

POPULAR WIRELESS

DOUBLE
CHRISTMAS
NUMBER

3d

A Feast of
GOOD CHEER

VOL. 22

10th DECEMBER 1932
No. 5497 Registered at the G.P.O. as a Newspaper

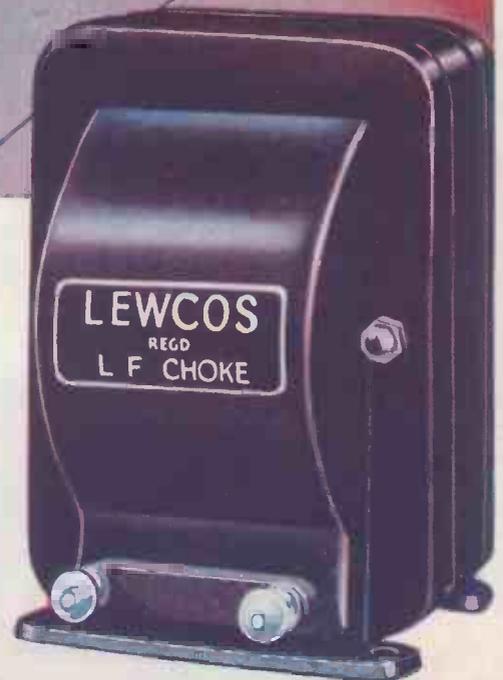


Lewcos
REGD

Radio Components

Fundamentally sound in every sense. Lewcos precision-made components owe their superiority to their creators' long experience as first-class wire manufacturers. All reputable dealers stock and confidently recommend Lewcos components of every type.

Descriptive Literature of the Components you need will be supplied on demand to Radio Publicity Dept. P.



THE LONDON ELECTRIC WIRE COMPANY AND SMITHS, LIMITED, CHURCH ROAD, LEYTON, LONDON, E.10

TREAT YOURSELF TO A CHRISTMAS PRESENT

MAKE A SELECTION FROM THE FOLLOWING

WHATEVER the state of your pocket after seeing to the family presents, this year select one for yourself from the splendid range illustrated on this page.

They vary in price from one to one hundred shillings, and every article will give you utmost satisfaction.

1. PROTECTION FOR YOUR VALVES. (Fuseholder and Fuse) No. F.5. 1/-
2. REPLACE THAT FAULTY SWITCH. (Toggle Quick-Make-and-Break) No. S.102 1/3
3. FOR EVERY MAINS SET USER. (Safety Fuse-plug and Fuses) . . . No. P.27 2/-
4. A WARNING SIGNAL LAMP. (Flush Mounting enclosed) No. D.9 2/6
5. FIT THIS NEW ROTARY SWITCH. (Controls Radio-Gramo and "Off") No. S.110 2/6
6. SIMPLE BUT ADEQUATE PROTECTION. (Double-pole Mains Fuse) No. F.14 2/3
7. WHAT ABOUT A NEW H.F. CHOKE? (Screened, High Inductance) . . . No. H.F.9 3/6
8. DELAY WHICH MEANS SAFETY. (Thermo-Delay Switch) No. S.101 7/6
9. FOR THOSE CHRISTMAS RECORDS. (Compensated Pick-up and Arm) . . . 30/-
10. AN INVALUABLE AID TO CONSTRUCTORS. (Universal Valve Emission Tester) No. V.T.10 35/-
11. NO HOLES OR COUNTERBORING. (Duplex, Mahogany Needlecup) No. N.C.1 2/6
12. TEST UNDER WORKING CONDITIONS. (Split Anode Testing Adapter) . . . No. A.7 2/6
13. SMOOTHING CHOKES FOR ELIMINATORS. (Special 20 H. at 20 m/a, 700 ohms) No. L.F.16 7/6
14. CHANGE YOUR OLD TRANSFORMER. (Transcoupler for purity and volume), No. L.F.10 11/6
15. DISPENSE WITH NUMEROUS KNOBS. (Combined Volume Control and Switch) from 7/6
16. GET THE BEST FROM YOUR SPEAKER. (Combined Filter Choke Unit) No. L.F.25 15/6
17. A SUPERB QUALITY KIT. "Simple Two-Three" (Includes Moving-coil Speaker and Handsome Walnut Cabinet 100/-

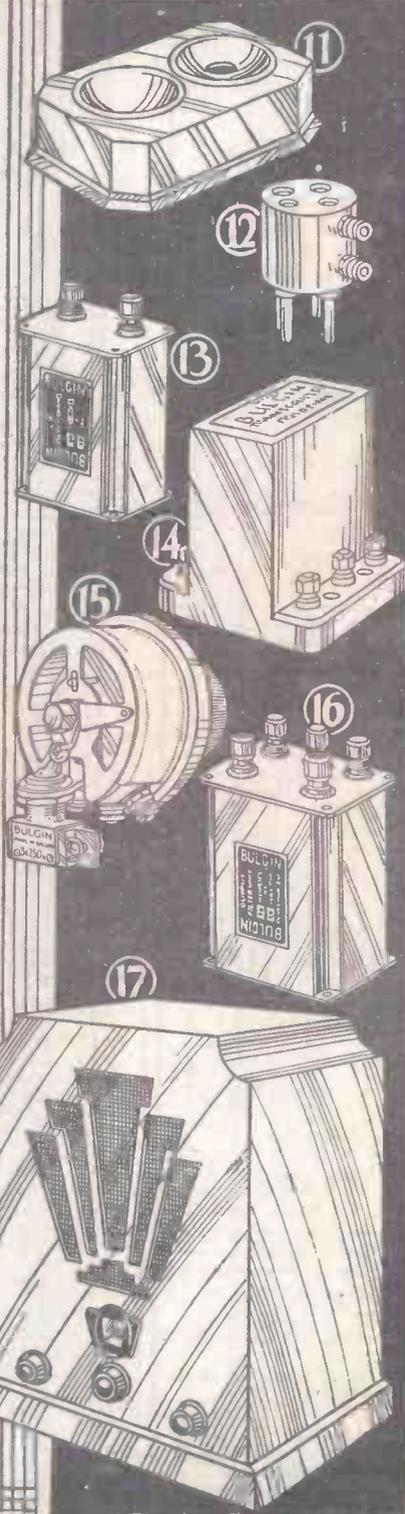
Full wiring instructions, etc., included with every item.

Supplies of these lines are available to all Dealers. In case of difficulty write direct.



SEND FOR 80-PAGE CATALOGUE 'P.'
Enclose 2d. postage.

A. F. BULGIN & CO., LTD.,
ABBAY ROAD, BARKING ESSEX
 Telephone; Grangewood. 3266-7.





PUBLISHED BY
T.C.C. CONDENSER CO

This Book will save you money

WITH electric light in the house—with ample power at your elbow, why use costly and inefficient batteries? From the moment you connect your batteries the power starts to decline—reproduction suffers, and soon—replacement! Get a copy of this book—it will tell you how—if you are on A.C. supply—to cut out battery costs and get better and more powerful radio. There is also an interesting and informative chapter on D.C. apparatus. If you have electric light you need this book.

Ask your Dealer

If you have any difficulty in obtaining a copy of this book, fill in the coupon and post to us with six penny stamps. We will send you a copy by return.

CONTENTS

- RADIO POWER UNITS—and how to build them.
- NOTES ON A.C. POWER UNITS.
- OPERATING RECEIVERS ON D.C. MAINS.
- ABOUT T.C.C. ELECTROLYTIC CONDENSERS.
- ELIMINATION OF INTERFERENCE.
- FOUR T.C.C. POWER UNITS with full constructional Details.
- ROTATING RESISTANCE CALCULATOR.

COUPON

To Publicity Dept., The Telegraph Condenser Co., Ltd., Wales Farm Road, N. Acton, London, W.3

Please send me a copy of your book "The Design and Construction of Radio Power Units," for which I enclose six penny stamps to cover cost and postage.

NAME :-

.....

ADDRESS :-

.....

P.W. 10/12/32.

PLEASE WRITE IN BLOCK LETTERS

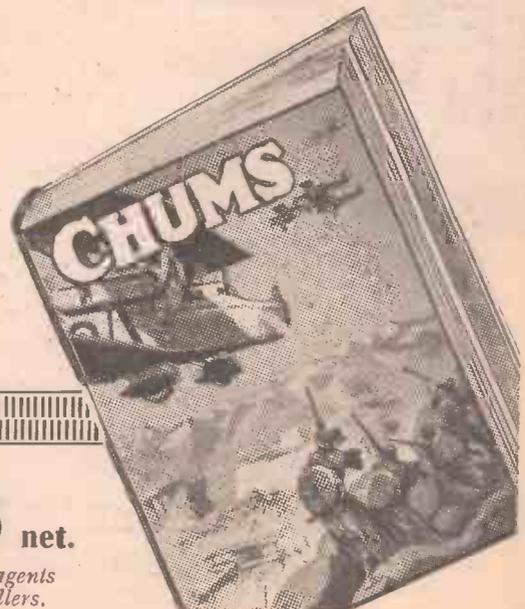
T.C.C.
ALL-BRITISH
CONDENSERS

2003

A REGULAR BOOK for A REGULAR FELLOW!

CHUMS ANNUAL is a regular book for a regular fellow. It contains 832 pages of gripping fiction and articles. And its pictures—there are hundreds of them, and all first-class—so are its beautiful coloured plates. CHUMS ANNUAL is good—boys will never tire of reading it. If you're in doubt what to give this year, the problem is easily solved if you get this splendid gift book.

CHUMS ANNUAL



12/6 net.

At all Newsagents and Booksellers.

RADIO POWER for **1**-NEXT YEAR

The Ideal Gift for a Battery Set



"ATLAS"

*Dear Listener,
A Happy Radio Xmas and
many Prosperous Years are
certain if you insist on
the Expert's Choice.*

THE OLYMPIA BALLOT WINNER

● ● ● An "ATLAS" Unit is the ideal Xmas gift from every point of view—maximum efficiency for your set, better radio for your family and a huge saving for you.

Dry batteries must have cost you at least 50/- this year. Power from the mains the "ATLAS" way will cut running costs to less than a shilling in 1933 and for many years to come.

Ask your dealer for a demonstration now and insist on "ATLAS," the Olympia Ballot Winner. No other can give the same reserve of silent, steady power. Models for every set from 39/6.

CLARKE'S "ATLAS"

MAINS

POST THIS COUPON NOW!

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

Please send me full details of "ATLAS" Mains Units.

Name.....
 Address.....
 30/10/32.....

UNITS

H. CLARKE & CO. (M/CR) LTD.
PATRICROFT, MANCHESTER.

London: Bush House, W.C.2.
Glasgow: G. E. S. Co., Ltd.,
38, Oswald Street.

WEARITE COMPONENTS

A Complete set of standard Wearite Components—made to the highest standard—ensures the most reliable and efficient performance in the construction of your S.T. 400.

WRITE TO-DAY FOR YOUR COPY OF THIS WEARITE BOOKLET NO. P.1.

USE A WEARITE "NO TOOL EARTH" 3/6

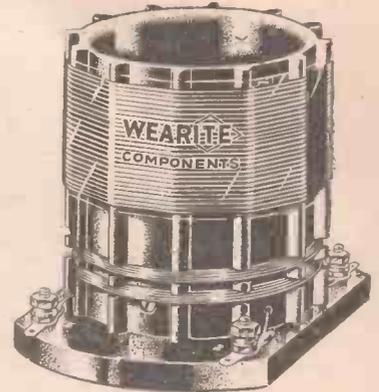
BUILDING THE S.T. 400?

—then get this Book *first!*

A set with the efficiency of the S.T.400 makes critical demands on its components—be sure that they are of proven reliability. When you use a Wearite part you use one made and backed by the first name in Radio components. Remember, too, all Wearite coils are subjected to special H.F. test with apparatus used only by Wearite—all coils are strictly "up to specification," and have been approved by designer.

USE THESE WEARITE PARTS

1 5-pin & 24-pin Valve Holders (S.1)	Price each	1/3
2 2-pt. Switches (G.S.P.)	"	1/-
1 S.G. Choke (H.F.O.)	"	6/6
1 Screened Choke (H.F.P.)	"	3/6
1 Toggle Switch (G.S.S.)	"	4/6
1 3-pole D.T. Switch (1.23)	"	2/3
and 1 S.T.400 Screen (1/9) and Foil (6d.)	Complete	2/3



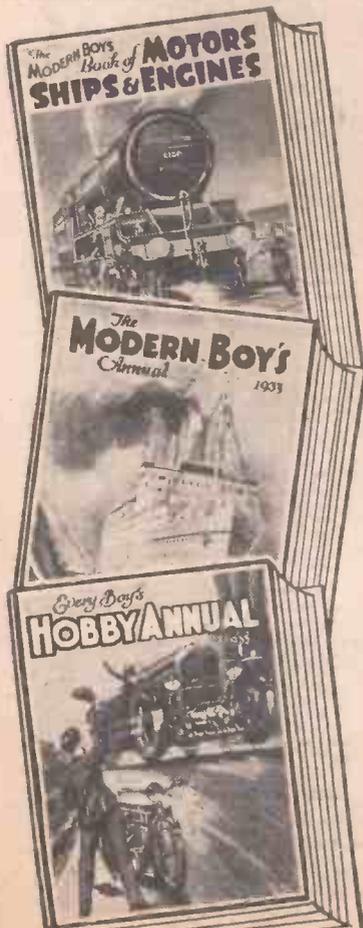
The WEARITE S.T. 400 Coils 9/10 per pair.

HERE IS THE NEW WEARITE "STICK-ON" SELECTIVITY CONTROL AERIAL LEAD IN—it fits any window—no holes—no tools—and can be used with any receiver. Price 1/- Complete with aerial anchoring block 1/6d.



WEARITE

WRIGHT & WEAIRE, LTD., 740, HIGH ROAD, TOTTENHAM, N.17.
Telephone: Tottenham 3847/8,9.



British Books for British Boys!

HOBBY ANNUAL
Price 6/- net

Every Boy's HOBBY ANNUAL is the finest book of its kind ever published. It is packed with brightly written articles on practically every hobby and subject appealing to the boy of to-day. Every boy who is keen on making things and finding out how things work will want this wonderful book. It is profusely illustrated with photographs and drawings that show how in the simplest way. There are also two large folding photogravure plates.

The MODERN BOY'S ANNUAL Price 6/- net

The MODERN BOY'S ANNUAL is packed with up-to-date attractions for all bright boys of all ages. It deals in fascinating and chatty fashion with Aeroplanes, Ships, Railways, Speed-boats and Seaplanes, Motor-cars and Motor-bikes, and other items that every up-to-date fellow wants to know about. There are also hundreds of wonderful photographs and pictures, beautiful coloured plates and three complete adventure stories. Get your copy to-day.

The MODERN BOY'S BOOK OF Motors, Ships & Engines
Price 7/6 net

A team of experts have written the intensely interesting articles, full of the romance of man's Mastery of Speed on Land and Water, which appear in the MODERN BOY'S BOOK OF MOTORS, SHIPS AND ENGINES. This magnificent NEW book is crowded with hundreds of fascinating pictures and well-written articles which tell of great achievements in things mechanical. It also contains four coloured plates.

On Sale at all Newsagents and Booksellers

NEW "SQUARE PEAK" SUPERHET

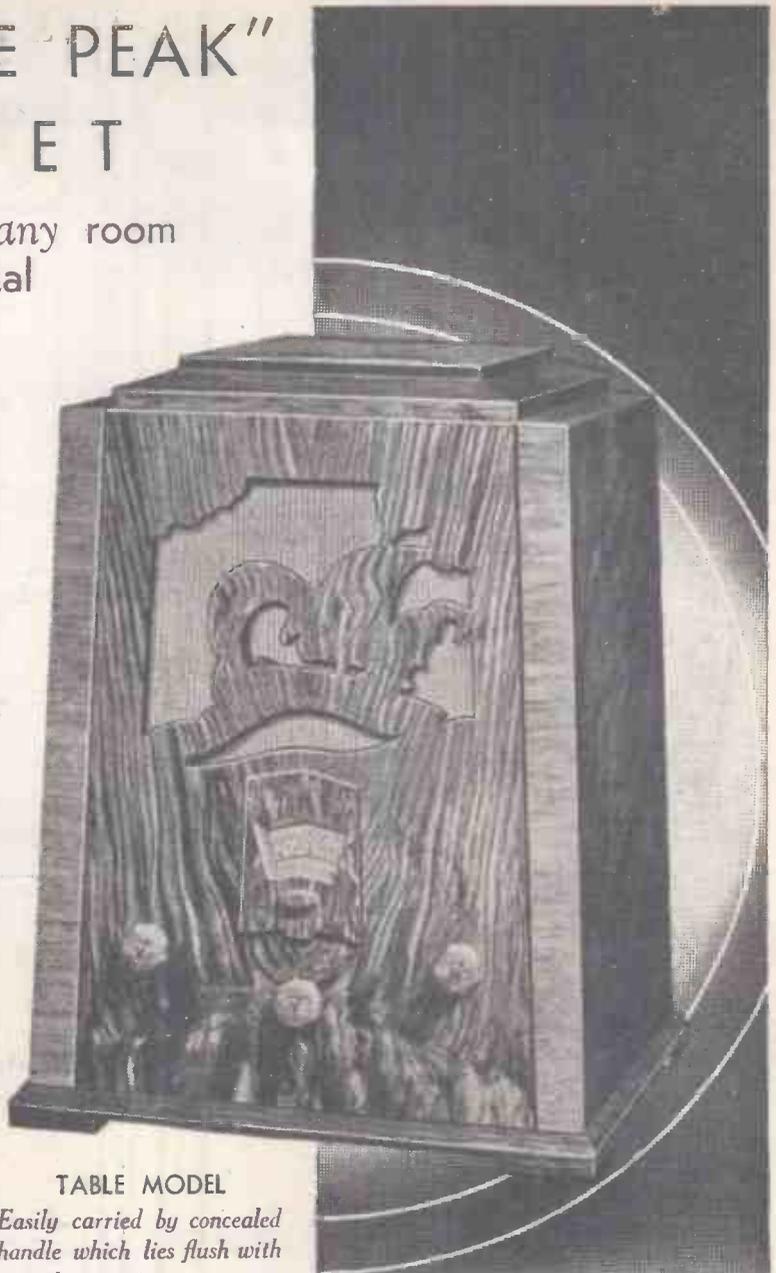
You may use it in *any* room
without external aerial

SELECTIVITY . . . day by day the need grows greater. Secure it in a Varley Superhet.

Knife-edge selectivity, fine quality and single knob control. Station after station clearly heard on the built-in moving-coil speakers. Radio in every room! For the local station just connect the set to any lighting socket and plug in the handy little "portable" aerial supplied.

Write for FREE art booklet and address of nearest dealer. He will gladly demonstrate Varley.

● For use with external aerial or with handy portable aerial supplied. Five valves and rectifier. VARIABLE-MU H.F. AND INTERMEDIATE FREQUENCY STAGES. Six tuned circuits with SINGLE CONTROL TUNING (remaining knobs on front are volume and mains switch). BAND-PASS INTERMEDIATE FREQUENCY COUPLING, giving great selectivity. ILLUMINATED SCALES marked with STATION NAMES as well as wavelengths. SEPARATE SCALES for the two wavebands. Operation of wave-change switch automatically discloses the correct scale (long or medium). TONE-BALANCED L.F. amplifier. Energised MOVING-COIL SPEAKER. Provision for using an external speaker in place of, or in addition to, the M.C. speaker. SOCKETS FOR GRAMOPHONE PICK-UP. Beautifully finished BURR WALNUT CABINETS. For A.C. supplies only, 200/250 volts, 40/100 cycles (25-cycle models, 1 guinea extra). Available on H.P. TERMS.



CONSOLE

Chassis as Table Model, but with moving-coil speaker of even more powerful type. No external controls on front or sides.

Undistorted Output 2,250 milliwatts. Current Consumption, 60 wats. Dimensions, 35 in. high by 15 in. deep by 20 in. wide. Model AP44. **35 Gns.**

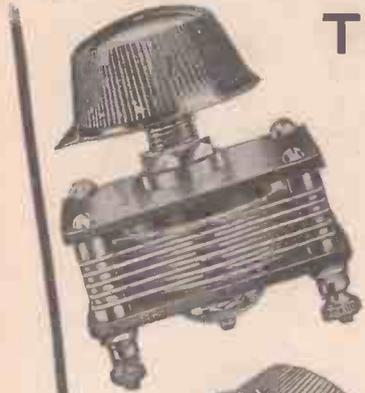
TABLE MODEL

Easily carried by concealed handle which lies flush with top when not in use.

Undistorted Output, 1,600 milliwatts. Current Consumption, 60 wats. Dimensions, 16½ in. high by 12 in. deep by 13 in. wide. Model AP38. **26 Gns.**



BUILD AN S.T. 400 THIS XMAS



J. B. DIFFERENTIAL.
·0003, 4/6. ·0001, 4/-.
Insulated centre spindle. Bakelite dielectric between vanes



J. B. MIDGET.
·00004. Complete as illustrated, 4/-
Small dimensions. Low minimum capacity. Ebonite insulation. Rigid one-piece frame



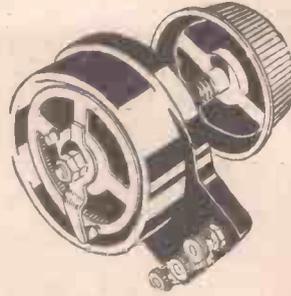
J.L.4 CONDENSER
Slow-motion type (35/1).
Capacity, ·0005. Complete with 3" dial, 7/6. Extra heavy gauge vanes. Rigid nickel-plated frame. High-grade ebonite insulation.

Ask
to
see
them
at
your
dealer's



Advertisement of Jackson Bros. (London Ltd.), 72, St. Thomas' Street, London, S.E.1. Telephone: 110p 1837.

YEAR AFTER YEAR IT GIVES UNFAILING SERVICE



SOVEREIGN VOLUME CONTROL

In all values from 50,000 ohms to 4/6 2 megohms

DESIGNED and manufactured by experts from first quality materials, the Sovereign Volume Control will give you years of unfailing service. Its patented construction ensures smooth silent action all round the resistance. A bakelite dust-and-damp proof cover (not shown here) protects the spring diaphragm contact. The Sovereign Volume Control is sold complete with bakelite pointer-knob and protecting cover and is obtainable from all dealers. To assure satisfaction—fit Sovereign.

BUILD THE SOVEREIGN SKYHAWK

If you wish to see how simple and cheap the Sovereign Skyhawk S.G.3 is to build, send us your name and address (Dept. 1012) and we will forward you the Blueprint (No. 8) & Sovereign Components Catalogue

FREE

SOVEREIGN PRODUCTS LTD. Sovereign House, Rosebery Avenue, E.C.1

The "LANGMORE" No. G.10

The "Langmore" Radio-Gramophone Cabinet G10 is well and attractively constructed in all oak and will house most sets, giving ample accommodation for tone arm, turntable, pick-up, motor, etc. wireless set, speaker and batteries.

Size Overall: 3 ft. 7 in. high, 21½ in. wide, 16 in. deep.

Gramophone Compartment: 4½ in. high, 19 in. wide, 14 in. deep.

Set Compartment: 12 in. high, 18 in. wide, 14 in. deep.

Speaker Compartment: 18 in. high, 18 in. wide, 14 in. deep.

The back is enclosed by double doors, so that all parts are easily accessible, and all are fitted with hinged lid and stay, motor board, baseboard, etc. In oak, beautifully finished medium shade, with overlay finished slightly lighter shade.

Beautifully Finished Jacobean Oak.

New Illustrated Catalogue Free.

THE MISCELLANEOUS TRADING CO., LTD.

13 & 17, NEW OXFORD ST., London, W.C.1.

Phone: Holborn 4894. Trade Enquiries Invited



Cost paid in Gt. Britain. **55/- Each**

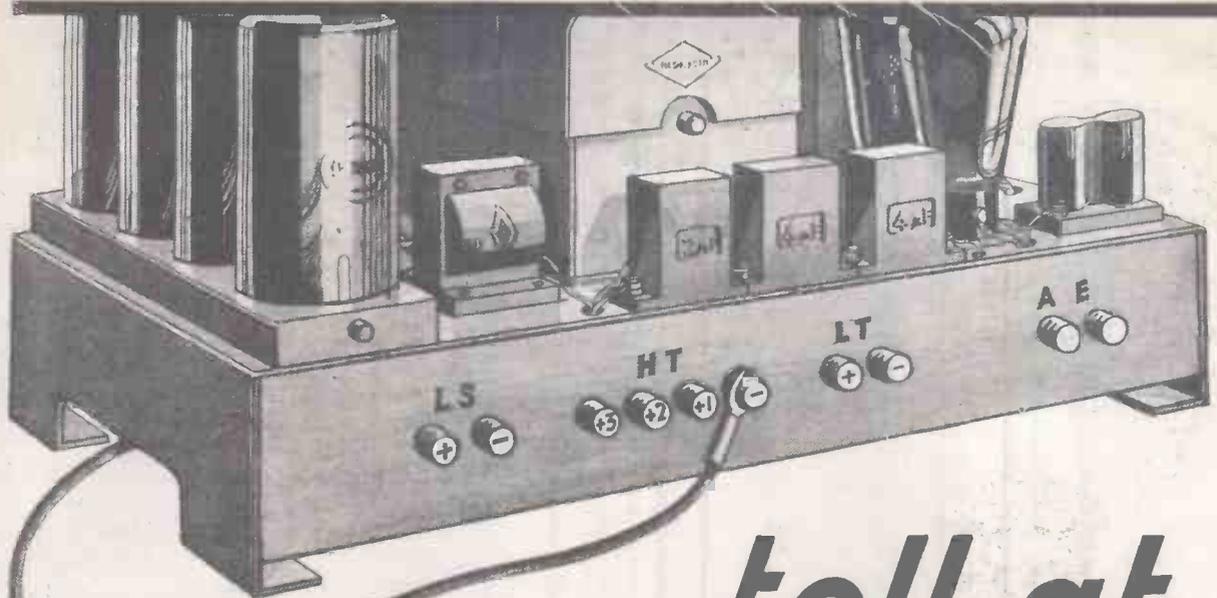
The Paper for the Boy of To-day!

Such is MODERN BOY. Its every issue is brimful of thrilling stories and articles on the very latest Invention, Adventure, Hobbies, etc. It is the paper for the youth of to-day Buy it regularly.

MODERN BOY

Every Saturday . . . 2D.

WHAT'S THE TROUBLE?



.. tell at a glance!

When trouble occurs—go over your set with an “All-in-One” Radiometer and quickly trace the true source of any fault.

Wherever it may be—circuit, valves, batteries, transformer, or other components—an “All-in-One” Radiometer gets to the root of the matter and registers it at once.

There is no other instrument like it—it is as essential to the radio user as a stethoscope is to the doctor. Ask to see it demonstrated at your radio dealer’s or electrician’s. If any difficulty, send P.O. to:

PIFCO LTD., High St., MANCHESTER
or Gray House, 150, Charing Cross Rd., London W.C.2

Standard Model “All-in-One” Radiometer for Battery Sets only, as shown here.

Price **12/6**

De Luxe Model, for Electric Receivers, Mains Units, and Battery Sets.

Price **£2:2:0**



PIFCO
ALL IN ONE
RADIOMETER

CHRISTMAS 1932-3-4?



GIVE your set a lasting gift this Christmas. Convert it to A.C. Mains operation by giving it a rectifier that will provide an unending and constant high tension supply; one that will enable your set to give of its best throughout its whole life.

GIVE IT A

WESTINGHOUSE 

METAL RECTIFIER

and enjoy better reception and reproduction now and for many years to come. Full details of Westinghouse Metal Rectifiers—the only rectifiers to remove the worry of periodical renewal—are contained in "THE ALL-METAL WAY, 1933."

THE WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD., 82 York Road, King's Cross, London, N.1

POST THIS COUPON TODAY!

WESTINGHOUSE PUBLICITY
82 York Road, King's Cross, London, N.1
Please send me "The All-Metal Way, 1933," containing full particulars of Westinghouse Metal Rectifiers, and telling me how to convert my existing set to METAL rectification.

Name.....

Address.....

P.W.10.12.32

PETO-SCOTT RADIO BY MAIL

ORDER YOUR XMAS RADIO NOW

TELSEN JUPITER S.G.3. Complete Kit as advertised less Valves and Cabinet. Cash Price, Carriage Paid **£3/17/0.** Balance in 11 monthly payments of 7/- only. Send **7/-** only

READY RADIO "METEOR" S.G.3. Three-valve Screened-grid Receiver with Valves, Cabinet and Permanent Magnet Moving-Coil Speaker. Tunes in short, medium and long waves without coil changing. Cash Price, Carriage Paid **£8/17/6.** Balance in 11 monthly payments of 16/3 only. Send **16/3** only

ATLAS ELIMINATOR. Type A.C.244. Three tappings. S.G., detector and power. Output: 120 volts at 20 m/a. Cash Price **£2/19/6.** Carriage Paid. Balance in 11 monthly payments of 5/6 only. Send **5/6** only

BLUE SPOT SPEAKER UNIT AND CHASSIS. Type 100U. Cash Price **£1/12/6.** Carriage Paid. Balance in 6 monthly payments of 5/2 only. Send **5/2** only

BLUE SPOT UNIT AND CHASSIS, Type 99P.M. Including matched transformer. Cash Price **£2/19/6.** Carriage Paid. Balance in 11 monthly payments of 5/6 only. Send **5/6** only

R & A "VICTOR" PERMANENT-MAGNET MOVING-COIL SPEAKER DE LUXE. With 6-ratio input transformer and protecting grille. Cash Price **£3/10/0.** Carriage Paid. Balance in 11 monthly payments of 6/5 only. Send **6/5** only

R & A CHALLENGER PERMANENT-MAGNET MOVING-COIL SPEAKER. With special Ferranti multi-ratio input transformer. Cash Price **£1/15/0.** Carriage Paid. Balance in 5 monthly payments of 6/6 only. Send **6/6** only

CELESTION P.P.M. PERMANENT-MAGNET MOVING-COIL SPEAKER. With impregnated diaphragm and dual impedance input transformer. Cash Price **£2/7/6.** Carriage Paid. Balance in 11 monthly payments of 4/6 only. Send **4/6** only

GARRARD JUNIOR "B" SPRING MOTOR. Complete with turntable. Cash Price **£1/13/0.** Carriage Paid. Balance in 5 monthly payments of 6/1 only. Send **6/1** only

ULTRA 1933 TIGER

A.C. or D.C. Mains. S.G., S.G. Detector and Pentode Moving-Coil Speaker. Complete with Mazda Valves. Ready for use. Cash Price, Carriage Paid **£15/15/0.** Balance in 17 monthly payments of 20/- only. Delivered Carriage Paid on first payment of **20/-**

LISSEN S.G.3 PENTODE BATTERY SET. In Walnut Cabinet complete with Speaker, Valves and all necessary Batteries. Wavelength calibrated. Cash Price, Carriage Paid **£8/17/6.** Balance in 14 monthly payments of 13/4 only. Send **13/4** only

PYE "G" 3-valve with Band-pass Tuning. Variable-Mu, Power-grid and Pentode. Complete ready to play, with Moving-coil Speaker. Walnut Cabinet. Cash Price, Carriage Paid, **£18/18/0.** Balance in 17 monthly payments of 24/3 only. Send **24/3** only

FIRESIDE CONSOLETTA
As described this week.
CASH or C.O.D. Carriage Paid.
£5 - 17 - 0
or 12 monthly payments of 10/8.

KIT "A"
Author's Kit of specified parts, but less valves, cabinet and panel.

KIT "B"
As Kit "A" but with valves, less cabinet. CASH or C.O.D. Carriage Paid. **£7-19-6** or 12 monthly payments of 14/7.

KIT "C"
As Kit "A" but with valves and Camco 'Embassy' Cabinet. CASH or C.O.D. Carriage Paid. **£9-17-6** or 12 monthly payments of 18/1.

3 Specified Valves **£2-2-6.** Camco Cabinet in Oak, including 3/- for drilling, 38/-.

SLEKTUN SCOUT S.G.3. S.G., Detector and Power, less Valves and Cabinet. Cash or C.O.D. Carriage Paid **£3/19/6.** Balance in 11 monthly payments of 7/3 only. Send **7/3** only

Radio for the Million. STATION MASTER THREE. Model B Battery Type. With 3 Valves. Speaker in attractive Cabinet. Cash or C.O.D. Carriage Paid **£7/10/0.** Balance in 11 monthly payments of 14/- only. Send **10/-** only

W. B. PERMANENT - MAGNET MOVING-COIL SPEAKER. Type PM4. Complete with transformer. Cash Price **£2/2/0.** Carriage Paid. Balance in 7 monthly payments of 5/9 only. Send **5/9** only

THIS YEAR'S WINNER LISSEN "SKYSCRAPER" S.G.3 COMPLETE WITH VALVES

CHASSIS KIT

Chassis Model with (Lissen) S.G., Detector and Pentode Valves. Cash Price, carriage paid **£4.9.6.**

Delivered, carriage paid on first payment of **8/3**

Balance in 11 monthly payments of 8/3.

CABINET KIT

With Lissen Valves, Walnut Cabinet and special balanced-armature Loudspeaker. Cash Price, carriage paid **£6.5.0.**

Delivered carriage paid on first payment of **11/6**

Balance in 11 monthly payments of 11/6.

ONLY FROM PETO-SCOTT ON GENEROUS EASY TERMS

Carriage paid to your door

AERODYNE SCREENED GRID 3. With Variable-Mu. Complete and ready to play with Valves, Batteries and Accumulator with Moving-Coil Speaker. Cash Price, Carriage Paid **£9/9/0.** Balance in 14 monthly payments of 14/3 only. Send **14/3** only

AERODYNE ALL-MAINS VARIABLE-MU S.G. 3. Complete and ready to play, with Moving-Coil Speaker. Cash Price, Carriage Paid **£15/15/0.** Balance in 17 monthly payments of 20/- only. Send **20/-** only

IMPORTANT.

Parts, Kits, Miscellaneous Components, Finished Receivers or Accessories for CASH, C.O.D. or H.P. on our own system of Easy Payments. Send us a list of your wants. We will quote you by return. C.O.D. orders value over 10/- sent carriage and post charges paid.

PETO-SCOTT CO. LTD. 77, CITY ROAD, LONDON, E.C.1

Telephone: Clerkenwell 9406-7
West End Showrooms: 62 High Holborn, London, W.C.1 Telephone: Holborn 3248
Dear Sirs, Please send me CASH/C.O.D./H.P. for which I enclose f.....s.....d. CASH/H.P. Deposit. Also send your FREE 1933 Radio Catalogue.

NAME

ADDRESS

P.W. 10/12/32.....

STRICT PRIVACY GUARANTEED — WE DEAL WITH YOU DIRECT

The UNIFORMITY

which ensures **BETTER
RADIO
RECEPTION**

Purer tone—greater
volume—more stations

MADE with the precision of
a watch accurate
. . . . exact valves
. . . . Cossor Valves hun-
dreds tens of thousands
. . . . each the exact counter-
part of its original design
unvarying : made with
hairline accuracy uniform
. . . . made so that the Cossor
Valve you buy is the valve *your*
Set needs suits if
coaxes from it Better Radio
Reception better all-round
performance Cossor.

Send for a free copy of the
40-page Cossor Valve and
Wireless Book which contains
a wealth of interesting and
useful information including
Radio Definitions — Useful
Circuits — List of Stations,
etc., etc. Please use the
Coupon.



COSSOR VALVES

To A. C. COSSOR LTD., Melody Department,
Highbury Grove, London, N 5.

Please send me, free of charge, a copy of
the 40-page Cossor Valve and Wireless Book
B.17.

Name

Address

P.W.10/12/32.

A. C. COSSOR LTD., Highbury Grove, London, N.5. Depots at Birmingham, Bristol, Glasgow, Leeds,
Liverpool, Manchester, Newcastle, Sheffield, Belfast and Dublin.



Scientific Adviser:
 Sir OLIVER LODGE, F.R.S.
 Chief Radio Consultant:
 CAPT. P. P. ECKERSLEY, M.I.E.E.
 Editor: NORMAN EDWARDS.
 Technical Editor: G. V. DOWDING, Associate I.E.E.

A HAPPY XMAS
 ENQUIRE WITHIN
 POTTED PROGRAMMES
 EMPIRE LEAD

RADIO NOTES & NEWS

SHORT WAVES, INDEED!
 RADIO SERVICE
 THAT TENTH BIRTHDAY
 MORE HOWLERS

"Ariel's" Greetings.

WELL, here we are again with a fine big Christmas Number, and the festive season just coming round the corner. Once again it is my privilege to wish you, one and all, the season's greetings.

And I do it with a goodwill and gusto unimpaired by the fact that as I write these words November has only just left me—the treacherous jade—and left me with a cold, at that! But whatever the weather, it warms the inmost cockles of my heart to greet all you boys once again, wherever you are, to wish you joy, to raise the convivial cup and slap down on paper that good old greeting—a Happy Christmas!

A Short-Wave Christmas.

FROM signs and portents apparent not only within my own family circle, but in the world outside, this is going to be a short-wave Christmas. In the Empire overseas there will be a demand for sets capable of receiving the new B.B.C. Empire Service, whilst at home boys are demanding compact sets to take back to school.

A great body of listeners to whom distance lends enchantment is forsaking the well-trodden ether of home and Europe for exploration of the world's holes, corners and back blocks. More cycles to 'em!

The Boy and the B.B.C.

HAVING mentioned schoolboys I am reminded that a young friend of mine recently showed me his essay on "Ten Years of Broadcasting," in which I noted the following gem.

"At first broadcasters howled and Captain Eckersley asked them not to do it. The B.B.C. was then formed."

Another nutty little bit I recall was:

"In the early days there was much music and songs, and only a few people listened on crystal sets, but later there began vordavil and five million lissenzes sprang up." "Sprang up" is good. I understand now why "The Rustle of Spring" so frequently appears in the programmes.

"Enquire Within" for Radio.

I AM still lost in admiration for the big book which our technical fellows have produced, the "Complete Handbook of Practical Radio." This eighty-four page book of close but businesslike print certainly contains more sound practical information to the acre than any seven-and-sixpenny full-dress treatise on radio which has come before me, and I specially recommend to the beginner Mr. Dowding's article, "How Your Set Works," which has the cleverest illustrations imaginable and gives you the essential secrets of radio reception without formulae or tears.

You may still be able to get a copy if you are lucky, and have sixpence and a friendly newsagent.

Potted Programmes for Empire.

SO the emissary of the new Empire Broadcasting Department of the B.B.C. is off on his tour of the Empire with his luggage full of sample records of English programmes. The intention is that broadcasting concerns shall purchase these records and so be able to give their listeners a genuine show from the Old Country.

As to the taste, judgment and tact with which the records have been compiled I can say nothing; I hope for the best. But I am slightly uneasy about the price.

I don't know what terms are to be offered, but I do know something about the B.B.C. and, moreover, I know that overseas British broadcasting people are none too opulent. Let us hope that B.B.C. missionary zeal will not be tempered with too searching a tincture of commercialism.

Marine Radio de Luxe.

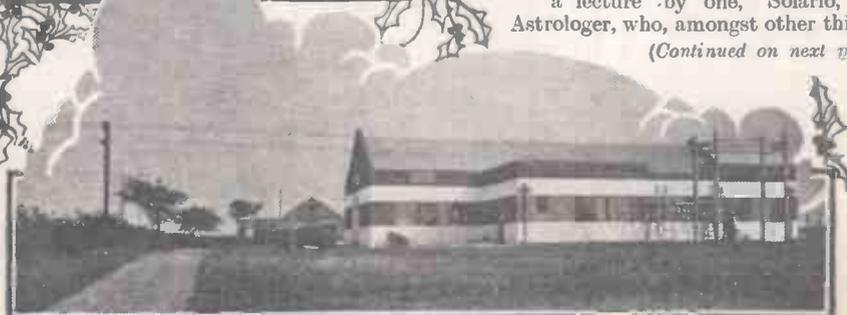
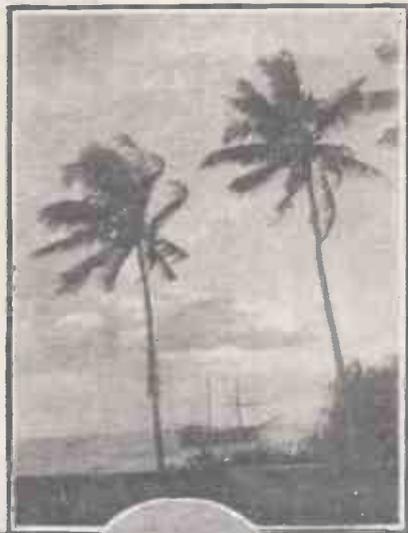
THE good ship "Rex," that great Italian liner which had such poor luck on her maiden trip, has the most wonderful radio equipment ever placed aboard the lugger. The radio on her occupies more space than on any other passenger ship afloat.

