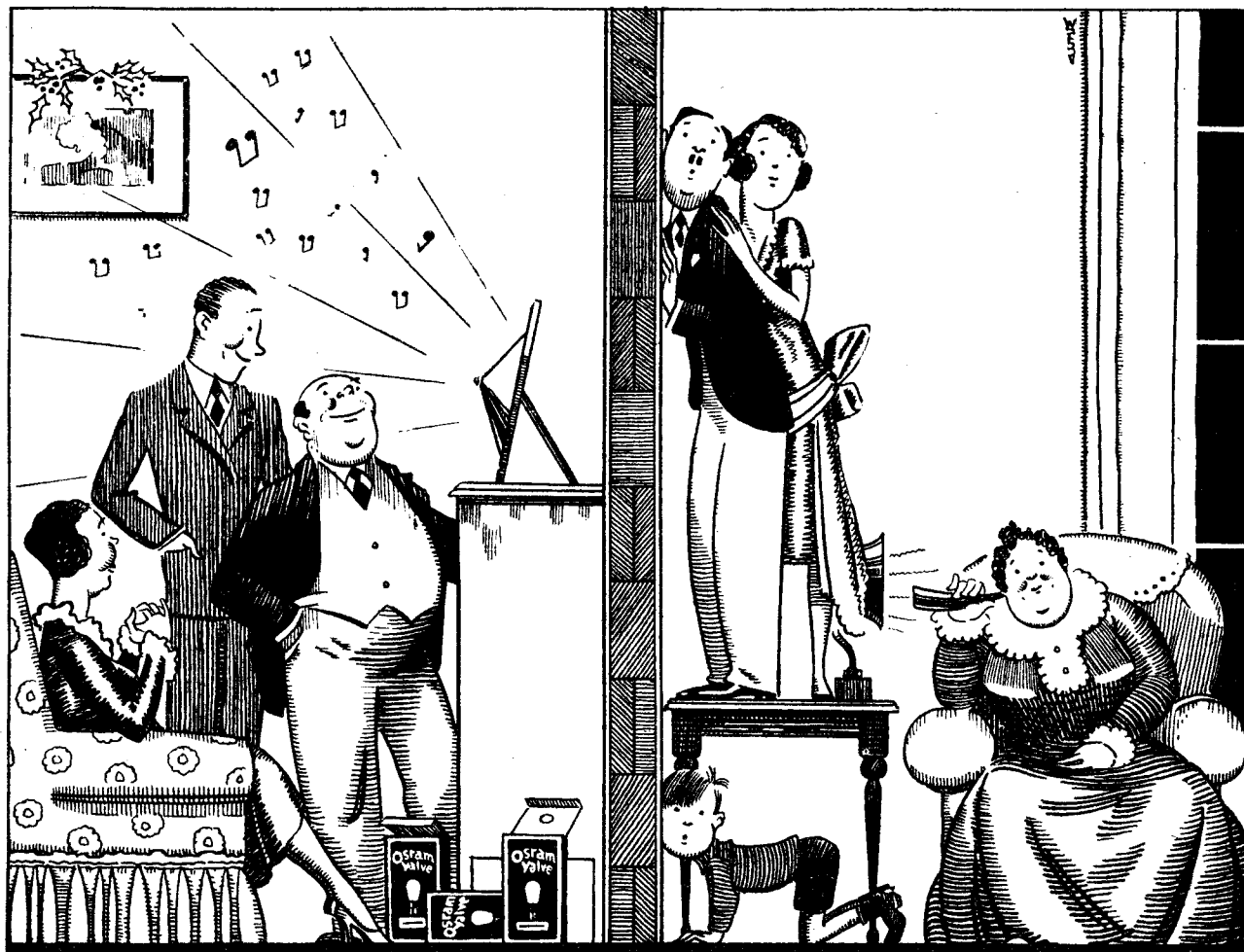
Now **XYZ** is the
Call-sign of Mars,
And **XXX** is the
Call-sign of Pa's!

ERIC A. ROBERTS.





LISTENING *and listening*



Give THE
acceptable
Xmas Gift

Osram
Valves

MADE IN
ENGLAND

Sold by all Wireless Dealers

FOR ALL 3-VALVE
SCREEN-GRID Sets
OSRAM S.215 - 20/-
OSRAM H.L.210 8/6
OSRAM P.215 - 10/6

they make **ALL** the difference

Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.



Music with Bridge—via a Marconi portable

YOUR NEW SET AND HOW TO MAKE THE MOST OF IT

A seasonable article of special interest to non-technical set-owners, by Alan Hunter

A NEW set is always an exciting affair; and at this time of year many new sets will be in process of installation, ready for the Christmas festivities via ether. Now, I suppose that, at a fair estimate, I "install," for a brief test period, at least two sets every week. These sets are as varied as the proverbs in Christmas crackers. So perhaps I can help some "A.W." readers by a little Christmas advice on the new set.

Portables are favourite radio installations, continuing to hold their own against all other types. They involve no fuss in installation. You can walk into a radio store, buy a portable, bring it home and play it to the family. It is as simple as a gramophone.

Portables

Well, if you are saying it with portables this Christmas, just remember that the batteries are *not* everlasting. The 2-volt accumulator in a portable set is usually quite a small cell of, say, 20 ampere-hours capacity. A set with four or five valves will take .5 ampere in filament current, so a 20 ampere-hour accumulator will last just under 40 hours. And when the set is

new it is surprising how many hours use it has! So do not dissipate 35 hours of the accumulator's charge on the days preceding Christmas, or the festive season will, in a radio sense, certainly peter out before Boxing Day.

The new portable will probably have a brand new high-tension battery. In most of the portables I have tested, this battery is expected to deliver over 10 milliamperes. The discharge rate of the standard-capacity battery is about 7 milliamperes, which means that the battery is overworked all the time the set is in use. Seven or eight weeks is about the limit of the useful life of such a battery.

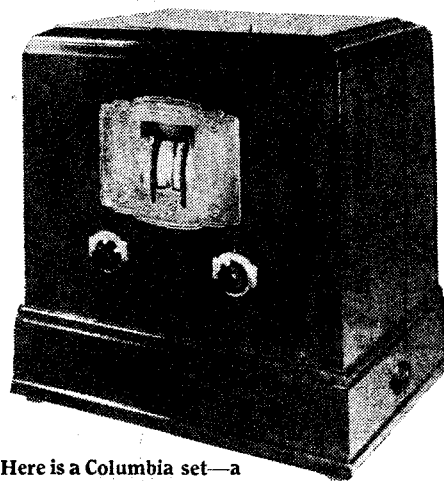
The pity is that, after this period, the set still goes on working and (so accommodating is the human ear) the gradual deterioration in volume and quality is not noticed until one night, when some special item is wanted, the family is horrified to find the set refuses to utter a sound. So, if the portable is not *quite* new, and has been in action for a few weeks, buy a new high-tension battery for Christmas.

Before leaving battery portables I would emphasise the fact that the amount of distortionless volume from a portable or any set working from a 100-volt high-tension battery is definitely limited. Short of the point where good quality ceases and a mere blare begins, there is enough volume to fill the average room. But if that room is full of noisy people, all talking at once, this amount of loud-speaker volume may well seem inadequate. The temptation to increase the volume is great, but instead of causing the dire din that inevitably follows from overloading a small power valve—switch off. The assembly will then very soon quieten down if they really want to hear an item.

At Christmas time the set is expected to supply the family with music for dancing.

While Jack Payne's and other dance bands will fill this need at frequent intervals during the holiday broadcasting, there is sure to be a clamour for dance music when the price of fat pigs or some other item of national importance is being broadcast.

Most new sets, particularly those working from the mains, are fitted with a gramophone pick-up switch. I wonder more use is not made of this fitment. Perhaps some non-technical listeners do not realise that every good set is also a potentially good gramophone-record amplifier. I often hear very fine radio music in homes where they



Here is a Columbia set—a receiver of distinctive appearance

put up with the most appalling gramophone-record reproduction, usually supplied by a cheap or old-fashioned mechanical machine.

A Useful Adjunct

Listeners with really good sets might do much worse than to spend a pound or so on a gramophone pick-up—one that will fit the tone arm of the mechanical gramophone. Then the family can have music, particularly dance music, whenever they want it. I favour the plan of "remote playing." The idea is to have the set and pick-up in one room and to run the loud-speaker leads to the party room, so that radio or gramophone dance music can be effectively faded in and out.

Whatever its type, unless it be extremely cheap, the new set will be expected to bring in some of the foreign stations during Christmas. At this period, also, the owner

(Continued on page 925)



Two popular Ediswan models—the power Pentode Two and the All-Electric Three for D.C. mains. Set Tester will describe his tests of the first-mentioned in next week's issue

Varley

FOR EVERY CIRCUIT

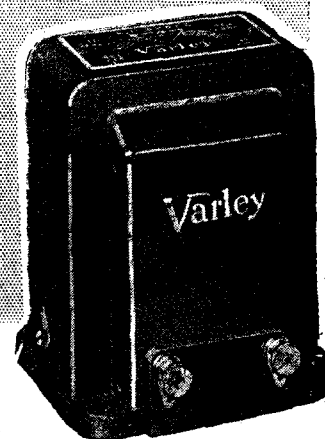
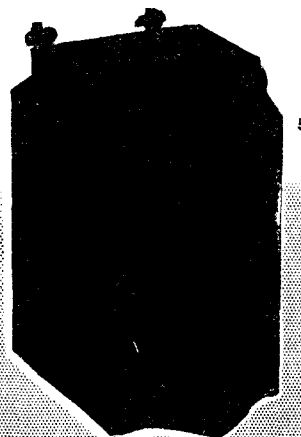
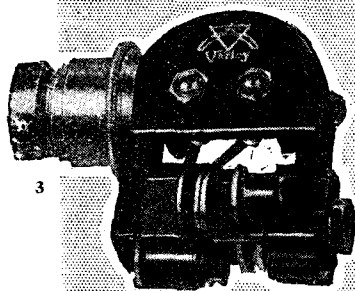
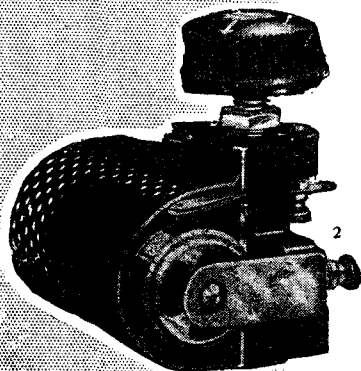
Varley components will make all the difference to your reception, whether you are building a new set or modernising an old one. Over thirty years of specialised experience is embodied in the long range of Varley products. They set the standard for accuracy of workmanship and careful, original design—the same qualities that have made the new Varley All-Electric Receivers such a big success.

Your dealer stocks Varley Components. Have a chat with him and examine them yourself. They make ideal Christmas gifts too—a Varley Pick-up—a Nicore L.F. Transformer—an Output Transformer or Choke. Send for the section of the Varley Catalogue in which you are interested.

SECTION A gives full particulars of 2- and 3-valve All-Electric Receivers, Radio-Gramophones, Gramophone Pick-up, Auto-arm and Volume Control.

SECTIONS B AND C deal with H.F. Choke, Regional Coils, Bi-duplex Resistances, Rheostats, Potentiometers, R.C. Couplers, and Anti-Mobos.

Details of Nicore Transformers, Output, Push-Pull Input and Output Transformers, Push-Pull, L.F. and Constant Inductance Chokes, etc., are given in SECTION D, whilst SECTION E deals with Mains Equipment—Power Transformers, Standard, Dual and L.T. L.F. Chokes, Constant Inductance Chokes, Power Potentiometers and Power Resistances.



For
RADIO
MANUFACTURE
Varley

1. Impedance Matching Output Transformer (six ratios) .. 22/6

2. Power Potentiometer, full range from 9/6 to 11/6

3. Gramophone Pick-up .. 37/6

4. Bi-Duplex Wire-wound Resistances (including holder), full range from 4/6 to 17/6

5. Nicore L.F. Transformer (ratio 4-1) .. £1

6. Standard L.F. Choke (20 Henries) .. £1

Advertisement of Oliver Pell Control Ltd., Kingsway House, 103 Kingsway, London W.C.2. Telephone: Holborn 5303.

Please Mention "A.W." When Corresponding with Advertisers

The B.B.C. CHRISTMAS PROGRAMMES

An article by our B.B.C. Correspondent giving a forecast of the holiday programmes

ON that first broadcasting Christmas, in 1922, when the B.B.C. (British Broadcasting Company) was barely six weeks old, it was on the cards that the activities of the young Colossus would be suspended for a day. It was a very attenuated staff who would have to carry on and certainly there was no prospect of relief at some other time as compensation for Christmas duty.

Early Efforts

However, with a heroism worthy of the cause, a few brave souls sacrificed their Christmas feasting and gathered at Marconi House to provide a programme—a mere skeleton as compared with the modern Christmas programme—and perhaps as many as ten thousand listeners up and down the land heard the result. A wonderful Christmas Day it was for them.

And this is how the programme ran: At five o'clock Vivienne Chatterton and her husband, Stanton Jefferies—the latter still with the B.B.C. at this 1930 Christmas as chief of Balance and Control—opened with children's songs. Kenneth Ellis, Charles Penrose, and Olive Sturgess filled up practically the rest of the evening with songs. Cecil Mannering, the entertainer, gave a turn. Sufficient material was found for two news bulletins, but their content matter is now lost in the mists of antiquity. The programme ended at 10.30 p.m.

A year later, on Christmas Day, 1923, 2LO started up at 6.30 with a children's programme. The LondonWireless Orchestra followed, at 7.30, with Klohr's "Federation March" and the "Poet and Peasant" Overture. Then an entertainment entitled "A Merry Christmas Party" was given by John Henry, Helena Millais, Ronald Gourley, and Jay Kaye. Only one news bulletin was broadcast and at 10.30 the Savoy Orpheans were heard. Already the B.B.C. was suffering for its sins of commission. One critic, obviously an opponent of syncopation, sent a "goodwill" message to the B.B.C. in the shape of an offer "to slit the throats of the entire Savoy Band for the sum of fourpence."

Steady Progress

You will perhaps assume, but wrongly, that the B.B.C. staff, although grown by Christmas, 1924, to imposing proportions, were yet disinclined to forsake entirely the temptations of creature comforts at home for the doubtful pleasures of the studio; because the programme in that year started later than in the previous two years. At 7.0 o'clock Sir Hall Caine gave a talk, and

this was followed by a light orchestral programme, with two singers and two entertainers in support, winding up with dance music. But it was not lethargy—stringency of funds, rather—that deflected the energies of the programme builders. Actually, the number of licences in force was 700,000 and the amount of money due to the B.B.C. was £430,000; but payment by the Post Office was made in arrear and the Company had received under £70,000. However, it was decided that no break should occur in the daily broadcasting service; and let it be said here, that no one at Savoy Hill conceives for a moment that a break ever will occur in the daily task, short of the necessity enforced by the end of the world.

The Pioneers

The B.B.C.'s struggle through infancy to adolescence is an oft-repeated tale; but the public's memory is so restricted that it has, no doubt, forgotten who has entertained them through the microphone on Christmas Days of the past. Are they not worthy of some special niche in the story of broadcasting, these artistes, not only because of their professional talents, but on account of the self-sacrifice involved in turning up at the broadcasting studio on a Christmas Night, the while they contemplated mentally the comfortable firesides which they have been induced to leave? The list of artistes is not a very long one; here it is:—Will Hay, George Grossmith, Stiles-Allen, Bransby Williams, Mabel Constanduros, Jack Hylton, Ian Hay, Wynne Ajello, Walton O'Donnell, and those few who have been mentioned earlier.

DO YOU KNOW—

that occasionally one comes across valves which have a slightly higher filament consumption than is stated by the makers? With portable sets, where it is possible to fit only a small accumulator, this increase may affect the period over which the accumulator will run when recharging.

It is no reflection upon these artistes, nor upon those who have been asked to broadcast on any Christmas Night and wouldn't, to say that one of the main difficulties of the programme builders is to find just the people who are wanted for the programmes. Artistes are only human in their desire to escape work for this day of all days. And so this year time creeps on and we come

perilously close to Christmas before the casting of the programmes is completed.

This Year's Programmes

So far as the main seasonal items for Christmas week are concerned, the programmes have already taken shape. The pantomime shall have pride of place; for is it not the pivot of all Christmas entertainment? The pantomime, then, will be provided by Ernest Longstaffe, a playwright who has composed revues, musical numbers and pantomimes for broadcasting over several years past.

Instead of reserving this entertainment until after Christmas, the B.B.C. intends, this year, to broadcast it to regional listeners on Christmas Eve and to National listeners on Christmas Night.

When Savoy Hill asked Mr. Longstaffe to suggest a title for his fourth Christmas broadcast pantomime, he replied airily: "Oh, let us make it 'Little Red Riding Hood.'" Mr. Longstaffe says: "When time began to press and it came to writing the book, I found that beyond the fact that one Red Riding Hood walked through a forest to take her grandmother some goodies and a wolf said: 'Pull the string and the latch will fall,' there was little to guide me. I hied me to a little bookshop at the top of Drury Lane, kept by an old woman with one watery eye and one dry one and said: 'Have you the story of Red Riding Hood, please?' to which she replied: 'Lumme; wot 'cher fink it is—Christmas?'"

"The British Museum was my next hope; but although the librarians were quite prepared to supply children's books as used in the something-or-other dynasty they did not show the slightest interest in a plain, unvarnished version of my pantomime. I therefore made up my mind that I must sit down and write my own version of the little red girl's adventures. I started at 7.30 one Sunday morning and, with the exception of a break for lunch and tea, kept at it until 11.30 that night.

