

FIRST GREATLY ENLARGED RADIOLYMPIA NUMBER!

Practical Wireless

3^D

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Edited by F. J. CAMM.

OLYMPIA

NATIONAL
RADIO
EXHIBITION

COMPLETE GUIDE to the SHOW

our Stand **No. 8**
GROUND FLOOR

PETO-SCOTT 75/- DISC TELEVISION KIT

ASSEMBLED IN 30 MINUTES

NO SPECIAL TOOLS REQUIRED

PETO-SCOTT, Pioneers in Television since 1927, have, after considerable research, produced this "up-to-the-minute" Disc Television Receiver Kit, of which Efficiency and Economy are the keynotes.

Designed to work from almost any 3-valve battery or mains set, the Peto-Scott 75/- Disc Television Receiver is supplied in Kit form, and comprises Peto-Scott Universal Television Motor and Stand; control-

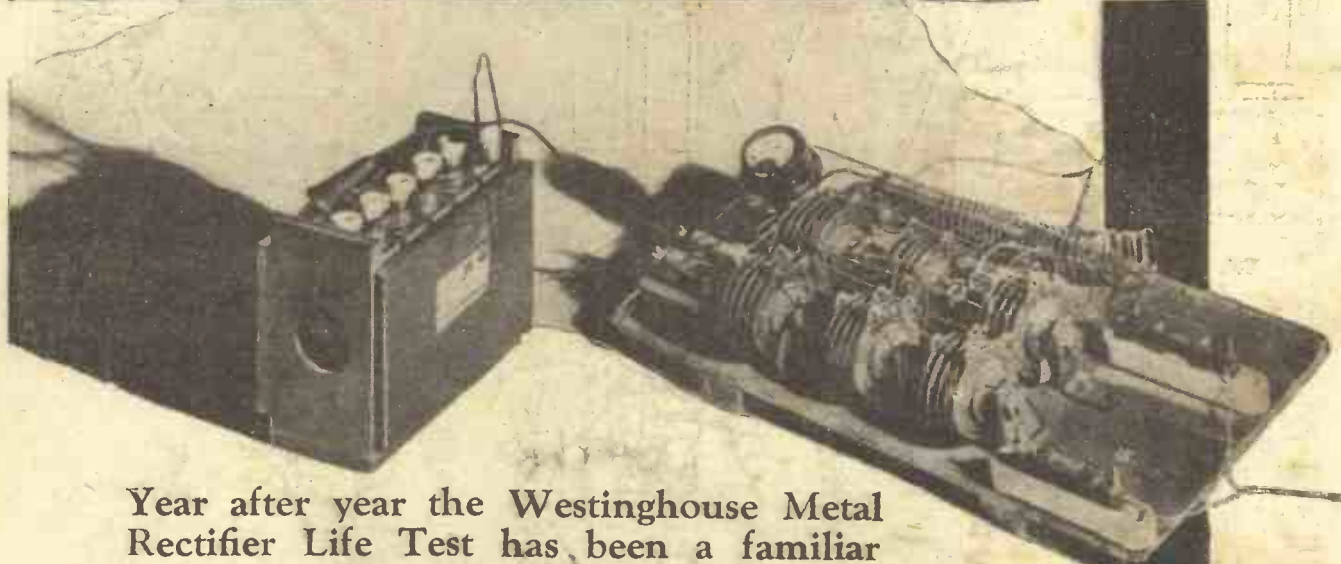
ling resistances; laminated and ready assembled chassis; Stroboscopic 16in. scanning disc; Lens and lensholder; Neon Lamp and holder, together with sundry small parts. It is absolutely complete down to the last screw and piece of wire. Full-size Blueprint with assembly, wiring and operating instructions included with every kit. Cash or C.O.D., Carriage Paid, 75/-, or yours for 15/- and 11 monthly payments of 6/3.



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15/-

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The METAL RECTIFIER BREAKS ALL RECORDS



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WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD., 82, YORK ROAD, KING'S CROSS, LONDON, N.1.

STAND
No
86



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OF ATTENTION
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The General Electric Co. Ltd. ("G.E.C.")—the largest British electrical manufacturing organisation in the Empire—has produced a magnificent range of receivers to meet every demand. The G.E.C. "A.C./D.C. Mains 3," typical of the new sets, is the finest radio value offered to-day. Insist upon your dealer demonstrating its remarkable performance and quality of reproduction.

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A "universal" mains receiver for both A.C. and D.C. supplies, providing exceptional quality and power with reasonable range and flexibility of operation. Built-in energised moving coil speaker with 2-watts output. Illuminated tuning dial. Connections for low-impedance extension speaker. Lustrous moulded Bakelite cabinet. BC3520 for A.C. mains 200/250 volts, 40/100 cycles, and D.C. mains 200/250 volts.
PRICE, including OSRAM Valves £7.15.0

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made to give
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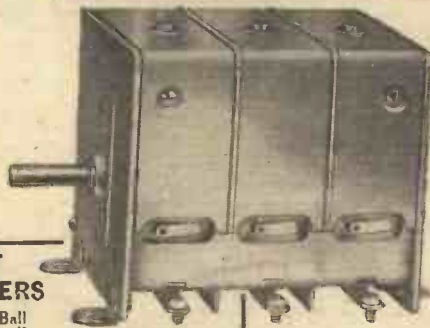
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ONE Midget 3 gang Condenser 16/6
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Slow Motion Drive.
Bevelled Scale.
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Slow motion drive. Horizontal pointer. Lampholders provided.

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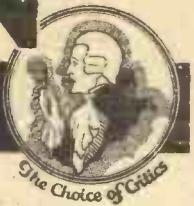
'Phone: Temple Bar 2244.

Works: Old Swan, Liverpool



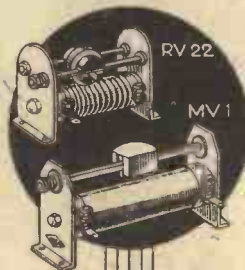
BULGIN

QUALITY
RADIO COMPONENTS



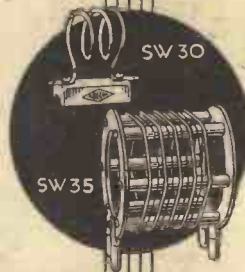
OLYMPIA STAND 121

Do not fail to call and examine the numerous brand new BULGIN Components now available, all designed in accordance with the latest research and practice. Prices have been reduced to the lowest level consistent with the high quality of material and workmanship for which BULGIN PRODUCTS are justly famed.



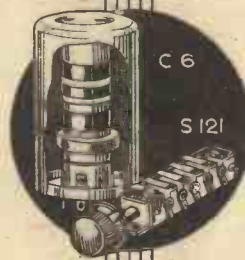
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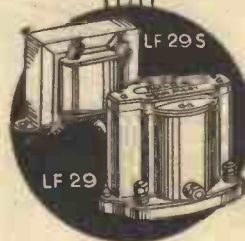
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Complete range of compact modern design screened coils to suit present-day conditions. New quick-make-and-break wiping contact wavechange switches.



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Specially designed high gain Q.P.P. Transformers suitable for use with latest Double Output Pentode Valves. Skeleton and Bakelite cased types available giving wonderful performance.

300
ILLUSTRATIONS

Please send me, post free, a copy of the New Bulgin Catalogue, No. 154 "N," for which I enclose threepence in stamps.

NAME

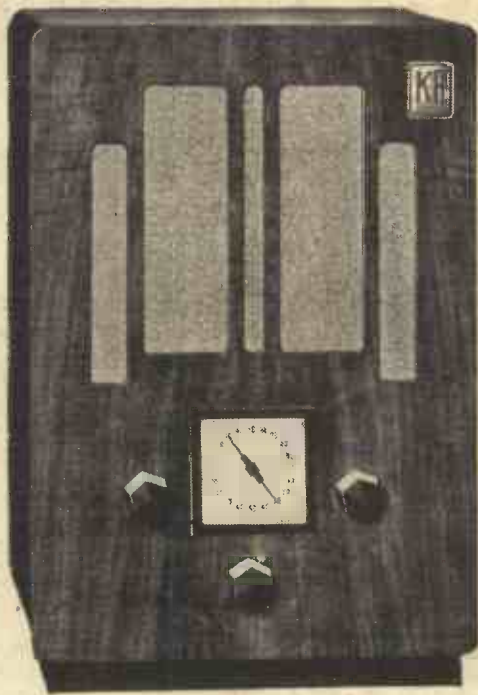
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50
NEW LINES

2 NEW KB

SUCCESSSES!



KB 'NEW PUP'

3 VALVES. MOVING COIL SPEAKER

£5.15

OR 10/- A MONTH

Here's one of the high-lights of the Show! Do you remember the original KB 'Pup'? More than 200,000 listeners have owned one. Now comes its successor—the 'New Pup' of 1935. We have aimed wholly and solely at giving the most and the best that we can for the money—really satisfying reception, and handsome cabinets.

fine volume and pure tone. It has full vision dial with names of principal stations. Four aerial tappings provide alternative selectivity.

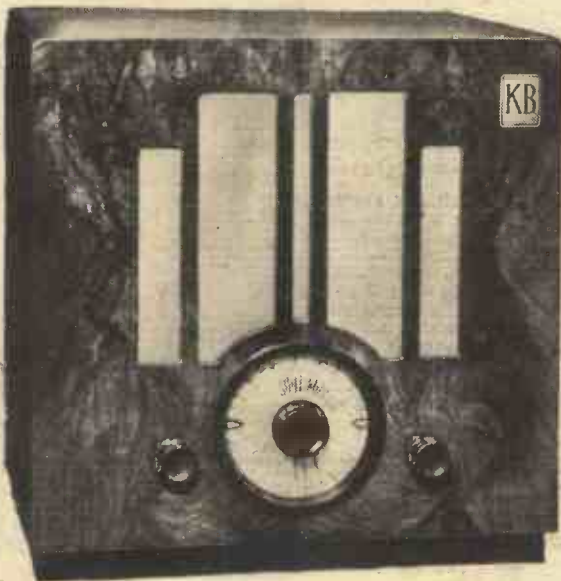
The 'New Pup' brings in a good range of British and Continental stations with

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KB 'NEW PUP' 3-valve A.C. Model **£6-17-6**
FINE WALNUT FINISHED CABINET

or first payment of 14/- (including 2/- insurance) and twelve monthly payments of 12/-



KB '381' SUPERHET

with delayed automatic volume control

5 VALVES. A.C. or D.C.

£10.10

OR 18/- A MONTH

Are you looking for radio that will bring you—and go on bringing you—first class entertainment without trouble? Here it is. Never has a receiver undergone such searching tests as this new superhet. It was 'taken for a ride' all over England, and stood up to the severest trials. It can never meet, in normal use, demands it has not already met.

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The '381' is a clean, clever job. Every component has earned its place. Every essential is there. We wanted extra robust valves, and had them made specially. We wanted high selectivity—and you'll find we got it.

The '381' has five valves, including rectifier. Operates on any A.C. or D.C. supply, 200-250 volts. Full vision dial marked with station names and wavelengths. Designed for KB Rejectostat system. Handsome walnut cabinet.

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KB RADIO from £5.15 to 65 gns.

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Please send me full particulars of the new KB Receivers.


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Pract. W. 18/8/34

NEW LINES

By **BELLING-LEE** OLYMPIA, STAND No. 41


Standard Disturbance Suppressor 1118

 This is all that is required in 80% of cases.
 Type 1118 .. 10/6

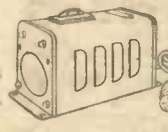
For Small unearthed electric motors.

 Type 1711 .. 8/6

Flashing Sign Suppressor


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 For use when 'hum' on D.C. mains is troublesome, such as when fed from Mercury Arc Rectifiers. Type 1140 £3 7 6

Car Radio Interference Suppression Kit





 6 cylinder 20/-
 4 cylinder 15/6

CONTACT SUPPRESSOR

 Type 1144 2/6

VOLTAGE DROPPER.
 Use practically any make or combination of universal valves on any mains supply without the use of additional resistances. Type 1173. 17/6





PLUG TOP VALVE Connectors

	Type 1175 .. 1d.
	Type 1167 .. 2d.
	Type 1156 .. 4d. (shrouded)
	Type 1166 .. 8d. (shielded).



PICK-UP. Model D.

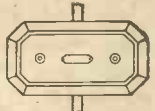
 Without volume control .. 30/-

AIR FORCE Wanderplug

 will not come out
 Type 1157 each 1/-

TELEVISION LETTERINGS

 Syn. Mod. Anode GN. X1, X2, Y1, Y2, A1, A2, B1, B2

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	" 1164 10d.		Type 1136-S 5 way .. 4d.
			Type 1138 7 way .. 5d.
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Double Choke and Condenser Unit

 3 to 30 amps.
 From £3 10

Better 1935 radio means using 1935 COLVERN components



The latest type Ferrocort coils, 12/6 each

Constant research and continuous experiment have resulted in the new Ferrocort coils and "Colpak" illustrated—even further advanced and in efficiency, provision and design than last year. Only by fitting Colvern components in your set can you be assured of the most brilliant reception. Make a special point of seeing them at Stand 38, Olympia. Made under licence from patentee, Hans Vogt.



The New Colpak tuning unit, 57/6

A description of the method evolved by the post office and by engineers throughout the world for the suppression of electrical interferences with Radio reception and including results of research work conducted by Belling & Lee, Ltd., with 37 illustrations. From your Radio dealer price 6d. or post free 6d. by sending the coupon.

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 Please send a Free Catalogue, b 6d. Book. Stamps enclosed.

Name

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P.W.18/8/34

STAND 38 OLYMPIA

FREE Blueprints of splendid specially designed "up to the minute" sets.

To COLVERN, Ltd., Romford, Essex. Please send me full details and Blueprint of the } COLPAK CLASS B J.A.C. MAINS SET

Strike out name of blueprint not required. Stamps value 3d. to cover postage are enclosed.

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In the days when receiving "a foreign station" was a matter for congratulation—when reception of any description was always rather a question of fortune—in those days Celestion was the Foremost Name in Sound Reproduction.

To-day, with a long list of achievements to its credit, the name of Celestion on a Loud Speaker means the same as the hall-mark on gold. Throughout ten long years Celestion engineers have striven always onwards to achieve their aim of perfect sound reproduction. That is why Celestion is still to-day the choice of those who know.

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CELESTION
The Very Soul of Music

was the foremost name
in sound reproduction

Duckingham

362
VALVES

OLYMPIA
STAND 244

An invitation to all radio enthusiasts; Call at our stand, and learn for yourself how 362 valves have solved the problem of "better—yet—cheaper" radio. Compare price and performance (study the characteristics) with any other make of valves.

362 BATTERY VALVES. H HL & L, 3/6. Power, 4/- Super Power, 4/6. SG & VS, 7/6. Pentode Type, 10/- BA & BX, 9/-.
362 AC MAINS. HL4, 7/6. PX4, 9/- SG4 & VS4, 12/6. ME & HM, 13/- RB41, 7/6. RB42, 10/- DC MAINS at SAME PRICES as AC MAINS.
Should your dealer not stock, send P.O. to Dept. 44.

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CAREW WILSON



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SEE OUR STAND No. 105, RADIOLYMPIA

T.M.C.
BRITISH MADE
HYDRA
CONDENSERS



The special method of sealing T.M.C.-HYDRA condensers definitely prevents the penetration of moisture and so preserves the high electrical properties of the condensers. T.M.C.-HYDRA condensers of all types are sold by your radio dealer, but if you have any difficulty in obtaining supplies, write to the Sole Distributors:

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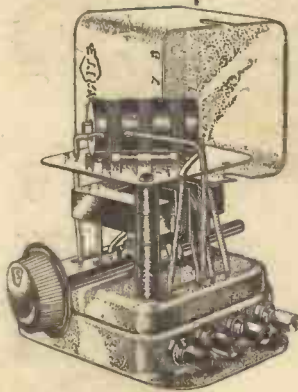
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NOW FOR THE
"SUMMIT 3"



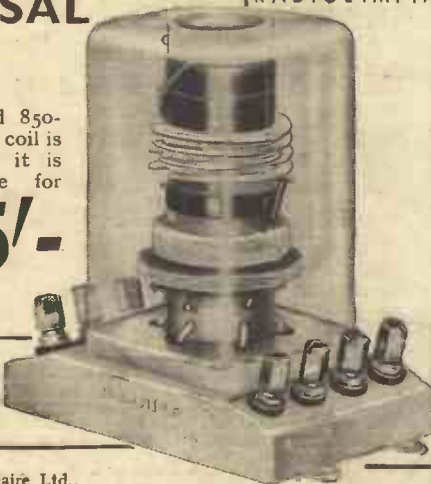
**THE WEARITE
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IRON CORE
COILS**

The outcome of many months intensive research work, these coils are again the choice of a leading Set designer. For your "Summit Three" you will need the following:

- ONE WEARITE A.D. Coil (Aerial) **12/6**
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Here is the famous
**SCREENED
UNIVERSAL
COIL**

Tunes 180-550 and 850-1950 metres. This coil is Universal in that it is equally suitable for Aerial, H.F. or Band - Pass Tuning.
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Price per coil



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NAME

ADDRESS
PRAC. 18/8/34. PLEASE WRITE IN BLOCK LETTERS.

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FIRST**

Blue Spot's reputation for quality in Loudspeaker design and performance is almost as old as broadcasting. The new Blue Spot "Star" Speakers represent the greatest advance in the science of loudspeaker reproduction. Your old friends 89PM and 45PM and their cabinet models are also being continued.

**OLYMPIA
STAND 90**

BLUE SPOT "STAR JUNIOR"

This is an exceptionally fine speaker at a very attractive price. The "Star Junior" gives a very high frequency response and the reproduction is amazingly natural and vivid in every detail of speech, song, or instrumental music.



FEATURES.

New Magnet design. Die cast chassis. No leakage of magnetism. Transformer with 12 point matching to suit all usual output stages or for use as extension speaker.

PRICE

35/-

Cabinet model in oak and chromium 48/6.

BLUE SPOT PICK-UP

This new model presents many attractive features. Tracking error is reduced to the minimum. The head lifts back for needle changing, eliminating risk of damage to records. Perfect reproduction of all frequencies without overloading. Screened leads. An earth connection provided. Special Volume Control giving silent and distortionless adjustment. Price £1 7s. 6d., or without Volume Control £1 1s. 6d.

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A really outstanding speaker giving a degree of naturalness in reproduction never before achieved. It has a special magnet, die cast chassis, novel exterior suspension, independent on/off switch and many other features. Price: 70s. Cabinet Model in walnut and chromium 98s.

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for use only with the Blue Spot "Star." It replaces the standard on/off switch and only controls the speaker to which it is attached. May be used free or fixed. Price: 10s. 6d.

SEND FOR SEASON'S CATALOGUE FREE. It describes in detail all the newest Blue Spot Models.



THE BRITISH BLUE SPOT COMPANY, LTD., Blue Spot House, 94/96, Rosoman Street, Rosebery Avenue, London, E.C.1.
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IT STANDS ALONE

10, 20 or 30 m/A
at either
120 or 150
volts.



69/6
CASH
or 10/- DEPOSIT
and 8 monthly
payments of 8/6.

THIS NEW "ATLAS" UNIT HAS 6 OUTPUTS & GIVES THE MOST POWER at the LOWEST COST

A MODEL FOR
EVERY SET.
**TRY ONE FREE
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There is an "ATLAS" Unit to make any Battery Receiver Mains-operated without alteration to set or valves; giving vastly improved performance for one-fiftieth the running cost of dry batteries. Prices from 39/6d. cash, or 10/- deposit.

The new "ATLAS" Model T10/30 is the last word in Mains Unit design. In power, output and value, it surpasses any mains unit ever made. No other unit in the world provides tapped alternative outputs of 10, 20 or 30 milliamps with alternative voltages of 120 or 150 for only 69/6 cash.

WHAT THIS MEANS TO YOU.

You can run your battery radio set of any type or size from the mains and cut running costs from 60/- a year to less than ONE SHILLING A YEAR. Moreover, it means that no matter what battery set you may buy or construct in future years, you are assured of the correct voltages and outputs you require. If you buy the "ATLAS" T10/30 and insist on it, you put an end for ever to the expenses and annoyances of Battery replacements, and accumulator charging.

SPECIFICATION.

H.T. Tappings, 60/80 v. (min. and max.), 50/90 v. (min., med. and max.), 120 v. and 150 v.

H.T. Outputs, 10, 20 or 30 m/A at either 120 or 150 v.

L.T. Trickle Charger, 2 v. at 0.5 A.

For A.C. Mains 100/125 or 200/250 v. 40/120 cycles. Model for 25 cycle mains at same price.

Guaranteed for 12 months.

Westinghouse Rectifiers.

NO OTHER UNIT GIVES SO MUCH FOR SO LITTLE.

Ask your dealer for a FREE demonstration to-day.

POST THIS COUPON NOW!

Messrs. H. Clarke & Co. (M/cr.), Ltd.,
Patricroft, Manchester.

Please send me full details of the unique new T10/30 and other "ATLAS" Mains Units.

Name

Address

7/65

ATLAS

MAINS UNITS 

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It does not matter how much or how little you have in mind to spend, you will find, in the "His Master's Voice" range, the set that is *exactly* what you want. "His Master's Voice" instruments range from £7. 19. 6 upwards, and each, at its price, is the finest set you can get for your money anywhere. Come and see the new models "His Master's Voice" are showing at Olympia. Very *cudibly* are they in advance of their time.

SEE THE NEW "HIS MASTER'S VOICE" MODELS AT OLYMPIA

A set for every purpose—to flatter every purse

STAND Nos. 61 & 33, THE RADIO EXHIBITION,

OLYMPIA, AUGUST 16th—AUGUST 25th



"HIS MASTER'S VOICE"

THE GRAMOPHONE CO. LTD.. 98-108, CLERKENWELL ROAD, LONDON, E.C.1

THE "SUMMIT" (BATTERY) AND "ARMADA" (MAINS)

See Pages 602 & 612.

1st SPECIAL SHOW NUMBER



Practical Wireless

Technical Staff:
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 Frank Preston,
 H. J. Barton,
 Chapple,
 Wh. Sch., B. Sc.,
 A.M.I.E.E.

VOL. IV No. 100 Editor F. J. GAMM Aug. 18th, 1934

Welcome to Stand No. 8, Ground Floor!

READERS visiting Radiolympia should make a point of visiting our stand, which is No. 8, Ground Floor. Our technical staff will be in attendance to answer readers' queries and to offer advice. Readers will also be able to inspect the latest literature dealing with all aspects of wireless.

Our Show Guide

ELSEWHERE in this issue we give a full forecast of the exhibits arranged in alphabetical order. This forecast may also be used as a complete guide to the Show.

Getting to the Show

FOR the convenience of readers we show on page 635 a map giving the bus and Underground routes to and from Radiolympia. If you are a provincial reader (or even a London reader!) you will find this map of great use.

A Complete List of Exhibitors

ON page 644 appears a complete list of exhibitors arranged in alphabetical order, the Stand No. of each exhibitor appearing against each entry.

Next Week's Complete Show Report

NEXT week's issue, our second greatly enlarged Radiolympia number, will contain a comprehensive stand-to-stand report of all the exhibits. There is always a colossal demand for our special Show issues and it is necessary for you to order next week's issue in advance.

The "Summit" and the "Armada" —our Special Show Receivers

OUR special Show receivers cater for both the battery and the mains user. The "Summit" represents the peak of performance at a really competitive price, and we enthusiastically recommend it to every reader who wishes to make an extremely selective, sensitive, and powerful receiver at low cost. The "Armada" is a small, mains-operated tablegram—small in size, and, therefore, ideal for a small room. As

its title, with subtle allusion to a different sort of mains, suggests, it will enable the reader to roam the mains of the ether. Both are backed by our guarantee.

Scottish Radio Exhibition

AN important event, from the wireless listeners' point of view, will be the opening of the Radio Exhibition, Kelvin Hall, Glasgow, which is being held under the auspices of the Radio Manufacturers' Association. The opening speeches will

SPECIAL FEATURES IN THIS ISSUE

	Page
A Message to New Readers...	601
The "Summit" Three ...	602
The New Valves ...	605
The Trend of Design...	606
Circuit Developments ...	607
Television is Imminent ...	608
Readers' Wrinkles ...	611
The "Armada" Mains Three	612
Loud-speaker Progress ...	617
Special Free-for-all Competition ...	618
Guide to the Show ...	621
Floor Plan of the Exhibition	624
List of Exhibitors ...	644
Practical Television...	648

be relayed in the Scottish Regional programme on August 31st. In the following week there will be three relays from the concert hall. The exhibition will be practically a replica of Radiolympia, London.

Our NEW monthly Magazine
PRACTICAL TELEVISION
6D. EVERY MONTH

Entertainment from Blackpool

ON August 24th another Blackpool Night's Entertainment will be broadcast from the North Regional. This will include organ music by Reginald Dixon from the Tower Ballroom; a sound picture of the crowds on the Pleasure Beach; dance music by Will Hurst's Band from the Palace Ballroom; variety from the Palace Theatre; dance music by Bertini's Band from the Winter Gardens; shows by the Arcadian Follies from the South Pier, and by Tom Vernon's Royal Follies from the Central Pier, and a visit to the Tower Circus.

Dominoes Dance Band from Newquay

WEST Regional listeners will hear Sutherland Felce (raconteur) and Philip Brown's Dominoes Dance Band relayed from the Headland Hotel, Newquay, on August 25th. The band, which consists of four players, was formed in 1925, and has broadcast on more than 120 occasions. A chance offering of a cabaret engagement whilst in the South of France decided the future career of Sutherland Felce, and he set out to create a style that was different.

Three Choirs Festival

IN the Regional programmes on September 4th a relay will be given from the Three Choirs Festival, which takes place at Gloucester. The relay consists of the Mozart Requiem Mass, and the three cathedral choirs of Worcester, Hereford, and Gloucester will be heard with the London Symphony Orchestra and with Isobel Baillie, Mary James, Trefor Jones, and Keith Falkner as soloists. Dr. Percy Hull, organist at Hereford Cathedral, will be the conductor. The conductor of the whole Festival is Herbert W. Sumson, who succeeds the late Sir Herbert Brewer as organist of Gloucester Cathedral. There are 350 voices in the Festival Choir.

Silver Band Concert from Bodmin

THE St. Dennis Silver Band, conducted by A. G. Richards will give a concert for West Regional listeners from the Foster Hall, Bodmin, on September 1st. Jack Collings, the fisherman bass, will be the artist.

ROUND the WORLD of WIRELESS (Continued)

Variety Performances from Olympia
THE B.B.C. announces that during the Radio Exhibition at Olympia (August 16th to 25th) three variety performances will be given daily in the theatre. The bill will be changed three times in the course of the Exhibition, each bill running for three consecutive days. Excerpts from performances are to be relayed in the National programme on August 16th, 20th and 25th, and in the Regional programme on August 18th and 22nd.

The following artists will appear: Claude

RADIO IN THE OPEN



A small picnic party using a Ferranti Lancastria Battery Portable.

Dampier and Billie Carlyle, comparative newcomers to the microphone; Ann Penn, whose impersonations have been a popular feature of B.B.C. programmes since February, 1929; Collinson and Dean, comedians; Phyllis Robins; Bertha Willmott, the "comedy girl with a voice"; and Clapham and Dwyer, who need no introduction to the public, Jass and Jessie, Arthur Prince and "Jim." Lily Morris, and the Carlyle Cousins, syn-copated singers, will also appear at Radiolympia. In addition there will be Stanelli and his Hornchestra; Stainless Stephen, who invented the "punctuation" style of broadcast humour; Alec McGill and Gwen Vaughan, the Cheerful Chatterers; Anona Winn, one of broadcasting's most versatile artists; and Hermione Gingold.

Broadcasts by Miscellaneous Bands

DURING the absence from the studio of the B.B.C. Dance Orchestra, directed by Henry Hall, who will be on the stage at the Radio Exhibition at Olympia from August 16th to 25th, Will Hanson, organizer of dance-band broadcasting, will carry into effect his policy of giving lesser-known combinations a turn at the microphone. The bands which listeners are to hear during the middle weeks of August are all extremely capable and able to put up an excellent show. In the first week, starting on August 13th, the 17.15-18.00 (5.15-6.0 p.m.) period will be filled on successive days by Percival Mackey and his Band, Reginald Foresythe and his New Music, The Barnstormers, Harry Leader and his Band, and Joe Loss and his Kit-Cat

INTERESTING and TOPICAL PARAGRAPHS

Band. The midday period on August 17th will be filled by Tommy Kinsman and his Band.

Band Music During the Second Week of the Show

THE 17.15-18.00 period of the second week of Henry Hall's absence at Radiolympia opens with Billy Mason and his Dance Orchestra (August 20th), followed by Terry Mack and his Serenaders, Dare Lea and his Band, Rudolph Dunbar and his Coloured Orchestra, and Don Sesta and his Gaucho Orchestra in the order named. For the midday period on August 24th, Henry Hall and the B.B.C. Dance Orchestra will make a temporary return to the studio.

Another Outside Broadcast

ANOTHER North Wales Night's Entertainment has been arranged for

Northern listeners on August 15th. Although the programme will be an entirely new one, it will be supplied by the same artists, these being the "1934 Evening Follies" from Arcadia, Llandudno, the Colwyn Follies from the Pier Pavilion, Colwyn Bay, and the Rhyll Municipal Silver Prize Band.

"Tangos"

FRANK CANTELL is to direct the Midland Studio Orchestra on August 21st in "Tangos." Thomas O'Hara, who has often broadcast with his piano accordion, will play with the Orchestra.

Concert by 2nd Battalion Black Watch

THE principal feature for Midland Regional listeners on August 22nd will be a relay from the Arboretum, Derby, where the Band of the 2nd Battalion Black Watch, conducted by Mr. F. G. Lewis, is to give a popular programme, including a Sullivan Selection and a Scottish Fantasia. It will close with the Regimental Slow March, "The Garb of Old Gaul." This band played at Helsingfors last September in the British Week there, and this year it took an important part in the Black Watch Historical Pageant at the Royal Tournament.

"Saturday Afternoon" Series

R. N. BILES will contribute to the Scottish Regional "Saturday Afternoon" series on August 25th, when he will discourse on "Pottering About the Garden." The majority of listeners have done this sort of thing themselves, and it should be

interesting to hear whether Mr. Biles has discovered a new way of killing time.

"Bitter Brevities"

HALBERT TATLOCK has devised another set of "Bitter Brevities" which will be broadcast on August 22nd in the Scottish Regional programme. He will be followed by a programme of "Tunes we Remember"—old tunes, gay tunes, new tunes, blue tunes. These gramophone records have been specially selected by Douglas Moodie.

Welsh Concert Orchestra

THIS orchestra, conducted by Ronald Harding, will give a concert from the studio for West Regional listeners on August 19th. This orchestra is composed of keen professional unemployed musicians, both men and women, who have no outlet for their talents and capabilities owing to the lack of vacancies in existing orchestras. Tudor Davies (tenor) will be the soloist.

Light Entertainment from Portrush

THE Society Entertainers and Sibbald Treacy and his Rhythm Kings will be broadcasting from Portrush on the night of August 22nd-23rd; but they will not be heard by Northern Ireland listeners. Their audience on this occasion will be a vast one, spread over the Empire, for the transmission, which starts at midnight, is being radiated by the Empire station.

For Scottish Regional Listeners

THAT popular combination, the John MacArthur Quintet, are in the Scottish Regional programme on August 19th. The items will include Der Vogelhandler, by Bauckner, a Gavotte by Bolzoni, Bourrée and Gigue by German, and a selection from "The Gondoliers" by Sullivan. The Scottish Military Band, conducted by John A. McIvor, will present a popular programme on August 20th. Laurence Morgan, tenor, will be the soloist.

(Continued at foot of facing page.)

SOLVE THIS!

PROBLEM No. 100.

Martinson had an old three-valve mains set employing a detector and two L.F. transformer-coupled stages. He decided to bring this up to date, and accordingly fitted iron-cored tuning coils and new ganged condensers with good results. As the set seemed now in good condition he decided to fit an R.C. coupled stage in place of one of the transformer-coupled stages, and therefore fitted this in place of the first stage, thus making the detector R.C. coupled to the first L.F. valve. He chose the values of the two resistances and condenser from the valve-maker's instruction sheet, but found that not only was the volume seriously reduced, but he could obtain no reaction. Why? Three books will be awarded for the first three correct solutions opened. Address your attempts to The Editor, PRACTICAL WIRELESS, Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, London, W.C.2. Envelopes must be marked Problem No. 100, and must be posted to reach this office not later than the first post Monday, August 20th, 1934.

Solution to Problem No. 99.

When Jackson made his change he overlooked the fact that he was not employing an H.F. stage, and consequently he affected the rectification properties of the valve as he applied the negative bias.

The following three readers successfully solved Problem No. 98, and books have accordingly been forwarded to them:—

H. Smith, 6, Marshfield Road, Settle.
 D. G. Adams, 228, Robin Hood Lane, Hall Green, Birmingham.
 J. A. Pangborn, 24, North Birkbeck Road, Leytonstone, E.11.

A MESSAGE TO NEW READERS

By The Editor



THE annual Radio Exhibition at Olympia is the period when thousands turn their attention to radio for the first time. A great proportion of this new generation of home-constructors become regular readers of PRACTICAL WIRELESS, and it is to them that this message is addressed.

This is not a normal issue, and for the benefit of new readers, who are making their acquaintance with PRACTICAL WIRELESS for the first time, I wish to reaffirm our objects and our policy. Quite naturally, the importance of the Wireless Exhibition has justifiably claimed a large proportion of our space, and to accommodate the Guide to the Show and announcements regarding manufacturers' new season's programmes, many regular features and articles have necessarily been held over.

Normal issues of PRACTICAL WIRELESS contain a fair blending of everything of interest to the wireless constructor, expert or amateur. There are practical articles on set-building, television, readers' ideas, coil-making, test reports on the latest components, fault-tracking, our experts' replies to readers' questions, and many other interesting features written in everyday language and attractively illustrated by means of PRACTICAL WIRELESS copyright illustrations.

The Beginner's Supplement

We regularly feature a special supplement for the absolute beginner, and a new course for beginners commences in next week's issue. This course starts from first principles and proceeds through all of the varied aspects of radio and home construction. It is written in non-technical language and illustrated by means of non-technical diagrams. Even experts will find it an interesting refresher course: Those who have just taken up the hobby should follow this series week by week.

For the Short-Wave Enthusiast

For the short-wave enthusiast there is our regular short-wave section, which deals with the latest designs for short-wave receivers, methods of operation, the latest short-wave components, and all other avenues of this interesting branch of radio, including the ultra short waves. This also is a weekly feature.

Half Guineas for Readers' Ideas

Our readers' wrinkles pages give each week a selection of the best ideas received from our readers. We pay 10s. 6d. for every

item so published. These wrinkles cover interesting and ingenious gadgets, components, and methods which considerably add to the enjoyment and the efficiency of home-built receivers.

We award a special prize each week of one and a half guineas for the best wrinkle submitted. This feature affords you an interesting means of earning sufficient money to pay for your wireless components. Every reader stands an equal chance of winning these cash prizes.

The Free Advice Bureau

For the reader requiring technical advice, there is our Free Advice Bureau, which answers readers' questions promptly and accurately free of charge.

"Practical Television"

Our Television Supplement presents the latest news about persons, programmes, and apparatus relating to television. You will find all the news about the radio screen in this regular weekly feature, and in our companion journal, "Practical Television"—6d. Monthly.

Our Policy

Our receivers are designed for cheapness of construction and efficiency and ease of operation, and PRACTICAL WIRELESS has played a great part in bringing about the present low prices of components and valves. We only specify the parts actually used by our designers—no alternatives. Every receiver of PRACTICAL WIRELESS design must function in the manner which we claim it to do, and readers who encounter a difficulty may freely avail themselves of the technical advice of the designer.

Our Laboratories

The PRACTICAL WIRELESS well-equipped laboratories are staffed by enthusiastic experts, who are always tirelessly at work designing the very best receivers for home constructors. Other contributions deal in a fascinating way with this most modern of all sciences, and as a new reader you will appreciate that PRACTICAL WIRELESS does a great deal more to deserve your patronage than normally comes within the province of a journal. In nailing your flag to its mast you have secured not only the best technical information and the services of trained experts; you are ensuring that you are obtaining from your receiver the maximum of efficiency for the money you spend and the most palatable presentation of technical knowledge.