Three lifts carry passengers to its portals from the various decks, where seven radio men await their pleasure. There are seven transmitters, each with the necessary receiving gear, four of them being lifeboat sets. The wireless telephony apparatus is similar to that carried by Marconi's yacht, "Elettra." Call-letters I C E J. Heard her?

Wireless and the Solar System.

I HAVE been reading with unmitigated astonishment a report of a lecture by one, Solario, an Astrologer, who, amongst other things,

(Continued on next page.)



THE EMPIRE STATION STARTS.

The full Empire broadcasting programmes start on December 19th from their modernistic low-built home at Daventry to the most distant shores of the world.

ARIEL'S RUNNING COMMENTARY ON RADIO (continued)

stated that the moon transmits material, mental and spiritual influences. The moon and the planet Mercury, he is alleged to have said, are relay stations between the sun and other planets.

Well, I should like to know what, in the light of what Sir James Jeans has told us of the composition and state of the sun, are the mental and spiritual influences it can broadcast, and what the moon, a dead world, can relay.

Empire Lead.

NOT the lead on which you put the dog for a walk in the park, but the lead of which were made the bullets of the "little man who had a little gun." I understand that under the auspices of the chief producers of Empire lead a private million-pound company is to be formed for the manufacture of accumulators. I do not know whether



there is room for such a large concern, but more power to them if they make employment for some of us.

Short-Waves Indeed.

IT is expected that early next spring a micro-ray service will be in operation between Lympne and St. Inglevert, near Calais. Operating on a wavelength of about 15 centimetres, this circuit is to be used for announcing the arrival and departure of aeroplanes which have no radio.

The aerials used for these tiny waves will be less than an inch long. Teleprinters will be incorporated in the circuit and will record the messages in the absence of the operator.

Radio Service.

ONE reason why the radio business is so healthy is that it is manned by a push of young, energetic and brainy chaps who believe in going out after business. The best idea which I have lately heard of is to get hold of people who are moving into houses on new estates and to offer to install the wireless set in the new house. This aims at securing the



battery charging business of the mover, plus odd supplies and repairs, goodwill, and possibly the sale of a new receiver.

For the credit of our butcher I feel bound to say that when I moved into my house, years ago, from a district five miles away, he had got my name and new address, and sent along a dish of chops, ready-cooked, just when we needed them most, at the end of a perfect (moving) day.

The Tenth Anniversary.

THE B.B.C.'s Birthday Week was a mighty fine bit of work. Somebody must have slogged to think it up and put it over. Congratulations poured in upon the Corporation from other broad-

casting companies and administrations, and as I have read a number of the telegrams I am in a position to say that the B.B.C. is acknowledged as the mother of European broadcasting and appears to be regarded as a model.

Incidentally, no one has pointed out that the present B.B.C. is not really ten years old, although British broadcasting is. Officially, broadcasting was put "on the map" by the Rt. Hon. F. G. Kellaway, P.C., who was P.M.G. in 1922, and the prime mover on the commercial side was the late Mr. Godfrey C. Isaacs.

News from Africa.

E. J. S. (Port Harcourt). I hope I have your initials aright. Anyhow, I have your letter, which is just the sort I like to get from you chaps overseas. It makes me go "all Trader Horn."

As to short waves, you cannot beat the "Amateur Call-Book," obtainable from Mr. F. T. Carter, Flat A, Glenagle Mansions, S.W.16, London, to whom I advise you to write. He is awfully matey.

SHORT WAVES.

Professor Nassau says it is his belief that the moon interferes with American wireless. We shouldn't have thought it would have dared.—"Punch."

"A sharp nose indicates curiosity," says a critic. Strangely enough, flat ears also indicate too much "listening-in."

Our own view is that in attempting to get "idyl" pronounced "iddle," the B.B.C. are simply iddling their time.

Wireless Programme. 6 p.m. Miss Miss O— (soprano). Thanks for the tip, we will.

An American millionaire says his mission in life is to do one good turn a day. The B.B.C. might follow this example.

"Some of these valves contain two LAMENTS, thereby making it possible to get every European station for a price of £4 17s.0d. wholesale," we read in an advertisement. Crying for more Continents to conquer, we suppose.

"Really, Herbert, you'll have to do something about Peter's naughtiness. Nurse has had to send him to bed early as a punishment—and now the wireless has gone wrong and we shan't be able to get him down to put it right!"—"Punch."

Before Christmas Day the new B.B.C. Empire station should open up and I hope that you will receive it unfadingly. Let me know. Love to the lions, if any. I will exchange 90 Kentish rats for one lion, with or without skin.

Mr. Percy Pitt.

THE sudden death of Mr. Percy Pitt (on Nov. 23rd) came as a shock to his many friends, personal and radio, who knew how fully and intensely he had lived. He was a successful composer and conductor—he conducted the broadcast of "The Creation" during the B.B.C.'s Birthday Week—and organist, and was music-director of the B.B.C. for five years.

Fine man and genial soul, his removal is a great loss to music and his wide circle. "P.W." respectfully tenders its condolences to his bereaved family.

Christmas Features.

AS a foretaste of Christmas fare I may say that our Christmas Morning service will be conducted by the Rev. Pat McCormick, D.S.O. In the afternoon there will be an Empire programme, and in the evening a concert relayed from Torquay. Other items include the Grenadier Guards Band, Grieg's music, John Coates a'singing, and Evensong from Winchester Cathedral.

Negro Spirituals Unlimited?

I HEAR tell of a project which is on foot in the U.S.A. to build a broadcasting station destined especially for the negro population. So far as dis chile is concerned, sar, all the Negro Spiritualisers I have ever heard are heartily welcome to sign contracts in perpetuity with the new station. Yes, massa!



I presume that there will be lots and lots of talks about chickens, melons and rye whisky, not to mention Brer Rabbit!

A Glaring Omission.

I OBSERVED that in its Birthday Week item, "Communications," the B.B.C. made not the slightest reference to cable and "Beam" wireless communications, which are much more important to the world than wireless telephone calls at £2 a minute. The "Beam" wireless system was developed within the past decade and is now used to connect Britain with India, Canada, Australia, and South Africa.

Cables which are fitted with the "regenerator" can flash signals as far as Australia in less than a second. 'Twas a grievous omission, I think.

More "Howlers"?

GOOD lad, F. P. (Liverpool). He sends me some more genuine "howlers."

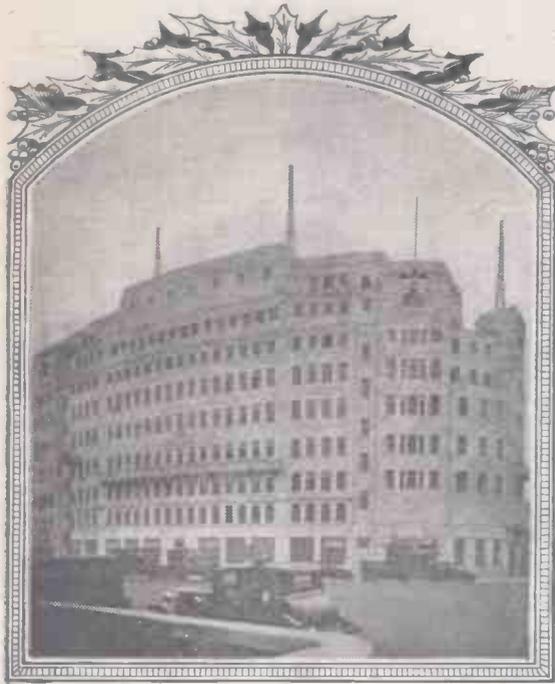
Well, not "howlers" such as school-boys produce, but good jokes all the same.

One fellow, on being asked if he got America, replied that he didn't go out for distant stations "because they don't half use the H.T.!"

Another said that he had "a selective pick-up and a grid condenser with a grid leak accompaniment."

Then, what of the chap who on being asked whether his set oscillated, said, "Oscillate? Why, I dare not take my hands from the dials." Will some other readers oblige with some "human documents" like these, please? **ARIEL.**





THE "D-G's"

CHRISTMAS BROADCAST

by SIR JOHN REITH

It is no easy matter being the Director-General of the B.B.C., but Sir John has found time to pen for "P.W." an article that is packed with good-humoured observation, and with interesting reminiscences of the birth of British Broadcasting.

TEN years! Well, we are ten years older at any rate. Wiser, I hope. More experienced, and, as for myself, experienced in directions which I certainly never contemplated.

Subsequent Directors-General, assuming that they retain that somewhat grandiose title, arc, I imagine, in some respects to be envied. In some respects no one with any sense would ever envy the occupant of such a position. But one thing they have surely missed, quite unconscious of having missed it though they will be, is the astonishing and absorbing interests and excitements of the first ten years.

Inspiration—or incubus?

I wonder how, if they think of us at all, they will feel. Will they vilify us, do you imagine, for all sorts of precedents which they regard as unfortunate? Or for not creating more precedents?

Shall we be an inspiration to them or an incubus? I don't know, and, to be quite frank, I don't very much mind.

Don't misunderstand me. Of course, in a sense I do care, and very greatly too. What I mean is that I have a sort of a feeling that we have done not only our best, but on the whole and all things considered and so on and so forth, not so terribly badly. Not complacent, that. Not by any manner of means.

The First Meeting.

Perhaps the ten years have been pretty hard—and I'm sure I ought in justice to myself to mention that I'm writing *very* late at night, so late in fact that it isn't night at all. And you will make allowance for that.

Anyhow, my point is that if these later D.G.'s do make faces, perhaps it may be as much their own fault as the fault of any of the pioneers.

What do you think of it all, Mr. Editor? I remember our first meeting. All sorts of funny people I found myself meeting. One's engagement book certainly showed a comprehensive cross-section of the popula-



SIR JOHN REITH, Director-General of the B.B.C

tion. Not that you were funny. Not in the least. And you saw nothing funny in "The Radio Times" when that came along. (Please don't think I am dragging in a free advertisement for our publication.)

But it really was rather funny to interview singers and solicitors, actors and artisans, editors and engineers, clergymen

and clowns, one after the other: deputations and individuals, mostly beetle-browed, almost always wanting what I didn't want or not wanting what I did.

What a day, I would say. But the next was just the same; and all was part of the game.

Armistice Day, you know. That's always a landmark—milestone rather. Every year when Armistice Day fell on a weekday, I used to go to a certain window in my room at Savoy Hill, at about five minutes before the hour, open it and stand there till the Silence was over.

Romantic River.

And always the last thing on December 31st I used to go through the performance—look out over the Embankment with its flashing lights mirrored mistily in the (usually wet) pavements and roadway; over the dark rather sinister, but romantic river: the intriguing little vessels moving up and down, their lights reflected in the water. Another year gone.

I remember especially December 31st, 1926, when the old Company died and the Corporation was born. How thankful I was that the B.B.C. was, like the river and the scene, unchanged.

Melodious Whistle.

I miss the river at Broadcasting House, you know. There's nothing to look out at now. And if I were less controlled than I am, every article of convenient size and of adequate weight would long since have been hurled at those monstrous people who race and roar their infernal engines round our premises and wake, as it would seem, the furthest recesses of Regent's Park with their infuriating horns. To exchange the dignified, melodious whistle of the river tugs for that!

Reverting to the subject of pioneers, there are some B.B.C. ones who are in danger of being forgotten. There is nothing

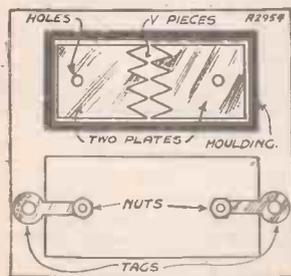
(Continued on next page.)

MAKE THEM YOURSELF

A lightning-arrester and a microphone which anyone can construct at home.

WITH a few alterations, an old fixed condenser can quite easily be converted into an efficient lightning-arrester so compact that when completed it can be neatly incorporated on the terminal strip between the aerial and earth terminals of the receiver.

The inside of the condenser to be used must be carefully dismantled, and the useful parts required, including the pitch filling, mica sheet, moulding, two plates, and bolts, put in readiness on one side.



The foil plates should be placed one on top of the other, and with a pair of scissors, cut in two halves—the pair with the holes being retained, out of which small V pieces are cut, as shown in the accompanying diagram.

When this is accomplished the lightning-arrester is ready for assembling. The two plates are placed into the moulding, one on either side, in such a way that the holes are directly over the holes of the moulding, and the mica dielectric sheet then placed over the two plates.

Fixing Tags.

Before proceeding any further, small tags for fixing should be cut from a piece of copper foil, or any good conducting material. A piece of connecting wire shaped with a pair of pliers is quite suitable.

With these on hand the bolts are passed through the respective holes of the mica,

unusual about that. It is a common fate among pioneers, and deplorable. We should remember the proverb which bids us not to forget those who went first, even though those who came later went further.

It is not Burrows nor Lewis nor Eckersley, nor any of the early B.B.C. staff, whom I have in mind at the moment. Not actually a B.B.C. pioneer at all, but a pre-B.B.C. one. The late Mr. Godfrey Isaacs, head of the Marconi Company, said on one occasion that he doubted whether there would ever have been just one B.B.C., had it not been Sir William Noble.

Now, we have no means of knowing for certain whether that is literally true or not, but we can be satisfied that it is sufficiently near the truth to cause us to remember Sir William Noble with gratitude. It was a long and somewhat acrimonious business, getting the manufacturers to agree to unite, to pool their patents, and to sponsor financially one broadcasting company.

Several of them wanted to broadcast independently. Then there were coalitions into two groups and for a time it seemed almost inevitable that there would be two. Then it was that Sir William Noble made his biggest contribution, and what the Post-

plates, and moulding from the inside—the tags being fitted from the outside, and screwed firmly into position by means of nuts. Care should be taken that the teeth of the two plates are parted by about the thickness of a visiting card.

To complete this little device, the pitch is melted, poured into the moulding over the mica and allowed to set. A.W.Y.

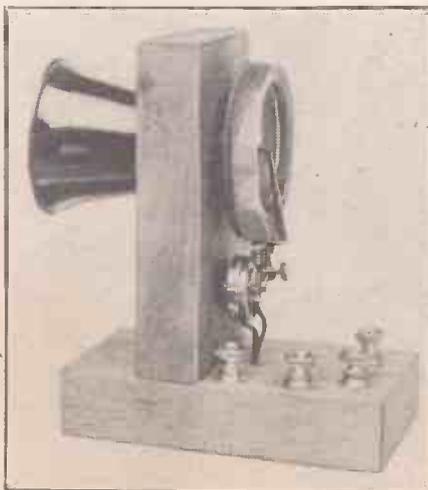
YOU can make an excellent transmitting microphone for general all-round working purposes by carrying out the following plan.

Obtain an old gramophone sound-box of either the metal or the mica diaphragm type. Procure, also, one of those small microphone buttons which are generally to be had for about sixpence or so apiece.

Now assemble these articles together, as shown in the accompanying photograph.

Here you will see that a wooden upright is drilled in the wooden upright to accommodate the neck of the sound-box which is simply wedged into the hole. On the

READY FOR ANNOUNCEMENTS



An old sound-box is pressed into service.

THE "D-G's" CHRISTMAS BROADCAST

(Continued from previous page.)

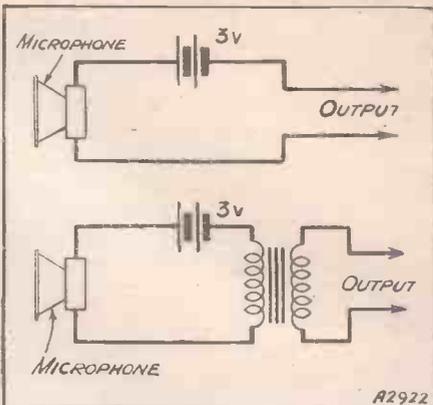
master-General, Mr. Kellaway, was desirous of having—great credit to him, too—was achieved.

Another prominent figure in those days was Mr. Archibald McKinstry, and a good friend to me. I knew nothing of the B.B.C. struggles to which I have referred, nor of the innumerable conferences and discussions with the Post Office. I was in peaceful ignorance of the fate awaiting me. But when, in December, 1922, I came upon the scene, I was given by Sir William Noble a cartload of papers on the subject.

Looking back on the early years, one is conscious of how much one owes to the first chairman, Lord Gainford; how very much more difficult one's task would have been but for his confidence and support.

With a chairman of another outlook and of another type, the history of British broadcasting might have been very different—the

WITH OR WITHOUT TRANSFORMER



The microphone will work without a transformer if you have not got a suitable one.

opposite side, a mouthpiece is also wedged into the hole.

Attached lower down to the wooden upright is the microphone button. This is wedged very tightly into the wooden panel, but not so tightly that one is unable to make a slight adjustment in the contact-pressure between the needle of the sound-box and the microphone diaphragm nut.

The terminals shown in the photograph are for the attachment of the necessary battery and for the taking of leads to the transformer.

Not Noisy.

The microphone will work with or without a transformer. Naturally, it works much better with a transformer. There is, however, no need to go to the expense of buying a special microphone transformer for the purpose. Make use of any old L.F. transformer which you may have lying about. If such a transformer is in electrical working order, it will suffice well enough.

This microphone works best on three volts. Properly adjusted, it is not noisy, and it will give clear speech and music transmission either direct to a telephone receiver or through a radio amplifier to a loudspeaker. J. F. C.

B.B.C. itself very different. And a Postmaster-General to whom the B.B.C. was under great obligation at a most critical time was the late Sir Laming Worthington-Evans.

He supported the company courageously and wholeheartedly against considerable opposition, and the wisdom of his action was confirmed within a few weeks. This was in October, 1923.

But, as I said, what do you think of it all? Well, I don't know, and, to be quite frank, I don't. Error. Erase last sentence. Well, I hope. In fact I hope very well. But as the Good Book says "Hope that is seen is not hope." And perhaps that's why we don't see it. Only just keep hoping.

The tenth year, the end of the tenth year is, after all, the beginning of the eleventh, and I think we should leave it at that, with all that that implies. Except for this, to wish you, and all your readers, quite irrespective of what they feel about the B.B.C.—although as a matter of fact I imagine they mostly rather like us—a happy Christmas.

Yours, neither in sorrow nor in anger, but with good-will, J. C. W. R.

P.W.'S XMAS GREETINGS

From SIR OLIVER LODGE to the readers of "Popular Wireless."

"In these difficult times there is an element of hope in the air, there is a feeling that the worst has now been passed, and that trade is beginning to revive. Much remains still to be done, and wireless experts can help.

"I therefore wish them all prosperity, and a speedy advance into less troubled surroundings. Meanwhile, a Merry Christmas to you all!"

From CAPTAIN P. P. ECKERSLEY.

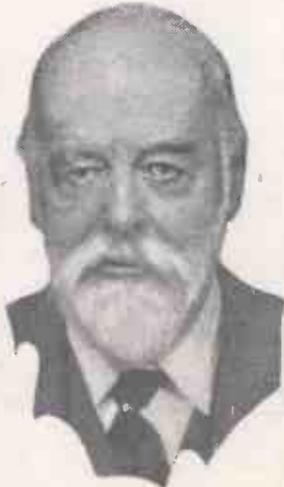
"I write to wish the readers of 'Popular Wireless' a very Happy Christmas. Broadcasting will soon have seen thirteen Christmases—two of them during the Writtle days, eleven during B.B.C. days. One can trace, during these years, the steady increase of technical facility and the decrease of programme vitality.

"In Germany the government has captured broadcasting. In Britain the same thing has happened, but less obviously. In Germany there is 'a certain liveliness'; in Britain none.

"So I write to wish you a Happy Christmas—and, therefore, sets which will receive foreign programmes. But you won't get very good results because Government control of European broadcasting is so strong that no one will even try to arrange the wavelengths so that you can pick up worthwhile transmissions. But comfort ye! it's a great hobby, and I do wish you the greatest happiness from it."

From MARCHESE MARCONI.

"Once again I have much pleasure in accepting your invitation



OUR
SCIENTIFIC
ADVISER
Sir
Oliver Lodge,
F.R.S.

And every
radio man will
recognise the por-
trait on the right
as that of the

MARCHESE
MARCONI.



to wish the numerous readers of 'Popular Wireless' a Happy Christmas and a Prosperous New Year.

"The future is full of promise and also, it may be, of surprises, and I am still of the opinion that we are a long way from finality in the utilisation of electric waves."

From SIR AMBROSE FLEMING, F.R.S.

"I wish all readers of 'Popular Wireless'

From SIR JOHN REITH.

"With the celebrations of the tenth anniversary of British broadcasting behind us, all who are engaged directly or indirectly in this great enterprise are looking forward to further progress and development along all lines—better programmes, better trade, and more interest.

"I am glad of the opportunity of wishing your readers a very Happy Christmas, and a much more Prosperous New Year than they have experienced for long enough."

From N. ASHBRIDGE, the B.B.C.'s Chief Engineer.

"In wishing all readers of 'Popular Wireless' a Happy Christmas and Prosperous New Year, I should like to express the hope that the pleasure they derive from broadcasting may steadily increase, both on account of the programmes and the interest they take in the technical side."

From A. W. MACNAMARA, Governing Director Telsen Electric Co., Ltd.

"Once more Christmas draws near, with all its pleasures, festivities, and expressions of goodwill. The wonders of radio have given us all, especially the home constructor, many hours of enjoyment, but perhaps at no other time of the year do we appreciate the thrill that radio can give us when listening-in to the joyous sounds of pantomime, and carols.

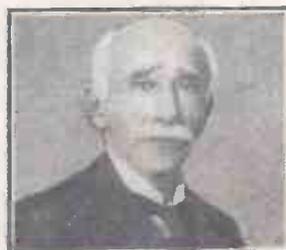
"It is with these thoughts in mind that I send my greetings of goodwill and prosperity to all readers of 'Popular Wireless' for Christmas, 1932."

(Continued on page 813.)



"It's a great hobby and I wish you the greatest happiness from it," says

Capt. P. P. ECKERSLEY.



SIR AMBROSE FLEMING, F.R.S.

Right:
The Director
General
of the
B.B.C.
Sir
JOHN
REITH.



Capt. Echersley's QUERY CORNER

Under the above title, week by week, our Chief Radio Consultant comments upon radio queries submitted by "P.W." readers.



Don't address your letters direct to Captain Echersley; a selection of those received by the Query Department in the ordinary way will be answered by him.

Running an M.C. Speaker.

V. K. C. (Salford).—"I am thinking of buying a permanent magnet moving-coil loudspeaker, but I have been told that these speakers are 'greedy' and will quickly cause my H.T. battery to run down. I don't want to increase the current consumption of my set, and am wondering whether an output transformer would enable me to cut this down and so prevent waste through the speaker windings?"

I suppose what is meant is that a permanent magnet moving-coil speaker takes more power to work it than an electro-magnetically energised type. This is true, in fact, but the quantities are not very different. The ear is generous and registers logarithmically, and it won't notice much difference between the two.

Your valve will work it all right if it will work an electro-magnetic type, and if you've a reasonable factor of safety. The same valve I mean, and therefore the same battery consumption.

Curing Heterodynes.

B. G. (Hatfield).—"The heterodyne interference is so bad in this locality, and since I only listen to the two London stations, I am seriously thinking of returning to a crystal set, and using telephones, but I have been wondering whether this trouble will still be present?"

Please, I don't understand—have you a heterodyne interference with the London station reception, or do you mean that people oscillate locally, or what?

Receivers having the same overall selectivity experience the same interference. But what about heterodynes with London at Hatfield a few miles from Brookmans Park—surely not!

Increasing Power.

A. C. (Gillingham).—"I have a det. and 2 L.F. receiver, and I am desirous of increasing the volume in the simplest possible manner. If I take out my present power valve and insert in its place a super-power, will this increase my range of reception?"

No! You must distinguish between power and volts. The lamp in your house works from (say) 200 volts, and has a given brightness.

If they install a 100,000-kilowatt generator in the power house instead of the 50,000-kilowatt generator they have been using, it will not make your lamp any brighter. It will, however, enable the power supply people to supply power to (say) one million more lamps.

If you substitute a super-power valve for the power valve, the voltage you apply

to your loudspeaker might be the same (for reason I won't go into it could quite likely be less), but you could use two or three more loudspeakers.

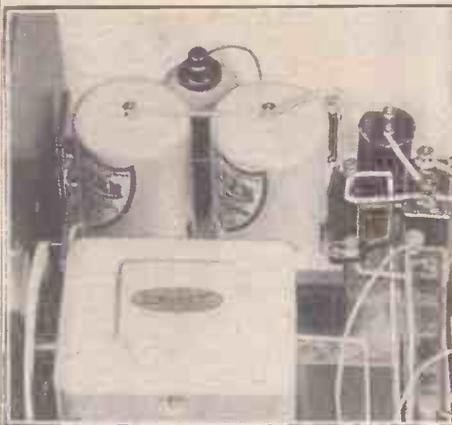
The way to increase volume is to supply more volts to the speaker; therefore more volts to the grid of the power valve; therefore a more sensitive set per the last stage, and also to have a valve which, when its output volts are raised, has the power necessary to feed the speaker with these increased volts.

Pre-Detector Volume Control.

P. D. G. (Kidderminster).—"I notice that in several commercial A.C. mains receivers and also in some designs intended for home construction that a pre-detector volume control operative by increasing the negative grid bias applied to the S.G. H.F. valve is used. These receivers use A.C. S.G. valves of the standard type, that is not variable-mu, and surely this method of volume control would introduce distortion, particularly as I find that with one of the receivers nearly 10-volts bias is required when receiving the local station?"

I have not actually worked out the case,

A POINT TO WATCH



Have you ever encountered mysterious instability in a newly constructed receiver and subsequently discovered that one of the coil "cans" was un-earthed? It is an easily overlooked connection, but very important. See how it's done in this set?

quantitatively, but I should think from designing distortion free high-frequency magnifying circuits that there would be very little tolerance on the value for grid bias to give this condition.

No! I do not like the scheme as you describe it: it seems inevitable that there would be distortion at some settings of the volume control.

Adjusting Band-pass Circuits.

H. M. (Chiswick).—"I have been trying to 'gang' up a band-pass circuit for some days without success. There are three tuned circuits altogether, and I find that when I get things in step over one portion of the waveband, the circuits fall out of step over another portion. Are there any particular 'snags' in ganging band-pass circuits?"

Yes! Lots! Beastly things anyway unless fully understood. If I had a band-pass arrangement, it would be my object to see that each element of capacity and inductance joining the closed circuits were equal to one another.

I would do this first by coupling resistances. I would then substitute the resistances by reactances. I would know that unless I did something else the band width of response would vary with the frequency of the station to which the whole thing was tuned.

And unless I'd done all the mathematical analyses of band-pass circuits I'd stick to two elements and never use three!

"Set-less" Reception.

L. F. H. (London).—"I am receiving without a set, but with the use of a pair of 2,000-ohm 'phones connected between aerial and earth. I was amazed at hearing Radio-Paris Sunday, and the National on week-days. I can hear our telephone ring in the 'phones when there is a call. Please can you give me an explanation?"

In order to receive wireless signals you must have a rectifier to cut off one side of the high-frequency impulses and use only the other.

I suggest that you are getting a chemical rectification somewhere where dissimilar metals join, or that the 'phones are non-linear in their response. I must say I am a little surprised and that I would hesitate to be dogmatic without a further investigation.

YOUR SET THIS CHRISTMAS

by G.V. DOWDING
Associate I.E.E.



Our Technical Editor had the real "Christmas Spirit" when he wrote this article, but nevertheless he gets in some useful hints which will help you to be sure of your Xmas radio programmes.

Do you realise what would happen if every radio receiving set in the country went wrong at Christmas? Of course you do. Our superlative B.B.C. would suddenly cease to exist. In its place there would merely be a million pound mouth bellowing to the desert air.

I realise that it is my duty to help to avert such a terrible catastrophe. The B.B.C., as you have probably noticed, invariably resorts to poetry when it wants to express itself on occasions of vital national importance, so, being a good listener, there is nothing for it but for me to follow suit.

Obtaining "Atmosphere."

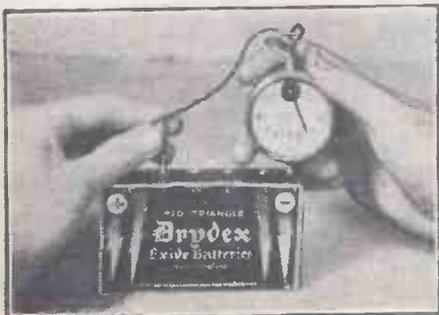
I must hasten to say that I am not the Poet Laureate—I refused that honour because of the absurd conditions attaching to it. For one thing, I simply could not face the prospect of having to wear a bardic crown at my meals.

Now how shall I start? (The first hundred stanzas are always the hardest.) Perhaps a solemn warning as to the dangers of neglecting to make sure a set is properly maintained will be in order. I shall deliver myself in the style of Keats. To obtain the correct atmosphere, I want you to turn on a little soft radio music and read aloud the following verses slowly—deeply.

DESPAIR.

Void and black the o'er-hung sky
Low dark clouds go sobbing by;
Winds in drossy grasses sigh
Too late! Too late!

Doom, doom, doom, the dreaded night,
Gloom, gloom, gloom the dimming light,
A brave set, a losing fight,
No Volts! No Volts!



I think that sounds grand. In fact, I've a fancy to enter it as a thesis for the next announcer's examination. The only snag is, I don't want to be an announcer.

Passing from the general to the particular, I have some lines maturing in my mind which ought to convey very clearly the prime need of battery inspection before the festival of Noel descends upon you. There is no need for a musical background this time.

THE DOOMED BATTERY.

Every plate as white as snow,
Charged again, but still won't go.
Can it be it's got sulphation
From which there is no salvation?
What a "cell"!

You will observe that I have employed the double entendre. I'm rather partial to it. It's a form of subtlety that doesn't need a psychologist to unbutton. I devised another little verse of the same order a few weeks ago. It ran something like this:

REAMER THE HOLE



If you haven't a drill quite large enough for some job, the reamer is a good way out.

To bitter strife about "valve life"
There may be no ending.
But I will bet regarding "det."
You won't catch me "bending."

(I need hardly point out that "det." is an abbreviation of "detector" or "de-

tection," and that "anode bend or leaky grid?" is still good controversy.)

However, I am straying from the subject, but before I proceed with the directly instructional matter, I'm going to pop in an antidote for the gloom with which I started.

A Rousing Shanty.

Funny that the moment I think of the B.B.C. the ink on my pen turns crepe black, isn't it? Or is it? Anyway, tune up your epiglotti for a rousing shanty.

Fifteen knobs on a he-man's set.
Yo! Yo! my lads, Yo! Yo!

You twist and turn and what d'you get?
"Allo! Meine Herren, Allo!"

Well, that is that! Having put your coats and collars on again, I presume you are all prepared for a little more instruction. I nearly used the word education. Education! Pah!

This time, my brothers, the text is "Don't do unto your neighbours as they do unto you." I go all Wordsworth. My pen is a daisy stalk, my ink a crystal dew-drop.

THE BIRD.

I would I were a little bird
To fly up in the sky.
I'd pin my songs to wireless waves
As they went slipping by.

You are a bird, you charming fellow
But your songs are foul.
For when you twist that right-hand knob
You make your darn set howl.

For the Short-sighted.

The pedantic will say that I have used the wrong metre. Of course I have. That's just the point! (If those who fail to see the point will apply at Tallis House at midnight on "All Hallows," I'll be pleased to supply them with first-class magnifying glasses—for the nominal price of one guinea.)

(Continued on next page.)



TESTING TIP—FLATTENING FOIL

Never take your grid-bias battery for granted—its volts may have walked out on you. Another good tip is to use a hot iron to flatten old copper foil.

NEWS FROM READERS

about a "Swagger" set and a Selective one.

AN EXTENSER DUAL-RANGER.

The Editor, POPULAR WIRELESS.

Dear Sir,—Here are a few photographs of my "Dual-Ranger Extenser" with push-pull amplification, the "Dual-Ranger" part is in accordance with diagram in "P.W." at end of last year. Note the horn loudspeaker (G.E.C.) which has a perfectly natural tone so far unapproached by any cone speaker I have heard.

I use D.C. mains "Ekco Unit" for H.T. supply. As regards station reception I can at loudspeaker strength receive 13 long-wave and 47 medium-wave. Hoping the photographs will interest you.

Hoping the photographs will interest you.

Yours faithfully,
WILLIAM W. JACKSON.

A PLUG-IN COIL LOOSE COUPLER.

The Editor, POPULAR WIRELESS.

Dear Sir,—I have used plug-in coils now for over eight years, and although I have tried many dual-wave-tuners, their efficiency is, as you admit, not to be compared with the plug-ins. They are, as you say, a compromise. I have always discarded them and reverted to the old loves.

In my own case I rarely use but two in order to avoid the necessity of coil changing, for after all, a programme can be quite as good on the medium wave-band as on the long, so why bother to change coils? Only on Sundays for a short time do I use the long-wave coils.

"My Selectivity I obtain with . . ."

My selectivity I obtain with a special form of loose coupler, and with it I obtain all the selectivity I need, and can tune in about thirty stations on the medium band, free of interference, in spite of my nearness to Moorside Edge.

These are all received at good strength on the loudspeaker, some too loud without control. The loose coupler I use is shown diagrammatically in the sketch herewith.

The usual coupling for these units is, as you know, a small capacity condenser, but I discarded this some time ago in favour of a 100,000 ohm non-inductive resistance (à la Capt. Eckersley). The special coil I made for it myself (after several try-outs), and consists of 70 turns of 30 D.S.C. wire wound round a slotted ebonite former 2 inches in diameter.

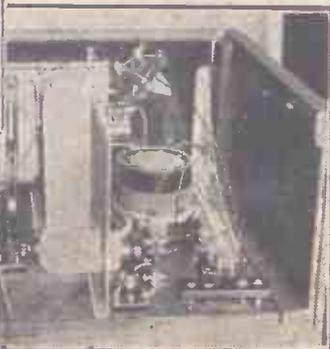
It has 8 slots, and 5 turns of wire are wound in each of the first and last slots, and 10 turns in each of the remaining six. The coil is tapped at the 35th turn.

The condenser in the aerial is a solid dielectric one of .0003 mfd., the aerial being taken to the moving vanes, the fixed vanes going to the coil. This condenser not only controls selectivity, but volume also.

In my own case I never altered its setting after

WITH PUSH-PULL AMPLIFIER.

The handsome exterior and the interior of Mr. Jackson's set. His letter appears at the top of this column.

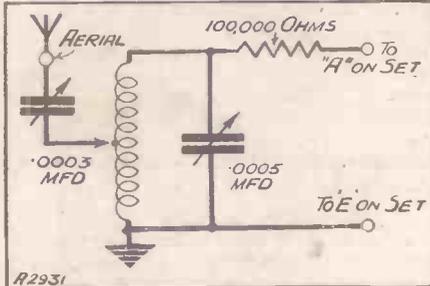


the first adjustment (about midway position). I simply tuned in the local (North Regional) at full strength, then adjusted the condenser to comfortable volume and left it at that. This allows ample margin for other stations to be tuned in (with the aid of reaction when necessary) at good volume on the loudspeaker, and quite free of interference.

Seeing that I reside in a swamp area, the results are entirely satisfactory. The aerial lead from the coupler should be taken to the start of the grid coil of the set, and not to a tap, if tapped coils are used, as the coupler itself is selective enough.

I may add that with the particular coils I use (including coupler coil) the dial readings are identical for all stations tuned in. This, of course, is very

A SCHEME WORTH TRYING



With this simple circuit Mr. Wood improves his set's selectivity.

convenient, though it might not happen in every case, especially if different coils were used. The coils in my set are Atlas, No. 60 grid coil, and No. 50 reaction.

Yours truly,
A. J. WOOD.

Chorlton-cum-Hardy, Manchester.

SERIES OR PARALLEL?

The best way to add a pair of phones, so that your guests can listen as well.

YOU would never think that a simple little matter like attaching an extra pair of phones could give you a moment's anxiety. Still, there are two ways of doing the job: in series and in parallel. In the series method, the current enters and leaves one pair of phones, before passing on to the next.

In the parallel method, the positive tags of all the phones are connected together, and then the negatives.

Quite recently, I had occasion to use a pair of phones upstairs. I detached one of three pairs from the set, which, by the way, are wired in series, and ran a length of twin flex to the required spot. So far, so good.

The surprise came, when I attached the phones to the flex. Volume was miserable compared with what it had been at the set. This was surprising, for the usual result of running an extension is, if anything, to increase the volume. Of course I blamed the phones.

As a precaution, I slipped them off, carried them down, and hooked them on in their usual place. Signals came through loud and clear. I confess, for a minute, I was puzzled; then a closer examination of the wiring solved the mystery.

I had connected the flex in parallel with one of the other pairs of phones. So, if you are using three or more pairs of phones, connect them in series, it may result in a welcome improvement in reception.

E. O'M.

YOUR SET THIS CHRISTMAS

(Continued from previous page.)

I feel that no collection of Christmas poems can be complete without the ubiquitous Kiplingesque. No sooner said than done. Here is my proud (humble to you, Shakespeare) offering.

If you muff your leads and wire

So it takes an hour to clear 'em.

If you twist your dials so slow

Stations close before you hear 'em

You're a "ham," my lad.

If you can make a super-het.

With no cross-modulation,

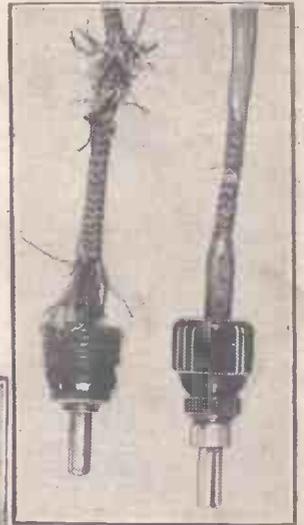
If you can run a tiny "two"

So it picks up all creation.

You're a "fan," my lad.

DEALING WITH FRAYED FLEX

Chatterton's Compound is a most useful material to the constructor. A little bit will make quite a neat repair in frayed flex.



They clean your tuning condensers as well as your pipe! It is important on short-wave tuning condensers to keep dust from between the plates, and a pipe-cleaner is ideal for the job.

By the way, talking about mains receivers—I wasn't, but I want a cue for another pungent spot of poetry.

Aunt Eliza's got A.C.

But won't run valves, no, not she,

Says her crystal's "luv-er-ly"

Here am I on dud D.C.

Isn't it a—well, you know the rest.

For the benefit of those who are more fortunate, I'll versify a little warning.

The music stops and silence reigns.

The young man cries, "I'll put it right,

Don't worry Pa, I'll mind the mains."

He didn't! Good Night Everybody.

Good Night!

Poetically speaking, you will observe that my style has slipped from the sublime to the ridiculous—from Milton to Music Hall as it were. I apologise; Christmas always affects me that way.

RADIO GIFTS FOR Christmas



"Only 15 more shopping days before Christmas"—it's time you started thinking about making a list! That Christmas-present problem always looms up very large about this time, doesn't it? But this year you will have no need to puzzle your brains because we have solved the problem for you—and here is the solution.

If you know of a good shop where they sell ties that don't wear out, chocolates that last long after the box has been thrown away, and cigars or cigarettes that give pleasure for years instead of for minutes, the Christmas-present problem is solved for you. Go straight to that shop, buy the aforesaid ties, chocolates or tobacco, and pat yourself on the back. No more Christmas-present problem for twelve months!