"Now I am very busy with the music. The B.B.C. has promised me quite a large orchestra, with horns, a harp and other luxuries which warm the heart of a music writer. Last of all will come the fitting of songs, and I am going to choose the very best melodies of the year irrespective of their origin. All I hope is that the good folks who listen to my pantomime will get as much pleasure out of its performance as I am having in its making."

On Monday, December 22, the Nativity Play from the fourteenth-century church of

(Continued on page 922)



EXPLORE THE CONTINENT WITH "RED STAR" RADIO RECEIVERS

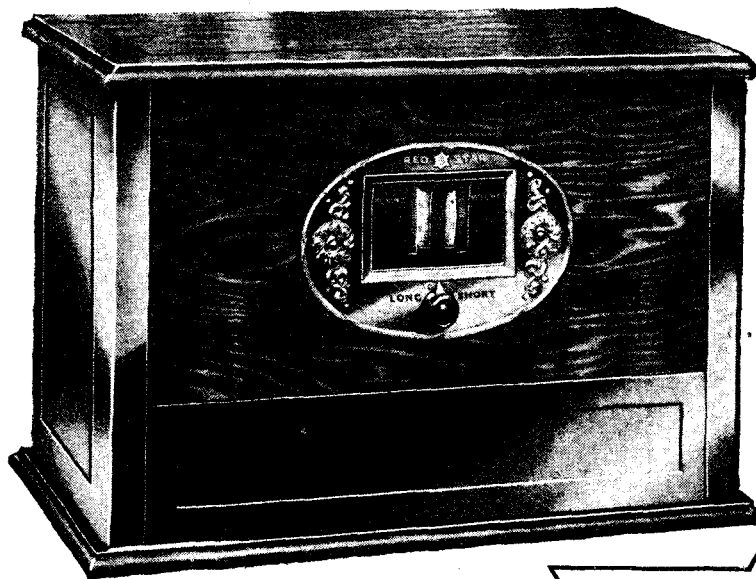


The phenomenal sets incorporating

- ★ **TWIN TAP COUPLING**
- ★ **VARIO SCREENING**
- ★ **DUAL DETECTION**

The amazing selectivity and long range of "Red Star" Radio Receivers are the natural results of brilliant design and stringent testing.

Experts all over the country are astounded at the volume and quality of tone, even under conditions, and in districts, which are notoriously bad. This being the outcome of the three exclusive "Red Star" features:—Twin-Tap Coupling, Vario Screening and Dual Detection. In addition to all British Stations, numerous foreign stations can be logged at full loud-speaker strength.



"RED STAR" RADIO RECEIVERS INCORPORATE THE FAMOUS TELSEN TRANSFORMERS, TOGETHER WITH ALL THE OTHER TELSEN COMPONENTS.

See what "Amateur Wireless" says about these Phenomenal Sets on page 906

TWO VALVE SET 63/-

THREE VALVE SET 84/- BOTH FREE OF ROYALTIES



RED STAR

THE WORLD'S WONDER
RADIO RECEIVERS

**LOOK FOR
THE SHOPS
DISPLAYING
THE
"RED STAR"
SIGNS**

THEY'RE ALL BRITISH!

Advt. of Red Star Radio Ltd., Birmingham.

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

A NEW RECEIVER

Some preliminary details of the Loftin-White Two, a novel mains-operated set to be described in next week's issue

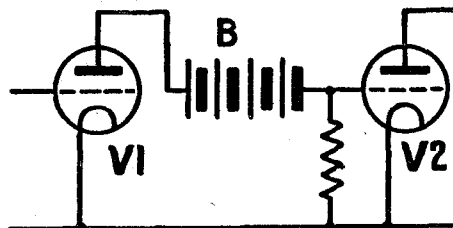
By J. H. REYNER, B.Sc., A.M.I.E.E.

A SHORT time ago I gave some particulars of a new Loftin-White circuit which has become rather popular in America. (AMATEUR WIRELESS, Nos. 422 and 423.) I suggested at the time that experiments were being carried out with the idea of making this circuit suitable for British valves; these experiments have now proved successful.

The Loftin-White arrangement is somewhat similar to the Simpler Wireless system, invented by a former member of the AMATEUR WIRELESS staff, Mr. J. F. Johnstone. It is possible to give a simple explanation of the action in a few words, but for a more detailed explanation the reader is referred to the article already mentioned. The diagram shows two valves coupled by means of the Loftin-White system. The second valve will be seen to have across its grid circuit a negative voltage provided by a grid-bias battery in series with the anode circuit of the first valve. If the first valve is conductive, this battery circuit is completed and the anode current of the second valve is reduced. We make the first valve conducting to a variable extent by applying voltages across the grid and filament, and therefore, the anode current of the second valve is also varied in a corresponding fashion. As there are no inductances or condensers which vary in impedance with

the frequency, this system is capable of giving great purity of reproduction.

This simple arrangement has been developed to apply to alternating-current working. Instead of using separate batteries, a fairly large voltage is generated which is applied across a potentiometer. Voltages



The Loftin-White system of coupling

are tapped off at various points on this potentiometer to give exactly the same effect as that described in the above simple outline. The net result is an arrangement which contains resistances only as far as the inter-valve coupling is concerned, so that it has an almost uniform characteristic over the whole frequency band right down to the very lowest frequency.

Low Cost

A certain number of condensers must be used, of course, for smoothing the voltage,

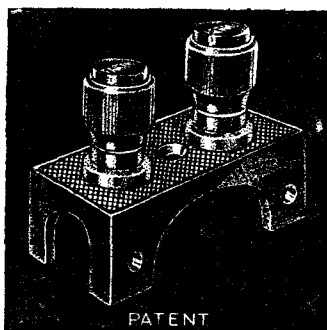
which is obtained from the A.C. mains by the use of the usual methods, but these do not enter into the inter-valve coupling. Moreover, it will be clear that as the system is so simple, the construction is considerably cheapened.

The early experiments with the system at Elstree gave extraordinary results. The volume output from the P625 valve was capable of operating our standard loud-speaker at what was considered uncomfortably loud volume.

American practice uses a high-frequency stage prior to the first valve in the amplifier as a matter of course, but it was felt that there would be many readers in this country who did not want to go to the trouble of an H.F. valve. On the other hand, attempts to use the arrangement as it stood to provide reaction and to operate satisfactorily did not meet with immediate success, and it was only after some considerable experiments had been made that a satisfactory system was evolved. The arrangement now, however, will give loud volume with great purity on the local stations and, with a gramophone pick-up, will dance twenty couples with ease, and this was felt to meet the needs of the majority of readers.

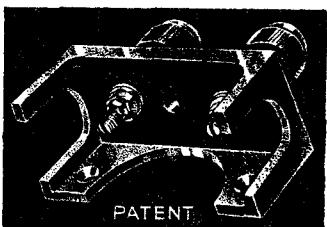
Full details of a two-valve receiver will be given in next week's issue.

HERE'S A NEW 'BELLING-LEE' IDEA



THE NEW BELLING-LEE TERMINAL MOUNT

A new Terminal Mount unique in its adaptability, it takes any Belling-Lee Terminal or Plug and Socket in pairs. Mount it with the terminals vertical or horizontal—on your baseboard, your window-ledge, your bench or wall. A screwdriver is all you need. Belling-Lee Terminals hold an unchallenged position.



NOW YOU CAN MOUNT THEM ANYWHERE.

Terminal Mount, highly finished in black bakelite.

PRICE 8d. each.

TERMINALS. Three types, each with clear permanent white lettering and heads that cannot come off.

Type "B," non-rotating name fully insulated ... 6d.
Type "M," non-insulated ... 4d.
Type "R," Junior Model, insulated 3d.

Write for FREE Belling-Lee Handbook, "Radio Connections" (2nd Edition), which shows some of the many uses of the New Belling-Lee Terminal Mount.

BELLING-LEE
FOR EVERY RADIO CONNECTION

Advertisement of Belling Lee Ltd., Queensway Works, Ponders End, Middlesex.

The MAIN ECONOMY

Use the new Westinghouse rectifier with the following specified components:—

Universal transformer **22/-**

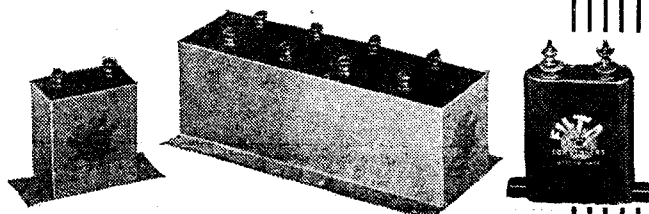
40-henri choke **16/-**

Filter condensers designed and made by the Condenser and Electric Company, in conjunction with the Westinghouse engineers.

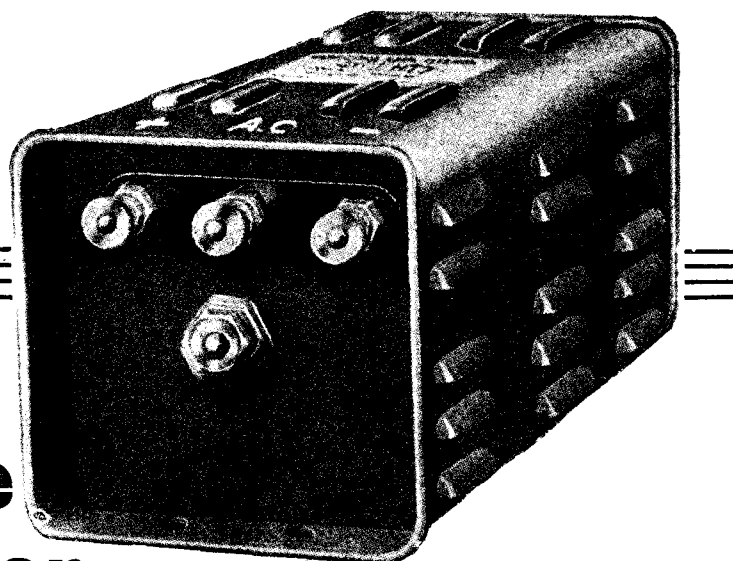
ALL MAINS COMPONENTS WESTINGHOUSE RECTIFIERS

Filter Bank Condensers require the best Condensers, Transformers and Chokes. Write for Full List

2 mfd. (By-pass) ...	3/3
4 mfd. (Reservoir) ...	5/3
4.4.4 mfd. (Voltage Doubler) ...	15/-
4.4.2.2 mfd. (Half-Wave) ...	15/6



THE MAINS POWER RADIO CO.
57 Farringdon Street, London, E.C.4



Why not a Westinghouse Metal Rectifier this Christmas?

IF he is going to build an A.C. mains receiver or would like to run his set from the mains, he would be sure to appreciate a Westinghouse Metal Rectifier.

These rectifiers provide really better reception. Once fitted they require no attention whatever; and as they contain no valves, chemicals, nor moving parts, no renewals are necessary.

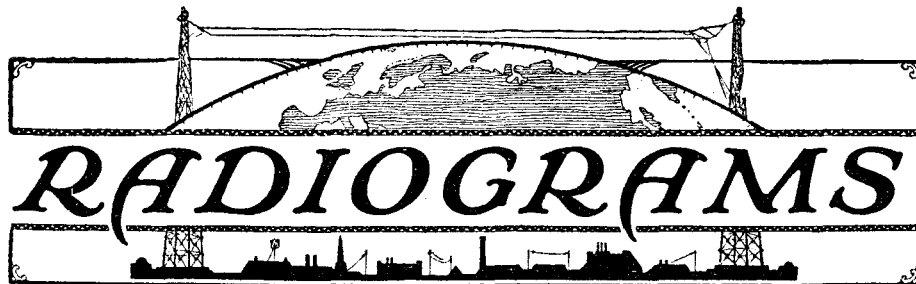
All good radio dealers sell and recommend the Westinghouse Metal Rectifiers; but we advise you to send for our informative forty-page booklet, "The All-Metal Way, 1931," together with 3d. in stamps. Address your request to Dept. A.W.

WESTINGHOUSE METAL RECTIFIERS

**THE WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD.
82 YORK ROAD, KING'S CROSS, N.1**



Please Mention "A.W." When Corresponding with Advertisers



A REVIVAL of *The Flowers Are Not For You to Pick*, which was specially written for the microphone by Tyrone Guthrie, will be broadcast on the National on December 18 and on the Regional on December 19.

To those who like to see broadcasting artistes in the flesh, an opportunity will be afforded on December 13, when a popular concert is given at Kingsway Hall, London.

Excerpts from Bach's "Christmas Oratorio" will be relayed from Malvern College to Midland Regional on December 14. The work will be given by the Malvern College Choral Society.

Cello solos by Harry Miller will be heard by Midland Regional listeners on December 16.

The Wednesday free concert at 1.15 p.m. on December 17 will be given in the National Museum of Wales. Those who make a point of attending the concert should note that the Wednesday concert is now fortnightly in the Museum, the concert on alternate weeks being in the Exchange.

The National Orchestra of Wales concert at the Patti Pavilion, Swansea, on December 16, will be a Wagner one, with Walter Widdop and Stiles Allen as vocalists.

The weekly concert at the City Hall on December 20 is a Christmas concert. Harold Williams and the Lyrian Singers will be the artistes.

Excerpts from a matinee in aid of Den-ville Hall, Northwood, the home of retirement for actors and actresses, will be relayed from the London Hippodrome on December 8. Many stars will be heard, including Henry Ainley, Noel Coward, Gertrude Lawrence, Sir Gerald du Maurier, Claude and Jack Hulbert and Evelyn Laye.

The first relay from Warsaw will be heard by Regional listeners on December 17, a Polish National programme having been arranged specially for that evening.

Another "Ragtime" Party takes place at the Birmingham studios on December 11.

The twelfth and last of the series of talks on "Science and Religion," which are

broadcast nationally on Sundays, will be given on December 14 by Dr. L. P. Jacks, of Manchester College, Oxford.

Radio Toulouse appears to have abandoned its irritating "ding-dong" between gramophone records broadcast from the studio. In its place, one stroke on a gong is given to attract the attention of listeners before an announcement.

Apart from Radio Normandie (Fécamp) France in the north-west possesses a new broadcasting station. It is situated at Caen and styles itself: Radio Nord-Ouest. Transmissions are made daily on 329 metres between midday and 1.30 p.m. and a news bulletin followed by a concert is broadcast at 7.15 p.m., G.M.T.

When Submitting Queries

Please write concisely, giving essential particulars. **A Fee of One Shilling** (postal order), a stamped addressed envelope, and the coupon on the last page must accompany all letters. The following points should be noted.

The designing of apparatus or receivers cannot be undertaken.

Modifications of a straightforward nature can be made to blueprints, but we reserve to ourselves the right to determine the extent of an alteration to come within the scope of a query.

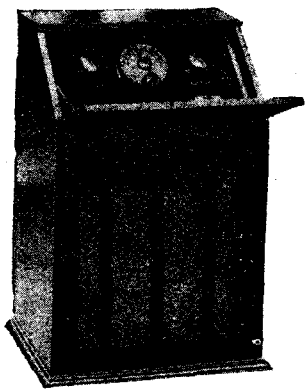
Queries cannot be answered personally or by telephone.

For Purity

Hear

THE EDISON BELL ALL MAINS 3

Quality, rather than extreme range, is the feature of this model, and with the unique speaker incorporated, brilliant and truthful reproduction is attained. Enclosed in an attractive walnut cabinet, with all connection points concealed at the back, the instrument may also be used as an amplifier of gramophone records in conjunction with a suitable electrical pick-up.



SPECIFICATION:

Circuit.—Detector, resistance-coupled L.F., transformer-coupled L.F., with super power output valve.

Eliminator.—Built into set, supplying all necessary H.T., L.T., and bias.

Controls.—Single slow-motion tuning dial, reaction control, mains switch, wavelength pick-up, change-over switch.

Wavelength.—190-500 and 1,000-2,000 metres, controlled by a small switch.

Pick-up.—Sockets provided at back of cabinet controlled by point on wavelength switch.

Valves Supplied.—Mazda AC/HL, AC/P, and Mullard A.C.064. Rectifier Mullard DW/2 or Philips 1821.

Voltage.—Standard model, 200-240 volts, 50-100 cycles. Other voltages to special order.

Speaker.—Cone speaker of special design incorporated in cabinet.

PRICE £19 : 19 : 0 inclusive

Send for particulars of ALL MAINS SETS.

West End Agents: Keith Prowse, 163, Regent St., W.1.

EDISON BELL, LIMITED, LONDON, S.E.15 & HUNTINGDON

The Easy Way TO PERFECT RADIO

DAY and NIGHT FROM NOW UNTIL XMAS

From now until Christmas our organisation will be working day and night without cessation in meeting the demand for better Radio this Christmas. We are determined that every customer ordering Radio from us before the Holidays will not be disappointed. Place your order now!

EVERYTHING RADIO FOR CASH OR EASY TERMS WITH SERVICE AFTER SALES

PILOT RADIO KITS

. . . build one of these fine "A.W." Sets for Xmas

Success Guaranteed. Every specified component for your new set, down to the last screw, in an attractive carton, including **The Famous Pilot Test Meter**, without which no set is complete.