The Editor.



Mr. W. J. Delaney.



Mr. Frank Preston.



Mr. H. J. Barton Chapple,
Wh. Sch., B.Sc.,
A.M.I.E.E.

ROUND THE WORLD OF WIRELESS

(Continued from facing page)

"Schemes"

A NEW series of talks, entitled "Schemes," commences in the North Regional programme on August 17th. The projects selected are all either Northern in origin or liable to have a marked effect on the life of the North; none of them has a purely commercial object; and they have been chosen largely for their "news value" irrespective of whether they are

yet practicable. Mr. Kenneth Spence, Honorary Secretary of the recently-formed Lake District National Reserve Association (better known as the "Friends of the Lake District") will initiate the series on August 17 with a talk about "The Future of the Lake District." In this he will outline the scheme which is on foot (sponsored by the "Friends" and kindred organisations) for preserving the beauty of the Lakes by regulating all forms of building development in the district, sometimes going so far as to buy stretches of country for the National Trust.

Radio Folk for Belgium

THE L.N.E.R. are arranging two special trains and special steamers for two parties, totalling 470 passengers, under the auspices of the Philco Radio and Television Corporation of Great Britain, Ltd., to visit Zeebrugge and the Belgian Coast.

The first party will leave Liverpool Street Station on Friday, August 10th, at 8.35 p.m., returning from Zeebrugge on Sunday night, August 12th; the second party will leave at 8.30 p.m. on Friday, August 17th, and return on Sunday, August 19th.

BUILDING

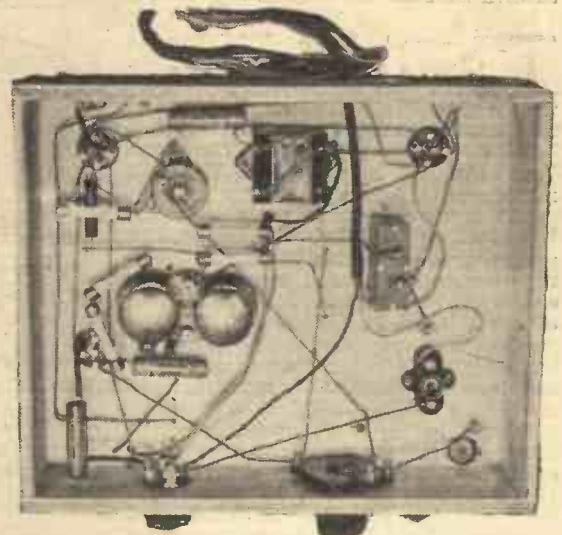
Our Latest Battery Receiver—
at a Really Competitive Price



Here is the "Summit" ready for insertion into its cabinet.

THE "Summit" can truly be described as one of the very best battery receivers that has been designed in the PRACTICAL WIRELESS laboratories. Regular readers know what this means, and that it would be difficult to give greater praise to any set. There is, therefore, no necessity to emphasize the extreme efficiency of the receiver, nor even to say that it is probably more effective than any simple three-valve battery set that could be made at a reasonable price. Another point of great interest is that the

make for better reception, or which might in any way simplify the operation. There are two tuned circuits, both of which may be controlled by means of a single knob, although an accessible trimmer is provided, and this takes the form of a second tuning knob concentric with the first. By this means the very distant stations which would never be received in the normal way can be brought in with ease; all the advantages of separate tuning condensers are thus secured without the attendant disadvantages.



This under-surface view of the "Summit" shows the wiring and will assist you in connecting up.

Variable Selectivity

It has been said that the sharpness of tuning is ample, and this statement might be amplified by stating that the London stations, when only about ten miles away, occupy no more than one degree of the tuning scale, even when the aerial is connected to the least selective tapping on the first coil. Moreover, either of these transmissions can be eliminated merely by

rotating the knob of the trimmer condenser through a small angle; this is true proof of the correct matching of the two coils and their associated circuits. Reaction is provided, but this is required only when distant stations are being received, or when extreme selectivity is called for, such as, for instance, when the set is being used within two or three miles of the local station. Both coils, and also the tuning condenser, are adequately screened so that there is no danger of "break-through" occurring.

It will be evident from the illustrations on this page that the set is entirely self-contained, the batteries and loud-speaker being all accommodated neatly within the

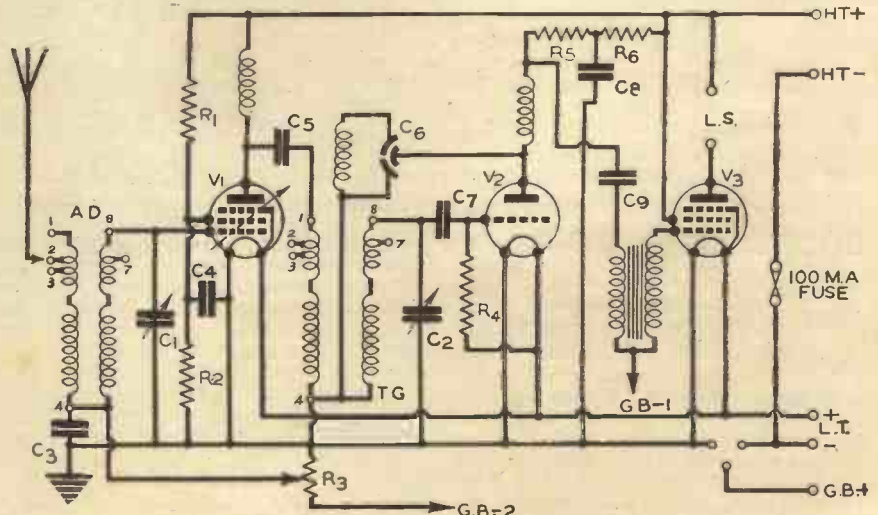


A three-quarter rear view of the complete receiver.

set has been designed on strictly economical lines; every unnecessary component has rigorously been obviated, and nothing except real essentials has been retained. This does not mean that those valuable refinements which are so popular on present-day sets have been omitted, for the set has every feature which is generally wanted by the average listener. For example, there is a remarkably smooth-working volume control which operates on the first (variable-mu pentode) valve, whilst iron-cored tuning coils are used in both tuned circuits. The "Summit" is selective enough for all requirements, but in addition there is ample provision for modifying the actual degree of selectivity to suit any particular set of conditions.

A Handsome Design

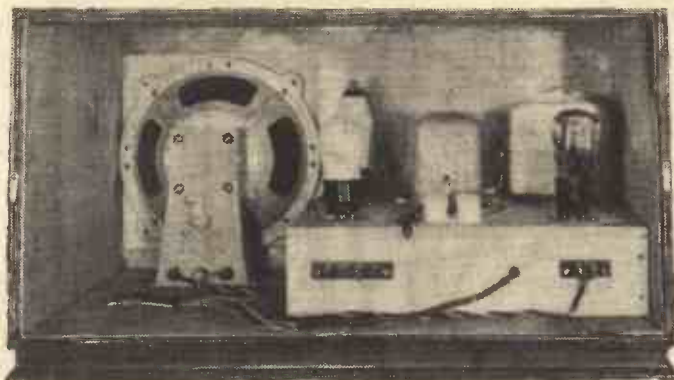
The special cabinet chosen is of very handsome design, and can be bought either as a plain table consolette, or with a set of legs so that the receiver may form a complete piece of furniture and may be stood on the floor. The controls are few in number, but nothing has been omitted which might



Theoretical circuit of the "Summit."

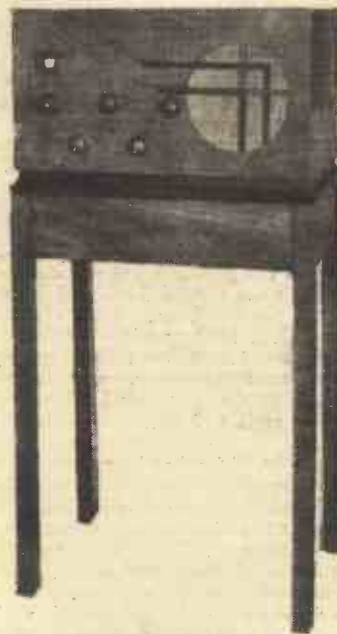
THE "SUMMIT"

The Peak of Performance
Selectivity, Sensitivity and Power



This view shows the "Summit" in its cabinet. The batteries are accommodated behind the speaker.

gang tuning condenser is fitted by means of the three bolts which are supplied with it. A word of warning is called for in connection with this component, especially since two of the bolts are used on the underside of the chassis for taking earth-return connections. Because of this the bolts must necessarily be screwed up tightly, and in doing this there is some danger of



The finished receiver in its cabinet, and mounted on the neat pedestal.

popular type of horizontal cabinet, specified. Incidentally, the loud-speaker unit is of an entirely new pattern just released by Messrs. Whiteley Electrical, Ltd.; its name—the "Stentorian"—is truly descriptive of the unit, for the volume which it delivers is truly remarkable, so much so, in fact, that it is hard to believe that Class B amplification is not employed.

The "Summit" Is Easy To Build

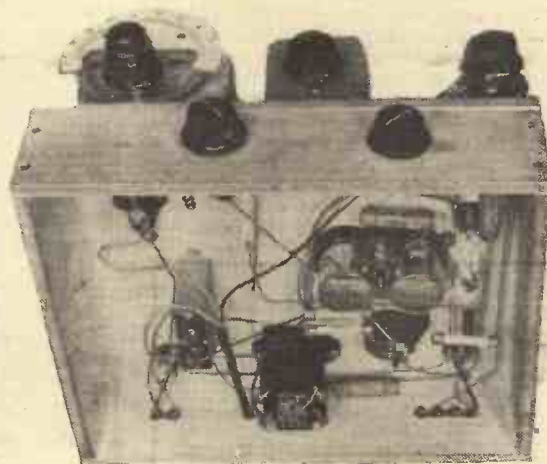
The whole of the constructional work is of the simplest possible nature, and can safely be undertaken by the beginner, even if he has never before attempted home construction. The chassis, which is of the metallized-wood type, is supplied in ready-made form by Messrs. Peto-Scott, and it is a perfectly simple matter to mount the necessary components. The positions of all the parts can readily be determined by making reference to the wiring plans and also to the photographs. Most of the components are attached by means of $\frac{3}{16}$ in. and $\frac{1}{4}$ in. wood screws, but the two-

the tubular "legs" on top of the chassis breaking through the metallized surface, so that they do not make proper electrical contact with it. This eventuality can be avoided in one of two ways; one is to place washers between the feet and the chassis surface, and the other is to avoid tightening the bolts unduly.

The twin-screened high-frequency choke is mounted by means of a $\frac{3}{16}$ in. bolt, the latter passing through the metal lug which is joined to the screening cases. By adopting this form of mounting the screen is properly earth-connected to the chassis by means of the bolt head.

Constructional Pointers

Terminal socket strips are used for making connection to the aerial and earth leads, and also to the loud-speaker, and these are mounted by means of wood screws after making two series of $\frac{3}{16}$ in. holes through which



Another view of the "Summit" which will help you in assembly.

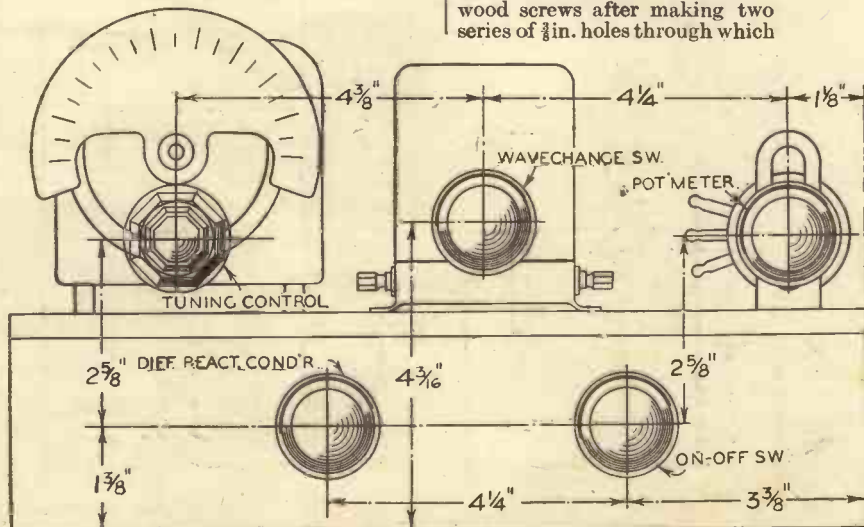
the metal sockets may pass. It will be found that the screw terminals on the back of the sockets are not at first accessible since they are adjacent to the baseboard instead of facing the bottom of the chassis. They can easily be reversed, before fixing, however, by gripping them with a pair of pliers.

The reaction condenser and on-off switch, it will be noted, are mounted on the three-ply front strip of the chassis, the latter having two 5-16 in. holes for the purpose. The rest of the assembly is perfectly straightforward and calls for no comment.

Straightforward Wiring

Little explanation is called for in respect of the wiring since this can readily be followed by referring to the large-scale wiring plans provided. Most of the connections are made by means of insulated connecting wire, and only a few of them require to be soldered. Those which are soldered are the connections to the volume control potentiometer and to the 1-mfd. fixed condenser. As can be seen from the various illustrations, the fixed resistances

(Continued on next page)



Use the dimensions shown here when drilling the cabinet front.

BUILDING THE "SUMMIT" BATTERY THREE

(Continued from previous page)

and tubular fixed condensers are attached to the various components by means of their own connecting wires, and these components have been placed in such positions that the wires do not need to be extended or even cut off short.

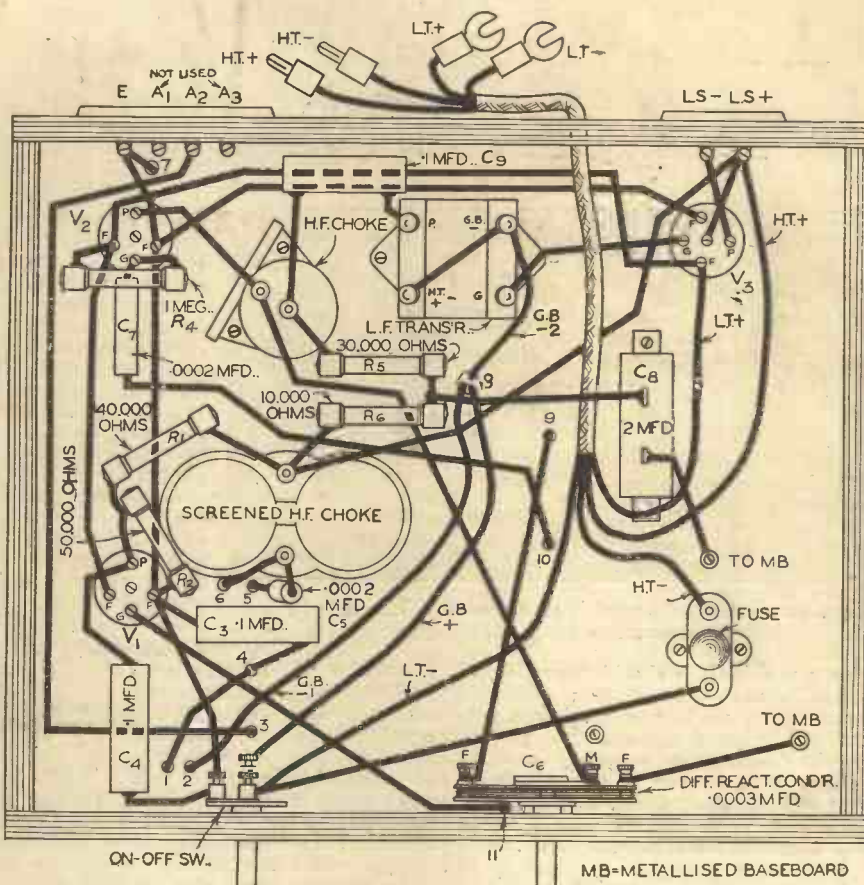
Battery Connections

There are three flexible leads, these being for the grid-bias battery connections, and these are passed through a hole made through the baseboard of the chassis near to the G.B. battery clip. The only other flexible leads are those which comprise the battery-cord assembly, and these are attached to the terminals by forming loops in their ends which fit over the terminal shanks.

After the wiring has been completed, and before the set is fitted into its cabinet, it will be advisable to give it a preliminary trial and to set the trimmer on the rear half of the gang condenser. This little matter will be fully dealt with next week, when full operating details will be given.

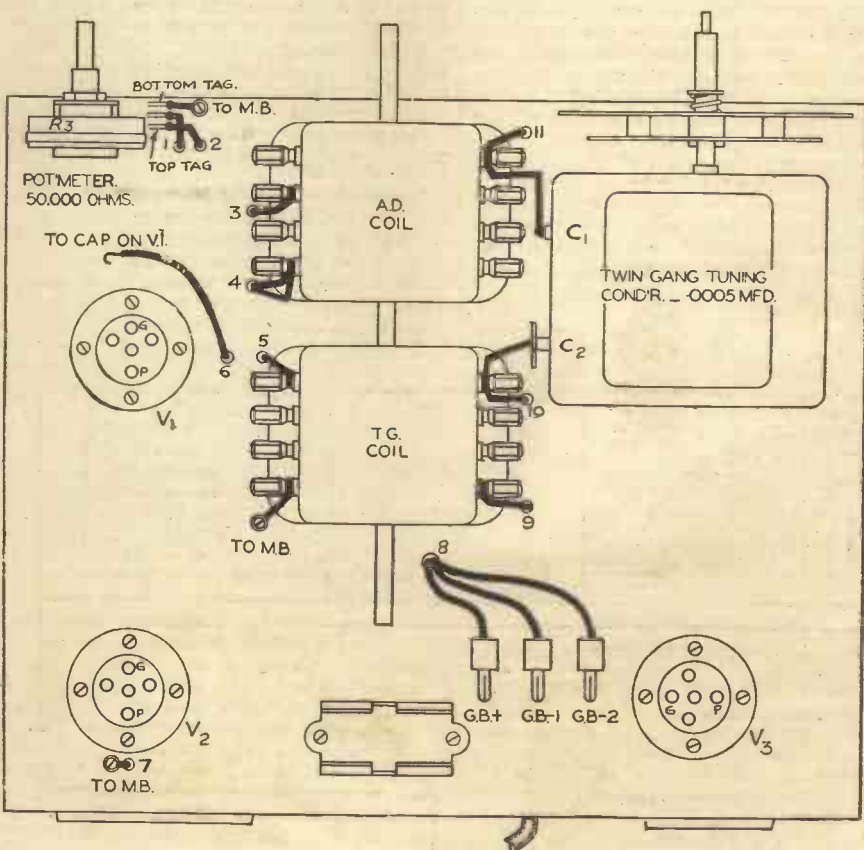
We shall also deal next week with fine adjustments, how to connect up the "Summit" for use as a radiogram, and, in fact, with how to extract the last ounce from this, our latest battery receiver which continues the policy of designing efficient receivers on a competitive price basis, which policy we inaugurated early this year with the "Leader Three." Readers who would care to inspect our experimental model of the "Summit" may do so on Stand No. 8 of the Ground Floor at Radiolympia. Our Technical Staff will also be delighted to answer any queries which intending builders care to ask, either at the Show itself or through the post.

WIRING DIAGRAMS OF THE "SUMMIT"



List of Components

- Two dual-range coils, types A.D. and T.G. (Wearite).
- One two-ganged condenser (C1 and C2) (J.B. "Unitune").
- One .0003 mfd. differential reaction condenser (C6) (Graham Farish).
- One 50,000-ohm potentiometer (R3) (Ferranti).
- Five resistances: 10,000 ohms, 30,000 ohms, 40,000 ohms, 50,000 ohms, 1 megohm. (R6, R5, R1, R2 and R4) (Dubilier, 1 watt).
- Three .1 mfd. fixed tubular condensers (C3, C4 and C9) (Graham Farish).
- Two .0002 mfd. tubular condensers (C5 and C7) (T.M.C.).
- One 1 mfd. fixed condenser (C8) (T.M.C.).
- One 3pt. on-off switch (Snap Switches)
- One 5.1 Niclet L.F. transformer (Varley).
- Three valveholders: 2, 4-pin and 1, 5-pin (Clix).
- One "L.M.S." screened H.F. choke (Graham Farish).
- One "Snap" H.F. choke (Graham Farish).
- One 100 m.a. fuse and holder (Bulgin type F.5).
- Three wander plugs, GB-1, GB-2, GB+ (Belling Lee).
- Two component brackets (B.R.G.).
- One "Summit" cabinet (Peto-Scott).
- One Metaplex chassis, 12in. x 10in. x 3in. (Peto-Scott).
- One four-way battery cord (Belling Lee).
- Two terminal socket strips: 1, A and E, and 1, L.S. (Belling Lee).
- One G.B. battery clip (Bulgin No. 1).
- One coil connecting wire; screws, etc. (B.R.G.).
- One "Stentorian" Standard M.C. speaker unit (W.B.).
- One 120-volt H.T. battery.
- One 9-volt G.B. battery.
- Three valves: 1, V.P.210; 1, H.L.210 and 1, H.P.T.220 (Cossor).





The New Valves

A RAPID SURVEY OF THE YEAR'S VALVE DEVELOPMENTS

Being a Summary of the Many Valuable Improvements which Have Been Made in Valve Design.

By BERNARD DUNN

IN a way, it might be said that there have not been so many changes in valve design during the past year, it being argued that there have been fewer new types introduced to the public. It is true that there have been no such startling novelties as Class B valves, variable- μ 's or high-frequency pentodes, but nevertheless considerable improvements have been made, and valve design has certainly not lagged behind developments in other directions.

The H.F. pentode has been well-nigh perfected; Class B has settled down and taken its proper place in battery-operated receivers; a successful double-pentode for Q.P.P. amplification has been placed on the market, and a variety of new multi-electrode valves have been introduced. It is perhaps the latter kinds of valves which have made the greatest "stir," for they have undoubtedly placed the modern superheterodyne on an entirely new plane. Such ingenious and rather complicated valves as the heptode, pentagrid, and octode have enormously simplified the design of a really effective frequency changer, besides bringing this portion of the superheterodyne many stages nearer to perfection.

Additional Electrodes

Whether or not it is entirely desirable that so many new valves which have upwards of ten electrodes should be introduced is rather a matter of opinion, but the fact that such valves can be made to be satisfactory in every way is a glowing tribute to the skill of the valve manufacturer. A testimony to the efficiency of these valves of advanced design is provided by the makers of complete receivers who have thought fit to incorporate them in their latest products. Moreover, the use of the valves has not, so far as one can judge, had any deleterious effect upon the "service" side of the manufacturers' activities; this is definite proof of complete reliability.

Whilst speaking of the newer types of valve, mention should be made of the improvements which have been made to the diode-triodes and similar valves which were first in evidence about a year ago. At that time they were looked upon as rather experimental, but to-day they are regarded as commonplace, since they have been thoroughly tried and tested. One no longer looks upon them as "stunts," but purely as reliable component parts of modern superheterodyne receivers.

Reductions in Size

Another direction in which valve

designers have demonstrated their skill has been in the production of reliable valves of much smaller physical dimensions. The miniature or midget valves have characteristics practically identical with those of their larger brethren, and the reduction in size has been brought about without any consequent loss in other directions. These small valves will probably become increasingly popular as time goes on, since there is already a large demand for midget components and accessories of every kind. This is all to the good, especially in so far as portable receivers are concerned, for most of those on the market, and all except one (the PRACTICAL WIRELESS "Atom") which have been designed for home construction, are much too large and too heavy for true portability.

Until fairly recently the British valve manufacturers left the production of universal (A.C. or D.C.) valves almost entirely in the hands of foreign makers, but it is interesting to note that things are now changing in this respect. Those (as yet few) universal valves which have been made by British firms are extremely good and truly reliable; they are, in fact, just as effective as the more usual battery and mains valves of standard pattern.

Constructional Improvements

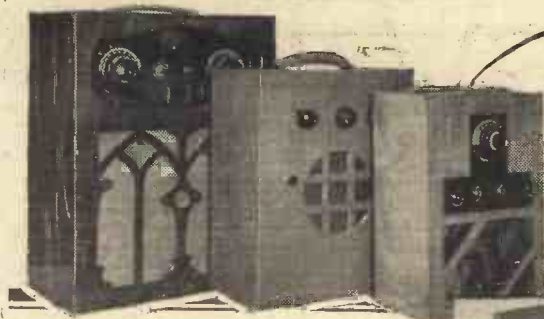
Quite apart from the new types of valves which have come into existence during the past twelve months, there have been several important developments concerning the constructional details. Although not spectacular, these items are of great importance, firstly because they make for better reception, and secondly because they are designed to ensure longer valve life. One of the most noticeable changes in construction is in respect of the shape of the glass envelope; instead of the older plain glass bulb, an electrode container rather similar in shape to a pear has come into favour. In all fairness, it should be pointed out that what was probably the first valve to be made in this way was the Cossor 220B (a 1-watt Class B valve) which was introduced at the very end of last season. The shape of the envelope is a very important aspect, since the narrowing-off at the top makes it possible to insert a special form of mica washer which fits over the electrode assembly and rigidly supports this in the centre. The rigidity so obtained entirely overcomes the old trouble of microphony caused by the electrodes vibrating mechanically, besides making it practically impossible for the characteristics of the valve to be changed accidentally due to jolts.

Valve-Base Modifications

Another important change which has been made in regard to the construction is in connection with the base connector. For something like fourteen years it had been standard to fit the base with pins of some kind or other which fitted into corresponding sockets in the holder. It was known that this method was not entirely satisfactory because it necessarily introduced unwanted capacity between the various electrodes, but it proved to be difficult to devise any better form of mounting. As the number of electrodes was increased, however, it became absolutely essential to invent some method of cutting down capacity, and the first idea (introduced some years ago) was to fit a terminal to the top of the glass envelope or to the cap, and to use this for making connection with one of the electrodes. The practical limit was set at one such connection, however, and the latest type of valve is provided with side contacts on the base cap and these make connection with spring contacts in a new type of holder. This holder, which has recently been illustrated in these pages, takes the form of a ring into which the base fits. In consequence there is no solid dielectric material between the various contacts or terminals, and the capacity is cut down to negligible proportions. Additionally, the new form of construction ensures that there shall be better contact between the valve and holder, so that many practical difficulties are at once solved.

The idea of joining one of the electrodes to a connector on top of the glass bulb has been retained, but the connector is now of different form. When an ordinary screw-down terminal was employed it frequently happened that the cap to which it was attached, and also the wire connecting the particular electrode to the terminal, became loose and broken due to the fact that the over-zealous user attempted to tighten the terminal unnecessarily. This trouble has been entirely overcome by replacing the terminal by a small closed metal cylinder to which contact is made by means of a spring clip. A further practical improvement has also been effected by using the top connector for the grid instead of the anode. This means that there is far less liability to short-circuit the H.T. supply (which is between the anode and the metal-covered bulb), and also that the capacity of the wiring is considerably reduced, whilst a more direct connection can be made between the grid and the corresponding tuning coil.

After what has been said there is no need to emphasize that the 1933-34 season has witnessed many notable improvements.



The TREND of DESIGN

WHAT changes have been made in the design of receivers since the 1933 Radiolympia? What changes will be made between now and the Radio Exhibition of 1935? These are two questions which the enthusiast might well ask himself, and from the consideration of which he might derive considerable mental entertainment.

Thinking over the changes during the past few months, perhaps the first impression which one gets is that receivers have been considerably reduced in size, as well as in price, despite their undoubted increase in the way of performance. The smaller dimensions have been secured by the use of modern components which the constructor has demanded should be less bulky and more efficient than their prototypes. There has been another strong influence at work, however, which is the rapidly-growing popularity of radio receivers for use in the car. It is obviously essential that a car receiver shall be extremely compact, and experiment very soon proved that it was possible to make a really compact instrument which was just as effective in every way as the larger ones which have become practically standardized during the past few years. As soon as it was generally realized that compactness could go hand-in-hand with efficiency, the public claimed that their wireless receivers should be reduced in size. After all, a small set is far less obtrusive, and can be placed in the drawing-room without making the latter look like a glorified laboratory, and it is easier to make the small instrument harmonize with the furnishings.

In spite of the pruning-down which has been done it is rather surprising to find that the external appearance of receivers has changed very little. There is still a fret, behind which is placed a loud-speaker unit, and the tuning dial—although altered in detail—still takes pride of place. It is true that the number of control knobs has been reduced, and this is certainly a move in the right direction, which is directed towards making a wireless set look like a piece of furniture and less reminiscent of the laboratory.

Automatic Tuning

Contrary to general expectations there has apparently been little attempt to camouflage the loud-speaker opening, and still less to dispense entirely with such a fretted hole in the cabinet. A couple of years ago there seemed to be a determined effort to produce a set with automatic tuning, and by means of which any one of a number of stations which happened to be wanted could be received merely by pressing an appropriate button. Moreover, a receiver of this type was actually made, but, although it appeared to be quite satisfactory on the whole, it is regrettable to find that the makers have found



The Changes Which Have Taken Place During Recent Times are Summarized in This Article, and Probable Future Developments are Indicated

By FRANK PRESTON

it necessary to go out of business. This must have been a case in proof of the fact that the public will not readily accept any device, however clever, which differs materially from others with which it is familiar. Let us hope (for the sake of non-technical listeners) that the automatically-tuned receiver will again be given a trial, and that it will prove as popular as it deserves to be.

Low-Priced Efficiency

Despite what has just been written, the home constructor has probably no

ceivers which can be made cheaply. The "Leader Three" battery and mains models were the first up-to-date, low-priced sets designed to demonstrate to the constructor that low price and extreme efficiency can be combined. An additional proof of the bold policy of "the best home-constructor receivers at the lowest cost" is given by the remarkable performance of the two "Olympia" sets described in this issue.

Chassis Construction.

Rather more than a year ago there were two schools of thought on the question of receiver chassis; one required a metal chassis which would give rigidity and ample screening; the other was in favour of a wooden one which was much easier for the average constructor to deal with. PRACTICAL WIRELESS solved the problem by standardizing the metal-sprayed wooden chassis. This has since been employed for every important PRACTICAL WIRELESS receiver and—significantly enough—the idea has been widely copied by other designers, including those who previously pinned their faith to the flat-baseboard form of construction. Yet another instance of "We lead—others follow!"

Generally speaking, the form of construction adopted has not changed very much during the year, and this is in agreement with the views which we expressed a year ago. This does not mean that design, or even home-construction, has become stagnant, but merely the constructional methods used by PRACTICAL WIRELESS a year ago were ahead of their time and were so sound that they could not be materially improved upon.

One could not leave the subject of this article without making reference to a tendency in design which was demonstrated a few months ago by the introduction of the "Atom Lightweight" portable receiver by this journal. This was, and still is, the smallest and lightest portable receiver of its kind ever placed before the home constructor. It will undoubtedly be copied, but it does point to the direction in which design is leading.

What of the Future?

Looking to the future one may justly wonder whether any very great improvements or modifications could be made to existing receivers, such is the height of their efficiency. They will certainly become smaller; more of them will be of the mains-operated type; automatic tuning will come; knobs and dials will disappear; loud-speakers will probably be separate from the receiver, and the number of valves will be reduced.

One other direction in which design will probably lead is in connection with the construction of a receiver of the semi-portable kind which can be used equally well in the car as in the home.

ITEMS OF NOTE AT THE SHOW.

Flood-light Tuning—

A novel system of tuning indication in which a column of light rises and falls in a thin glass tube. Seen on Marconiphone, H.M.V. and Columbia receivers.

Automatic Record Changer—

An ingenious device which plays thirty records, turning each one over and playing both sides. Seen on Autotrope receivers.

Spectrum Tuning—

A device which illuminates the tuning dial with red and green lights for each waveband and so renders only the appropriate station names visible. Seen on Atlas receivers.

Pointograph Tuning—

A device which renders accurate tuning possible by means of a moving pointer. This is normally at an angle, but when accurately tuned the pointer becomes vertical.

desire for a set which removes all necessity for delicate adjustments which allow him to employ the skill he has acquired by long experience. What he wants is a type of receiver which will give results equal to those obtainable from an expensive commercial receiver, but at a fraction of the cost. Design has been all in his favour during recent months, and one may be excused for emphasizing the success which has attended the policy recently introduced by PRACTICAL WIRELESS of designing home-constructor re-



Circuit Developments

Few Changes in Circuit Arrangements Have Occurred during the Last Year, but Those of Importance Are Reviewed on this Page.

TO the more technical of wireless amateurs and experimenters "the circuit is the thing." The circuit arrangement comes first and foremost; it is the nucleus around which the whole set is designed, and the basis of all experiment. On other pages in this issue it is shown how the whole science of wireless has moved forward during the past year or so, and in summarizing the position one cannot help referring to the circuit alterations which have eventuated.

So far as ready-made receivers are concerned, it has been a very definite superheterodyne year, and a large number of the circuit improvements and modifications concern this type of valve arrangement. Looking back over the last five years one quickly realizes that superhets. have made wonderful progress. Only a very short time ago a superhet. had upwards of seven valves, these being arranged as: first detector, oscillator, three intermediate-frequency stages, second detector and low-frequency output valve. To-day it is possible to construct a reliable superhet. by using only three valves. The first of these is a combined first-detector oscillator, the second is a highly-efficient variable-mu pentode I.F. amplifier, and the third is a diode-pentode which performs the functions of second detector, L.F. amplifier and automatic volume control.

Improved A.V.C.

A very notable circuit improvement which has taken place during the last year or so concerns the provision of really effective automatic volume control. Whereas with the older receivers distant stations were useless for entertainment purposes due to the fact that their received signals varied in intensity as a result of the inevitable fading, these stations can to-day provide good, enjoyable programmes. The change is due entirely to the provision of effective A.V.C. whereby the signal voltages applied to the detector (second detector in a superhet.) are used to bias a preceding variable-mu stage. Thus, as the signal voltage applied to the detector increases, so the negative grid-bias voltage fed back to the H.F. amplifier increases, thereby reducing the effective degree of H.F. amplification. When the signal voltages are at a minimum the bias voltage is reduced and the H.F. amplification is thereby increased.

At first it was considered that A.V.C. could be applied only to superheterodynes or receivers having a minimum of two H.F. stages, but the simple three-valve receiver introduced by PRACTICAL WIRELESS last October proved that this was not the case. It was not claimed that this set

would reproduce all stations at uniform volume level, but those who made it did find that it very largely overcame the fading which was normally experienced when listening to certain stations.

H.T. Economisers

Another circuit improvement which has been effected, and which is somewhat similar in principle to A.V.C. is the provision of a means for cutting-down the consumption of high-tension current by a battery valve of the high-power L.F. type. This improvement was incorporated in the "1934 Fury Four Super," and consists of a means of varying the grid-bias voltage to the output valve according to the intensity of the signal voltages being handled. The economiser unit consists essentially of a high-frequency metal rectifier, connected in series with a fixed condenser, between the anode of the last valve and earth. A fixed potentiometer is connected in parallel with the rectifier, and the tapping is connected to grid bias positive, whilst the negative G.B. lead goes to the grid of the valve in the usual manner. Normally the G.B. voltage is set to a much higher value than that actually required by the valve, but a small percentage of the signal voltages appearing at the anode are rectified and tend to make the positive G.B. point more negative. In other words, the rectified voltage acts

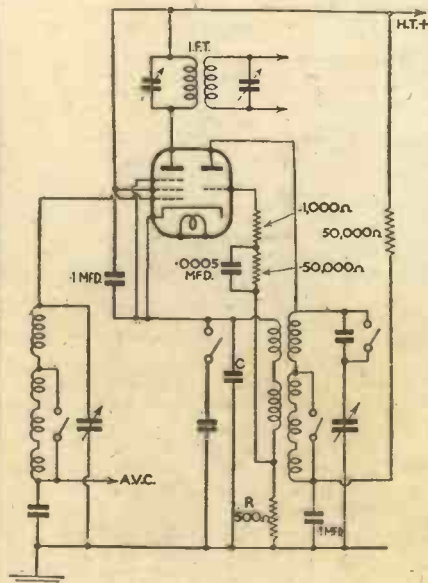
in opposition to the G.B. battery, with a result that the negative voltage applied to the grid of the valve is reduced. It will be seen that as the signal voltages increase the G.B. voltage is reduced. Consequently, when the valve is fully loaded it receives its rated G.B. voltage, but when the signal intensity is low it is over-biased, so that it consumes less H.T. current. As the valve is fully loaded for only a very small proportion of its "working" time the saving in current is considerable.