But if you fear that the usual ties make unenterprising gifts, and that everybody has thought of chocolates and so on years ago, and yet you wish to give lasting pleasure and a touch of surprise to your pals—well, it's a radio gift every time. For there is better value for money and more lasting satisfaction to be had from radio than from any other single industry to-day.

All For a Few "Bob."

You don't have to bother with long lists of this, that or the other—just let your mind wander over the marvellous assortment of wireless goods and present prices.

"Only a few bob to spend," you say? "That settles it" (as the man said when he took the seidlitz powder). You can command amazing radio resources with "only a few bob" to-day.

Drawing a deep—a very deep—breath, you can go into a radioshop and ask to see some sets of wander plugs, some anode connectors, well-sprung valve holders, toggle switches, spaghetti resistances, posh terminals, grid leaks, differentials, series or "selectivity" condensers, pre-sets, twin-tap plugs, battery cords, sets of spade terminals, safety fuses, and some nice little on-off switches.



Just Remembered.

As soon as the astonished assistant has displayed all these miscellaneous and attractive wares, and you have picked what you simply must have, you can remark that you've just remembered

that you would also like to see (take another very deep breath here) a few good H.F. chokes, some clearly marked terminal blocks, 3-point switches, stand-up-or-lie-down fixed condensers, earth tubes, grid-bias batteries, panel lights, tag condensers, L.F. coupling chokes, a percolative earth, a nice smooth volume control, and one of those bakelite dielectric tuning condensers.

The assistant, obliging fellow that he is, will then probably catch the spirit of the



SELECTING A SET?

If you can run to it there is nothing like a complete set for giving complete satisfaction.

Above is Macnamara—"The Golden Voice" receiver, produced by Telsen's, Ltd.

The R.L. Madrigal, depicted to the left, is for operation from A.C. mains.

To the right is another famous A.C. receiver—the Clarke's "Atlas" model R.A.2.



thing and say, "Well, sir, if you have only a few bob to spend, how about trying one of these S.G. binocular chokes, or a fuse with holder, or a potentiometer, or a reaction choke, or a" But there, he may go on all night like that! Enough said to convince even the sceptic that there is plenty of variety in low-price radio gear nowadays!

The fortunate shopper with a little more money to spend on presents can have no

end of a good time with it. A new cabinet, for instance; or loudspeaker; or a unit to mount in a cabinet (as described in those "P.W." articles three or four weeks ago); or a spot of parallel feeding for the L.F. stage with one of those "temptatious" units that arrived on the radio scene this year.

Robust and Reliable.

Then there is the whole question of high-tension and low-tension supply. Robust and reliable batteries are so low in price now that the mains unit manufacturers have simply had to cut their prices to the bone for handy little units that are also as robust and reliable as anyone could wish.

Then valves—those staggering new valves. Who wouldn't be pleased to find one of those beauties in his Christmas stocking? Or a nice Extenser to save wave-change bother? Or a short-wave adapter? Or a pick-up? Or a ganged condenser? Yes, there is plenty of variety.

And, if you like, you can break right away and give your friend abroad the biggest treat he has had since goodness-knows-when by arranging that "P.W." or "Modern Wireless," or "The Wireless

Constructor" shall be sent to him regularly—as they appear—and free of all bother to you.

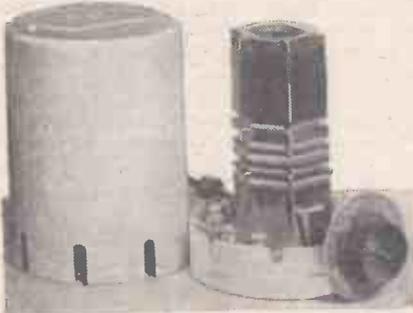
What a Present!

The rates for sending "P.W." are given on our back cover, and a year's subscription and postage for "M.W." costs only 17s., while that for the "Constructor" is

8s. 6d. per annum—except for Canada, which is 7s. 6d. What a present any one of those would make!

Finally, if you are not yet on the track of exactly what you want, cast a contemplative eye over the other pages in this number of "P.W." Said eye will then be presented with what is technically termed "an eyeful" of bargains. And you can be sure that someone, as a result, is going to have a happy Christmas.

RADIO PRESENTS IN PICTURES



A Telsen fully-shielded dual-range coil would fill an important niche in any Christmas set, besides giving service for many summers afterwards! Note the neat control knob, and the extension rod for ganged switching.



Comparatively few people enjoy the sense of security which is achieved by knowing the state of one's batteries at all times. This useful Ferranti voltmeter has a triple scale for reading L.T. voltages up to 10 volts, and H.T. voltages up to 100 in one case and 200 in the other. A fine gift.



A bit bulky for the Christmas stocking, but nevertheless a very welcome gift to the man who wants simplified tuning. This J.B. gang condenser is a fully screened, disc-drive instrument with a pleasant panel-mounting escutcheon.



To give a present which will save the recipient several pounds a year is as good as giving twice! You can easily achieve this happy state of affairs by giving an Atlas all-mains unit (D.C. or A.C. mains) which for less than 2/- a year will supply H.T. to the receiver and keep the accumulator charged!



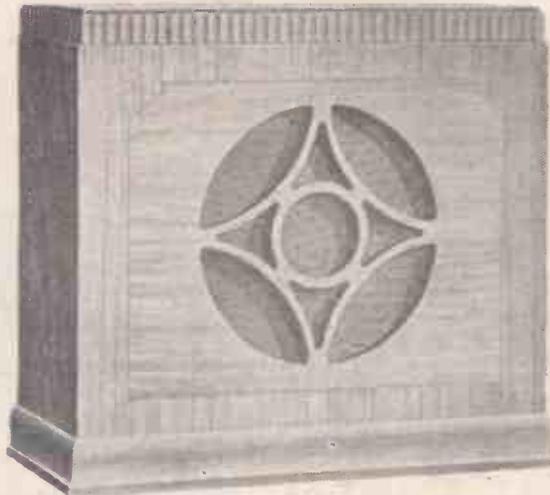
A Graham Farish "Filt" earthing device buried on Christmas Eve will demonstrate the importance of good connection underground.



The man who cannot work his receiver from the mains because he hasn't got 'em will have little cause to grumble if you sent him one of these Ediswan super-capacity dry batteries. They really do give "punch" to the receiver.



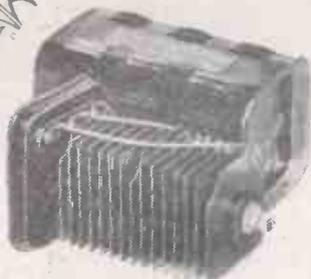
Valve or condenser? Both or them indispensable to the modern receiver—so you can take your choice between the Dubilier dry electrolytic condenser and the Mullard valve. Both are excellent value—either would be welcomed by any constructor.



And don't forget loudspeakers on your list of presents. For luxury of performance and appearance the Blue Spot 32 P.M. would be hard to beat. Moving-coil unit, of course, and a cabinet of fine walnut that would grace any room.



R.I. can offer a big range of Christmas gifts from among their well-known components. A good example of efficiency combined with value for money is found in this Parafeed coupling unit. An original design, isn't it?



The Westinghouse metal rectifier, type H.T. 7, makes big claims on your attention for its neat appearance, sturdy performance and continuous efficiency. There are 3 1/4 million homes with A.C. mains—any one of them would welcome this gift!



This is a neat unit which must appeal to the up-to-date constructor. Three Lissen dual-range shielded coils with ganged wave-changing on a special metal base that will mount on the baseboard.



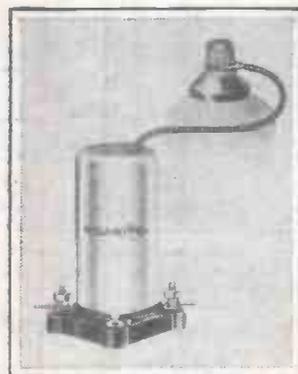
Don't overlook this fine example of what Goltone can turn out for the critical constructor. It is a super H.F. choke with a range of 10-2,750 metres. (Ward & Goldstone.)



Utility in name—utility in nature! Wilkins & Wright are responsible for the fine tuning condenser seen above.



Just for a change let's have a look at an L.F. choke—the Slektun 40 henries model, for instance, which is an excellent example of how good workmanship and low cost can be combined to give maximum efficiency.



A Wearite H.F. choke (with armoured pig-tail) is to be seen in many modern receivers. If you know anyone who hasn't used it, yet—then send him one!



You cannot have too many valves in your workshop. So let your constructor friend add to his collection with one of the extensive Marconi range.



If you are feeling really rich here's something to please you—the walnut-finished 7-valve superhet radio-gram made by H.M.V. When you've heard it demonstrated you will probably want to keep it for yourself. So much the better for you!



S.G., det. and L.F.—that describes the majority of receivers to-day. And here's the Osram screened grid valve all ready and waiting for somebody's set. Don't keep it waiting long!



You probably know how a receiver can eat up H.T. So why not do someone a good turn by sending along a Drydex battery (made by Exide) which will definitely give long and efficient service?



Slip two or three of these T.C.C. tag condensers in an envelope and send them to any constructor friend. You can't go wrong over this—everyone needs condensers, and the name T.C.C. is the hall mark of quality in this respect.



There's plenty of power in the Ever Ready "High Power Sixty," and it's all waiting to be poured into someone's receiver. Send it to any listener friend and let his reception contain "that little something the others haven't got!"



This transformer by Leweos would prove acceptable to the lover of good reproduction.



Your friend's reproduction will be "The very Soul of Music" when he installs your gift of a Celestion M.12 chassis.



An ever-welcome gift. A spare accumulator from the Oldham range.



Consult Heayberd's (who made this transformer) if you want to give the A.C. man the right gift.



The extensive range of Bulgin components will meet any radio requirements. Here are two suggestions.



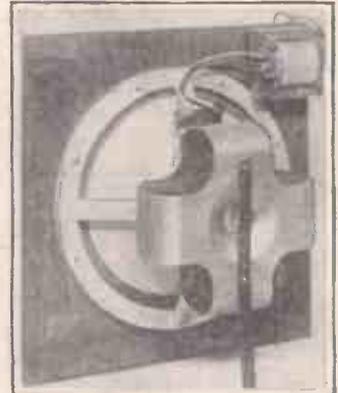
Radio's latest refinement is tone correction, and the lucky recipient of an Igranico Response Corrector can modernise his set.



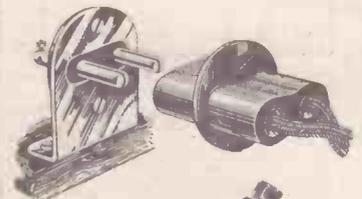
If you are thinking of giving yourself a present, this Lotus all-mains 3-valver is a very sound proposition.



Wave-changing, selectivity and L.T. switching are all controlled by the single knob on this Ready Radio Dual-Range Coil.



To the moving-coil enthusiast, nothing could be more acceptable than a speaker "by W.B."



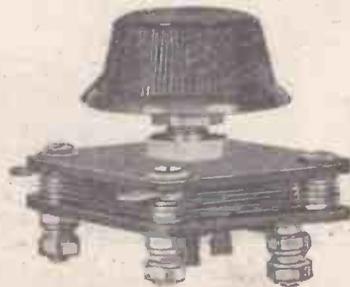
Constructors of mains sets will one and all appreciate a Belling & Lee Input Connector.



The wide range of Cossor valves is bound to contain one suitable for a "spare" to someone's set.



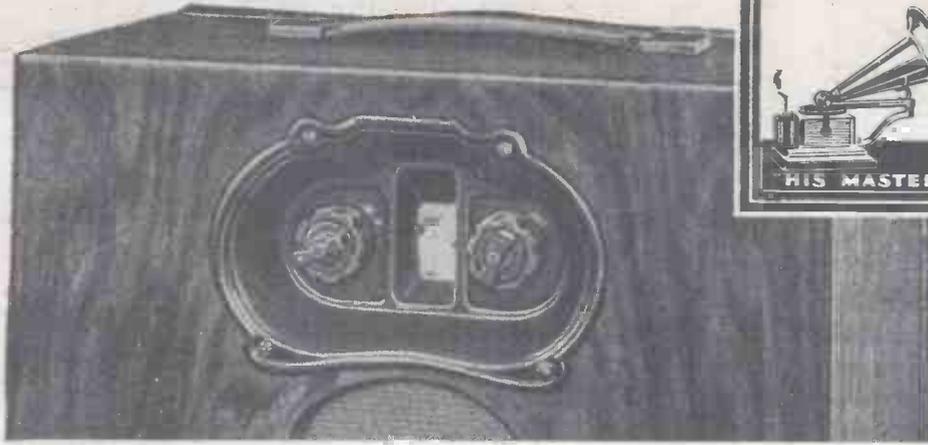
Don't forget that G.E.C. make grid batteries when distributing your largesse.



Almost every home-constructed set contains a differential reaction condenser, and this Polar model will be certain to please the man who builds at home.



Your friend's power valve will get its full 120 volts H.T. when he installs this Pertrix H.T. battery.



SUPERHET PORTABLE SIX—



all stations without overlap



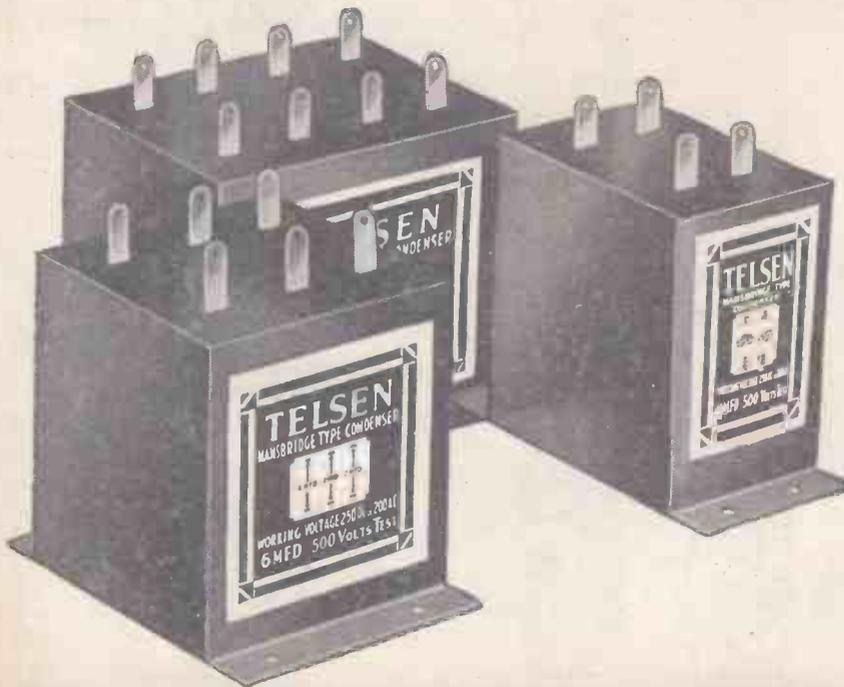
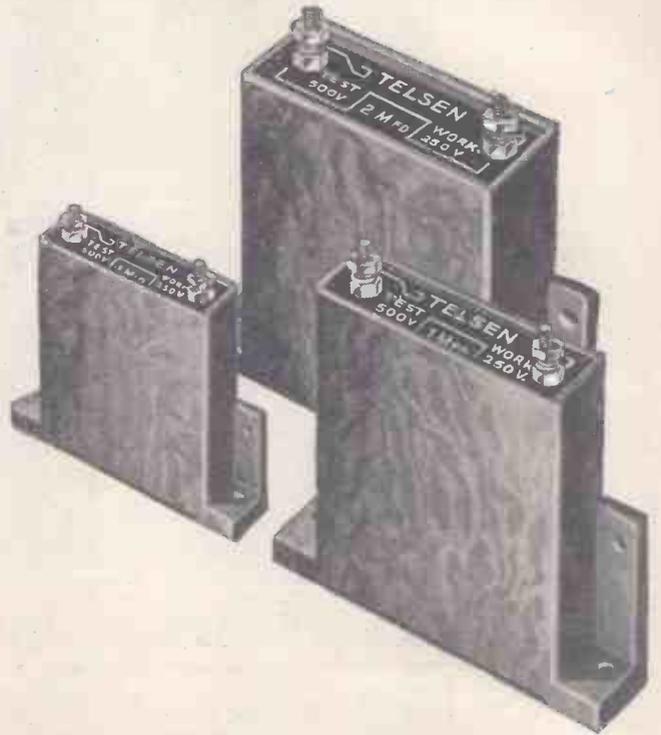
The Portable of your dreams"—strong praise, that, for any set nowadays, but it's how the "Daily Telegraph" radio expert sums up the "His Master's Voice" Superhet Portable 'Six'—while Captain Robinson, radio critic of the "Observer" calls it "the finest portable on the market." Actually it is the first battery set "His Master's Voice" have made, and, as such, was not put on the market until proved as nearly perfect as modern research and methods could make it. As to selectivity—"almost every station on the European map at full volume, and even America" ("Daily Telegraph" again). The set complete with batteries—price 17 guineas or by hire purchase.

"His Master's Voice"

"TRUE - TO - LIFE" RADIO

TELSEN SELF-SEALING CONDENSERS

TELSEN Self-Sealing Condensers represent a very definite advance on current condenser practice, embodying numerous features of outstanding importance. Only the highest quality foil paper and the finest linen tissue are employed in the exclusive method of manufacture, each individual plate being self-sealing and the case itself being finally triple-sealed with a newly discovered bitumastic compound, for permanent efficiency. Every condenser is subjected to rigorous tests up to Post Office and Admiralty standards, the exclusive method of construction making them genuinely non-inductive. It is only because of this unique combination of research, plant, materials, method of manufacture and rigorous testing that Telsen Self-Sealing Condensers give such high insulation with such freedom from breakdown—built for lasting efficiency under all conditions.



TELSEN SELF-SEALING BAKELITE CONDENSERS

In attractive moulded bakelite cases, specially designed for 2-way fixing. . .

Cap. Mfd.	500 Volt Test	1000 Volt Test
.01	1/6	2/6
.02	1/9	2/9
.1	1/9	2/9
.25	2/-	3/-
.5	2/3	3/3
1	2/3	3/6
2	3/-	5/-

TELSEN SELF-SEALING BLOCK CONDENSERS

In metal cases with soldering tags. . .

Cap. Mfd.	500 Volt Test	1000 Volt Test
4	5/6	9/6
6	8/-	14/6
8	10/6	

TELSEN

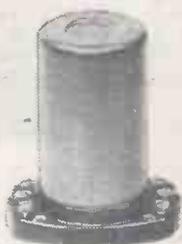
RADIO COMPONENTS

IT'S THE 'LASTING EFFICIENCY' THAT COUNTS

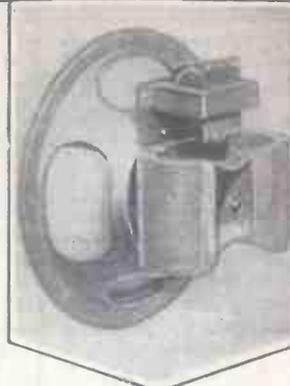
ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM



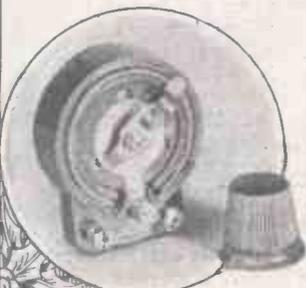
This Motor moving-coil speaker will broadcast goodwill in no uncertain voice.



You can be certain of obtaining efficient valves by purchasing either Standard or Tungram. The Benjamin Transfeeda is a gift for your constructor friend.



Up-to-the-minute in name and design. The Epoch 20th century permanent magnet moving-coil speaker.



Attractive appearance and perfect performance are embodied in this Watmel Volume Control.

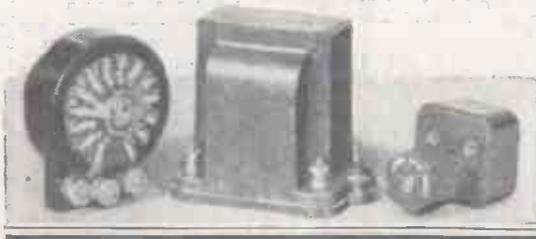


A novel gift for the home constructor whose joy in trying out new sets and designs would be a selection of Clix connection devices.

High efficiency and long life characterise all Varley resistances, including their wire-wound potentiometer.



Any constructor would be glad to get this distinctive component—the Sovereign Varie choke.



The "Tunewell" firm offers plenty of scope for the discriminating present-purchaser. Here are displayed a volume control, L.F. Transformer and radio-gram switch.



That friend of yours who worships selectivity—give him back his high notes by presenting a Multi-tone L.F. transformer.



Banish someone's batteries by giving an Ekco mains unit.



Pioneers of mains apparatus, Regentone can be relied upon to satisfy when your choice inclines to a mains receiver.



Whoever gets this Pifco multi-range meter becomes his own service man.

THE MIRROR OF THE B.B.C.

CHRISTMAS FARE

The Nativity Play—Carol Services—
A Royal Message.

CHRISTMAS DAY, falling as it does on Sunday this year, is also the beginning of a fresh week's broadcast programmes, so that the seasonal entertainments of the B.B.C. are even more divided than usual into two distinct periods.

Once again the programme builders have done their best to ensure that the Yuletide fare shall make the widest possible appeal, and with five million licensed listeners, and several times that number of others to be supplied now that broadcasting has a place in practically every British home, wireless will contribute a tremendous share to the enjoyment of the nation.

It is perhaps better in writing of the Christmas programmes to deal first and separately with those to be radiated from the National transmitters. At the same time it is also necessary to refer first to the week leading up to Christmas Day in which, of course, the Yuletide spirit is dominant.

Simple Act of Devotion.

Sunday, Monday, and Tuesday, December 18th, 19th, and 20th, are not particularly outstanding. There is a vaudeville entertainment on the Tuesday evening, which follows Christopher Stone's recital of gramophone records, with spots of Christmas music here and there, played by orchestras in and outside the studio. Wednesday, December 21st, brings a relay of the Nativity Play from St. Hiliary in Cornwall. I hear that after careful consideration the B.B.C. has asked Mr. Walke to revive "Bethlehem," which has been given for six years already, and to wait until 1933 before putting on his new play.

As listeners know, the Nativity Play is performed by villagers without any pretension of being an item comparable with other parts of the programmes. It is rather a simple act of devotion by simple people, and if the repeated broadcasts have brought fame to the Cornish hamlet, listeners are still more privileged than otherwise in being able to hear it.

Old-Time Music.

An interesting item for afternoon listeners on Friday, December 23rd, is a relay from the Guildhall, London, of the proceedings at the thirty-ninth annual banquet to Little Londoners, organised by the trustees of the Treloar Crippled Children's Christmas Hamper Fund.

By the evening plenty of Christmas music of the old-time kind will be heard; and so we come to Christmas Eve, with still more played by Sydney Gustard on the organ of the Gaumont Palace Cinema, Chester; by the orchestra at the Commodore Theatre, Hammersmith; the Coventry Hippodrome Orchestra; and by Reginald Foort on the organ at the Regal, Kingston-on-Thames. Two carol services have been arranged for Christmas Eve, the first in the afternoon at 3.30 p.m. from King's College, Cambridge, and the second from Whitechapel Church.

These carol services have been features

of the Christmas programmes for some years, and there is no more popular way than in the singing of traditional English carols of celebrating the approach of the great festival. Space has also been reserved in the programme at 6.45 p.m. for a recital of carols, old and new, by Tom Pickering (tenor), as the Welsh Interlude from Cardiff.

The most attractive feature of Christmas Eve, however, will be the relay of Acts I and II of the "Yeoman of the Guard" from the Savoy Theatre. Copyright difficulties prevent more than very occasional broadcasts of the Gilbert and Sullivan operas, so that to most people the relay will come as a big treat.

Celebrity Records.

Christmas Day opens with a short studio service conducted by the Rev. Pat McCormick, D.S.O., at 10.15 a.m., and after the usual weather forecast for farmers and shipping there is a silent period until 12.30 a.m. as is customary on Sundays. Light, tuneful Christmas music played by the Theatre Orchestra, and songs by Olive Kavann (contralto), will be heard until 1.45 p.m., when Raie da Costa gives a pianoforte recital and Christopher Stone puts on a concert of miscellaneous celebrity gramophone records.

By far the most important part of the Christmas programmes will be the speech by His Majesty the King to the people of the Empire—the first direct broadcast of his voice, as distinct from a relay from some official ceremony.

It is an event of the greatest importance,

"MRS. BUGGINS" MERRY XMAS



They are *not* Christmas presents she is carrying, but her luggage, for "Mrs. Buggins"—otherwise Miss Mabel Constanduros—has been ordered a holiday, and the photographer caught her as she was boarding the liner en route for Tenerife.

and by now most listeners are aware that His Majesty will speak from his Norfolk home at Sandringham, where the Royal family always spend Christmas. The speech will form part of a special Empire programme, when for an hour messages from all parts of the Empire will be broadcast as they are heard direct over the various official wireless links.

Listeners will remember that a somewhat similar programme (apart from the King's broadcast) was arranged as one of the

(Continued on page 814.)

THE LISTENER'S NOTEBOOK

A rapid review of recent
programme subjects.

LISTENING-IN has now become such a national habit that it isn't surprising to learn that, with the serious-minded at any rate, it is becoming methodical.

An acquaintance of mine has such confidence in the policy of a certain weekly journal featuring a broadcasting column, that he is satisfied he is getting everything that is worth while from Portland Place if he confines his interest exclusively to what he finds mentioned under the heading, "Items not to be missed."

Another, adopting the same method, and distrusting his own ability to select, stakes his all on another journal's tips, aptly labelled "The Pick of the Week."

And since it is fashionable with many periodicals to offer a selection of this nature one may conclude they are only supplying a needed want.

Surprising Similarity.

I have taken the trouble to compare a number of these weekly selections, and although the journals studied were vastly different in policy, there was a surprising similarity in the tips they gave to listeners.

What was more surprising, perhaps, was the fact that they all seemed unanimous about what they should omit. There is a danger in this, it seems to me, if this habit of putting implicit confidence in another's selection should spread. If carried to excess, it is conceivable that half the week's programmes will have no bigger following than the rankest outsider at Epsom on Derby Day.

And it will be bad luck on all outsiders, particularly if the B.B.C. programme builders should ever attach importance to these weekly tips as an indication of what the public wants, or of what it listens to.

Born to Blush Unseen.

Some remarkable omissions, I noticed, were well-remembered favourites, but, perhaps, their reputations are so well established as to need no recommendation now; and the fact that their inclusion in the programmes seemed to escape notice didn't matter. But with less reputable turns it isn't the same thing. They aren't listened to because they aren't "tipped," and consequently, they will never have the task of maintaining a reputation, because, in all probability, they will never have one.

It is for this reason that I view with disfavour this "Items not to be missed" method, if practised too vigorously. Fresh talent must ever be coming along if the B.B.C. programmes are to keep their freshness and vitality. Many a rose may be born to blush unseen for no other reason than that the professional broadcasting tipster nipped it prematurely by failing to give it the recognition it deserved.

If I were asked to suggest a method of listening-in, it would be this. "Do your own selecting." Certain items, of course, need no recommendation, but always be

(Continued on page 815.)

TELSEN

DIFFERENTIAL, REACTION & TUNING CONDENSERS

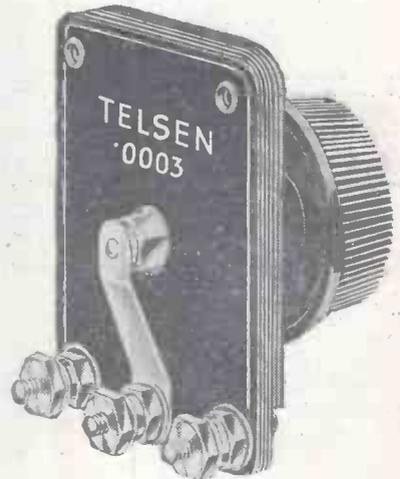


TELSEN DIELECTRIC TUNING CONDENSERS

New design of great rigidity and exceptional compactness, ensuring the utmost efficiency in use even where space is very limited. The well-braced vanes are interleaved with a minimum of the finest solid dielectric, giving absolute accuracy of tuning. Supplied complete with knob. In capacities '0005 and '0003 **2/6**

TELSEN DIFFERENTIAL CONDENSERS

Improved type of exceptionally rigid construction. The rotor vanes are keyed to the spindle and fitted with definite stops. A strong nickel silver contact makes connection to the rotor, a positive connection being made to the stator vanes. Supplied complete with knob. In capacities '0003, '00015 and '0001 **2/6**



TELSEN REACTION CONDENSERS

Built to the highest standards of efficiency, embodying every improvement and refinement indicated by the latest research. The vanes are interleaved with the finest solid dielectric, the construction throughout being of great rigidity and exceptional precision. Supplied complete with knob.

In capacities '0003, '00015 and '0001 **2/-**
In capacities '00075 and '0005 **2/6**

TELSEN AERIAL SERIES CONDENSER

The ideal volume and selectivity control, solidly constructed, with very low minimum capacity. The externally keyed switch-arm when rotated to a maximum position, connects with a contact on the fixed vanes, thus short-circuiting the condenser for maximum volume. Supplied complete with knob. Capacity '0003 **2/3**



TELSEN

RADIO COMPONENTS

TELSEN RADIO COMPONENTS ARE 100% BRITISH

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

TELSEN L.F. TRANSFORMERS COUPLING UNITS and OUTPUT CHOKES

TELSEN "ACE" L.F. TRANSFORMER

The Telsen "Ace" is eminently suitable for Receivers where highest efficiency is required at low cost and where space is limited. Its characteristic curve bears comparison with that of the most costly transformers
Ratio 3-1 **5/6**
Ratio 5-1

TELSEN "RADIOGRAND" (Ratio 1.75-1) TRANSFORMER

For use in high-class receivers employing two stages of L.F. amplification. When used following an L.F. stage employing choke or resistance coupling, it gives ample volume with remarkable reproduction. **10/6**

TELSEN "RADIOGRAND" (Ratio 7-1) TRANSFORMER

Gives extra high amplification on receivers employing only one stage of L.F. amplification. Not recommended for use with two L.F. stages, as overloading is likely to occur. **10/6**

TELSEN 1-1 INTERVALVE COUPLING UNIT

A modern development of the R.C. unit, incorporating a low pass filter feed in its anode circuit, thus preventing instability due to common couplings in eliminator and battery circuits. Used with an H.L. type valve it gives an amplification of about 20 and a perfect frequency response on a negligible consumption of H.T. current. Its remarkable "straight line" characteristic curve places it in the forefront of all components of its type. **7/6**

TELSEN INTERVALVE L.F. COUPLING CHOKES

Primarily designed for use as coupling chokes but may be used in any circuit carrying not more than the stipulated maximum current. The 100H type is for H. or H.L. type valves and the 40H for L. types. **5/-**

Normal Rating Current	Max. Current
40H—5 m.a.	10 m.a.
100H—3 m.a.	8 m.a.

TELSEN TAPPED PENTODE OUTPUT CHOKO

For mains and battery operated pentodes taking an anode current of up to 20 m.a. The single tapping provides (by reversing) ratios of 1-1, 1.6-1, 2.5-1, ensuring perfect matching under widely varying conditions. Also suitable for matching a low impedance speaker with an ordinary power valve, a 1 mfd. coupling condenser being recommended for this purpose. **7/6**

TELSEN OUTPUT CHOKO

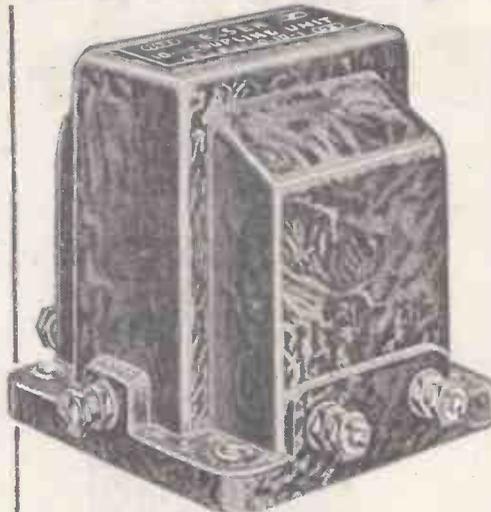
Designed for use with power or super-power valves taking an anode current of up to 40 m.a., this output filter provides an ideal response curve under all conditions. For use with a condenser of not less than 1 mfd. capacity. **7/-**

TELSEN POWER PENTODE OUTPUT CHOKO

For mains operated pentodes taking an anode current of up to 40 m.a. Serves both to prevent direct current passing through the speaker and to match the speaker to the pentode valve, with the choice of three ratios—1-1, 1.3-1, 1.7-1. Used with a 1 mfd. condenser it gives a great increase both in quality and volume. **10/6**

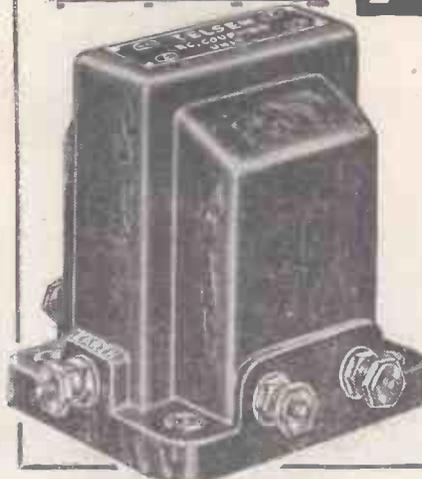
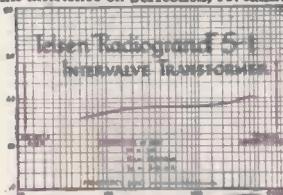
TELSEN MULTI-RATIO OUTPUT TRANSFORMER

For use with moving-coil speakers, having a low impedance speech coil winding, and suitable for anode currents of up to 40 m.a. Three ratios—9-1, 15-1, 22.5-1—allow for correct matching of speakers of widely varying characteristics. **10/6**



TELSEN RADIOGRAND (Ratio 5-1) L.F. TRANSFORMER

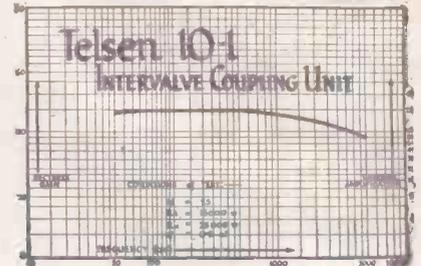
Telsen Radiogrand Transformers have signified to expert designer and enthusiastic constructor alike all that is finest in British Radio craftsmanship. They are designed in accordance with recent research, constructed on the soundest engineering principles and tested rigorously under broadcast conditions for immaculate performance and enduring efficiency. The excellence of the characteristic curve is only the logical result of this insistence on perfection, revealing the fact that they give a performance equal to that of the highest priced transformers: Ratio 3-1 Ratio 5-1 **7/6**



TELSEN OUTPUT TRANSFORMER (Ratio 1-1)

For connecting the speaker to the output stage, using a triode valve. Avoids saturation by isolating the D.C. from the speaker windings. Also keeps H.T. voltage from the speaker and its lead, which is specially important where a D.C. eliminator is being used. Suitable for anode currents of up to 40 m.a. **10/6**

TELSEN 10-1 INTERVALVE COUPLING UNIT
A filter-fed transformer using a high permeability nickel alloy core, securing a 10-1 voltage step-up while preserving an exceptionally good frequency characteristic. The response is compensated in the higher frequencies for use with a pentode valve giving an amplification greater than anything previously achieved, equal to two ordinary L.F. stages but with better quality of reproduction. **12/6**



TELSEN R.C. COUPLING UNIT.

A complete assembly in a compact and convenient form for effecting Resistance Capacity Coupling in the L.F. stages of a receiver, conforming in design to the Telsen L.F. Transformers and Chokes. The Unit incorporates a 50,000 ohms wire wound anode feed resistance and a .01 mfd. coupling condenser. For best results it should be preceded by an H.L. type of valve having an impedance of approximately between 10,000 and 30,000 ohms, and be connected to an H.T. supply of not less than 80 volts. **4/-**

TELSEN

RADIO COMPONENTS

TELSEN RADIO COMPONENTS ARE 100% BRITISH
ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

The RECEIVER OF THE FUTURE

By Noel Ashbridge, B.Sc. 
 CHIEF ENGINEER, B.B.C.



How will they be different—those receivers of 1940 or 1950? The prophet is easily confounded, but the Chief Engineer of the B.B.C. seems to be treading on fairly firm ground when he suggests that short waves, directional aerials, interference preventers, and anti-fading devices will be treated with respect by set designers of the future.

ANY forecast of the lines on which scientific apparatus is likely to develop can only be made with considerable risk to the forecaster's reputation as a prophet! In the case of broadcast receivers, where development has already been very rapid, it is particularly difficult to foresee the type of receiver which will be in common use in, say, ten or fifteen years' time.

High Present-Day Standard.

If one tries to look much further ahead than that, then the task becomes practically hopeless, and it is not even possible to guarantee that by that time the distribution of broadcast programmes will still be by wireless. However, it will be interesting to consider what improvements might be made to the modern receiver, without becoming unduly imaginative, but at the same time without regard to what at present would be prohibitive on account of cost.

One can conscientiously say that the present-day receiver has reached a high standard, and that the time has passed when the quality of reproduction of a medium-priced receiver is such as seriously to limit the type of programme which should be taken. This does not mean, of course, that there are not hundreds of thousands of receivers in use which are a long way from doing justice to the quality of reproduction actually radiated, but in discussing a problem of this kind it is only feasible to consider the type of receiver at present on sale in the shops.

Modern Set's Shortcomings.

If a reasonable price is paid for a receiver it is, in general, capable of reproducing almost everything that is sent out by the transmitting station without adding any very noticeable distortion.

This, of course, is tantamount to saying that the limitations of performance of the modern receiver are not vastly different from the limitations of the microphone and other links in the chain of transmission.

On the other hand, let us consider for a moment what disadvantages a modern receiver still possesses, and let us assume that we are only considering receivers

which are driven by alternating current mains:—

- (1) Most receivers still reproduce an audible amount of 50 cycle hum, not seriously obtrusive, but nevertheless audible.
- (2) Almost all receivers, irrespective of price, are not as reliable as they might be. For example, the wavechange switch seems to give trouble almost invariably, sooner or later. (Incidentally, this has been used as an argument against the use of "Long Waves" in America.)
- Other troubles are noisy valve holders, burnt out anode resistances and badly-soldered joints.
- (3) Some receivers do not possess variable selectivity.
- (4) Only one or two broadcasting receivers so far as I am aware, possess any means of

obviating fading when receiving distant stations on medium wavelengths after dark.

(5) No one seems to have developed a method of avoiding some of the interference from other wireless stations by the serious use of directional reception.

(6) No means have been devised for eliminating man-made, or other parasitic interference.

(7) The appalling inefficiency of loud-speakers from the energy conversion point of view.

Points No. 1 and 2 are not particularly interesting. The 50-cycle hum can be removed if enough money and care is spent on the details of the design, but the designer, in most cases, would tell you that it did not pay to get rid of that last trace of hum and that no one, in fact, ever notices it.

Question of Reliability.

It is quite true that the 50-cycle hum in itself is not particularly noticeable, but where the trouble comes in, is in connection with orchestral and organ music, where certain beat tones may be introduced which cause that bad quality of a rather subtle type. This is a trouble which I think we can expect to disappear in a year or two.

Similarly with regard to the question of reliability, this is a matter which time will undoubtedly cure, although no one buying a new receiver need be in the least anxious in these days that they will not receive good service, if they buy from a reputable firm. After all, ten years after the motor-car had become established, there were a good many breakdowns due to petty unreliability, but this certainly does not happen now, even with inexpensive cars.

Variable Selectivity Wanted.