THE CHALLENGE TWO

(See this issue)

Kit 'A' { Cash	£2 15 10	Or 12	5/-
Kit 'B' { Price	£3 14 10	monthly	6/10
Kit 'C' { Price	£4 7 4	payments of	8/-

THE CHALLENGE THREE

(Described in "A.W." Nov. 8th, 1930)

Kit 'A' { Cash	£6 6 7	Or 12	11/7
Kit 'B' { Price	£8 5 7	monthly	15/2
Kit 'C' { Price	£9 10 7	payments of	17/5

THE CHALLENGE FOUR

(Described in "A.W." Oct. 18th, 1930)

Kit 'A' { Cash	£7 19 10	Or 12	14/8
Kit 'B' { Price	£11 1 10	monthly	20/4
Kit 'C' { Price	£13 16 10	payments of	25/4

MAINS MODEL. For additional apparatus required add 28-3-8 to each of the cash prices above, or 15/- to each of the monthly payments.

SHORT-WAVE TWO

(Described in last issue)

Kit 'A' { Cash	£4 13 10	Or 12	8/7
Kit 'B' { Price	£5 12 10	monthly	10/4
Kit 'C' { Price	£6 9 4	payments of	11/10

IMPORTANT NOTE

KIT "A" is less valves and cabinet. KIT "B" with valves less cabinet. KIT "C" with valves and cabinet. Any parts supplied separately.

SEND NOW FOR

THE PILOT CHART

Contains detailed Price Lists of all the latest and best Kits, and over 30 valuable Hints and Tips for the Amateur Constructor.

Manufacturers' Kits and Accessories

Send **10/-** **COSSOR EMPIRE MELODY MAKER KIT**, 1931 model, S.G., detector, and power. Cash Price **£6 17 6**

Only Balance in 11 monthly payments of **12/9**.

Send **23/6** **1931 OSRAM MUSIC MAGNET KIT**, two S.G., detector, and power. Cash Price **£11 15 0**

Only Balance in 12 monthly payments of **18/6**.

All above Kit prices include valves and cabinet

Send **7/4** **EKCO 3F.20 H.T. ELIMINATOR**, 20 m.a. Tappings for S.G., 60 volts, and 120/150 volts. For A.C. mains. Cash Price **£3 19 6**

Only Balance in 11 monthly payments of **7/4**.

Send **8/6** **EXIDE 120-VOLT WH. TYPE AC-CUMULATOR**, in crates. Cash Price **£4 13 0**

Only Balance in 11 monthly payments of **8/6**.

Send **6/5** **LAMPLUGH INDUCTOR SPEAKER**, for perfect reproduction. Unit and chassis complete, ready mounted. Cash Price **£3 10 0**

Only Balance in 11 monthly payments of **6 5**.

Send **8/3** **EPOCH PERMANENT MAGNET SPEAKER**, Type B.4. Cash price, **£4 10 0**.

Only Balance in 11 monthly payments of **8 3**.

Send **39/6** **THE ADAPTAGRAM**, the instrument which converts your existing radio receiver into a modern radio gramophone. Garrard gramophone motor, B.T.H. pick-up and tone arm, and Frost volume control included. Takes any set up to a panel size, 21 by 8 in., or baseboard depth, 16 in. Cash Price **£11 19 6**

Only Balance in 11 monthly payments of **20/-**.

Send **4/7** **BURNDEPT NEEDLE ARMATURE PICK-UP AND TONE-ARM**. Cash Price, **£2 10 0**

Only Balance in 11 monthly payments of **4 7**.

Send **12/9** **LISSEN S.G. THREE KIT**, S.G., Detector, and Power. Cash price, **£6 19 0**.

Only Balance in 11 monthly payments of **12 9**.

Send **10/6** **DYNAPLUS SCREENED THREE KIT**, S.G., detector, and power. Cash Price **£5 14 6**

Only Balance in 11 monthly payments of **10 6**.

Send **10/9** **REGENTONE W.5 COMBINED H.T. ELIMINATOR AND TRICKLE CHARGER**. One S.G., 1 variable, and 1 fixed tapping for H.T. L.T. charging for 2, 4, and 6 volts. For A.C. mains. Cash Price **£5 17 6**

Only Balance in 11 monthly payments of **10 9**.

Send **7/6** **STANDARD WET H.T. BATTERIES**, 144 volts, 20,000 m.a. Cash Price **£4 2 0**

Only Balance in 11 monthly payments of **7 6**. Other voltages and capacities available. Detailed prices on application.

Send **7/9** **BLUE SPOT MODEL 61R CABINET SPEAKER**. Cash Price **£4 4 0**

Only Balance in 11 monthly payments of **7 9**.

Send **12/4** **B.T.H. R.K. PERMANENT MAGNET SPEAKER**. Unit only. Cash Price **£6 15 0**.

Only Balance in 11 monthly payments of **12 4**.

Send **11/-** **B.T.H. ELECTRIC GRAMOPHONE MOTOR**. An entirely new model. Cash price, **£3 3 0**.

Only Balance in 5 monthly payments of **11/-**.

Send **11/-** **ATLAS H.T. ELIMINATOR AND CHARGER**, Model 188 for A.C. Mains. Cash Price **£6 0 0**.

Only Balance in 11 monthly payments of **11/-**.

**IMMEDIATE
DELIVERY**

**STRICT PRIVACY
GUARANTEED**
to Easy Payment Orders

**ALL ORDERS
CARRIAGE PAID**

PETO SCOTT CO. LTD.

LONDON : 77 City Road, E.C.1.

'Phone : Clerkenwell 9406-7-8.

62 High Holborn, W.C.1.

'Phone : Chancery 8266.

MANCHESTER : 33 Whitelaw Road,

Chorlton-cum-Hardy.

'Phone : Chorlton-cum-Hardy 2028

NEWCASTLE, STAFFS : 7 Albany Rd.

OUR NEW CATALOGUE

describing **ALL THE LEADING MAKERS' Receivers, Components, Radio Gramophones, Pick-ups, etc.** A veritable guide to Radio. Get your copy to-day.

PLEASE SEND ME FREE YOUR (a) 1931 EASY WAY CATALOGUE; (b) LATEST PILOT RADIO CHART.

NAME _____

ADDRESS _____

A.W. 6 12 30

PROMPTITUDE . . . FAIR DEALING . . . TRUSTWORTHINESS

(A customer's unsolicited testimony)

Advertisers Appreciate Mention of "A.W." with Your Order

Buy by post - it's quicker. Post this Coupon NOW



Christmas - Light Waves Greetings from the Stars



"May the jolliest lilt of life's musical comedy ring in your ears at this season."
Yours sincerely,

Harold Kimberley

"The man's a fool," my own expression about myself, and yet I would not change it. When I think of my correspondence, letters charming-pathetic, letters cheery-tragic, letters from the old folks, the exiles from home, the sick, and the sightless, then to all those I have amused, bored, or left just indifferent, wherever and whoever you are, I wish you just what the privilege of broadcasting has given to me—I wish you great happiness."



Harold Kimberley



Gershom Parkington wishes all listeners sincere good wishes for Christmas, 1930.

"Hello, Folks! Here's wishing you all a joyous Christmas and happy New Ears—sorry, Years."—Yours with holly on,

Tommy Handley

"Greetings," said he, 'to all this Yule, From Stainless Steve (the man's a fool). To little Nell, her Dad and Mamma, Good health and prosperity comma. May everything for you be bon in A.D. 1931.'"



Stainless Steve



"Un Bon Souhait To all readers a right merry Christmas and a New Year brim full of happiness"
—Vot're sincerement.

Yvette Daruac

"Here's comfort to the sad, health to the sick, good fortune to the needy, and love to you all."



Marcel Constantino

"My very best wishes to all listeners for a merry Christmas and prosperous New Year."

Jean Allistone

"THE B.B.C. CHRISTMAS PROGRAMMES"

(Continued from page 916)

St. Hilary, Cornwall, will come to us again via the Plymouth stations of the B.B.C. The play is by Rev. Bernard Walke, and he asks listeners to remember that it is performed not as entertainment but as an act of worship on the part of the village actors. The whole church is their stage about which they move, from the west end to the Jesus Chapel, as the action dictates.

An interesting programme for regional listeners is "A Christmas Miscellany," which will be heard on December 23. With Gershom Parkington Quintet music, the voices of the Wireless Singers and a fifteenth-century background, the programme will range through Chaucer and Shakespeare to Ben Jonson, Herrick, Tennyson, and Bridges.

The Lord Mayor's dinner at the Guildhall to little Londoners on December 23, will provide a broadcast breathing the spirit of Christmas. Listeners may visualise the arrival of the sheriffs and aldermen in their gorgeous civic robes and the festive scene as the scarlet-coated trumpeters sound the fanfare which ushers in the plum pudding.

To many of these crippled children the Lord Mayor is Father Christmas.

On December 23 also, an excerpt lasting nearly an hour and a half will be given from *The Love Race*, relayed from the Gaiety Theatre.

Christmas Eve brings a relay of carols from Whitechapel Parish churchyard, and for this the Wireless Choir and part of the Wireless Military Band will journey to the East End. Year after year the carol singer decreases in number. The B.B.C. singers have taken their place and bring their music nearer still to our fireside.

The programme on Christmas Day opens with a relay from Canterbury Cathedral, followed, after a short interval, by cinema organ music by Reginald Foort. The service will be heard on Midland Regional also, and this station will have the Shipping Forecast to enable listeners to tune in and not oscillate after the service has begun.

The regional wavelength will be given over to a long spell of gramophone record broadcasting—from noon until 3.0 p.m., to be precise—to enable listeners to test the new sets which the B.B.C. staff hope may be found among the gifts in many a home this Yuletide. Jack Payne and the B.B.C. Dance Orchestra play from 5.15 to 6.15.

In the evening Rev. J. A. Mayo, rector of Whitechapel, will conduct a studio service at 6.30. Mr. Mayo was the first parson to broadcast for the B.B.C., having taken part in its first Christmas programme in 1922.

It is unlikely that any news bulletin will be given on Christmas night; and so, after the pantomime, an orchestral concert will take place, followed by a programme of reminiscences, in which the spirit of Christmas will arouse happy memories in the listener's heart. The evening will close with dance music, starting on the regional wavelength at 10.15, and on the Daventry national wavelength at 10.45, and lasting until 1.0 o'clock on Boxing morning.

At some period in the Christmas night programmes an interchange of Greetings between Britain and America will be relayed, fitting in as nearly as possible with the time when all good Americans are eating their Christmas dinner. The arrangements for the relay have yet to be made, but it is hoped that some eminent persons on both sides of the Atlantic may consent to take part in the broadcast.

The last play of the year will be *The Silver King*, which is to be heard by regional listeners on Boxing Day.



EVERYBODY'S ALL-ELECTRIC RADIO-GRAPHOPHONE

by

Columbia

Made by the makers of Columbia graphophones and records, this instrument is popularly priced yet retains a quality worthy of the high Columbia standards. It brings a Columbia Radio-Graphophone within the reach of thousands of homes. A demonstration (see coupon) will enable you to appreciate its merit.

OAK
40 gns.

A.C. mains supply for H.T., L.T., and gramophone motor. Moving Coil Speaker. 3-valve screen-grid circuit with Super-power output. Illuminated single tuning control, marked in wavelengths.

MAHOGANY
43 gns.



* I should like to hear Model 310 playing in my home. Please arrange this without cost or obligation to myself.
* I should like a copy of the Columbia Radio Book and/or catalogue of Radio-Graphophones.

* Cross out if not required.

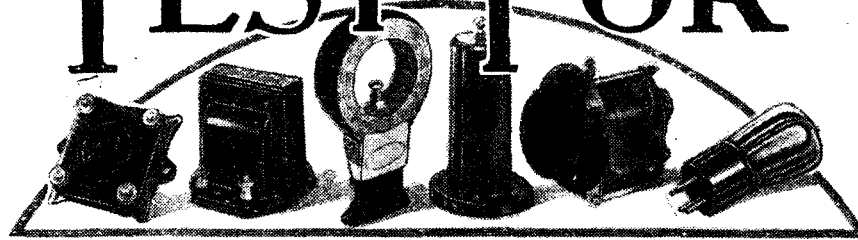
Cut this out and post it in an unsealed envelope bearing a 1d. stamp to:—
Columbia, 102, Clerkenwell Road, London, E.C.1.

NAME

ADDRESS

WE TEST FOR YOU

A weekly review of
new components

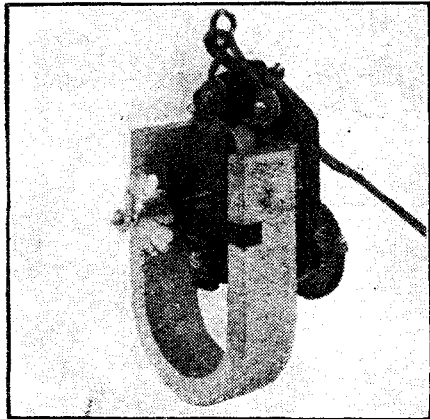


and tests of
apparatus.

Conducted by our Technical Editor, J. H. REYNER, B.Sc., A.M.I.E.E.

Kone-Dope Speaker Unit

WE have received for test a simple but robust speaker unit made by the Kone-Dope Co.



The Kone-Dope speaker unit

This unit consists of two pole pieces of laminated iron, in conjunction with a large horseshoe magnet. A vibrating reed is mounted over the pole pieces and may be

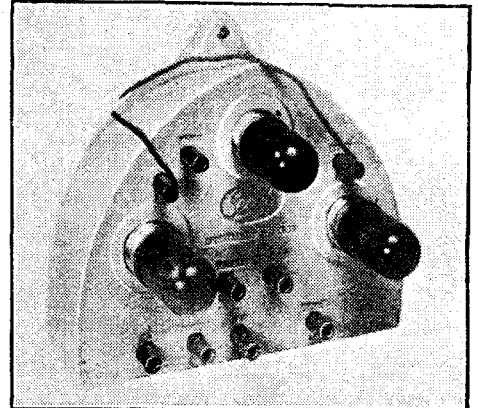
readily adjusted to give the minimum gap with maximum sensitivity by rotating a knob in a clockwise direction.

When mounting in a cabinet it is necessary to drill three holes to take the fixing screws, and a clearance hole for the adjusting spindle.

During tests, the unit was mounted to a 10-in. cone of known efficiency behind a 2-ft. baffle. It was found that sensitivity was up to standard, and the tone full in quality. Tested on a strong output such as might be obtained from a super-power valve, there was no tendency to dither. It is not to be expected that a simple and inexpensive unit of this type could reproduce with equality the full audio-frequency spectrum; nevertheless the reproduction was pleasant to hear, and the articulation of speech satisfactory.

E. Paroussi, 10 Featherstone Buildings, High Holborn, W.C.1.

In this, the current from the mains is



A novel direct-current eliminator,
marketed by Paroussi

Paroussi Eliminator

AN eliminator and battery trickle charger, for D.C. mains, selling at 30s. complete, is an attractive proposition. Such is the briefest description of the Secol eliminator-charger, obtainable from Messrs.

passed through three resistance lamps, which in conjunction with reservoir condensers provide three voltage tapplings. (Continued on the next page)

BROADCAST TELEPHONY

Broadcasting stations classified by country and in order of wavelengths. For the purpose of better comparison, the power indicated is aerial energy.

Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)
GREAT BRITAIN				DENMARK				HOLLAND				SPAIN			
25.53	11,751	Chelmsford (G5SW)	15.0	338.2	887	Veltheim (Lourain)	15.0	246.4	1,217.2	Cassel	0.3	31.31	826.1	Frederiksstad	0.7
242	1,238	Belfast	1.2	281	1,067	Copenhagen	1.0	233.4	1,184	Leipzig	2.3	453.2	662	Porsgrund	1.5
261.3	1,148	London Nat.	68.0	1,153	260	Kalundborg	10.0	259.3	1,157	Gleiwitz	5.6	451.2	662	Nidaros	1.2
288.5	1,040	Newcastle	1.2	ESTONIA				270	1,112	Kaiserslautern	0.25	1,060	283	Oslo	75.9
288.5	1,040	Swansea	0.16	401	748	Reval (Tallinn)	0.7	276	1,085	Königsberg	1.7	POLAND			
288.5	1,040	Stoke-on-Trent	0.16	FINLAND				283.6	1,058	Magdeburg	0.6	214.2	1,400	Warsaw (2)	1.9
288.5	1,040	Sheffield	0.16	221	1,355	Helsinki	15.0	283.6	1,058	Berlin (E)	0.6	231	1,283	Lodz	2.2
288.5	1,040	Plymouth	0.16	291	1,031	Vilpuri	15.0	283.6	1,058	Stettin	0.6	244	1,229	Cracow	1.5
288.5	1,040	Liverpool	0.16	1,706	107	Lahti	54.0	316.6	947.6	Bremen	0.3	312.8	959	Wilno	0.5
288.5	1,040	Hull	0.16	FRANCE				318.8	941	Dresden	0.3	381.1	887.1	Poznan	1.9
288.5	1,040	Edinburgh	0.4	200	1,500	Radio Roubaix	0.2	325	923	Breslau	1.7	381	788	Lxov	2.2
288.5	1,040	Dundee	0.16	222.9	1,346	Fécamp	1.0	360	833	Stuttgart	75.0	409.3	732	Katowice	16.0
288.5	1,040	Bournemouth	1.2	235.1	1,275	Nîmes	1.0	372	806	Hamburg	1.7	1,411	212.5	Warsaw	14.0
288.5	1,040	Bradford	0.16	240.6	1,247	Beziors	0.6	390	770	Frankfurt	1.7	SWEDEN			
301	995	Aberdeen	1.2	249.7	1,201	Juan-les-Pins	0.5	418	716	Berlin	1.7	251	1,193	Barcelona	1.0
300.9	968	Cardiff	1.2	256	1,171	Toulouse (PTT)	1.0	HUNGARY				SWITZERLAND			
356.3	842	London Reg.	45.0	265	1,130	Lille (PTT)	15.0	312.8	959	Eindhoven (PCF)	30.0	230.6	1,301	Malmö	0.75
376.4	797	Manchester	1.2	272	1,103	Rennes	1.2	290	1,004	Hilversum	8.5	257	1,166	Hörby	15.0
398.0	752	Glasgow	1.2	286	1,040	Montpellier	2.0	IRISH FREE STATE				300.2	999.3	Falun	0.65
479	626	Midland Reg.	38.0	286.8	1,040	Radio Lyons	0.5	224.4	1,337	Cork (IFS)	1.5	322	932	Göteborg	15.0
1,554	193	Dayentry (Nat.)	35.0	296.4	1,012.1	Limoges (PTT)	0.08	413	723	Dublin (2RN)	1.5	433	689	Stockholm	75.0
AUSTRIA				300	1,000	Strasbourg	1.0	ITALY				542	534	Sundsvall	15.0
240	1,220	Linz	0.6	304	988	Bordeaux (PTT)	35.0	60	Rome (3RO)	9.0	770	389	Ostersund	0.75	
246	1,220	Salzburg	0.6	315	952.5	Neuilly (Paris)	0.3	296	1,103	Turin (Torino)	8.5	1,229.5	244	Boden	0.75
283.6	1,058	Innsbruck	0.6	316	958.5	Natan-Vitus	0.7	312	916.2	Genoa	1.5	1,348	222.5	Motalla	40.0
352	851	Graz	9.5	316	950	Marseilles (PTT)	1.5	441	686	Rome (Roma)	75.0	318.8	943	Basle	0.65
453	666	Klagenfurt	0.6	328.2	914	Grenoble (PTT)	1.2	453	662	Bolzano (IBZ)	0.2	403	743	Berne	1.1
517	581	Vienna	20.0	329	911	Caen (Normandy)	0.6	501	599	Milan (Milano)	8.5	459	653	Zurich	0.75
BELGIUM				329.5	910.3	Poste Parisien	1.2	NORWAY				678.7	454.6	Lausanne	0.6
203	1,456	Ververs	0.3	GERMANY				361	824	Bergen	1.0	700	395	Geneva	1.5
206	1,457	Antwerp	0.4	31.33	9,560	Zeesen	15.0								
212	1,415	Bincbe	0.2	218	1,373	Flensburg	0.6								
216	1,391	Chateaufort	0.25	227	1,319	Cologne	1.7								
243	1,235	Courtrai	0.1	227	1,319	Münster	0.6								
244.7	1,226	Ghent	0.25	227	1,319	Aachen	0.31								
244.1	1,227	Schaerbeek	0.5	232.2	1,292	Kiel	0.3								
609	590	Brussels (No. 1)	1.2	239	1,256	Nürnberg	2.3								

"WE TEST FOR YOU"*(Continued from preceding page)*

one marked S.G., the second, "detector," and the third, "power." A porcelain case, having overall dimensions of 6½ in. by 6½ in. by 4½ in., forms the holder for the lamp and the output sockets.

Tested in our laboratory on an input of 240 volts, an output of 170 volts was obtained from the power socket with a consumption of 20 milliamps. From the detector socket 85 volts were obtained at 6 milliamps, and from the screen-grid socket 120 volts were obtained at 8 milliamps. The unit was then tried with a variety of receivers and was found to give good hum-free reception.

"YOUR NEW SET—AND HOW TO MAKE THE MOST OF IT"*(Continued from page 914)*

of the set has the leisure to get to know the relative settings on the tuning dial of the more important stations.

The really keen owner of a new set known to have a good range of reception, is referred to the article "On the track of those thirty stations" in **AMATEUR WIRELESS** dated November 1. But for the more casual ether searcher I can name the outstanding stations.

The long waves are full of such stations; set the wave-range knob to "long," turn the knob, dial, or whatever tuning control is fitted, to the Daventry mark. Then move upwards a few degrees for Radio Paris. Move down a little below Daventry for the Eiffel Tower. Right at the top of the scale is Huizen, and right near the bottom is Oslo. Just above Oslo is Kalundborg.

These stations do not depend upon darkness for their good reception; but when we go down to the medium waves the strength is not good on any foreign station until after about 5 o'clock in the afternoon. Logs may be compiled of 30, 40, or even 50 stations by the old hand. The man in the street, trying out a new set for the first time, need expect less than a dozen good foreign signals.

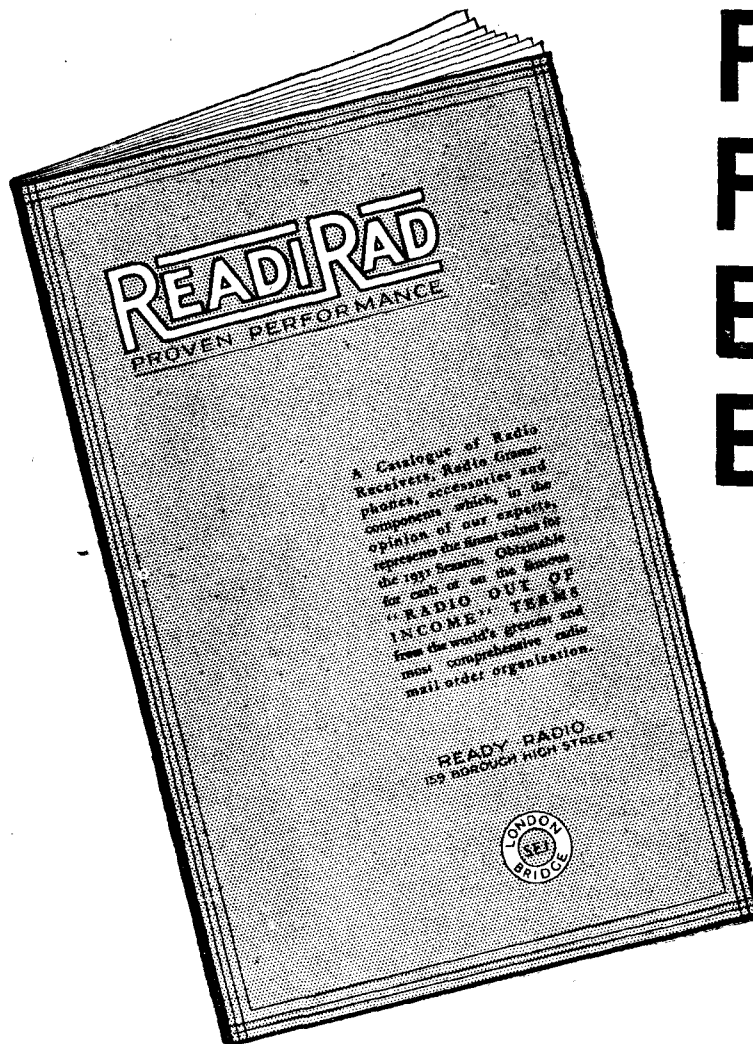
One of these will almost certainly be Budapest, at the very top of the scale. A few degrees lower will be heard Vienna. Not far below the Midland Regional, Rome and Stockholm will be found, within a degree of each other. Just above the London Regional is Toulouse and not far below the London Regional are Strasbourg and Bordeaux. Below the London National are Cologne and Nurnberg, all easily identifiable.

"Amateur Wireless and Radiovision." Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd."

General Correspondence is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets. **Contributions** are always welcome, will be promptly considered, and if used will be paid for. **Queries** should be addressed to the Editor, and the conditions printed at the head of "Our Information Bureau" should be closely observed. **Communications** should be addressed, according to their nature, to The Editor, The Advertisement Manager, or The Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4.

THIS NEW CATALOGUE

FREE



Send this Coupon for your free copy to-day

TO READY RADIO,
159, BOROUGH HIGH ST.,
LONDON BRIDGE, S.E.1

Please send me, by return,
a copy of your FREE
CATALOGUE

"RADIO OUT OF INCOME"

NAME

ADDRESS

A.A.W.

A catalogue of the finest modern Radio - Gramophones, Receivers, Components, and Accessories, obtainable by our famous Easy Terms—

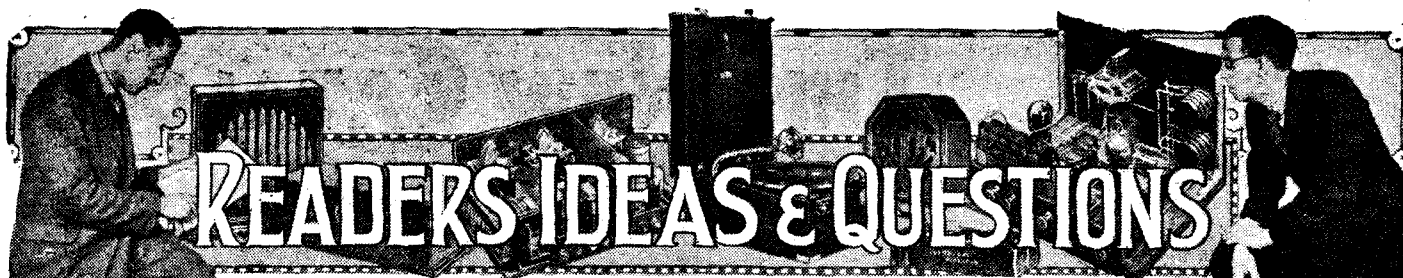
"RADIO OUT OF INCOME"

Ready Radio

159, BOROUGH HIGH STREET,
LONDON BRIDGE, S.E.1.

Telephone: HOP 5555 (Private Exchange) Telegrams: READIRAD, SEDIST.

Advt. of Ready Radio (R.R. Ltd.), 159, Borough High Street, London, S.E.1.



Testing Moving Coils

SIR.—We are writing to draw the attention of readers to a point in connection with the demonstration of moving-coil speakers, which, although one would expect it to be widely known, yet experience indicates that such is not the case. We refer to the employment of a baffle board or suitable cabinet when demonstrating moving coils.

The theory of operation of these speakers indicates that a baffle is essential if the bass notes are to be produced, and this fact is fairly well known amongst experimenters. A considerable number of cases have, however, been brought to our attention where amateurs and dealers have tested moving-coil speakers without the use of a baffle, with consequently very poor results.

This procedure is excused on the grounds that other speakers, with which comparison is made, have been tested under similar conditions, but obviously a moving-coil speaker of any make if operated without a baffle or suitable cabinet to isolate the sound emitted from the front of the diaphragm from that emitted from the back, can give only a caricature of the results of which it is capable when normally used.

FERRANTI, LTD. (Hollinwood).

Those Nationals!

SIR.—I.L.S.J. (Stoke-on-Trent) asked recently what is to prevent the five Nationals using one wavelength for the same programme. Personally, I can think of no reason, unless it is that the B.B.C. is desirous of preventing the reception of alternative programmes from abroad. Like I.L.S.J., I cannot see either the need for the proposed high power for the small areas to be served.

I am so fed up with the interference by Brookmans Park with the foreigners that I listen-in on Sundays only now between 6 and 8 p.m., when Brookmans Park is not on the air to spoil everything. That is to

say, two hours a week instead of about twenty-six under the old conditions.

D. R. P. (Richmond).

The Northern Regional

SIR.—A correspondent in Stoke-on-Trent suggests putting all National programmes on one wavelength after the manner of the present relays.

If he lived in this district, where we are situated on the half-way line between Stoke and Liverpool, he would not give the matter any further consideration. When you tune to the "common wave" the result in your speaker is a roar comparable with the entire air forces of the world passing overhead!

J. D. H. (Newton).

Stroboscopic Testing

SIR.—We notice a mention is made in "A.W." No. 437 of the stroboscopic method of testing. You might be interested to know that this method by what is called the Plateau disc is almost obsolete now, and the big picture corporations in this country and the United States are using the Ashdown Rotoscope almost exclusively. We have applied it to the examination of high-frequency electrical discharges necessitating a shutter speed for the instrument of 1,500 per second.

A. J. ASHDOWN, LTD. (London, S.W.1).

"British Broadcast Two"

SIR.—Perhaps the following remarks concerning your "British Broadcast Two" will be of interest. I have had for about a year a well-known factory-made all-mains A.C. two-valve set, employing detector and pentode valves. I am about fifteen miles from Brookmans Park and use a 60-ft. indoor aerial of Super Electron wire. With my all-mains set I get plenty

of volume from Brookmans Park and fairly good signals from 5GB. I can only get a faint whisper from 5XX.

I built the "British Broadcast Two" a few weeks ago, and I was amazed at the results. I use only a small power valve.

The volume from Brookmans Park is as good as with the all-mains set and the quality is better. Both stations are separated easily. Furthermore, 5GB comes in a little louder than with the mains set, and 5XX very much louder using the same aerial and earth. I have also heard on the speaker Turin, Radio Toulouse, and Rome, but, of course, not very loudly.

C. V. T. (London, W.13).

Mains Working

SIR.—In the concluding sentence of his recent article on mains working, Mr. Kenneth Ulyett states that it is a bad plan to have the trickle charger running at the same time as the set.

As a matter of practical experience, I have been running a Ferranti charger for the last two and a half years, and it is usually running with the set. I asked the makers if this procedure was likely to harm the charger, and they replied that I needn't worry if I didn't mind the hum. As my mains unit is very generously smoothed, I find no hum to mind. The valves in the set have been going for three years, often five, six, or even eight hours a day; so I can't see much harm in the arrangement myself.

G. M. P. (Tunbridge Wells).

With a good charger there should be negligible hum, but the danger is in the increased low-tension voltage. A freshly charged accumulator may have a voltage of considerably over two volts per cell, and the continued application of this (with a charger always in circuit) will very probably shorten the valve life. There is the risk, too, that the accumulator may accidentally be disconnected, when the charging voltage will be applied direct to the valves.—KENNETH ULYETT.

"A.W." Solves your Wireless Problems

SPECIAL ANNOUNCEMENT TO LONDON LISTENERS

YOU would doubtless like to be spared the constantly recurring expense of Dry Batteries and the poor reception caused by the gradual voltage drop. The many unquestionable advantages of Wet H.T. Accumulators can be yours—without the problems of initial cost and re-charging. Our unique hire service offers you the famous CAV High Tension

Accumulators fully charged and ready for immediate use. They are delivered to your door (anywhere within 12 miles of Charing Cross) at convenient intervals; and at an inclusive charge which represents a vast saving over your present expenditure, and definitely guarantees better reception than partly-discharged Dry Batteries. Over 11,000 London listeners

testify to the excellence of this unique service which caters for every possible High and Low Tension wireless accumulator requirement, either by our hire service or the maintenance of your own accumulators. Write for interesting Price List NOW.

Radio Service (London) Ltd., 105a Torriano Ave., Kentish Town, N.W.5. 'Phone, North 0623 (3 lines).

LISSEN ACCUMULATOR



Free CARRIER SUPPLIED

One more triumph of Lissen organisation—one more example of Lissen value for money—the Lissen L.T. accumulator. Here is a complete range of highly efficient accumulators, sturdily built to give absolute satisfaction in use and long life. These accumulators are designed to give absolutely trouble-free service. The plates are all very thick, the containers are strongly made, and the general appearance and finish of the Lissen accumulators is far in advance of usual standards.

All the Lissen accumulators listed below are supplied with strong carrier, free.

PRICES DULL Emitter (Type G.M.)

L.N.503 2-volt, 20 amp. hours	4/6
L.N.504 2-volt, 20 amp. hours	8/6
Multiple plate type, glass containers.	
L.N.500 2-volt 20 actual amp. hours	9/6
L.N.502 2-volt 45 actual amp. hours	13/6
L.N.500 2-volt 60 actual amp. hours	17/6

EXTRA CAPACITY

L.N.555 2-volt 24 actual amp. hours	10/6
L.N.557 2-volt 48 actual amp. hours	14/6
N.L.559 2-volt 72 actual amp. hours	18/6



H.T. ELIMINATORS YOU CAN USE WITH YOUR SET LIKE A BATTERY

The current you get from Lissen Batteries is the purest power you can get for radio. But if you want to use an eliminator, use a Lissen Eliminator. You'll then get H.T. current from your mains smoother, steadier, better than before.

There are 4 types of Lissen Eliminator: one of them will almost certainly be just right for your set. Tell your dealer what voltage your mains supply is and whether it is A.C. or D.C.; tell him what output you require, or what valves you are using, and he will show you the Lissen Eliminator to suit your needs. Then you only have to take your battery out and put the Lissen Eliminator in its place. No need for special wiring. These Lissen eliminators are cased in insulating material and the lead is heavily insulated cab-type flex.

TYPES AND PRICES	
D.C. MODEL "A" (100-150 volts and 200-250 volts.)	D.C. MODEL "B" (100-150 volts and 200-250 volts.)
Employs 3 H.T. + tap- pings; H.T. +1, giving 80 volts for S.G. valves; H.T. +2, giving 60 volts at approximately 2 m.a. for detector valves; H.T. +3, giving 120/150 volts at 20 m.a.	Employs 3 H.T. + tap- pings; H.T. -1 and H.T. +2 are con- tinuously variable (by means of two control knobs) and capable of giving any desired voltage up to 120/150 volts at approximately 2 m.a.; H.T. +3, giving 120/150 volts at 20 m.a. for power valves.
Price ... 27/6	Price ... 39/6

A.C. Model "A"
Tappings as in D.C. Model "A."
100-125 volts and 200-250 volts.