Paraphase Amplification

A circuit development which has taken place on the low-frequency side concerns what is known as paraphase amplification. The chief advantage conferred by paraphase is that harmonic distortion is almost entirely overcome, and reproduction is made more "natural." This form of amplification has not yet become very widely known, nor is it yet employed at all extensively, because the "characteristic" requirements of the special L.F. transformer are somewhat critical and depend upon the valves employed and other parts of the circuit. This means that the transformers have to be made separately and specially chosen to match the rest of the circuit; this involves a certain additional expense to which most constructors are not prepared to go. A slight modification of the original paraphase arrangement consists of using two similar valves in the output stage, the primary winding of the output transformer being connected between the anode of the first valve and the grid of the second.

Band-pass Arrangements

A circuit modification which has this year come into great favour, although it was certainly employed as long as two years ago, is the use of a band-pass filter between the H.F. and detector valves instead of in the input circuit to the first valve. In the simpler types of three-valve H.F.-det.-pen. circuit this idea has proved very valuable. By its adoption even greater selectivity has been obtained than with the form of coupling previously in use, and greater efficiency on the H.F. side has been secured. Apart from this modification, band-pass coupling has not been so popular during the past year as it was in the two preceding years. The reason is probably to be found in the better selectivity to be secured by the use of up-to-date coils, and the fact that those who employ a simple receiver do not now feel so anxious to receive a number of foreign stations as to obtain really good quality reproduction from the "locals."



Circuit diagram of triode-pentode oscillator combination—one recent circuit development.



Television is Imminent!

Why You Should Prepare for the Forthcoming Addition
to Home Entertainment. By W. J. DELANEY

A PART from the fact that scientists and technical research experts must endeavour to develop television as an art, it is essential that, in order to complete our broadcast entertainments, this branch of wireless must be added to that which we already possess. There are, of course, many sceptics who hold that it can never come in our day, but they, presumably, are content to sit at home during a broadcast relay, and whilst they listen (?) to the loud-speaker, read a book, or sit and look out of a window at the passing traffic, or in some other manner divide their attention. Surely no one can hold that they are getting even 50 per cent. from the transmission. Experts have even written in various places stating that for the full enjoyment of a programme it is necessary to darken the room—or in other words prevent the attention from being distracted. It needs very little imagination to visualize the great advantage which would accrue to the listener who could not only hear, but also see, the various items which are performed for his benefit. It is quite true that little would be gained by seeing a violinist play his instrument, or even a singer rendering a song. But there are numerous items which would not only be improved by a vision accompaniment, but which are definitely of little value without such.

We are sure the majority of listeners will agree that television must soon be made practicable, and the various demonstrations which we have witnessed bear ample proof that it is now only a matter of a little time before the listener will be enabled to look in and obtain even greater pleasure from his pastime. So convinced are we that the day is near at hand that, as readers will no doubt already have noticed, we are launching a new monthly—*Practical Television*—in which articles relating to the subject will be given and constructional details of home-receiving apparatus will appear.

Comparison with the Films

Many people endeavour to try and compare broadcasting with the films and liken the present type of transmission to the original silent films, which gave entertainment for many years. But this is hardly a fair comparison. In the silent days, we were able to see just what was done by the gesticulations of the actor, and if some point needed stressing which was not exactly related to the scene being depicted, a caption was thrown on the screen. With the broadcast performance, however, we can-

not have someone interpolating "He now walks across the room," to tell you that some stormy scene is about to be witnessed between two people. True, the all-important Effects Department have spent much time in developing "noises off," and a good imitation of someone walking across a room can be broadcast. But on probably the majority of receivers this might also sound as though someone were knocking at a door, or beating time to something. Thus, the type of the broadcast has to be arranged to suit the invisible manner of the audience and much of the quality of a transmission is thereby lost. There are hundreds of artists who cannot at present appear in the home owing to the

do not like this type of entertainment. As we have pointed out, television must come and all our readers should hasten to acquaint themselves with the principles involved and commence to take advantage of the present limited transmissions in order to see for themselves how far the art has at present progressed and to join in the general development of a new science.

Television Images Seen in Country

Although to many the 11 a.m. television transmission furnished by the B.B.C. every Friday morning is inconvenient, there are no doubt many readers free at that time who take advantage of the signals to carry out tests. It may not have occurred to these that with the holiday periods, and fine days available, the opportunity presents itself to take a trip into the country by car and watch the images under a new set of conditions. The receiving equipment, especially if it is of the transportable nature, can easily be accommodated in a car together with any batteries. Then when actually undertaking the reception tests it is quite useful to have the receiver on the running board. The television set can be of the portable disc type, while the radio receiver can also be of a simple type for this purpose. If any trouble is experienced from the daylight, then a temporary stiff paper observation tunnel can be mounted over the image screen aperture. Open-air experiments of this nature will prove invaluable.

**OUR NEW MONTHLY JOURNAL
PRACTICAL TELEVISION
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fact that their abilities lie in their actions or skill in some particular direction, and anyone who has already seen the television programmes will know that the acrobatic performers form a most pleasing object for broadcasting. No sound whatever is needed for this type of broadcast, except perhaps a quiet musical background, and yet there must be very few members of the public who



Pack your television receiving apparatus in a car and go into the country to watch the B.B.C. morning transmission.



KINGS OF THE AIR

WIDEN YOUR CHOICE OF PROGRAMMES

No matter what type of Receiver you use—Battery or All-Electric (A.C. or D.C.)—there is a Cossor Screened Grid Valve to suit it. By fitting one of these highly efficient valves you can considerably widen your choice of programmes.

Because Cossor S.G. Valves have negligible inter-electrode capacity they permit exceptionally high effective amplification, and this means increased range. To fit a Cossor Screened Grid Valve, therefore, is a simple way of improving performance.



COSSOR SCREENED GRID VALVES

Cossor 2-volt Screened Grid Valves

Type	Fila-ment Amps.	Anode Volts	Imped.	Amp. Factor	Mutual Conduc-tance m.a./v.	Price
*215 S.G.	.15	120-150	300,000	330	1.10	12/6
*220 S.G.	.2	120-150	200,000	320	1.60	13/6
*220 V.S.G.	.2	120-150	110,000	—	1.60	13/6
*220 V.S.	.2	120-150	400,000	—	1.60	12/6

Cossor A.C. Mains Screened Grid Valves

Type	Purpose	Imped.	Amp. Factor	Mutual Conduc-tance m.a./v.	Price
**MSG-HA	Super H.F. Amp'n.	500,000	1,000	2.0	17/6
*41 MSG	Super H.F. Amp'n.	400,000	1,000	2.5	17/6
**MSG-LA	Super H.F. Amp'n.	200,000	750	3.75	17/6
**MVSG	Variable-Mu S.G.	200,000	—	2.5	17/6

The above Valves have Indirectly Heated Cathode, 4 Volts, 1 Amp

Cossor D.C. Mains Screened Grid Valve

**DVSG	Variable-Mu S.G.	—	—	2.5	17/6
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The above Valves have Indirectly Heated Cathode, 16 Volts, 0.25 Amp.

* These Valves available with or without Metallised Bulbs.

† Characteristics measured at -1.5 grid volts

** Stocked with Metallised Bulb only

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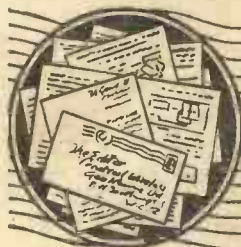
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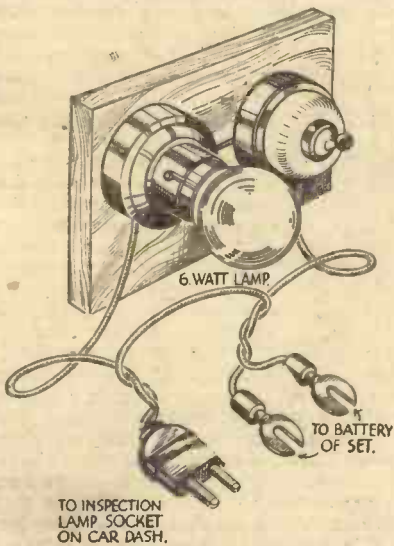
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READERS' WRINKLES



Charging a Portable-Set Accumulator
FOR those who are in the habit of using portable sets with their cars, the following dodge will eliminate the possibility of a run-down accumulator. The requirements are as follows: A miniature on-off switch, batten mounting bulb-holder, tail-lamp bulb, length of twin flex, inspection-lamp plug (or two single plugs of the Clix type). One lead from the plug is wired in series with the lamp-holder



Charging a portable-set accumulator.

and switch, and is taken to one terminal of the set battery. The other lead from the plug is taken straight to the set battery. With the plug and lamp in position we thus have a simple charging plant taking half an ampere from the car battery. It is important that the plug be inserted the correct way so as to charge the battery. To determine this position reverse the plug once or twice. The position in which the lamp shows the least light is the correct one, and the plug should be marked accordingly. The accumulator can be charged while the set is in operation or otherwise. The drain on the car battery is insignificant, but sufficient to keep the L.T. up to the mark.—R. LIDDINGTON (Hull).

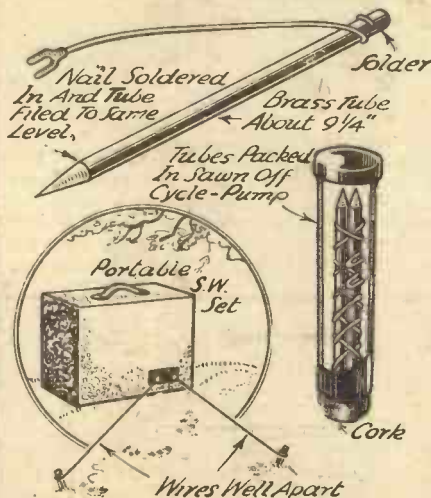
S.W. Reception with Novel Equipment

EXPERIMENTS reveal that short-wave signals can be received satisfactorily on either elaborate or simple aerial-earth equipment, and often without an earth or an aerial. A new way, simple yet effective, is to use two earths, one as usual, the other replacing the aerial. This novel "signal-collecting" method is particularly interesting to the man who takes the short-wave set outdoors, and the simple equipment illustrated is for this purpose. Briefly, two 9in. lengths are cut

THAT DODGE OF YOURS!

Every Reader of "PRACTICAL WIRELESS" must have originated some little dodge which would interest other readers. Why not pass it on to us? We pay £1.10.0 for the best wrinkle submitted, and for every other item published on this page we will pay half-a-guinea. Turn that idea of yours to account by sending it in to us addressed to the Editor, "PRACTICAL WIRELESS," George Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2. Put your name and address on every item. Please note that every notion sent in must be original. Mark envelopes "Radio Wrinkles." Do NOT enclose Queries with your Wrinkle.

from carpet or curtain-rod of small diameter. De-headed nails are then pushed up the stems—allowing about 1in. protrusion—and are soldered in, and the tube-ends filed to same level. The opposite ends are soldered up, and on the side nearby are soldered leads of thin flex or stranded wire, ending in a small spade. The container, an old cycle pump, cut down and fitted with a cork—allows the equipment to be neatly packed, and carried in an inside pocket.



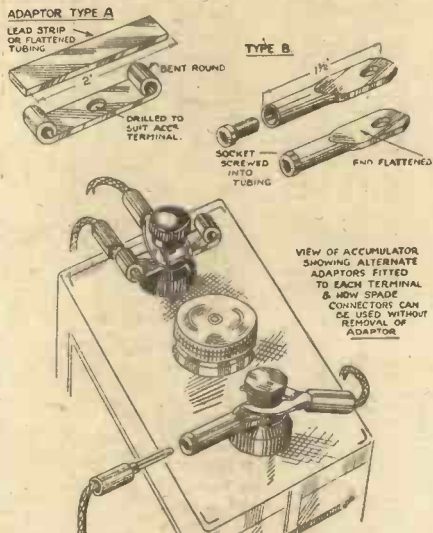
A novel aerial and earth arrangement for S.W. reception.

In use, the tubes are kept well apart, and the lead length determined by actual experiment.—F. J. GOUGH (Ellesmere).

Plug-in Adaptors for Accumulators

ALTHOUGH it is usual to fit the ends of an accumulator leads with spade terminals, it may sometimes be found necessary to make connection to the accumulator by the plug-and-socket method. For instance, in some short-wave adaptors where connections from L.T.+ , L.T.— and H.T.+ arc made by plugging into the detector valve-holder, it may be required to use the set separately with 'phones, and plug-in adaptors will then be found very handy.

Two types can be made up quite simply. Type A being merely a short strip of lead, bent round at the ends to take the plug as

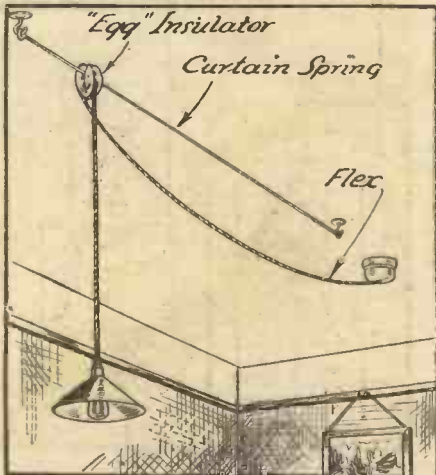


Handy plug-in adaptors for accumulators.

shown in sketch. Type B is made from a short length of ordinary lead casing from electric-lighting wire. One end is flattened and the other receives a socket (such as Clix) which is screwed in and the casing pinched round as shown.—R. L. GRAPER (St. Albans).

An Adjustable Workshop Light

IHAVE found the following idea very useful in my workshop where I had no portable light. I fixed a cheap curtain spring about 1/2 in. in diam. and 8ft. long, on two cup hooks in the ceiling (about 10ft. apart), and threaded on this one of the "egg" type aerial insulators, as shown in the sketch. Through the other hole in the insulator I threaded the flex from the ceiling rose. With this arrangement I have a handy electric light, which can easily be moved to any position over the bench.—A. HAWKINS (Needham Market).



A simple adjustable workshop light.

THE "ARMADA"

An Efficient Low-priced Radiogram, Satisfy the Most Exacting Require-



This view shows the completed radiogram in its neat cabinet.

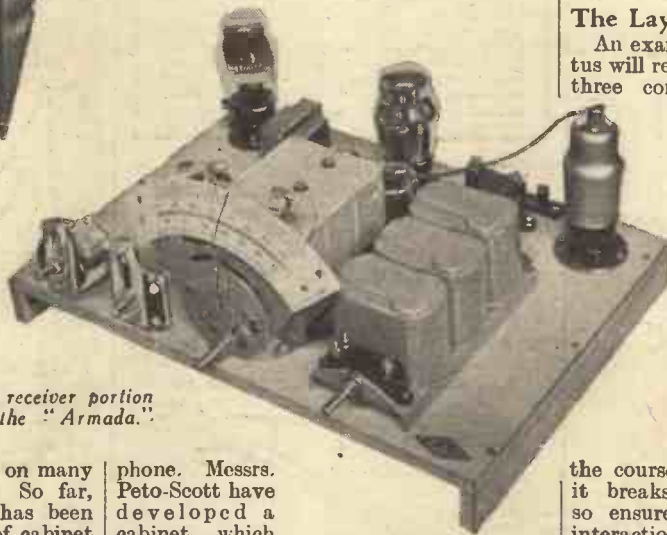
THE builder of a modern mains-operated receiver desires that it shall be operative for the reproduction of gramophone records in addition to the radio programmes, and the reason is to be found in the fact that, generally speaking, the mains receiver is capable of a much greater output of volume than a battery receiver and, consequently, it will be used on many occasions for dancing purposes. So far, however, the radio-gramophone has been looked upon as an ornate piece of cabinet work, and has generally been designed and built to resemble the cabinet gramophone of two or three years ago. The term "radio-gramophone cabinet" in fact, on glancing through any cabinet catalogue, will be found to include pedestal items ranging in

size from one just sufficient to incorporate a gramophone mechanism and a radio set to an elaborate piece of furniture housing a complete library or cocktail cabinet. Portable and table-model gramophones have for a long time been on the market, and there is obviously a need for a radiogramophone which will take up no more room than a moderately-sized table gramophone.

will provide the full entertainment which is obtainable from the combination of radio and gramophone records. It does not, unfortunately, house the records, but a suitable small cabinet could be obtained for that purpose and built to form the lower section in place of the table or stool, or, alternatively, one of the many commercial portable record-carrying cases could be utilized and would take up very little space.

The Layout

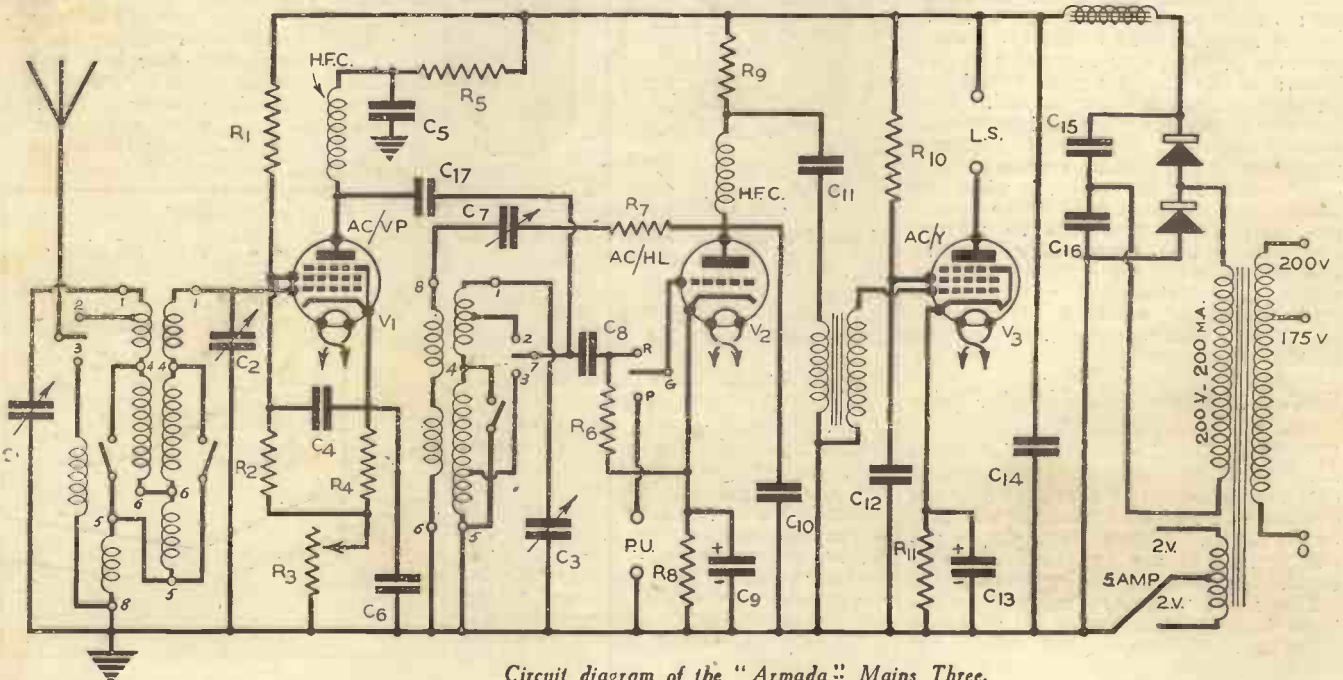
An examination of the complete apparatus will reveal that it has been divided into three completely separate sections—the receiver proper on the lower part of the cabinet, the mains section or power pack on the centre section, and the gramophone motor and pick-up on the upper portion immediately beneath the lid. This method of sub-division is not necessarily carried out on account of the smallness of the cabinet, but greatly facilitates construction from the point of view of the home constructor, and will also assist in testing and in the location of any faults which might develop during



The receiver portion of the "Armada."

phone. Messrs. Peto-Scott have developed a cabinet which follows these lines, and the "Armada" has been designed to be incorporated in this cabinet. Accordingly, it may be stood on a table, or on a small low stool or pedestal, and although taking up no more room than an orthodox radio set,

it breaks up the various circuits and so ensures stability and freedom from interaction from the various parts should they be clumsily associated. Thus even the new-comer to home construction may safely undertake the assembly of a receiver of this nature, as he is freed from all anxiety concerning the results of his handiwork.



Circuit diagram of the "Armada" Mains Three.

MAINS THREE

the Performance of which will
ments. Simple and Cheap to Build.

The Circuit

The circuit of the complete receiver is shown in Fig. 1, and it will be seen that the more or less standard arrangement of H.F. stage followed by a detector and a pentode-output stage is employed. The H.F. valve is one of the new variable-mu H.F. pentodes, and is fed from the aerial system through the medium of a band-pass tuner, which, together with the H.F. coupling coil, is one

valves. It will be noticed that no fuses are included in the actual apparatus, and safety is assured by the utilization of a special plug which includes two fuses. This is attached to the mains flex and is used for connecting the apparatus to the nearest mains socket. Although of the two-pin type, it is possible, when desired, to connect this to an ordinary lamp socket by using one of the special Goltone converter plugs. Before doing this, however, you should make certain that your local electricity supply does not prohibit the use of a radio-gramophone on the lighting circuit. To ensure hum-free operation electrolytic condensers have been used in the L.F. biasing circuits, and ample decoupling is provided at every point.

Construction

The actual construction may be divided up into three sections, as mentioned above, and the receiver proper will receive our first attention. The chassis will be found to be ready metallized and cut to size, and before mounting any components it is preferable to drill holes at the points marked "M.B." and to insert in these holes short



The receiver portion of the "Armada" in its cabinet. The mains unit shown on the left stands on the upper shelf.

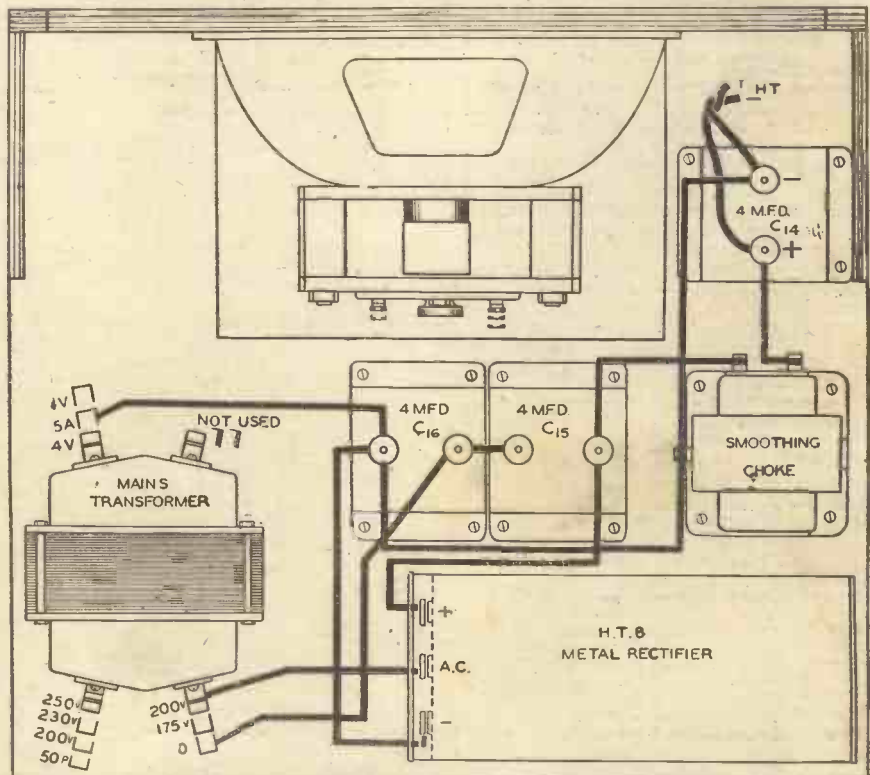


The mains section and the loud-speaker.

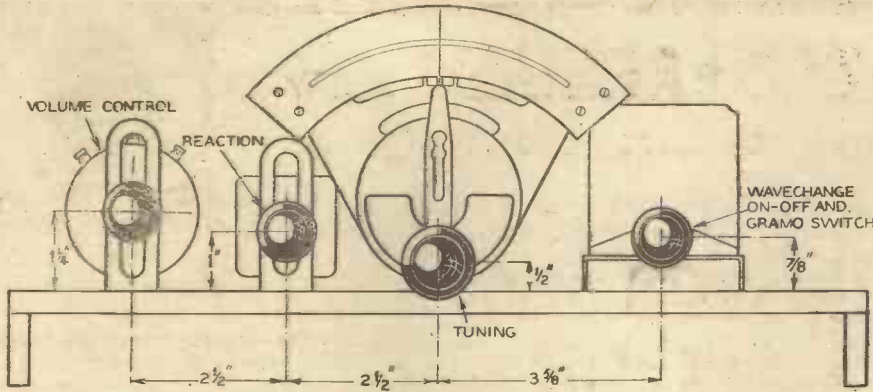
of the latest iron-core assemblies, a Colvern "G" combination. This coil assembly includes on its base-plate two other components, also operated by the coil wave-change switch. These are the radio-gramophone switch and the mains on-off switch. The former is of the single-pole change-over type and completely isolates the radio side when the receiver is used for gramophone reproduction. The latter is of the single on-off Q.M.B. type, and breaks the lead between the mains and the mains transformer. A four-position indicating control knob is fitted to the coil, and thus in one position the receiver is completely dead, or "off," and as it is rotated through its complete movement it brings the receiver into working condition on the medium and the long waves, and finally brings the pick-up into circuit. The actual settings are clearly indicated by letters embossed on the control knob. The detector valve is resistance-transformer coupled to the output pentode; and this is one of the latest valves designed to provide an output, when fully loaded, of over three watts. From gramophone records or a powerful local station, therefore, it will provide sufficient volume for dancing in a small hall. The loud-speaker is one of the latest types, the R. and A. Multima, and this is easily capable of handling the output without distress and with really admirable quality. The H.T. supply is obtained from a Westinghouse metal rectifier, and a separate winding on the mains transformer feeds the heaters of the

bolts, under the heads of which soldering tags should be fitted. These provide earth-anchoring points for various wires, as shown in the wiring diagram. Next cut the slots, or drill separate holes, to accommodate the leads from the coil unit. With the maker's

(Continued overleaf)



Wiring diagram of the mains section of the "Armada."



Dimensioned diagram of the controls of the "Armada."

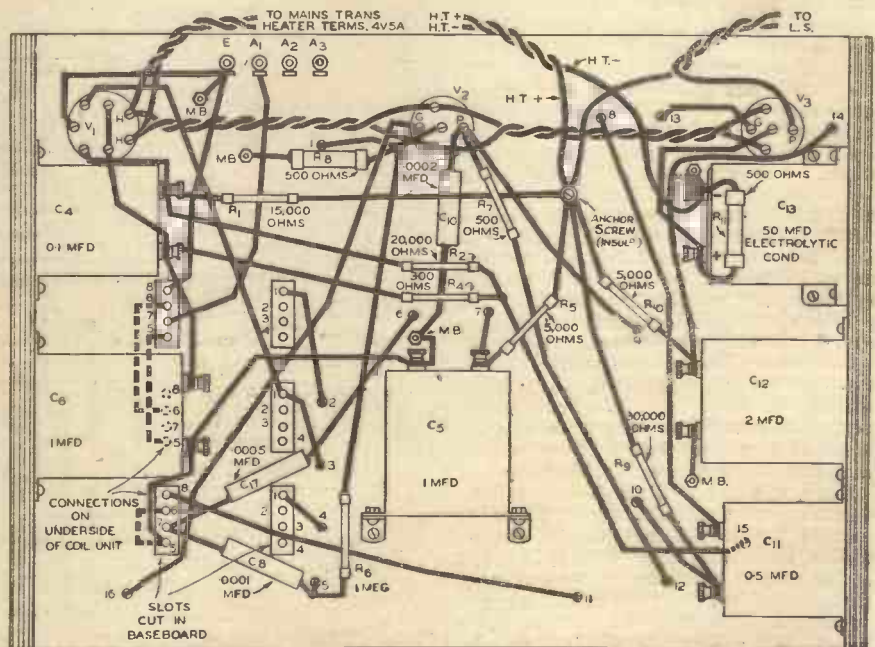
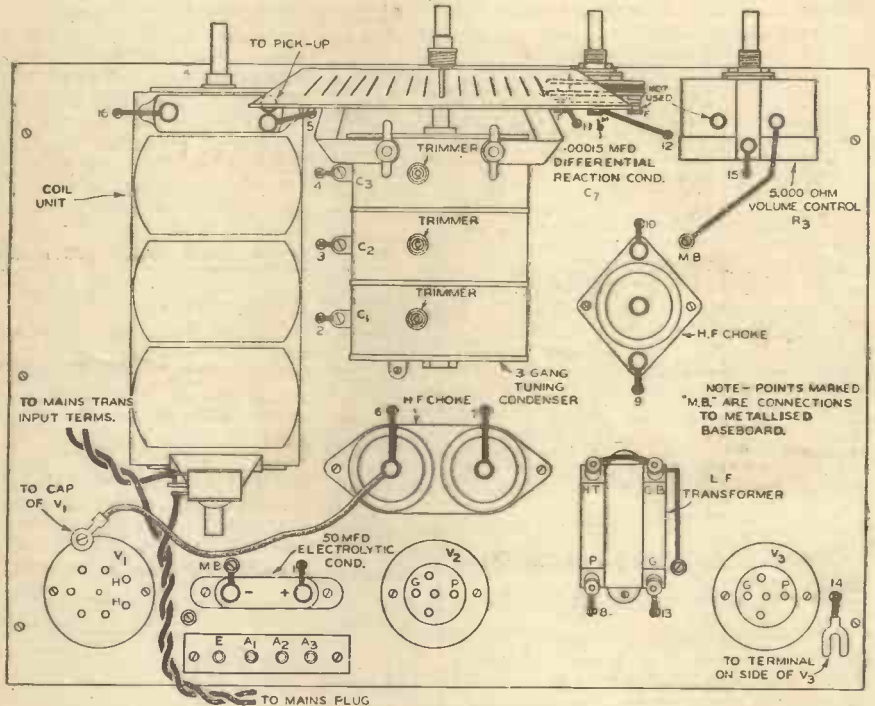
(Continued from previous page)

template, drill holes to accommodate the fixing bolts of the three-gang condenser, and finally drill the holes to take the aerial and earth terminal strip. The various holes for the inter-connecting wires should next be drilled, after marking their position, by placing the various components temporarily in position, using the photographs and the wiring diagram as a guide. When this has been done the parts may all be mounted, leaving the condenser and coil unit until last to avoid the awkwardness of the complete assembly. Wiring is carried out

LIST OF COMPONENTS FOR THE "ARMADA" MAINS THREE.

- One set Ferrocart coils, types G1, G2 and G3, with mains on/off switch (Colvern).
- One three-gang Midget condenser (C1, C2 and C3) Polar.
- One Arcuate slow-motion drive (Polar).
- One .00015 mfd. differential condenser (C7) (Polar).
- One 30,000-ohm 1 watt resistance (R9) (Ferranti).
- One 20,000-ohm 1 watt resistance (R2) (Ferranti).
- One 15,000-ohm 1 watt resistance (R1) (Ferranti).
- Two 5,000-ohm 1 watt resistances (R10 and R5) (Ferranti).
- Three 500-ohm 1 watt resistances (R7, R8 and R11) (Ferranti).
- One 300-ohm 1 watt resistance (R4) (Ferranti).
- One 1 megohm grid leak (R6) (Ferranti).
- One .0005 mfd. tubular condenser (C17) (T.M.C.).
- One .0002 mfd. tubular condenser (C10) (T.M.C.).
- One .0001 mfd. tubular condenser (C8) (T.M.C.).
- One .1 mfd. type 250 condenser (C4) (T.C.C.).
- One .5 mfd. type 80 do. (C11) (T.C.C.).
- Two 1 mfd. type 80 do. (C5 and C6) (T.C.C.).
- One 2 mfd. type 80 do. (C12) (T.C.C.).
- One 50 mfd. electrolytic type 501 (C9) (T.C.C.).
- One 50 mfd. electrolytic type 521 (C13) (T.C.C.).
- Three .4 mfd. type 80 (C14, C15 and C16) (T.C.C.).
- Two 5-pin valveholders (Clix).
- One 7-pin valveholders (Clix).
- One screened H.F. choke (binocular) (Telsen).
- One screened H.F. choke (standard) (Telsen).
- One mains choke (Telsen).
- One 5/1 pip transformer (Graham Farish).
- One type W.31 mains transformer (Heyberd).
- One type H.T.8 metal rectifier (Westinghouse).
- One "Multimu" speaker (R. and A.).
- One tablegram cabinet (Peto-Scott).
- One Blue Spot pick-up and volume control (Blue Spot).
- One 5,000-ohm volume control (C.P.157) (Varley).
- One "Trusped" electric gramophone motor (B.T.H.).
- One A.C./V.P., one A.C./H.L., and one A.C./Y valve (Hivac).
- Aerial and earth terminal strip (Belling Lee).
- Two component brackets (B.R.G.).
- One Bulgin fuse plug (with fuses).
- One Metaplex chassis to fit tablegram cabinet.
- Wire, flex, screws, etc.

with coloured connecting wire, soldering being resorted to at the common connecting points. Make certain that the insulating washers are included when mounting the volume control, or this component will not function. The reaction condenser is provided with an insulated spindle and bush, and therefore this necessity for precaution does not arise. When this has been completely wired the mains unit should receive attention, and it will be noticed that the speaker is mounted on the baseboard with these parts. Wiring may be completed from the wiring diagram, and it then only remains to connect the two parts and the gramophone section, and details concerning the completion of the apparatus will be given in next week's issue, together with operating instructions.



WIRING DIAGRAM OF THE "ARMADA" THREE.



SUMMIT 3 • ARMADA MAINS 3

NEW SPEAKERS—ELIMINATORS—KITS



PILOT AUTHOR KIT EXACT TO SPECIFICATION

The Pilot Kit SERVICE was founded in 1919.

See the PILOT on the carton. It's a real guarantee.

● Originators of Kits of Parts in 1919, we supply all your Radio needs CASH, C.O.D. or EASIWAY. Our Customers are invited to take advantage of our FREE Technical Service or call for Demonstration at our Showrooms—77, City Road, London, E.C.1, or 62, High Holborn, London, W.C.1.



NEW Manufacturers' KITS in Sealed Cartons

NEW LISSEN SKYSCRAPER THREE. Chassis model with Detector and Pentode Valves. Cash or C.O.D. Carriage Paid, £3/17/6. Send **7/-** only

Balance in 11 monthly payments of 7/-.
NEW LISSEN SKYSCRAPER FOUR ALL-WAVE CHASSIS MODEL. Complete Kit comprises all components, including set of Lissen Valves. Cash or C.O.D. Carriage Paid, £5/12/6. Send **10/3** only

Balance in 11 monthly payments of 10/3.
NEW LISSEN BAND-PASS SKYSCRAPER THREE. Complete Kit comprises all components, including set of Lissen Valves. Cash or C.O.D., Carriage Paid, £5/0/0. Send **9/3** only

Balance in 11 monthly payments of 9/3.
GRAHAM-FARISH SKYRAIDER THREE. Complete Kit for building, includes valves and modern walnut cabinet. Cash or C.O.D. Carriage Paid, £6/4/0. Send **11/3** only

Balance in 11 monthly payments of 11/3.