With regard to (3), it has often been pointed out in the pages of this journal, that if a listener lives in an area of strong field-strength from a particular station he ought to be in a position to receive that station in such a way as to include all the frequencies emitted by it, and that he ought not to be limited in this respect by the selectivity which is necessary when receiving the same station at the limit of its service area. To explain this point further, there may be band-pass circuits included in the receiver which cut off fairly sharply at, say, 5,000 cycles per second, or even lower.

These may be fixed and quite suitable for reception of a weak signal, but it is a pity that the listener situated near a station

(Continued on next page.)

WAR ON INTERFERENCE



Not much can be done at the receiving end to counteract machinery interference. Here is an attempt, by means of a choke coil on a tram, to stop it at the source.

THE RECEIVER OF THE FUTURE

(Continued from previous page.)

cannot receive up to 7,000 or 8,000 cycles by altering the adjustment of his receiver. Many receivers cover these requirements quite well, but others do not.

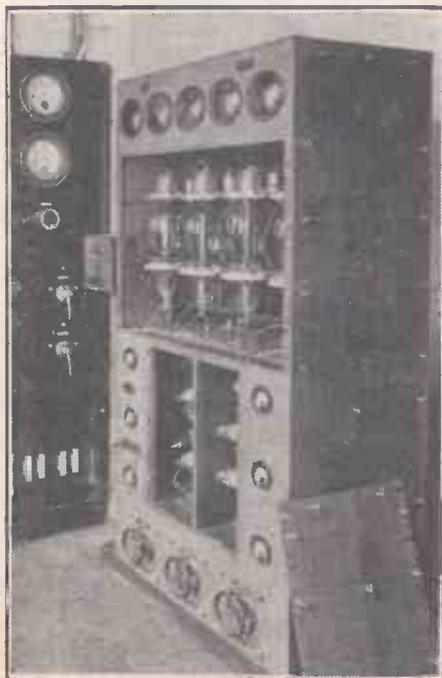
So far we have only discussed what might seem to be comparatively unimportant details, but when we come to (4), namely the question of fading, we have to consider something a little more revolutionary. At first sight one might say, how can the receiver do anything towards eliminating fading, seeing that the radiation reaching the receiving aerial is actually varying in strength?

Automatic Volume Control.

Most people would say, "Surely it is up to you transmitting people to do something about this." The answer to this is that experiments have been made in several countries, with the object of trying to reduce the fading which limits the service area of a station working on medium waves to somewhere between 50 and 100 miles.

Transmitting aeriels have been designed which were intended to concentrate the energy radiated by the aerial in a direction more or less tangible with the earth's surface, and to cut out the rays travelling upwards at a comparatively steep angle. I think I am right in saying that it has not yet been established beyond all doubt that any type of aerial is able by this means greatly to increase the effective service area of a station after dark or to make the service area for really good quality reception the same after dark as it is during the day.

A MODERN TRANSMITTER



The very best receiver cannot do much if the transmitter is at fault. That is why so much care is taken to keep all B.B.C. apparatus—such as this ultra short-wave transmitter—in first-class working order.

These experiments have not yet been brought to finality, so that we may still hope for something on these lines. However, when we turn to the question of the receiver, it has to be borne in mind that in these days most people expect to be able to get fairly good reception after dark from "medium wave" stations situated at distances of 400 to 1,000 miles.

In this case, of course, reception is by indirect ray only, and therefore one cannot visualise any kind of transmitting aerial which will prevent variations in the strength received at a distance.

The question therefore arises, can nothing be done to the receiver to prevent this, which at once suggests the use of an automatic gain control. Such devices are not simple, but they exist in many forms, and some of them seem to be very effective indeed.

It does not seem unreasonable to expect that most de luxe receivers will eventually incorporate such a device, but it certainly would mean more valves, more possibilities of breakdowns, and so on.

It may be interesting to mention that we use in the B.B.C. a successful type of automatic gain control in connection with our apparatus for taking continuous records of the depth of modulation of a distant broadcasting station.

Turning to the next question, (No. 5), I remember about six years ago I had a very elaborate American receiver which was of the super-heterodyne type and had 10 valves, followed by a separate unit containing a moving-coil loudspeaker with a power amplifier. It was also equipped with a rotating frame which was supposed to possess true directional properties.

Frame Aeriels for Selectivity.

I think that it was intended for use in cities such as New York and Chicago, where there are a number of transmitters working, and it seemed to me at the time that this idea of a rotating frame was quite a useful aid to the other means of selectivity provided in the receiver. Of course, if it were possible to give such a receiver directional properties following the well-known heart-shaped polar diagram of the modern Ship's Direction Finder, then quite a lot could be done towards cutting out some of the unwanted transmissions and interference without recourse to what might be called brutal selectivity in the receiver itself.

One wonders, therefore, whether anything will ever be done on these lines on a general scale. Of course, the trouble is that at present the tendency is to make the receivers self-contained, with no visible aerial at all, in fact there seem to be less true



The author, Mr. Noel Ashbridge, who is responsible for the technical side of the B.B.C.'s work.

frame aeriels in use now than there were some years ago, but still fashions change.

We now arrive at (6), the much discussed question of eliminating noises caused by tramways and other industrial machinery at the receiving end. It is usually said that nothing very much can be done in this connection at the receiver end, but I do not think it is impossible that we shall hear more of this even in the fairly near future.

Finally, the last point concerns the inefficiency of energy conversion of loudspeakers. At present a so-called power-valve is necessary to produce a minute amount of sound energy.

If loudspeakers could have an efficiency comparable with that of most other electrical components, most of the low frequency amplification could be done away with.

Future of the "Ultra-Short."

So far we have assumed that broadcasting is going to be carried out on the existing wavelengths, and that reception is going to be troubled by the same kind of difficulties which exist to-day. Possibly this is a rash assumption.

I am asked frequently in these days what about ultra-short waves. However, it is my opinion that whatever may be done with ultra-short waves, and I think that eventually something useful will be done, nevertheless the bulk of broadcasting for the next fifteen years will certainly be carried out on wavelengths between 200 and 2,000 metres.

Receiver designers of the future—perhaps the near future—may be faced with the necessity for adding adapters for much shorter wavelengths, by which I mean those below 10 metres in length, but at the risk of being a bad prophet I still would say that ultra-short waves are not likely to revolutionise broadcasting as we know it to-day, although by this statement it is most certainly not meant that no use is likely to be made of them.

A WIRELESS HANDBOOK

Intended for the Navy—But good for all Students.

THE Navy has a reputation for thoroughness; and in wireless technique this thoroughness first takes the form of issuing to all ratings concerned, a well-prepared up-to-date explanatory handbook, dealing with the theory and practice of radio communication.

The "1931" Admiralty Handbook of Wireless Telegraphy, now available to the public from H.M. Stationery Office, is a remarkable technical bargain at 7s. 6d. Very strongly bound, excellently illustrated, with over a thousand pages—its mere size and scope is inspiring.

Naturally, it emphasises the transmission and marine aspects of radio, rather than broadcasting, but anyone who wants a summary of wireless fundamentals will find the new Admiralty Handbook an extremely good investment.

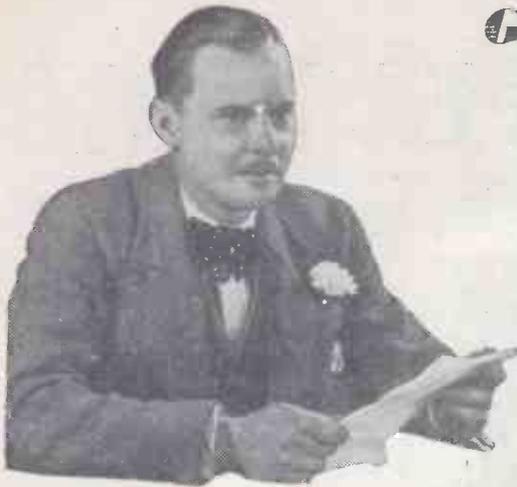
In any case the fundamental principles of radio technique are the same whether for broadcasting or marine practice.

Moreover, it is well laid out and arranged, with heavy type judiciously used in a manner that makes it invaluable to students.

Graham Farish says

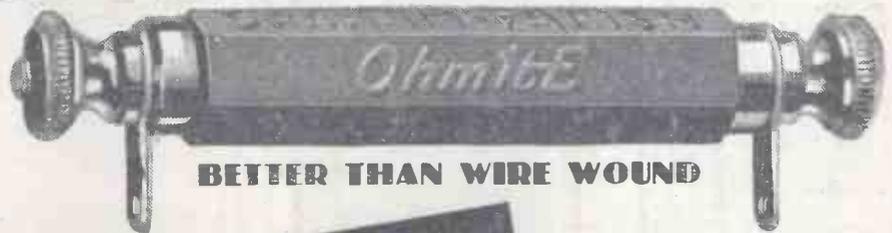
IT COSTS ME MONEY

It costs me literally thousands of pounds to tell you about my products. My business instincts, my Scottish caution tell me it would be money wasted to exaggerate my claims. That's why you can safely follow my recommendation to try G.F. Components. Believe me, you'll find them a step ahead of any you've tried before.



Graham Farish **OHMITE** RESISTANCES

The popular and efficient resistances for all general purposes. All values 300 ohms to 5 megohms. 1/6d. each.



BETTER THAN WIRE WOUND

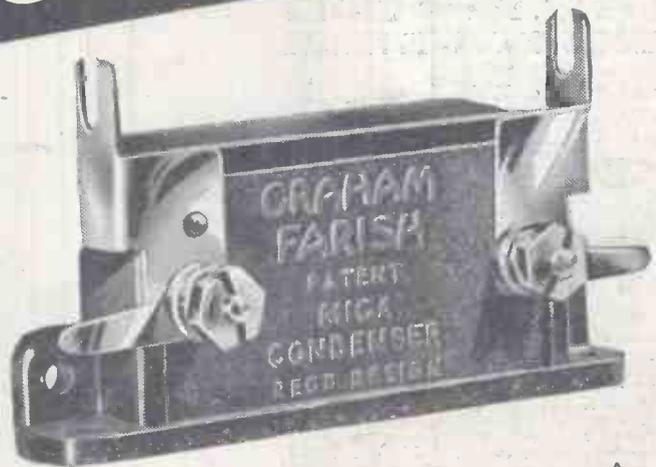
1/6
EACH

FIXED Graham Farish **CONDENSERS**

In a complete range of capacities, upright or flat mounting. Registered design No. 723271. Every condenser is tested on 750 volts D.C. The capacities are accurate within fine limits, and every condenser can be thoroughly relied upon.

.00005 mfd. to .005 mfd. to
.004 mfd. .01 mfd.

1/6 **1/6**



GRAHAM FARISH COMPONENTS

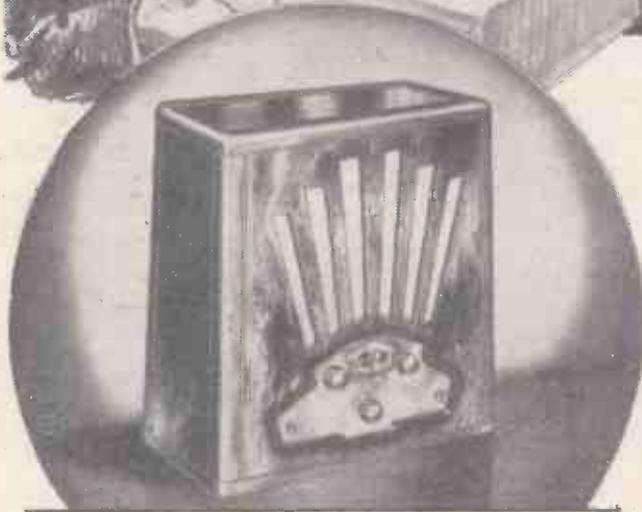
GRAHAM FARISH LTD., MASONS HILL, BROMLEY, KENT.

SKYSCRAPER RADIO

What greater gift for any home?



**ABSORBINGLY INTERESTING TO BUILD
70 STATIONS TO CHOOSE FROM
CHRISTMAS
ENTERTAINMENT
FROM ALL OVER THE WORLD**



**GREAT LISSEN CONSTRUCTIONAL CHART TELLS
EXACTLY WHAT TO DO WITH EVERY SINGLE
NUT AND SCREW!**

Firstly, there is the absorbing interest of watching the Skyscraper develop under your own hands from a box of parts to a clean, glistening, all-metal radio receiver. Then the thrill of trying it out—of bringing in stations you have never heard before—of being able to pick any programme you like from your Christmas newspaper and bring it in with certainty—of dancing all Christmas night if you like to bands from the ends of Europe. Lissen have published a 1/- Constructional Chart, giving the most detailed instructions ever printed for the building of a wireless set. You can't go wrong—every part, every wire, every terminal is identified by photographs. Everybody, without any technical knowledge or skill, can safely and with COMPLETE CERTAINTY OF SUCCESS undertake to build this most modern of radio receivers from the instructions given and the parts Lissen have supplied.

COMPLETE IN CABINET WITH LOUDSPEAKER £6.5s *or 11/6 down and twelve monthly payments of 10/6*

GIVE A SKYSCRAPER FOR CHRISTMAS

This new Lissen SKYSCRAPER Kit set is the only one on the market that you can build yourself employing a Metallised Screened-Grid Valve, High Mu Detector and Economy Power Pentode Valves. Around these three valves Lissen have designed a home constructor's kit the equal of which has never been before.

THE ONLY KIT YOU CAN BUILD YOURSELF EMPLOYING METALLISED S.G. HIGH MU DETECTOR AND ECONOMY POWER PENTODE VALVES



COMPLETE WITH VALVES
89/6
OR 8/6 DOWN AND 12 MONTHLY PAYMENTS OF 7/6 DOWN

Why be satisfied with whispering foreign stations when you can BUILD WITH YOUR OWN HANDS this LISSEN SKYSCRAPER that will bring in loudly and clearly distant stations in a profusion that will add largely to your enjoyment of radio?

You can get the Lissen Skyscraper Chart FREE from any radio dealer, or by posting the COUPON below direct to factory.

To-day you can buy the LISSEN SKYSCRAPER KIT on Gradual Payment Terms.

Skyscraper Chassis Kit, complete with Valves, CASH PRICE 89/6 Or 8/6 down and twelve monthly payments of 7/6. Skyscraper Kit complete with Walnut Cabinet and Inbuilt Loudspeaker, as illustrated, £6 5s. CASH. Or 11/6 down and twelve monthly payments of 10/6.



Insert this COUPON in unsealed envelope with only halfpenny stamp, and address to:—
LISSEN LIMITED, Dept. P.W. 15, Worples Road, Isleworth, Middlesex.
Please send me FREE copy of your 1/- Skyscraper Chart.

NAME
ADDRESS

LISSEN SKYSCRAPER KIT 3

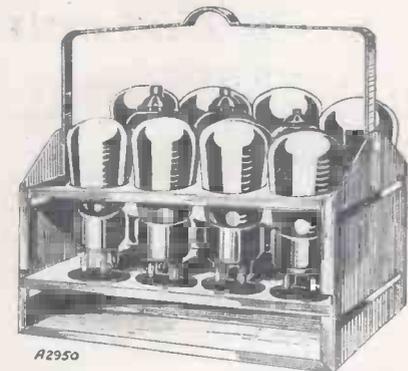
GREATEST CHART EVER PUBLISHED — GREATEST SET EVER BUILT!



★.....★ **Valve Safety for Sixpence** ★.....★

Those who are lucky enough to have a small stock of spare valves are often puzzled as to how to keep them safely. Valves are such fragile things, though expensive, and get broken very easily if left lying about after their original cartons have been discarded.

To all those who have access to a branch of a certain famous multiple stores, a simple solution is available for sixpence.



A new use for an old idea, which protects your favourite valves.

For this sum an egg-stand may be purchased which forms a most convenient portable rack in which to keep your valves.

★.....★ **Your Set on Wheels** ★.....★

Few wireless enthusiasts are lucky enough to have the use of an entire room in which to carry on their activities free from the devastation of the duster, the vicious jabs of the vacuum cleaner, and the daily disturbance of apparatus due to domestic activities. Most of us are merely allotted a certain amount of space somewhere and have to make the best of it.

A cupboard is by no means an ideal receptacle for gear which is actually in use, as the light is generally bad, parts are inaccessible and adjustments hard to make. There is, however, a way out.

The large dinner wagons so popular in the Victorian days can be pressed into useful service once again, and for the benefit of those whose boxrooms do not contain a discarded dinner-wagon, it may be mentioned that they can be picked up for a very few shillings at most second-hand furniture shops.

These wagons are generally about four feet long by one and a half feet broad, and usually have three tiers, this being equivalent to a table twelve feet long and of equal breadth.

This should prove sufficient space for the accommodation of all the gear that is

likely to be in use at any one time, and, by the simple expedient of fitting accessible aerial, earth, loudspeaker, and mains connections which can be easily disconnected.

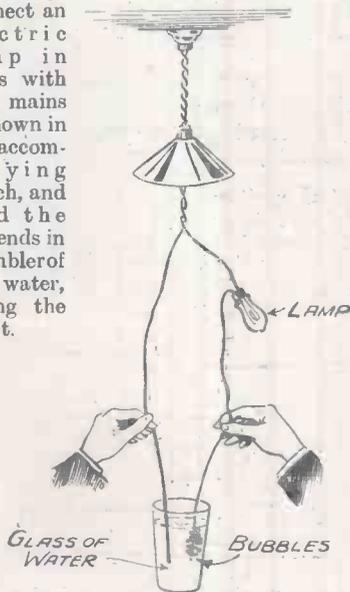
The entire set-up can be wheeled out of the room during the dangerous domestic activities, and so remain entirely undisturbed.

★.....★ **Which is Which?** ★.....★

ALTHOUGH D.C. mains have their disadvantages, they certainly have it over the A.C. variety for charging, where simplicity is concerned. The problem always arises, however, how to determine the positive and the negative main.

Here is an easy method of finding the polarity.

Connect an electric lamp in series with the mains as shown in the accompanying sketch, and hold the two ends in a tumbler of salt water, noting the result.



A glass of salt water gives an easy test for D.C. mains polarity.

The wires should be kept about an inch apart under the surface, and it will be noted that one of the leads gases. This is the negative wire.

★.....★ **Screening the Pick-up** ★.....★

IT is sometimes difficult entirely to cut out hum due to an electric gramophone motor, although the external leads to the pick-up may be encased in an earthed metal shield.

This is due to the fact that induction probably exists between the motor and the windings actually in the pick-up head.

The trouble with the small D.C. motors can usually be cured by shunting large condensers across the brushes. With an

A.C. motor, of course, this expedient is useless.

The easiest plan in this case is to screen the motor from the pick-up. A layer of



Metal foil on the motor-board ensures screening for pick-up.

thin metal foil should be cut, ensuring ample space for all fixing holes, and lightly fastened to the motor-board.

Care must be taken to see that the foil does not short circuit any mains connections. The pick-up may be screwed down to the foil and board, the wires passing straight through the foil. In some cases a complete cure of hum will be effected by earthing the foil.

★.....★ **Differential Input Control** ★.....★

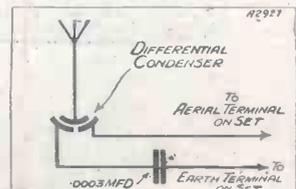
OVERLOADING, of course, is not always confined to the L.F. portion of the receiver, and

close to a powerful transmitter it is desirable to provide some form of pre-detector volume control. This is particularly the case with big sets employing one or more stages of H.F. amplification. It is wise, in fact, to fit the control actually before the first stage.

Unfortunately, however, big sets usually have ganged tuning circuits, or at any rate, two or more dials to be adjusted. The normal

simple forms of input control, such as a series aerial condenser, are thus unsatisfactory, since they upset tuning.

An excellent scheme, however, is that indicated in the diagram. The .0003 condenser is of the pre-set type and can be adjusted to such a position



Pre-detector volume control.

(Continued on next page.)

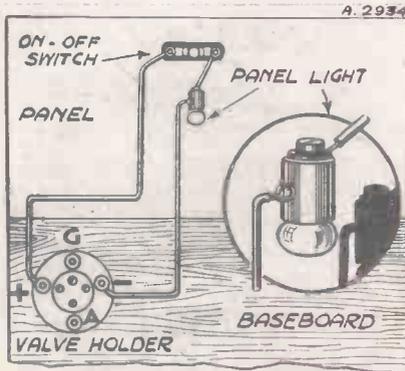
RECOMMENDED WRINKLES

(Continued from previous page.)

that it will be found that a movement of the moving plates of the differential condenser has little effect on the tuning, while it will, of course, control volume.

Switching a Panel Light **ECONOMICAL** constructors often reject the idea of fitting a panel light even though it does take only a few milliamps from the L.T. accumulator.

Such a disadvantage, however, can quite easily be overcome by the inclusion of a small on-off switch, which may be fitted neatly on the panel. By means of



Switch off the lamp when you've tuned in and save your L.T.

this device the panel light need be used only when required, and once the desired station is tuned the lamp may be extinguished until again required.

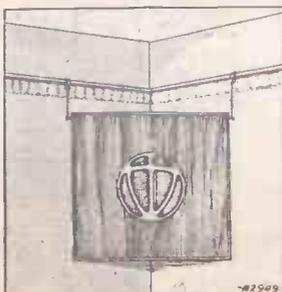
From the accompanying diagram the simplicity of the connections will be apparent. The positive side of the most convenient valveholder is wired to one side of the panel-light switch, the other side of which is joined to one terminal of the lamp, and the remaining side of lamp is connected to the negative side of the filament, or the nearest earthing point.

Baffle Positions **THOSE** who prefer a baffle board to a cabinet for their loudspeaker may come up against the problem of its accommodation at some time. The simplest thing to do is to fix it up in the corner of the room.

This can very easily be done by two pieces of wire attached at their lower ends to the top corners of the baffle and at their top ends to picture hooks. The latter are put on the picture rail as for picture hanging.

If there is no picture rail two strong nails may be used in place of the hooks. The baffle fits snugly into the corner of the room as shown by the sketch.

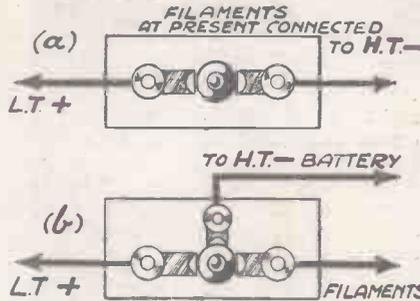
If yours is a heavy moving-coil speaker, make sure the picture-rail is firmly fixed,



Neat and efficient.

Cutting out H.T. **MANY** set-owners are uncertain as to the best method of cutting out the H.T. battery as well as the L.T., when switching off.

All that is necessary is a three-point switch, instead of the ordinary two-point on-off arrangement. Two contacts on the



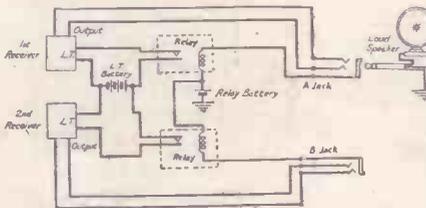
A.2933

"three-point" are connected to make or break the low-tension circuit, as is usual, and the third contact carries the H.T. negative flexible lead, which thus joins the L.T. through the switch instead of direct to the filament wiring.

The original (a) and improved arrangements (b) are shown in the sketch.

Remote Control **IN** the usual form of remote control of a wireless set, plugging the loudspeaker into a jack on the wall the wireless set situated in some other part of the house is automatically switched on, and alternately when the plug is withdrawn then the set is automatically switched off.

Now obviously there are limitations to this form of remote control, inasmuch



that the set can only be switched on and off, and furthermore it is only possible to listen to one station.

What is required, therefore, is a system of remote control by which it is possible to alter the controls on the set and get more than one station as well as switching the set on and off.

There are a number of methods of doing this.

The simplest method is to have two different sets (see diagram) together with two jacks A and B in the various rooms from which it is desired to remote control the wireless set. Thus, if one set is tuned to one programme and the second set tuned to another, then to change from one programme to another by remote control merely means taking the loudspeaker plug out of jack A and inserting it in jack B. Thus one set is switched off while the other is switched on.

Although two different wireless sets are in operation, it is, of course, only necessary to

use the same H.T. and L.T. batteries, etc., by means of paralleling them on both sets.

A Mystery Solved **IT** is common practice to place a small fixed condenser (C_1 in dia.) of some .0001-mfd. capacity between the plate and filament of the detector valve, in order to improve the rectification. This has no disadvantages on ordinary broadcast wavelengths; but on short waves, apart from the difficulty of reaction, there is another effect.

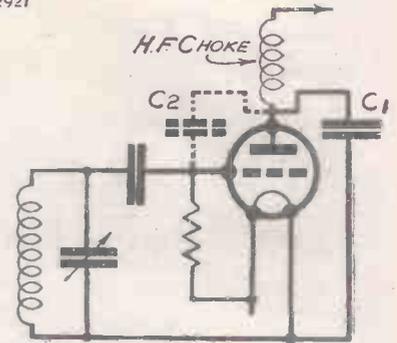
It will be found that the minimum wavelength to which a given coil will tune will be increased.

For instance, the set in which this effect was first noticed, originally tuned down to 18 metres, but on inserting the anode to filament condenser, the minimum went up to 22 metres.

It took some little time to puzzle out the cause of this.

Here it is. The grid and anode form a

A2921



small condenser (C_2 in diagram); thus we have C_1 and C_2 in series shunted across the grid circuit, thus increasing its minimum capacity, and consequently increasing its minimum wavelength.

A Combined Aerial **IF** you don't like the idea of putting up with an indoor aerial and you have not room outside to erect a proper outdoor aerial, try combining the two.

Start off by fixing the wire with an insulator as high up and as far away from the house as possible. Then thread the wire through an ebonite tube fixed in the window frame, and continue by running round two or three sides of the room.

Fix the wire an inch or two from the wall with insulators, and anchor the end well, leaving a length of wire sufficient to reach down to the set's aerial terminal. You will then have quite an efficient aerial, with no join in the wire.

Ebonite Economy **IN** the interests of economy, many people use wood instead of ebonite for their panels. Provided that the wood is quite dry this is permissible, but you should avoid the use of black stains, as these are very often conductive.

By far the best plan is to polish the panel without staining it. The effect produced is very pleasing if the cabinet is fairly dark in colour. Of course, components on a conductive stained panel may be insulated therefrom as with metal panels.



Graham Farish says

YOU CAN'T BE MORE CRITICAL THAN I AM

I don't know what tests you make of the Components you buy, but I do know that every one I sell is tested far more stringently before it leaves my factory. It has to be not only capable of doing the job for which it is designed—but it has to bear electrical stresses greater than will ever be required in practice before I allow it to bear my name. That is why you can trust every Graham Farish product to the limit.

EARTH WITH
Graham Farish
FILT

2/6
COMPLETE

You'll never know how good your set can be till you fit **FILT**. **FILT** means efficient earthing—a vital factor in good reception. Greater volume, increased range, reduced oscillation, mains hum and crackle eliminated. Hundreds of listeners have expressed their surprise at the improvement obtained by **FILT**.

Simply bury the copper receptacle containing the wonderful **FILT** chemical which spreads through the earth, attracting moisture and making a highly conductive area several feet deep. **FILT** keeps moist and highly conductive, earthing your set perfectly and giving you every ounce of power, range and purity.

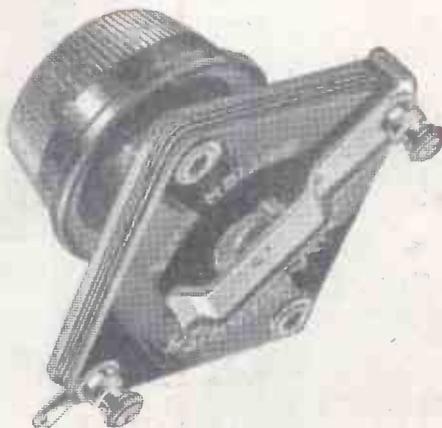


Filt is a patented device and proceedings will be taken in all cases of infringement.

Graham Farish
LIT-LOS
SOLID DIELECTRIC
VARIABLE CONDENSERS

2/-
EACH

A very carefully constructed instrument, compact in size and efficient in design, with accurately gauged bakelite dielectrics and solid brass pigtail connection to moving vanes. Made in all capacities up to .0005 mfd. in tuning, straight line capacity and differential types. Used by many leading manufacturers and specified in sets by famous designers. One hole fixing; supplied complete with terminals.



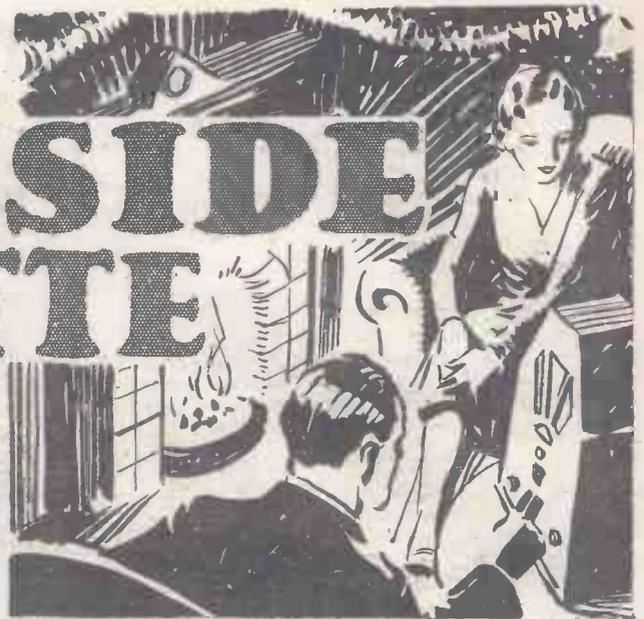
GRAHAM FARISH COMPONENTS
GRAHAM FARISH, LTD., MASONS HILL, BROMLEY, KENT

BUILD *The* FIRESIDE CONSOLETTTE

with a

DIRECT RADIO GUARANTEED KIT

A POWERFUL LONG DISTANCE SET THAT BRINGS IN ALL HOME AND FOREIGN STATIONS



	2 s. d.
1 Baseboard, 18" x 10"	1 6
1 J.B. Unitune 2-gang .0005-mfd. tuning condenser	18 6
1 Ready Radio .0001-mfd. variable series aerial condenser	2 0
1 Ready Radio .0005-mfd. differential reaction condenser	3 0
1 Igranite type Megha .5-meg. volume control	5 0
1 Dubilier 2-meg. resistance and holder	1 6
1 Dubilier 80,000-ohm resistance and holder	1 6
1 Dubilier 45,000-ohm resistance	1 0
1 Dubilier 30,000-ohm resistance	1 0
1 Dubilier 1,000-ohm resistance	1 0
1 Lissen 2-gang screened coil unit	17 6
1 Lowcos H.F. choke	6 0
1 Ready Radio screened-grid H.F. choke	5 6
1 Ready Radio rotary change-over switch	2 9
3 T.C.C. 2-mfd. fixed condensers	10 6
1 T.C.C. 1-mfd. fixed condenser	1 10
1 T.C.C. .01-mfd. fixed condenser	2 6
1 Dubilier .0005-mfd. fixed condenser, type 670	1 0
1 Dubilier .0001-mfd. fixed condenser, type 670	1 0
4 Valve holders	2 0
1 R.I. Audirad output choke	8 9
1 R.I. Hypermic L.F. transformer	12 6
1 Fuse holder	6

1 Terminal strip, 3" x 14"	3
2 Belling-Lee terminals	5
3 Belling-Lee plugs	6
1 Belling-Lee Scruface 60-m.a. fuse	6
1 3/4" switch bracket	6
1 Coupling link	6
1 Extension spindle	6
1 Piece copper foil, 18" x 10"	1 6
3/4" of flexible metallic single-screened tubing	3
Screws, flex. connecting wire, etc.	1 6
4 Mullard valves to specification	2 2 6
1 "159" Consolette cabinet	2 0 0
	£9 17 0

- Kit Model No. 1**
(less valves and cabinet)
£5:14:6
or twelve monthly payments of 10/6
- Kit Model No. 2**
(with valves less cabinet)
£7:17:0
or twelve monthly payments of 14/6
- Kit Model No. 3**
(with valves and cabinet)
£9:17:0
or twelve monthly payments of 18/6
- Kit Model No. 4**
(with Epoch Super Junior Permanent Magnet Moving Coil Speaker.)
£11:4:6
or twelve monthly payments of £12:6

SCOTT & AGGAR'S S.T. 400

STANDARD MODEL

KIT Model 1

(less valves and cabinet) **£4:19:6**
Or 12 equal monthly payments of 9/3

KIT Model 2

(with valves less cabinet) **£6:18:9**
or 12 equal monthly payments of 13/-

KIT Model 3

(with valves and cabinet) **£7:19:9**
or 12 equal monthly payments of 15/-

DIRECT RADIO DE LUXE MODEL KIT No. 1

(less valves and cabinet) **£5:15:0**
or twelve equal monthly payments of 10/9

KIT No. 2

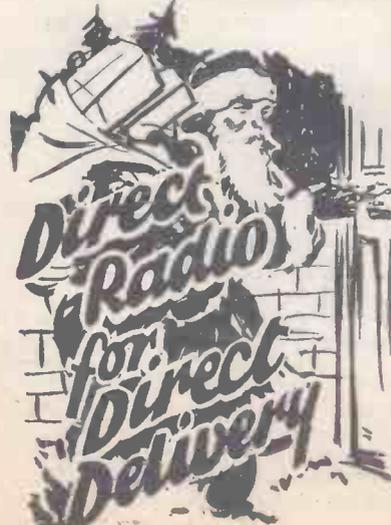
(with valves less cabinet) **£7:17:0**
or twelve equal monthly payments of 14/6

KIT No. 3

(with valves and cabinet) **£9:2:0**
or twelve equal monthly payments of 16/8

KIT No. 4

(with valves and special "159" S.T. 400 De Luxe Consolette cabinet and Epoch A2 Dance Orchestra Speaker.)
£12:15:0
or twelve equal monthly payments of £1:4:0



Direct Radio

Any Proprietary S.T. 400 Kits, Manufacturers' Receivers and Components can be supplied from stock. Order early for Xmas.

CASH, C.O.D. AND EASY PAYMENT ORDER FORM.
To: Direct Radio Ltd., 159, Borough High Street, London Bridge, S.E.1

Please dispatch to me at once the following goods.

(a) I enclose
for which (b) I will pay on delivery { Cross out line }
(c) I enclose first deposit of { not applicable }

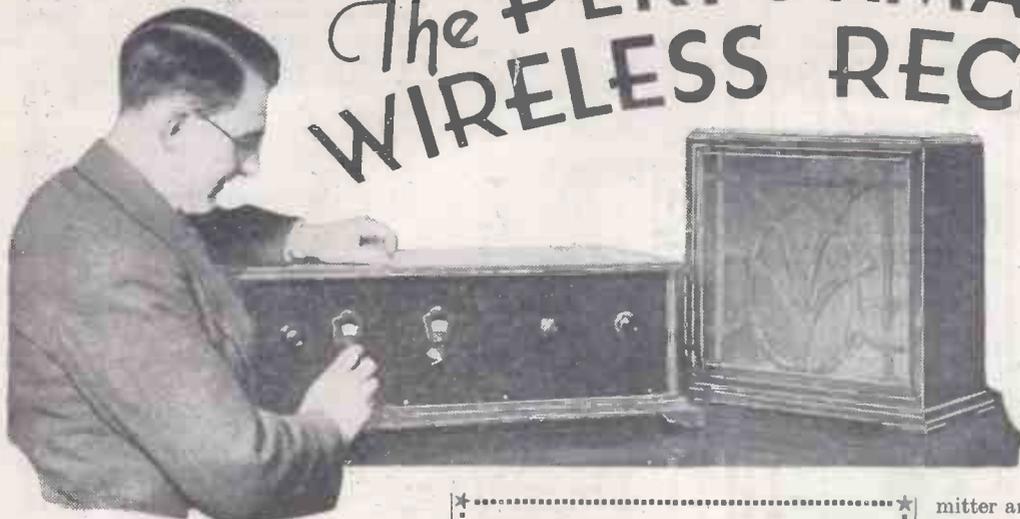
NAME

ADDRESS

Pop. W. 10/12/32

**159
BORO
HIGH
STREET
LONDON
BRIDGE**

The PERFORMANCE of WIRELESS RECEIVERS



by
Sir Ambrose Fleming
F. R. S.

WE are told on good authority that about five million wireless reception licences have been issued this year by the General Post Office, also there is evidence that many millions of thermionic valves have been made and sold in this country in the same time. If we put down only two listeners-in for each licence, it is clear that at least one-quarter and probably one-half of the inhabitants of the British Islands are interested in wireless reception.

Acute Critics of Performance.

Only a very, very small fraction of them are concerned with any scientific knowledge of the processes or appliances used to conduct this modern miracle of supplying speech and music "on-tap" in our own houses. The great bulk of them know little and care less about the inside of their receiving set, but they are acute critics of its performance and can say at once if they are receiving what they wish and as they wish it.

Apart altogether from any criticism of the broadcasting programmes or the imperfections of speech quality in the speakers who take their place at the microphone, it is a fairly easy task for the most unscientific to say if the performance of their receiving set satisfies their demands.

On the other hand, the makers of receiving sets are compelled by the sharp competition to continually strive for better things. Here then we have some very practical and important questions presented for solution.

Many Unsolved Problems.

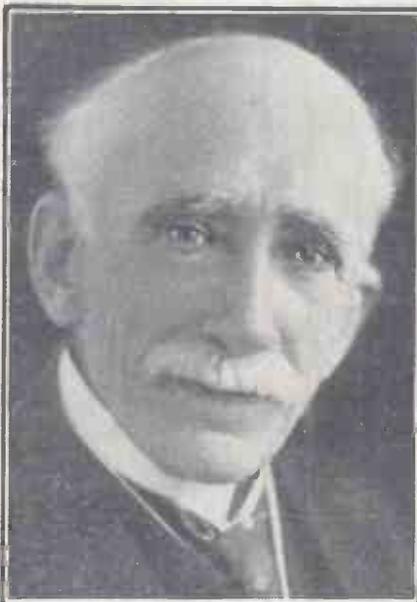
The manufacturer demands from research workers information as to the structure to be given to receivers to make them as perfect reproducers of speech and music as possible; and the purchaser asks to be told what qualities he should ask for and find in a high-class receiving set when he is buying one, having regard to the increasing number of high-power broadcasting stations.

Unfortunately, however, there are many yet unsolved problems in connection with perfect reception and apart even from interference of unwanted stations, or of atmospherics or fading even, the processes

This is no high-brow and difficult-to-read treatise, but a clear exposition of radio fundamentals, made fascinating by terse and vigorous statement.

The author's fame is world-wide as writer, as lecturer, as scientist—and as

THE INVENTOR OF THE VALVE



Sir Ambrose Fleming, F.R.S.

involved in reception from a single broadcasting station are in dispute and not fully understood as yet.

As far as regards transmission, we may, I think, take it that there is no great room for improvement.

The powerful valve generators of the present-day, controlled in frequency by standard tuning forks or quartz oscillators, provide the means of sending out an extremely uniform carrier wave of defined frequency.

The modern microphones also modulate this carrier wave with great similarity to the changes in air pressure at the diaphragms due to the sounds to be broadcast. What happens in the space between trans-

mitter and receiver or in the receiver itself is another story.

Let us begin by considering the manner in which certain musical instruments work. Take, for instance, a piano.

Importance of Damping.

On looking at its mechanism, we see that the first effect of putting the finger lightly on a key is to raise a damper off the corresponding wire and leave it free to vibrate. A little farther depression of the key causes the hammer to strike the string a blow, and then it flies back leaving the string free to vibrate.

The instant, however, that the finger is raised from the key the damper falls back and stops or quenches the vibration of the string.

Hence matters are so contrived that the string begins to vibrate the instant the finger is struck on the key and stops the instant it is raised. The vibrations are sharply quenched.

Hence in a series of finger impacts the musical sounds or notes emitted are distinct from each other.

If, however, the loud-pedal is put down the dampers are all put out of action, and the notes persist or are only slowly quenched, and hence "tread on one another's heels," when a rapid series of notes is played.

The Human Ear.