Price ... £3:0:0

A.C. MODEL "B"
Tappings as in D.C. Model "B."
100-125 volts and 200-250 volts.

Price ... £3:15:0

LISSEN ELIMINATORS

LISSEN LTD., Worpole Road, ISLEWORTH, Middlesex.
(Managing Director: T. N. COLE).



12/6 BUYS YOU The LISSEN FOUR-POLE ADJUSTABLE BALANCED ARMATURE UNIT

The Lissen 4-Pole Balanced Armature Unit brings something approaching loud-speaker perfection within the reach of everybody who owns a radio set. You can build any type of cone loud-speaker with it; you can use it with a big baffle board, or put it in a cabinet. You can build a linen diaphragm loud-speaker with it, or you can buy it completely assembled and ready to connect up to your set. It has a fine adjustment, and you therefore get the utmost volume from it without chatter.

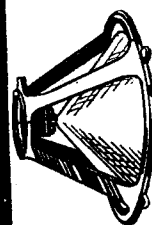
In brown moulded case with attachment for fitting to any type of cone. PRICE 12/6

Cast aluminium Chassis, specially designed to give the best results from the Unit. PRICE 7/6

13-in. cone for use with the above, 2/6

COMPLETE ASSEMBLY

with which you get the nearest possible approach to moving-coil tone and fine full volume without chatter.



Ready for use
or to mount
in a cabinet.
PRICE

22/6

GIVE YOUR SET A XMAS GIFT



H.T. from
the mains
■
No more
worries

A Saving of 40%

If you want to be sure that your set will be working at its best during the Christmas holidays replace your old-fashioned H.T. dry battery *now* with a Stal H.T. Eliminator.

The Stal Eliminator gives you H.T. direct from the mains in a steady flow—free from violent fluctuations and free from the steady loss of power which is inevitable with the old style dry battery. That is why the Stal Eliminator cannot fail to improve the performance of your set.

You can build the Stal Eliminator in less than two hours with only a screwdriver and a pair of pliers. Everything you need (except the rectifying valve for A.C. Eliminators) is included in the kit. There are no holes to drill, no soldering, no trouble, and no mess. Detailed instructions, diagrams, and photographic reproductions are given. It is practically impossible to go wrong.

Get a Stal Kit to-day and have it in service for Christmas. You will save at least 40% and the Stal will give you as good service as the dearest eliminator you can buy.

STAL A.C. H.T. KITS

40m/a Senior Kit. Output, 175 v. 40 m/a. 60/-
3 variable tappings.

20m/a Junior Kit. Output, 140 v. 20 m/a. 42/-
1 variable tapping.

STAL D.C. H.T. KITS

30m/a Senior Kit. Output 150 v. 30 m/a. 2 variable tappings. 45/-

20m/a Junior Kit. Output 120 v. 20 m/a. 1 variable tapping. 30/-

Built-up Eliminators

A.C. Senior Kit—Output 40 m/a 175 v. 3 Variable Tappings (including Triotron Rectifying Valve) ... £3 19 6

A.C. Junior Kit—Output 20 m/a 140 v. 1 Variable Tapping (including Triotron Rectifying Valve) ... £2 19 6

D.C. Senior Kit—Output 30 m/a 150 v. 2 Variable Tappings... £2 10 0

D.C. Junior Kit—Output 20 m/a 120 v. 1 Variable Tapping ... £1 12 6

STAL

ELECTRIC LAMP SERVICE COMPANY, LTD.
39-41 Parker St., Kingsway, London, W.C.2
Telephones: Holborn 6634, 6635, 0070.
Northern Distributors: CHORLTON METAL
COMPANY, LTD., Millgate House, 18 Amber
Street, Shudehill, Manchester. Telephone:
Blackfriars 7637.



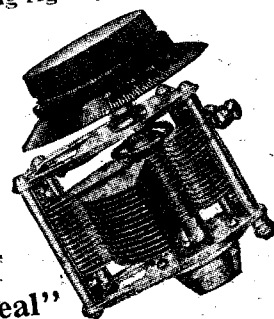
Polar makes tuning easier

because:

The Fast and Slow motion control as fitted to the "IDEAL" gives you direct and definite control over your condenser with *no* noisy gears to be sprung in or out.

The reduction movement runs on ball-bearings and the main shaft is suspended on ball races at either end, resulting in an action which is marvellously smooth yet precise.

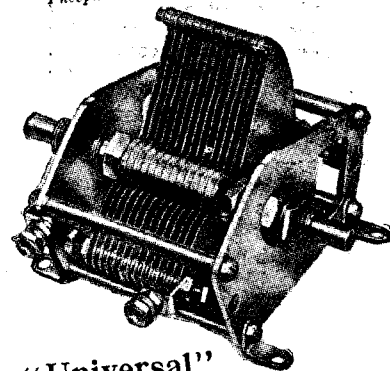
The entire condenser is rigidly built in a stout frame ensuring rigidity of rotor vanes.



The "Ideal"

Reduction movement enclosed and fully protected. One-hole panel mounting. Built throughout of chemically cleaned, hard brass.

.0003 - 12/- .00035 - 12/3 .0005 - 12/6
Phosphor Bronze Balls 6d. extra.



The "Universal"

A Condenser specially designed for ganging. Fitted with detachable spindle (various lengths supplied). Baseboard mounting lugs ensure rigidity and accurate alignment. Locked rotor vanes. Suitable for mounting to any type of S.M. dial.

.0003 - 7/-
.0005 - 7/6
Phosphor Bronze Balls 3d. extra.

FREE—24 PAGE POLAR CATALOGUE

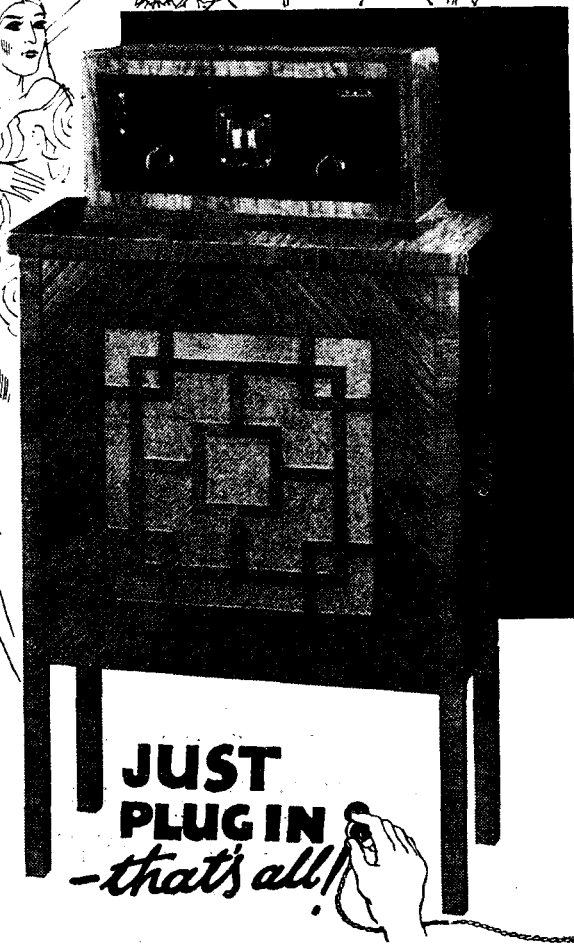
WINGROVE & ROGERS, LTD.,
188-189 STRAND, LONDON, W.C.2

Polar Works: Old Swan, Liverpool.



To Ensure Speedy Delivery, Mention "A.W." to Advertisers

DANCE TO THE SPECIAL XMAS HOME and CONTINENTAL PROGRAMMES!



**JUST
PLUG IN**
-that's all!

WATTS

"All Electric 4"
Set complete. 4 valve S.G. receiver (as illustrated on top of cabinet speaker) in handsome polished walnut case ready for reception. Provided with pick-up sockets. Price £25 or £24.6 first payment.

All Electric Set with Pedestal Cabinet Loud Speaker Complete (as illustrated). Incorporating the Watts 20" Double Cone Chassis and Watts Star Unit. A handsome piece with remarkable tonal quality and volume. Price £31.6.0 or £21.5.6 first payment.

All Electric Radio-Gram. Paillard Electric turntable motor. Watts Double Cone Speaker, Unit and Pick-up and Watts A.C. all mains 4 receiver and amplifier. A superb instrument. Mahogany, £51.10.0 or £41.1.6 first payment. Walnut, £54.10.0. Oak, £50.

Hear it demonstrated. Your dealer can supply. Guaranteed for twelve months by:

The STANDARD BATTERY CO.

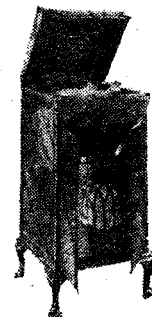
(Dept. A.W.), 184-188, SHAFTESBURY AVENUE, LONDON, W.C.2

TANNOY PRODUCTS

"ALL-ELECTRIC" RADIO-GRAMS

Not massed produced, but individually built—A matched transformer-coupled moving-coil speaker is incorporated in this set—slow speed induction motor, high stage gain screen-grid H.F., power detector, one R.C. stage and with 10-watt power output stage—illuminated dials.

PRICES from **45 GNS.**

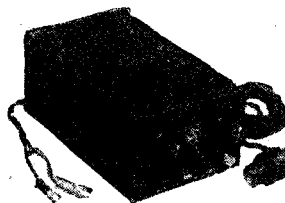


MAINS UNITS

A.C. and D.C. models from stock suitable for all voltages. No hum. Everlasting—trouble free. H.T. 120 v. at 15 m.a.

£2 17 6

H.T. and L.T. combined (with Westinghouse Rectifier) **£5 10 0**



DALTON STREET, WEST NORWOOD, S.E.27



Specified for the Searcher Short-wave 2

Every short-wave set seems these days to have a pair of Ericsson Supersensitive Telephones hooked up.

Their sensitivity is really astonishing, and their well-planned construction permits of long comfortable sessions at the dials.

Crystal users will find them wonderfully sensitive to the weakest signal. They get the last ounce out of a good crystal set. Sold by all first-class retailers or direct from:

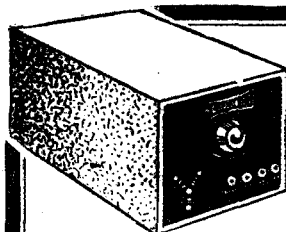
ERICSSON TELEPHONES LTD.
67/73 KINGSWAY, LONDON, W.C.2

120, 2,000 and
4,000 ohms.

12/6

Ericsson

**BRITISH
SUPERSENSITIVE
TELEPHONES**



Have you seen the new HEAYBERD Eliminator Kits at your dealer's?

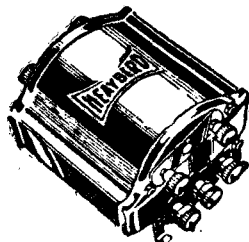
The new A.C. eliminator kits that are absolutely complete. Containing only the finest components and including a Westinghouse Metal Rectifier. These eliminators, when constructed, are far cheaper to run than accumulators and supply steady hum-free power far more consistent than that obtained from batteries. Prices of kits from 69/6 according to power required. When ordering state mains voltage.



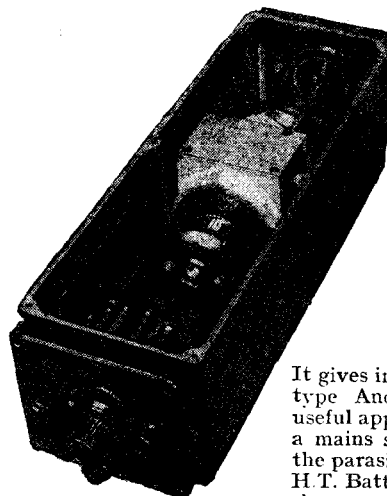
F. C. HEAYBERD & CO.
10, Finsbury Street, E.C.
↑ Phone: Met. 7516

Below is an illustration of the Heyberd H.T. Transformer, an exceedingly reliable component for mains eliminators. Endorsed by the leading Radio papers, who comment on its remarkable efficiency and careful construction. Designed for use with Westinghouse Metal Rectifiers, these transformers range in price from 14/- according to output required. Write for Lists.

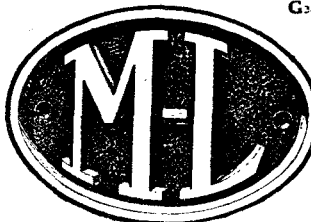
The HEAYBERD H.T. Transformer



WHY READERS ARE SENDING FOR LEAFLET 547/1



It gives interesting details of the M-L BX type Anode Converter—a particularly useful apparatus for radio users without a mains supply and which is free from the parasitic noises often associated with H.T. Batteries. It can be operated from the same accumulator as is used for heating the valve filaments. Can be supplied to run from a 6 volt accumulator, gives an output of 15 m.a. at 120 or 150 volts. Get your copy of leaflet 547/1. Send a p.c. TO-DAY.



ANODE CONVERTER

Contractors to:—The Air Ministry,
The British Broadcasting Corporation,
The General Post Office, Marconiphone,
The Gramophone Co., Ltd., etc., etc.

RADIO DEPT. J. **M-L MAGNETO SYND. Ltd., COVENTRY.** TEL. 5001

FOR .. ELECTRIC REPRODUCTION USE A LIMIT

Adjustable
Length, Track-
ing Angle
Spring Tension

Continental
& Foreign
Fittings.

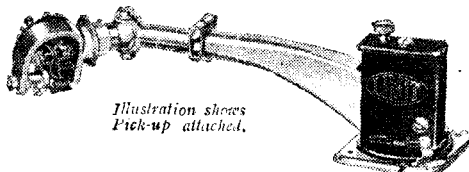


Illustration shows
Pick-up attached.

PICK-UP ARM 15/6 EACH

Obtainable through all factors and dealers
or write

LIMIT RADIO LIMITED, ALBION ST., LONDON, N.1

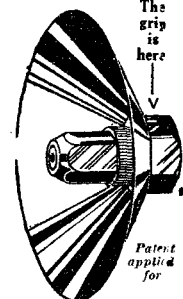
A NEW CHUCK that makes a wonderful dif- ference to purity and tone of all Cone Loud-speakers

The firmer the grip on the reed, the finer the reproduction. TONAX has, in addition to the usual small screw, a Split End Taper Chuck with screwing device, which grips the reed at the back so securely that all possibility of chatter, which causes tinniness and poor tone, is eliminated. The TONAX definitely allows every atom of energy to be reproduced to its full extent without the slightest sign of distortion.

Get your TONAX at once and improve the purity of your present Cone Loud-speaker by 100 per cent. PRICE 1/-. Nickel-plated finish. Specially lined washer. If your dealer cannot supply, send us 1/2 and we will supply by return. Post Free. Address: Dept. "A. X."

Sole manufacturers:

GARRATT STORES (Wholesale Dept.)
193 GARRATT LANE, WANDSWORTH, LONDON, S.W.18.



Price 1/-
From most dealers.
**TRADE ENQUIRIES
INVITED**

4/6

POST 4d.

2 valves or more
sent POST FREE.
Matched Valves
1/- extra per set,
Sent C.O.D. if
desired.

*Phone:
City 3788.



LIST OF P.R. SUPER GOLDEN SERIES.									
Type	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts	Watts
4/6	50	100	200	400	800	1600	3200	6400	12800
10/6	50	100	200	400	800	1600	3200	6400	12800
15/6	50	100	200	400	800	1600	3200	6400	12800
20/6	50	100	200	400	800	1600	3200	6400	12800
25/6	50	100	200	400	800	1600	3200	6400	12800
30/6	50	100	200	400	800	1600	3200	6400	12800
35/6	50	100	200	400	800	1600	3200	6400	12800
40/6	50	100	200	400	800	1600	3200	6400	12800
45/6	50	100	200	400	800	1600	3200	6400	12800
50/6	50	100	200	400	800	1600	3200	6400	12800

A JOLLY GOOD VALVE

**Plenty of Volume — Fine Selectivity
and the lowest priced BRITISH Valve**

Don't run away with the idea that because a valve is expensive it must be good. There is just as much scientific thought—just as much careful workmanship in the Golden P.R. Valve as there is in the highest-priced valve of any make, and it is covered with a written guarantee of life and efficiency. Until you have tried a Golden P.R. you do not know what you have missed in tone, selectivity and mighty volume; and you save a fine sum, too.

The Best, and the CHEAPEST

For selectivity and volume a better valve cannot be obtained anywhere with such a low consumption of H.T. and L.T. The glass bulbs are of a distinctive golden colour, and each valve has a golden guarantee band.

All valves dispatched under guarantee of Money Back in Full if not satisfied and returned within 7 days. All valves are carefully packed and breakages replaced.

Ask your Dealer for them, or send direct to:

P.R. PRODUCTS (Dept. E), P.R. HOUSE, 14 NEWGATE ST., LONDON, E.C.4
(Opposite G.P.O. Tube Station)

Advertisers Appreciate Mention of "A.W." with Your Order

A "DIX-ONEMETER"



**An Ideal Gift
this year for
Christmas**

*Advised by Mr. Reynier
:: for Radio Tests ::*

50/- only. Multipliers 6/6

FELLOWS GIANT III, oak cabinet, three valves, 35/-; list £8. Edison Two-valve Sets, 25/-; G.E.C. Victor III new three Receivers, in metal cabinet, 9 by 8 by 5 in., two-drum dial, flush tuning. 200-2,000 metres, with valves. List £7; Sale, 54. R.A.F. Three-valve Receivers in wood carrying case, 30/-; valves extra.