NEW ELIMINATORS

ATLAS C.A.25, for Mains, Class "B" and Q.P.P., four tappings; 60/80, 50/90, 120, 160 25 m/A. Cash or C.O.D. Carriage Paid, £2/19/6. Send **6/-** only

Balance in 10 monthly payments of 6/-.
ATLAS C.A.12, for A.C. Mains, 100/250v. three tappings; 60/80 v., 90/100 v., 120/150 v. 12 m/A at 120 v. Cash or C.O.D. Carriage Paid, £2/12/6. Send **5/9** only

Balance in 9 monthly payments of 5/9



NEW SPEAKERS

W.B. STENTORIAN SENIOR, Permanent Magnet M.C. SPEAKER. For Power, Pentode and Class "B." Cash or C.O.D. Carriage Paid, £2/2/0. Send **5/9** only

Balance in 7 monthly payments of 5/9.
W.B. STENTORIAN STANDARD Permanent Magnet M.C. SPEAKER. For Power, Pentode and Class "B." Cash or C.O.D. Carriage Paid, £1/12/6. Send **5/-** only

Balance in 6 monthly payments of 5/-.
BLUE SPOT "STAR" MOVING-COIL SPEAKER. Complete with Universal matching transformer. Cash or C.O.D. Carriage Paid, £3/10/0. Send **6/6** only

Balance in 11 monthly payments of 6/6

Peto-Scott PERMANENT MAGNET MOVING COIL SPEAKER

Not a Midget—FULL SIZE CONE Power or Pentode. Cash or C.O.D. Complete with input transformer. Send **19/6** Carr. Paid. Balance in 5 monthly payments of 4/-.
Class B Model, Cash or C.O.D. Carr. Paid, **2/6** DOWN



£1/2/6 or 2/6 down and 6 monthly payments of 4/-.

SUMMIT 3

KIT "A" Author's Kit of First Specified Parts, less Valves and Cabinet. Cash or C.O.D. Carriage Paid £4/6/0. Yours for **7/9** and 11 monthly payments of 7/9

KIT "B" as for Kit "A" but with set of specified Valves, less Cabinet. Cash or C.O.D. Carriage Paid, £5/18/6. Or 12 monthly payments of 10/9.

KIT "C" as for Kit "A" but with set of specified Valves, and Peto-Scott Summit Cabinet. Cash or C.O.D. Carriage Paid, £6/18/0. Or 12 monthly payments of 12/6.

These are the Parts the Author Used

	£	s.	d.
1 Peto-Scott Metaplex chassis, 12 x 10 x 3 in. Ready Drilled	3	0	0
2 Wearite dual range coils, A.D. & T.G.	1	5	0
1 J.B. 2-gang Unitune. .0005 mfd.	17	6	
1 Graham-Farish .0003 mfd. diff. reaction	2	0	
1 Ferranti 50,000 ohm potentiometer	4	6	
5 Dubilier 1 watt resistances, values—10,000, 30,000, 40,000, 50,000 ohms and 1 megohm	5	0	
3 Graham-Farish fixed tubular condensers, .1 mfd.	4	6	
2 T.M.C. .0002 mfd. tubular condensers	1	0	
1 T.M.C. 1 mfd. condenser, type 25	2	3	
1 Graham-Farish Snap 3 point on/off switch	1	0	
1 Varley 5.1 L.F. Niclet transformer	7	6	
3 Clix sub-baseboard valveholders, 2, 4 and 5 pin	2	1	
1 Graham-Farish L.M.S. H.F. Choke	4	6	
1 Graham-Farish Snap H.F. Choke	2	0	
1 Bulgin 100 m/A fuse and holder, type F.15	1	0	
5 Belling Lee wander plugs—G.B.+1, G.B.+2, G.B.—, H.T.+ , H.T.—	7	3	
2 B.R.G. 2 1/2 component brackets	8		
Wire, screws, flex, etc.	2	0	
KIT "A" Cash or C.O.D.	£4	6	0
VALVES: Set of 3 Specified Valves	1	12	6

EXCLUSIVELY SPECIFIED PETO-SCOTT Walnut CABINET 19/6

Specially designed at the request of PRACTICAL WIRELESS for the Summit 3. In exquisite walnut, a superb example of cabinet craftsmanship. Internal Dimensions 20" wide; 10" high; 12" deep. Carriage Paid. *A strongly-built Walnut Stool, 28in. high, for the Summit 3 Cabinet. 27/6 Carriage Paid.*

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ARMADA Mains 3

KIT "A" Author's Kit of First Specified Parts, less valves and cabinet. Cash or C.O.D. Carriage Paid £10/9/6. Yours for **19/3** and 11 monthly payments of 19/3

KIT "B" as Kit "A" but with set of specified valves. Cash or C.O.D. Carriage Paid £12/8/0. Or 12 monthly payments of 22/9.

KIT "C" as Kit "A" but with set of specified valves and Peto-Scott Tablegram Cabinet. Cash or C.O.D. Carriage Paid £14/13/0. Or 12 monthly payments of 26/6.

EXCLUSIVELY SPECIFIED PETO-SCOTT TABLEGRAM CABINET

Another magnificent Peto-Scott cabinet, specially designed for the Armada Mains 3. In beautifully grained woods, faultlessly constructed and hand french polished. In Oak or Mahogany to choice, no extra. State which when ordering. **45/-**

ANY ITEM SUPPLIED SEPARATELY—ORDERS OVER 10/.

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I am the Exide “Indicator” Battery. When I say “Full” I *am* full—and that’s that. When my hand approaches “Empty” it is time to get me recharged—and that’s *that*. The point is that with me you always know where you stand. I put an end to uncertainty. I put an end to the risk of being let down by a run-down battery.

★ The Exide Batteries already equipped with this invention are the “D” types listed below.

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Type DTG-C 2 volt 20 a.h. 5/-
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“INDICATOR” BATTERY

For wireless H.T. get

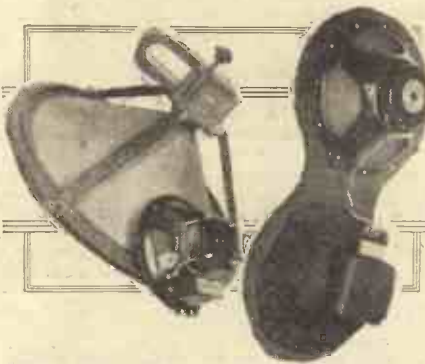
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Exide Batteries are obtainable in sizes to suit every set from Exide Service Stations and all reputable dealers. Exide Service Stations give service on every make of battery. ● EXIDE BATTERIES, Exide Works, Clifton Junction, near Manchester. Branches: London, Manchester, Birmingham, Bristol, Glasgow, Dublin, Belfast.

R.70.

‘STILL KEEPS GOING WHEN THE REST HAVE STOPPED’



SPEAKER PROGRESS

How the Loud-speaker Has Developed During the Past Season

AT last year's exhibition a number of interesting changes was witnessed in the design and construction of loud-speakers, and one of the most interesting, and one which undoubtedly attracted the greatest amount of attention, was the Microlode principle incorporated in the W/B speaker. As our readers are by now aware, this was an ingenious tapped matching transformer, fitted with selector arms, so that by a combination of the setting of the two arms it was possible to match the impedance of any type of output valve and so obtain optimum results from the speaker.

Class B

In addition to this we saw for the first time various Class B speakers in which a complete Class B stage was fitted. At this year's exhibition we cannot expect to see such radical departures from existing design, and it is quite safe to say that the loud-speaker of to-day, so far as quality is concerned, is practically perfect and will deal satisfactorily with the range of frequencies at present transmitted by the B.B.C. There is, however, room for improvement in the range which can be handled, and this will be dealt with later on.

W/B Again

At this year's exhibition the great surprise is again promised by Whiteley Electrical. As with last year's surprise, so this year they have developed something new, but instead of a departure from existing design, the improvement is to be found in the magnet system. A new alloy has been found which has resulted in greatly increased magnetism, and thus for a given size of magnet a much stronger gap strength has been obtained. This has far-reaching results, as may be seen from the following. The experimenter knows that the speech coil of an M.C. speaker is included in a small gap which is part of a magnetic system,

and consequently the speech or music current fluctuations through the speech coil intersect the magnetic lines existing in this small gap, and this gives rise to the movement of the speech coil which, as it is part of the diaphragm, causes this to move and so reproduce the sounds. Obviously, therefore, if the magnetic lines are weak, the movement of the speech coil will also be weak.

Gap Size

To maintain a sufficient and reasonably strong field across the gap this is reduced to extremely small dimensions, and consequently the speech coil must be very small, and to enable the diaphragm to be given a substantial movement it must be made

definitely does not extend into the range of the higher harmonics, and although it gives splendid results when well designed, it cannot be said that it reproduces faithfully any sound which is rich in these harmonics. In America a speaker has been developed which is remarkably good in this latter respect, and it utilizes a movement which arises from the effect of electrical currents on a crystal of rochelle salt, or, as it is more commonly known, a piezo crystal. Unfortunately, as with practically everything in this life, nothing is perfect, and the ability to deal so faithfully with the upper frequencies is met in this system with a failure to go right to the other end of the scale. Consequently, to obtain a true overall response, in which the lowest and the very highest frequencies are handled faithfully, it is necessary to combine a piezo-crystal speaker with a moving-coil speaker and this combination will be seen for the first time this year on the Rothermel stand. It is interesting to note that the piezo crystal has also been utilized by this firm in the production of gramophone pick-ups and microphones.

OUR NEW MONTHLY

Practical Television

6^D. FROM ALL NEWSAGENTS

Television Frequencies

These two instances represent probably the only radical "introductions" at this year's exhibitions, but before closing these notes perhaps it would be well to point out that with the introduction of television transmissions, and the consequent necessity of greatly extending the frequency range at present utilized, a demand will arise for improved design in both broadcast amplifiers and loud-speakers, as the probability is that the amateur will build a high-class receiver to which to connect his vision apparatus and will, at other times, utilize that amplifier for broadcast reception. With the natural progress which will result from the increased frequency response it is only natural to expect some change in quality of sound output, and thus speaker design may need modification before the next exhibition arrives.

light in weight. With the new magnet it is found possible to use a much larger gap, and consequently the speech coil may be made more substantial, leading to the introduction of a larger cone and so, throughout all the parts that matter, introducing improvements. Great things may thus be expected of this new arrangement.



The Beethoven S.G.A. Battery Model No. 54.



The Rola F7 P.M. Speaker.

The Piezo Speaker

A failing of the cone type of speaker has always been the poor high-note response. By this is not meant that the cone type of speaker is no good for high notes, but it



The Beethoven Minor Portable Model P75.

What is Your Favourite Circuit?

OUR SPECIAL RADIOLYMPIA COMPETITION

PRIZES: FIFTY W.B. STENTORIAN SPEAKERS IN SIMPLE FREE-FOR-ALL COMPETITION

Fifty of these splendid new W.B. Stentorian speakers, which incorporate an ingenious new principle in speaker construction, providing greater output for a given input, and vastly improved quality are offered in a simple competition in accordance with the Rules and Conditions given below. These speakers cost 42/- each, and are renowned for the brilliance of their reproduction and extreme sensitivity. A switch-arm is incorporated at the back which enables matching to be carried out without having to disconnect the speaker—in fact whilst the speaker is in operation.



Here is one of the 50 New W.B. Stentorian Speakers offered as Prizes in this Simple Competition.

ENTER NOW for this simple competition in which every reader—expert and amateur alike—has an equal chance! Here is a golden opportunity to win the very latest in loud-speakers, and an excellent chance of obtaining an important part of your new season's equipment. There is no entrance fee, and you may send in as many attempts as you like. The competition will be judged quickly so that you will not be kept waiting for the result.

STUDY THESE RULES CAREFULLY!

1. In the centre column appears a list of nine features of design. What you have to do is to answer the various questions in the space provided. The fifty senders of coupons most nearly agreeing with the popular vote will each receive one of the W.B. Stentorian speakers.
2. After filling in the coupon in this way, fill in your name and address in block letters at the foot of the coupon, and post, in a sealed envelope, addressed to The Editor, "Practical Wireless," Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, London, W.C.2.
3. Mark the word COMPETITION in the top left-

WHICH IS YOUR FAVOURITE CIRCUIT ?	
Battery or Mains ?	
All-Wave, Broadcast, or Short-Wave Bands ?	
Superhet or Straight Circuit ?	
Power Output over or under 2 Watts ?	
Self-contained or External Speaker ?	
Table or Console Cabinet ?	
Combined or Separate Controls ?	
Radiogram or Provision for Pick-up ?	
Self-contained or External Aerial ?	
Name	
Address	

hand corner of the envelope. Post to reach us not later than August 31st.

4. Readers may send in as many attempts as they like in one envelope, provided that each attempt is written on a separate coupon, each of which must bear the full name and address of the sender.
5. Only one speaker can be awarded to each reader.
6. The result will be published in our issue dated September 15th.
7. The Editor's decision is final and legally binding, and this is an express condition of entry. No correspondence whatever can be entered into regarding this competition.

REPUTATION

The **AMPLION** reputation for producing speakers giving life-like reproduction, fine tonal balance, sensitivity and the ability to handle heavy input without the slightest signs of distortion, is faithfully upheld in this 1935 "LION."

Perfect Matching to every class of output is obtained through the **Universal Transformer** covering from 1 to 20 ohms and from 2,000 right up to 40,000 ohms; normal or centre tapped.

Refinements include, terminals for connecting up an extension speaker. Sockets to which can be connected leads for volume or tone control. The terminal strip is clearly engraved so that it is a simple matter to secure exact and perfect matching with any receiver which you may acquire.

Sealed Magnetic Gap. Every AMPLION "LION" Speaker can be relied upon to indefinitely maintain its perfection of reproduction, because all incorporate the new "Sealed Magnetic Gap."

AMPLION "LION"

PERMANENT MAGNETIC MOVING COIL SPEAKER

Universal Transformer. Cone diameter, 7 inches. Magnet of new design. Exceptionally heavy and provides extremely high sensitivity. **47/6**

AMPLION "LION SUPER" 10-INCH CONE, 55/-

AMPLION (1932) LTD.

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OLYMPIA—STAND 63

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11, HAMMERSMITH ROAD
FACING OLYMPIA **AUGUST 16th to 25th**

The LOTUS

DOUBLE PENTODE

- SCREENED PENTODE DETECTOR AND PENTODE OUTPUT.

- MAINS ENERGISED MOVING COIL SPEAKER.

- WORKS ON ANY ELECTRIC MAINS (A.C. or D.C.) 150 to 250 volts



This amazing new set has been designed to give the very finest possible reproduction. It is selective, easy to tune and of handsome appearance.

PRICE COMPLETE

£4.17.6

The LOTUS



TRIPLE PENTODE

Variable Mu H.F. pentode. E.F. pentode detector. Output pentode. Mains energised moving coil speaker. Provision for gramophone pick-up. Works on any electric mains (A.C. or D.C.) of 150 to 250 volts. Handsome insid modern cabinet in walnut and sycamore.

Price complete: £7.19.6

Also two other splendid new LOTUS models as follows

The LOTUS

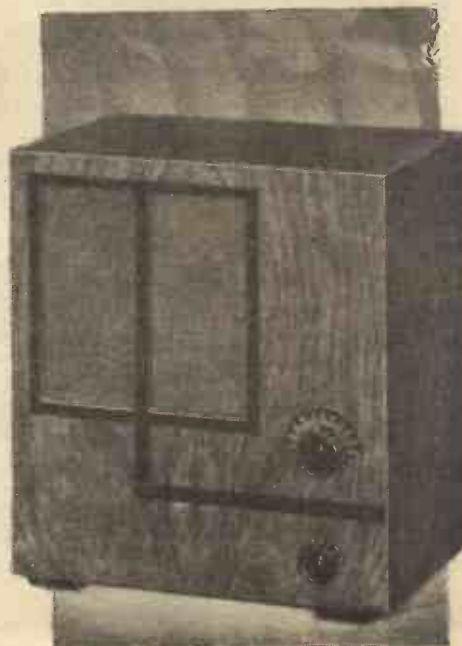


TRIPLE-TUNED A.C.

Matched triple-tuned dual range tuning inductances. Variable Mu H.F. Pentode amplifier. Screened pentode detector. 9-watt output valve. Energised moving coil loudspeaker. Handsome walnut cabinet with full vision scale. Ultra selectivity and long range. 31 watts output.

Price complete £10.10.0

MODEL "33"
AC/DC UNIVERSAL
DOUBLE PENTODE



★ **WRITE FOR FREE ILLUSTRATED BROCHURE**
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OLD FRIENDS AND NEW.....



TRANSFORMERS

1 which make any set a better set. The AF5 illustrated here, price 30/- is the choice of engineers and musicians—specified wherever high amplification and nearly perfect reproduction are essential. (Ratio 1/3.5, Inductance 260/80 henrys, 0/10 m/A).

AT OLYMPIA

At Stand No. 70 you will see some old friends. The AF3 and AF5 will be there for instance, because after years of service, these transformers have proved their title to supremacy. But the many new friends will prove to be of interest to the Radio man whose watchword is "Quality." The AF9cs; the new Resistances; the Volume controls; the Electrolytic Condensers, and above all, the comprehensive range of Ferranti Valves. The new season's range of constructor's sets alone is worthy of the closest inspection. A display of Radio at its very best. A Wireless Exhibition in itself.

FERRANTI NEW RESISTANCES

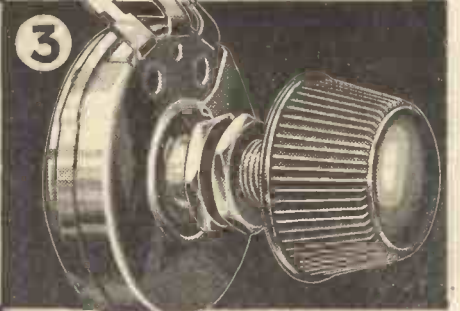
Types G·5, GH·5, G·1 and GH·1

2 Accurate to within 5% of their rated values, non-varying and maintaining the stated value even when working at full rate for long periods. Inductance and capacity negligible. From 300 ohms to 2 megohms. Price 1/- and 1/6 each. Without holder 6d. each less.



POTENTIOMETERS

3 Ferranti Potentiometers are constant in value and silky in action. Although not usually required to carry appreciable current they will dissipate 0.25 watt continuously. They have a slight negative temperature coefficient. Standard values: 50,000 ohms, 100,000 ohms, 250,000 ohms, 500,000 ohms, 1 megohm. Type P with knob as illustrated, Price 3/9 Type PS with knob and mains switch 4/6 Logarithmically graded types, 1/- each extra.



THE HEPTODE

4 The Ferranti VHT4 combines in one valve the function of both oscillator and modulator, and, in addition, is a variable Mu type, enabling full A.V.C. to be obtained in sets with only one I.F. stage. Price 20/- 2-volt Battery Heptode VHT2 also available Price 18/6



CONDENSERS

5 Ferranti (the lowest price quality condensers on the market) are made with extreme care to work efficiently and without possibility of breakdown. They are designed and made by engineers whose experience includes the building of condensers for working pressures of more than 1,000,000 volts. Prices from 1/-

STAND No. 70



M.1. SUPER SPEAKER

After being unsurpassed for years the M.1. speaker is now available in a still better form. A new suspension better and freer than before and a remarkable magnet of aluminium steel with a gap half-inch deep, are now incorporated.

Write for leaflets to FERRANTI LTD., HOLLINWOOD, LANCASHIRE.

The Practical Wireless COMPLETE GUIDE TO THE NATIONAL RADIO EXHIBITION



ACE RADIO, 2a, West Harbour Street, E.1. Stand No. 19.

ADEY PORTABLE RADIO, 99, Mortimer Street, London, W.1. Stand No. 115.

A **UNIQUE** portable will be seen on this stand, together with a valve which has been designed by Mr. Adey to simplify the construction of a neat portable of the type which he has so successfully produced. Some novel features are included in this portable which is one of the smallest receivers made commercially. Four valves are employed, and the total weight of the receiver, with batteries, is only about 12½ lbs. The price has been reduced to £7 10s.

AERIALITE, LTD., Junction Mills, Ashton-U-Lyne. Stand No. 253.

NOVELTIES in aerial and earth equipment will form the basis of the exhibits by this firm, and amongst these may be mentioned "Quikfix," some ingenious Aerial brackets designed to simplify the erection of an aerial; "Levenstrand," a new type of aerial wire; "Percolite," an all-copper earth tube, and a complete Aerial and Earth Kit, incorporating some of the above parts.

AERODYNE RADIO, LTD., Aerodyne Works, Walthamstow, E.17. Stand No. 68.

A **FULL** range of 1935 "Aerodyne" receivers will be exhibited on this stand. The range will include some of the sets which were popular last year, but these will be exhibited in new and up-to-date form.



The novel and compact Adey portable receiver which employs the Adey self-coupling valves.

AUTOMATIC COIL WINDER AND ELECTRICAL EQUIPMENT CO., LTD., Winder House, Douglas Street, London, S.W.1. Stand No. 2.

THE Avometer is now well known, and the makers of this ingenious testing instrument will be showing this fine meter as well as some entirely new lines developed this season. The Avodaptor is now brought up to date by the inclusion of a seven-pin adaptor. Also on show will be a Universal Avometer having a fully-jewelled movement with cobalt-steel magnets and a 5in. untarnishable anti-parallax dial; a D.C. Avometer providing thirteen different ranges; the Avominor—a small edition of the D.C. Avometer with eleven ranges; and the Avo-oscillator.

AUTOMATIC RADIO GRAMOPHONE Co., Ltd., Crown Street Hall, Brighton. Stand No. 110.

BAKERS SELHURST RADIO, LTD., 75, and 77, Sussex Road, Croydon, Surrey. Stand No. 242.

ALTHOUGH manufacturers of high-quality loud-speakers which will form the centre of interest on this stand, for the first time a complete receiver will take a position at the show. This has been designed for Car Radio purposes, and consists of a 4-valve receiver designed for H.T. battery-operation. Steering column control is fitted, and the circuit utilizes iron-core coils, R.C. coupling and a moving-coil loud-speaker. Extension loud-speakers will also be on show, together with the new Justone speaker, which incorporates a novel output matching device.

BALCOMBE, A. J., LTD., 52-58, Tabernacle Street, London, E.C.2. Stand No. 32.

THE well-known Alba receivers will appear on this stand, and these include table models as well as radiograms. Battery receivers and A.C. mains apparatus will be shown, and the circuits incorporated include bandpass tuning as well as the modern superheterodyne feature.



A very useful and inexpensive test meter—the Avominor, which is made by the Automatic Coil Winder and Electrical Equipment Co., Ltd.

FOR FLOOR PLAN

See page 624.

ALLWAVE INTERNATIONAL RADIO AND TELEVISION, LTD., 4a, Wimbledon Hill Road, S.W. Stand No. 113.

UNIVERSAL AC/DC all-wave receivers will be featured on this stand, and the models include a chassis which covers from 15 to 2,000 metres in four bands, each band calibrated on separate scales visible through one opening, the appropriate scale being illuminated for each switch position. A fully

SPECIAL NOTICE.

This guide is arranged in alphabetical order, and gives details of all the new season's programmes released up to the moment of going to press.

NEXT WEEK'S SECOND ENLARGED SHOW NUMBER.

Next week's issue will contain a comprehensive stand to stand report of the exhibits. Order your copy to-day.

AN INVITATION.

A cordial invitation is extended to every reader to call at our stand, No. 8, ground floor, if in need of information, advice or assistance regarding any radio or kindred subject.

variable tone control is also fitted, and the speaker is of the M.C. type with a 15-watt excited field.

AMALGAMATED PRESS, Fleatway House, Farringdon Street, London, E.C. Stand No. 12.

AMPLION (1932) Ltd., 52, Rosoman Street, E.C. Stand No. 63.

ANSON AND HOPWOOD, LTD., 41, Cheval Place, S.W.3. Stand No. 108.

LUXE receivers incorporating self-changing mechanism for gramophone records will be seen here, and the capacity of the mechanism is thirty records, all automatically changed and turned over. Known as the Autotrope, this apparatus sets a new standard for home reproduction, and visitors will find the exhibit most interesting.

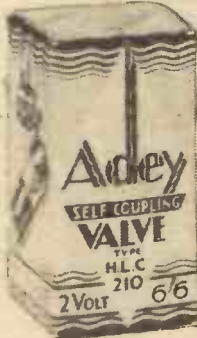
HOW TO GET THERE.

See page 635.

Practical Wireless GUIDE TO THE SHOW

BELLING AND LEE, LTD., Cambridge Arterial Road, Enfield, Mdx. Stand No. 41.

THIS firm needs no introduction as the manufacturers of small radio accessories. In addition to already popular items such as terminals, connectors, etc., some new and ingenious interference eliminating units will be on show. These are designed for use with all



The unusual Adey Self-coupling Valve, which has an inductance wound around its base.

types of apparatus, from sewing machine motors to flashing electric signs. Car-radio suppressors will also be featured, and the smaller items, such as valveholders, connectors, terminal strips, etc., will provide the home constructor with much interesting material.

BEETHOVEN RADIO, LTD., Beethoven Works, Great College Street, Camden Town, London, N.W.1. Stand No. 57.

A TWIN-speaker G-valve A.C. mains superhet; an S.G.4 Portable, and an S.G.3 battery receiver will be seen on this stand together with some other receivers embodying the latest principles. Full-vision tuning scales and modern work in birdseye maple are features which will give some indication of the modern style of these receivers.

BENJAMIN ELECTRIC, LTD., Brantwood Works, Tarriff Road, Tottenham, London, N.17. Stand No. 42.

THE exhibits on this stand will consist of small components and the famous Magnavox loud-speakers. Among the smaller items may be mentioned valveholders, battery-switches, chokes, battery economizing unit, and transformers. The



A useful testing instrument for the experimenter, the Avo-Oscillator.

speakers include the new Double Six speaker intended specially for sets and radio-gramophones of the highest quality.

BERNARD JONES PUBLICATIONS, LTD., 58, Fetter Lane, E.C.4. Stand No. 10.

BIRMINGHAM SOUND REPRODUCERS, LTD., Claremont Works, Claremont Street, Old Hill, Staffs. Stand No. 235.

ON this stand will be seen a most comprehensive range of goods, including amplifiers, radio chassis and H.F. amplifier units, turntables, speakers, baffles, microphones, radio receivers and gramophones, oscillators and valve voltmeters. The amplifiers cover various purposes and have outputs from 12 watts to 80 watts, whilst the microphones are suitable for speech or music, and may be obtained complete with table stand or floor stand. The speakers range in price from £5 5s. to £22 2s., the latter having two horns and a "Y" connector, together with a substantial reproducing unit.



employing an exclusive magnet of nickel aluminium alloy and an impedance-matching panel fitted with a simple wander plug. This costs 70/-. Other exhibits will include a remote control and a pick-up, the latter having a lifting head and a re-designed arm reducing tracking error to the lowest possible minimum.

A special volume control is incorporated, and the price, with volume control, is £1 7s. 6d. Without the control the pick-up only costs only £1 1s. 6d.

This is the self-contained battery-operated car radio equipment made by Messrs Bakers (Selhurst) Radio, Ltd.



BRITISH BROADCASTING CORPORATION PUBLICATIONS, Broadcasting House, W.1. Stand No. 88.

BRITISH G.W.Z. BATTERY, CO., 205, Bedford Avenue, Trading Estate, Slough, Bucks. Stand No. 206.

BRITISH PERMEL ENAMELLED WIRE, LTD., Charlton, S.E.7. Stand No. 21.

BRITISH PIX CO., LTD., 118, Southwark Street, London, S.E.1. Stand No. 237.

HERE will be seen Pix valves, the Pix Invisible Aerial, the Modula armchair control and similar small but useful items for the listener. For the improvement of the earth connection a new material known as "Hydrolyte" has been introduced by Messrs. Pix, and this is obtainable in a bottle at 1s. or included in a special canister ready for burial in the earth at 2s. The armchair control has already been reviewed in our pages.



The "Atlas" new-model receiver. This set embodies what is known as spectrum tuning whilst, as can be seen, the loud-speaker baffle board is arranged at an unusual angle.

BLOCK BATTERIES, LTD., By-Pass Road, Barking, Essex. Stand 31.

IMPORTANT recent additions now make available a complete range of Block plateless accumulators for every radio purpose. The three main varieties are the original cylindrical 80 a.h. type L.T., a new range of square-shaped L.T.'s of

smaller capacity, and H.T. accumulators.

The new square-shaped L.T. accumulators are specially designed for use in radio sets, and all varieties are plateless, thus providing maximum capacity for minimum space and weight, together with greater endurance and ability to hold full charge for long periods when inactive. All are enclosed in coloured mottled bakelite cases.



A new pick-up, with built-in volume control, by the British Blue Spot Co., Ltd.

BRIDGER AND CO., LTD., 4 Factory, Shelford Place, Church Street, Stoke Newington, London, N. 16. Stand No. 216.

BRITANNIA BATTERIES, LTD., Union Street, Redditch, Worcs. Stand No. 94.

A REPLACEMENT battery for any receiver is the keynote of the Britannia factory, and a comprehensive range of batteries for all purposes will be seen on this stand. In addition, accumulators and grid-bias batteries will also be displayed and some old friends will be seen in newly-designed and improved containers.

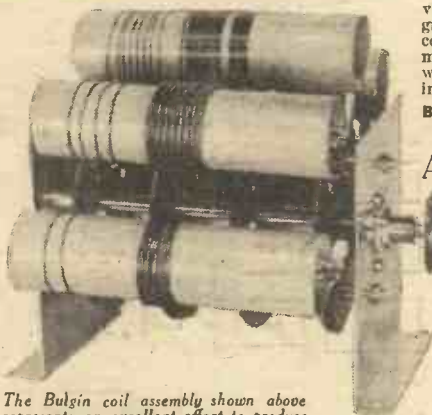
BRITISH BLUE SPOT CO., LTD., 94/96, Rosoman Street, Rosebery Avenue, London, E.C.1. Stand No. 90.

NEW models to be introduced by the well-known makers of the Blue Spot speakers will include a novel magnet principle which results in greatly improved performances. The Super Dual, costing £11 11s. with permanent magnet and £8 8s. with energized magnet, represents a most attractive type of speaker which is suitable for the home or the theatre. The Blue Spot Star is a new model



This interesting-looking instrument is an excellent modulated oscillator which is produced by Messrs. W. F. Brown Radio Co.

Practical Wireless GUIDE TO THE SHOW



The Bulgin coil assembly shown above represents an excellent effort to produce a really satisfactory all-wave tuner. It is the result of several years' experiment.

BROADCASTER, 29, Bedford Street, Strand, London, W.C.2. Stand T27.

BROWN BROS., LTD., Great Eastern Street, E.C.2. Stand No. T20.

WM. F. BROWN RADIO CO., Oscillo Works, Brierly Hill, Staffs. Stand No. 229.

THIS firm will be showing a wide range of wave meters, calibrated oscillators of both the radio- and audio-frequency types. These will be of especial interest to the more advanced experimenter and to those members of the trade who are interested in the calibration of various components. There will be a number of various types on view, and these will range in price from £14 for a radio-frequency oscillator to £35 for an audio-frequency unit. An extremely accurate pattern of valve voltmeter will also be shown.

BULGIN AND CO., A. F., LTD., Abbey Road, Barking, Essex. Stand No. 121.

IN addition to many existing and popular lines, Messrs. Bulgin will be showing a number of new components which will still further add to the long list of useful parts which have been produced during the past years. From the smallest switch to the new short-wave coils the components are of very high merit, and visitors will be able to spend an interesting time at this stand. Among the new items may be mentioned the multiple short-wave 5-range coil chassis; the all-wave testing unit; a new decorative signal lamp, and some short-wave tele-

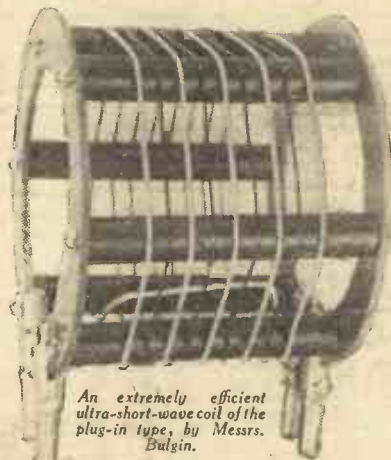
vision coils. A further point of great interest to the home constructor is the announcement that many existing lines will be substantially reduced in price.

BURGOYNE WIRELESS (1930), LTD., Great West Road, Brentford. Stand No. 102.

A RANGE of receivers at competitive prices will be shown, all of which are provided with a new form of tuning scale which is on the "clock-face" principle; it is called by the makers "one-glance tuning." The range covers battery receivers of all types, including three different portable models and one instrument fitted with dual loud-speakers and having a Class B output stage.

BURDEPT, LTD., Light Gun Factory, Erith, Kent, 81.

BURTON, C. F., and H., Progress Works, Bernard Street, Walsall, 3.



An extremely efficient ultra-short-wave coil of the plug-in type, by Messrs. Bulgin.

BUSH RADIO, LTD., Woodger Road, Shepherds Bush, W.12, 82.

CADISH AND SONS, 5-6, Red Lion Square, W.C. Stand No. T7.

A REPRESENTATIVE selection of commercial apparatus will be seen on this stand, Messrs. Cadish being wholesalers only.

CELESTION, LTD., London Road, Kingston-on-Thames. Stand No. 28.

A S representative of loud-speakers, this stand will be devoted to reproducers of various types. From the small single permanent-magnet type of speaker to the large double-energized balanced units every taste is catered for by the Celestion Company. The Auditorium speaker, for instance, costing £18 18s., and weighing 74½lbs., represents one of the larger models, whilst the E.5, costing 17s. 6d. and weighing only 11b. 4ozs., represents the other extreme. In addition, the P.2 pick-up will also be seen, and this embodies all the latest features in modern pick-up technique.



A new series of efficient and low-priced coils of the "stripped" type, which has just been introduced by Messrs. Bulgin as a reply to the "Practical Wireless" Low-price-with-efficiency Campaign.

CENTRAL EQUIPMENT, LTD., 188, London Road, Liverpool. Stand No. 4.

SOME novel aerial and earth accessories will be seen on this stand, including the No-Mast Aerial and Siltit. The former is a novel arrangement of stout copper wires built into an insulator and designed for vertical erection against the side of a house, whilst the latter is a similar arrangement incorporated with a special hygro-metallic compound for improving the efficiency of the earth connection.

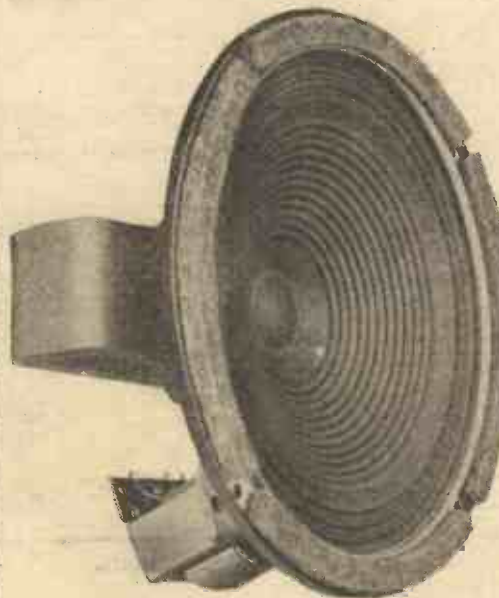
CHLORIDE STORAGE AND BATTERY, CO., 231, Shaftesbury Avenue, London, W.C.2. Stand No. 254.

A FULL range of Exide and Drydex batteries will be seen on this interesting stand in the Grand Hall Gallery. A feature of the exhibit will be the "D"-type cells fitted with the indicator which created so much interest on its recent introduction. The indicator consists of a dial over which moves a needle between positions marked "full," "half," and "empty," giving a correct indication as to the state of the cell and affording an accurate idea of the time it can be expected to last before re-charging is necessary. Examples of all types of Exide high-tension batteries include the specially-designed polished wood crates to hold Exide 60-volt batteries. It will be noticed that the range of Drydex dry batteries has been extended, a number of special batteries having been developed for the latest and most recently-designed battery operated receivers.

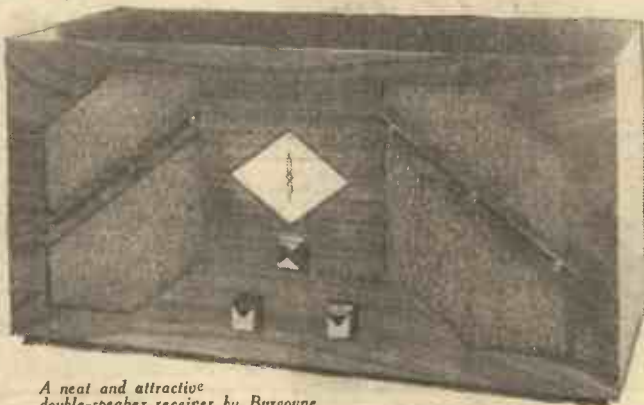
CHURCHMAN'S LTD., 79, Maidenburgh Street, Colchester. T23a.