In the case of wind or breath-blown instruments the sound is quenched the moment the performer ceases to blow or the wind supply is stopped by the key-being raised.

In string instruments like the violin or 'cello, the damping is under control by the bow.

In percussion instruments like the drum there is little or no damping.

In the human ear there is an entire absence of any persistence, but complete damping. The vibrations of the ear tympanum and the auditory sensations in the mind follow with perfect accuracy the smallest changes of air pressure made against the ear tympanum.

There seems nothing in the ear which corresponds to persistence of vision in the eye.

Hence when listening in a concert-room directly to the complicated sounds sent out

(Continued on next page.)

THE PERFORMANCE OF WIRELESS RECEIVERS

(Continued from previous page.)

by the orchestra or singers the ear appreciates distantly the minutest changes in air pressure caused by the simultaneous production of numerous musical sounds differing in pitch or frequency, duration, loudness or amplitude and quality or wave form.

We receive the music in concert room perfection and the same for speech.

Next let us consider what is taking place in the wireless receiver when it is receiving broadcast music from a distance.

Trains of electric waves are falling on the aerial and exciting electric oscillations in it. However complicated the aerial circuit may be, it is equivalent to a simple circuit possessing resistance, capacity, and inductance, and therefore a certain damping and natural time period of oscillation.

This circuit is coupled to some other circuit which contains some rectifying device, and the modulated oscillation induced in it by the tuned aerial is converted into a direct pulsating current. This, again, is transferred to a "telephone" circuit and the audio frequency pulsations of rectified current set the telephone diaphragm in oscillation and reproduce in some degree the sound made to the microphone at the transmitting station.

A "Nimble" Circuit.

To do this effectively the receiver must have not merely syntonic agreement with the transmitter carrier frequency, but must also have a quality I will call *nimbleness*, which enables it to follow as far as possible instantly the slightest variation in pitch, amplitude or quality in the modulation of the carrier wave.

When the electric waves strike the receiver aerial a certain number of oscillations have to take place to work up the aerial current to its full strength. If the incident electric waves stop arriving then the aerial circuit continues to oscillate for a brief time.

The same takes place in the "telephone" circuit. Hence there is a certain *lag* at the beginning and drag or persistence at the end of each train of arriving waves in the response of the telephone, and unless this is corrected it cannot follow with sufficient nimbleness very slight, or short-lived, changes in the modulation of the transmitted wave train.

Effects of Modulation.

The more complicated this modulation the more difficult is it for the telephone to reproduce it accurately. Accordingly the performance of a wireless receiver is not merely a question of selectivity or sharp tuning to one particular carrier frequency, viz., that of the unmodulated carrier wave, but of sufficiently rapid and accurate response to the changes in its modulation.

At this point we must draw attention to the fact that if two pure electric carrier

waves of different frequency and amplitude are superimposed or added together, the result is to create what is called a modulated carrier wave in which the amplitude rises and falls regularly. This can be proved mathematically.

The point, however, to particularly notice is that it does not follow that, because two purely different frequency carrier waves superimposed are equivalent to a modulated oscillation, therefore every modulated oscillation is produced by two superimposed carrier waves. This is a matter which is in dispute between radio-theorists. One school say that to receive music well a receiver must



PROGRESS

in radio technique is well illustrated here, the larger picture showing a special parabolic reflector microphone, which can be "focused" on one instrument or performer to the exclusion of the others, during operas, etc.

The left is the Royal Microphone used by the Prince of Wales at Belfast recently. (It was specially made by the Marconiphone Co., Ltd.)



not be too selective but must be able to pick up the whole range of side-band waves, as they are called, into which the modulated vibrations or electric waves reaching the receiver can be resolved.

Thus, if the broadcasting station is sending out a carrier wave having a frequency of 1,000 kilocycles, that means a million vibrations per second, and if this wave is modulated by a microphone picking up music, the audio-frequency of which lies between, say, 50 and 5,000, then the modulated vibrations will be equivalent to a range of carrier or unmodulated waves lying between 995 and 1,005 kilocycles and the receiver must be able to pick them all up and re-combine them into the modulated vibration.

The other school deny this conclusion and say that the receiver cannot be too sensitive or selective, but that to pick up highly modulated carrier waves of a single frequency and render music well the receiver construction must be such as to make it *nimble*; that is to say, the "telephone" must respond to the slightest change in the modulation amplitude or frequency, no matter how brief its duration may be.

Also, the notes must not overrun one another but the sound of any note in the loudspeaker or telephone must stop as soon as the corresponding note in the concert room. Also, there must be no sensible lag or delay in the beginning of the "telephone" sound at the receiver. If the receiver is in this way responsive it cannot be too selective.

Need for Selectivity.

The validity of this last opinion is supported by the performance of the Stenode Radiostat receiver invented by Dr. James Robinson, in which very high selectivity is obtained combined with good reproduction. What is required in a good wireless receiver is very sharp selectivity or response only to a single carrier wave frequency, combined with very small internal energy losses, but also means equivalent to the dampers in a piano for effectively quenching the electrical vibrations as soon as the corresponding impulse from the corresponding musical note ceases to fall on the aerial.

That means there must be instant response to the feeblest and shortest changes in modulation amplitude or frequency.

Is Broadcasting in Danger?

The rapid multiplication of high-power broadcasting stations in Europe combined with the narrow limits within which their carrier-wave frequencies can lie, will kill all broadcasting before long unless receivers with the above-mentioned characteristics can be obtained at prices it is possible for the general public to pay.

SOME PRACTICAL HINTS

which will help you to secure trouble-free reception.

When testing L.T. accumulators with a hydrometer it is important to remember to return the acid to the cell from which it was taken immediately after the specific gravity has been ascertained.

If your set seems a bit noisy and you can see gas bubbles adhering to the plates of the accumulator, give this latter a gentle shaking to remove the bubbles, which are likely to be the cause of the trouble.

The contacts of aerial-earth switches should always be kept bright. So as to avoid the necessity for too-frequent overhaul, the switch should be protected from the weather by some sort of cover.

Shutting a window down on an aerial or earth wire is one sure way of laying up trouble, as the strands are bound to get cut through in time; and this may happen when covered by insulation, which makes it all the more difficult to detect.



B.T.H. MINOR PICK-UP has been re-designed and improved and now includes a special volume control fitted in the base of the tone-arm pillar. This model is constructed in a one-piece moulding of B.T.H. "Fabriolite" and is recommended to those requiring a highly efficient but inexpensive pick-up. Price 25/-.

B.T.H. SENIOR PICK-UP (1933 model). This has been completely re-designed and gives an even better response curve than hitherto. Free coupling of the head to the tone-arm reduces pressure on records and facilitates needle changing, and a ball-bearing universal joint on the tone-arm support ensures easy tracking. And Independent and specially designed volume control of correct value is supplied with this connoisseurs' model. Price £2.2.0 complete with volume control.

B.T.H. SENIOR PICK-UP complete with four adaptors to fit standard tone-arms. Price 27/6



**THIS
PICK-UP
MINDS
ITS OWN
BUSINESS**



PICK-UP and Tone Arm

EDISWAN RADIO
100% BRITISH

It's a pick-up that doesn't take liberties with the record—it plays all there is on the record—no less, no more. That is why leading radiogram manufacturers use it; why radio engineers choose and recommend it—for its even, accurate and sensitive response over a wide range of frequencies.

All good radio dealers stock B.T.H. pick-ups and will be pleased to demonstrate them.

THE EDISON SWAN ELECTRIC CO. LTD.



155 CHARING CROSS RD., LONDON, W.C.2

W194

PEEPS BEHIND THE SCENES

IN PRODUCING A PLAY SEVERAL STUDIOS ARE USED & THE SOUNDS PRODUCED FROM EACH ARE SCIENTIFICALLY MIXED BY THE PRODUCER INTO A HARMONIOUS WHOLE.

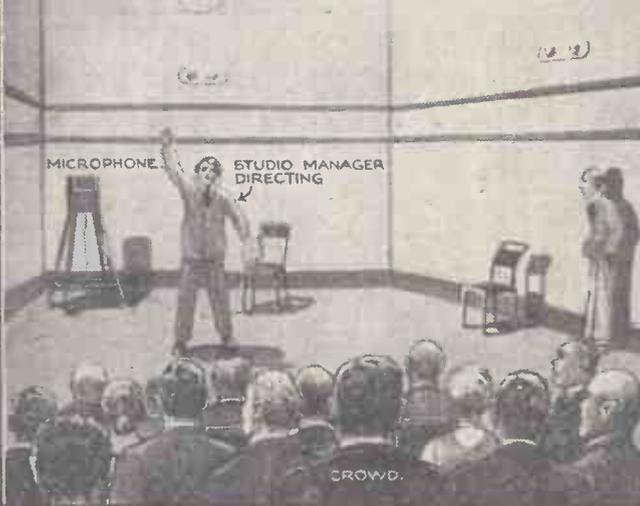


NOTE: THE ECHO STUDIOS ARE SITUATED IN THE BASEMENT.



THE CHIEF ACTORS ARE SPEAKING THEIR PARTS IN ONE STUDIO.

FROM YET ANOTHER STUDIO COME THE NOISES OF A CROWD.



THE WHOLE OF THE PLAYERS, MUSICIANS, & TECHNICIANS ARE CONTROLLED BY THE PRODUCER, WHO, BY MEANS OF THE DRAMATIC CONTROL PANEL, SIGNALS THE PERFORMERS WHEN TO PROCEED, MODULATING THE BAND, CROWD & EFFECT NOISES & SCIENTIFICALLY MIXING THE OUTPUT OF ALL THE STUDIOS EMPLOYED.



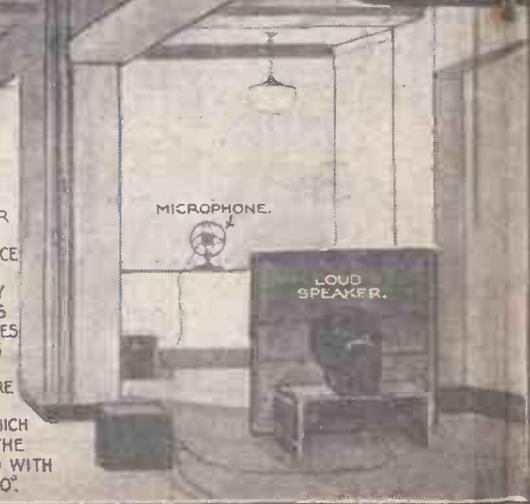
EVERY ARTIST, MUSICIAN OR ASSISTANT IN ALL STUDIOS WORKS STRICTLY TO THE LIGHT SIGNALS CONTROLLED BY THE PRODUCER

FROM THE GRAMOPHONE EFFECTS STUDIO COME OTHER SOUNDS SUCH AS THE RUSH OF AN EXPRESS TRAIN, REAL GUNFIRE, &C., &C.



THE ECHO STUDIO.

MUSIC OR OTHER SOUND NEEDING SPECIAL RESONANCE IS CONVEYED TO A ROOM ESPECIALLY SELECTED FOR ITS "ECHOING" PROPERTIES. HERE THE SOUNDS EMITTED FROM A LOUSPEAKER ARE PICKED UP BY A MICROPHONE WHICH NOW RECORDS THE ORIGINAL SOUND WITH THE ADDED "ECHO".



AT BROADCASTING HOUSE

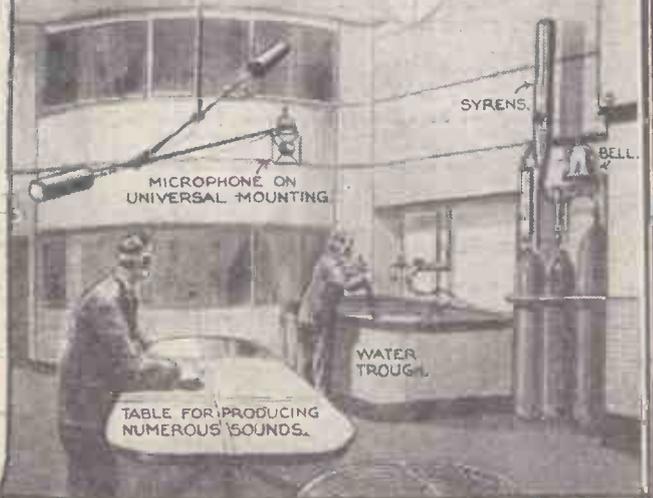
ANOTHER STUDIO CONTAINS THE ORCHESTRA SUPPLYING THE MUSICAL BACKGROUND.



THE MUSIC BEFORE GOING TO THE PRODUCER'S PANEL IS BALANCED & CONTROLLED BY AN EXPERT.



THE EFFECTS STUDIO SUPPLIES OTHER SOUNDS SUCH AS RUNNING WATER, HOOF-BEATS, SHIPS' SYRENS, ROWING, BELLS, ETC.



IN THE CONTROL ROOM THE OUTPUT OF THE STUDIOS PROPERLY MIXED & TECHNICALLY CONTROLLED IS SENT BY LAND-LINE TO THE TRANSMITTING AERIALS.

STANISLAS: You don't sleep enough - that's what's wrong with you, my dear Paul. A week ago we were dancing in Petersburg. I beg its pardon - Petrograd.

THE COUNT: I know.

X 8A.
6P.

[Behind the hoof-beats "Fades of Vienna Woods" fades in very softly. The two noises continue together, and then the latter fades out.]

It's a century ago. I've forgotten how to dance by now. I've forgotten all my partners.

STANISLAS: [laughing] Hard-hearted brute! I haven't.

THE COUNT: [laughing] Then you'd better, Sentimentalist! I pause. The hoofs beat on, and! What's that?

STANISLAS: Nothing.

X 6D

[The hoofs beat on. Suddenly a single shot rings out.]

THE COUNT: Gollop! Gollop, you devils! Through or over - go for the flashes! Wounded meat shift for themselves. Come up you brute!

X 6D

[The hoofs rattle as the horses are gathered together, and plunge forward in a wild charge. A few more shots.]

THE COUNT: Steady there! Halt! Stanislas!

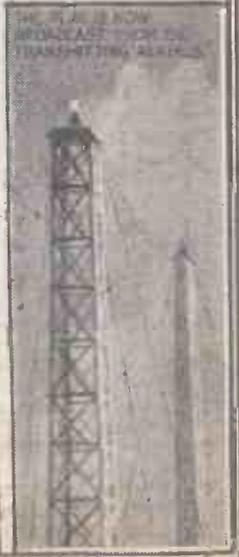
STANISLAS: All right, Paul. Clean through - what a show!

THE COUNT: You can thank your stars you're not dead. Forward, and keep your eyes skinned!

X 6D

[The hoofs die away, fading back into Scene VIII.]

Fade out



The FIRESIDE CONSOLETTA



WITH less than three weeks to go to Christmas Day, many of our readers will be looking to "P.W." to provide something special in the way of a set-design for the great occasion. Here it is—the "Fireside Consoletta."

The title photograph will show you that this latest "P.W." set is housed in a handsome cabinet of particularly convenient design, enabling it to be placed unobtrusively on a sideboard or table. And such a cabinet, neatly containing the batteries and the loudspeaker, is nowadays known as a "consoletta."

Tidy and Compact.

Its up-and-coming popularity is easily understood. It keeps the set free from straggling leads to batteries, makes it tidy and compact, and enables it to fit easily into its allotted corner or place, as a good family set should.

Best of all, this set justifies its name and place in the friendly fireside circle of a modern home by its ever-ready entertain-

DESIGNED
and
DESCRIBED
by the
"P.W." Technical
Staff.

ment powers. What would you like to listen to to-night?

A lazy song from Spain? A symphony

POWERFUL LONG-DISTANCE SET

SELF-CONTAINED—

EASY TO BUILD—

For MAINS or BATTERY H.T.

concert from Berlin? A waltz direct from Vienna? (the very place where it was written, perhaps, by Johann Strauss). All

of these and a thousand other such delightful programme items are provided by the "Fireside Consoletta."

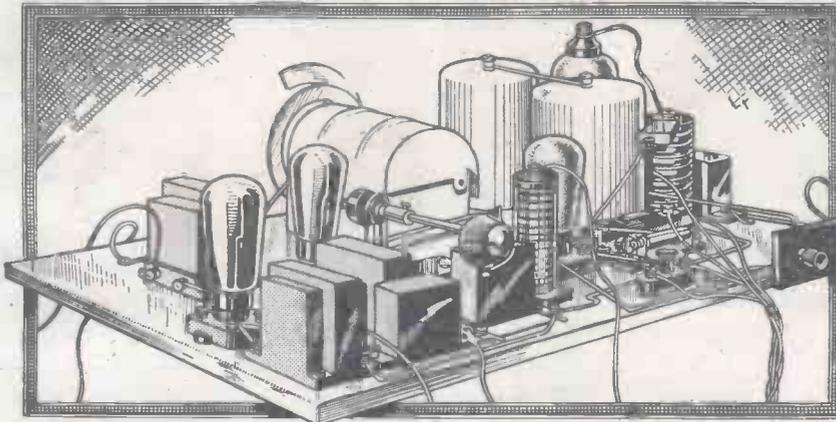
A Four-Valve Circuit.

Without attempting to discuss the circuit niceties, we can remark in passing that it is an A1 long-distance set, employing four valves. The first is a screened-grid, high-frequency amplifier, which precedes a detector working on the always popular and recently vindicated grid-leak and condenser principle.

Following this comes a low-frequency

(Continued on page 785.)

WHY NOT MAKE IT FOR XMAS?



Baseboard, 18 in. × 10 in.

Cabinet (Camco Embassy).

1 2-gang '0005-mfd. tuning condenser (Polar Uniknob, J.B., Radiophone, Lotus, Utility).

1 '0001-mfd. to '00015-mfd. variable series aerial condenser (Telsen Type W.190, Polar, Graham Farish, Ready Radio, Lotus, Igranic, Lissen, Ormond, Cyldon).

1 '0003-mfd. to '00035-mfd. differential reaction condenser (Keystone, Graham Farish, Lotus, Telsen, Ready Radio, Peto-Scott, Polar, Bulgin, Cyldon, J.B.).

1 5-meg. volume control (Igranic Megostat, Wearite, R.I., Varley, Graham Farish, Lewcos, Tunewell, Watmel, Sovereign, Magnum).

1 2-meg. resistance and holder (Graham Farish, Goltone, Dubilier, Telsen, Igranic, Lissen, Watmel, Ready Radio, Ferranti).

1 80,000-ohm resistance and holder (Graham Farish Ohmite, Dubilier, Colvern, Ferranti).

1 45,000-ohm resistance (Colvern Strip, or see above).

1 30,000-ohm resistance (Colvern Strip, or see above).

1 1,000-ohm resistance (Graham Farish Ohmite, or see above).

1 2-gang screened coil unit (Lissen).

1 H.F. choke (Lewcos Super, Atlas, Bulgin,

Lotus, Peto-Scott, R.I., Ready Radio, Varley, Dubilier, Lissen, Wearite, Magnum, Watmel, Goltone).

1 H.F. choke (Ready Radio screened grid, or see above).

1 Rotary change-over switch (Bulgin Type S.86, Ready Radio, Tunewell, Colvern).

3 2-mfd. fixed condensers (Telsen Type W.226, T.C.C., Dubilier, Graham Farish, Lissen, Igranic, Ferranti, Formo, Sovereign).

1 1-mfd. fixed condenser (Telsen Type W.231, or see above).

1 '01-mfd. fixed condenser (Dubilier Type 610, T.C.C., Ferranti, Igranic, Graham Farish).

1 '0003-mfd. fixed condenser (Dubilier Type 670, Ready Radio, Telsen, Dubilier, T.C.C., Lissen, Ferranti, Igranic, Graham Farish).

1 '0001-mfd. fixed condenser (Dubilier Type

Multitone, R.I., Varley, Sovereign, British General, Lissen, Telsen, Ferranti, Igranic, Tunewell).

1 Fuse holder (Bulgin Type F.5, Goltone, Belling & Lee).

1 Terminal strip, 3 in. × 1½ in. (Goltone).

2 Terminals (Belling & Lee, Clix, Goltone, Igranic, Eelex).

8 Battery plugs and spades (Clix, Belling & Lee, Eelex, Igranic, Goltone).

6 yards of systoflex and 7 yards of 18-gauge tinned copper wire (Goltone and Wearite).

1 60-ma. fuse (Belling & Lee Serufuse).

1 3½-in. switch bracket (Wearite).

1 ⅜ in. × ⅜ in. coupling link (Wearite).

1 ⅜ in. × 2½ in. extension spindle (Wearite).

1 Piece of '004-in. copper foil, 18 in. × 10 in.
3½ in. of flexible metallic single-screened tubing (Goltone).
Screws, flex, etc.

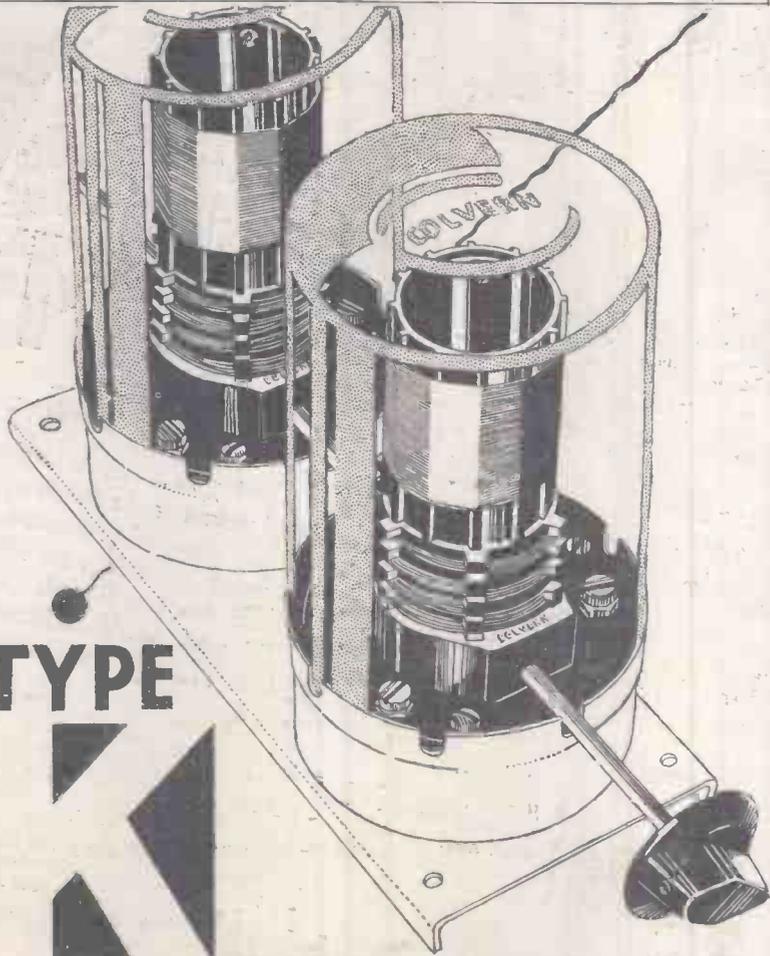
670, T.C.C., Telsen, Igranic, Graham Farish).

4 Valve holders (Benjamin Clearer Tone, Bulgin, Clix, Igranic, Formo, Lissen, Lotus, Ready Radio, Telsen, W.B., Wearite, Peto-Scott, Goltone).

1 Output choke (R.I. Audirad Igranic, Lissen, Varley, Ferranti, Atlas, Wearite, Bulgin, Lotus, Tunewell).

1 L.F. transformer (Lotus Type 3, ratio 1-5 or 1-3 or 3½, Atlas, Bulgin,

COLVERN



TYPE



COILS

There is a Colvern Coil for every modern radio receiver
 Colvern Coils are designed to give maximum efficiency combined with selectivity

They are your guarantee that your receiver will give maximum performance.

Make Colvern 'K' Type Coils your choice for the "Fireside Consolette."

1 KBLC } ganged and
 1 KGR } mounted
 on an
 aluminium
 base
 19/- per pair.

Strip Resistances :-
 1-45,000 ohms . 2/3
 1-30,000 ohms . 2/3
 1 S.4 Switch . 2/6

Send for the Colvern Circuit Booklet, Radio List No. 10. Free on request.

COLVERN LIMITED

MAWNEYS RD.

ROMFORD, ESSEX.

904V

2LO calling! Remember how you listened to that ten years ago on a crystal set. Strained your ears to catch every word, every note — But now what a difference! Mullard have given you A.C. mains valves. No more straining, no more headphones. Sit back at ease and roam the Continent. Use Mullard A.C. mains valves — the 904V and 354V detectors — valves that are built on the Rigid Unit Principle and abolish microphony.

Type 904V
OPERATING DATA

Heater Voltage	4.0V
Heater Current	1.0A
Max. Anode Voltage	200V

CHARACTERISTICS

(1.) (At Anode Volts 100; Grid Volts Zero)	
Anode Impedance	34,000 ohms.
Amplification Factor	75
Mutual Conductance	2.2 mA/V
(2.) (At Anode Volts 200; Grid Volts Zero)	
Mutual Conductance	3.0 mA/V

Price 13/6

Type 354V
OPERATING DATA

Heater Voltage	4.0V
Heater Current	1.0A
Max. Anode Voltage	200V

CHARACTERISTICS

(At Anode Volts 100; Grid Volts Zero)	
Anode Impedance	12,000 ohms.
Amplification Factor	36
Mutual Conductance	3.0 mA/V

Price 13/6

The valves specified for the "S.T. 400" are: P.M.12A. (Met.), P.M.1H.L. (Met.), P.M.2D.X., P.M.2A, or P.M.202.

Ask T.S.D.—Whenever you want advice about your set or your valves—ask T.S.D.—Mullard Technical Service Department—always at your service. You're under no obligation whatever. We help ourselves by helping you. When writing, whether your problem is big or small, give every detail. Ask T.S.D.

switch over to . . .
Mullard
THE · MASTER · VALVE

THE "FIRESIDE" CONSOLETTA

(Continued from page 782.)

amplifying valve, which is coupled by means of an L.F. transformer to the fourth and final valve. A very powerful and efficient valve team!

Moreover—and this is a very important factor in entertainment value—the set is fitted with a radiogram switch, for the electrical reproduction of gramophone records.

Remember, that even if you have no gramophone in the house at present, you may win one in that sweepstake, and then with the aid of a pick-up you can play over all your favourite records at will.

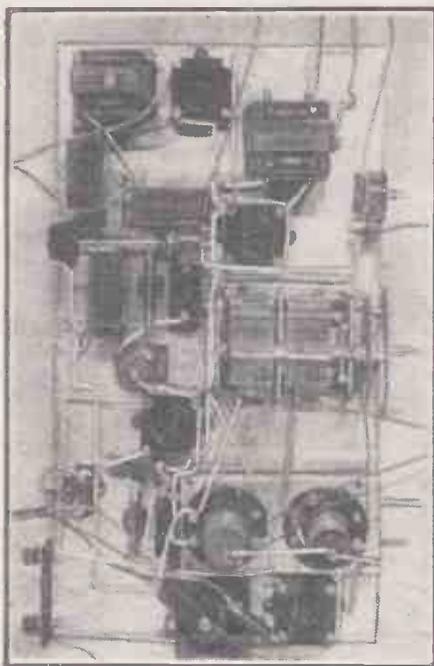
Just One Tuning Control.

It is true that the radio side of the "Fireside" Consolelette brings in so many excellent foreign stations which give good gramophone concerts that you may not feel the need of playing your own programmes via the loudspeaker. But it is nice to have the opportunity, if ever you want it, and that is why we have provided for a gramophone pick-up.

Before we get down to practical details there are just one or two other "Fireside" Consolelette points to which attention is invited.

Simplicity of operation is one. The set has just one single tuning control, which operates a double-ganged tuning condenser.

To the left of this is a wave-change switch for long or medium waves. The switch,



SIMPLICITY IN WIRING

is a marked feature of the "Fireside" Consolelette, there being no panel to "cramp your style."

Note the two flex leads which go to the "aerial series" condenser, mounted on the cabinet. Also, the three flex leads to the differential reaction condenser. This is also on the cabinet, directly above the main tuning control.

too, is ganged, to control both circuits simultaneously, so to go over to the other waveband you have merely to operate this single knob, and then re-tune as desired.

To the right of the condenser is a volume control. And you will need it, for four modern valves, working in conjunction with high-efficiency components, give the loudspeaker "something to shout about"! Full, satisfying volume on dozens of foreign programmes will be the normal and commonplace achievement when the set is finished.

Looking at the set from the constructional angle, we find it presents several uncommon points. There is no panel, for instance.

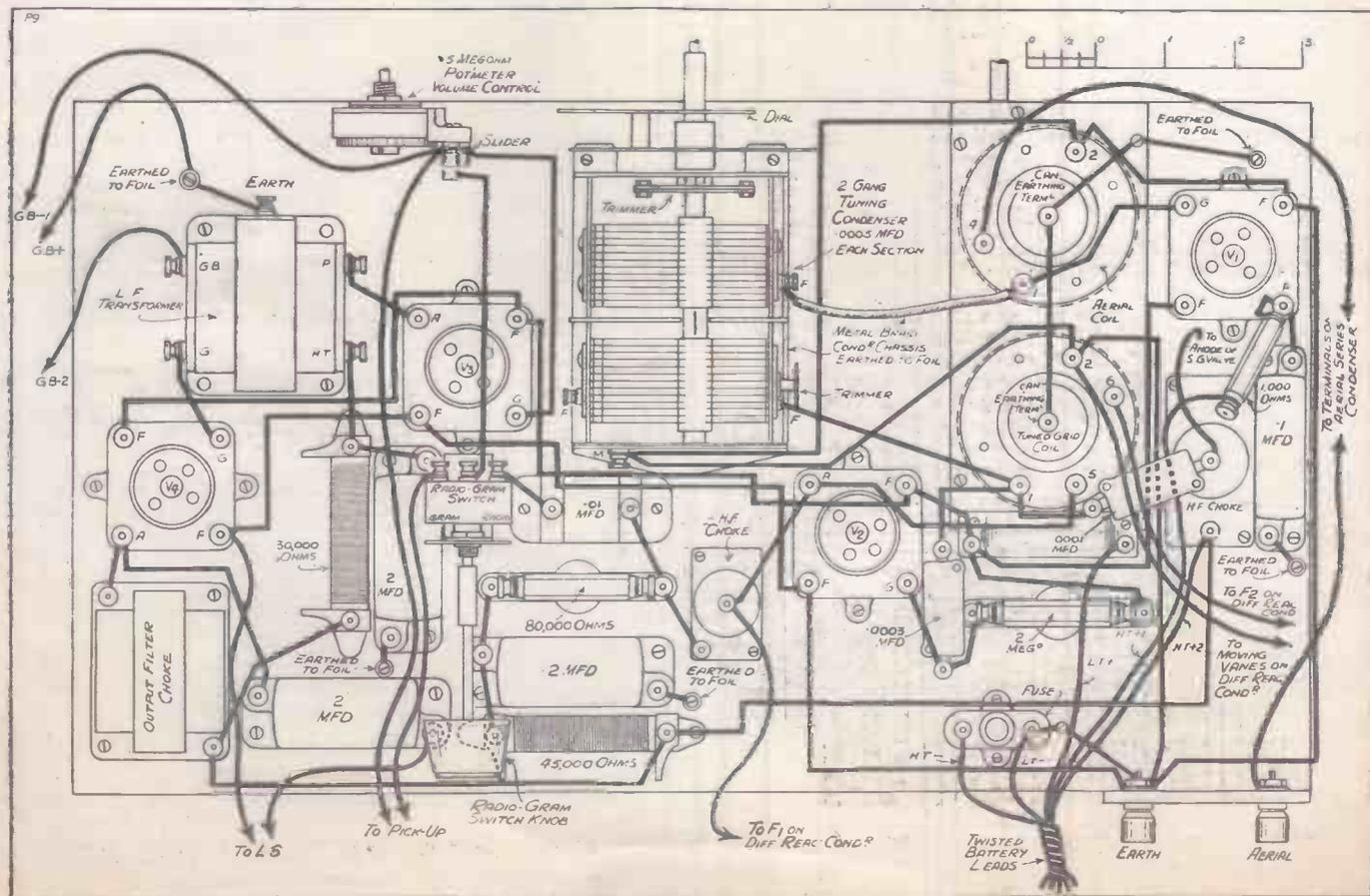
One of the advantages of the consolette type of receiver is that often a separate panel is quite unnecessary, as in this instance. Instead, the few control knobs normally carried by a panel are either supported on spindles projecting through holes in the cabinet, or else the particular component in question is fixed to the woodwork, and provided with flex leads to the set inside.

No Elaborate Screens.

Construction is simplified by this method, for the set is thus virtually all arranged on a single baseboard, which, having no panel affixed, is get-at-able from all sides during the building of the set.

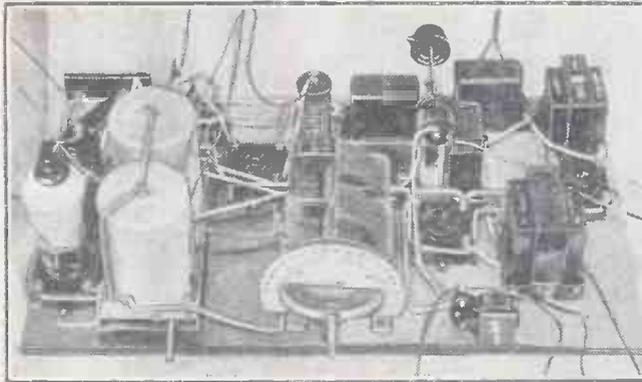
That is one reason why even the most inexperienced set-builder need have no hesitation in tackling this fine four-valver. Another reason is that there are no elaborate screens to worry about; the design being such that full use is made of self-screened components which are easy to wire up and yet do away with any necessity for awkward sheets of metal—these make excellent

(Continued on next page.)



THE "FIRESIDE" CONSOLE

(Continued from previous page.)



the choke, etc. They have all been arranged with care, to facilitate constructional efficiency, and the closer you follow our positioning of all the parts, the better the set will be.

The "series aerial condenser" and the differential reaction condenser are to be mounted on the cabinet itself, so lay them aside and bear them in mind.

Note that underneath the coil unit

From the front of the baseboard project three spindles, the centre one for tuning, right for volume control, and left for combined wave-change and on-off switching. The holes for these are drilled in the cabinet front, thus rendering a panel unnecessary.

the foil there will probably be some expensive fireworks!

As the work of affixing components proceeds, take a breather every now and then, and slip the baseboard into the cabinet, trying to visualise the finished set. You will thus avoid the nuisance of fixing something down only to find it is then going to interfere with the grid bias battery, or something of that sort. (Another argument in favour of getting as close to the original specification as ever you can.)

When the parts are all fixed on the baseboard, wire up the points connected on our wiring diagram, keeping the leads nice and short and direct, as shown in the photographs.

Correct Adjustment of H.T.

The screen of this valve is fed by the H.T. + 1 lead. Correct adjustment of H.T. + 1 is important, if the set's full amplification is to be obtained; so remember later to readjust this H.T. plus tapping when you have tuned in a weak station, which will enable you to decide exactly what voltage is best for H.T. + 1.

The output (anode) terminal of the S.G. valve is joined by a flexible lead to an H.F. choke, which must be a good one. Its object is to provide a very high impedance at this part of the circuit, and a poor choke will mean losses, because its impedance will be too low, or will be offset by stray capacity.

Attached also to the anode of the S.G. valve is the coupling condenser. This condenser, also, must be of good quality.

It is important that both insulation and capacity should be O.K., so this component will repay careful choice.

From the other terminal of this coupling condenser goes the lead to the second (H.F.) coil unit, the tuned output of which is applied to the grid of the detector valve (V₂) via a grid condenser.

All the main constructional details are here, so you will be able to get the set completed. The question of operation will be dealt with next week.

shields against straying high-frequency, no doubt, but are confounded nuisances from a wiring-up point of view!

The first practical step towards construction is to get together the components, making sure that they are of suitable types for the work they

will have to do. Our own list of components, etc., will be the guide here, and it gives numbers of alternatives to allow the constructor as much latitude in choice as possible.

Making a Start.

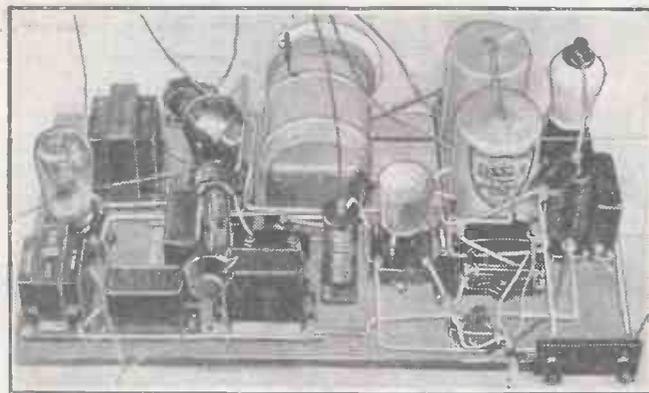
The accompanying photographs and wiring diagram (which is drawn exactly to scale) will enable you to copy the original model very closely if you exercise just a little care when selecting parts. (Small variations won't matter a jot, but keep as close to the original as ever you can.)

With all the parts selected, you can clear the decks for the first operation—fixing the foil to the baseboard. The initial fixing need not be elaborate, for the components will hold the foil more securely in place than a lot of tacks at the earlier stages.

But the placing of the components on the foil is important. Note how they stand in relation to all surrounding components—this valve holder with its grid terminal so, this one with its plate towards

THE VALVES WE RECOMMEND

	H.F. Stage	Detector	1st L.F.	Output	Output (Mains Unit)
Mullard	P.M.12	P.M.1H.L.	P.M.2D.X.	P.M.2A.	P.M.202
Cossor	220S.G.	210H.L.	210L.F.	220P.A.	230X.P.
Mazda	S.G.215	H.L.2	L.2	P.220	P.220A.
Marconi	S.22	H.L.2	L.210	LP.2	P.2
Osram	S.22	H.L.2	L.210	LP.2	P.2
Tungsvam	S.210	H.210	L.G.210	P.220	S.P.230
Lissen	S.G.215	H.L.210	L.210	P.220	P.X.240
Eta.	B.Y.6	B.Y.1814	B.Y.1210	B.W604	B.W.602
Six-Sixty	215S.G.	210H.L.	210D.	220P.A.	220S.P.



The three flexible leads "in the air" passing over the main tuning condenser (see photograph above) are those to the differential reaction condenser which is mounted on the face of the cabinet above the tuning condenser and below the speaker aperture.

SUITABLE ACCESSORIES.

BATTERIES.—L.T accumulator (Pertrix, Oldham, Ediswan, Lissen, G.E.C., Exide).

H.T. battery. This should be of ample size to deal with the requirements of the valves chosen. (Lissen, Magnet, Ever Ready, Pertrix, Drydex, Marconiphone, Ediswan, Oldham.) G.B. battery. See above list.

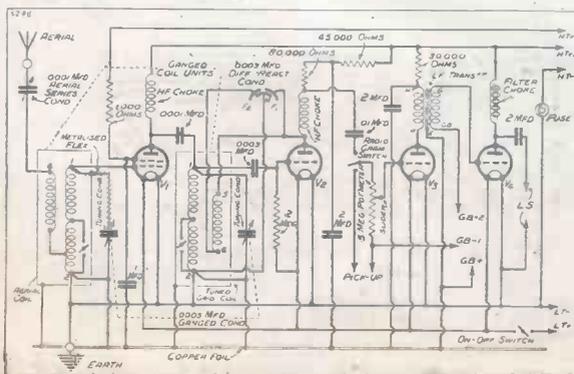
AERIAL AND EARTH EQUIPMENT: Electron "Superial," Graham Farish "Filt" earthing device.

MAINS UNIT.—This should have two plus tappings with output to suit valves chosen (Atlas, Heayberd, Ferranti, Regentone, R.I., Tunewell, Ekco).

LOUDSPEAKER.—Igranie, Baker's Selhurst, Blue Spot, Celestion, Ferranti, R & A, Epoch, B.T.-H., W.B., Ormond, Clarke's Atlas, Lanchester, Marconiphone 95.

is a spacer-baseboard, three-quarters of an inch thick, to raise the coil-base from the metal foil. This is important, too.