PORTABLE FIVE-VALVE SETS by Royal Radio, etc. New, in green or brown. Wonderful range and quality. £7 5s., to clear. Cases only with sets of parts, 55/-; Suitcase only, with panels, 27/6.

CRYSTAL RECEIVERS. Brownie No. 2, 7/6. Boudoir Crystal Sets, 3 11.

TELEPHONES. Lightweight 4,000-ohm Phones, with cord, 3 6. Brown's 4,000 or 2,000 ohm., pairs, headband and cord, 20/-; 750 ohms ditto, 15/-. Single Brown "A" Receivers, 60 or 750 ohms, 7/6. Magnetic Receivers for Pick-ups, 1 6.

MICROPHONES. W.E. Micro Butters, 1/-; Pendant Mikes, with cord, 4/6. Wrist Mikes, 15/-. Ring Pedestal Mikes, 16 6. Public Address Mikes from 63/-. Write for Special Leaflet.

ELECTRIC FESTOONS. Sixteen Fairy Lamps on Flex with clip and battery adapter, 220 volts, 12 6.

ELECTRIC BLOWERS, 30/-; hot and cold air. Flat Irons, 4 1/2 lb., 10/-. Immersion Heaters, 3/6, 5/-, and 30/-. Soldering Irons, all sizes, from 7 6. Single Hot Plates, 7 6 (state voltage).

SWITCH GEAR. Main Set Glass Fuses, 2 amps, 3d. Slow Motion Geared Slide Rheos., 250 watts, 7/6. Eight-way Lucas Switch Boxes, mahogany, brass cover, 6 S.P., 1 D.P., 1 C.O., 3/6. 100- or 200-volt Lamps, 6d. Lamps for Charging, 2/6. 1,000-ohm Resistance Lamps, 6d. Slider Wire-wound Resistances from 12 6. Auto Cut-outs from 7/-. Switches, Controllers, and Charging Boards built to order.

BUZZERS. Townsend Wavemeter Buzzers, 2/6. D III, 10/-; Sounders, 16 6. Signal Lamp, three colour bulbs, 7/6. Buzzer, with key and phone, 7/6. Tapping Keys for signals of morse, 6/-. Electric Programme Selector Clocks, 35/-.

LOUD-SPEAKERS. The Famous Violina now only 22 6, all mahogany, for wall or mantel. The New Royal Hexan Cabinet Speaker, latest Celoidian Melody Cone, long cord and tone filter; dark oak, with black and green fret front and back, 20/-; list 5 guineas. Brown new Cabinet Loud Speaker, 6-guinea model, 45/-; Blue Spot model O Units, 10/-; ditto in cast.

TRANSMITTERS. No. 1 30-watt Transmitting Sets, polished mahogany and ebonite panel; work off 6/10 volts, 18 6. No. 2 Small Ship Set, 50-mile range, 80 metres, 20 watts, with key, 14/-.

TRANSMITTING VALVES. A.T. 40, special offer, 4 6 each. Seven volts will work off 100 to 1,000 volts.

A Wonderful Stock of Radio and Scientific Apparatus. Send your inquiries for Moving-coil Speakers, Mains Sets, Gensco Motors, Chokes, Condensers, Recorders, Relays, Special Apparatus for Transmission and Testing.

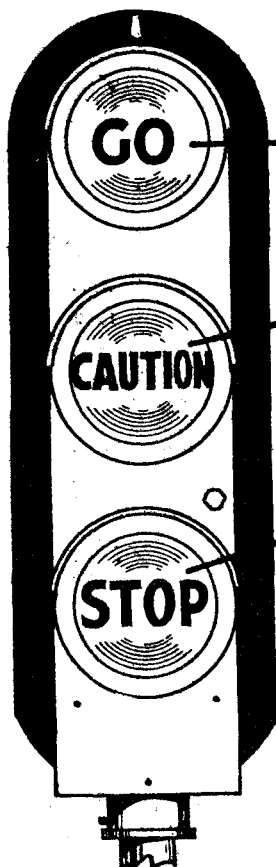
Dynamos and Motors, all sizes in stock. Bridges, Galvos, Switch and Control Gear of every description.

**Now Ready—The New Edition of our
72-Page Catalogue, 4d.**

Send stamped addressed envelope for
our new Green November Bargain List.

ELECTRADIX RADIOS

218 Upper Thames Street, E.C.4
City 0191 Electradix Cent London



a little further into the
quality of components

Be sure they bear
the name **Bulgin.**

at nothing to obtain
the best — Therefore
insist upon **Bulgin.**

BULGIN

The Choice



of Critics

9-10-1 CURSITOR ST.

LONDON, E.C.4

SEND NOW FOR OUR
NEW 60-PAGE CATALOGUE
ENCLOSE 2d. POSTAGE

CLIX for Contact

Is Your Set O.K. for Xmas?

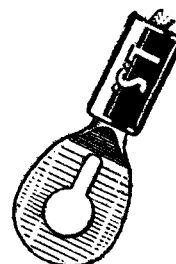
Look to your Contact Points and
specify Clix for your replacements.

THE NEW CLIX SHOWCASE

to be seen on your dealer's counter
will help you. It's the little things
that count!



No. 3 Pat.
"Fit-all"
Spade
Terminal
2d.



No. 5 Pat.
Ring
Terminal
2d.



No. 9 Pat.
Pro. Pat.
Parallel
Plug 2d.



There are 27 different Clix fittings for per-
fect contact. Illustrated Folder on request



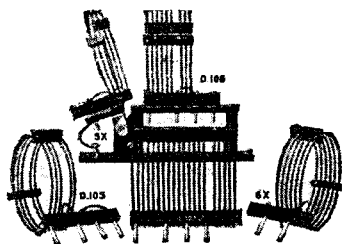
No. 2 Pat.
Pin Ter-
minal
2d

LECTRO LINX, Ltd., 254, VAUXHALL BRIDGE ROAD, S.W.1

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

EDDYSTONE

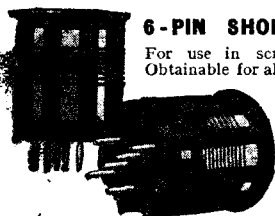
SHORT-WAVE APPARATUS



SHORT WAVE INDUCTANCE UNIT

This Unit forms the complete inductance portion for a short-wave receiver, providing variable aperiodic aerial coil, grid coil and reaction winding. Complete with stand and 5 coils, it covers efficiently the whole short waveband from 15-95 metres.

Price **22/6** complete with full circuit details.
(Extra coils for B.B.C. waveband can be obtained)



6-PIN SHORT WAVE COILS

For use in screen-grid S.W. circuits. Obtainable for all wavebands from 12.5 to 2,000 metres. Air wound on a skeleton bakelite former. Special banana type pins ensure perfect contact.
Price **4/6** to **5/6** per coil
Plain Former - **2/6**
Ribbed Former **3/-**

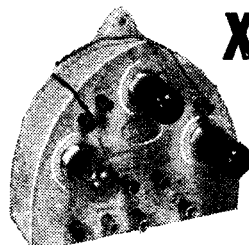
Send for list No. 30 of Short-wave Apparatus.

Sole Manufacturers:
STRATTON & Co., Ltd.
Brims Grove St.,
Birmingham.

London Service Depot:
C. WEBB LTD.,
164 Charing Cross Road,
W.C.2

PAR EX

Products PAR EXcellence



X M A S

PROBLEMS

SOLVED

The SECOL
D.C. Eliminator
is the GIFT OF
THE GODS.

For 30/- it will make your set an ALL MAINS RECEIVER. (It will do the same for your friend's).

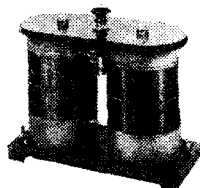
Simple to work, economical. Eliminates H.T. Battery, Charges your accumulator and is entirely guaranteed.

"Finest value on the market."

"Improved my set 50%."

"Perfect reproduction and no hum."

These are some comments by satisfied customers.



CHALLENGE

COILS

as specified
10/6 each.

Order direct from

E. PAROUSSI,

10 Featherstone Buildings, High Holborn,
W.C.1

Easy Terms

FIRST IN 1924

FIRST IN 1930

COSSOR EMPIRE MELODY MAKER KIT, 1931 model, S.G., Detector and Power.

Cash price **£6 17s. 6d.**

Balance in 11 monthly payments of **12/9**.
1931 OSRAM MUSIC MAGNET KIT, 2 S.G., detector and power.

Cash Price **£11 15 0**

Balance in 11 monthly payments of **18/6**.
DYNAPLUS SCREENED THREE KIT, S.G., Detector and Power.

Cash price **£5 14s. 6d.**

Balance in 11 monthly payments of **10/6**.
LAMPLUGH INDUCTOR SPEAKER for perfect reproduction. Unit and Chassis complete, ready mounted. Cash price **£3 10s.**

Balance in 11 monthly payments of **6/5**.
ULTRA Cabinet Model Loud-speaker, incorporating the famous Ultra K. Chassis Air Chrome, 14 in. x 14 in. Oak or Mahogany.

Balance in 11 monthly payments of **5/3**.

STANDARD WET H.T. BATTERIES, 144 volts, 20,000 m.a.

Cash price **£4 2s. 0d.**

Other voltages and capacities available, detailed prices on application.

Balance in 11 monthly payments of **7/6**.

EKCO 3F.20 H.T. ELIMINATOR, 20 m.a. Tappings for S.G., 60 volts and 120/150 volts. For A.C. Mains. Cash price **£3 19s. 6d.**

Balance in 11 monthly payments of **7/4**.

EXIDE 120-volt W.H. Type ACCUMULATOR, in crates. Cash price **£4 13s.**

Balance in 11 monthly payments of **8/6**

Every make of Radio Set or Accessory supplied on **EASY TERMS**. Send for our splendid Catalogue. It's free.

New Times Sales Co

56 LUDGATE HILL, LONDON, E.C.4

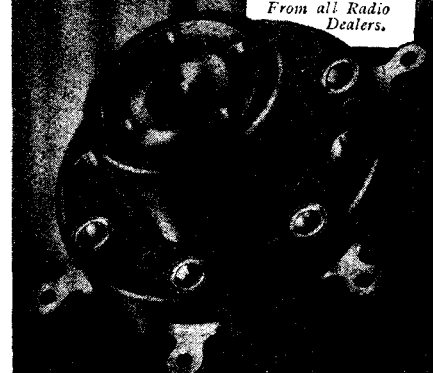
(Established 1924)

Telephone: CENTRAL 2716

The LOTUS VALVE HOLDER

The Lotus rigid type Valve Holder is only 1 1/2" in diameter and is available with or without terminal units. The current-carrying capacity is considerably in excess of what is required for the ordinary valve holder. Universal for 4- or 5-pin Valves. Price With terminals 1/- Without " 9d.

From all Radio Dealers.



Write for illustrated Catalogue to
CARNETT, WHITELEY & Co., LTD., LIVERPOOL.

FRANKLIN

FULLY GUARANTEED CONDENSERS

PRICES		
1 mfd. 500 v. D.C.	test 2/-	
2 mfd. 500 v. D.C.	" 2/8	
4 mfd. 500 v. D.C.	" 4/8	
1 mfd. 500 v. A.C.	" 2/6	
2 mfd. 500 v. A.C.	" 3/3	
4 mfd. 500 v. A.C.	" 5/10	
1 mfd. 1,000 v. D.C.	" 3/-	
2 mfd. 1,000 v. D.C.	" 4/6	
4 mfd. 1,000 v. D.C.	" 7/6	



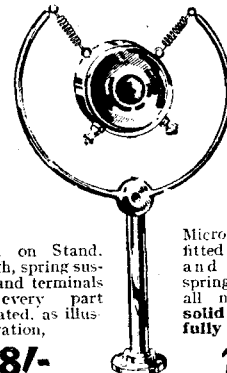
Franklin Resistors 1 1/2" x 1/4". Indestructible, constant, accurate, non-inductive.

Anode Resistances, Grid Leaks, De-couplers, etc. Plain Caps 1/- each. Screw Terminals 1/3 each. Clips for intermediate tappings 2d. each. Clips for mounting to panel 3d. each.

Please apply for price list.

FRANKLIN ELECTRIC CO. LTD., 187-189, Ilford Lane, ILFORD, Essex. Phone: Ilford 0281

INEXPENSIVE MODERN PUBLIC ADDRESS and Speech and Music Transmission Microphone



Complete on Stand. 19 in. high, spring suspension and terminals fitted, every part nickel-plated, as illustration.

Microphone only, fitted with hooks and terminals, springs supplied, all nickel-plated, solid construction, fully guaranteed.

18/-

12/6

This thoroughly efficient Microphone has been especially designed for use with small Valve Amplifiers, or in connection with Wireless Sets which are adapted to work from a Gramophone Pick-up. When connected to two or three L.F. Stages, through a Microphone Transformer, this Microphone is GUARANTEED to transmit speech and music without distortion and with ample volume to fill a large hall.

MICROPHONE TRANSFORMER

special design to obtain best possible results from sensitive Microphones when connected to Valve Set, or Valve Amplifier; best Transformer for clear speech with volume speech and music transmission, Public Address Microphones, etc.; Prim. and Sec. terminals; full directions and diagrams of connections free. Goods by return post.

6/-

FREDK. ADOLPH, Actual Maker,
27 FITZROY STREET, LONDON, W.1.
Phone: Museum 8329.

Advertisers Appreciate Mention of "A.W." with Your Order

NOW ONLY 17'6

THE WORLD'S MOST ECONOMICAL BATTERY..

Columbia 4780
60 volt^s
Triple cap^{acity}
17/6



The world's most economical battery — Columbia 4780—Triple Capacity—now costs only 17/6. It is economical—it gives you smooth flowing power for hour after hour, day after day, month after month. And such radio—pure, evenly-balanced, and entirely trouble free. Remember Columbia 4780—the battery you have waited for.

For large Sets employing power valves, Columbia "Layerbilt"—truly a battery and a half. No. 4486, 45 volts, 24/-

For 2- or 3-Valve Sets, Columbia No. 4721. 10/6

For Portables, Columbia No. 4755, 99 volts. 18/-
Columbia Grid Bias Battery 9 volts. No. 4756. 2/-

Columbia

RADIO BATTERIES

J. R. MORRIS, Imperial House,
15 Kingsway, London, 'W.C.2.

Scotland: J. T. Cartwright, 3 Cadogan St., Glasgow

Postcard Radio Literature

For Valve Users

I RECOMMEND every set owner to write to the Mazda people for a fine book, a copy of which I have just received, giving full details of the new Mazda valves. These valves are backed by the research and manufacturing experience of three huge manufacturing concerns, the Edison Swan Electric Co., Ltd., the British Thomson-Houston Co., Ltd., and Metropolitan Vickers Electrical Co., Ltd., which perhaps explains why they have so quickly earned a wonderful reputation. **112**

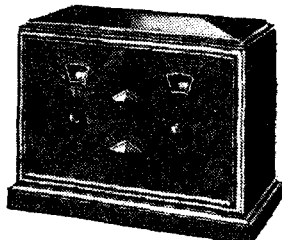
The Simple Way

The "Simple Way to All-electric Radio" is the full title of a new booklet, describing all the Regentone eliminators and the new mains-driven four-valver. To anybody thinking of changing over to mains operation, this book is practically a necessity. **113**

The New Pye Sets

I have, on a previous occasion, referred to the Pye "twin-triple" portable; but you must not think that it is the only star in (Continued on next page)

BROWNIE DOMINION BATTERY S.G.3



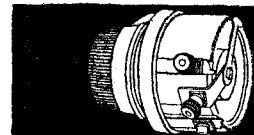
The most powerful of all 3-valve combinations—screen grid, detector and pentode—in the most beautiful of cabinets—richly polished solid walnut...that's the Brownie DOMINION Battery S.G.3! It's easily Britain's best three-valver—sensitive, selective, easy to operate, easy-to-buy... yours for only... **ONLY 19'6 DOWN**

DOMINION (BATTERY) S.G.3.

Price, including valves & royalty **£10 : 15** or **19/-** down

BROWNIE WIRELESS COMPANY (G.B.) Ltd
Dept. U, Nelson Street Works, London, N.W.1

The Colvernstats



THE VARIABLE COLVERSTAT

A recent addition to the range of Colvern products, the Variable Colverstat fills all requirements, being silent, smooth and constant in operation, with a variety of uses.

All Colverstats are wire wound and absolutely silent in operation. Consequently, they make an ideal volume control.

1,000, 5,000, 10,000,
25,000, and 50,000
ohms.

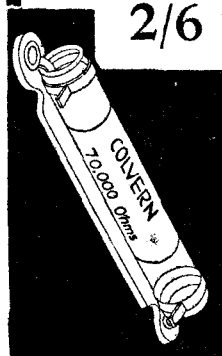
PRICE **5/6**

THE COLVERSTAT

Illustrated here also has a variety of uses—voltage regulator, potential divider, automatic grid bias, etc.—for all of which it gives the same constant dependable performance. Its wire-wound spaced single layer winding on glass gives low capacity and inductance. It dissipates 10 watts and is accurate to within 2 per cent. From 1/100,000 ohms.

PRICES

2/6 and 3/6



COLVERN

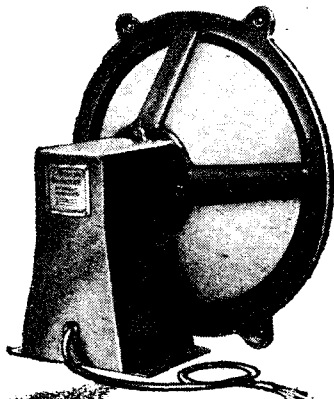
RADIO

Advt. of Colvern Radio Ltd., Mawneys Rd., Romford

Don't Forget to Say That You Saw it in "A.W."