CITY ACCUMULATOR CO., LTD., 18-20, Norman's Buildings, Central Street, London, E.C.1. Stand No. 89.

THE "Austin" Receivers will attract a great deal of attention on this stand. The manufacturers point out that the exhibits here will consist of receivers, amplifiers and tuning packs, designed and sold many months prior to the exhibition, and not some items hastily thrown together at the last moment. The Superpak Tuning Unit is a superhet tuning pack specially designed for the Heptode Frequency Changer, and is complete with 3 coils 3-gang condenser, padding condenser and 25,000-ohm tone-control potentiometer. This sells at £2 12s. 6d.



One of the permanent-magnet moving-coil speaker units from the British Rola range.

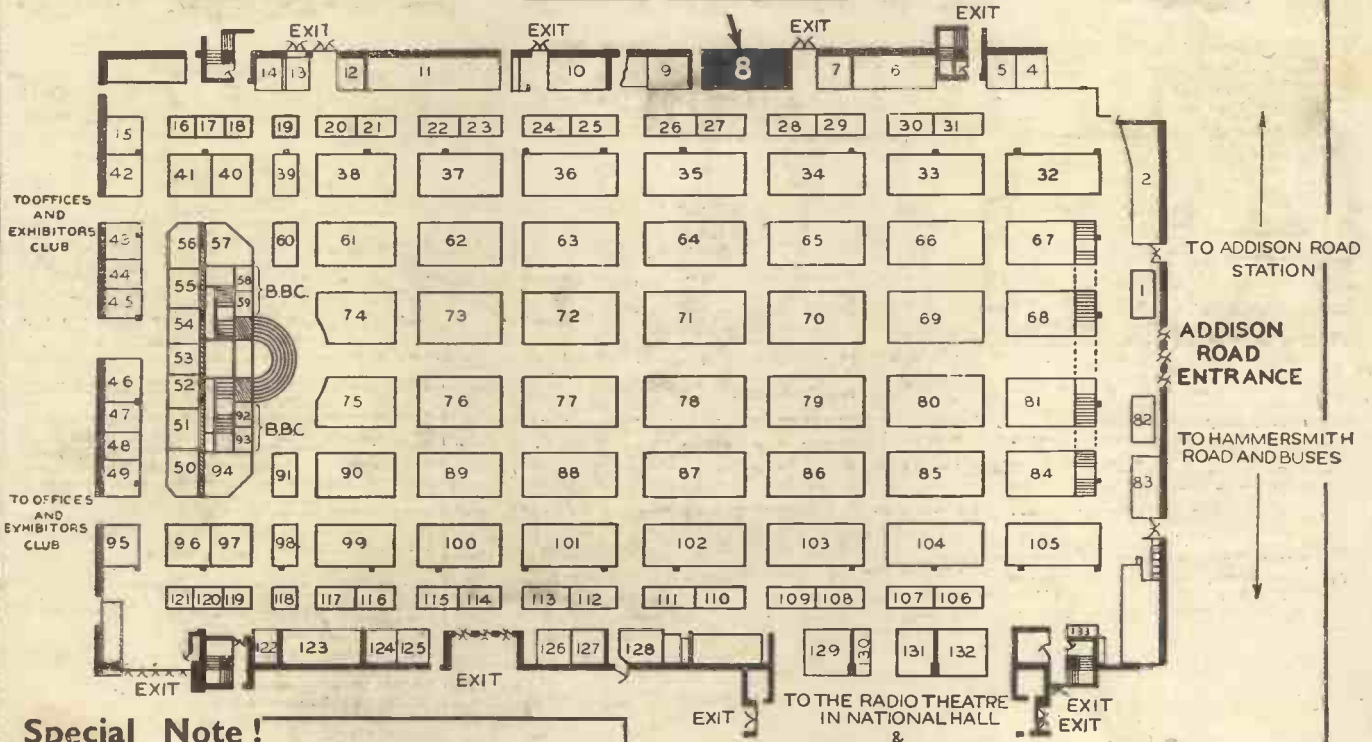


A neat and attractive double-speaker receiver by Burgoyne Wireless, Ltd. It has an attractive form of "clock-face" tuning.

Practical Wireless GUIDE TO THE SHOW

GRAND HALL - FLOOR PLAN

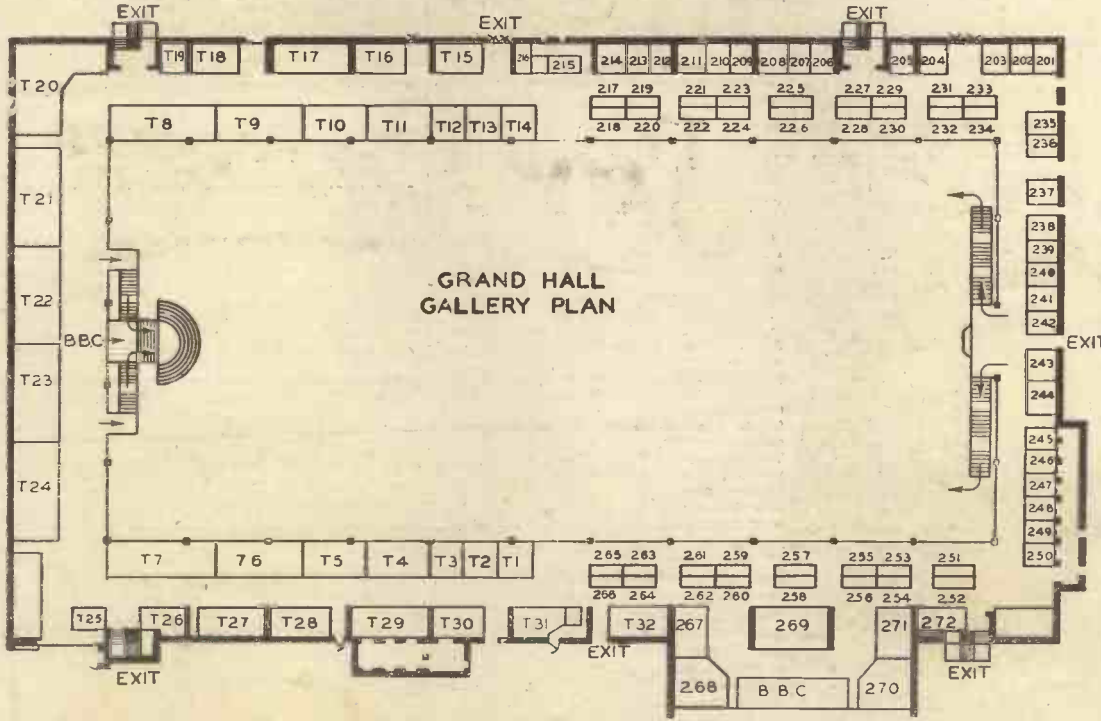
"PRACTICAL WIRELESS" THE LEADING WIRELESS WEEKLY



Special Note!

Stands Nos. 1 to 133 are on the Ground Floor; Stands 201 to 272 and T1 to T32 are in the Gallery.

ENTRANCES IN HAMMERSMITH RD



For Details of 'Bus and Underground Routes to and from Olympia See Page 635.

A Detailed Stand to Stand Report of the Exhibits will appear in Next Week's Second Enlarged Show Number! Order your Copy Now!

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The finest Radio Magazine ever published

"RADIO CONTACT"

Magazine ever published

Packed from cover to cover with Interest, and Instructions for building 3 magnificent new Battery Sets

out Today



SKY RAIDER

The most advanced set of our time. NEW-type Coils, NEW-type Valves, NEW-type Speaker . . . AND results that will amaze you.

SKY RAIDER IS THE SET TO BUILD!
Fully described in this issue with full-size Blue Print FREE

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Wonderful new BATTERY VALVE developments

Host of new ideas for your present set

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STAND TO! AT

SEE THESE
TWO FOREMOST

Stand 2

Radio Fault - Tracers



Testing made Easy—Accurate—Simple!

A Sensational New UNIVERSAL (A.C.&D.C.) AVOMINOR

REG. TRADE MARK.

Here — for everyone — is a younger brother of the famous Universal Avometer. This new meter makes both A.C. and D.C. tests. It gives you a wonderful new ability to trace faults accurately — quickly — easily — with all the assurance of the technical engineer. Entirely new testing facilities are combined with famous AvoMinor precision and simplicity.

22 METERS IN ONE	
D.C. VOLTS	A.C. VOLTS
0-75 millivolts	0-5 volts
0-5 volts	0-25 "
0-25 "	0-100 "
0-100 "	0-250 "
0-250 "	0-500 "
0-500 "	
MILLIAMPS	RESISTANCE
0-2.5 milliamps	0-20,000 ohms
0-5 "	0-100,000 "
0-25 "	0-500,000 "
0-100 "	0-2 megohms
0-500 "	0-5 "
	0-10 "

- The newest and best of inexpensive A.C. and D.C. meters.
- Entirely self-contained. Dimensions: 4½" x 3½" x 1½".
- 3" accurately marked scale.
- Simple range selection.
- Simple switch determines A.C. or D.C.

£5

Deferred Terms if desired.

See the Universal AvoMinor at Olympia, or write for descriptive folder.

The Famous D.C. AVOMINOR

REG. TRADE MARK.

Ten ACCURATE Meters in One

A NEW AID Radio Servicing Simplified

This invaluable new Book gives a complete survey of radio testing in non-technical language. The testing of modern valves, and every phase of fault-finding are explained in easy phraseology. Numerous diagrams. A book compiled for both the amateur and engineer.

2/6 Post free 2/9

Radio's triumphant little helpmate. Testing is simple, easy and accurate with this instrument. It tracks the slightest defect, traces the most baffling fault. Ten precision meters are combined in one. You can test your set like an expert. No other small D.C. meter has the same accuracy.

See it at Stand 2 and see how it can win you a valuable cash prize.



THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
WINDER HOUSE · DOUGLAS STREET · LONDON · S.W.1 · TELEPHONE · VICTORIA 3404/7

Practical Wireless GUIDE TO THE SHOW

CLARKE, H., AND CO. (M/c), LTD., Atlas Works, George Street, Patricroft, Manchester. Stand No. 85.

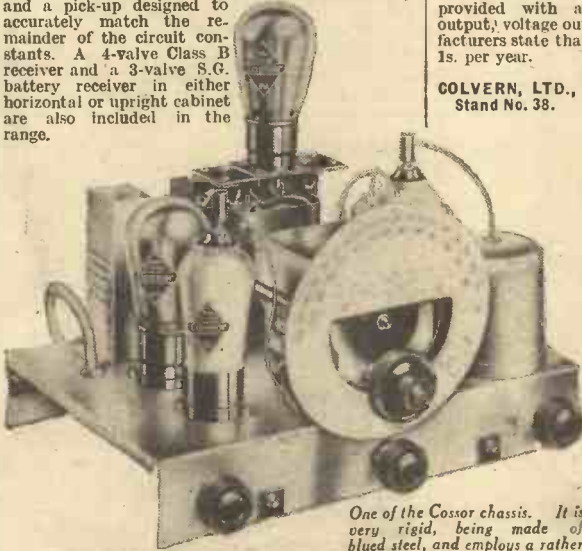
AS makers of the popular "Atlas" branch of wireless apparatus, this firm is already well known. The popular Atlas Mains units will also be shown on this firm's stand, and the range has been increased this year by the addition of model T.10/30. All previous models of receivers have been discontinued, and one new model is being marketed, in table and console types. These are known as the 7-5-8, the figures representing seven tuned circuits, five valves and eight separate functions. In addition, a novel form of tuning dial is employed in which the colour of the illumination changes for each waveband and only the names of the stations on the appropriate waveband may be seen.



This is a set of the latest type of Colvern G-type coils, the cores of which are now self-supporting, no wax being used in their assembly.

CLIMAX RADIO ELECTRIC, LTD., Haverstock Works, Parkhill Road, Hampstead, N.W.3. Stand No. 56.

AMONGST the receivers to be seen on this stand is the S5/W, employing the latest Octode frequency changing circuit, variable H.F. pentode, etc. The radiogram BG/S5 employs the latest Collaro Induction motor with fully automatic stop and a pick-up designed to accurately match the remainder of the circuit constants. A 4-valve Class B receiver and a 3-valve S.G. battery receiver in either horizontal or upright cabinet are also included in the range.



One of the Cossor chassis. It is very rigid, being made of blue steel, and employs a rather unusual form of mounting for the rectifying valve.

noise and interference between stations. Fully delayed A.V.C. (amplified) will also be featured. In addition, the well-known power units, in some of which provision for trickle-charging is made will also be seen. Each of the new Ekco units is provided with adjustable tappings for current output, voltage output and S.G. supply. The manufacturers state that running costs are approximately 1s. per year.

COLVERN, LTD., Mawneys Road, Romford, Essex. Stand No. 38.

VARIOUS types of iron-core (Ferrocarb) coil will be seen on this stand, and it will be noticed that the method of assembling the bakelite casing on these coils has been modified and is now practically perfect. The coils themselves are still designed to have the same characteristics and it is only in the mouldings that the modifications have been made and the new cases provide greater mechanical strength and durability. A coil for every purpose may be seen here.

CONCORDIA ELECTRIC WIRE CO., LTD., New Sawley, near Manchester. Stand No. 238.

CONSOLIDATED RADIO CO., LTD., Warple Way, Acton, London, W.3. Stand No. 20.

THE "Ranger" series of receivers will be seen on this stand, and they cover transportable, and table types of receivers designed for battery

E. K. COLE, LTD., Ekco Works, Southend-on-Sea. Stand No. 72.

THE popular bakelite-cased receivers will form a wonderful setting on this stand, and the extremely modern design of some of the cabinets will strike a new note. The modification of the tuning scale which Messrs. Ekco have introduced will go a long way to popularising their receivers owing to the simplification of tuning which is provided. Among the new circuit features incorporated in the receivers may be mentioned the station pre-selector and noise suppressor which enables the super-heterodyne circuit to be rendered insensitive only to a pre-selected number of high-quality stations and at the same time entirely suppresses all

and mains operation. There is a screen-grid four-battery-operated at £8 10s. 6d.; an All-wave Universal Mains Band-pass four at 11 guineas; a de luxe battery superhet at



The large and easily-read tuning dial is an interesting feature of this Ekco consolette.



The "No-Mast" aerial which has become so popular since its recent introduction.

18 guineas, and other similar types of apparatus. Full vision scales are fitted to all the receivers and the circuit details are fully modern and will be found to satisfy all modern requirements.

COSSOR, LTD., Cossor Works, Highbury Grove, London, N.5. Stand No. 73.

IN addition to the exhaustive range of wireless valves some other interesting equipment will be seen here. Cathode ray tubes and associated apparatus; neon tuning devices; complete receivers and kit-sets will share a place on the stand. The popular Melody Maker Kit will again be seen, and this incorporates the screened H.F. pentode in A.C. models together with an all-metal chassis ready drilled and all nuts bolts and screws supplied ready for assembly.

DALLAS AND SONS, LTD., 6-10, Betterton Street, London, W.C. Stand No. 112.

AS wholesalers a representative selection of commercial apparatus will be on show at this stand.



A console radiogram from the extensive Cossor range of 1935 receivers.

DARWINS, LTD., Fitzwilliam Works, Sheffield. Stand No. 40.

MAGNETS for all purposes are manufactured by Messrs. Darwins and consequently this stand will be devoted to an exhibition of this type of article.

DE LA RUE CO., LTD., Shern Hall Street, Wattham-stow. Stand No. 5.



Another Ekco set of attractive and unusual design.

Practical Wireless GUIDE TO THE SHOW



The well-made public address "mixer" which has been introduced by Messrs. R. H. Dent, makers of the "Ardente" deaf-aid devices.

DENT, R. H. (ARDEnte), 300, Oxford Street, London, W.1. Stand No. 45.

SPECIAL apparatus for the use of deaf persons will be the principal feature on this stand, and such items as microphones, loud-speakers and cinema apparatus to enable deaf persons to hear the performances will also be exhibited. Some Public Address amplifiers will also be shown in types ranging from £24 to £35, as well as a special Mixing Unit for use with the amplifiers.

DEW AND CO., A. J., LTD., Rathbone Place, Oxford Street, London, W.1. Stand No. T22.

AS wholesale suppliers, Messrs. Dew will have on show receivers and components of every description, and by nearly all the well-known manufacturer.

DIBBEM, LTD., 34, Carlton Crescent, Southampton. Stand No. T21.

AS factors, this firm will confine its exhibits to items selected from various sources.

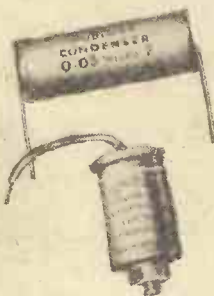
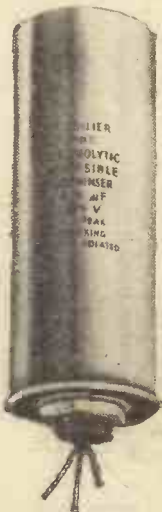
DIGGLE, A., CO., Reliance Works, Jane Street, Rochdale, Lancs. Stand No. 13.

CHARGING Plant will form the basis of this firm's exhibit, and various instruments from £33 will be shown. These items are designed to operate in a most efficient manner, and are low in running costs and easy of maintenance. They are obtainable on hire-purchase terms.

DUBILIER CONDENSER CO. (1925), LTD., Ducon Works, Victoria Road, North Acton, London, W.3. Stand No. 96.

AS manufacturers of condensers, this firm will obviously devote its exhibits to various types of capacitors. From the minute mica condenser, no larger than a penny, to the large transmitting condensers which are used in commercial stations, there is practically no type of condenser which Messrs. Dubilier do not make. Among the new items will be

seen some novel electrolytics in metal cases, where the polarity may be reversed without damage. A "block" type of electrolytic in metal case will also be seen. Mica, paper, and dry electrolytic condensers are also on view in



A variety of the well-known Dubilier electrolytic and tubular condensers.

various types and sizes, whilst resistances, anti-interference devices, and static condensers will also be included on the stand.

DULCETTO-POLYPHON, LTD., 2-3, Newman Street, Oxford Street, London, W.1. Stand No. T16.

MESSRS. DULCETTO intend to give a general wholesale display of most of the manufacturers exhibiting. All provincial representatives will be in attendance, and special facilities for trade customers to review the exhibition in miniature, and under comfortable conditions, will be provided.

DYSON AND CO., J., LTD., 5, Godwin Street, Bradford. Stand No. T4.

THE principal exhibits on this stand will be the range of accessories and receivers for which

they are wholesalers. In addition, there will be a number of H.T. units, transformers, chokes, and rectifiers of which they are the makers.

EARL MANUFACTURING CO., LTD., Avenue Works, Hanover Park, London, S.E.15. Stand No. 240.

A WIDE range of the well-known Earl reproducers will be shown, and ample technical details regarding these will be available to the intending purchaser.

EASTICK, J. J. AND SONS, 118, Bunhill Row, E.C. Stand No. T23.

A SELECTION from commercial ranges will form the exhibit of this firm of wholesalers.

EAST LONDON RUBBER COMPANY, LTD., 29, Great Eastern Street, London, E.C. Stand No. T18.

AS wholesalers, this firm will confine its exhibits to a representative selection of commercial products.

ECONASIGN CO., LTD., 92, Victoria Street, London, S.W.1. Stand No. 227.

THE exhibits on this stand will be of interest particularly to the wireless retailer, and will not be planned for the amateur.

EDGE RADIO, LTD., Dolly Blue Works, Raphael Street, Bolton. Stand No. 91.

EDISON SWAN ELECTRIC CO., LTD., 155, Charing Cross Road, London, W.C.2. Stand Nos. 18 and 58.

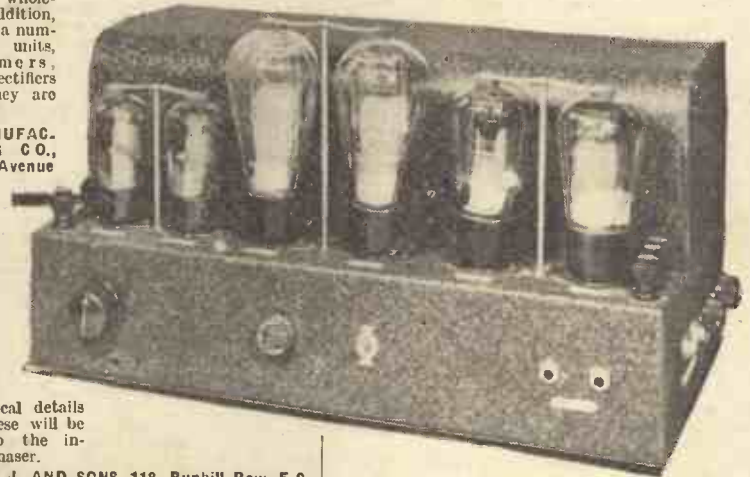
AS in previous years, this firm will be showing a range of the famous R.K. loud-speakers, the B.T.H. Needle Armature Pick-Up and Tone-Arm, at 40s., the B.T.H. Minor Pick-Up and Tone-Arm, and the full range of Mazda valves. A special display will be made of the Senior R.K. speakers in both A.C. and D.C. types, the prices of the two being, £7 15s. and £5 17s. 6d., respectively.

ELDECO RADIO, LTD., 62, Conduit Street, London, W.1. Stand No. 93.

AMONG the receivers to be seen on this stand, will be some radio-gramophones, incorporating the Stenode principle. In addition, a 5-valve battery superhet, incorporating a quiescent output stage will attract attention. The largest model, a 9-valve radiogram, with automatic record changer, incorporates every modern refinement, including silent and visual tuning. The output is 8 watts, obtained from a powerful push-pull stage.

ELECTRO DYNAMIC CONSTRUCTION CO., Devonshire Grove, S.E. Stand No. 117.

ON this stand will be seen the well-known Electro Dynamic Interference free-rotary converter, and other types of anode converter and alternator. In addition, a new line in the form of a petrol-driven alternator, consisting of a neat and compact self-contained petrol engine, tank and silencer coupled to a self-exciting alternator will be seen.



The power amplifier, intended for public-address work, shown above is being exhibited by the "Ardente" people.

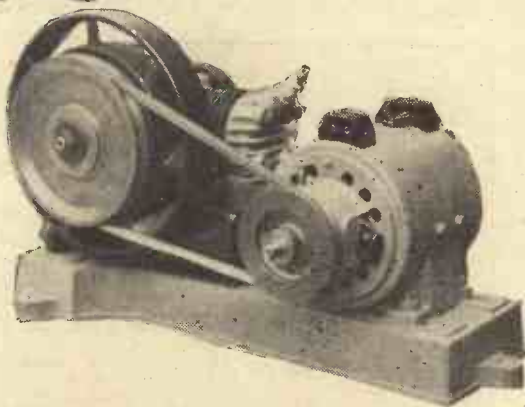
ENSIGN, LTD., Ensign House, 88-89, High Holborn, London, W.C.1. Stand No. T5.

AS wholesalers, this firm will devote its exhibits to a representative collection of receivers and accessories chosen to provide dealers and others with a combined selection arranged under one group.



The Beethoven S.G.4. Major Portable Model P.85.

Practical Wireless GUIDE TO THE SHOW



A petrol-driven battery-charging plant made by the Electro Dynamic Construction Co.

EVERETT, EDGUMBE AND CO., Colindale Works, Hendon, London, N.W.9. Stand No. 212.

THIS firm is well known as manufacturers of high-grade testing and measuring instruments, and this year they have added to their range by taking over the Radiolab products. Thus the stand will be devoted to an exhibition of instruments suitable for all testing purposes, and will range from midjet meters suitable for panel-mounting purposes to large apparatus suitable for laboratory use.

THE EVER READY CO. (GT. BRITAIN), LTD. Hercules Place, Holloway, London, N.7. Stand No. 83.

THE whole Ever Ready range of over sixty different types of high tension and grid bias batteries will be featured on this stand. This range permits the selection of the exact battery and voltage for every requirement. Ever Ready batteries are contained in dust—and short-circuit proof covers.

The Ever Ready high tension batteries are divided into eight groups:—The Winner series (in dark blue board containers); The Popular series (in brown containers); The Popular Portable series (also in brown leather board containers); The Popular "Power" series (in brown leather board containers); The Ever Ready "Standard" series (in blue containers); The Ever Ready Power series (in blue containers); The High Power "60" battery (in blue and orange leather board containers), and Super Capacity batteries.

A range of Ever Ready and Winner grid-bias batteries will also be shown. These have a voltage range of 6 to 22½ volts.

Another feature of the display on this stand will be the Ever Ready accumulators which have been a speciality of the firm for the past 30 years.

ELECTRICO, 97, George Street, Croydon. Stand No. 246.

FERRANTI, LTD., Hollinwood, Lancashire. Stand No. 70.

IN addition to the extensive range of high-class radio receivers and gramophones, a number of small components will be seen on Messrs. Ferranti's stand. These will include transformers (audio and output), chokes, condensers, resistances, potentiometers, valves, and various types of multi-range testing instruments. For the first time a Universal receiver will also be seen on this stand, and this incorporates five valves and a barretter, one of the valves being a heptode. No gramophone pick-up connection is provided in this particular receiver.



Some new Formo lines: on the left is an iron-core coil; above are some screened tubular paper condensers for easy mounting, and on the right is a cleverly-designed single tuning condenser with attractive scale.

FILM INDUSTRIES, LTD., 60, Paddington Street, London, W.1. Stand No. 207.

PUBLIC address loud-speakers and allied equipment will be featured on this stand. The speakers will be of several types, all of which are fitted with horns, generally of the exponential pattern. In each case the units are of the moving-coil type, and are fitted with cobalt-steel permanent magnets. Another interesting line is a new moving-coil microphone specially designed for P.A. work. A third item which is sure to have a wide appeal is the F.I. Junior Address Equipment, which is supplied complete with a small microphone, gramophone turntable, and power amplifier, the whole being accommodated in a stout wooden container which is readily transportable.

FLINDERS (WHOLESALE), LTD., Shaftesbury House, Colchester. Stand T10.

SELECTED items from various ranges will be displayed by this firm of wholesalers.

FULLER ACCUMULATOR CO. (1926), LTD., Woodland Works, Chadwell Heath, Essex. Stand No. 124.

IN addition to the already popular accumulators manufactured by this firm will be seen a new high tension accumulator, type S/DMHG, which will be similar in size and voltage to their type DMHG, but will have raised intercell connectors protected by a grease barrier, which not only prevents corrosion and cell-to-cell leakage, but also enables intermediate tappings to be taken by means of the usual type of wander plug. A new range of accumulators, known as "Standard de Luxe" plate types, will also be seen. The H.T. batteries will be found to have been modified in several respects and now bear identifications consisting of coloured circles. Thus the Green Circle batteries take the place of the previous "Sparta" batteries, whilst the Blue Circle batteries take the place of "Super" batteries. Price modifications and size adjustments have also been made in these batteries, while one or two of the smaller batteries have been completely discontinued.

GARRARD ENGINEERING AND MANUFACTURING CO., LTD., Swindon, Wilts. Stand No. 54.

A FEW items in the vast Garrard range will include a Universal Gramophone Motor, designed for operation from A.C. or D.C. mains. This is fitted with speed regulator, automatic stop, etc. A new radiogram. unit will also be seen, in which the over-



all dimensions have been reduced to enable a complete unit to be included in a smaller cabinet than was hitherto possible. This is complete with pick-up, etc. The Garrard Pick-up, Volume-control, and Record Changing Units will also be exhibited.

GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, W.C.2. Stands Nos. 34, 66 and 225.

THERE are two battery-operated receivers figuring in this season's programme. One of these is called the "Compact 3," a powerful and well-built three-valve set in a handsome bakelite cabinet, which houses a moving-coil speaker as well as the accumulator and battery. It has single-tuning control, an illuminated scale, and separate selectivity and volume controls. The other battery set, which has "Class B" output, is a four-valver with the power of a mains receiver, giving a wide range of stations with exceptional quality.

GEORGE NEWNES, LTD., 8-11, Southampton Street, Strand, London, W.C.2 (see Newnes, Ltd., George).

GILBERT & CO., LTD., 73, Arundel Street, Sheffield. Stand No. T9.

A SELECTION of Trade items will form the basis of this exhibit.

GOODMAN, J., 28-30, Drysdale Street, London, N.1. Stand No. 217.

AT the time of going to press no details have been released concerning this exhibit.

GOODMANS (CLERKENWELL), LTD., Turnmill Street, Clerkenwell, London, E.C.1. Stand No. 125.

LOUD-SPEAKERS will form nearly the whole of the display on this stand, no less than seven entirely different models being exhibited. These



An energized moving-coil speaker from the wide range being shown by Goodmans (Clerkenwell), Ltd.

will range from a 25-watt public address instrument with 13in. cone to a truly midjet model—the P.M.6—which is only 6½in. diameter and costs 27s. 6d. The other models to be shown are of various sizes and power-handling capacity, and the range includes both permanent-magnet and energized types. Exhibits other than speakers will include displays of coil winding, turned parts, transformers, chokes, etc.

GRAHAM FARISH, LTD., 153, Masons Hill, Bromley, Kent. Stand No. 59.

ON this stand will be seen many small items of particular appeal to the listener. Such items as fixed condensers, chokes, tuning condensers, resistances, valveholders, earth and aerial accessories, and transformers all find a place in the exhibits, and, in addition, some of the Formo 1935 components will be seen.

GRAMOPHONE CO. (H.M.V.), LTD., 98-108, Clerkenwell Road, London, E.C. Stands Nos. 33 and 61.

ON the stands of this company will be found eleven different types of receiver, ranging from small battery models to elaborate radio-gramophones with automatic record-changing devices.

The stands themselves should be one of the sensations of Olympia, for they will present the instruments in a way which has never been seen at any exhibition before.

Special apparatus from the "His Master's Voice" research laboratories and factories will also illustrate the painstaking care that is taken in the construction of modern radio instruments. A life-testing machine will demonstrate how the mechanical parts of instruments are tested for wear, whilst



Another Formo component, a double-gang tuning condenser, which is fitted with a new and unusual form of tuning dial.

Practical Wireless GUIDE TO THE SHOW



The "Halcyon" receiver shown on the left is a good example of the present tendency to combine the radio set with a useful piece of furniture. The instrument on the right is an attractive "Halcyon" console model.



transformers and coils will be seen in humidity chambers which reproduce any temperature from the Arctic to the Tropics. Another ingenious apparatus to be shown is an "artificial train," which subjects apparatus to severe shaking and ensures that production instruments can withstand the roughest handling.

Fluid-light tuning is incorporated in some of the receivers, the super-heterodyne circuit will be used in most of the receivers, and every model will include a moving-coil loud-speaker. Among the accessories will be the H.M.V. Pick-up, Volume Control and connecting leads which costs 32s. 6d., the Model 178 loud-speaker and the Model 180 speaker.

GROSVENOR ELECTRIC BATTERIES, LTD., 2-3, White Street, Moorgate, London, E.C.2. Stand No. 104.

In addition to batteries of all types, some novel electric torches will be seen on this stand. The batteries are made in various sizes, and a number of special batteries are designed for special commercial receivers. In addition, smaller batteries for torches, etc., will be found. Some new accumulators, with both jelly and free acid will also be seen on the stand this year, and some specially developed cells for medical apparatus and similar articles will be shown.

HACKER H., AND SONS, Perfecta Works, Ray Lea Road, Maidenhead. Stand No. 116.

High standard "hand-made" quality receivers, will again be seen on this stand, and again the utilization of straight circuits employing several tuned stages with iron-core coils will be seen in preference to the superhet type of circuit. In addition, a novel variable neon searchlight tuner will cause interest. An all-wave radio-gramophone will also prove an attraction.

HALCYON RADIO, LTD., 83a, Valetta Road, Acton, London, W.3. Stand No. 36.

This well-known firm of receiver manufacturers are showing a comprehensive range of modern sets, which include both battery and mains-operated types. The battery sets are of three- and four-valve types, and are of particularly up-to-date design. A 9-stage 7-valve superheterodyne for A.C. operation will be a particular attraction embodying, as it does, such features as automatic volume control, visual tuning, tone control, provision for extension speakers, etc. Another extremely interesting line is a superheterodyne for either A.C. or D.C. operation. This set has seven tuned stages and a similar specification to that of the A.C. model above referred to. Both models are available in either table or console cabinets, the respective prices for the A.C. model being 10 guineas and 22 guineas.

HARNER & SIMMONS, LTD., 223, Hoe Street, Walthamstow, E.17. Stand No. 209.

No details are available at the time of going to press concerning this firm's exhibits.

HARTLEY TURNER RADIO, LTD., Thornbury Road, Isleworth, Middlesex. Stand No. 119.

High-quality apparatus will be seen here, including receivers, kit sets, amp-

lifiers, and loud-speakers. The latter are high-class pieces of apparatus costing £7 7s. for a D.C. model and £9 9s. for an A.C. model with 40-watt rectifier for the field supply. In addition some small accessories, including the Hartley-Turner A.F. Coupling Unit, will be seen. This is available for use with triodes used singly or in push-pull, and is priced 30s. Power and smoothing chokes will also be on show.

HAYNES RADIO, 57, Hatton Garden, E.C.1. Stand No. 9.

HEAYBERD AND CO., F. C., 10, Finsbury Street, London, E.C.2. Stand No. 24.

A comprehensive range of mains apparatus and equipment will be exhibited on this stand. The range includes mains transformers, chokes, and condensers suitable for inclusion in a home-made unit or receiver, and the complete equipment consists of chargers, etc. The chargers are suitable for either home or garage use and provide charging currents from .5 amp. upwards. An interesting addition to the range of mains accessories is the auto-transformers for stepping up or down the mains voltage to suit various types of apparatus which is now obtainable.

HELLESENS, LTD., Hellesen Works, Morden Road, South Wimbledon, S.W.19. Stand No. 78.

A most comprehensive range of batteries will be seen on this stand, and they are obtainable for flash lamps, etc. The H.T. batteries are manufactured in many types for normal use as well as for special commercial receivers, where the dimensions have been modified in order to accommodate a certain type of battery. Grid-bias batteries and cycle-lamp batteries will also be included in the exhibits.

HENLEY'S TELEGRAPH WORKS CO., W. T., LTD., Holborn Viaduct, London, E.C.1. Stand No. 109.

The display on this stand will comprise two ranges of the many products of the firm—namely, electric soldering irons and radio wires and cables. The irons will be found in several styles, suitable for ordinary domestic purposes or for factory use. Another interesting exhibit is Solon resin-cored solder, which consists of a tube of alloy (lead and tin in equal parts) with a pure resin filling. All types of wire will also be seen.

THE HIGH VACUUM VALVE CO., LTD., 113-117 Farringdon Road, London, E.C.1. Stand No. 27.

A complete range of battery and mains valves will be seen here. In addition to existing types the new A.C. mains valves will be on view for

the first time and these include H.F. pentodes, a General Purpose Triode and a 3½ watt output pentode. A full-wave rectifier will also be shown and all these valves are characterized by the high performance and low price, the output pentode, for instance, costing only 10s. 6d.

HENDERSON'S WHOLESALE ELECTRICAL AND RADIO, LTD., Queen's Rd., Brighton. Stand No. T2.

HILLMAN BROS., 123, Albion Street, Leeds. Stand No. T3.

HOBDAY BROS., LTD., Great Eastern Street, London, E.C.2. Stand No. T17.

RECEIVERS and components by all the leading manufacturers will be displayed on this stand.

LIFFE AND SONS, LTD., Dorset House, Stamford Street, S.E. Stand No. 6.

As publishers of various books, the main items on this stand will consist of various specimens selected from their range.

ITONIA, LTD., Itonia House, 59, City Road, London, W.C.1. Stand No. T6.

As in previous years, the exhibits on this stand will consist of receivers manufactured by those firms who are signatories to the F.T.A.



The Hivac valve shown above has only just been released—it is the mains-operated H.F. pentode.



Messrs. Heayberd are again showing a comprehensive range of mains transformers specially designed for the home constructor, and a few of these are shown above.