We advise you to slip a stout cardboard disc under each valve holder, to prevent any of its wiring accidentally touching the foil. Any tags or connections coming near the foil may with advantage be protected by an insulated base in this way, the idea being that if the wire or tag sags and touches cardboard it won't hurt, but if it touches



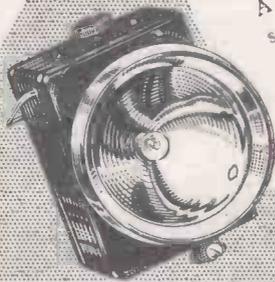
What I am giving



this Christmas BY SANTA CLAUS



FOR CYCLISTS
A Drydex Cycle Lamp—a little searchlight to push back the darkness. 4/-



FOR STAY-AT-HOMES
To make sure they hear the Christmas programmes, a spare Exide D.M.G. Battery for L.T. 11/-



And a Drydex for H.T. 9/-



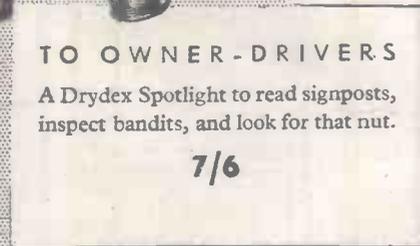
FOR SMOKERS' WIVES
A Drydex Gas Lighter to save squabbles when he steals the matches. Press the button and the Drydex lights the gas. 5/-



FOR TIRED AND SHORT SIGHTED CARS
An Exide Double-Life Battery—that grand restorer of energy and brightness. (It's guaranteed for 2 years. Unconditionally!) 65/-



TO OWNER-DRIVERS
A Drydex Spotlight to read signposts, inspect bandits, and look for that nut. 7/6



P 31.

Exide AND Drydex

BATTERIES ★ DRY BATTERIES & TORCHES

From Exide Service Stations or any reputable dealer. Exide Service Stations give service on every make of battery Exide Batteries, Exide Works, Clifton Junction, nr. Manchester. Branches: London, Manchester, Birmingham, Bristol, Glasgow, Dublin, Belfast



To ensure the Highest Possible Efficiency - - -

POLAR

UNIKNOB

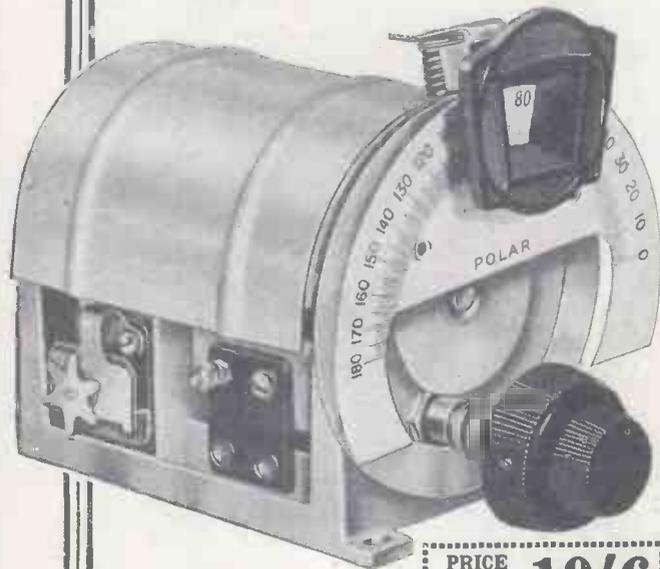
was selected to tune

The "FIRESIDE CONSOLETTA"

No set which incorporates ganged tuning can be of the highest efficiency unless this tuning is carried out with a Polar "Star" Gang Condenser.

Where a "UNIKNOB" is used, tuning is greatly simplified, and, what is more important, there is a marked increase in selectivity.

*Matching is accurate to within 1/2 of 1% plus or minus 1 mmfd. Rigid die-cast frame maintains this accuracy under all conditions of use. Trimmer of 35 mmfd. in parallel with front section is operated by a small knob situated concentrically with the tuning knob, allowing finest adjustments to be easily made.



PRICE Including Cover **19/6**

To Builders of the S.T.400: Mr. John Scott-Taggart specifies and recommends these Polar Condensers:—
Differential '0003, 3/9; Pre-set '0003, 1/6; Reaction "No. 4" '00004, 3/9; "No. 2" '0005, 6/6.
Obtainable from all Dealers.

POLAR STAR CONDENSERS

Write for the Polar Catalogue.

WINGROVE & ROGERS LTD.,
188-9, STRAND, LONDON, W.C.2.
Polar Works Liverpool.



MULTITONE TONE CONTROL L.F. TRANSFORMER

will adapt the tone of your set

1. To any speaker;
2. To any particular station to which you are listening.

Multitone suppresses heterodyne whistle and increases the bass or treble at will. Invaluable for radiogramophone reproduction and pentode output.

EASILY FITTED TO ANY SET



17/6

Our Booklet (B) on Tone Control will be sent post free on receipt of a postcard.

MULTITONE

tone control L.F. TRANSFORMER

MULTITONE ELECTRIC COMPANY LTD.
95-98, WHITE LION STREET, LONDON, N.1. NORTH 5063

M.C.33

Simpson's Electric Turntable



Fits any Gramophone

1. Only 2 1/2" deep.
2. Sizes 10" and 12".
3. 50 Cycles, 100/150 and 200/250 volts A.C.
4. Goes by itself.
5. Costs less than 1d. per week.
6. Correct speed of 78 revs. per minute.
7. Nothing to go wrong.
8. Anyone can fit it.

The most remarkable gramophone invention of the age—a gramophone turntable that "goes by itself." In a few minutes you can convert an ordinary gramophone into an automatic electric one. It takes little longer, following the simple instructions supplied, to convert your present Radio Set into a **super Radio-gram.** The total cost is only **39/6**. It lasts a lifetime with no additional cost. Ask your Dealer for illustrated leaflet and demonstration.

SIMPSON'S ELECTRICALS LTD.,
GRANGE ROAD - LEYTON - E.10.

OSBORN

RADIO CABINETS

Osborn Super Acoustic Baffle Board. Prevents 90% speaker worry. Any size hole cut free. Guaranteed no vibration. 18in. x 18in., 3/-; 24in. x 24in., 5/-; 30in. x 30in., 8/-; 36in. x 36in., 11/3. Carriage paid U.K. Send for free sample.

Model No. 220. A Radio or Radiogram Cabinet. 3ft 9in. high x 2ft. 2in. wide x 1ft. 6in. deep. Size of baffle behind fret, 24in. x 24in. Silk fabric for fret front included. Opening at top and back. Takes panel 2ft. x 9in. or smaller. Complete with motor-board. Also obtainable as follows: 3ft. 6in. high x 2ft. 2in. wide x 1ft. 6in. deep. Size of baffle behind fret, 24in. x 17in. Silk fabric for fret front included. Opening at top and back. Takes panel 24in. x 13in. or smaller. Accommodates any type of gramophone motor. Both specifications sold at same price. **FRICES.** Mached Ready to Assemble: Oak £3.5.0; Mahogany £3.10.; Walnut £4.0.0. Assembled ready to Polish: Oak £4.5.0; Mahogany £4.10.0; Walnut £5.0.0. Assembled and Polished: Oak £5.5.0; Mahogany £6.0.0; Walnut £6.15.0. All Models Carriage Paid.

WRITE FOR FREE CATALOGUE.

CHAS. A. OSBORN
Dept. P.W., Regent Works, Arlington Street, London, N.1. Telephone: Clerkenwell 5095.
Showrooms: 21, Essex Road, Islington, N.1. (2 minutes from Essex Road Tube Station). Telephone: Clerkenwell 5834.

RECEIVERS

No. 14.

of RENOWN



THE LISSEN "POPULAR" TWO.
A SELF-CONTAINED "DET.-PEN-
TODE" FOR BATTERY OPERATION.

WE have often drawn attention in these columns to the desirability of expanding the existing inadequate range of battery-operated receivers.

Despite the fact that at the present time the biggest potential market for the sale of commercial receivers is among listeners who are not provided with mains of any description, a large number of the British manufacturers still confine their activities solely to the manufacture of receivers of the all-electric variety. In many respects that is a state of affairs to be regretted, for it will be many years before the all-electrification of the country is anywhere near complete.

A Special Tribute.

But while the somewhat wholesale march of "all-electric" progress has been going on, it should not for one moment be imagined that battery sets have been standing still. On the contrary, several of the British manufacturers have concentrated almost entirely upon the production of battery models, and the results of their researches are most gratifying. Our only complaint is that there are not enough of them!

In this connection, we feel that a special tribute is due to Messrs. Lissen, Ltd., who have consistently attended to the needs of that vast army of listeners to whom mention of the word "mains" can convey only two things—gas and water!

To Messrs. Lissen goes the credit of having produced one of the most comprehensive ranges of components in the world. The same organisation is responsible to a large extent for the present low-priced but high-efficiency batteries that are now available. Nor is that all.

With their usual foresight and a keen appreciation of the present position, they have contributed a range of self-contained sets to the battery-operated market which, frankly, do them credit.

Standard of Performance.

The one with which we are concerned in this present review is the "Popular" Two-Valver, a self-contained "det.-pentode" arrangement which sets a standard not only of high performance but of low price.

A mental calculation of the cost of two valves (one of which is a pentode), the necessary batteries, and a loudspeaker should be sufficient in itself to commend to your special notice a set that sells complete, and in a well-finished walnut or maple cabinet, for the astonishingly low price of four guineas.

Even if it only gave you the programmes from the local stations you would have no

cause to complain of the value that you were getting for your money.

But the Lissen "Popular" Two does more than that, and as a result of our practical tests it is with confidence that we can assure you that when used with a reasonably efficient outdoor aerial the set will receive at least half a dozen other stations at quite good strength on the speaker.

Above the Average.

That, in our opinion, is a very good performance; in fact, we can go one better than that by telling you that, judged

COMMENDABLY COMPACT



The space occupied by the actual receiver is surprisingly small, yet the results given by the set under test conditions are decidedly above the average.

against the standards that are set for receivers of this class in our test laboratory, the Lissen "Popular" Two is definitely above the average.

After all, any "two" must largely be

dependent upon the judicious use of reaction for its long-distance properties, and the control of reaction in this particular instrument is all that can be desired.

Fundamentally, the circuit is quite straightforward, but it owes much of its overall efficiency to the proportioning of the coil windings, and the tapping point has been effected in a way which has resulted in practically the ideal selectivity-volume compromise.

Accessible and Unobtrusive.

As one would expect of a set of this type, the controls are very simple. Apart from the on-off switch, there is only just the one tuning control and the knob by which reaction is regulated. For purposes of wavechanging, use is made of a simple plug-and-socket system.

All the controls are neatly tucked away at the side of the receiver in a position where they are readily accessible yet completely unobtrusive. That is only one of several ways in which the set shows evidence of careful design.

The speaker built into this set is of the moving-iron type, and adjustment of the reed is effected by rotation of the small screw to be found centrally at the front of the instrument. That, again, is in a most accessible position, and obviates the necessity of poking about inside the set.

The set is supplied with a 20-ampere hour (actual) accumulator, and since the L.T. current consumption of the set is 35 amperes, theoretically it should last for approximately 57 hours on each charge.

In practice, it rarely happens that an accumulator lives up to its theoretical life, but in the present case it is fairly safe to assume that the set will operate satisfactorily for a period of not less than 45 hours on each charge, which, assuming five hours' use a day, is not far short of ten days.

On the H.T. side, the current consumption is approximately 8.5 milliamps, which is very low indeed for a "det.-pentode" arrangement.

Worth Every Penny.

Summarised, this set, in our opinion, is a most commendable proposition for anybody who is in need of a good, self-contained battery "two." It is most economical in operation, it is efficient, it is in every sense of the word a family set, and for the extremely modest outlay of only four guineas it must necessarily be considered as an installation worth every penny of the money charged for it.

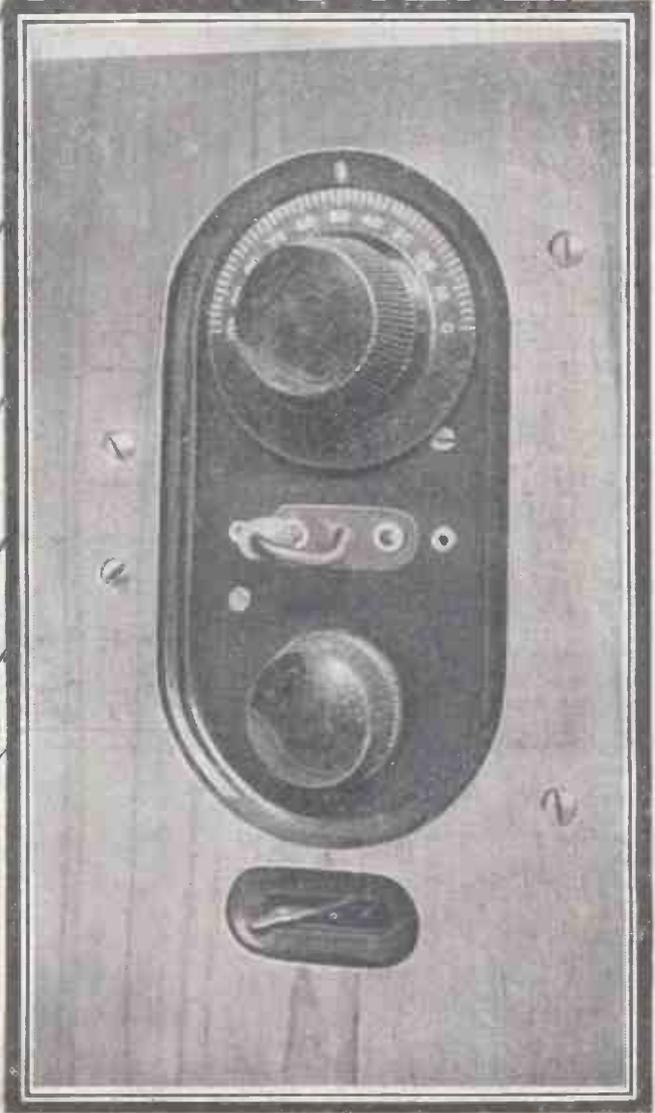
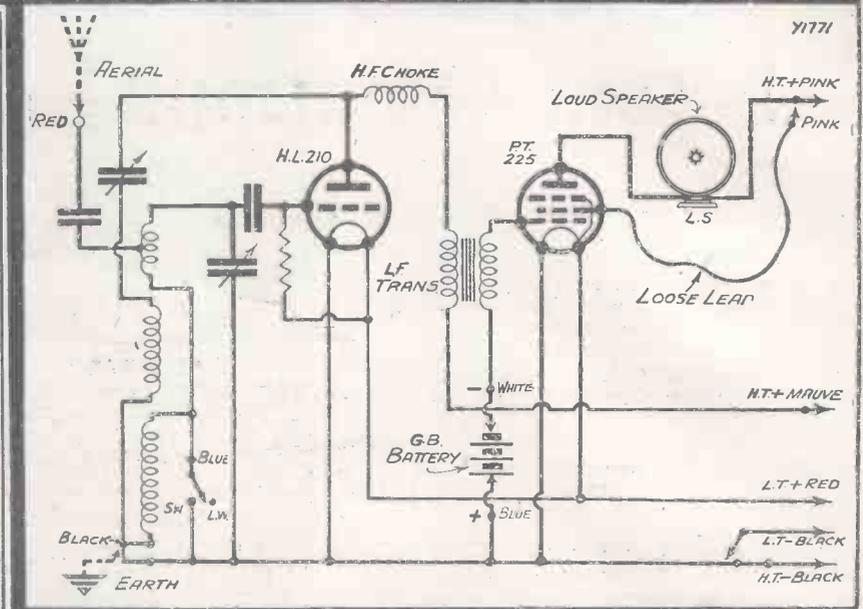
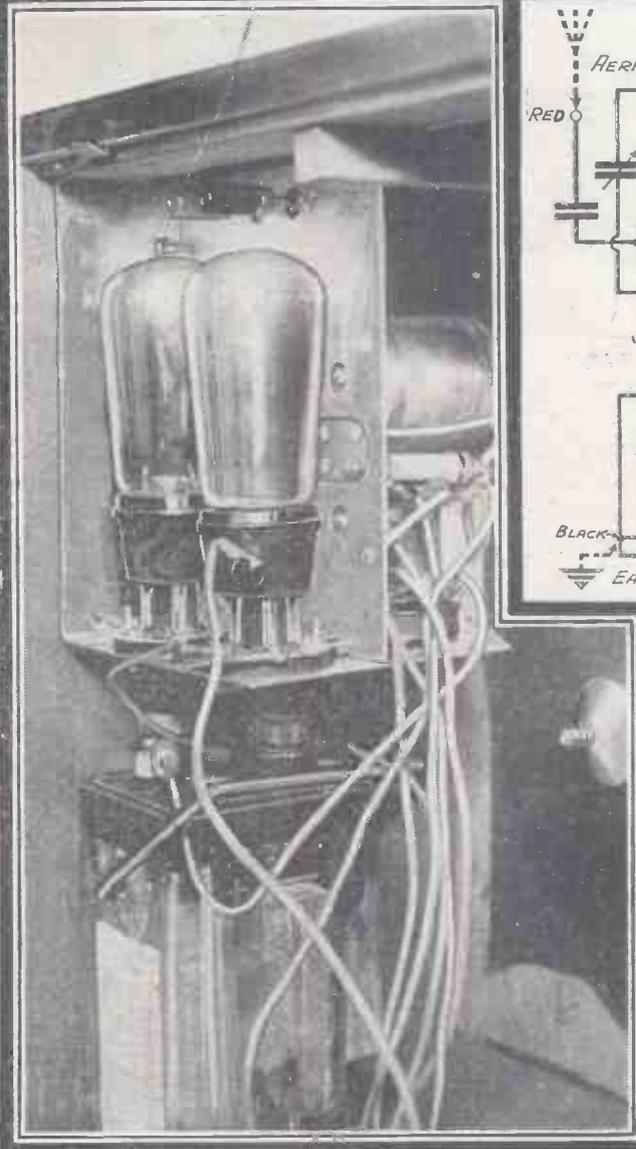
(Continued on next page.)

TECHNICAL SPECIFICATION

GENERAL DESCRIPTION: Completely self-contained battery-operated receiver requiring only the addition of aerial and earth.
NUMBER OF VALVES: Two.
CIRCUIT: Detector and Pentode.
CONTROL ARRANGEMENTS: One for tuning; one for reaction; and "on-

off" switch. Wave-changing is effected by means of a simple plug-and-socket scheme.
(NOTE: All controls are conveniently placed at the side of the receiver.)
PRICE: Four Guineas complete.
MAKERS: Lissen Limited, Worples Road, Isleworth, Middlesex.

THE LISSEN "POPULAR" TWO—(Continued from previous page.)



THE SET ANALYSED

An excellent idea of the remarkably compact design of the receiver part of the Lissen "Popular" Two can be gathered from the photograph above. To have achieved such a high standard of efficiency from a "two" is a tribute to the thoroughness with which the design has been tackled.

Fundamentally, the circuit is straightforward, but careful attention to the proportioning of the coil windings and the positioning of the "tap" has resulted in a selectivity-volume compromise which is as near to the ideal as can be obtained with a set of this type. The claim to simplicity of operation is exemplified in the picture of the controls seen on the right.



Is your Christmas list complete?

When you've purchased  the turkey,
 the  nuts  crackers & cordials, 
 bought the son's car,  & the daughter
 a house,  collected your array
 of trifles for friends & relations 
 Buy yourself a **LISSEN BATTERY** 

and make sure your radio is right for Christmas



LISSEN H.T. BATTERY



FROM THE TECHNICAL EDITOR'S NOTE BOOK



TESTED AND FOUND-?

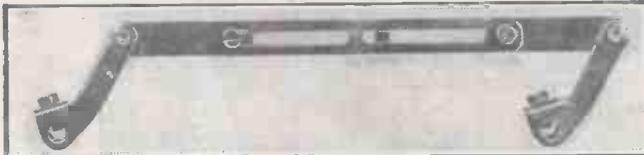
GANGED WAVE-CHANGING

WHILE two or even three wave-change switches are often forced upon us because there is no simple way of avoiding them, there are few who will say that they like a multiplicity of switches.

Therefore, it is beyond doubt that anything or anyone who can eliminate a "knob" in a practical fashion deserves our sincerest thanks. And I am now speaking as a member of the great home-construction public.

Telsen, in their usual thorough-going manner, completely anticipated this in their

A LINK FOR TELSEN SCREENED COILS



The inexpensive fitment which "gangs" the wave-change switches of two Telsen coils arranged parallel with the panel.

screened coils. As sent out from the factory, these can be coupled in line so that both wave-change switches of a pair of them can be ganged.

Additionally, for the almost nominal price of sixpence, a Telsen coil switch coupling assembly can be purchased. This enables the wave-change switches to be ganged when the coils are arranged parallel to the panel. The one switch knob then controls both wave-changes.

It is a perfect mechanical action, and has no electrical disadvantages such as usually attend the use of one switch to operate two circuits.

COMPONENT COMPACTNESS

One of the most outstanding features of this radio season is the component neatness and compactness manufacturers are achieving. There used to be a sharp differentiation between front and back of panel parts. The theory was based on that old tag, "What the eye doesn't see the heart doesn't grieve at."

What the theory failed to take into consideration is the fact that the home constructor looks at the "innards" of his sets almost as much as at their panels.

Therein lies the instructional fascination of "building your own."

The new technique is adequately illustrated by the Dubilier H.F. choke which, in itself, is a complete, well-finished article, and not an obvious detached part of some whole.

It is built into an attractive moulded case, refined and well-groomed in appearance.

These adjectives apply equally well to its performance. We have just had the type S.W. on test, and find that it covers its specified 22½ to 100 metres in a very satisfactory fashion. As with the other types of Dubilier H.F. chokes, it lists at 3s.

NEW "UTILITY" PRODUCT

One of these days "straight-line" readings are going to be the hall-mark of good

THE DUBILIER H.F. CHOKE



This photo is a trifle under full size.

sets which claim to be up-to-date. That is the thought which occurs to me every time I see the "Utility" straight-line dial.

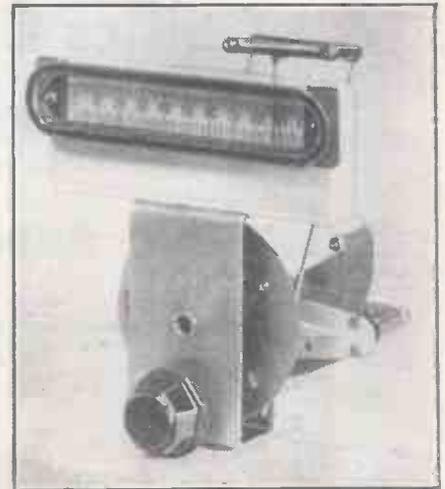
At the present moment, like all new things, the principle is in that stage where if it does not exactly have to struggle for recognition it is at least pressing at the door of popularity.

But it has the force of intrinsic merit behind it. No one can deny the advantage of having readings in a straight line, and I have no doubt that those commercial sets which employ the method owe considerable proportions of their success to that fact.

And now any constructor can include it in his set at no great cost, for the Utility straight-line dial is available, fitted to a standard "Utility" condenser, for the very reasonable price of 9s. 6d.

Of course, it is somewhat more difficult to mount than those "one-hole" panel-mounting condensers, but the constructor who allows himself to be completely drugged by the insidious "one-hole" fetish is not worthy of the name!

STRAIGHT-LINE READINGS



The standard Utility condenser is now obtainable fitted with the new Straight-Line Dial.

VOLUME ADJUSTMENT

I believe I am right in saying that Lissen, Ltd., were the first firm to achieve real smoothness in variable resistances, and that was a very long while ago now.

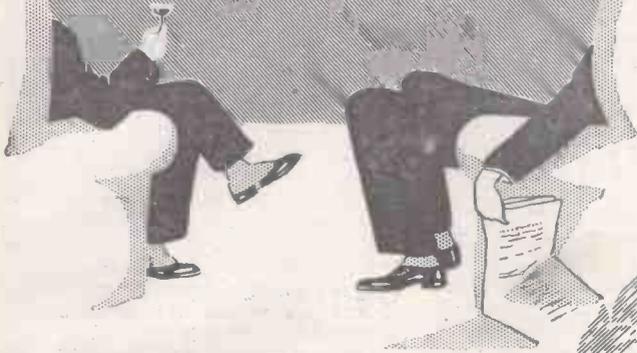
Anyway, their present volume control reveals not the slightest indication that they have forgotten how to achieve that desirable result.

Smoothness alone is not, however, enough. There ought to be sufficient mechanical resistance in the movement to enable more or less microscopic settings to be easily obtainable. Also the moving contact must maintain its efficiency throughout the whole of its travel, whether it be operated quickly or slowly.

The Lissen Volume Control adequately fulfils the above requirements and is a neat, compact and well-finished component into the bargain.

It is made in two types: one (of ½-meg. resistance) to connect across a pick-up or an L.F. transformer secondary, and the other, a 50,000-ohm wire-wound type, which can be employed as a voltage regulator in D.C. or A.C. sets.

"I'm glad I took your advice —"



"I little imagined there could be such a world of difference between loud speakers."

"Until you heard mine, eh?"

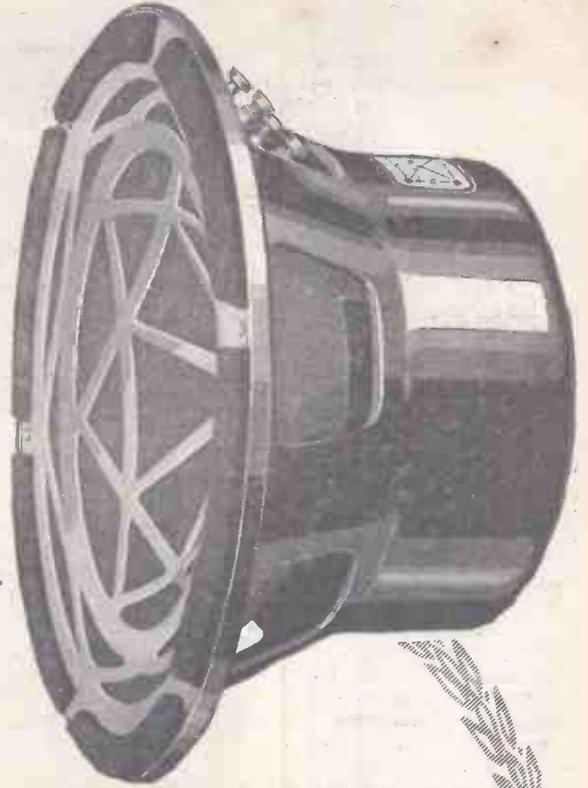
"Yes, and to realise I had endured a mediocre performance without realising how poor it actually was."

"Comparisons are useful."

"If only to demonstrate how really bad some loud speakers can be."

"I could never imagine how you tolerated your old loud speaker, with its absence of bass response, its resonances, and its wheezy top-note performance."

"Let us drop the subject—enough to express my heartfelt gratitude to you for introducing R. & A. Reproducers to me."



R&A "VICTOR"

PERMANENT MAGNET M.C. REPRODUCER DE-LUXE

The "VICTOR" is the Reproducer *par excellence*, providing as it does a superb quality of reproduction from the lowest to the highest audible note, and for its ability to handle large inputs with complete freedom from overload.

Notwithstanding its power handling capabilities, its sensitivity is such that it reproduces the output from small Receivers employing the average Pentode or Super Power Valve, and gives the same high quality reproduction.

COMPLETE WITH 6-RATIO FERRANTI TRANSFORMER

70/-



R&A "CHALLENGER"

PERMANENT MAGNET M.C. REPRODUCER

The most popular low-priced P.M.M.C. Reproducer ever offered, and capable of a quality of reproduction in advance of any other make in its price class.

INCLUDING 3-RATIO FERRANTI TRANSFORMER

35/-

Resolve to enjoy Christmas Radio to the full by installing an R&A Reproducer, the instrument which "stands in a class by itself."

Ask your dealer to demonstrate, and refuse any so-called substitute. Write us for full particulars.

REPRODUCERS & AMPLIFIERS LTD., WOLVERHAMPTON

DO you remember the old-fashioned Christmas when it really was a family affair, with sisters and cousins and aunts and grandfathers and in-laws all gathered round the fire singing the rousing choruses?

You haven't got to be very old, either, to remember them—"Daisy Bell," "The Miner's Dream of Home," "Down at the Old Bull and Bush," and the rest.

Christmas hasn't been like that lately. "Let's go out to a show!" has been the general cry, and the old fireside has been rather deserted.

What are you going to do for Christmas nineteen-thirty-two?

"Ah, ha!" you say at once. "Non-stop variety, lots of it everywhere—a new show each night, just the thing."

Well, I know a trick worth two of that! Non-stop, certainly; variety, as much as you wish. But I'm not going to bother to dress up and go out for it.

Back to the old fireside for me, and let's turn on the radiogram. There's all the variety you'll want for many a long day.

There's no end to the famous people you can have in your home this Christmas. Look at the H.M.V. list as an example.

Harry Lauder, Gracie Fields, Peter Dawson, Ray Noble, Cicely Courtneidge, the Hulberts, John Henry, Ambrose. They're all there.

Let's see what some of these stars have got to say about this "Record" Yuletide.

The Hulbert Brothers.

The Gainsborough Studios at Islington was my first port of call. I persuaded Jack Hulbert to give me his opinion on records at Christmas—in the intervals of rehearsing his new film. Unfortunately for the interview, brother Claude happened to butt in at a critical moment, and the conversation went like this:

Myself: "What do you think of Christmas with a gramophone, Mr. Hulbert?"

Jack: "I think it is a very excellent idea to try and entertain your friends at Christmas by playing gramophone records—especially our records."

Claude: "Well, I don't."

Jack: "Who's asking you, anyway?"

Claude: "Nobody."

Jack: "Well, then, shut up!"

Claude: "I'm not crazy about Christmas."

Jack: "Why not?"

Claude: "Because it happens to be my birthday, and I only get one lot of presents."

Jack: "What's that got to do with people buying records?"

Claude: "Nothing."

Jack: "Am I wrong, or are you annoying me? We're trying to boost our records, aren't we?"

Claude: "I don't know. Are we?"

Jack: "Of course we are. Aren't we?"

Claude: "I don't know."

Jack: "Say 'yes'; it'll save a lot of trouble."

MAKE IT

A RECORD YULETIDE!

Some of the famous stars who record for H.M.V. give here, in an interview with Patrick Campbell, Christmas wishes and seasonal suggestions to readers of
"POPULAR WIRELESS"

Claude: "I can't. I don't think our records are very good."

Jack: "Neither do I, but can't you bluff it out?"

Claude: "No. After all, we must be fair."

Jack: "You mean you wouldn't recommend them to anybody?"

Claude: "No."

Jack: "All right, then, we'll call the whole thing off. Give the world your message, Claude."

Claude: "Don't buy our records!"

Ambrose and His Orchestra.

"A happy Christmas from us all," was the message Ambrose gave me for "P.W." readers when I saw him at the Mayfair Hotel. "This is going to be a very enjoyable Christmas for me because I know that at this season of the year I have the opportunity of providing cheerful entertainment—through my gramophone records—in many thousands of homes throughout the country."

"Everybody dances at Christmas—from grandfather to five-year-old—and for this reason I have chosen for my Christmas records bright and jolly tunes with real dance rhythm, in the hope that they may help you to remember that 'the clouds will soon roll by'."

"Once more, a happy Christmas to you all."

Peter Dawson.

Although I tackled Mr. Dawson very early in the morning, he was enthusiastic at the idea of an old-fashioned Christmas.

"Certainly I believe in the old-fashioned Christmas; as a matter of fact, I was brought up on it, and we couldn't have enjoyed ourselves more."

"And the old songs, too. You cannot beat them. The Indian Love Lyrics; those songs by Ketelbey—I get just as much enjoyment out

of them to-day as I ever did.

"I hope all the readers of POPULAR WIRELESS may have a very happy Christmas—and an old-fashioned Christmas!"

Gracie Fields.

"Our Gracie" gave me her views in her dressing-room at the Stratford Empire.

"A jolly Christmas? Of course; but I don't believe in being jolly only just at Christmas-time. Jolly all the year round is my motto!"

"Wait a whole year to enjoy oneself? Why, if I waited a year to be jolly I should forget what it felt like."

"So cultivate that jolly spirit all the year round, and if you want to be *special* merry at Christmas, then you have a hearty invitation to 'Gracie's Christmas Party,' which my mother and I have recorded for your benefit."

"So here's a happy Christmas and a happy year in 1933."

Ray Noble.

"One of the jolliest parts of Christmas for me is the mass of correspondence I get from all over the world. Batavia, South America, Honolulu—these are but three of the places in which I have valued friends whom I have never seen and who only know me through our records. It isn't too easy for the New Mayfair Orchestra, with no public performances, to make for itself a personality, but it is a cheerful thought that we are able to entertain such a large, unseen audience this Christmas."

"I should like to wish a very happy Christmas to POPULAR WIRELESS readers in every part of the world."

Raie da Costa.

"Christmas 1932 is going to be a very jolly one for gramophone enthusiasts. The very high standard of recording technique and the keen competition in all branches of gramophone entertainment have enabled everyone to have, in the home, the very best talent in the musical world."

"On Christmas Day I shall be broadcasting from the B.B.C. for half an hour."

"But because of the gramophone I hope that that half-hour may lead to many more half-hours throughout the year for those many friends I should not otherwise be able to play for."

"A merry and a musical Christmas!"

SILVER THREADS AMONG THE GOLD



What memories of long ago—when she, too, used to waltz to the strains of "The Merry Widow" and "The Blue Danube"—are brought back to grandmother as she listens to the new H.M.V. transportable radiogram!

**THE BATTERY
THAT POWERS THE SET
CONTROLS THE TONE**



THE EVER READY CO. (GREAT BRITAIN) LTD., HERCULES PLACE, HOLLOWAY, LONDON, N.7



WE are certainly having a wonderful time for long-distance reception just now. There hasn't been a trace of an atmospheric for many days as I write and what is really more important, hardly any of the principal stations is now affected by heterodyne troubles.

Early this season I was rather afraid that whistles accompanying transmissions would be the rule rather than the exception, and up to a week ago it seemed as though these fears would be fully justified. Matters were pretty bad then, but now, for some reason which I cannot attempt to explain, heterodyne whistles are comparatively few and far between.

Certain Alternatives.

The only grouse that one has is that for some reason or other there has been a recrudescence of spark interference, particularly near the top of the medium waveband. On the long waves, too, there is far too much Morse during daylight hours.

European broadcasting can never be in a really satisfactory condition until both the long and the medium wavebands are completely cleared of spark, tonic-train and continuous-wave commercial transmissions.

The long waves are a joy nowadays, for almost at any time, except, of course, when you ought to be in bed, you can switch on with the certainty of finding several excellent alternative programmes. Oslo has enormously improved, and Motala seems to be in his best form once more. Huizen, Radio-Paris, Zeesen, the Eiffel Tower and Warsaw all provide excellent reception.

EVERY letter that reaches me, nowadays, seems to contain some reference to the coming Empire Broadcasting. "What will it mean to me in Cornwall?" "What shall we hear of it in Madeira?" "Will it be better than G 5 S W for us out here in Nigeria?" And so on.

The answer, ladies and gentlemen, is the proverbial lemon. We cannot say how good the transmission is going to be until we have heard it. The B.B.C. have great expectations; the site is excellent, and the transmitter is built by people who know their job from A to Z. Make your own deductions from that.

The Super-het.

I suspect an organised attack upon myself! In fact, I am fairly sure that I am being intimidated, for a large number of letters, all from the same district, and all containing practically the same subject matter, have reached me.

The writers thereof, in the politest terms imaginable, inform me that I have been bribed, by person or persons unknown, to "keep off super-hets." "Why," they ask, "when you must realise that the super-het.

At the bottom of the medium waveband, from about 260 metres downwards, the spark nuisance has been an impediment to good reception on some evenings. This is a very great pity, for there are some fine stations down there. Amongst the best are Fécamp, Nurnberg, Trieste and Gleiwitz.

Turin, Heilsberg and Hilversum are all to be heard quite often in daylight, and after dark their volume is enormous. Bratislava varies somewhat, but if you find him at his best you will probably have a real surprise.

Breslau and the Poste Parisien are also daylight stations. Göteborg is usually good, but is subject to a certain amount of variation. Milan so far is hardly living up to his 60 kilowatts. Brussels No. 2 is tremendous, and I have had huge volume from Brno as early as four o'clock in the afternoon.

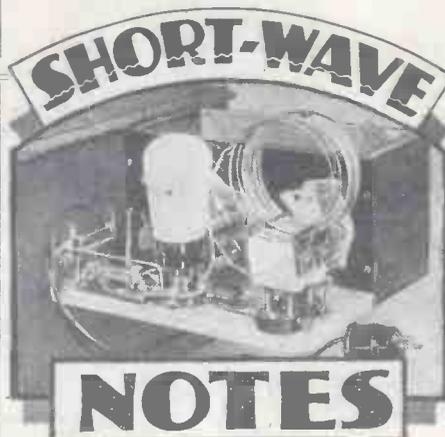
Reception of America.

Strasbourg is now quite reliable, but Hamburg appears only on odd nights. Toulouse is still rather lacking in quality, but Leipzig is a wonderful station either in daylight or after dark.

I can record good reception from Söttens, Katowice, Berlin Witzleben and Madrid. The Paris Ecole Supérieure has come in wonderfully well on many nights and Lyons Doua should not be neglected. Stockholm, Rome, Beromünster and Langenberg are all good, and Prague seems to be making the fullest use of his 120 kilowatts.

Vienna is a very much improved station, coming in at loudspeaker strength on most nights. Munich varies, but he is usually to be heard. Budapest is always ready to entertain, and I have heard him lately in broad daylight on a big super-heterodyne receiver.

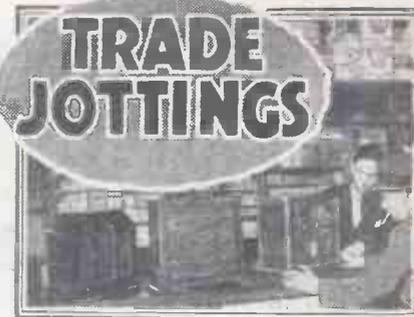
To night-birds I can strongly recommend the thrills of transatlantic reception, which is wonderful at the present time. Not only the U.S.A. stations, but also those in the Argentine and in Mexico are coming through well, and on a good night from a dozen to twenty stations can be logged with the aid of a three-valve set. R. W. H.



is the short-wave set, do you keep fiddling about with one-valvers that anyone could make without any help from you?"

Here is the answer. *One*; I have kept off super-hets. for a bit, chiefly because, on account of the expense and complication, they do not appeal to anything like the wide circle of readers that would be catered for by a small set.

Two; because one-valvers have been so fascinating to me (and, judging from correspondence, to my readers as well), that I



WIRELESS, or perhaps I had better say more accurately public-address equipment, apparently plays a most important part in the affairs of the Swiss Parliament (not to be confused with the Swiss Navy!).

In the Swiss Federal Parliament House it is the custom for each delegate to speak from his own seat, and not from a central tribune, which, from the point of view of the engineers who were called upon to provide a public-address installation, was something of a difficult problem.

Satisfactory Solution.

But the Marconiphone Company, which was responsible for the installation, was not to be outdone by a little matter like that, and they found a satisfactory solution in the provision of a separate microphone for each delegate. That meant a total of 200 "mikes"!

Then, in order to provide even distribution of the amplified voice, no less than 100 speakers were installed below the desks of the delegates; one loudspeaker being placed between each pair of chairs.

It is interesting to note that this special installation is now one of the most comprehensive sound amplifying systems in any part of the world.

I have just heard of an interesting outcome of the recent Manchester Exhibition. "The Manchester Evening Chronicle," in conjunction with the local branch of the
(Continued on page 812.)

have pegged away at them rather than trying to do two things at once.