LAMPLUGH

Twelve months' guarantee



Manufactured under FARRAND and LECTO-PHONE STAND-ARD HOPKINS PATENTS and Patent Applications

CHASSIS COMPLETE
£3-10

IN STANDARD CABINET

£5-10

IN DE-LUXE CABINET

£6-10

THE BRITISH . . . All British

and it has amazed the World!

It has changed the fashion in Speakers . . . for good

STEREOSCOPIC REPRODUCTION. Every instrument reproduced with extreme fidelity—speech ported with uncanny realism.

Appreciated by the Press as having all the qualities of a Moving Picture without its drawbacks—no hum—no heat—no electricity—unparalleled "Pot."

Sensitivity is such that we guarantee adequate volume with amazing quality off a 2-valve set using Power or Pentode Valve. Make no mistake—ask for the **ALL BRITISH LAMPLUGH INDUCTOR SPEAKER.**

S. A. LAMPLUGH LTD.

KING'S ROAD - TYSELEY - BIRMINGHAM

Scottish Distributor: Mr. Michael Black, 184 West George St., Glasgow.

SERVICE MODEL STEEL MASTS

NO HOLES TO DIG

26 Feet high. In 3 sections of 1 1/4 in. Steel tube tapering to 1 in. Carriage, London 1/6; Midlands 2/6; elsewhere 3/6. Weight 24 lbs. **15/-**

34 Feet high. In 4 sections of 1 3/4 in. Steel tube tapering to 1 in. Carriage, London 2/-; Midlands 3/-; elsewhere 4/-. Weight 34 lbs. **21/6**

The "SUPER" MAST
42 Feet high. In 5 sections of heavy 1 1/2 in. Steel tube tapering to 1 in. A real bargain. Carriage, London 2/6; Midlands 3/6; elsewhere 4/6. Weight 46 lbs. **29/6**

P.R. MASTS

No bother. These masts are easy to erect, damp- and rot-proof. Made of sturdy British steel tubing tapering from 1 in. to 1 1/2 in. in 9 ft. sections complete in every detail. Cast iron bed plate, steel ground pegs, stay rings and galvanized wire stays cut to length, pulley bolts, washers, etc.—

No Further Outlay.

P.R. PRODUCTS (Dept H), P.R. HOUSE
14, NEWGATE STREET, LONDON, E.C.4

Opposite G.P.O. Tube Station.

Phone: City 3788.

POSTCARD RADIO LITERATURE

(Continued from preceding page)

the Pye range. A new and finely-produced catalogue has just been sent me which gives full details of other Pye sets and accessories. You should have this. **114**

News from Varley

I like the new Varley catalogue, a copy of which I have just been glancing through; it should be in the hands of every set builder and can be obtained through my free catalogue service. **115**

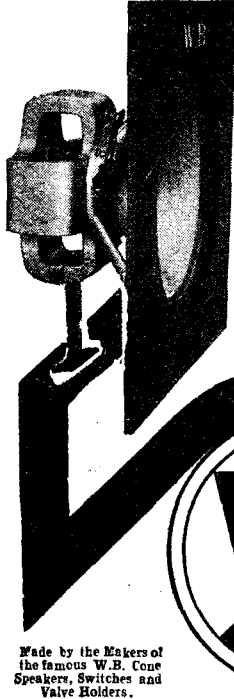
GET THESE CATALOGUES FREE.

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them **FREE OF CHARGE**, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," "AMATEUR WIRELESS," 58-61, Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire.

Messrs. Warners Radio inform us that every purchaser of any component, no matter how small, at one of their branches, will receive a voucher automatically entering him for a special Christmas draw, the first prize for which is an Osram Music Magnet receiver.

Home builders of sets, who appreciate the convenience of complete kits of parts when it comes to making up a receiver, will be interested to know that Messrs. Ready Radio, of 159 Borough High Street, London Bridge, S.E.1, supply kits of parts for every receiver published in "A.W." These kits can be obtained by easy payments, if desired.

NEITHER BOOM NOR RESONANCE



Mr. Barton Chapple has "nothing but praise" for the new W.B. Permanent Magnet Moving Coil Speaker. "A nice crisp note is revealed" he says, "while a very even balance is maintained throughout the musical scale—nothing boomy, nothing shrill." Hear this new speaker yourself—your dealer will demonstrate.

Available in chassis form with 14 in. baffle.

£6 : 6 : 0
Oak Cabinet Model, £8 : 8 : 0
Mahogany, £8 : 18 : 6
Walnut, £9 : 9 : 0

Made by the Makers of the famous W.B. Cone Speakers, Switches and Valve Holders.

Whiteley Electrical Radio Co., Ltd., Radio Works,
Nottingham Road, Mansfield, Notts.

VIBRANTI THE SUPER ONE-PIECE Baffle

Constructed from a Single Board 24" x 24" x 3/4" for the Latest Efficient Cone Units

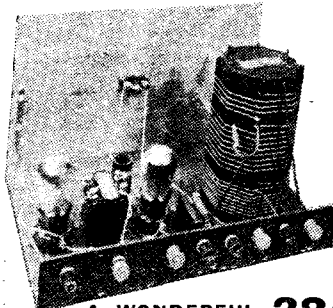
C-ONE BUY-ONE THE TONE OF YOUR SPEAKER WILL BE A-ONE

Supplied in Six Attractive Finishes

From **RADIO DEALERS**, or

CHAS. BORST & SONS
306 EUSTON RD., LONDON, N.W.1

THE S.R.S. UNIVERSE SHORT-WAVE



A WONDERFUL 38/6
SHORT-WAVE SET FOR (Postage 1/- extra)
THE S.T. WITH WHICH "AMATEUR WIRELESS"
TUNED IN ALL PARTS OF THE WORLD

SEND FOR TEST REPORT LEAFLET and **FREE CONSTRUCTIONAL CHARTS**
Extremely simple to build—all vital wiring done for you. 11 wires only. Utilizes your present valves, batteries, aerial, and earth. Kit includes everything, including drilled metal panel, drilled terminal strip, name terminals, etc.

RESULTS ASSURED UNDER WRITTEN GUARANTEE
This amazingly successful short-wave owes its efficiency to the world famous **S.R.S. ultra short-wave unit**, which converts any valve set into an ultra short-wave set instantly without alterations of any description or complications. (Postage 9d. extra) Price **18/6**
Send for Leaflets.

BRITAIN'S SHORT-WAVE SPECIALISTS, and the **ONLY FIRM MANUFACTURING SHORT-WAVE APPARATUS EXCLUSIVELY**

STONEHOUSE RADIO SUPPLIES
54, UNION STREET
PLYMOUTH, DEVON. Phone: 2496.



SNICK!

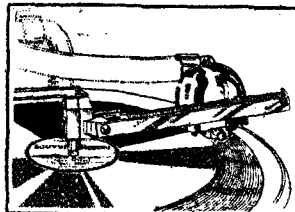
Think of the convenience of being able to make all the circuit changes possible to a Double-pole Change-over Switch merely by giving a half-twist to the bakelite pointer knob of this switch. See the circuits in which it can be used in our 1931 Radio Catalogue free on request.

The BENJAMIN ELECTRIC LTD.
Tarriff Road, Tottenham, N.17
Tottenham 1500

3/6

BENJAMIN

DON'T WRITE YOUR XMAS GREETINGS—SPEAK THEM!

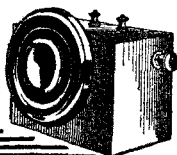


Here is an opportunity to make permanent gramophone records of your children's voices, musical talents, greetings and messages to your relatives and friends in your own voice. The records are made by a simple device connected up to your radio set and gramophone.

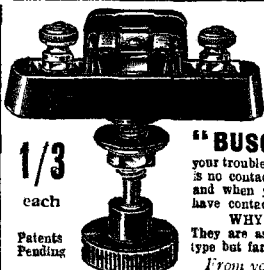
Complete apparatus, with six double-sided records. **PRICE £4 : 12 : 0.** Extra records 4d. each.

Write for full details and descriptive leaflet, explaining the secret of this wonderful home recording device to—

CAIRNS MORRISON, LTD.,
33 Percy St., London, W.1
Phone: Museum 6564.



DOES YOUR SWITCH SPINDLE TURN ROUND?



IF SO, YOUR SET
"CRACKLES!"

BY FITTING A

"BUSCO" SWITCH

your trouble is ended because there is no contact point to turn round, and when you "switch on" you have contact like a power switch.

WHY NOT FIT ONE?

They are as cheap as the inferior type but far superior in operation. From your local dealer, or

BUSBY & CO., LTD. (Patentees)
Dept. A.W., PRICE ST., BIRMINGHAM

Easy Terms

We supply the following Radio Apparatus on deferred terms. We carry adequate stocks and can give prompt delivery.

NEW HEAYBERD A.C. ELIMINATOR KIT G.150.—Complete Kit of Parts for building an H.T. Eliminator including steel case. Output 25 m.a., 150 volts, 3 H.T. Tappings, one variable.

Cash Price, £3/16/-

or 7/6 with order and 11 monthly payments of 7/-

NEW EPOCH PERMANENT MAGNET MOVING COIL UNIT PM66.

Cash Price, £5/15/-

or 11/- with order and 11 monthly payments of 10/6.

LISSEN 2-VALVE SET.—Battery Model, including valves. A Reliable Regional Receiver.

Cash Price, £3/10/-

or 5/6 with order and 11 monthly payments of 6/6

NEW OSRAM MUSIC MAGNET 4 KIT.—A first-class long-distance Receiver, incorporating 2 H.F. stages, single-dial tuning.

Cash Price, £11/15/-

or 16/- with order and 11 monthly payments of 21/-

NEW MULLARD ORGOLA 1931 3-VALVE KIT.—A high-grade complete kit of parts, including valves and cabinet.

Cash Price, £8

or 10/6 with order and 11 monthly payments of 14/6

NEW COSSOR EMPIRE 3 KIT.—A considerable advance on last season's 3-valve Kit and at a lower price.

Cash Price, £6/17/6

or 10/- with order and 11 monthly payments of 12/6

R.K. FARRAND INDUCTOR LOUD-SPEAKER UNIT.—Quality of reproduction almost equal to a moving-coil speaker.

Cash Price, £3/10/-

or 5/6 with order and 11 monthly payments of 6/6

B.T.H. PICK-UP AND TONE ARM.—One of the best pick-ups available.

Cash Price, 45/-

or 5/- with order and 9 monthly payments of 5/-

CAIRNS & MORRISON'S HOME RECORDING OUTFIT.—Including special Microphone Pick-up. Descriptive Leaflet on request.

Complete Kit. Cash Price £4/12/-

or 8/- with order and 11 monthly payments of 8/6.

NEW BLUE SPOT 66R UNIT.—The finest balanced-armature movement on the market. Complete with large Cone and Chassis.

Cash Price, £2/10/-

or 5/- with order and 10 monthly payments of 5/-

LONDON RADIO SUPPLY CO.
11 OAT LANE, NOBLE STREET,
LONDON, E.C.2

Telephone: National 977

WIRELESS MAGAZINE

The Big British
Wireless Monthly

1/-



THE XMAS GIFT FOR WIRELESS ENTHUSIASTS

This beautiful cabinet ready to assemble. Wonderful value.

SELECTED figured Oak ply. Overall size 24" x 15" x 36" high to take panel 21" x 8" in the clear, bottom cupboard opening 21" x 15". Top flap and doors 12 1/2 m.m. ply. Four twist legs.

All timber accurately sawn, planed and sandpapered ready for polishing. Doors and flaps slightly full to allow fitting. R.T.A. Complete with handles, hinges, ball catches, etc.

Carriage paid to your address. Already assembled in white with fittings as above. Carriage Paid. **29/6**

Polished medium Jacobean. Carriage Paid. **45/-**

(Dept. A.3), A. H. FOSTER & Co.
11 HIGH ST., ERDINGTON, B'HAM.

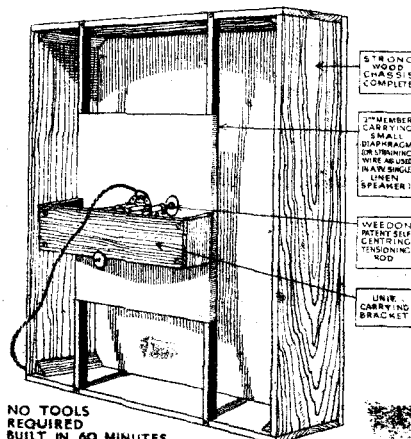
BUILD THIS FINE 21" sq. SINGLE or DOUBLE LINEN SPEAKER FROM OUR COMPLETE KIT OF PARTS (except Unit)

INCORPORATING THE PATENTED "SELF-CENTRING ROD" 17/6

Any type of Unit supplied

COMPLETE

The greatest tension yet obtained with wonderfully improved results

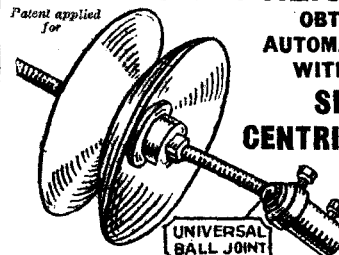


NO TOOLS REQUIRED
BUILT IN 60 MINUTES

KIT OF PARTS CONSISTS OF:—

Strong wooden chassis ready built; Weedon's special "Self-centring Rod" for this kit; best Irish linen; 8" x 12" taunting dope; screws and instructions. (State when order whether single or double linen type is required.)

PERFECT UNIT ALIGNMENT OBTAINED AUTOMATICALLY WITH THIS SELF-CENTRING ROD



PRICE complete
1/6
Post 1/8

Relieves driving rod of all side stress and chatter, allows perfect adjustment of unit and enormously improves tone and volume.



GOLDEN TAUNTING DOPE

Maintains full tautness of the linen, will not deteriorate. Gives a full rich tone. Waterproof and non-inflamm. 1/- per large tin. Post 1/8.

SUNDRIES FOR THE "A.W." LINEN SPEAKER

Tension wire, 4d. per foot. Set of 4 B.A. Screwed rods complete with nuts and washers, 1/6. Linen, best Irish, 6/- per sq. yd., any size cut. Extra large reversible cone washers and chuck, 6d. per set. Deliveries from stock. Trade enquiries invited.

WEEDON & CO.

80 LONSDALE AVENUE, LONDON, E.6

A LIST OF OUR BLUEPRINTS APPEARS ON PAGE 936

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

THE EELEX 3 in 1 TERMINAL

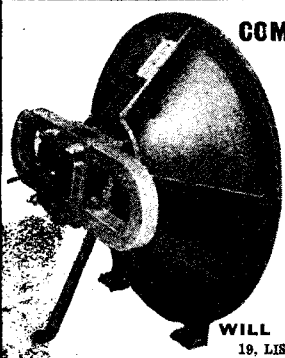
-A TERMINAL OF
WONDERFUL
ADAPTABILITY

Holds securely—spades,
plugs, pins and eyes. No
radio enthusiast should
be without them.

Write for list J4

J. J. EASTICK & SONS,

178 BUNHILL ROW,
LONDON, E.C.1



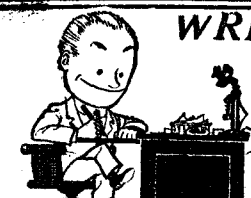
**COME AND HEAR
THE BEST
SPEAKER
IN TOWN.**

**FARRAND
INDUCTOR**

£3 10s.

FROM STOCK.

WILL DAY LIMITED
19, LISLE STREET, W.C.2
Regent 6921



WRITE NOW

for BAKER'S new
32-page booklet on
REALISTIC
PRODUCTION!

**BAKER'S
Selhurst
—RADIO—**

42 Cherry Orchard Road
East Croydon

MAKE OR BUY A GRAMOPHONE AT

a quarter shop prices. Or buy
Cabinets for Wireless. British double
spring motor, 12 in. v.d.vet turntable,
even arm, metal sound-box, ampli-
fier, needle cups, for £18 6 p.p., and
build your own Cabinet. Portable
Gramophones from 15/6, postage 1/6.
Motors from 7/6. Lists free. 64 pp.
1931 Catalogue No. 226 with Reduced
Prices, Drawing and How to Make
Gramos 3d. Established 26 years.

Regent Fittings Co., A.W., 120 Old St., London, E.C.1

**DX THE STANDARD
PLUG-IN COIL**

Sold everywhere from 1/-

DX COILS Ltd, London, E.8

REPAIRS

to any make of L.F. Transformer, Headphones or
Loud-speaker (except Blue Spot) dispatched in
48 Hours—TWELVE MONTHS' GUARANTEE
with each repair. 4/- post free. Cash with order.

TRANSFORMER REPAIR CO.
Dept. S, 953 GARRATT LANE, LONDON, S.W.17

**High-Grade
QUEEN ANNE STYLE WIRE-
LESS CABINET**

Hand French Polished

Figured Oak 25 5 0
Figured Mahogany 26 8 0
Figured Walnut 26 15 0

Carriage paid.

The Acme of Craftsmanship
Models from £22.0 to £20. Thirty-
page illustrated catalogue, post free.

GILBERT, Cabinet Maker,
Established 1860, SWINDON

TAYLOR, WES & CO. BAKERS

New Prices: Jars 1/3, Sacs 1/2, Zins 10d. Sample doz.
18 Volts complete with bands and electrolyte 4. 1 post 9d.
Sample unit 6d. Illus. booklet free. Bargain list free.
AMPLIFIERS, 30/- 3 VALVE ALL-STATION SET £5
A. TAYLOR, 57, Studley Road, Stockwell, LONDON.