Our NEW Sixpenny MONTHLY MAGAZINE

"Practical Television"

may be purchased from Stand No. 8, Ground Floor.

- **NEW MAGNET PROVIDES TWICE THE VOLUME.**
An extraordinary new magnetic material, exclusive to W.B. Stentorian Speakers, gives double the strength of an ordinary magnet at the same cost.
- **NEW SPEECH COIL BRINGS AMAZING REALISM.**
Previously used only on W.B. public address models, the Whiteley Speech Coil becomes usable on Stentorians because of the new magnet's enormous strength. It gives crisper attack and better definition.
- **INNUMERABLE ADDED REFINEMENTS COMPLETE A BRILLIANT DESIGN.**
Improved "Microlode" feature gives accurate matching to any output as principal speaker or extension. Complete dust protection at back, front, and sides of air gap. Oversize cone on Senior Model and many other improvements in detail.

AN AMAZING ADVANCE



WE ARE EXHIBITING AT



Stentorian Senior (PMS1) ...	42/-
Stentorian Standard (PMS2) ...	32/6
Stentorian Baby (PMS6) ...	22/6

Write for the new W.B. Stentorian leaflet.

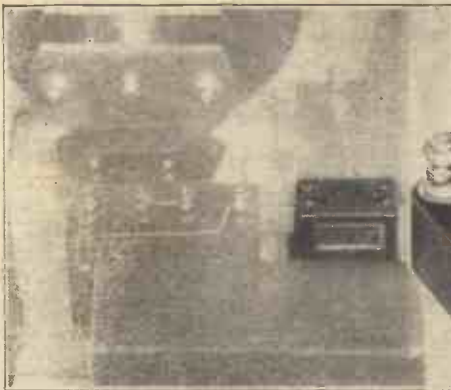
See them at Stand No. 98

STENTORIAN

A W.B. Speaker is specified exclusively or as author's first choice in every prominent journal's "Star" Exhibition receiver

TELSEN COMPONENTS

specified
for the
'Armada 3'



View of the mains output section, showing the position of the Telsens L.F. Smoothing Choke.



View of set showing the position of the Telsens Standard and Binocular Screened H.F. Chokes.



TELSEN L.F. SMOOTHING CHOKE

Fulfills every high-efficiency requirement when used in the rectified mains output circuit of a receiver. The maximum permissible current is 50 m.a., D.C. resistance 1,000 ohms and inductance is 28 henries at 25 m.a. Presented in an attractive black bakelite moulded case, with easily accessible terminals and fixing holes.

12/6

TELSEN STANDARD SCREENED H.F. CHOKE

For wavelengths between 100 and 2,000 metres, such as are covered by the ordinary radio receiver. Carefully designed and constructed in accordance with the latest technique, it provides consistently high efficiency over the whole of its wave range, interaction with other components being eliminated by the earthed metal screen.

3/6

TELSEN SCREENED BINOCULAR H.F. CHOKE

Designed and constructed to ensure consistently high efficiency over the entire waveband for which it is intended, viz., 10 to 2,000 metres. Small and compact, it occupies the minimum of baseboard space, while the metal screen, which is connected to an earthing terminal, entirely prevents interaction with other components.

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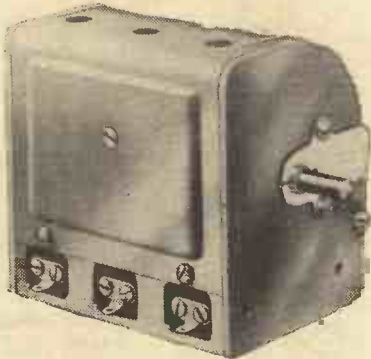
VISIT STANDS NOS. 75 AND 101 AT RADIOLYMPIA

Announcement of THE TELSEN ELECTRIC COMPANY LIMITED, ASTON, BIRMINGHAM

Practical Wireless GUIDE TO THE SHOW

JACKSON BROS. (LONDON), LTD., 72, St. Thomas Street, London Bridge, S.E.1. Stand No. 114.

GANGED condensers, disc drives, and complete tuning packs will form the main attractions on this stand. These items need no introduction



The latest type of Jackson Bros. all-enclosed three-gang condenser.

to the home-constructor as they have already been extensively used by us in the construction of some of our receivers. Small modifications in design and alterations in the prices of some of the components will add interest to the exhibits.

JOHNSON TALKING MACHINE CO., 96, Clerkenwell Road, London, E.C. Stand T13.

A SELECTION of various commercial products will be seen on this wholesale stand, and will include some of the highlights from the exhibition.

KINGSWAY RADIO, LTD., 3-9, Dane Street, High Holborn, W.C.1. Stand No. 44.

THIS firm will exhibit all types of transformers as well as a comprehensive range of L.F. transformers, chokes, tuning coils, microphone transformers, mains transformers, and other components. As sole licensees for the manufacture and sale of the "Simpson Electric Turntable," these will also appear on the stand.

The "Bowl" loud-speakers, containing a specially designed 35 per cent. Cobalt steel magnet, and finished in pastel shades to customers' requirements, will also be shown. About eight shades will be on the market.



A particularly handsome radiogramophone which is being shown by Kolster Brandes.

The Simpsons Electric Turntable will again be shown on this stand, and the price has now been fixed at two guineas, in either 10 or 12in. sizes. The turntable is suitable for 200-250 volts or 100-150 volts 50-cycle mains.

KOLSTER BRANDES, LTD., Cray Works, Sidcup Kent. Stand No. 84.

THE design of the cabinets used for the K.B. receivers will prove a great attraction, and the various circuit details will interest many. The Selectrola, a 7-valve superhet at 19 guineas is a very attractive model, and the 8-valve A.C. radiogramophone is a luxury instrument, in which the cabinet has provision for storing records. Two output pentodes in push-pull deliver ample volume for dancing in a small hall.



This illustration is of the Lampex "Unifoc" receiver. Above it is the Lampex "Unifive" de luxe radiogram; a very attractive console receiver of the de luxe type.

LAMPEx RADIO AND ELECTRIC CO., Phantom House, Brewery Road, London, N.7. Stand No. 22.

VARIOUS receivers ranging from a straight-three battery set to a Universal Radiogram will be seen here. The latter employs a Universal A.C./D.C. motor, pick-up and dual balanced mains-energized loud-speaker, and is housed in a full-size walnut radiogram cabinet inlaid with bird's-eye maple.

LECTROLINX, LTD., 79a, Rochester Row, London, S.W.1. Stand No. 218.

THIS firm will again be showing a variety of wireless connecting devices which are well known to all readers under the trade name of Clix. Chassis-mounting valve-holders of every type, including Continental and American patterns, and those suitable for use with the new 9-pin valves. There will also be a thimble connector for use with the

recently introduced H.F. pentodes which have thimble connectors. Terminals, wander plugs, socket connectors, etc., will be shown as last year.

L. E. S. DISTRIBUTORS, LTD., 15-16, Alfred Place, Tottenham Court Road, London, W.C.1. Stand No. T25.

A REPRESENTATIVE range of new season's receivers and components will be seen on this stand, Messrs. L. E. S. Distributors being wholesalers only.

LISSEN, LTD., Lissenum Works, Isleworth, Middlesex. Stand No. 83.

A COMPREHENSIVE range of battery, A.C. and D.C. mains receivers will be shown by Messrs. Lissen, and these will range in price from £4 10s. to £9 9s. In addition, some interesting Kits of Parts will be on view, including the now famous Sky-scraper series. Also, a complete range of H.T. and G.B. batteries will be seen, together with some L.T. accumulators. Car radio will be represented, and radio enthusiasts should make a point of seeing the excellent Lissen developments in this branch of radio.

LONDON AND PROVINCIAL FACTORS, 146, Theobald's Road, London, W.C.1. Stand No. T.26.

LUGTON AND CO., LTD., 203, Old Street, London, E.C.1. Stand No. T1.

THIS firm supplies at wholesale rates only, and the exhibits on the stand will comprise the popular ranges of receivers by all the well-known makers.

MAINS POWER RADIO, LTD., Broadway Works, Eastern Road, Romford. Stand No. 230.

MAINS Units and apparatus of various kinds will be found on this stand. Units for incorporation in battery-operated receivers and units for the building of complete mains sets will form an attractive display.

MANUFACTURERS ACCESSORIES CO., LTD., 85, Great Eastern Street, London, E.C. Stand No. T.24.

REPRESENTATIVE items from various manufacturers' lines will be seen here.

MARCONIPHONE COMPANY, LTD., 210-212, Tottenham Court Road, London, W.1. Stand No. 76.

EVERY type of receiver, from the simple battery-operated three-valver to the 9-valve super-heterodyne auto-radiogram, may be seen on Stand No. 76. This will probably prove the most comprehensive range of receivers ever exhibited on a single stand, and here will be found a receiver to suit any individual need. In addition, the popular pick-up will also be seen, together with loud-speakers and batteries suitable for the operation of the battery receivers. The Marconiphone receivers present a number of novel features, and such items as tone correction, simplification of control, and clearly-marked tuning scales have received the full attention of the firm's designers, so that no exception can be raised to any detail.



The Lissen B.P. receiver—an attractive little set at a competitive price.

Practical Wireless GUIDE TO THE SHOW



A distinctive note is struck by this latest Marconiphone console receiver. It is a set for the connoisseur.

McMICHAEL RADIO, LTD., Slough, Bucks. Stand No. 60.

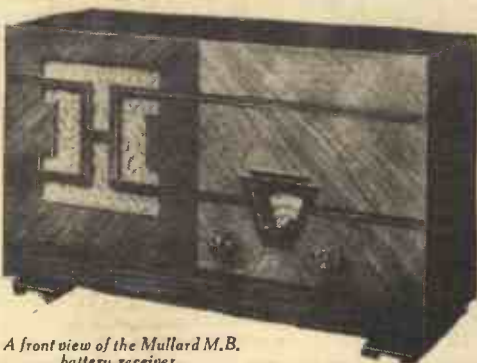
THE exhibits on this stand will comprise a still wider range of McMichael complete receivers. The suitcase portable which has been a popular favourite for a number of years will again be in evidence and is this year priced at 15 guineas. Other receivers on show will be a powerful mains superhet at 16 guineas, a twin-speaker superhet (for A.C. mains) at 18 guineas, a mains transportable superhet, at 16 guineas, and the "Duplex" battery transportable, which has Class B output, at 14 guineas. The twin-speaker superhet is a very advanced model employing fully delayed automatic volume control in conjunction with an inter-station noise suppressor and automatic tone control. The mains transportable is capable of supplying an undistorted output up to 3 watts.

MICHELL AND BROWN, 153, Turney Road, Dulwich, London, S.E.21. Stand No. 210.

THE item of outstanding interest on this stand will be a new loud-speaker to be known as the "Mastersinger." This is based upon a novel idea in sound-projection which has been found to produce excellent results. The speaker is mounted close to the ceiling, the sound being projected upwards and then reflected down again. An electric-light shade is suspended below the speaker, and this helps to produce the combined speaker and light shade. The price of the standard model "Mastersinger" speaker has been fixed at 12 guineas, including shade, whilst a senior model is available at 25 guineas.

MULLARD WIRELESS SERVICE CO., LTD., Mullard House, Charing Cross Road, London, W.C.2. Stand No. 65.

YEAR by year the radio enthusiast and the professional radio engineer expect to see on the stand of the Mullard Wireless Service Co. something which represents a notable, if not startling, advance in radio valve technique. They have never been disappointed, and they will certainly not be disappointed this year.



A front view of the Mullard M.B. battery receiver.



An old favourite in its latest form, the McMichael "Duplex" portable.



This is another smart receiver which is being exhibited by McMichael. It is an A.C. superhet.

MILNES RADIO CO., LTD., Victoria Works, Bingley, Yorks. Stand No. 249.

AS manufacturers of the ingenious H.T. supply unit, which, as our readers are aware, may be charged from a 6-volt accumulator, this item will prove the centre-piece of the

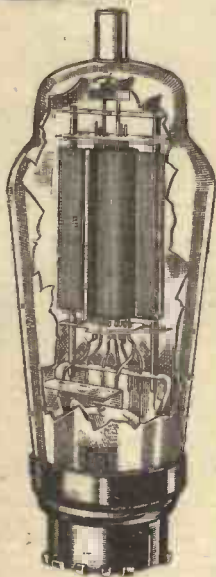


A useful piece of apparatus produced by Multitone Electric.

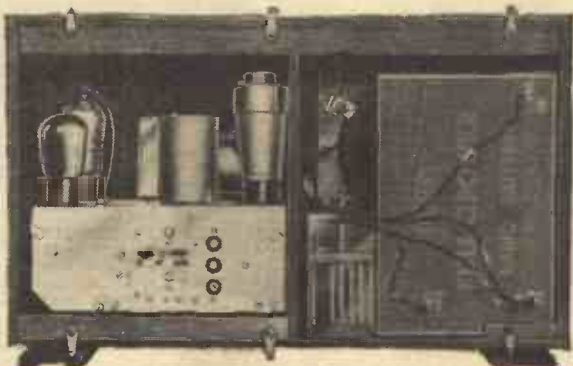


stand. In addition, however, Messrs. Milnes will be exhibiting some new speakers, obtainable in cabinets or as chassis, together with a new receiver designed for battery operation from the H.T. supply unit. Special switching is fitted so that this unit may be put on charge as required, and such refinements as A.V.C., tone control, extra speaker switching, etc., are fitted. Although employing only 5 valves, there are 8 stages with 9 tuned circuits, so that the selectivity is of a very high order.

The latest Marconiphone pick-up, which is noted for its excellent response.



One of the new Mullard universal valves, which is fitted with a new type of base.



This picture shows the neat internal arrangement of the Mullard M.B. 3 receiver.

Practical Wireless GUIDE TO THE SHOW

NOVO RADIO-ELECTRIC, LTD., Novo House, 34, Lovaine Place, Newcastle-on-Tyne. Stand No. 17.

THE items displayed on this stand will include the "Northumbria Five-Six," a four-pentode set built round three iron-core coils of special construction, giving great selectivity without loss of sensitivity or of the quality of reproduction. A feature of the "Northumbria Five-Six" is the



A Novo Radio-Electric receiver which is designed on strictly modern lines.

application of delayed A.V.C. across the two variable-mu H.F. pentode valves by the operation of a separate diode valve resulting in complete elimination of any A.V.C. service trouble. A variable selectivity and tone control, operated from a panel control, enables adjustment to be made to suit individual localities and tastes. A nine-kilocycle frequency separation is guaranteed. The latest type energized moving-coil type speaker is specially matched to the set. Gramophone P.U. and additional speaker connections are provided.

NUVOLION ELECTRICS, LTD., Meredith Works, Park Crescent, London, S.W.4. Stand No. 236.

ON this stand will be seen an oscillographic demonstration of Patent Grid Compensated Relay and Public Address Equipment giving 50-watt output with 5 per cent. distortion from two DA 60 valves, with uniform response to 10,000 cycles per second. Also a 20-watt high-fidelity Public Address loud-speaker. In addition, large distortionless output transformers, and domestic moving-coil loud-speakers, will also be shown.

ORMOND ENGINEERING CO., LTD., Ormond House, Rosebery Avenue, London, E.C.1. Stand No. 100.

ALL the existing lines which have proved so popular in the past will appear on this stand. Tuning dials, condensers, loud-speakers and loud-speaker units, transformers, volume controls, and cone chassis will be seen in a variety of types and ranges.

ORR RADIO LTD., 79a, Parkhurst Road, N.7. Stand No. 64.

OSSICAIDE, LTD., 447, Oxford Street, London, W.1. Stand No. 211.

A REPRESENTATIVE range of amplifiers, microphones, etc., both of the portable and permanent installation models will be on show at this stand. There will also be various types of amplifiers and equipment for use in cinemas, churches, etc., to enable deaf persons to follow the service, etc.

A new and improved model microphone for high-quality reproduction of speech and music has been produced and will be on show at the Exhibition.

There will also be shown a new Universal Amplifier in the portable range, giving an output of 6 watts undistorted speech. The amplifier will work off both A.C. and D.C. mains supplies of 200/250 volts, and should prove very popular with dance bands.

Another new exhibit will be a very small portable and self-contained amplifier designed to aid the deaf and persons hard of hearing. It is a three-stage amplifier employing the new midget valves. Means

are provided for adjusting the frequency response of the amplifier to suit different types of deafness, and also to correct for the differences in acoustic properties of the various situations where the aid may be in use.

PARTRIDGE, WILSON AND CO., LTD., Davenset Works, Evington Valley Road, Leicester. Stand No. 29.

THIS stand will be occupied principally by a variety of battery-charging plants, which are marketed under the trade name of "Davenset."



The "Ossicaide" portable deaf-aid unit.

The units are extremely well made, being steel-constructed and fitted with automatic overload switches. A "Davenset" electric shop window display sign will also be on view, as well as a number of mains transformers and power chokes.

PHILIPS LAMPS, LTD., 145, Charing Cross Road, London, W.C.1. Stand No. 62.

AN extremely wide range of receivers, one of which is suitable for every requirement, will be displayed by Messrs. Philips. Every receiver is an entirely new model, although several of them employ the Philips superinductance principle which was such a popular feature in the last year's sets. Of the eight sets to be shown, four are for A.C. operation, two are universal in regard to their current requirements, whilst two are battery-fed. All except one of the A.C. models employ the superinductance principle, but another A.C. model, and also one of the universal sets, are superheterodynes. The two battery sets have six and five valves respectively, and are priced at 11 and 10 guineas. The mains receivers vary in price from 9 to 23 guineas.



A new Philips radiogram.

PLEW TELEVISION, LTD., Waddon, Croydon. Stand No. 11.

TELEVISION apparatus of various types will be shown by this company, and in addition to a simple model designed to be coupled to an existing radio receiver will be seen a



This console receiver is being produced and shown by Orr Radio.

complete long-range television receiver fitted with microscopic adjustment. Picture reproduction from discs resembling gramophone records, combined with sound reproduction from the same disc, is also a feature of apparatus manufactured by this company, and a model will be seen on the stand.

PORTADYNE RADIO, Gorst Road, North Acton, London, N.W.10. Stand No. 71.

PORTADYNE receivers, which have been so popular for a number of years past will be shown in their latest form. The largest model will be a 6-valve transportable superheterodyne listed at 14½ guineas. This receiver employs a variable-mu pentode signal-frequency amplifier, followed by a frequency changer and I.F. amplifier; a double diode-triode functions as second detector, first I.F. and A.V.C., whilst a power pentode is employed in the output stage. The receiver has an output of 2½ watts, and is fitted with a suppressor switch for quiet A.V.C. Another set of similar up-to-date design, but for battery operation will be shown, as well as four other models, down to a 4-valve battery receiver at 10 guineas.

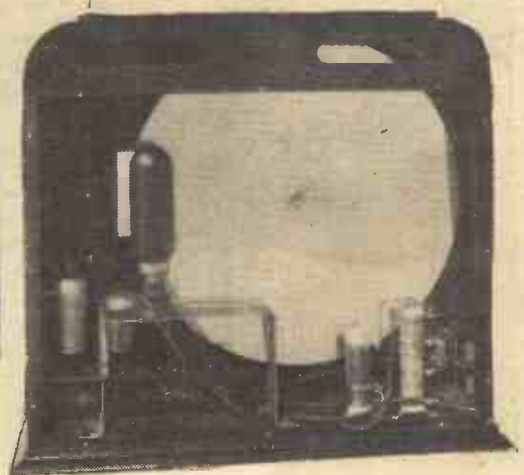
POWERTONE PRODUCTS, 102, Cromer Street, W.C. Stand No. 15.

**PRACTICAL WIRELESS.
PRACTICAL MECHANICS.
PRACTICAL TELEVISION.
PRACTICAL MOTORIST.**

Published by **GEORGE NEWNES,** Stand No. 8, Ground Floor.

PROVINCIAL INCANDESCENT FITTINGS, CO., LTD., Pitco House, High Street, Manchester. Stand No. 111.

THE popular Pifeo testing instruments will be seen on this stand, and two new models will be seen for the first time. One of these is a deluxe Rotameter, and the other an A.C.-D.C. Radiometer. This latter instrument costs only 12s. 6d.,



The new Plew disc-type television receiver, which has a built-in power amplifier.



Diameter 8½"
Height 8½"
Depth 4½"

The revolutionary "MULTIMU" gives instantaneous matching from 1 to 40,000 ohms. This reproducer is therefore ideal for every purpose—principal or extension instrument; any type of valve or circuit without exception.

The 1935 range of R & A Permanent Magnet and Mains Energised Reproducers includes models from 21/- to 55/-.

Unsurpassed reproduction and fidelity in each class.

It will pay you to hear the new R & A models before making a purchase.

Send us a postcard for full details.

OLYMPIA—STAND 53

REPRODUCERS & AMPLIFIERS, LTD.,
WOLVERHAMPTON

"Impedance Tuning"

solves this
problem—

what is the correct
transformer ratio
to give perfect
reproduction?

R & A "MULTIMU"
gives instantaneous
matching with any
valve or circuit

The R & A Multimu not only sets a higher standard of reproduction, but also instantly solves the 'matching' problem! It is now a matter of ease and precision to accurately match the speech coil impedance with that of any and every known type of output valve, and it can be used with every circuit in present or future use.

Furthermore the 'Multimu' with its entirely new and amazingly efficient magnet system has a sensitivity greater than ordinary P.M. Speakers—it is even more sensitive than the average mains energised speaker.

Get a 'Multimu' Reproducer. Use it as principal speaker, as an extension speaker, or in conjunction with any other speaker. Its use is universal and its performance a revolution in vividness of sound.

42/-

The **R & A**
"MULTIMU"
P.M.M.C. REPRODUCER

Practical Wireless GUIDE TO THE SHOW

and thus enable listeners for a really low price to obtain a test instrument which will measure both D.C. and A.C. supplies. The de luxe Rotameter costs 42s. and is a most elaborate instrument incorporating nine separating test scales, each brought into use by the range switch.



This useful and neat testing instrument is the Pifco "Rotameter."



One of the new Regentone receivers.



Another excellent test meter which is made by Pifco; the "Rotameter."

18s. 6d., and for a 6-cylinder, 24s. 6d.

RADIO SOCIETY OF GREAT BRITAIN, 53, Victoria St., London, S.W.1, Stand No. 204.

A TEX-WATT C.W. and telephony transmitter, a two-valve receiver, a dual-range frequency meter with 100 Kc. Quartz Bar calibration, and a one-valve transmitter will form features on this stand. The exhibits will also include apparatus made

PYE RADIO, LTD., Africa House, Kingsway, London, W.C.2, Stand No. 69.

THIS well-known firm of receiver manufacturers will this year have an even wider and more comprehensive range than heretofore. There are several new models, one of the most interesting of which is the "Cambridge" radiogramophone which is priced at 50 guineas for either A.C. or D.C. use. This price includes an automatic record changer, but either model can be obtained without the changing device, the prices then being 40 guineas and 43 guineas for A.C. and D.C. respectively. There is also an extremely attractive table model superhet fitted with A.V.C., tone control, and a cabinet of very modern and pleasing design. This can be obtained for either battery or mains operation, the prices being 16 guineas and 15 guineas respectively. A particular feature of many of the new Pye receivers is the concealment of the controls, these being placed underneath the hinged lid.

RADIO GRAMOPHONE DEVELOPMENT COMPANY, 18, Frederick Street, Birmingham. Stand No. 74.

RECEIVERS and radiogramophones in the luxury class will be seen on Stand No. 74. Among the larger pieces of apparatus the model 1203 will be found to employ all that modern science has introduced in the musical home-reproducer. A 12-valve superheterodyne forms the basis of the apparatus, and automatic record changing mechanism is fitted. The cabinet work is outstanding for design and workmanship, and the quality and volume of the output leave nothing to be desired.

RADIO INSTRUMENTS, LTD., Purley Way, Croydon, Surrey. Stand No. 80.

RADIO RESISTOR CO., LTD., 1, Golden Square, Piccadilly, London, W.1. Stand No. 14.

ERIE Resistors are the most important of the exhibits on this stand. In addition to the well-known range of rod resistors which have been made for a few years past, there will also be a series

of carbon resistors retailing at 1s. per watt and some well-made wire-wound components with ratings up to 100 watts. Another useful packing for the service man is a set of replacement resistors in various sizes and ratings. There will also be a range of volume controls in all resistance ratings, with and without snap-action switches. The price without switch is 8s. 6d., and with double-pole switch, 5s. A new line will take the form of

by members of the society.

REGENTONE, LTD., Regentone Works, Worton Road, Isleworth, Middlesex. Stand No. 99.

THE main feature of interest on this stand will probably be an entirely new receiver—the AS/35—which, although it employs only four valves, comprises eight stages and the functions of seven valves. The latest types of multiple valves are used throughout, and such features as automatic volume control, noise suppression, a continuously-variable tone control and a "sound reflector" cabinet. A full-vision tuning scale is fitted and this is clearly marked with station names. The price of the new set is 12 guineas.

REPRODUCERS AND AMPLIFIERS, LTD., Frederick Street, Wolverhampton. Stand No. 53.

ONLY two instruments are carried over from last season, the rest being entirely new models. These are the Type 60, a 12in. 4-pole differential armature reproducer retailing at 21s., and the "Multex," an 8in. permanent-magnet moving-coil reproducer which has been considerably improved in performance by fitting an entirely new magnet system, and which has been increased in price from 30s. to 32s. 6d. This instrument is fitted with a transformer offering 30 ratios and is suitable for use with any type of output valve.

The latest, and probably the most interesting, addition to the "R. and A." range is the new "Multimu," in which a new system of "impedance tuning" has been incorporated and which enables instantaneous matching of any impedance between 1 ohm to 40,000 ohms.

An entirely new model is the E.85, which is a mains-energised unit retailing at 27s. 6d. There will also be a new output transformer—the O.P.58—which will produce 58 ratios and is priced at 18s. 6d.



The Pye "Cambridge" receiver, which has concealed tuning controls.

complete suppressor kits for car-radio equipments; a kit for a 4-cylinder car costs



This modern wireless transmitter will be on view on the stand of The Radio Society of Great Britain.



A truly de-luxe receiver by the Radio Gramophone Development Co.



Two new lines by Messrs. Reproducers and Amplifiers; a universal output transformer (left) and the "Multimu" speaker (right). The latter is being used in the "Practical Wireless" "Armada" receiver.



Practical Wireless GUIDE TO THE SHOW

A. RIST (1927), LTD., Wavency Works, Lowestoft. Stand No. 233.

THE products exhibited on this stand, No. 233, will be representative samples of all wires, flexibles and conductors used for wireless, including lead-in wire, battery cords, crocodile clips, loud-speaker cords, headphone cords, aerial wires, connecting wires, screened tubing, screened flexible tubing, and also mains leads.

SELECTA GRAMOPHONES, LTD., 81, Southwark Street, London, S.E.1. Stand No. T11.

AS wholesalers, this firm will be showing a variety of receivers and components by all the well-known makers.

SIEMENS ELECTRIC LAMPS AND SUPPLIES, LTD., 39, Upper Thames Street, London, E.C.4. Stand No. 77.

NO details have yet been received concerning the exhibits on this stand.

SINCLAIR SPEAKERS, LTD., 13, Vale Royal, N.7. Stand 232.

SMITH AND SONS (M/A), LTD., Cricklewood Works, London, N.W.2. Stand No. 47.

NO details have been received at the time of going to press concerning the exhibits of this firm.

SONOCHORDE REPRODUCERS, LTD., Rothermel House, Canterbury Road, N.W.6. Stand No. 43.

THE main features of the display on this stand will consist of the well-known loud-speakers having both permanent magnet and energized field magnet systems. The range consists of the Midget, Junior, Standard, Senior, and De Luxe Models, and some special models designed for manufacturers' use will also be seen. The new piezo-electric speakers, pick-ups and microphones will also be shown.

SOUND SALES, LTD., Tremlett Grove Works, Junction Road, London, N.19. Stand No. 203.

THERE will be one or two interesting power amplifiers showing on this stand as well as a special double time base for 30-line and 120-line cathode-ray television. In addition to these items there will be a special battery charger for use with car batteries which are normally overloaded due to the extra drain imposed upon them by car-radio equipment. The "Sound" moving-coil loud-speaker which proved so popular at last year's Show will again be exhibited, in conjunction with an extensive range of mains transformers, chokes, and Class B Equipment. An entirely new line will be a range of paper condensers designed particularly for use in smoothing circuits. These will be available in capacities of from 1-mfd. to 8-mfd., and with working voltages from 250 to 1,500.

STRATTON & CO., LTD., Eddystone Works, Bromsgrove Street, Birmingham. Stand No. 30.

MESSRS. STRATTON will be showing a range of short-wave receivers designed essentially for overseas requirements, including the All-World Four for battery and A.C. all-mains operation, a super-heterodyne instrument using switched coils in a cabinet with self-contained loud-speaker for A.C. all-mains working, and the Overseas Four model for battery and A.C. mains operation, in cabinet with self-contained loudspeaker. A wide range of short-wave components will also be on view.

SUNBEAM ELECTRIC, LTD., Park Royal Road, North Acton, London, N.W.10. Stand No. 35.

FOUR receivers will be seen on this stand, two four-valve universal mains super-hets, and two five-valve receivers, one a universal mains set and the other a car-radio receiver. Shadow tuning is incorporated in two of these receivers, and all circuits embody the latest devices such as A.V.C., etc. The car-radio receiver has no cable drive to the remote control, so that back-lash is avoided. The output is 3 watts undistorted with a total consumption of less than 3 amps. from the car battery.

SUN ELECTRICAL CO., LTD., 118 & 120, Charing Cross Road, W.C.2. Stand No. T19.

THIS exhibit will consist mainly of items selected from various manufacturers' ranges and will prove of great interest to the dealer.

SWIFT LEVICK & SONS, LTD., Clarence Steel Works, Sheffield, 4. Stand No. 118.

HERE will be seen a comprehensive display of permanent magnets used by loud-

speaker manufacturers. The cross and link type permanent magnets for loud-speakers in chrome and cobalt steels will again be on view as these have proved to be most efficient and are still being used in large quantities for moving-coil loud-speakers. The new nickel aluminium steel will be employed in magnets of various attractive designs combined with a beauty of finish not previously obtained and will doubtless appeal to those who are in the market for the last word in loud-speaker magnets. The largest and smallest moving-coil speaker magnets in the world will also be exhibited.

TANNOY PRODUCTS, Canterbury Grove, West Norwood, London S.E.27. Stand No. 95.

IN addition to existing types of public address amplifiers and associated equipment, Messrs. Tannoy will be exhibiting some new lines consisting of portable band amplifiers; mobile amplifiers; projection speakers and a new radio-gramophone. Amplifiers for any output from 6 to 120 watts will be seen, and some of the equipment will well repay inspection.



The Sunbeam Universal Midget receiver which had attained considerable popularity.

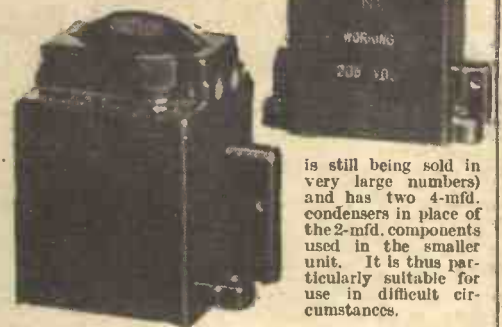
TELEGRAPH CONDENSER CO., LTD., Wales Farm Road, North Acton, London, W.3. Stand No. 37.

AS all readers are well aware, Messrs. T.C.C. are one of the largest firms of condenser manufacturers. They will be showing their extensive range at Olympia, including one or two new lines such as the No. 2 Interference Suppressor. A new type of condenser, designated the type 87, and having a working voltage of 450, will be in evidence. This latter component has a paper dielectric, but it has been specially designed to withstand a peak, or surge, voltage up to 650. A variety of dry and aqueous electrolytic condensers in all working voltages will be exhibited, as well as several high-voltage components designed for use in transmitting sets. The new type of interference suppressor is somewhat larger than the previous model (which



A new Telsen intermediate-frequency transformer, which is of neat design.

Two popular T.C.C. components; on the left is the No. 2 Interference Suppressor, and on the right is a unit from the comprehensive range of fixed condensers.



is still being sold in very large numbers) and has two 4-mfd. condensers in place of the 2-mfd. components used in the smaller unit. It is thus particularly suitable for use in difficult circumstances.

TELEGRAPH CONSTRUCTION AND MAINTENANCE CO., LTD., Telcon Works, East Greenwich, S.E.10. Stand No. 112.

NO details have been received concerning the exhibits of this company.

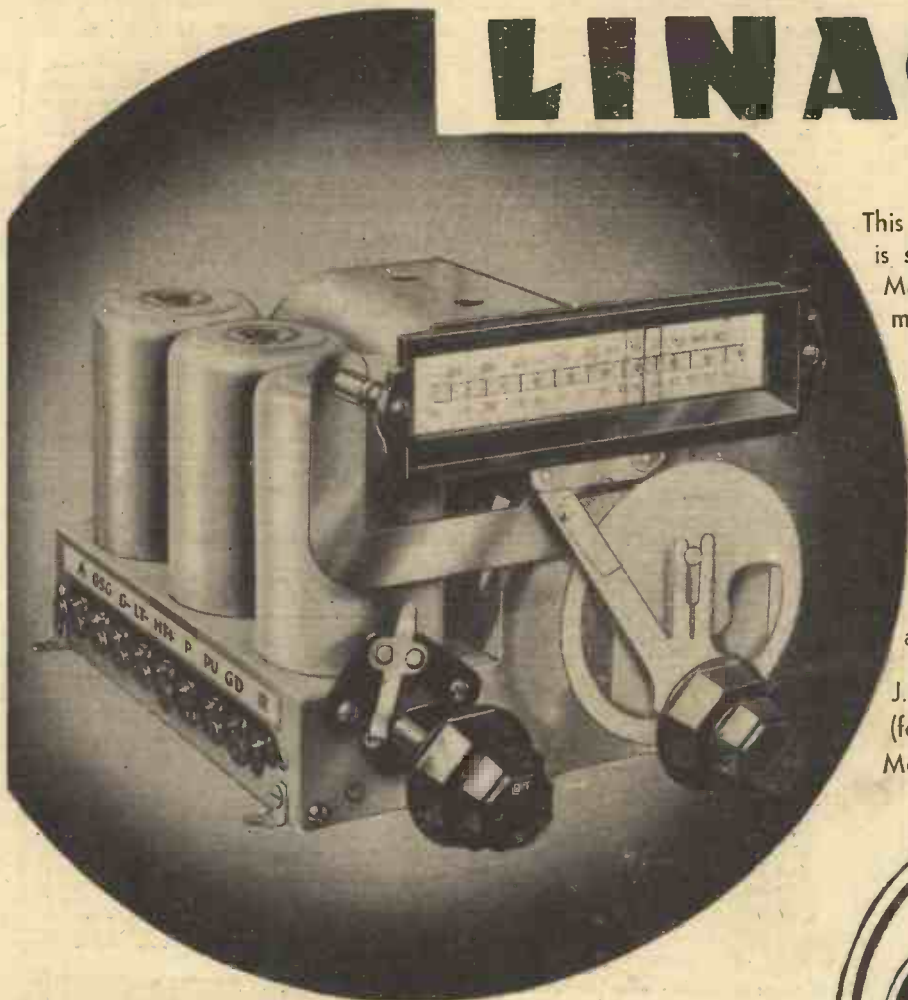
TELEPHONE MANUFACTURING COMPANY, LTD., Hollingsworth Works, Martell Road, West Dulwich, S.E.21. Stand No. 105.

THE display will consist principally of "T.M.C. HYDRA" paper dielectric condenser. These condensers are based on the specifications of the famous "HYDRA" condensers and are manufactured in England by an entirely British Company in a plant of the most up-to-date description, under the supervision of experts whose experience of condenser design and manufacture extends over many years. A range of five types of "T.M.C. HYDRA" paper condensers in metal cases, for working voltages of 250-750 V.D.C., as well as non-inductive tubular paper condensers of varying capacities and tested at 2,000 V.D.C., will form the main exhibit. There will also be shown a selection of sub-divided block condensers, typical specimens of the kind supplied to manufacturers for inclusion in receivers. T.M.C. HYDRA condensers for power-factor correction of Neon signs will be represented by a selection of the sizes most generally in demand. Finally a collection of moulded bakelite switches and connectors will complete the exhibit.