Three; I have nothing whatever against the super-het. *Four*; to write these notes I have had to tear myself away from the skeleton of the short-wave super-het. that I am now engaged in designing.

For Empire Programmes.

I think "Clause Four" will satisfy the plaintiffs. The set is a super-het. specially designed for the reception of the Empire programmes in far-away parts, on the loudspeaker, and is therefore a good all-round loudspeaker set for all short-wave broadcast.

Chassis construction is being employed, and the minimum possible number of valves is being used. H.T. consumption will not be prohibitive, and simplicity will be the keynote of the set. For further information, "watch this space."

The background brigade is still going strong, and helpful hints on the subject appear in nearly every post. "P. M." (South Devon) suggests the use of a 50,000-ohm potentiometer across the 'phones, and
(Continued on page 810.)

THE S.T. 400 ——— AND TWO FAMOUS THREES

You must build one of these sets

S.T. 400

COMPLETE KIT

£4 : 17 : 6

Or deposit of 9/6 and 11 monthly payments of 9/9

Model A

Complete Kit with four specified valves and beautiful Walnut Cabinet fitted with Moving-Coil Speaker.

£10 : 10 : 0

Or deposit of 20/- and 11 monthly payments of 21/-.

Model B

Complete Kit with four specified valves.

£6 : 16 : 9

Or deposit of 12/6 and 11 monthly payments of 13/9.

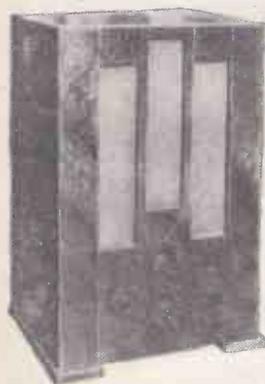


Obtainable from all leading Radio Dealers. In case of difficulty, order direct.

OVER 100 STATIONS!

The new 4-valve set which will give you over one hundred programmes—more than fifty at "local" strength. Amazing selectivity and sensitivity—wonderfully fascinating to build and operate. You must build it. **Insist on the Ready Radio Authorised Kit as approved Mr. John Scott-Taggart, A.M.I.E.E., F.Inst.P.**

Full-size blue print and copy of "Wireless Constructor," and helpful instructions by Mr. G. P. Kendall free with every Kit.



THREE-O-THREE

COMPLETE KIT

£2 : 7 : 3

Or deposit of 9/6 and 5 monthly payments of 9/-

Model A

Complete Kit with set of three Mullard Valves and beautiful Walnut Cabinet, fitted with Permanent Magnet Moving-Coil Speaker.

£6 : 17 : 6

Or 10 monthly payments of 16/-.

Model B

Complete Kit with set of three Mullard Valves.

£3 : 10 : 0

Or 7 monthly payments of 11/9.

METEOR S.G. 3

COMPLETE KIT

£3 : 15 : 3

Or 9 monthly payments of 9/9

Model A

Complete Kit with set of three Mullard Valves and beautiful Walnut Cabinet, fitted with Permanent Magnet Moving-Coil Speaker.

£8 : 17 : 6

Or 12 monthly payments of 17/-.

Model B

Complete Kit with set of three Mullard Valves (Metallic Screened Grid, Detector and Power).

£5 : 7 : 6

Or 10 monthly payments of 12/6. (A Pentode may be used if desired—8/9 extra.)



BUILT IN TWENTY MINUTES

The most efficient type of Detector-2 L.F. Set. Remarkably selective and sensitive, giving an excellent choice of home and foreign programmes with superb moving-coil quality. Incorporates the unique Ready Radio Dual Range Coil, fitted with four-in-one control (On-off, Wavechange, Selectivity and Volume Control all operated by one knob). Only five components to mount and five wires to connect—you will build it in twenty minutes.

Full instructions, diagrams and photo-plans with every kit.

SUPER SCREENED-GRID SELECTIVITY

The only kit set to give you all the wonderful features of the S.T.300 plus the additional advantage of ultra-short-wave reception of stations in all parts of the World. Super-sharp selectivity; huge volume; a minimum of thirty stations guaranteed. Moving-coil reproduction. Very easy to build.

Full instructions, diagrams and photo-plans with every kit.

READY RADIO

To READY RADIO LTD. (Book Dept.), Eastnor House, Blackheath, S.E.3.

Please send me full details of your Kits and tell me about your Registered Users' Scheme. I enclose 14d. stamp to cover postage.

Name.....

Address.....

P.W.16

Christmas is Coming

so buy yourself a copy of

THE XMAS NUMBER

OF

MODERN WIRELESS

NOW
ON
SALE

AT
ALL
BOOKSTALLS

USUAL
PRICE
1/-

SPECIAL
LARGE
SECTION

"FOR THE
CONSTRUCTOR"

including
full details of how to build

**THREE
FINE RECEIVERS**

THE
"DIODION"
SUPER
SEVEN

THE
"METRIC"
THREE

THE
"WHOLE
WORLD"
FIVE

AND

A GIFT

FOR EVERY READER!

A unique station-identification
and set-calibration chart

"M.W." DIAL DIAMONDS

easy to use, simple to understand,
interesting to all and

FREE

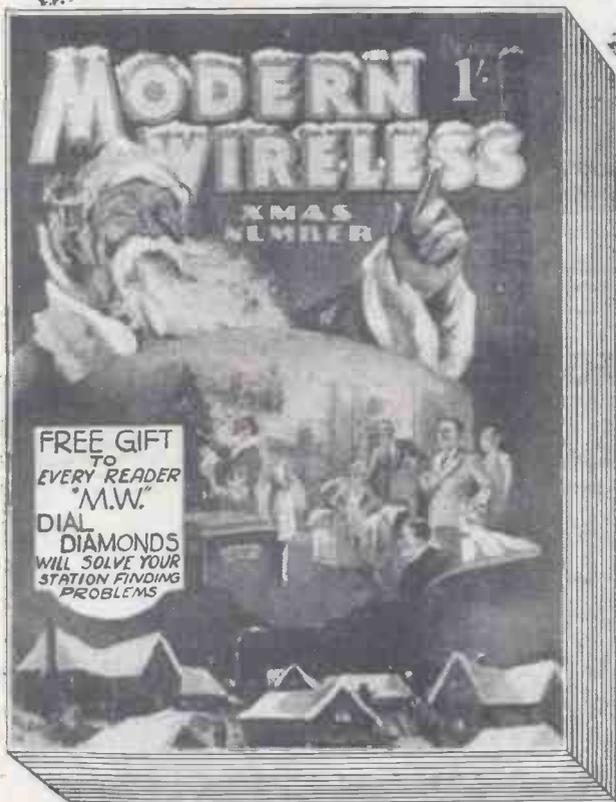
ALSO

THE WORLD'S PROGRAMMES

a supplement for

THE LONG-DISTANCE LISTENER

Telling all about the
foreign stations—
when, where and
how to listen
for them



OTHER ITEMS IN THIS NUMBER
INCLUDE:—

Xmas Greetings from Daventry

— Some Seasonal Suggestions —

Radio Xmas Gifts — Better Radio —

Behind the Scenes at Queen's Hall

— "Warming-Up" a Short-Wave One,

etc., etc., etc.

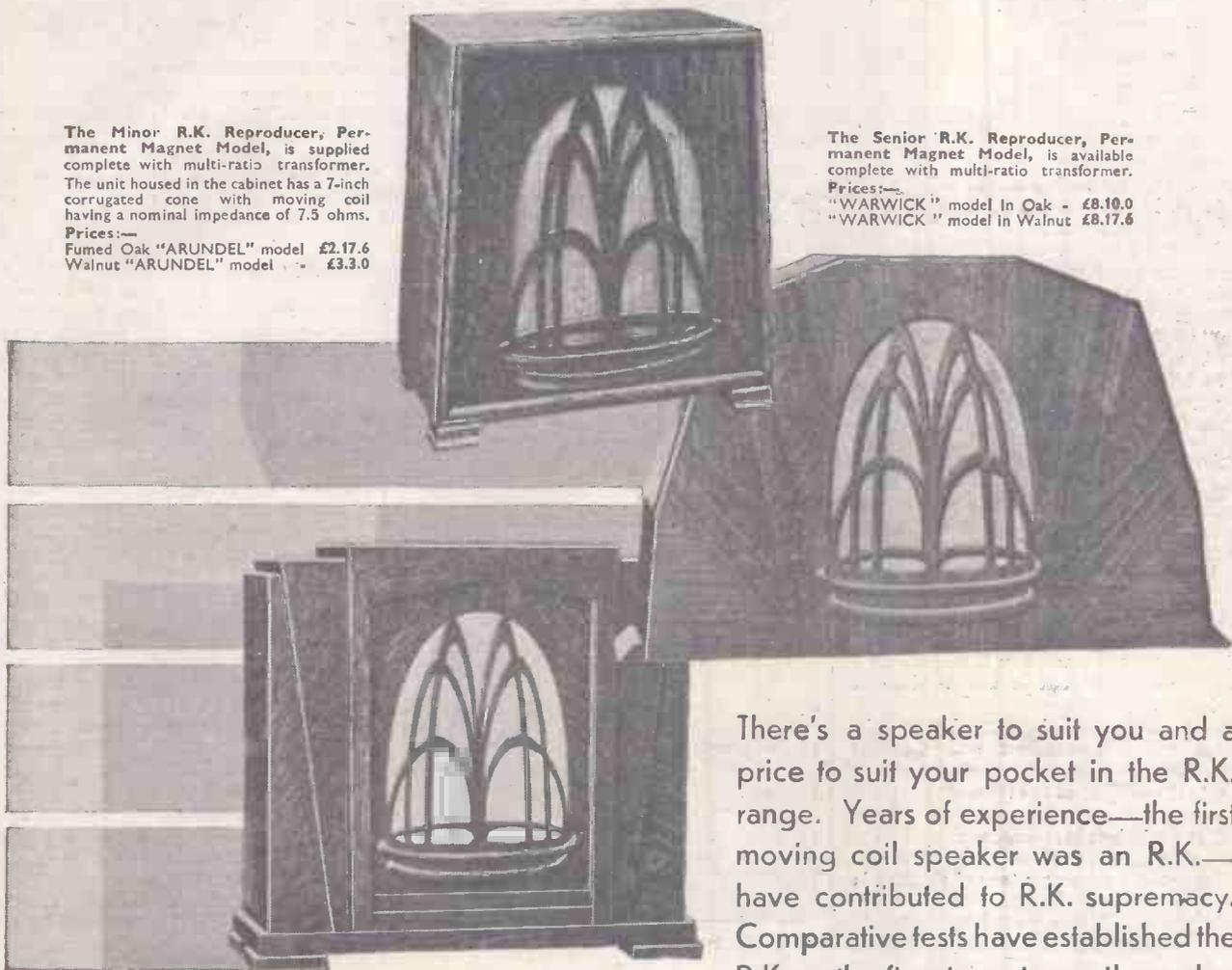
DON'T MISS

MODERN WIRELESS

THERE'S THE SPEAKER YOU WANT IN THE B.T.H. RANGE of MOVING COIL REPRODUCERS 1933 MODELS

The Minor R.K. Reproducer, Permanent Magnet Model, is supplied complete with multi-ratio transformer. The unit housed in the cabinet has a 7-inch corrugated cone with moving coil having a nominal impedance of 7.5 ohms.
Prices:—
Fumed Oak "ARUNDEL" model £2.17.6
Walnut "ARUNDEL" model £3.3.0

The Senior R.K. Reproducer, Permanent Magnet Model, is available complete with multi-ratio transformer.
Prices:—
"WARWICK" model in Oak - £8.10.0
"WARWICK" model in Walnut £8.17.6



The Senior R.K. Reproducer, Permanent Magnet Model, is available complete with multi-ratio transformer.
Price:—
"WINDSOR" model in Oak - £8.10.0

There's a speaker to suit you and a price to suit your pocket in the R.K. range. Years of experience—the first moving coil speaker was an R.K.—have contributed to R.K. supremacy. Comparative tests have established the R.K. as the finest moving coil speaker made—regardless of price. You pay no more but you get a better speaker.

All good radio dealers will be pleased to demonstrate R.K.'s to you. A range of output transformers specially designed for use with R.K.'s is available.

EDISWAN RADIO 100 PER CENT BRITISH

The Edison Swan Electric Co. Ltd.



155 Charing Cross Rd. London. W.C.2

W.192

OVERSEAS AT CHRISTMAS

By CAPT.
P. P. ECKERSLEY
M.I.E.E.

CHRISTMAS, 1932, finds the problems of broadcasting much the same as they were at Christmas, 1922, but ten years has given us the knowledge of how to solve them all, and the ability to solve a great many.

I think broadcasting can be considered to be "perfect" when:

(1) Whatever programme is transmitted can be heard so that it is, to all intents and purposes, indistinguishable from the original (with all that that implies).

Anywhere in the World.

(2) Condition (1) is fulfilled wherever the programme originates, i.e. one should be able to transmit the "sounds" of this or that from anywhere in the world and therefore, by implication, simultaneously to all the listeners of the world.

(3) The listener has so wide a choice between different kinds of programmes that his loudspeaker is a window through which he apprehends all that is worth while in world thought.

No. 1 above is solved to-day; only obsolescence of equipment and thought delays the introduction of perfect quality. No. 2 is the subject of the following article. No. 3 will come about by the use of both wired and wireless broadcasting.

But about No. 2!

To-day there are many tens of thousands of people in the world who are sentimentalising "home" into something infinitely desirable. Roasted by foreign suns, they ache to hear the sigh of the wind in bare trees—to them the dearest music is the slash of rain against a black window. Cold with the dank and cheerless day, some of us, this time, long for blue seas, blue skies, and the feel of the sun on our bodies.

Environment.

Few can be strong-minded enough to live without being influenced by their environment. But, to most, home calls strongest, and a station has been erected (by taking part of the money we pay to be "en-

OUR CHIEF RADIO CONSULTANT

—who never forgets that radio's true purpose is to give programmes—here discusses the matter of Empire Broadcasting and, as usual, views the topic from a unique but vitally relevant angle.

tertained"), and its seventeen aerials are set, this way and that, fronting the Empire upon which the sun never sets. Britain is attempting to bring the atmosphere of "home" into the lives of the overseas settler. Big Ben will boom in the loneliest loudspeaker, Christmas gaiety will make the jackass laugh louder.

It is all a charming idea—one which I



"I picture to myself the problems confronting the would-be lonely listener."

would have sponsored with the more enthusiasm as I felt the service given would be the more appreciated. It has been my unenviable task to put a damper upon too great an enthusiasm for the idea only because the technical

means are still to some extent limited. I have been round the world a bit. I picture to myself the problems confronting the would-be lonely listener.

First and foremost he must make up his mind to put up with a quality of reproduction which is greatly inferior to a gramophone or a wireless set tuned to a local station. Secondly, he must on many occasions fail to pick up signals at all. Thirdly, he, as likely as not, will get a bad background crackle. Fourthly, being in the wilds, he will have to use batteries for high tension and for his filaments.

The Services Available.

The high-tension battery will, I imagine, run down very quickly in tropical climates. The low-tension battery requires charging.

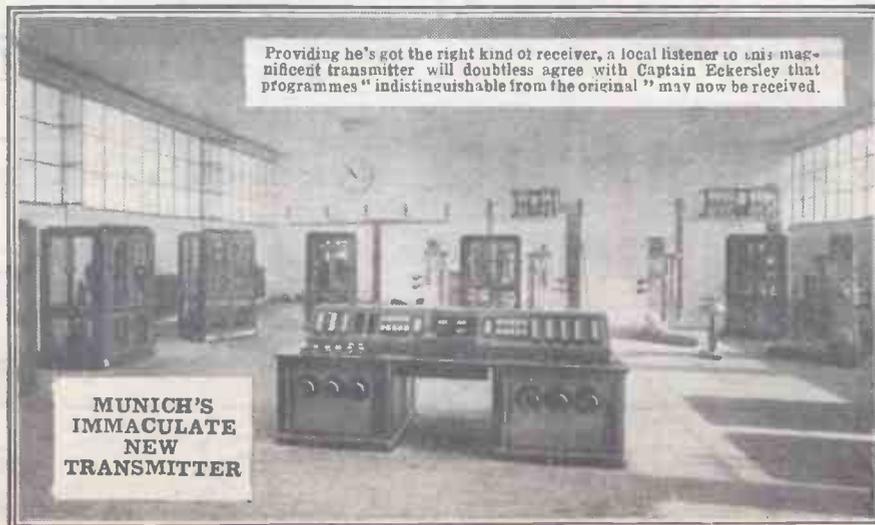
The Australian, way back, will get a better, if still, to-day, mediocre service from his Australian station.

The Canadian gets a really passable service from America and his local station. The New Zealander has local stations and Australian stations, probably giving a service superior to that given by the "Empire" station. But in the archipelagos of the South Seas, in West Africa, Kenya and India, the listener will probably pick up the new Empire service better than anything else.

I am as anxious as anyone to bring "contacts" to the lonely—I am not trying to be funny or sarcastic—I wish no one ill, but I feel that our ideals would probably be more nearly realised if we considered an extension of the idea,

Fading of short-wave signals can be overcome and quality levelled up to an amazing degree by the use of what is known as spaced aerial reception. In brief, one erects

(Continued on page 802.)



Providing he's got the right kind of receiver, a local listener to this magnificent transmitter will doubtless agree with Captain Eckersley that programmes "indistinguishable from the original" may now be received.

MUNICH'S
IMMACULATE
NEW
TRANSMITTER

The Gift

that gives confidence to the giver and perfect reception to the receiver.

PERTRIX
TRADE MARK
DRY BATTERIES
& ACCUMULATORS



Britannia Batteries Ltd, 233
Shaftesbury Ave, London, W.C.2.
Telephone: Temple Bar 7971
(5 lines). Works: Redditch
(Worcs.) Branches at Glasgow,
Manchester, Bristol, Dublin,
Leeds and Newcastle.



IT began when I happened to pick up the second number of "Modern Wireless"—in, I think, March, 1923. The B.B.C. had just started up from 2 L O and 2 Z Y, and a local ironmonger had given a much-talked-of demonstration with ump-teen pairs of headphones on a green baize table.

Not long after I got bitten by the bug properly—and after a lengthy struggle, financial and otherwise, built a crystal set on a soap box. I think I was eleven years old at the time, and how on earth my pocket money stretched to the dimensions needed for components in those days is a mystery now. Perhaps it is as well!

His First Foreigner.

Anyway, one evening in 1923, the whole family took turns with the headphones—by the way, those headphones cost thirty shillings, and I am still using them—to listen to the complete evening's programme from 2 Z Y. It was wonderful. So clear. So realistic. But I was already dreaming about valves.

Christmas and a birthday came and went before the first valve set could be got together, but when at last it materialised, and my single Dutch bright-emitter valve was lighting the room comfortably, there was another lengthy struggle to get the thing to work.

It was actually spread all over a good-sized table, held together and connected by yards of D.C.C. wire! But it worked at last, and I heard all the B.B.C. stations then operating.

Curiously enough, I never heard a foreigner. Until—

One night when the house was asleep, I tip-toed downstairs. Caution was necessary because at that particular period of

Starting Short-Wave Work

Christmas is the time for reminiscences and you'll enjoy reading these memories of nearly ten exciting years of evolution—from an impecunious school-boy to a grown-up short-wave "fan."

my life great parental stress was laid upon the desirability of eight hours' sleep. Scarcely daring to breathe, I switched the set on, and turned the dials.

I was rewarded by hearing, very faintly but distinctly, W G Y at Schenectady, N.Y. In my excitement I upset a cup and saucer which somebody had left on the table overnight. I pass over the scene that ensued!

Well, during the next year or so sets came and went, and my single Dutch valve yielded to three authentic British ones. Most of the time I was using a circuit which would be thought very curious nowadays.

All the Rage Then.

The first valve was made to act first as an H.F. amplifier, and then, the rectified signal being handed back through a transformer, the same valve amplified the L.F. currents! Dual Amplification, the thing was called, and—providing one could get it to work—it was all the rage in those days.

About 1924, there began to appear items in the daily press which intrigued me. Amateurs on the unheard-of wavelength of 100 metres were communicating with America and even New Zealand!

More scheming. Chopped-down coils and a pet detector valve deprived of its metal base. I spent a week with a list of the Morse signs in front of me at meals, and

And finally, awaiting the time when perfect methods are available, let us hope that those in the far-off places will enjoy what they can pick up, and will remember in gratitude the B.B.C., who have, out of our licence revenue, given them this boon.

But let us all remember it's not all just too easy and, that hopes now high may be dashed. In the end it depends upon programme value—a good programme and mediocre reception is worth while.

then started a frenzied chopping and changing of circuits.

Then one Sunday afternoon I heard a faint station signing off "A 2 C M." Australia! Surely Mr. McClurcan, the owner of A 2 C M, must have a heart of gold.

The Boiled Owls.

In reply to my hysterical—and probably badly spelt—letter, he sent me a beautiful Q S L card, with his call-sign framed in an outline map of the Australian continent.

That started me off. From the famous A 2 C M afternoon I date my gradual distaste for sleeping. I made converts.

Before long there were three of us in my district interested in short waves; and each Sunday morning we held a Boiled Owl Session, rising about 3 a.m., and settling down to our respective receivers. After breakfast we would foregather with huge lists of DX.

This went on for about four years; and the fact that in the small hours we could sometimes hear each other's sets oscillating led to practical jokes and curious call-signs.

Well, growing up and going out into the world contrived to split us; and there was even a period just after I started work when my own short-wave set was consigned to rusty oblivion in the tool shed.

Weird and Wonderful.

Then, about a year ago, I read an announcement in "P.W." of a short-wave contest. Followed a period of dusting and oiling, and with the purchase of some new parts, I got on the air again, and have since been making up for lost time to such an extent that "W. L. S." firmly believes I have my work, meals, etc., brought to me as I sit turning the dials!

All sorts of sets have come and gone since that first crystal set. Weird sets, wonderful sets, sets the size and shape of a coffin, sets that howled, sets that wouldn't even do that.

I have been ten years at it now—very nearly half my lifetime—and I still get the old thrill at hearing a voice from across the world—and still the old joy at badgering out why a thing won't work, or why the bath on the other side of the wall from the set absorbs a whole band of wavelengths! For sheer interest, I would not exchange a simple short-wave receiver for the most up-to-date and furniture-like broadcast set made.

S. W.

OVERSEAS AT CHRISTMAS

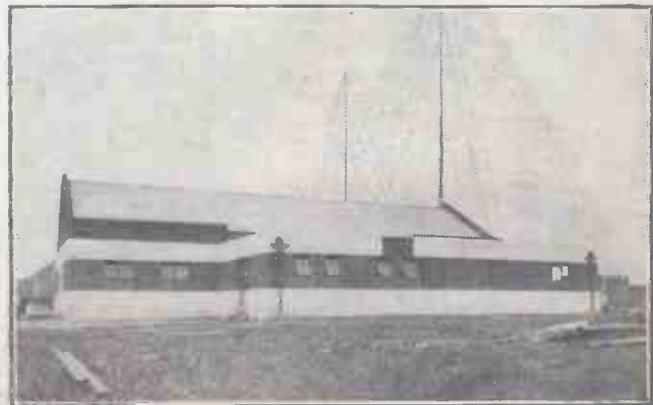
(Continued from page 800.)

aerials at three different places a few wavelengths apart, attaches each to a separate receiver and arranges to combine the output so that when the signals fade at one point they are strong at another, and so on.

Now in general I feel that receiving of short waves ought to be done for but not by the lonely listener, and then he ought to get his service from a powerful local station. I feel so many a lonely listener is going to be disappointed if the present methods are used.

But, of course, if there were no short-wave service from England my scheme would not work! So let them be glad of that anyway.

THE FOCUS OF THE EMPIRE'S EARS



A close-up of the new Daventry short-wave transmitter house. We at home all hope that overseas listeners will obtain good reception.

YOU MUST HEAR IT TO BELIEVE

HOW PURE REPRODUCTION CAN BE

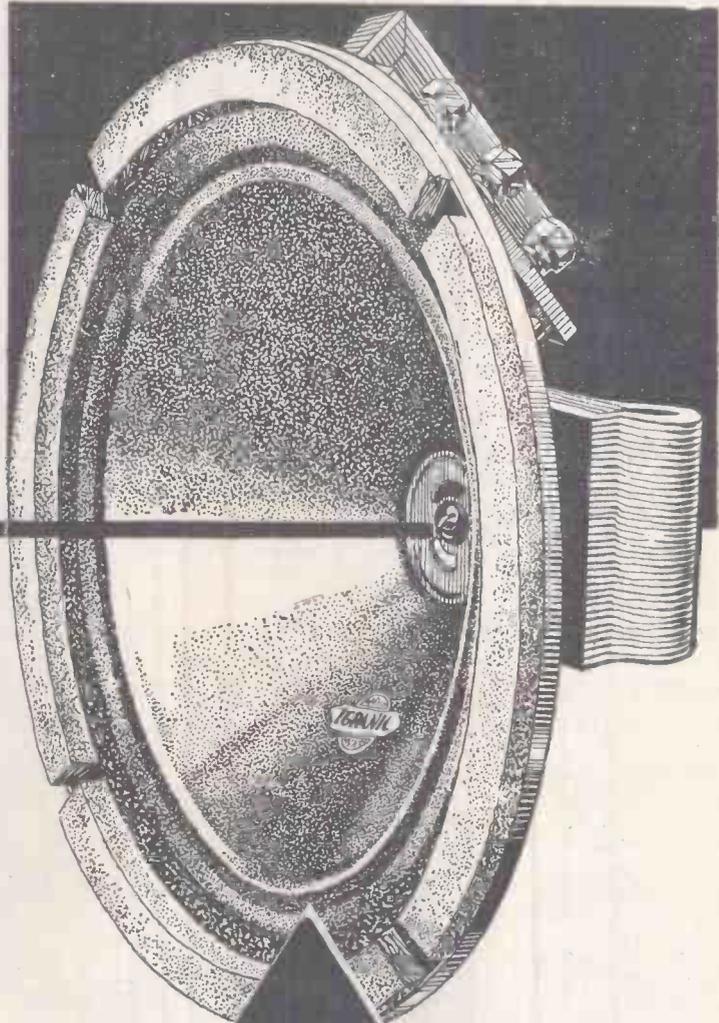
GIVE AN XMAS
PRESENT
that is certain of
GOOD RECEPTION

Hearing is believing. Compare the Igranic D.9 with some other speaker and you will decide in favour of Igranic. Never before have you heard such faithful reproduction of every note throughout the register—of voice and instrument alike.



PERMANENT MAGNET
MOVING COIL LOUD-SPEAKER

HEAR IT AT YOUR
DEALER'S NOW!



Write to-day for fully illustrated Catalogue
No. R.195 of complete new range of Igranic
Quality Components.

Igranic Electric Co. Ltd.,
149 Queen Victoria Street, London, E.C.4.

SEND FOR THE 1932 CATALOGUE

NOTES FROM THE MIDLANDS AND THE WEST.

ALTHOUGH Sir John Reith recently made a public statement that he was not aware of any dissatisfaction on the part of listeners in the Provinces with the nonets established in place of the former wireless orchestras, this subject is constantly coming to the surface in the Provinces.

The sense of loss which still exists in the Midlands was emphasised at a recent meeting in Birmingham of Press representatives with Major Gladstone Murray of the B.B.C. In reply, Major Murray pointed out the financial difficulties of the moment, including the B.B.C.'s heavy contributions to the Treasury, but he held out the prospect that when things became easier the provincial station orchestras might be restored.

An Important Statement.

This is a statement of the greatest importance for broadcasting in the Regions, but no less significant was a speech made on the same occasion by Mr. Percy Edgar, the Midland Regional Director.

So active from time to time have been the advocates of centralisation, and so pressing in their arguments, that even amongst broadcasting officials in the Provinces there has grown up a tendency to compromise, with the result that the present

provincial programmes are a curious cross-breed of local and London items.

Mr. Edgar revealed himself, however, as the champion of a bolder policy, stating that his ambition is to make the Midland Regional programme 100 per cent Midland in origin.

Since then, Mr. Edgar has given me some further observations on this subject. His desire is to see the Midland programme reflect the life and spirit of the area it serves.

"Instead of bits and pieces from all over the place," as Mr. Edgar puts it, "I should like to see a programme genuinely and typically Midland in origin, as to the material, as to the artistes performing it, and as to those giving the talks."

To achieve such an object a good deal of exploration and research would be needed, but Mr. Edgar is convinced that a lot of material suitable for broadcasting, and with a purely and distinctly Midland flavour, is to be found for the searching.

The Midland County programmes are to date the most important examples of this Regional character given by the Midland station. Lincolnshire Week will commence on December 11th and will include a novel relay from the dockside at the port of Grimsby, and organ music from Lincoln Cathedral, and a broadcast of the dedication of the fourteen bells in Boston Stump, the highest church tower in England, with a descriptive talk by Mr. S. P. B. Mais.

Reports have been published that the new West National transmitter at Watchet will be synchronised with London National on 261.6 metres wavelength. This, however, is not quite certain.

"Public reception tests will start in the spring of 1933," an official told me, "but

it is impossible to state definitely the wavelengths which will be used by the West Regional and West National transmitters, as we expect a rearrangement of European wavelengths next spring. It is probable that the West Regional transmitter will use at first a wavelength in the neighbourhood of that at present used by Cardiff, while the National transmitter will use a shorter wavelength giving sufficient separation to prevent interference between the two programmes."

Bristol as Land-line Centre.

When the new station is in operation, the S.B. centre at Gloucester will be closed down and Bristol will become the land-line control centre for the West. The land-lines from London to the West Regional station, and also from the Cardiff studios, will go via the Bristol control centre. There is also a studio at Bristol.

This practice of establishing studios in towns other than the main Regional centres appears to be growing, and the latest suggestion is that the Midland Region should have a studio at Nottingham as well as those in Birmingham. This proposal is being considered by the B.B.C.

T.C.C.'S NEW BOOK.

Their extremely useful and practical book on The Design and Construction of Radio Power Units was advertised by The Telegraph Condenser Co., Ltd. in last week's Popular Wireless (page 728), but unfortunately the address was omitted by a printer's error.

The coupon should be sent with six penny stamps to:—The Publicity Dept., The Telegraph Condenser Co., Ltd., Wales Farm Road, North Acton, London, W.3., by those who have difficulty in obtaining a copy of "The Design and Construction of Radio Power Units."



Ten Trumps!

WILLS'S

CAPSTAN

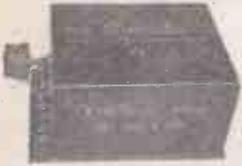
CIGARETTES

They suit everyone

10 for 6^D
20 for 11½^D

Electradix Presents

New Bargains. Ex S. G. Brown & Co.



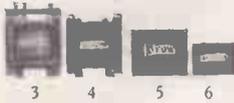
It gives three voltages of D.C. from your filament battery and lasts indefinitely and is an S. G. Brown boon and blessing to H.T. Battery users.

No H.T. Batteries needed with a SUPERSEDER even if you are not on the mains. Reduced from £3:15:0 to **37/6** from us only



Make Your Own Permanent Magnet Moving-coil Speaker with these new powerful British Cobalt Steel 4-claw Magnets. 8,000 lines per c.m. For 1-in. coil, 14/- only.

14/-



CHOKES.—New Chokes by S. G. Brown, as illustrated, less than half price. No. 1, 1 amp., 20 H., 3 1/2 lb., 8/6. No. 2, H.T. D.C., 30 H., 1,075 ohms, 1 1/2 lb., 4/6. No. 3 Centre Tap Choke, 1,075 ohms, 1 1/2 lb., 5/-. No. 4, A.C. Mains Choke Centre Tap, 120 ohms, 1 1/2 lb., 4/6. No. 5, H.T. Unmounted Chokes, 1,020 ohms, 15 H., 1/2 lb., 3/6. No. 6, 5 H., 1,500 ohms, for H.T., 3/-. 200 H.M.V. 10 H., 700 ohms, 4/6. Igranic 20/80 H., 45 m.a. 8/6. 28 Igr., 15 H., 4/6. Parmeko 16 ohms Heavy-duty Choke, 500 m.a., 21/-. B.T.H. Double Yoke, Centre Tap, Heavy-duty Chokes, 500 m.a., 25/-. L.F. Smoothing Chokes, C.T., 160 ohms, 200 m.a., 40 H., 7/6. L.F. Double-wound Chokes, 70 ohms, 50 m.a., 30 H., 6/6. Varley Double-wound Chokes, 50 m.a., 4/6.

PUBLIC ADDRESS

MICROPHONES

Highest grade for all purposes. £20 Brown's P.A. Sale, £12. No. 5 Announcers, 65/-. No. 12 Ring Pedestal, 18/6. Hand Transmitting, 15/-. Solo Pendant, No. 11, in armoured case, 6/6.



LOUD-SPEAKERS

Special Bargain in Brown's Bakelised Cones with H.M.V. Speaker Unit, 3/- pair. R.K. 220-volt Cinema M.C. Speakers, 15-in. cone, £2. 100 R.K. Cinema 110-volt Magnet Pots, 10/-. Cinema Iron Baffles, 4/-. Brown Solo Reed Units, with cone and metal chassis, 7/6. K.B. Moving-coil 6-volt Speakers, cone and metal chassis, 10/-. Cone Lampshade Speakers, rose silk finish, new, 7/6. Silvervox Horn Loudspeakers, new, 10/-. H.M.V. No. 5 Cone Units, special for portables, 2/6.



RECEIVERS at Bargain Prices.

Valves extra.

Fellows Premier V 5 valve, in mahogany cabinet, £2/10/-. Elesca 3 valve in sloping cabinet, £1/15/-. R.A.F. 10 5 valve in mahogany cabinet, £2/10/-. R.B. 2H 2 valve, in leatherette cabinet, £1/5/-. T.M.C. 1 valve set, top panel, 10/-. 2 valve, 12/-. Marconi 3 valve, in vertical cabinet, £2. W.E. Marconi 3 valve, in vertical cabinet, £2. Burndept 2 valve short-wave set, 30-100, £3/10/-. Ediswan 2 valve Compactum, 10/-. 5-valve Mahogany Transportable, £3/10/-. Polar IV 4-valve set in vertical cabinet, £2. 2-valve A.C. Mains Set, 200-250 v., £6/10/-. 2-valve Marconi Battery Set, £1/15/-. Voltron S.G. II, new sloping cabinet with drum dial control, £4. Faradex S.G. II, new, with speaker, blue leatherette, £1/12/6. G.E.C. Victor III, brown metal case, £1/15/-. Mullard Master III and £6/6/- Celestion speaker, £5. B.T.H. 2-stage set, bakelite case, £1/10/-. All Mains A.C. Chassis, S.G., det., pentode, and rectifier, band-pass, switch, L.S., and gramo, £6/10/-.



PARCELS of experimental odd Coils, Magnets, Wire, Chokes, Condensers, Switches, Terminals, etc., post free, 10 lb. 7/-; 7 lb., 5/-.

1, 90 other bargains in New Sale List "P."

ELECTRADIX RADIOS,

218, Upper Thames St., London, E.C.4

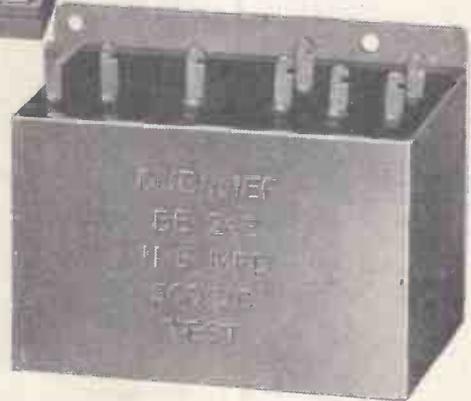


Dubilier Condensers chosen by "CLARKE'S ATLAS" for dependability

Mr. Clarke, of Messrs. H. Clarke & Co. Ltd., the famous manufacturers of ATLAS Radio Products, writes:—"In every case I have found your products to be most satisfactory."

Messrs. Clarke & Co. Ltd. have made certain of obtaining persistent results with their famous "Atlas Receivers" by incorporating Dubilier Condensers. With no other Condensers could they be so sure of getting the same absolute dependability.

Constructors who have used them are equally enthusiastic about their performance. The number of returns is negligible, that is why Dubilier prices are always competitive. In the long run it will cost you far less to get satisfaction if you buy Dubilier Condensers.

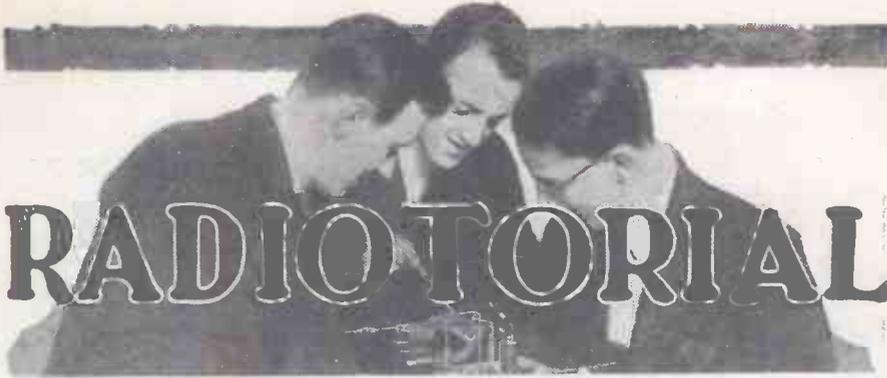


DUBILIER CONDENSERS

P.13

DUBILIER CONDENSER CO. (1925) LTD.
Ducon Works, Victoria Road, North Acton, London, W.3

Distributing Agents for Irish Free State: KELLY & SHIEL LTD., 46/47 Fleet Street, Dublin, C.4



RADIO TUTORIAL

All Editorial communications should be addressed to the Editor, POPULAR WIRELESS, Tallis House, Tallis Street, London, E.C.4.

The Editor will be pleased to consider articles and photographs dealing with all subjects appertaining to wireless work. The Editor cannot accept responsibility for manuscripts or photos. Every care will be taken to return MSS. not accepted for publication. A stamped and addressed envelope must be sent with every article. All inquiries concerning advertising rates, etc., to be addressed to the Sole Agents, Messrs. John H. Lill, Ltd., 4, Ludgate Circus, London, E.C.4.

The constructional articles which appear from time to time in this journal are the outcome of research and experimental work carried out with a view to improving the technique of wireless reception. As much of the information given in the columns of this paper concerns the most recent developments in the radio world, some of the arrangements and specialities described may be the subjects of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

QUESTIONS AND ANSWERS

"KEEP THE PARTY KEEN."

L. F. (Gt. Malvern).—"Last year we had no end of fun with the 'ghostly voice' you described in 'P.W.'"

"I disconnected the detector's plate circuit from the L.F. transformer, wired a cone loudspeaker across the primary, and got a most realistic 'ghostly voice' on the main loudspeaker, which we concealed inside the bottom of paper-covered bran-tub.

As the loudspeaker was in the dining-room and the set in the kitchen, we kept an eye on the voice through the serving hatch between the two rooms, and it absolutely mystified the adults as well as all the kids!

"This year we want to 'keep the party keen' again, with a stunt along the same lines. Can you suggest anything using the new set, which is S.G. det. and 2 L.F. with pick-up?"

Any good set, with provision for a pick-up, can be used as a sort of detectaphone, to bring up distant whispers or voices, and there are great possibilities in that.

You can have the loudspeaker standing innocently in one room (concealed, if you like), and arrange so that every word said anywhere near it, even whispers, can be heard plainly on telephones in some other

room. So if you get a fortune-teller dressed up, to wear the telephones, he or she will be able to mystify the company by telling them what they were talking about, etc. Very amusing possibilities!

All you have to do is the following:

Disconnect the pick-up from set's pick-up terminals and disconnect the long leads from speaker to set, at the set end.

Then join these long leads from the distant loudspeaker to the "pick-up" terminals on the set. Finally, fix the telephones to the set's output or loudspeaker terminals.

Switch on, and you will find that whispers near the loudspeaker are enormously magnified. So use a volume control across the 'phones, if necessary.