FULL-SIZE BLUEPRINTS

When ordering, please send Postal Order, NOT STAMPS

CRYSTAL SETS (6d. each)	
Regional Crystal Set	WM176
ONE-VALVE SETS (1s. each)	
Monodyne	AW258
Hartley Single-valver	WM193
TWO-VALVE SETS (1s. each)	
Talisman Two (D, Trans)	AW194
No-battery A.C. Mains Two (D, Trans)	AW239
No-battery Gramo-radio 2 (D, Trans)	AW238
1930 Talisman 2 (D, Trans)	AW239
Easy Tune Short-wave 2 (D, Trans)	AW242
Searcher Two (D, Trans)	AW245
Arrow Two (D, Trans)	AW249
Forty-five-shilling Two (D, 8 Trans)	AW250
Challenge Two (D, Trans)	AW251
Searcher Short wave 2 (D, Trans)	AW260
Brookman's Two (D, Trans)	WM168
New Crusader (D, Trans)	WM182
Radio-Record Two (SG, D)	WM187
Gleaner Two (D, Trans)	WM201
Music Monitor (D, Trans)	WM208
Merlin Two (A.C. Set)	WM213
Five-Point Two (D, Trans)	WM220

THREE-VALVE SETS (1s. each)	
1930 Ether Searcher (SG, D, Trans)	AW211
Best-by-Ballot Three (SG, D, Trans) Price 4d. free with copy of "A.W."	AW217
Everybody's All-electric Three (SG, D, Trans)	AW221
A.C.	AW221
1930 Clarion Three (SG, D, Trans)	AW223
Beginner's Regional Three (D, 2LF)	AW233
Britain's Favourite Three 1930 (D, 2 Trans)	AW243
Car Three (D, R.C. Trans)	AW244
The "A.W." Exhibition	AW244
Brookman's Three (SG, D, Trans)	WM167
Community Three (D, R.C. Trans)	WM164
Brookman's Push-Pull Three (SG, D, Trans) 1/6	WM170
All-nations Three (D, 2 Trans)	WM178
Inceptordyne (SG, D, Pentode)	WM179
Brookman's A.C. Three (SG, D, Trans) 1/6	WM184
Music Marshal (D, 2 Trans)	WM190
Gramo-Radio D.C. Three (SG D Trans)	WM196
Concert Three (D, 2 Trans)	WM199
New Lodestone Three (HF, D, Trans)	WM205
De-Luxe Three (D, R.C. Trans)	WM209
Five-Point Three (SG, D, Trans)	WM212
Falcon Three (A.C. Set)	WM217
New Brookman's Three (SG, D, Trans)	WM218

FOUR-VALVE SETS (1s. 6d. each)	
Music-Lover's Gramo-radio (Loud-speaker) 1s.	AW2028
Horizon Four (SG, D, 2 Trans)	AW237
Challenge Four (2SG, D, Trans) with copy of "A.W." 4d. post free	AW251
Challenge Four (2SG, D, Trans, mains operated) with copy of "A.W." 4d. post free	AW252
1930 Monodial (2SG, D, Trans)	WM158
Electric Four (All A.C.—SG, D, R.C. Trans)	WM162
Brookman's Four (2SG, D, Trans)	WM174
Transportable Four (SG, D, 2 RC)	WM180
Super Q4 (SG, D, 2 Trans)	WM189
Lodestone Four (HF, D, R.C. Trans)	WM193
Searcher's Four (SG, D, R.C. Trans)	WM194
Invitation Four (SG, D, R.C. Trans)	WM200
Regional Band-pass Four (SG, D, R.C. Trans)	WM211
Five-Point Four (SG, D, R.C. Trans)	WM216
Regional A.C. Four (SG, D, R.C. Trans)	WM222

FIVE-VALVE SETS (1s. 6d. each)	
James Quality Five (2SG, D, R.C. Trans)	AW227
All-wave Lodestone Five (HF, D, R.C. Push-pull)	WM146
1930 Five (2HF, D, R.C. Trans)	WM171
Dual-screen Five (2SG, D, R.C. Trans)	WM185
Radio-Record Five (SG, D, Trans-parallel)	WM188
Overseas Five (2SG, D, Trans)	WM191

PORTABLE SETS	
Continental Portable (SG, D, Trans)	AW241 1/-
Pedlar Portable Two (D, Trans)	WM195 1/-
Pedlar Portable Three (D, 2 Trans)	WM197 1/-
James Portable SG3 (SG, D, Trans)	WM203 1/-
Foursome Portable (SG, D, 2 Trans)	WM206 1/6

Copies of the "Wireless Magazine" and of "Amateur Wireless" con-
taining descriptions of any of these sets can be obtained at 1s. 3d. and 4s.
respectively, post free. Ladies letters "A.W." refer to "Amateur
Wireless" sets and "W.M." to "Wireless Magazine."

AMATEUR WIRELESS 58-61 FETTER LANE
LONDON, E.C.4.

**RELIABILITY
WIRELESS GUIDE NO. 296X**

A Complete List of all
that is best in Radio
at Reasonable Prices.
Trade Enquiries Invited.

J.H. TAYLOR & CO.
3, Radio House, MACAULAY STREET,
HUDDERSFIELD. Phone 341.

POST
FREE
ON
REQUEST

**YOU CAN BUILD A
£40 GRAMO-
PHONE WITH
OUR SCALE
DRAWINGS FOR 40/-**

Book of instructions 3d. Catalogue
of Motors, Tonearms, Soundboxes,
latest internal amplifiers Gramo-
phones and Cabinets Free. Cash
or Terms.

W. BURT, 185 High St., Deptford.

PREPAID ADVERTISEMENTS

Advertisements under this head are charged
THREEPENCE PER WORD, minimum charge
THREE SHILLINGS. DEPOSIT SYSTEM

As the Publishers cannot accept responsibility for the
factual accuracy of advertisements in this publication, they have
introduced a system of deposit which it is recommended
should be adopted by readers when dealing with persons
with whom they are unacquainted. It is here explained.

Intending purchasers should forward to the Publishers
the amount of the purchase money of the article advertised.
This will be acknowledged to both the Depositor and the
Vendor, whose names and addresses must necessarily be
given. The deposit is retained until advice is received of
the completion of the purchase, or of the article having
been returned to and accepted by the Vendor. In addition
to the amount of the Deposit, a Fee of 6d. for sums of £1
and under, and 1s. for amounts in excess of £1, to cover
postage, etc., must be remitted at the same time. In cases
of persons not resident within the United Kingdom double
fees are charged.

The amount of the Deposit and Fee must be remitted by
Postal Order or Registered Letter (Cheques cannot be
accepted), addressed to

"AMATEUR WIRELESS" ADVERTISEMENT DEPARTMENT
58/61 FETTER LANE, LONDON, E.C.4

PATENTS.—Trade Marks, Advice Handbook free.—B. T.
King, Regd. Patent Agent, 149a Queen Victoria Street,
London.

WIRELESS BARGAINS.—New 5-valve Portable Sets,
Radio-Grams, etc., for disposal by Liquidator of well-
known Wireless Company. Sets ready for immediate use
and may be bought singly.—P. G. Lambirth, Chartered
Accountant, 4 Broad Street Place, E.C.2. London Wall
7120.

ENGINEERS.—IMPORTANT NOTICE.—Results now to
hand show that 93 per cent. of our candidates pass their
Exams. at the first attempt, a remarkable record, un-
approached by any other organisation and showing why
we alone guarantee "NO PASS—NO FEE." If 93 out
of every 100 ordinary men can succeed, why should you
remain in the ranks? Now is the time to "get busy"
and investigate. Our handbook, "ENGINEERING
OPPORTUNITIES," explains the most simple and
successful home-study methods of passing B.Sc.,
A.M.I.Mech.E., A.M.I.E.E., A.M.I.E.E., A.M.I.A.E.E.,
G.P.O. C. & G. Matric., etc. Exams. This book out-
lines Courses in all branches of Civil, Mech., Elec., Motor
and Wireless Engineering, shows the unique advantages
of our Appointments Dept. and includes a brilliant fore-
word by Prof. A. M. LOW, in which he shows clearly the
chances you are missing. Send for FREE HANDBOOK
now (state branch, post, or Exam.).—BRITISH
INSTITUTE OF ENGINEERING TECHNOLOGY,
109 Shakespeare House, 29-31 Oxford Street, London.

ALEXANDER BLACK, Wireless Consultant, will call and
cure your set. (London and Home Counties). Radio
Association appointed representative. Components and
McMichael Portables on hire.—55 Ebury Street, S.W.1.
Sloane 1655.

BANKRUPT STOCK BARGAINS, new and genuine, all
satisfaction or cash refunded, any C.O.D. or A.W. deposit
system. Telsens Ace transformers 3-1, 5/6. Watnet H.F.
chokes, 1/6. Cossor transformers, 10/6. Mullard Permacore,
10/6. Ferranti AF3C, 16/6. Lotus reaction condenser,
0.0034, 3/6. Wearite 4-pole rotary switches, 2/9. Graham
Farish resistances, 250,000, 500,000 and 5,000 ohms, 1/3
each. Precision valve holders, large, 7d. each. Ediswan
3-meg. leaks, 8d. each. Ebonite leak holders, 3d. Ediswan
2-volt valves all new. H.F., L.F., 5/6 each; R.C. 4/6;
Power, 6/6. Phillips 506 H.T. rectifier valves, 12/6. Osram
U.S. 12/6. L.S. and Mullard DFA7, 16/6, all new. Note
callers any time. Bus stop outside door, alight Fitzalan
Street.—G. A. Ryall, 182 Kennington Road, London,
S.E.11.

AGENTS WANTED to sell Wireless Goods, all makes in
sets, components and accessories. Cash or easy terms.
Liberal commission.—New Auto Supply Co., 241 Park
Road, Aston, Birmingham.

RADIO SATISFACTION.—Osram, Mullard Kits, Cossor,
Varley, McMichael Sets, Speakers. Kits assembled, no
extra. Portables and Transportables. Delivery free.
London area same day C.O.D. Send card for quotation.
Batteries, Valves, Pick-ups, etc., at right prices.—Dudley,
37 Hartley Street, London, E.2.

WANTED. Agents outside London part time to sell Radio
goods, sets and components. Cash or Hire-purchase on
commission. Hambling, 104 High Holborn.

WET BATTERY REPLACEMENTS.—New Process Sacs,
approximately 20,000 m.a., 2/6 per dozen. Particulars free.
—Scottish Batteries (A.W.), Branside, Uphall Station.

REPUTABLE firm requires representatives in all towns for
the sale of probably the best-known All-Electric Receiver,
(Whole or spare time). Salary and commission. Box 47,
c/o "Amateur Wireless," 58 Fetter Lane, E.C.

WE WILL ACCEPT YOUR SURPLUS APPARATUS
(making you a high allowance) in part payment for any
new apparatus; your inquiry will be dealt with promptly.
Bostock & Son Ltd, 1 Westbourne Terrace, S.E.23.

For YOUR SET or RADIO-GRAM

Radio Furniture de luxe!
Gives style to the home.

Nothing cheap or shoddy.
Advantages also of PIANO-TONE baffles
enables BETTER REPRODUCTION
(3,000 clients and Leading Experts.)

DIRECT from makers, APPROVAL
7 days FREE, 75/- to £15,
Cash or EASY PAYMENTS.
Photographs FREE.

PICKETTS, Radio Furniture Works
(A.M.) Albion Road, Bexleyheath, Kent

Amateur Wireless

COUPON
Available until Saturday
DECEMBER 13, 1930

Have **YOU** a "Cossor Empire Set"
"Brookmans Three"
"Mullard Orgola" or....?

then
**READ
THIS**

and
CONVERT
it in
10
minutes

to
ALLMANS
A.C. Operation

Equally suitable
for most battery-
operated sets.

SAY

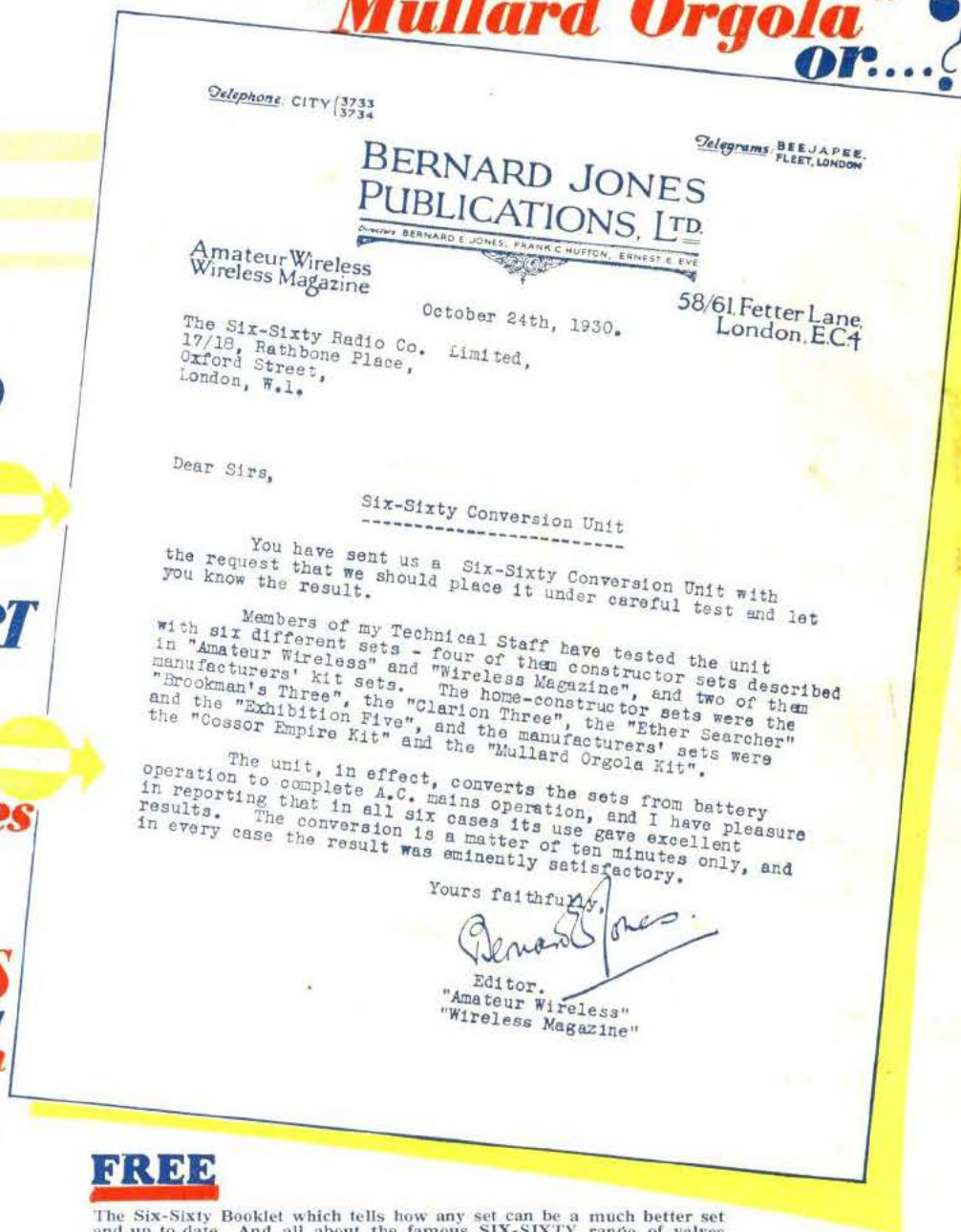
FREE

The Six-Sixty Booklet which tells how any set can be a much better set and up to date. And all about the famous SIX-SIXTY range of valves and equipment. Write for it NOW.

SIX-SIXTY

(B.V.A. RADIO VALVES AND EQUIPMENT)

Advertisement of Six-Sixty Radio Co., Ltd., Six-Sixty House, 17/18 Rathbone Place, Oxford Street, London, W.1. Tel.: Museum 6116/7.





Everybody can have better radio this Christmas



*Give Pertrix Dry Batteries
and Accumulators as Presents
this Year*

DRY BATTERIES

60 volt Standard	8/-	60 volt Super	13/-
90 " "	11/9	100 " "	21/-
100 " "	13/-	120 " "	25/6
120 " "	15/6	150 " "	31/-

The Improved Pertrix Accumulators are sold in all capacities at prices ranging from 4/6. Ask your dealer.

Good company . . . bright lights . . . a cheery fire . . . happy laughter . . . and music clear and pure from a good radio that has been made better by Pertrix. What more *could* one wish for?

It is because NO sal-ammoniac is used in a Pertrix Battery that it gives the purity of current that is so essential in obtaining perfect reception.

So don't forget, make it a Pertrix Christmas this year, and *enjoy* your radio.

Pertrix Accumulators more than do their bit in giving you better L.T. current, too.

PERTRIX

SUPER LIFE

DRY BATTERIES AND ACCUMULATORS

"The batteries you can trust"

PERTRIX LIMITED, Britannia House, 233 Shaftesbury Avenue, London, W.C.2.

Works : Redditch.

Printed in England. Published by Bernard Jones Publications, Ltd., 58/61 Fetter Lane, London, E.C.4.
Sole Agents for South Africa: CENTRAL NEWS AGENCY, LIMITED. Sole Agents for Australasia: GORDON & GORCH, LIMITED. Saturday, December 6, 1930.