Made by Telsen, the above is a modern pedestal receiver.

THE NEW "J.B." UNIVERSAL **LINACORE**



This new J.B. Universal "Linacore" Tuner is suitable for use with either Battery or Mains valves. It has been designed to make possible the construction of really efficient receivers with the minimum possible complication and the maximum certainty of success. It simplifies set building considerably—and is far more efficient and compact than if home assembled. Complete with volume and reaction controls and all switching. Use this new Universal "Linacore" and get performance like a superhet!

J.B. "LINACORE" UNIVERSAL TUNER
(for use with Battery or Mains valves)
Model B.P.U. (Cat. No. 2129) **65/-**



TO HELP YOU INCORPORATE
THE "LINACORE" IN YOUR SET

We are offering you—for only 3d. (4d. Post Free)—a large broadsheet "Vivid Radio" containing three full-size blue-prints and full wiring instructions for incorporating a "Linacore" in your set. Post the coupon today, and be sure of getting your broadsheet before they are out of print!

**FILL IN COUPON
AND POST TO-DAY**

See the "LINACORE" at
Stand No. 114, Radiolympia.



COUPON

To Jackson Brothers (London) Ltd.,
72 St. Thomas' Street, London, S.E.1.

Please send me "Vivid Radio." I
enclose 4d. in stamps to cover postage, etc.

Name.....

Address.....

.....

.....

Practical Wireless GUIDE TO THE SHOW

TELSEN ELECTRIC CO., LTD., Aston, Birmingham. Stands Nos. 75 and 101.

IN addition to complete receivers, Messrs. Telsen will also be exhibiting a complete range of their smaller components designed for home construction purposes. The complete receivers incorporate some novel features, including the "Pointograph" tuning dial which utilizes a pointer traversing a large screen at an angle, and which straightens as the exact tuning point is reached. This enables a station to be tuned in with the volume control set to inaudibility. The S.G.3 and 323 Kit sets will also be seen.

THE 362 RADIO VALVE CO., LTD., Stoneham Works, Stoneham Road, Northwood Road, Upper Clapton, London, E.5. Stand No. 244.

AS valve manufacturers, this firm will confine its exhibits to valves of all types—battery, A.C., D.C. and Universal mains. In addition, the appearance of the stand will be enhanced by a large sectional model of the cathode which is employed in 362 A.C. mains valves, as well as a mechanical device demonstrating the process of manufacture of this type of valve.

THOMSON, DIAMOND AND BUTCHER, 34, Farringdon Road, E.C. Stand T.8.

AS wholesalers, this firm's exhibit will consist of selected items from various firms.

ULTRA ELECTRIC, LTD., Erskine Road, Chalk Farm, London, N.W.3. Stand No. 67.

CLOCK-FACE tuning forms the principal feature of the Ultra receivers, but the cabinet work and circuit details have received just as much attention as the design of the tuning indicator, and the receivers embody all that is modern in workmanship and design. Models for A.C., D.C. and Universal mains will be on show, and range from the most simple type of receiver to the elaborate radiogram.

VANDERVELL, C. A., LTD., Well Street, Birmingham. Stand No. 234.

ON this stand will be seen a full range of L.T. accumulators in glass and celluloid cases, all the former with ball discharge indicating devices. In addition jelly acid non-spillable cells will be seen together with free acid non-spillable cells developed in accordance with the desires of one or two manufacturers. Some new mass plate L.T. cells with two positive plates enclosed by two negatives all of the same thickness will also be shown. In addition, dry batteries and rechargeable H.T. accumulators will take a place on the stand.

VARLEY, Bloomfield Road, Woolwich, London, S.E.18. Stand No. 103.

NEW items to be seen on this stand will include the Duo-nicore tuning coils. These are not fitted with switches and so permit of individual design and layout. A new type of core is employed and special attention has been paid to the reduction of medium-wave breakthrough. In addition to standard types of coil, Superhet coils and I.F. transformers are also obtainable in this particular range.

The Permeability Tuner will also be shown, together with a new Power Transformer delivering outputs of 325 volts at 50 mA. (Centre-tapped), 4 volts 2.5 amps and 4 volts 4 amps. This retails at 22s. 6d. Other items will consist of the Power Puncher—a battery economiser, the A.V.C. Unit and the already popular Nicore range of tuning coils.

VEE CEE DRY CELL CO. (1927), LTD., Northwood Road, Stoke Newington, London, N. Stand No. 126.

ARANGE of batteries will be seen on this stand for the first time, including standard sizes suitable for discharge up to 12 mA and super capacities suitable for discharge currents up to 25 mA. The No. 2 range, known as Plumax Standard Energy batteries are suitable for discharge currents up to 8 mA, and in the super-capacity type up to 12 to 20 mA.

VOIGT PATENTS LTD., The Courts, Silverdale, London, S.E.26. Stand No. 255.

MESSRS. VOIGT will be showing a protected unit which is intended to withstand the rough handling inseparable from many P.A. jobs. This unit is arranged so as to be shower-proof, and when the developments now taking place are complete it will be capable of handling a sound output estimated at 4×10^7 ergs. They will also show a bent 4ft. mouth horn encased so as to be suitable for domestic use. The price of the bent horn without its case is £10 0s. 0d. The cost of the case will depend upon the style of finish selected. The excellent quality for which the Voigt loud-speaker is known will therefore be available to the connoisseur without objection from the womenfolk. Reflector type encased horns will also be shown.

WESTINGHOUSE BRAKE AND SAXBY SIGNAL COMPANY, LTD., 82, York Road, King's Cross, London, N.1. Stand No. 86.

METAL rectifiers in various types suitable for H.F. and other purposes will form the basis of the exhibit of this firm. Rectifiers suitable for H.T. mains units, or chargers for various ratings, as well as larger units suitable for commercial use will be found, and the special H.F. units which have rendered the H.T. economiser and other accessories possible will well repay examination.

WESTERN ELECTRIC INSTRUMENT CO., LTD., Kingston Bypass, Surbiton, Surrey. Stand No. 239.

WHARFEDALE WIRELESS WORKS, 62, Leeds Road, Bradford. Stand No. 205.

WHITELEY ELECTRICAL RADIO CO., LTD., Radio Works, Victoria Street, Mansfield, Notts. Stand No. 98.

SOME startling new types of speaker known as the Stentorians will be seen on the W.B. stand and these will attract considerable attention. Possessing new magnet systems, these speakers have made reproduction a much more realistic thing than



One of the new Ultra table console receivers.

hitherto. Smaller air-gaps, larger diaphragms, greater field strength and such factors have contributed to the strides which have been made, and no doubt this will prove one of the highlights of the show.

WINGROVE AND ROGERS, LTD., 188-189, Strand, London, W.C.2. Stand No. 87.

ALL the existing popular lines such as the Polar Minor Gang condensers, the Polar Uniknob, the Polar Drives, pre-set condensers, etc., will be seen on this stand, and in addition, the new Midget Gang condensers will be shown together with two new full-vision scales. In addition, the Polar-N.S.F. components will be included in the exhibit. These include volume controls, resistors, tubular condensers and semi-dry electrolytics, all of which will, in future, be obtainable only through Messrs. Wingrove and Rogers. The N.S.F. components have, of course, been well known for a considerable time and have been standardised by a number of set manufacturers for some years.

WIRELESS AND GRAMOPHONE TRADER, Dorset House, Stamford Street, S.E.1. Stand T.14.

WIRELESS LEAGUE, 12, Grosvenor Crescent, London, S.W.1. Stands Nos. 248 and 251.

HIGHLY qualified technical advisers will be on these stands to answer questions regarding exhibits and other details. Arrangements will be made to have someone always at hand.

WIRELESS RETAILERS ASSOCIATION, 316, First Avenue House, High Holborn, W.C. Stand No. 231.

NO details are yet available concerning the exhibits on this stand.

WOLSEY WHOLESALE LTD., 54, Lamb Conduit Street, London, W.C.1. Stand No. T.15.

THE exhibits here will consist of selected items from various manufacturers and the exhibits will thus be principally Trade items. In addition, a new Television Kit, consisting of a standard disc apparatus, will be introduced to enable experimenters who so desire to take up this new hobby.

WORLD RADIO RESEARCH LEAGUE, Broadcasting House, London, W.1. Stand No. 88.

WRIGHT AND WEARE, LTD., 740, High Road, Tottenham, London, N.17. Stand No. 1.

ALL the lines which proved so popular last year are being continued and will be exhibited in conjunction with several new and interesting components. One of the latter is the General Purpose Iron Core Coil which is similar in many respects to the Universal coils that were used with such outstanding success in the "Practical Wireless" "Leader Three." There will also be a range of new short-wave components, all of which use "Mycalex" as the insulating medium; this material is non-hygroscopic and has extremely good insulating properties. A new oscillator coil which has been designed for use in conjunction with the Universal coils, and which is priced at only 5s. will also be in evidence.

**FOR COMPLETE
STAND TO STAND
REPORT
see
NEXT WEEK'S
2nd ENLARGED
RADIOLYMPIA
NUMBER**



This is the W.B. "Stentorian Standard" speaker which is specified for the "Practical Wireless" "Summit" three-valve battery receiver.

IMPRESSIONS ON THE WAX

THE "His Master's Voice" record of the month has again been produced by Richard Crooks, with two English ballads, "A dream of Paradise" and "Oh song divine," on H.M.V. DA1368. In many ways this artist is the world's most remarkable tenor. The music of these two songs was, in fact, sent to America for him to record especially for H.M.V. Although a singer of great capabilities and a favourite of the Metropolitan Opera House, New York, he specializes in records of ballads and light songs. On H.M.V. DA1368, his latest contribution, are two of the best recordings he has ever made.

Good Orchestral Discs

Practically all the ordinary records of the latest "His Master's Voice" lists are of a light nature. Marek Weber and his Orchestra have made the most polished orchestral record that has been issued for many months with a selection of those entrancing airs from "Lilac Time" on H.M.V. C2673. This should be especially popular, for these tunes will be heard in the new film about the life of Schubert which is to be released shortly.

Two other orchestral records of note are "Kiss me again" and "Echoes from the Puszta," by the London Palladium Orchestra on H.M.V. B8189, and a selection of celebrated love songs arranged by Henry Hall, called "Love Tales," by the New Mayfair Orchestra, on H.M.V. C2674. The pieces by the Palladium Orchestra were popular items during the recent Crazy season at this well-known music-hall. The tender intimacy of "Speak to me of Love," the carefree philandering of "A Bachelor Gay," the passionate intensity of Grieg's "Ich liebe dich," the quiet fervour of "Drink to me only," the longing of "God send you back to me," and the wartime memories of "If you were the only Girl," are all admirably played in this selection.

Another medley is entitled "On the March," and is played by the premier English Military Band, that of H.M. Coldstream Guards, conducted by Lieut. J. C. Windram on H.M.V. B8187. It is interesting to compare this performance with the "Zampa Overture," played by the American Legion Official Band on H.M.V. C2680.

Stirring Songs by Peter Dawson

From stirring music we pass to stirring songs, where Peter Dawson can be heard singing "The Devout Lover" and "The Tramp's Song," on H.M.V. B8191. This popular Australian singer probably holds the record for having made the most gramophone recordings. He must be nearly approaching his thousandth title.

Two essentially English songs are "The Fiddler" and "Come to the Fair," which are admirably sung by Stuart Robertson on H.M.V. B8194, whilst lovers of organ music will recognize "Moonlight and Roses," which Walter Glynn sings with "The World is waiting for the sunrise" on H.M.V. B8195, as being the motif of Lemare's organ piece "Andantino."

Paul Robeson seems to have been specializing in songs about children during the last few months, and his admirers will learn with interest that he has now recorded "Little man you've had a busy day" on H.M.V. B8202, coupled with "I ain't lazy, I'm just dreamin'."



1 Watt 1/2
2 Watt 2
3 Watt 3

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DUBILIER CONDENSER CO. (1925) LTD., DUCON WORKS, VICTORIA RD., N. ACTON, W.3.

"Evergreen" Hits

Jessie Matthews' memorable performance in "The Good Companions" has now been eclipsed by her work in "Evergreen," her latest picture. The story of the film (which is based on the play) centres on the daughter of an actress impersonating her mother, and goes back from the present day over a period of twenty-eight years. Miss Matthews plays the daughter, and, as is natural in so kaleidoscopic a rôle, she has a good many songs to sing. "Just By Your Example," "When You've Got a Little Springtime," "Tinkle, Tinkle," "Over My Shoulder," and, of course, "Dancing on the Ceiling"—these are the principal ones, and these hits Jessie Matthews has recorded for Columbia on two records in her own inimitable manner (DB1403-4).

"Butterfly"

"Butterfly" contains some great music, which runs with the gamut of every phase of conduct or emotion as the pitiful tale unfolds. The sublime, childlike faith of Butterfly in *One Fine Day*, gloriously sung by Rosa Pampanini; the Love Duet in Act I—emotion lit with perfect music; the cruel disillusionment (E Questo?), despair in poignant melody—all unforgettable experiences for the hearer. There are, in fact, few operas whose music tells the tale so faithfully as this. Well, this is "Butterfly." You must decide if you are able to cope with a strange tongue, and whether tragedy may be sung to you or not. But perseverance is worth while in hearing this opera; it will penetrate the consciousness from the first moment.

(Continued on page 647)

AN ALPHABETICAL



NAME.	ADDRESS.	STAND No.			
Ace Radio, 2a, West Arbour St., E.1		19	Dibben, Ltd., Horace, 34, Carlton Crescent, Southampton	T21	McMichael Radio, Ltd., Wexham Rd., Slough, Bucks
Adey Portable Radio, 99, Mortimer St., W.1		115	Diggle & Co., Ltd., Jane St., Rochdale, Lancs.	13	Michell & Brown, 153, Turney Rd., Dulwich, S.E.21
Aerialite, Ltd., Junction Mills, Welbeck St., Ashton-under-Lyne		253	Dubliner Condenser Co. (1925), Ltd., Ducon Works, Victoria Road, North Acton, W.3	96	Milnes Radio Co., Ltd., Bingley, Yorks.
Aerodyne Radio, Ltd., Aerodyne Works, Walthamstow, E.17		68	Dulcetto-Polyphon, Ltd., 2-3, Newman St., W.1	T16	Mullard Radio Valve Co., Ltd., Mullard House, Charing Cross Rd., W.C.
Allwave International Radio & Television, Ltd., 4a, Wimbledon Hill Rd., S.W.		113	Dyson & Co., Ltd., J., 5, Godwin St., Bradford	T4	Multitone Electric, Ltd., 95, White Lion St., N.1
Amalgamated Press, Ltd., Fleetway House, Farringdon St., E.C.4		12	Earl Mig., Co., Ltd., Avenue Works, Hanover Park, S.E.15	240	National Accumulator Co., Ltd., 50, Grosvenor Gardens, S.W.
Amplion (1932), Ltd., 82, Rosoman St., E.C.		63	East London Rubber Co., Ltd., 29, Great Eastern St., E.C.	T18	National Radio Service, Ltd., 15, Alfred Place, W.C.1
Anson & Hopwood, Ltd., 41, Cheval Place, S.W.3		108	Eastick & Sons, J. J., 118, Bunhill Row, E.C.	T23	New London Electron Works, East Ham, E.6.
Automatic Radio Gramophone Co., Ltd., Crown St. Hall, Brighton		110	Econasign Co., Ltd., 92, Victoria St., S.W.	227	Newnes, Ltd., George, 8-11, Southampton St., W.C.
Automatic Coil Winder & Elec. Equip. Co., Ltd., Winder House, Douglas St., S.W.		2	Edge Radio, Ltd., Dolly Blue Works, Raphael St., Bolton	91	Novo Radio Electric, Ltd., 34, Lovaine Place, Newcastle-on-Tyne
Bakers Selhurst Radio, Croydon, Surrey		242	Edison Swan Electric Co., Ltd., 155, Charing Cross Rd., W.C.	18 and 58	Nuvolon Electric, Ltd., Meredith Works, Park Crescent, Clapham Park Rd., S.W.4
Balcombe, Ltd., A. J., 52, Tabernacle Street, E.C.		32	Eldeco Radio, Ltd., 62, Conduit St., W.1	93	Ormond Engineering Co., Ltd., Ormond House, Rosebery Avenue, E.C.
Beethoven Radio, Ltd., Beethoven Works, Gt. College St., N.W.		57	Electrico, 97, George St., Croydon	246	Orr Radio, Ltd., 79a, Parkhurst Rd., N.7
Belling & Lee, Ltd., Cambridge Arterial Rd., Enfield, Middx.		41	Electro Dynamic Construction Co., Ltd., Devonshire Grove, S.E.15	117	Osscaide, Ltd., 447, Oxford St., W.1
Benjamin Electric, Ltd., Brantwood Works, Tariff Road, N.17		42	Ensign, Ltd., 88, High Holborn, W.C.	T5	Partridge Wilson & Co., Ltd., Leicester
Bernard Jones Publications, Ltd., 58, Fetter Lane, E.C.4		10	Erie Resistor, Ltd., Cricklewood, N.W.	14	Philips Lamps, Ltd., 145, Charing Cross Rd., W.C.
Birmingham Sound Reproducers, Ltd., Clarendon Works, Clarendon St., Oldhill, Staffs.		235	Everett Edgcombe, Ltd., Hendon, N.W.	212	Plew Television, Ltd., Waddon, Croydon
Block Batteries, Ltd., By-Pass Rd., Barking, Essex		31	Ever Ready Co. (G.B.), Ltd., Hercules Place, Holloway, N.7	83	Portadyne Radio, Gorst Rd., North Acton, N.W.
Bridger & Co., Ltd., R. O., 4, Factory, Shelford Place, Church St., Stoke Newington, N.16		216	Ferranti, Ltd., Hollinwood, Lancs.	70	Powertone Products, 102, Cromer St., W.C.
Britannia Batteries, Ltd., Union St., Redditch, Worcs.		94	Film Industries, Ltd., 60, Paddington St., W.1	207	Provincial Incandescent Fittings Co., Ltd., Pifco House, High St., Manchester
British Blue Spot Co., Ltd., 94, Rosoman St., E.C.		90	Flinders (Wholesale), Ltd., Shaftesbury House, Colchester	T10	Pye Radio, Ltd., Africa House, Kingsway, W.C.2
British Broadcasting Corporation Publications, London, W.1		88	Fuller Accumulator Co. (1926), Ltd., Woodland Works, Chadwell Heath, Essex	124	Radio Gramophone Dev. Co., Ltd., 18, Frederick St., Birmingham
British G.W.Z. Battery Co., 205, Bedford Avenue, Trading Estate, Slough, Bucks.		206	Garrard Engineering & Mig. Co., Ltd., Newcastle St., Swindon, Wilts.	54	Radio Instruments, Ltd., Croydon, Surrey
British Permel Enamelled Wire, Ltd., Charlton, S.E.7		21	General Electric Co., Ltd., Magnet House, Kingsway, W.C.2	34, 66, and 225	Radio Society of Gt. Britain, 53, Victoria St., S.W.
British Pix Co., 118, Southwark Street, S.E.		237	Gilbert & Co., Ltd., C., 73, Arundel St., Sheffield	T9	Regentone, Ltd., Worton Rd., Isleworth, Middx.
British Radiophone, Ltd., Aldwych House, Aldwych, W.C.2		97	Goodman, J., 28-30, Drysdale St., N.1	217	Reproducers & Amplifiers, Ltd., Frederick St., Wolverhampton
British Rola Co., Minerva Rd., Park Royal, N.W.		48	Goodmans (Clerkenwell), Ltd., Broadyard Works, Turnmill St., E.C.	125	Rist (1927), Ltd., A., Freenant Rd., Lowestoft
Broadcaster, 20, Bedford St., Strand, W.C.		T27	Graham Farish, Ltd., Bromley, Kent	59	Selecta Gramophones, Ltd., 81, Southwark St., S.E.1
Brown Bros., Ltd., Great Eastern St., E.C.2		T20	Gramophone Co., Ltd. (H.M.V.), 108, Clerkenwell Road, E.C.	33 and 61	Siemens Electric Lamps & Supplies, Ltd., 39, Upper Thames St., E.C.4
Brown, Wm. F., Ossillo Works, High St., Brierley Hill, Staffs.		229	Grosvenor Electric Batteries, Ltd., 2-3, White St., Moorgate, E.C.	104	Sinclair Speakers, Ltd., 13, Vale Royal, N.7
Bulgin & Co., Ltd., A. F., Abbey Rd., Barking, Essex		121	Hacker & Sons, H., Perfecta Works, Ray Lea Rd., Maidenhead	116	Smith & Sons (M/A), Ltd., S., N.W.2
Burgoyne Wireless, Ltd., Great West Rd., Brentford		102	Haleyon Radio, Ltd., 83a, Valetta Rd., Acton, W.3	36	Sonochorde Reproducers, Ltd., 1, Willesden Lane, N.W.
Burndett, Ltd., Light Gun Factory, Erith, Kent		81	Harmer & Simmons, Ltd., 223, Hoe St., Walthamstow, E.17	209	Sound Sales, Ltd., Tremlett Grove Works, Junction Road, Highgate, N.19
Burton, C. F. & H., Bernard St., Walsall		3	Hartley Turner Radio, Ltd., Thornbury Rd., Isleworth, Middx.	119	Stratton & Co., Ltd., Eddystone Works, Bromsgrove St., Birmingham
Bush Radio, Ltd., Woodger Rd., Shepherd's Bush, W.12		82	Haynes Radio, 57, Hatton Garden, E.C.	9	Sunbeam Electric, Ltd., North Acton, N.W.
Cadisch & Sons, R., 5-6, Red Lion Square, W.C.		T7	Hayberd & Co., F. C., 10, Finsbury St., E.C.	24	Sun Electrical Co., Ltd., 118, Charing Cross Rd., T19
Celestion, Ltd., London Rd., Kingston-on-Thames		28	Hellesens, Ltd., Morden Rd., Wimbledon, S.W.	78	Swift, Levick & Sons, Ltd., Clarence Steel Works, Sheffield
Central Equipment, Ltd., 188, London Rd., Liverpool		4	Hendersons Wholesale Electrical & Radio, Ltd., Electric House, Queen's Rd., Brighton	T2	Tannoy Products, Canterbury Grove, S.E.27
Chloride Electrical Storage Co., Ltd., 231, Shaftesbury Avenue, W.C.2		254	Henleys Telegraph Works, Ltd., Holborn Viaduct, E.C.	100	Telegraph Condenser Co., Ltd., Acton, W.3
Churchmans, Ltd., 79, Maidenburgh St., Colchester		T23A	High Vacuum Valve Co., Ltd., 113, Farringdon Rd., E.C.	27	Telegraph Construction & Maintenance Co., Ltd., Telcon Works, East Greenwich, S.E.10
City Accumulator Co., Ltd., 18, Normans Bldgs., Central St., E.C.		89	Hillman Brothers, 123, Albion St., Leeds	T3	Telephone Mfg. Co., Ltd., Martell Rd., S.E.
Clarke & Co., Ltd. (M/C) H., Atlas Works, George St., Patricroft, Manchester		85	Hobday Bros., Ltd., 21, Great Eastern St., E.C.	T17	Telsen Electric Co., Ltd., Aston, Birmingham 75 and 101
Climax Radio Electric, Ltd., Haverstock Works, Parkhill Rd., Hampstead, N.W.3		56	Hiffe & Sons, Ltd., Dorset House, Stamford St., S.E.	6	Thompson, Diamond & Butcher, 34, Farringdon Rd., E.C.
Cole, Ltd., E. K., Ekco Works, Southend-on-Sea		72	Itonia, Ltd., 58, City Rd., E.C.	T6	Ultra Electric, Ltd., Erskine Rd., N.W.3
Colvern, Ltd., Mawneys Rd., Romford, Essex		38	Jackson Bros. (London), Ltd., 72, St. Thomas St., S.E.	114	Vandervell, Ltd., C. A., 319, Regent St., W.1
Concordia Electric Wire Co., New Sawley, nr. Nottingham		238	Johnson & Phillips, Ltd., Charlton, S.E.7	21	Varley Co., 103, Kingsway, W.C.2
Consolidated Radio, Ltd., Warple Way, Acton, W.3		20	Johnson Talking Machine Co., 96, Clerkenwell Rd., E.C.	T13	Vee Cee Dry Cell Co. (1927), Ltd., Northwold Rd., Stoke Newington, N.
Cosson, Ltd., A. C., Cosson House, Highbury Grove, N.5		73	Kingsway Radio, Ltd., 3-9, Dane St., W.C.1	44	Voigt Patents, Ltd., Silverdale, S.E.26
Dallas & Sons, Ltd., John E., 6-10, Betterton St., W.C.		T12	Kolster-Brandes, Ltd., Sidcup, Kent	84	Westinghouse Brake & Saxby Signal Co., Ltd., 82, York Rd., King's Cross, N.
Darwins, Ltd., Fitzwilliam Works, Sheffield		40	Lampex Radio & Electric Co., 62, Brewery Rd., N.7	22	Weston Elec. Instrument Co., Ltd., Kingston By-pass, Surbiton, Surrey
De La Rue & Co., Ltd., Thos., 90, Sherrhall St., E.17		5	Lectrolin, Ltd., 79a, Rochester Row, S.W.1	218	Wharfedale Wireless Works, Bradford
Dent, R. H. (Ardente), 309, Oxford St., W.1		45	L.E.S. Distributors, Ltd., 15-16, Alfred Place, W.C.	T25	Whiteley Electrical Radio Co., Victoria St., Mansfield, Notts.
Dew & Co., Ltd., A. J., 33, Rathbone Place, W.1		T22	Lissen, Ltd., Worpole Rd., Isleworth	83	Wingrove & Rogers, Ltd., 188, Strand, W.C.2
			Loudon & Provincial Factors, Ltd., 140, Theobalds Rd., W.C.	T26	Wireless & Gramophone Trader, Dorset House, Stamford St., S.E.
			Lugton & Co., Ltd., 203, Old St., E.C.	T1	Wireless League, 12, Grosvenor Crescent, S.W. 248 and 251
			Mains Power Radio, Ltd., Broadway Works, Eastern Rd., Romford	230	Wireless Retailers Association, 316, First Avenue House, High Holborn, W.C.
			Manufacturers Accessories Co. (1926), Ltd., 85, Great Eastern St., E.C.	T24	Wolsey (Radio & Allied Trades) Wholesale, Ltd., 54, Lamb's Conduit St., W.C.
			Marcniphone Co., Ltd., 210, Tottenham Court Rd., W.1	76	World Radio Research League, Broadcasting House, W.1
					Wright & Wearle, Ltd., Tottenham, N.17

RANDOM JOTTINGS

By the Editor

B.B.C. Educational Talks

SINCE the autumn of 1924 the B.B.C. has set aside part of the evening programme for adult education, and during last winter some 1,100 discussion groups met regularly to follow the series of talks, and they comprised, approximately, 13,200 listeners, although the number of listeners to broadcast talks is certainly infinitely larger. The growing public interest, as shown in the public demand for the printed programmes of talks (of which 200,000 copies are now distributed three times a year), implies that there exists a large audience which listens to talks individually and perhaps spasmodically. The results of such listening cannot be scientifically traced, but that they are considerable is shown periodically by the effect on public opinion of some of the more important series. Experience has shown that adult education talks should last for not less than twenty minutes or more than thirty minutes, and should be delivered between 19.30 and 21.00 (7.30 and 9 p.m.).

Good-bye, Poldhu

ACCORDING to a recent report, Poldhu (MPD) is closing down. This station will always be remembered as the first one to span the Atlantic. In the old days, Poldhu meant a great deal to home-ward-bound seamen, and many wireless operators will remember the thrill of switching up to the long wave when within the two-thousand-miles radius on the off-chance of picking up a few dots and dashes of MPD's note—the first sign of home after months of absence in foreign waters. Poldhu, which did such good service in the early days, was eventually eclipsed by the big strides made in wireless development in recent years. Operators who used to listen regularly for its note began to miss it, and then learned that experimental work was the cause of its desertion of ships at sea.

New Broadcasting Station for Palestine

IT is interesting to note that the Palestine authorities have decided to provide a broadcasting service for the Holy Land. Plans for the new service are already well advanced and a site for the broadcasting station has been selected about seven miles north of Jerusalem.

The work of constructing and installing the new station has been entrusted by the Palestine Department of Posts and Telegraphs to the Marconi Company, and work on the manufacture of the equipment has started at the Company's Works at Chelmsford, Essex.

The power of the new station is 20 kilowatts unmodulated aerial energy, and broadcasting will take place on a wavelength of 449.1 metres. The transmitter is, however, adjustable from 200 to 545 metres, so that a change of wavelength can easily be effected should this be desired at a future date.

(Continued overleaf)

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MAX TRANSFORMER
PARALLEL FEED

4'6

One of the most astounding Graham Farish contributions to better and lower priced 1935 radio. Alternative ratios of 1-1, 1-2, 1-3, 1-4, 1-5, 1-6 and 1-7½ are obtainable with the same transformer. Fitted with the new type of terminal developed by Graham Farish for the home constructor. Without doubt the greatest value in radio to-day. Price 4'6d.

QUIP TRANSFORMER

Suitable for the new Q.P.P. double Pentode valves or any push-pull circuit requiring a high step-up ratio, parallel fed. It has a high primary inductance of 60-70 henries and straight line amplification over 50 to 9,000 cycles and a full step-up ratio of 1/8. Extremely low capacity windings and minimum flux leakage. Price **10'6**



and a NEW Ohmite Volume Control for only 2/9

Yet another striking example of Graham Farish value. Element of extra high current-carrying capacity. Spring wiper operating through a cylindrical sleeve ensures a firm but positive point contact. Finished in black bakelite with dreadnought grey metal cover, complete with control knob. All standard values. Price **2'9**



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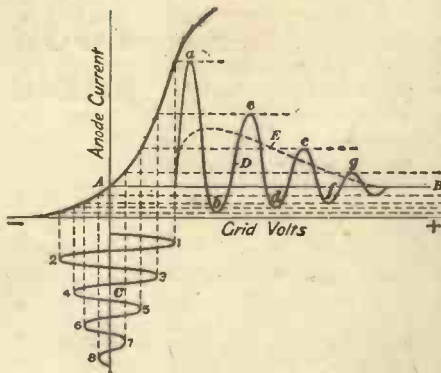
MR. RALPH STRANGER, who is a master of lucidity, has produced in this book a valuable and fully explained synopsis of technical terms that everybody can understand. It will prove indispensable to everybody who reads technical books and journals. Fully illustrated throughout.

DICTIONARY OF WIRELESS TERMS

By RALPH STRANGER

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The man who can analyse these curves and understand what they indicate knows his job. But if they do not convey to him perfectly definite information, it would appear that he needs more training than he has had. He is not competent to fill a responsible position in wireless.

Radio has developed so rapidly throughout the last ten years that it has now greatly outgrown the supply of technically qualified men required for the better posts. Moreover, it continues to develop with such speed that only by knowing the basic principles can pace be kept with it.

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- RADIO EQUIPMENT
- RADIO SERVICING AND SALESMANSHIP
- WIRELESS ENGINEERING
- WIRELESS OPERATORS
- EXAMINATION (state which)

Name Age.....

Address

(Continued from previous page)

Transmitter Design

THE transmitter consists of a number of aluminium panels placed in line, on which the controls and measuring instruments are mounted. The transmitting valves, with their associated wireless circuits, are behind the panels with safety gates on both sides to prevent unauthorized access. A control desk placed in front of the panels is used for the supervision of the power supply and other circuits. The switchboard and the control desk are finished in grey cellulose enamel with highly-polished aluminium borders, which give a distinctive appearance to the equipment.

A high precision quartz-crystal oscillator for stabilizing purposes is provided. Its constancy is five in one million and thus fully ensures that the transmitter will adhere with great accuracy to its allotted frequency.

Aerial

AN inverted quarter-wave aerial of the "T" type, suspended between two lattice-steel masts, is to be used. The masts are 100 metres in height, and they are insulated and stayed. Following modern practice the energy for the transmitter is conveyed to the aerial by means of a two-wire feeder line, which terminates in a small building at the lower end of the aerial, where appropriate coupling circuits ensure the correct transfer of energy from the feeder to the aerial.

RADIO CLUBS AND SOCIETIES

Club Reports should not exceed 200 words in length and should be received First Post each Monday morning for publication in the following week's issue.

SLADE RADIO

There was a lecture on "Ohm's Law," by Mr. N. B. Simmonds at the last meeting of this society. After giving the formula, he went on to explain how it could be applied and gave a number of illustrations. At the end of the lecture there was a short talk by Mr. L. Griffiths, and a demonstration of the 1935 Ekco A.C. 85 superhet receiver, a 6-valver including rectifier and incorporating a disturbance suppressor. The demonstration showed that, using the suppressor, all stations both medium and long wave, shown on the dial, which were working could be received at good strength without any trace of interference. Switching out the suppressor, a number of other stations could be received, but the background noise became very noticeable.—Hon Sec., 110, Hillaries Road, Gravelly Hill, Birmingham.

THORNTON-HEATH RADIO SOCIETY

A meeting of this society was held at St. Paul's Hall, Norfolk Road, on Tuesday, July 24th, presided over by Mr. S. J. Meares.

By the courtesy of the G.P.O. Mr. R. E. Dabbs (2BUS) was enabled to give a demonstration of his short-wave transmitter. He briefly described the working of a transmitter, and then outlined the two methods in use, namely the self-controlled and the crystal-controlled, the latter being the more modern. Mr. Dabbs explained in detail the various stages of the transmitter and amplifier which he illustrated on the blackboard, and then dealt with the question of modulation.

Full particulars of future programmes can be obtained from the Hon. Sec., Mr. Jas. T. Webber, 368, Brigstock Road, Thornton Heath.

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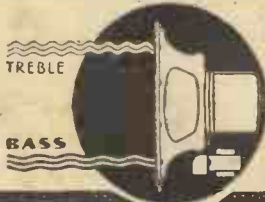
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IMPRESSIONS ON THE WAX

(Continued from page 643)

Brilliant Harp Recording

An unusual instrumental record is a harp medley of National Airs played by Mario Lorenzi, coupled with Lincke's "Glow Worm Idyll." This record conveys very faithfully the fullness of tone or range of expression of which the harp is capable in the hands of a master.

Raie da Costa's rhythmic piano playing is as brilliant as ever in her arrangements of "Just by your example" and "Ridin' around in the rain" on H.M.V. B8206, whilst Derickson and Brown are heard singing "Lazin'" and "All I do is dream of you," on H.M.V. B8204 in their own inimitable style.

Ray Noble's New Dance Successes

Amongst the new dance records Ray Noble is again the star. He has recently been using a new arrangement for recording in the studios whereby he conducts his orchestra from a soundproof box and hears their performance through a loud-speaker at his side. He is thus able to determine exactly how the finished performance will sound and ensures that all the instruments of his orchestra are recorded in their proper perspective. On H.M.V. B6507 he conducts his band playing one of America's newest hits, "Moon Country" and a cheery one-step, "Happy," whilst on B6504 he treats two fox-trots, "When you've got a little springtime" and "Over my shoulder" with polish and originality of style.

Eddie Duchin and his Orchestra, who are now causing such a furore in America, have recorded "Ill Wind" and "As long as I live," on H.M.V. B6501, whilst a new American band, Raymond Paige and his Orchestra, give a novel performance of the popular hit of the moment, "Love thy neighbour," coupled with Isham Jones's Orchestra playing "Ridin' around in the rain," on H.M.V. B6505.

We are now able to hear film orchestras playing their hits on records in exactly the same way as they do for the screen performances. The R.K.O. Studio Orchestra play "Carioca Rumba" from the film "Flying Down to Rio" on H.M.V. B6506, with Rudy Vallee and His Connecticut Yankees version of "Sleepy Head" on the other side.

The hot rhythm record of the month is Hoagy Carmichael playing his own composition, "Lazy River," coupled with Henry Allen Jr. and His Orchestra giving an exhilarating performance of "Swing Out."

New Columbia Records

Albert Sandler and his Orchestra have provided in the August Columbia supplement "Maruschka" and "Cuban Serenade," two dreamy, wistful pieces of Continental origin. These records, with their melody and lilting rhythm, are certain of widespread appeal (DB1406).

Radiolympia Signature Tune

The theme tune of Radiolympia this year is "Tune In," and Henry Hall and the B.B.C. Dance Orchestra, who will play throughout the run of the exhibition, will be responsible for introducing it to the huge audiences that will throng the great radio show. As was to be expected, Mr. Hall and our national dance orchestra have recorded the signature tune on Columbia, with "Night on the Desert" on the reverse (CB766).

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TELEVISION REVIEW

CHANGING FASHIONS

By H. J. Barton Chapple, Wh. Sch., B.Sc., A.M.I.E.E.

WE are all familiar with the changing fashions in radio both at the transmitting and receiving ends, but few have given thought to the radical

enormous transmitter used by Mr. Baird for some of his early attempts at scanning large scenes. On the left are the two discs having overlapping slots to produce the

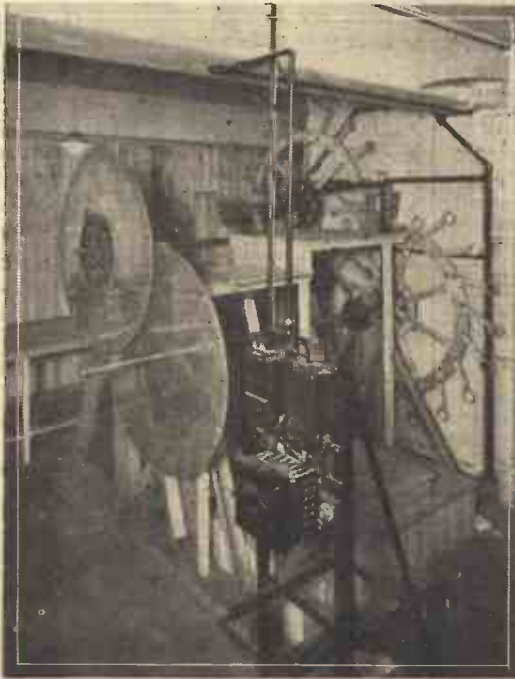


Fig. 1.—The large double-scanning transmitter used by Mr. Baird in some of his early efforts to scan big scenes.



Fig. 2.—One of the first forms of portable Baird television transmitter, which has now been superseded.

differences in design in television transmitting equipment.

In Fig. 1 is shown the complicated and

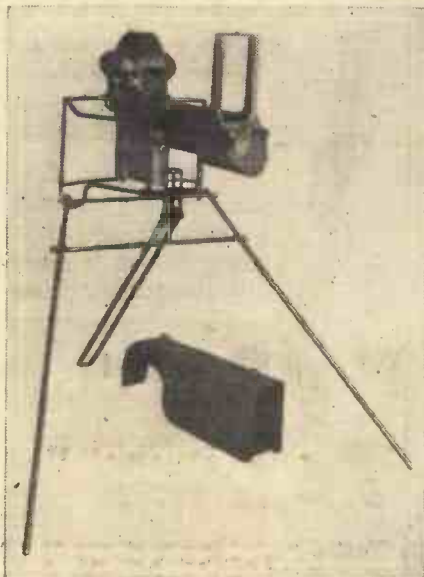


Fig. 3.—The first portable mirror-drum transmitter. This machine was the forerunner of that now used by the B.B.C. for its present television service.

scanning effect as shown in a recent note in these columns. Coupled with this are the large metal wheels with radial arms terminating in lenses. With equipment of this character a very powerful driving motor was essential and this, coupled with the cumbersome nature of the machine, led to its final abandonment.

The next step was the straightforward apertured disc transmitter which ultimately took the form of a very simple disc machine of a portable type. This is shown in Fig. 2, and was developed for the first transmissions made from the old Savoy Hill headquarters of the B.B.C. some three years ago. The revolving disc, driving motor and arc lamp are supported on a small revolving turntable which in turn is secured to a three-legged stand with large wheels. In front of the circular case housing the disc is a sector-shaped arm hold-

ing two lenses. Either of these could be brought into use at will and were included to give a focussed light spot scanning field for close-up or semi-extended images.

In the search for a more intense spot of light this machine was also abandoned in favour of the mirror-drum light spot transmitter, and the first design for this machine is illustrated in Fig. 3. The top cover is removed to show the mirror drum itself. Immediately below the drum is the arc light housing the resultant light beam passing along the tubular section, to be reflected back on to the drum mirrors, and finally reflected from these mirrors as an intense spot of light tracing out the scanning light strips. The tubular framework support allowed the scanning beam to be moved to left or to right on a back runner. From the experience gained from this model the ingenious mirror-drum transmitter installed in the B.B.C. studio at No. 16 Portland Place was evolved. This machine is shown in Fig. 4, and it has been in constant use now for nearly two years, and, for the thirty line service, gives outstandingly good results.

Watching the Image

ONE of the recent morning transmissions by the B.B.C. Television Department included Signor Podrecca's marionettes. As these figures move about within a relatively small compass it is possible to arrange the travelling light spot area to close-up dimensions, and the effects produced are really remarkable. Drama, melodrama, comedy, and ballet are performed by the puppets, the movements and actions being controlled by a veritable maze of strings. Transmissions of this character have been a great favourite in the past, and in Fig. 4 is shown one of the original acts of the London Marionettes in progress. The photo-electric cells were fixed in a box above the aperture cut in the wall dividing the studio from the control room. This can be seen clearly and also the special scenery painted for television work, while the strings supporting the "performers" on the front of the stage are quite visible.

The "Televisor" employed by the B.B.C. for Press and public demonstration is a particularly interesting machine standing about 5ft. high. The image screen size is 14in. by 6in., while the screen itself

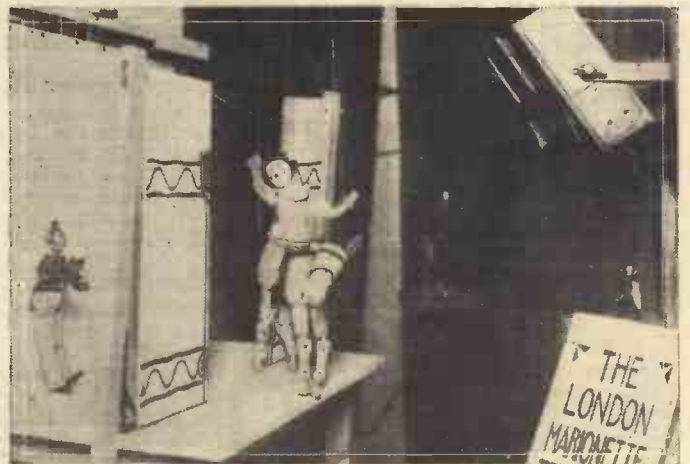


Fig. 4.—Indicating how the first marionette shows were produced for television. The photo-electric cells are housed in the rectangular apertured box on the right.

is made from thin frosted glass. This is shown in Fig. 5, together with the machine controls which are grouped round the screen for convenience of adjustment. The question of automatic synchronizing by means of the picture signal does not arise, for since the mirror drum of the television transmitter is driven by a synchronous motor, then it is only necessary to employ a similar synchronous motor in the receiving "televisor" and feed this from the same mains supply. The two switches at the top of the left and right panels are the main on-off switch and motor start-run switch. Initially both these switches are snapped down, this feeding the mains supply to the independent running winding and furnishing a starting voltage of 300. When the motor pulls into its synchronous speed the right switch is moved up to give the running voltage of 110 volts, while the hood over the switch knob of the left-hand switch is released and springs back to its initial position.

For tuning-in the 261-metre transmission,

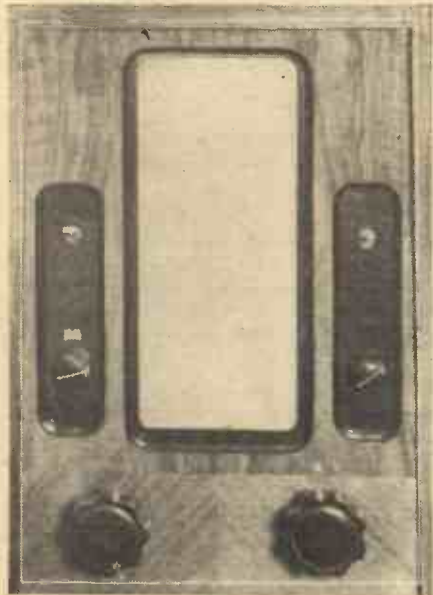
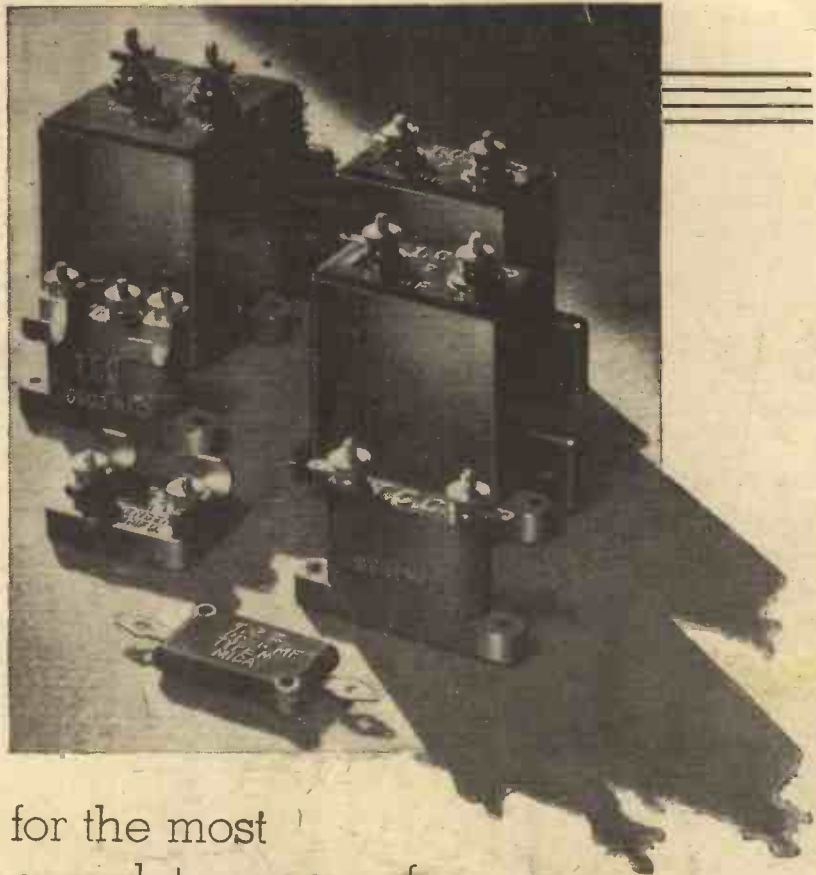


Fig. 5.—A close-up view of the image screen and controls contained in the B.B.C. Televisor situated in the listening room at Broadcasting House.

the left-hand arrowed knob is turned, the small aperture above this indicating the wavelength. The actual image reception is effected by a grid cell working in conjunction with a thirty-mirrored drum, so to control the bias voltage on the cell and thus alter the brilliance of the image to suit individual taste, a potentiometer is adjusted by means of the right-hand arrowed knob. The large right-hand knob is a volume control operating on the radio receiver proper so that the signal strength may be altered to the required value. Finally, there is the left-hand large knob for a combined image phasing and framing adjustment. This is brought about by a relative movement between the rotor and stator of the motor itself and locates the image exactly in frame within the translucent screen.

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"FIGHTING FACTS"

A VERY attractive folder bearing the above title has just been issued by E. K. Cole, Ltd., which tells an interesting story of this firm's ten years' progress in the radio industry. This folder, copies of which are being distributed to all Ekco dealers, points out that this well-known firm are launching another new radio programme which should make the season 1934/5 an even greater Ekco year. New sets are to be introduced which will enhance the range of popular Ekco models. The folder is particularly topical in view of the approaching Radio Exhibition.

FERRANTI ELECTROSTATIC VOLTMETERS

MESSRS. FERRANTI, LTD., have recently marketed two new electrostatic voltmeters. One is a 150 v. instrument, spring mounted in a cast-iron case, and arranged for measurements to be taken with the dial in a horizontal position. The other model is a 12 kv. instrument, with an upright dial, and is fitted in a polished wood case. A leaflet (Wh. 526/1) gives further particulars of these meters, and also details regarding a new 2½ in. A.C. and D.C. instrument, which may be used as the basis of an elaborate testing equipment by those who desire to construct such apparatus themselves. With this instrument, A.C. and D.C. readings can be made at choice by the operation of a switch at the top of the instrument. The full scale readings are 5 v. A.C. and 50 Mv. D.C. Both these ranges have a resistance of 1,000 ohms per volt, giving additional ranges of 0.1 mA. A.C. and 0.1 mA. D.C. Copies of the leaflet can be obtained on application to Ferranti, Limited, Hollinwood, Lancashire.

"GOLSTONE" RADIO COMPONENTS

MANY useful components and radio accessories for the set constructor are shown in the new season's list issued by Ward and Goldstone, Ltd. There is a fine range of H.F. chokes including some heavy duty types suitable for A.C. or D.C. sets. Iron-cored tuning coils, H.F. coupling units, screened dual-range coils, a switch unit chassis, condensers in metal or bakelite cases, compression type condensers, and switches of different types are also listed. Among the other material given in this comprehensive list are instrument wire in all gauges, rubber and flex covered wires, voltmeters and ammeters, the "Golstone" screened down-lead, accumulator charging boards, and a range of bakelite moulded adaptors and lamp holders. There are also several other useful accessories, too numerous to mention, and every set constructor is advised to write for a copy of this invaluable list.

BELLING-LEE PRODUCTS

THIS well-known firm have recently issued a loose-leaf catalogue setting forth their latest components. Noticeable amongst these are single and double choke units, in cases, for electrical disturbance suppression. The double choke unit consists of two H.F. mains chokes and condensers housed in a cast aluminium case. They can be adjusted for A.C. or D.C. and to provide several different filter circuits. In addition there are a D.C. ripple suppressor, and a car radio interference suppression kit. The popular Belling-Lee indicator and other terminals, fuseholders, and connectors, are also listed, together with the Belling-Lee spares kit, a handy little box of small parts and pilot bulbs for the home constructor or service man.

ROTHERMEL SPEAKERS

A FINE range of moving coil speakers, including a new Piezo Electric Speaker, is displayed in an attractive leaflet issued by R. A. Rothermel, Ltd. This new speaker is characterized by its unusual frequency response and sensitivity. Among the other models listed are two midget speakers suitable for portable or car receivers, one a D.C. type and the other P.M. type. Both are available with power or pentode transformers, and the P.M. model is also obtainable with a Class "B" transformer. Another interesting item is the Microvox, which is admirably suited for use as an extension speaker, provision being made for either high or low impedance by terminals located at the bottom of its cabinet. Also included in the range are Junior, Standard, Senior and De Luxe models at prices ranging from 25s. to 65s.

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PRACTICAL LETTERS FROM READERS

The Editor does not necessarily agree with opinions expressed by his correspondents. All letters must be accompanied by the name and address of the sender (not necessarily for publication).

Test Match Broadcasts in Australia

SIR,—Now that the Test matches are on I think it would be of interest to your many readers to know how the play is broadcast out here in Australia. The play starts at 8 p.m. (our time) and finishes at about 3.30 a.m. The whole broadcast is carried out by cables which come here after every over. These cables, which contain about twelve words, contain all the details of the preceding over. The announcer, together with some of his own patter about the cable, talks till the next cable arrives which is generally in about three minutes. In conjunction with the announcer is a gramophone record taken at some previous Test match of a crowd cheering. The volume of this record which is being played all the time is increased when something startling happens such as a 4, 6, a catch, or a man going out. At first many Australians thought that the announcer was at Trent Bridge seeing the actual cricket.

The tests are very popular out here in Australia. For instance, I stay up until about 4 a.m. each morning listening to the tests. I might also add that I do not begrudge the time thus spent as it affords me a great deal of pleasure, especially for short-wave testing.

In conclusion, I should be very pleased to correspond with someone in England if an enthusiast would please forward his address through the Editor.—Mr. ROTH JONES (Bendigo, Victoria, Australia).

Using Cheap Voltmeters

SIR,—The advice given in the July 28th issue of PRACTICAL WIRELESS on the use of cheap voltmeters is only too correct as I once found out for myself. About nine months ago I made a D.C. H.T. unit described in the PRACTICAL WIRELESS Encyclopædia. After connecting to the mains, I tested the readings with a cheap voltmeter, the 150-volt tap read 30 volts only, the 80-volt tap just made a slight flicker on the needle. At first I thought the unit was at fault, but I found this was not so when I made a quick short circuit between the H.T.— and H.T.+ tap. Thinking the meter was broken, I put a "Pifco" meter on test, and a correct reading of 80 volt and 150 volt was obtained. I tested an H.T. battery with the cheap meter, and this read correctly. I at once came to the conclusion that the cheap meter was taking more milliamps than the H.T. unit would give out. I tested this cheap voltmeter, in series, with a good milliammeter and found that it was taking not less than 30 milliamps, in fact, the needle went bang over to 30 milliamps; it might have gone more but for the fact that the meter was rated from 0 to 30 m.a. The moral, of course, is never use cheap meters when testing H.T. batteries, etc.—G. C. SURRIDGE (Crawley).

"Fury III" and Double-Diode-Triode

SIR,—Last year I suggested to you that "Fury III" should include a double-diode-triode, but you do not seem to have carried the matter any further. Perhaps the new Mullard is a suitable valve.

One often reads that the selectivity of the straight set cannot equal that of the superhet. I have not seen the following tried:—Aerial into a Band Pass unit with 2-gang condenser. (Probably an extra preset would be necessary because of the aerial.) The 2 H.F. coils to be controlled by a second 2-gang condenser. As, presumably, reaction would not be included, there can be no objection to two tuning controls.—H. M. SMITH (Westward Ho).

"Hush Hush Mixture"

SIR,—I have got an Ecko transverse microphone, but there is a lot of background noise and it won't pick up sound within a distance of two to three feet. The background noise is too loud. Do you sell that "hush hush mixture" that makes the silent background quality?

[The above letter was recently received by one of our advertisers, Messrs. Electradix Radios, apparently from one of their customers.—Ed.]

S.W. Stations and Postal Addresses

SIR,—With reference to my article entitled as above, published in the July 28th issue, I notice that the address given for reports of the German transmissions is the old one, which was correct when the article was written. In order that PRACTICAL WIRELESS readers, especially new ones, will not be misled, it may be pointed out the new address was given on the Practical Letters page of the January 27th issue. It is as follows: German Short Wave Station, Broadcasting House, Berlin, Germany.—THE AUTHOR.

CUT THIS OUT EACH WEEK.

Do you know

—THAT some novel tuning devices will be seen at the show in which accurate tuning settings are definitely located.

—THAT the reason for the above devices is to be found in the employment of A.V.C. circuits and side-band cut-off resulting in poor quality.

—THAT some new types of speaker will be seen during the coming season and will considerably modify current ideas concerning reproduction.

—THAT in a new recording system for gramophone records the conductor of a band stands in a sound-proof cabinet and hears the band playing through the medium of phones.

—THAT the grid-bias battery must be disconnected in a receiver employing a variable-mu-stage, or the battery will discharge itself through the control potentiometer.

—THAT the tuning condenser employed with iron-cored coils must be of good quality or the benefit of the coils will be lost.

The Editor will be pleased to consider articles of a practical nature suitable for publication in PRACTICAL WIRELESS. Such articles should be written on one side of the paper only, and should contain the name and address of the sender. Whilst the Editor does not hold himself responsible for manuscripts, every effort will be made to return them if a stamped and addressed envelope is enclosed. All correspondence intended for the Editor should be addressed: The Editor, PRACTICAL WIRELESS, Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, W.C.2.

Owing to the rapid progress in the design of wireless apparatus and to our efforts to keep our readers in touch with the latest developments, we give no warranty that apparatus described in our columns is not the subject of letters patent.

TELEVISION—A SUGGESTION

CHANCING to come across a recent copy of an Australian radio journal, it was most interesting to note an expression of opinion in regard to that country's outlook on television. After pointing out the difficulties with which nearly everyone is now familiar, the writer went on to say that many of those closely associated with actual television activities hold the view that the public to-day will only accept television when it is given to them in a form comparable with the standard of picture possessing an entertainment value similar to the moving and talking pictures of to-day. He also said that as radio has developed to a very fine art, and the reproduction of music, etc., in the home is accomplished in a most satisfactory manner, the public will also demand a similar standard from television. Without entirely disagreeing with this point of view, it is suggested that television will best be introduced to the public on lines similar to the manner in which radio and other industries have been developed. There is no doubt that the public always pay either directly or indirectly for all developments and progress. Even motor-cars were not developed in the laboratory or on the testing grounds of the manufacturers, but rather in the hands of the public along the highways of the various countries and, in the initial stages, under conditions of bad roads, solid tyres, faulty engines, badly designed bodies, and other innumerable difficulties; but to-day we find the motor-car developed to a high degree of efficiency in every direction. The same applies to the radio receiver.

Now, if a television transmitting station is erected in any particular capital city, and even elementary signals, for instance, large words, black and white pictures, and other simple visionary objects are televised, it would create a large demand for television components, and the large number of existing listeners could be encouraged to buy these parts and achieve results with their own hands. This would not in any way interfere with the sale of complete broadcast receivers, but would rather tend to increase the public demand, as television transmissions would be linked up with some broadcasting station, thus requiring two receivers—one to reproduce the object, and the other to reproduce the sound. Those of us who have been associated with radio for the last fifteen years are apt to forget that there is another generation growing up, and that the youth between the ages of 12 and 20 is a definite candidate for the purchase of parts to experiment with.

Undoubtedly this is a very sound argument, and one which could very well be given serious consideration by the authorities concerned.

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LET OUR TECHNICAL STAFF SOLVE YOUR PROBLEMS

QUERIES and ENQUIRIES

by Our Technical Staff

The coupon on Page iii of cover must be attached to every query

SPECIAL NOTE.

We wish to draw the reader's attention to the fact that the Queries Service is intended only for the solution of problems or difficulties arising from the construction of receivers described in our pages, or on general wireless matters. We regret that we cannot, for obvious reasons—

- (1) Supply circuit diagrams of complete multi-valve receivers.
- (2) Suggest alterations or modifications of receivers described in our contemporaries.
- (3) Suggest alterations or modifications to commercial receivers.
- (4) Answer queries over the telephone.

Please note also that all sketches and drawings which are sent to us should bear the name and address of the sender.

Matching a Speaker

"I am using a Mullard PM.2B (with 150 volts on the plate) in conjunction with the M.C. speaker having a speech coil of 11 ohms. I wish to know the correct ratio of the output transformer to use. I remember seeing an article on this subject, but cannot trace it."—E. A. P. (Catford, S.E.6.)

The formula for ascertaining the correct transformer ratio is

$$\text{Ratio} = \sqrt{\frac{\text{Optimum Load of Valve}}{\text{Impedance of Speaker}}}$$

The optimum load of the valve you are using is 14,000 ohms, and the impedance of the speaker is 11 ohms. If, however, the figure which you give is the D.C. resistance of the speech coil, and not its impedance, you should multiply that figure by 1½. That is to say, the impedance of an 11-ohm speech coil may be taken as 13.75 ohms. The ratio of the transformer will be found to be 45 to 1, this being the nearest commercial value obtainable.

Short-Wave Circuit Wanted

"I am on the look-out for a two or three valve short-wave circuit. It must be cheap and

fairly simple to construct. Have you published anything which would be suitable for me?"—D. R. H. (Streatham).

The Empire Short-Wave Three might prove of use to you, or the All-Wave Two. The former utilized a detector and two L.F. stages, together with a special type of short-wave coil manufactured by Radio Instruments. The latter employed iron-cored coils to cover short, medium and long waves. Blue Print No. 7 is obtainable in respect of the Empire Short-Wave Three and No. 28 in respect of the All-Wave Two.

A Microphonic Valve

"I have a valve which has been used in many circuits and it makes an unpleasant microphonic howl. This is very annoying when trying to tune in a station and someone walks across the floor. I have tried wrapping it in cotton wool, and also using various types of spring valveholder. Can you help me? I am also interested to know what makes it microphonic."—T. G. (Stoke Newington).

The noise is caused by the vibration of the electrodes and, therefore, you must arrange to prevent these from being set in vibration. A sprung valveholder will prevent jolts from being transmitted to the valve, but you will also find it necessary to cover the glass and preferably damp the glass by using lumps of plasticine or similar material under the wrapping. A tin or other type of cover over the valve, with some felt or other thick material round the valve so as to fit the cover, should prove effective.

A Ford Coil Query

"I am interested in the A.C. rectifier hint which you recently published, but am in doubt regarding one point. Your Ford coil seems to be the same as mine, opening with a sliding panel to the right. I have opened my coil and taken as much pitch as

possible away, but I cannot find the primary negative to the second negative—only the leads to the condenser. Could you please help me in any way?"—W. A. C. (York).

The two leads in question will be found attached to the brass contact stud on the side of the case.

Finding the Capacity

"Will you kindly explain to me how to find the value in mfd. of any variable or reaction condenser when they are not marked?"—D. D. (Weston-super-Mare).

The capacity depends upon the dielectric, the area of overlap of the plates and the thickness of the dielectric. You will find it rather difficult to calculate these factors from most condensers and, therefore, think the most satisfactory method would be to take the particular components to a local dealer and have them compared with similar items.

Fuse Position

"I have had an argument concerning the position of a fuse in a simple battery receiver. Can you please state definitely the correct position for the fuse so as to prevent the valves burning out?"—T. H. (Pinner).

If you examine a standard circuit you will see that H.T.—and L.T.—are joined together and to earth, and thus one side of the H.T. battery is already joined to the filaments. Consequently, you must arrange matters so that should the positive H.T. lead be joined to the filaments the entire H.T. supply will not be thrown across this part of the circuit and, therefore, the most obvious position for the fuse is in the H.T. negative lead. Use a fuseholder with two terminals, connecting one terminal to H.T.—and the other to L.T.—and to the filaments.

The Queries Coupon appears on Page iii of cover.

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ALL models are completely hum-free on A.C. or D.C. mains!

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Advertisements are accepted for these columns at the rate of 3d. per word prepaid - minimum charge 3/- per paragraph - and must reach this office not later than Tuesday for the following week's issue. Radio Components advertised at below list price do not carry manufacturers' guarantee. All communications should be addressed to the Advertisement Manager, "Practical Wireless," 8, Southampton Street, Strand, London.

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SPECIAL Offer of P.M. and Energised M.C. Speakers. Purchased from well-known gramophone co.

TYPE 10971G. 9in. diameter, 115 ohm field, 120/200 m.a. with power output transformer. Handles 4 watts, 17/6.

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TYPE 10955F. 9in. diameter, 11,650 ohm field, 20/30 m.a., auditorium type power transformer. Handles 10 watts, 30/-.

TYPE 10955H. 9in. diameter, 115 ohm field, 350/400 m.a., auditorium type Pentode transformer. Handles 10 watts, 30/-.

TYPE 4480. 9in. diameter, permanent magnet. Handles 4 watts. 7 ohms speech coil, 13/6. Multi-ratio transformer, 4/6 extra.

PREMIER SUPPLY STORES Announce the Purchase of the Complete Stock of a World Famous Continental Valve Manufacturer; all the following standard mains types, fully guaranteed, 4/6 each, H. H.L. power, High, Medium, Low magnification and Variable-Mu Screen Grid. Directly heated Pentodes, 1 watt, 3 watt and 4 watt A.C. outputs. 250v. 60 milliamp, full wave rectifier.

THE following Type, 5/6 each; 350 v. and 500 v., 120 milliamp full wave rectifiers, 2/2 watt indirectly heated pentode.

THE Following American Types at 4/6; 250, 227, 112, 171, 210, 245, 26, 47, 24, 35, 51, 58, 55.

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v., 20 m.a., 20/-; trickle charger 8/- extra; 150v., 30 milliamps, with 4v., 2-4 amps. C.T., L.T., 25/-; trickle charger, 6/6 extra; 250v., 60 milliamps with 4v., 3-5 amps, C.T., L.T., 30/-; 300v. 60 m.a. with 4 volts, 3-5 amps., 37/6; 200v. 100 milliamps, 39/6.

PREMIER chokes, 40 milliamps, 25 hys., 4/-; 65 milliamps, 30 hys., 5/6; 150 milliamps, 30 hys., 10/6; 60 milliamps, 80 hys., 2,500 ohms, 5/6; 25 milliamps, 20 hys., 2/0.

ALL Premier Guaranteed Mains Transformers have Engraved Terminal Strips, with terminal connections, input 200-250v., 40-100 cycles, all windings paper interleaved.

PREMIER H.T.7 Transformer, output 135v. 80 m.a. for voltage doubling, 8/6; 4v. 3-4a., C.T. L.T. 2/- extra; with Westinghouse rectifier giving 200v. 30 m.a., 17/6.

PREMIER H.T.8 and 9 Transformers, 250v., 60 m.a., and 300v. 60 m.a. rectified, with 4v. 3-5a. and 4v. 1-2a, C.T. L.T. and screened primary, 10/-; with Westinghouse rectifier, 18/6.

PREMIER H.T. 10 Transformer, 200v. 100 m.a., rectified with 4v. 3-5a., and 4v. 1-2a. C.T. L.T., and screened primary, 10/-; with Westinghouse rectifier, 19/6.

PREMIER Mains Transformer, output 250-0-250v. 60 m.a., 4v. 3-5a., 4 v. 2-3a., 4v. 1-2a. (all C.T.) with screened primary, 10/-.

PREMIER Auto Transformers, 100-110/200-250v. or vice versa, 100-watt, 10/-.

WESTERN ELECTRIC Mains Transformers, 300-0-300v. 65 m.a., 4v. 1-2a., 4v. 2-3a., 6/6; 500-0-500v. 150 m.a., 4 v. 3-5a., 4v. 2-3a., 4v. 2-3a., 4v. 1a. C.T., 4v. 1a. C.T., 19/6; 1,000-0-1,000v. 250 m.a. 4v. 3a. C.T., 4v. 3a. C.T., 49/6; 2,000-0-2,000v. 150 milliamps, 49/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-200v. or 200-250v., output 180-0-180 volts 40 m.a., 4v. 1 amp., 4v. 3 amps., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

PREMIER L.T. Charger Kits, consisting of Premier transformer and Westinghouse rectifier, input 200-250v., A.C., output 8v. 1/2 amp., 14/6; 8v. 1 amp., 17/6; 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1 amp., 37/6; 2v. 1/2 amp., 11/-.

B.T.H. Trussed Induction Type (A.C. only) Electric Gramophone Motors. 100-250v.; 30/- complete.

COLLARO Gramo. Unit consisting of A.C. motor, 200-250v., high quality pick-up and volume control, 49/-; without volume control, 40/-.

Continued at top of column three

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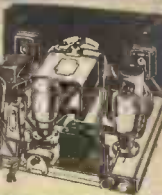


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Complete kit of parts for building. Send only 2/6, balance in 8 monthly payments of 5/-. Cash or C.O.D. Carriage Paid, £1/19/6.

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If valves required, add £1/11/8 to Cash Price or 2/6 deposit and 6 monthly payments of 5/-.



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(Continued from foot of column one.)

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POLAR Star, manufacturers' model, 3-gang condensers, fully screened, 7/6; with trimmers.

AMERICAN Triple Gang 0.0005 Condensers, with trimmers, 4/11; Utility Bakelite 2-gang 0.0005 screened with uniknob trimmer, 3/6; Polar Bakelite condensers, complete with knob, 0.00015, 0.00035, 0.0003, 0.0005, 1/-.

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VOLUME Controls, 60,000 ohms, New, 1/3.

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ELIMINATORS, 25 m.a., D.C. 10/-, A.C. 21/-; Transformers 3-1, 5-1, 1/9. British-made valves, H.F., L.F., and Decat., 1/9. Power 2/- S.G. 5/- Carriage Paid Cash with Order.—Radio Electrical Supplies, 237, Camberwell Road, London, S.E.5.

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GRANIC Intermediate Frequency Superhet Transformer Unit. List price 10/6. Our price 3/9 each.

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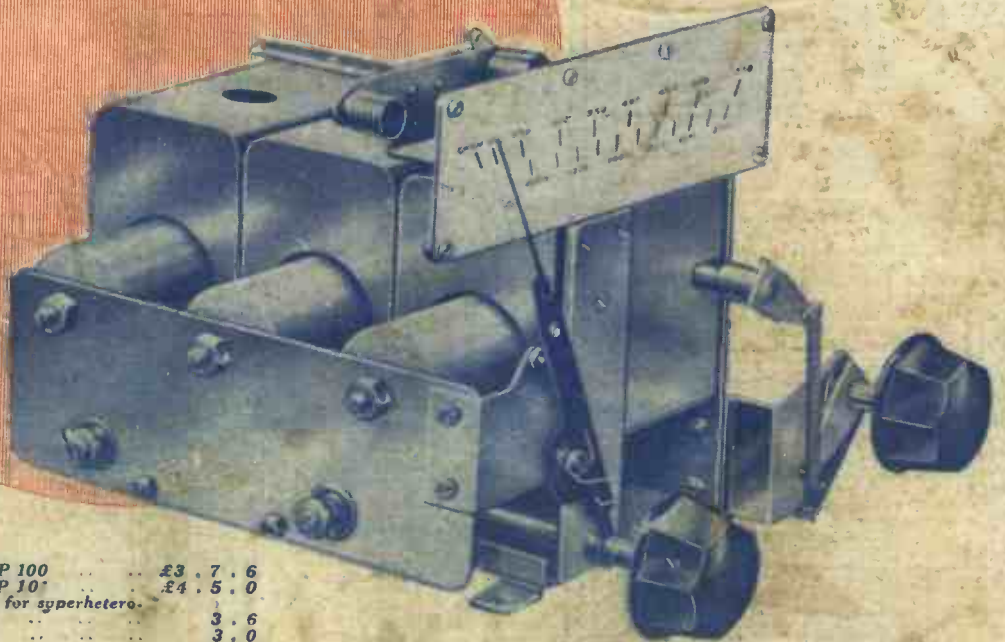
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2/6

ADVERTISEMENT INDEX

	Page
Amplion (1932) Ltd.	619
Automatic Coil Winder and Electrical Equipment Co., Ltd.	626
Belling & Lee	594
British Blue Spot Co., Ltd.	596
British Institute of Engineering Technology	652
British Rola Co., Ltd.	647
Bulgin, A. F., & Co., Ltd.	592
Celestion, Ltd.	595
Clarke, H. & Co. (M/cr.), Ltd.	597
Colvern, Ltd.	594
Cossor, A. C. Ltd.	609
Dubilier Condenser Co., Ltd.	643
Electradix Radios	653
Eugen Forbat	654
Exide	616
Ferranti, Ltd.	620
Fluxite, Ltd.	653
Formo Products, Ltd.	637
General Electric Co., Ltd.	589, 591, 610
Gilbert	652
Graham Farish, Ltd.	625, 645
Heayberd, F. C., & Co.	Inside Back Cover
High Vacuum Valve Co., Ltd.	651
International Correspondence Schools	646
Jackson Bros. (London), Ltd.	641
King's Patent Agency	652
Kolster Brandes	593
Lectro Linx, Ltd.	653
London Radio Supply Co.	647
Lotus Radio (1933) Ltd.	619
Multitone Electric Co., Ltd.	653
New Times Sales Co.	655
Osborn, Chas. A.	615
Peto Scott, Ltd.	Front Cover Strip 615
Pitmans	646
Practical Television	650
Regent Fittings Co.	653
Reproducers & Amplifiers, Ltd.	638
Taylor, N.	652
Telegraph Condenser Co., Ltd.	Page ii Television Supp.
Telephone Mfg. Co., Ltd.	595
Telsen Electric Co., Ltd.	632
The Gramophone Co., Ltd.	598
362 Radio Valve Co., Ltd.	595
Varley, Ltd.	Back Cover
W. T. Henley's Telegraph Works Co., Ltd.	647
Wet H.T. Battery Co.	652
Westinghouse Brake & Saxby Signal Co., Ltd.	Inside Front Cover
Whiteley Electrical Radio Co., Ltd.	631
Wingrave & Rogers	592
Wright & Weaire	596

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