Best wishes for a good time!

PICK-UP SWITCH CONNECTIONS.

C. S. P. (Shortlands, Kent).—"P.W.' sets are getting better than ever. I am using the 'Pop-Vox' in radio-gram form at present for my 'Broadcasting' set and a modification of the

(Continued on page 808.)

DO YOU KNOW—

The Answers to the following Questions ?

There is no "catch" in them, they are just interesting points that crop up in discussion on radio topics. If you like to try to answer them, you can compare your own solutions with those that appear on a following page of this number of "P.W."

- (1) Why does the B.B.C. transmit a "tuning-note" before the programme begins?
- (2) If a set has several H.T. + leads, is there any need to interfere with its internal wiring in order to fit a "decoupling" circuit?
- (3) Where is Radio City?

"NEW RADIO FOR OLD"—FOR CHRISTMAS

WE BUY YOUR OLD SET AND SUPPLY YOU WITH A NEW SEASON'S MODEL

Liberal Allowances and Balance Payable by Cash or Hire Purchase

HUNDREDS OF TESTIMONIALS FROM SATISFIED CLIENTS

EVERY MAKE OF SET, KIT OR RADIOGRAM SUPPLIED

It will pay you to write for particulars of our amazing exchange offer, enclosing 1½d. stamp, naming your old set and the new model you fancy. A FREE QUOTATION WILL FOLLOW.

Complete transactions executed by mail.

FREE WIRELESS SET to introduce the Radialaddin Club.

Please forward this INQUIRY FORM (without obligation):

Please quote me free your allowance for the new set:

Make..... Model and List Price.....

My Present Set is: Make..... Batteries or Mains.....

Date of purchase..... Original cost of Set.....

Balance of purchase price would be payable by me as follows:

Plan A. Whole of balance in cash.

Plan B. Whole of balance over Six, Nine, Twelve* months.

*Delete unwanted words.

NAME, in Full (Block Letters).....

ADDRESS.....

VISIT OUR SHOWROOMS.

RADIALADDIN, Limited

THE LARGEST RADIO EXCHANGE IN THE UNITED KINGDOM.

(Dept. P.W.), 46, Brewer Street, London, W.1.

*Phone: Gerrard 4055.

THE MOST POPULAR RADIO-GRAM CABINET ON THE MARKET

REDUCED TO 39'6 Carriage TO Paid!!!

QUALITY GUARANTEED IMPROVED Soundly constructed in selected oak, etc. and hand polished.

SPECIFICATION.—3' 3" high, 1' 10" wide, 1' 6" deep. To take panels up to 18" x 7". Panel opening to suit set. These cabinets allow ample room for the following:—Pick-up, Motor, Speaker, Batteries, etc., all for the reduced price of 39'6.

Catalogue Post Free. From one of the Largest Mail Order Works in England.

W. S. WILKINSON Cabinet Manufacture, 12-26 Nelson Mews, Southend-on-Sea, Essex.

Guernsey Depot:—Messrs. Leale, Ltd., 7, Bondage, Guernsey



BRITISH GENERAL



OUTPUT TRANSFORMER

Enables the speaker to be correctly matched to the valve, giving increased volume and better tonal balance. Prevents damage to the loudspeaker due to sudden switching on and off of large currents.

Price **9/6** Multi Ratio.

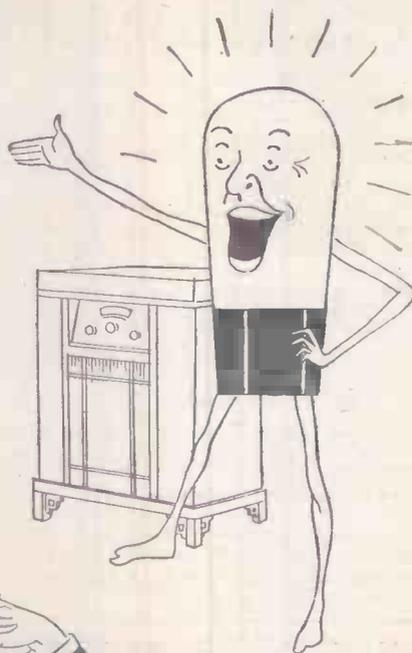
From all dealers or direct.

British General Manufacturing Co., Ltd., Brockley Works :: London :: S.E.4.

Osram Valves

MADE IN
ENGLAND

WITH THE
WEMBLEY FILAMENT



For correct types ask your wireless dealer. Also write for the OSRAM WIRELESS Guide (1932 Edition).



The Christmas tonic to any Set!

SOLD BY ALL
WIRELESS
DEALERS

PRESCRIBE OSRAMS for your own & your friends' sets this **CHRISTMAS.**

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

**RADIOTORIAL
QUESTIONS AND ANSWERS**

(Continued from page 806.)

'W. L. S.' short-wave one (det plus R.C.C. L.F.) for my S.W. receiver in my radio station, which is housed in a shack in the garden

"Now you present the '1933 Four,' which seems to be a fine combination of simplicity and modern design. However, I have noticed a small theoretical flaw in the circuit, though in practice it amounts to very little.

"In the circuit as you have given it, if the switch is left thrown over to pick-up when the set is switched off, as will often be the case, there will be a constant (though small, I admit) drain on the grid-bias battery via the pick-up, the switch, grid leak, filament, and then to G.B. positive

"By using a D.P.D.T. switch, this could be avoided. Of course, the drain on the G.B. battery would be extremely small: ignoring the resistance of the pick-up and valve filament, and assuming the G.B. voltage to be 1½ volts, the current would only be 00075 milliamps.

"As 'P.W.' and perfect theory are understood to be synonymous, I suggest that the D.P.D.T. switch, which is just as simple, is more desirable. I should be very pleased to hear your views on this."

We are glad that you spotted this point, and congratulate you on being one of the few

who noticed that the simple switching adopted involved the placing of pick-up, filament and

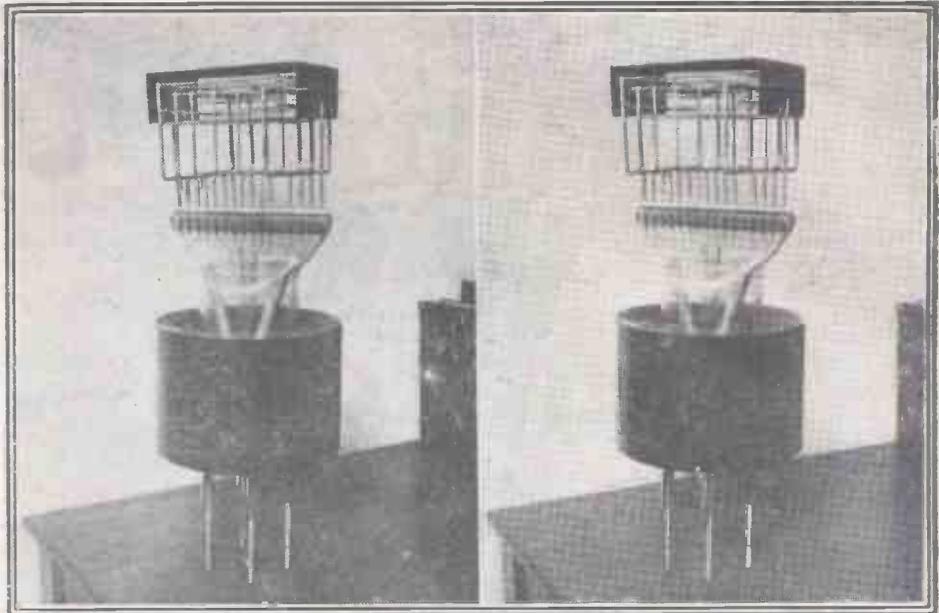
grid leak in series across part of the G.B. battery. As you say, it could have been avoided by the use of a double-pole double-throw switch. And, in fact, in one version of the original model we went a step further and worked out how it could be avoided even when using a single-pole double-throw switch.

In practice, however, there was one other factor you appear to have overlooked—viz. the "bonk" that often accompanies the switch-over if the grid leak is not left attached to the grid.

We decided that to get rid of that a very tiny discharge current was permissible, for the current

(Continued on page 810.)

A TRUE-VIEW OF THE VALVE



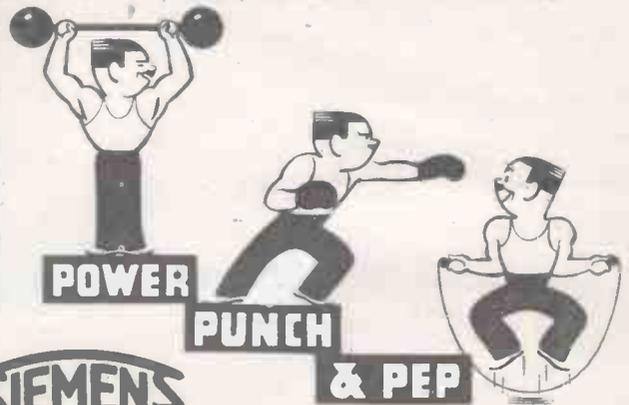
This stereoscopic picture shows the extreme accuracy of the electrode-spacing of the Mullard PM22A, when it is seen through a "P.W." True-viewer.

"P.W." PANELS, No. 101.—COPENHAGEN.

The usual call is "Kalundborg-København" (Kalundborg being the associated long-wave station). Copenhagen works on 281 metres, and is nearly 800 miles distant from London.

Both male and female announcers are employed. The interval signal is a melody from an old Danish folk-song. The station usually opens with one stroke on a gong, and closes down with three strokes.

The **BATTERY** that **MAINTAINS ITS-**



SIEMENS
FULL O'POWER
RADIO BATTERIES
WITH THE ONE PIECE PURE ZINC CELLS

Dept. of SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED, 38/39, Upper Thames Street, London, E.C.4.

THE RADIOPAK specified



for the P.W. "ALL-IN-THREE"

TO BE DESCRIBED
IN NEXT WEEK'S ISSUE.

THE band-pass 'Radiopak,' on account of its superlative value to set constructors, has been used in the "Popular Wireless" "All-in-Three," details of which will appear in next week's issue.

The band-pass 'Radiopak' simplifies set construction as well as it simplifies selectivity. Revolutionary in conception and design, neat, compact, and robust, above all the 'Radiopak' is efficient. Consisting of screened coils with provision for reaction, ganged condenser with drive, combined volume control, and on-off power switch, mounted neatly on a metal chassis, the 'Radiopak' needs only the addition of valves, low-frequency circuit, loudspeaker, and batteries or mains unit to form a complete receiver.

Because the coils and condenser are matched with the highest possible degree of accuracy before leaving our factory, all ganging difficulty is eliminated, and each unit is supplied with a tuning scale calibrated in wavelengths.

FOR THE "P.W."
"ALL-IN-THREE"

Type
535A/50,000.
with extra knob
for Reaction
Condenser

60/6

RADIOPAK

TRADE MARK

THE ONLY COMPLETE BAND-PASS TUNER

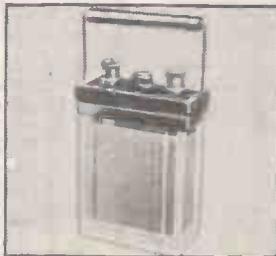
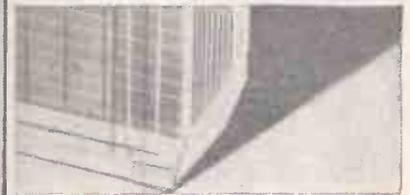
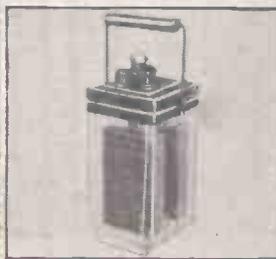
BRITISH RADIOPHONE LTD., Aldwych House, London, W.C.2.
Telephone—HOLBORN 6744.

BALANCED CAPACITY

GIVES LONGER LIFE

AND HIGHER AMPERE HOUR

EFFICIENCY



Type E.L.9. 80 a/h capacity	12/3
Price - - - - -	
Type E.L.M.4. 45 a/h capacity	8/-
Price - - - - -	
Type E.L.S.7. 60 a/h capacity	12/6
Price - - - - -	

● That's the secret, "balanced capacity," the newest principle in modern accumulator making.

The scientific design of the positive and negative plates which preserves exact electrical "balance" allows this accumulator to be charged more quickly, and to give a longer life per charge. Twenty-five years experience in battery building has gone to produce the Ediswan "Extra Life" cell. Here are some of the additional refinements incorporated: screwed vents, non-interchangeable and non-corrodible connectors, British made containers of clear glass and metal carriers which fit neatly round the containers.

EDISWAN

EXTRA LIFE

ACCUMULATORS



THE EDISON SWAN ELECTRIC CO. LTD.
155 CHARING CROSS ROAD, LONDON, W.C.2.

New Times Sales Co.
EST. 1924



EVERYTHING CARRIAGE PAID

● LISSEN SCOUT 3 CHASSIS KIT Cash or C.O.D. 89/6, or 12 monthly payments of.....	8/3
● LISSEN SKYRIDER 3 COMPLETE KIT Cash or C.O.D. 26/5/7, or 12 monthly payments of.....	11/6
● COSSOR MELODY MAKEA MODEL 331 Cash or C.O.D. 26/7/6. First payment, 10/-; balance 11 monthly payments of.....	11/10
● COSSOR MELODY MAKEA MODEL 335 Cash or C.O.D. 27/17/6. First payment, 10/-; balance 11 monthly payments of.....	14/10
● SLEKTON SCOUT 3.4.3 CHASSIS KIT Cash or C.O.D. 23/19/6, or 12 monthly payments of.....	7/3
● STATION MASTER 3 CHASSIS KIT Cash or C.O.D. 25/11/-, or 12 monthly payments of.....	10/2
● KENDALL-PRICE 3 CHASSIS KIT Cash or C.O.D. 24/6/6, or 12 monthly payments of.....	8/-
● DUBS SCOUT 3 CHASSIS KIT Cash or C.O.D. 21/12/6, or 7 monthly payments of.....	5/2
● PETO-SCOTT WALKER 3 CHASSIS KIT Cash or C.O.D. 21/15/-, or 6 monthly payments of.....	6/6
● W.B. PERMANENT MAGNET MOVING-COLL SPEAKER TYPE P.M.4 Cash or C.O.D. 22/7/6, or 12 monthly payments of.....	4/6
● W.B. PERMANENT MAGNET MOVING-COLL SPEAKER TYPE P.M.2 Cash or C.O.D. 24/5/-, or 12 monthly payments of.....	7/9
● W.B. PERMANENT MAGNET MOVING-COLL SPEAKER TYPE P.M.4 Cash or C.O.D. 22/2/-, or 8 monthly payments of.....	5/9
● R & A VICTOR PERMANENT MAGNET MOVING-COLL SPEAKER DE LUXE Cash or C.O.D. 23/10/-, or 12 monthly payments of.....	6/5
● R & A "CHALLENGER" P.M. MOVING-COLL SPEAKER Cash or C.O.D. 21/15/-, or 6 monthly payments of.....	6/6
● CELESTION P.M. MOVING-COLL SPEAKER Cash or C.O.D. 22/7/6, or 12 monthly payments of.....	4/6
● W.B. PERMANENT MAGNET MOVING-COLL SPEAKER TYPE P.M.4 Cash or C.O.D. 22/9/6, or 12 monthly payments of.....	4/6
● ELIMINATOR TYPE A.C. 34 Cash or C.O.D. 22/19/6, or 12 monthly payments of.....	5/6
● EKCO H.T. ELIMINATOR A.C. 18 Cash or C.O.D. 23/7/6, or 12 monthly payments of.....	6/3
● HEAYBERD H.T. UNIT D.1 Cash or C.O.D. 24/6/-, or 12 monthly payments of.....	8/10
● GARRARD INDUCTION MOTOR MODEL 23 Cash or C.O.D. 22/10/-, or 12 monthly payments of.....	4/7

Send FIRST PAYMENT with order and ensure PROMPT DELIVERY

Miscellaneous Components, Accessories, etc., supplied CASH, C.O.D., or H.P. on our own Private System of Easy Payments. Any items advertised in this Journal sent C.O.D. If value over 10/- sent all C.O.D. charges paid.

To NEW TIMES SALES CO. 52, Ludgate Hill, London, E.C.4
Please send me (a) your 1933 Catalogue

(b).....for which I enclose first payment of £.....s.....d.
Name.....
Address.....
P.W. 10/12/32

SAFEST FOR EASY TERMS

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 808.)

really is very tiny—far below one-thousandth of a milliamp!—so it could not possibly hurt the grid battery, and was a "disadvantage" not worth considering against the merit of the switching scheme we adopted.

(We note with pleasure that you have "heard" all continents" at G2BWE. Congratulations.)

WHAT IS THE ELECTRIC IRON ?

J. N. (Salford).—"Could you explain the following curious fault, and say whether it was due to our electric iron or other cause ?

"Although we have electricity mains in the house, I use batteries for the wireless, and until recently have never been annoyed by disturbances. Then a most appalling crack-and-sizzle began to make its appearance in the evenings, and it was noticed by my wife

SHORT-WAVE NOTES

(Continued from page 796.)

finds that it reduces noises without cutting volume down very much.

Why this should be so I cannot say, but I remember that when I used a volume control across the 'phones I always found that it had the effect of dropping off the background noises long before it started cutting down the signals.

"P. M." by the way, is in the unusual predicament of having to use short waves only, local interference making medium-wave reception impossible, but not interfering too much with the "shorts." One generally finds things the other way round.

A Selectivity Tip.

"R. S. B.," a fifteen-year-old Durban resident, is anxiously waiting for Australia and South America to qualify for "H.A.C.," which, incidentally, has been rather quiet lately. He complains bitterly about the high cost of components in South Africa. They have to pay 2s. for a "cheap" valve-holder.

He finds trouble in cutting out the local station, half a mile away. Seeing that it puts out 5 kw. on 400 metres, it is not surprising that he receives it faintly all over the short-wave bands. I suggest. "R. S. B.," that instead of using capacity-coupling for your aerial, with that neutralising condenser, you use inductive coupling with a small coil very loosely coupled.

Others in a similar predicament might note that loose inductive coupling always gives an increase in selectivity, and generally decreases general background noises as well.

"V. H. C." (Northfleet) recommends the good old "sausage aerial" for short-wave reception. This really comes to the same thing as using stranded wire and pulling all the strands out round 3-in. rings. It certainly used to be thought a very efficient arrangement, and there is no reason why it should not be but I rather doubt whether it is worth the trouble.

Reception Conditions.

But it is just the sort of thing that should appeal to the experimenter who wants to get the last ounce out of every component he uses, including the aerial. Readers who think that they come in that category might note the "sausage" for future experiments.

Now, to get away from generalities—one of my correspondents calls them "artistic verbiage"—let us talk about conditions at the time of writing. I have found conditions on practically all waves to be excellent during the afternoons.

Judging by the amateurs—always a good test on account of their low power—I find conditions superlatively good for North America, below 30 metres, at practically any time between 2 p.m. and 5 p.m. After that, things are fairly dead, but the longer wavelengths buck up.

On the amateur 40-metre band Australians may be heard from 4 p.m. to 7 p.m., and New Zealanders between 6 a.m. and 8 a.m.

It may seem queer that Australia and New Zealand come in at such different times, but it has already been shown fairly conclusively that their signals come round the World in opposite directions.

W. L. S.

THE ANSWERS

TO THE QUESTIONS ON PAGE 806 ARE GIVEN BELOW.

- (1) Originally the note was helpful in obtaining correct adjustment of receivers—hence its name; but the real object of it now is for checking the modulation-levels at the various stations.
- (2) Probably not, as decoupling is usually concerned with H.T.—and the Detectors H.T. + lead, and these are generally taken to external terminals of their own. (The method is to fit an L.F. choke or resistance in series with the + lead, and then join a large condenser between that terminal and H.T. neg.)
- (3) Radio City is the name given to the huge block of skyscrapers now being built in New York for headquarters of the National Broadcasting Company of America.

DID YOU KNOW THEM ALL ?

that it seemed to have something to do with the ironing.

"To cut a long story short, I put a new flex and connector on the electric iron (which was getting a bit past the old one) and the trouble stopped. Since then we have heard nothing, but I should like to know how an electric iron could upset reception on a battery set in this fashion."

Undoubtedly it was the use of the iron that caused the trouble. The probability is that one of its connections or contact points was "wonky," and allowed arcing to take place.

This causes a terrible "crack and sizzle" as you so aptly describe it, and would probably be heard in the neighbours' sets as well as in your own. Particularly if they use the mains for radio.

Some months ago another "P.W." reader reported a somewhat similar state of affairs, and he traced it definitely to a slight arcing in the iron.

Such incidents afford an excellent example of the need of good contacts at lighting switches, etc., and show that one such fault may cause no end of trouble in neighbouring sets.

IS YOUR SET BEHAVING ITSELF ?

Perhaps your switching doesn't work properly? Or some mysterious noise has appeared and is spoiling your radio reception? Or one of the batteries seems to run down much faster than formerly?

Whatever your radio problem may be remember that the Technical Query Department is thoroughly equipped to assist our readers, and offers its unrivalled service.

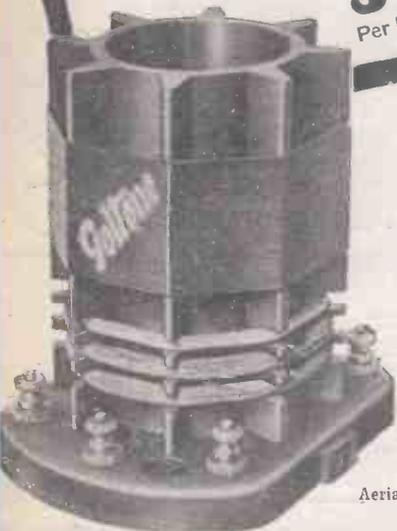
Full details, including scale of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

A post card will do. On receipt of this an Application Form will be sent to you post free immediately. This application will place you under no obligation whatever, but, having the form, you will know exactly what information we require to have before us in order to solve your problems.

LONDON READERS PLEASE NOTE: Inquiries should NOT be made by phone or in person at Fleetway House or Tollis House

**"GOLTONE"
S.T. 400**
COILS tested and fully
approved by
Mr. J. Scott-Taggart.

Price
8/-
Per Pair



Aerial Coil

**BUILD THE
"WIRELESS CONSTRUCTOR"
S.T. 400
with "GOLTONE"
SPECIFIED COMPONENTS**

The outstanding performance and excellency in finish of "GOLTONE" COMPONENTS leads to their specification in all the leading Radio Journals, including "POPULAR WIRELESS."

- ALSO SPECIFIED FOR THE S.T. 400.**
- 1 "GOLTONE" Pre-set Condenser, Type J, R15/84, 1/- each.
 - 1 "GOLTONE" Radio Earth Tube, R29/300, 2/9 each.
 - 1 "GOLTONE" Super H.F. Choke, suitable for the above-mentioned circuit, R3/46, 4/6 each.
- OTHER "GOLTONE" PARTS ENTIRELY SUITABLE FOR THIS RECEIVER:**
- 1 "Grand" L.F. Transformer, 3:1 Ratio.
 - 1 4-Socket Valve Holders, 1 Universal Valve Holder.
 - 2 2-Point Push-pull Switches.
 - 1 .0003-mfd. Fixed Condenser.
 - 1 1-meg. Grid Leak with Holder.
 - 1 20,000-ohm Spaghetti Resistance.
 - 1 1,500-ohm Spaghetti Resistance.
 - 1 50,000-ohm Spaghetti Resistance.
 - 1 60,000-ohm Spaghetti Resistance.
 - 11 Terminals (Tripartite), 1 Panel, 16" x 7" x 3/16".
 - 1 Terminal Strip, 16" x 1 1/2" x 3/16".
 - 5 Engraved Wander Plugs, 2 Spade Terminals.
 - 5 Connecting Wire, Flex, etc.

"GOLTONE" SCREENED DUAL-RANGE COILS for practically all "P.W." set designs. Folders and full details on request. Obtainable from all First-Class Radio Stores. Refuse substitutes. If any difficulty, write direct. Large Illustrated Radio Catalogue sent FREE on request.



Radio Earth Tube

Wound on extreme'ly Low
Loss Ribbed Ebonite
Formers, exactly to de-
signer's specification.
Top Slot in Aerial Coil
is wound with **WHITE**
Silk Covered Wire.



HOW TO ACQUIRE A MODERN SET!

Present and especially future conditions when Continental stations increase their power enormously in 1933, demand a set giving the utmost selectivity.

HIGHEST PRICE FOR YOUR OLD SET (of any description)
—in part exchange for ANY MAKE OF NEW 1933 RECEIVER.

Terms: Cash or by Instalments.

Our **FREE SERVICE** includes information and technical advice. Under our scheme you keep your old set until the NEW one is actually in your possession.

WHY NOT WRITE NOW FOR FULL PARTICULARS?

MESSRS. K. RAYMOND, Ltd. (Radio Exchange Dept.)
26/27, D'ARBLAY STREET, WARDOUR STREET, W.1
Without obligation please state your terms

To supply 1933 model!

Present set.....

I desire to pay by *Cash *Instalments * (Delete as required). I enclose 1/- stamp.

NAME

ADDRESS

A SUPER-SELECTIVE AERIAL



THE

SELECTANET

Reg. No. 520797
Pat. No. 37153

Super-Selective Aerial has a collective surface area of over 800 ft. of pure copper ribbon wire, woven into a tubular net only 9 ft. long. No other aerial has such a ratio. It reduces interference to a minimum. Get one to-day and improve your set. Of all dealers, or direct, postage 3d. extra, from

SPONG & Co., Ltd.,
Woodville Grove, LONDON, N.15.

2/6
EACH

**APPEARANCE
AND
PERFORMANCE**

Camco Cabinets incorporate both these important points of Cabinet design. That is why you should make certain of satisfaction—make your choice a Camco Cabinet—know you are getting the best.

THE CAMCO POPULAR.

A handsome Cabinet suitable for converting your set into a modern radio-gram. Finished shaded walnut designed on sound acoustical lines. Price only 75/- complete with baffleboard, shelf, etc.

THE CAMCO "DOMINION."

A splendid Speaker Cabinet for small units. Handsomely finished in oak 12/6 complete.



FREE Send the Coupon for free copy of new Camco Cabinet Catalogue and see the Complete range in our showrooms. Open 9.15 to 5.45 (Saturday 12.30).

CARRINGTON MFG. CO., LTD.
Showrooms: 24, Matton Garden, London, E.C.1.
Phone: Holborn 8202.
Works: South Croydon.

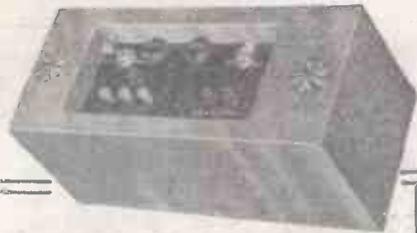
Post in 1/- envelope.

Name

Address

10 P.W.

THE "POPULAR"



SPECIALISTS in MAINS apparatus

You cannot be too careful when buying a Mains Unit. Make a point of buying from specialists. Heayberd have specialised in Mains apparatus since 1922. All units are soundly constructed from selected materials. At every stage of production they are carefully tested, receiving a final severe test before leaving the Works. Heayberd Mains Units are individually built—not mass produced. Nothing is skimmed to keep the price low; components are not included unless they are in every way suitable for the purpose.

HEAYBERD D.150 MAINS UNIT
Alternative Outputs: 25ma. at 120v. and 150v. Tappings: 40/110v. Var. S.G., 60/130v. Var. and 150v. fixed.
Incorporating Heayberd Transformer, Choke, 16 mf. Condensers, Westinghouse Rectifier, Safety Fuse, etc. Complete in neat metal case. Flex and adapter—ready to switch on. Guaranteed three years.
Price - - - - - **86/-**

POST COUPON NOW

I enclose 3d. stamps for latest Handbook "Mains Power for your Radio." Packed with useful Technical Tips, Hints and Diagrams for running your Radio from the Mains.

Mr.
Address

P.W.10



MONARCH OF THE MAINS.

10, FINSBURY ST., LONDON, E.C.2.
One minute from Moorgate Underground Station.

EXACT TUNERS

250 to 2,000 Metres.
14/- each. Post free.

Send for particulars and circuit FREE
THE EXACT MANUFACTURING CO.,
Croft Works, Priory Street, Coventry.

MASTER MAINS TRANSFORMERS

IDEAL FOR MODERN SET CONSTRUCTORS

250-0-250 volts, 50 m.a.—4-v. C.T.
3 amp.—4-v., —1 amp. Universal primary suitable for any mains.
LARGE STANDYNSIS CORE ensures good regulation and freedom from modulated hum. All connections taken to terminal tags on top of instrument. Supplied complete with fixing bolts and full instructions, 18/6, packed and carriage free.
Measures 4 1/2" x 3 1/2" x 3 1/2".
SEND YOUR ORDER TO—
MASTER RADIO CO. (Dept. P.W.),
102-105, Shoe Lane, Fleet Street, LONDON, E.C.4.

18/6
Packed and Carriage Free
Sold elsewhere at 28/-

TRADE JOTTINGS

(Continued from page 796.)

Wireless Retailers' Association, organised a ballot to determine what, in public opinion, was the best value-for-money set on show.

The Ferranti 7-Valve Super-heterodyne came out at the top of the list with a large majority, and this success had a happy sequel in the form of a presentation of a Silver Trophy to Mr. V. Z. de Ferranti, the Managing Director, by Miss Ann Penn, the celebrated Radio Impersonator. Congrats! Messrs. Ferranti.

It is too late now for "P.W." readers to enter the competition, but it is not too late to learn all about the set that came out on top, and I shall be pleased to arrange for details to be sent to any readers making use of the postcard (No. 11) scheme.

H.R.H. Prince George recently paid his first visit to a radio factory when he visited the works of Messrs. Kolster Brandes at Sidcup.

Accompanied by Mr. Shepherd, the General Manager, he made a tour of inspection of the various departments

A ROYAL VISIT



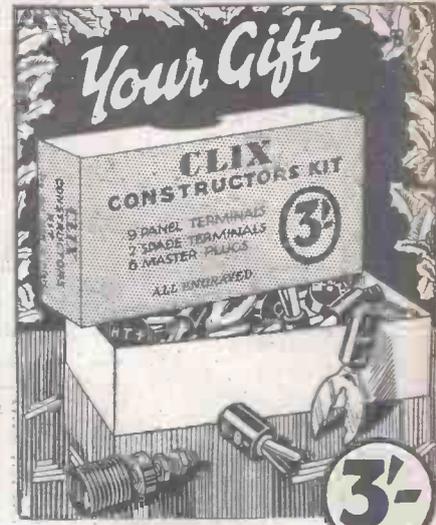
Prince George shows his practical interest in radio development by a visit to the Kolster Brandes factory at Sidcup.

in the factory, and His Royal Highness showed very keen interest in the modern, scientific developments of radio manufacture.

With a first-hand knowledge of the excellence of the Blue Spot range of all-electric receivers, special significance is attached to the Company's recent announcement of appreciable price reductions.

The prices now operating are 12 guineas for the Model W.400; 14 guineas for the model WS.400; and 16 guineas for the Table Grand instrument, and if any reader would care for further details of any of these sets, I shall be pleased to make the necessary arrangements (No. 12) upon receipt of a postcard.

I have just seen a copy of an excellent book on the design and construction of Radio Power Units. It is published by our old friends the Telegraph Condenser Co., Ltd., and next week in my notes, by when I shall have had time to go carefully through it, I propose to tell you some more about it together with details of how it can be obtained.



Give yourself or your friend a **CLIX CONSTRUCTORS' KIT** for Xmas. It contains 9 Panel Terminals, 2 Spade Terminals, 6 "Master" Plugs; all the components necessary to give perfect A. E., H.T., G.B., L.T., and L.S. contacts to any two- or three-valve receiver.

There is also in this kit a "S.T. 400" KIT containing 3 "DUAL" PLUGS, 9 "MASTER" PLUGS, 11 PANEL TERMINALS. All exactly as specified.

Write for interesting Folder "P.W." Free.

Obtainable from all Dealers.



LECTRO LINX Ltd., 254 Vauxhall Bridge Rd., S.W.1

AUCTION SALES OF RADIO. GODDARD & SMITH
Special December 15th and 16th Sale.
800 lots of great variety, quantity and quality Radiograms, All Mains and Battery Receivers Loudspeakers and all accessories.

Large Quantity of Gramophones, Records, etc
Entries can still be accepted. Prompt Settlements.
These Auction Sales are held monthly and afford an excellent medium for quick realisations.
Goods awaiting sale stored free of charge. Sale conducted on Customers' own premises if preferred.
Full particulars at
70, Seymour Place, Marble Arch, W.1
Paddington 0277-8 and 5805.

BRITAIN'S BEST CONNECTOR ALL INSULATED TERMINALS



BAKELITE MOULDING. BRITISH MADE. CONSTRUCTED TO TAKE SPADE OR PIN. NON-ROTATING NAME. ALL INSULATED TOP AND BASE.

2 1/2 D. FROM ALL LEADING SHOPS

Big discounts for Wholesale Factors.

S. LILLEY & SON Ltd., Alcester St., Birmingham

ALL APPLICATIONS for ADVERTISING SPACE in "POPULAR WIRELESS" must be made to the Sole Advertising Agents, **JOHN H. LILE, LTD.,** 4, LUDGATE CIRCUS, LONDON, E.C.4. Phone: City 7261.

You can build ANY Set BETTER -at LESS COST!

8 FREE BROWN PRINTS



The new Tunewell Components have been specially designed to give you Super Radio, but by lowering our profits amazing values are offered. Use Tunewell Components wherever you can, and be sure of Super results.

The Volume Control illustrated above is an example of the superior quality and efficiency of Tunewell Components. It increases power of reception, and the losses are much less than with ordinary types.

Logarithmically wound with double silk-covered wire. Paper laid between windings. Type V. All sizes up to 50,000 ohms, 5/6; from 50,000 to 100,000 ohms, 7/6.

Type P. Variable Resistance or Potentiometer. Equal resistance between studs. Max. dissipation 3 watts, 5/6.

The Tunewell range includes Coils, Chokes, Transformers, Mains Components and Eliminators, etc.

Send the Coupon now for Tunewell "Guide to Super-Radio"—an interesting folder which you will keep for reference. It includes 8 FREE Circuits (Kit Eliminator, All-Mains Band Pass 3, etc.).

★ Have you heard the amazing TUNEWELL A.C. Radiogram ?

This new instrument has created a sensation with its truly amazing tone—quality of reproduction never before attained. No "mass-produced" Radiogram can compare with this *individually made* instrument. Before you buy a Radiogram, hear this latest Tunewell achievement. 27 gns. (plus 25/- Royalties)

Send coupon for full details.

TUNEWELL

To Tunewell Radio Ltd.,
54, Station Road, London, N.11

Please send me:—

- ★ (a) "Guide to Super-Radio."
- ★ (b) Radiogram Brochure.

Name

Address

★ Cross out if not required. P.11.

P.W's. XMAS GREETINGS

(Continued from page 755.)

From W. S. VERRELLS, Managing Director, E. K. Cole, Ltd.

"I am very pleased to accept your invitation to use your columns for conveying my seasonable good wishes to the readers of 'Popular Wireless.'

"No members of the listening public can realise more, than do the readers of your progressive journal, the rapid strides which radio continues to make, and how firmly it has become established as a national entertainment.

"For the wireless fan, home life without radio is hard to imagine; yet there are countless numbers of homes wherein radio still has no place. Without a doubt, the finest way in which your readers can spread the good spirit of Christmas is to give radio gifts—particularly to those of their friends not now possessing a wireless set.

"So, in sending Christmas greetings to your readers, I say, 'Give radio this Christmas, and make Wireless even more "Popular."'"

From RICHARD ARBIB, Manager, Press Dept., The Gramophone Co., Ltd.

"His Master's Voice' send their greetings to all 'Popular Wireless' readers for a Merry Christmas and a Happy and Prosperous New Year."

From CHAS. P. BEARDSALL, Radio Sales Manager, Ferranti Ltd.

"If you could spare me a little space in your Christmas Number, I would like to send a message of greeting to your thousands of readers throughout the British Isles—that great army of wireless enthusiasts for whom 'Popular Wireless' has done so much—and for whom we, as radio manufacturers, have a very high regard.

"We can never forget that the foundation of radio, as we have it to-day, was laid, good and solid, by those intensely enthusiastic pioneer constructors with their crystal sets and coils, and telephones and batteries and valves; and we can never forget how that enthusiasm was developed and fostered by 'Popular Wireless' from the earliest days, ever stirring its readers on to greater achievements.

"Popular Wireless' and its readers have done a great work in the years that have gone, and no one is more ready to acknowledge that than I am.

"Therefore, Mr. Editor, it is with profound sincerity that I wish your readers a Merry Christmas, feeling convinced that with the wireless they love so well, their Christmas-time will be not only a happy time, but time well spent."

From J. JOSEPH, Managing Director, Radio Instruments, Ltd.

"Christmas is a tonic which should go far to help us to forget the difficult times through which many of us have passed during 1932.

"None will deny that the pleasure of wireless has helped to lighten the load; to many it has brought the greatest blessing.

"To all the readers of 'Popular Wireless' I wish a right Merry Christmas, and my grateful thanks to those who have included in their sets R.I. components for the past ten years."

From G. J. FRESHWATER, Publicity Manager, The Marconiphone Co., Ltd.

"It gives us the greatest pleasure to have the opportunity, through your editorial columns, to wish the readers of 'Popular Wireless' a very Merry Christmas. Radio is the biggest contribution towards Happy Christmases since Father Christmas was first invented, and Marconiphone rejoice to think at this time of year of the thousands of homes to which they have contributed the enormous benefit of really good radio."

EPOCH

MOVING COIL SPEAKERS

are acknowledged by the greatest experts to be the finest in the world in each of their price classes.

EPOCH

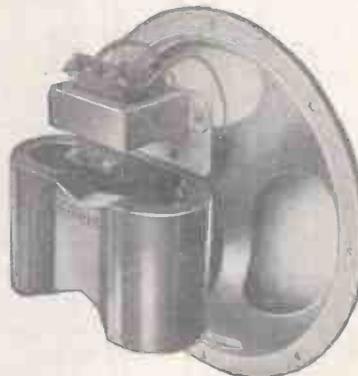
are the originators of the modern P.M. Moving Coil Speakers and are still years ahead of other makes.

Two examples of **OUTSTANDING SUPERIORITY** in the P.M. Market



SUPER JUNIOR MODEL

A full-size (not a midjet) Quality P.M. Speaker at the extraordinary **PRICE OF 27/6** (including 5-ratio Matching Transformer)



The famous **20th CENTURY MODEL**

PRICE **35/-**

(with 5-ratio Matching Transformer) Either of the above supplied also in Handsome Polished Oak Cabinet at 12/6 extra. There are 40 other models of Epochs covering every requirement from a portable to a battleship ranging in price from 27/6 to £85.

Ask for the New Booklet P.S.5b, it is free. EPOCH RADIO MANUFACTURING Co., Ltd. Exmouth House, Exmouth St., London, E.C.1 At the junction of Rosebery Avenue and Farringdon Rd. Phone Clerkenwell 6666 (4 lines.)

A wonderful Speaker that needs no introduction

The PPM SOUNDEX



PRICE **27/6**
Including Transformer

Tonal quality, sensitivity and a remarkable depth of volume has stamped this Speaker as a most outstanding achievement.

The PPM Soundex offers really wonderful value for money. Although only small in size the results obtained are equal to many speakers with much larger diaphragms.

It includes a Hy-flex diaphragm, and a tapped universal transformer. Insist upon your local dealer giving you a demonstration—you will be more than surprised at the life-like results.

CELESTION
The Very Soul of Music

CELESTION LTD., London Rd., Kingston-on-Thames
London Showrooms: 105 Victoria Street, S.W.1.

MIRROR OF THE B.B.C.

(Continued from page 766.)

features of last year's Christmas Day programmes, but something misfired at the last minute which resulted in cancellation.

Daylight will be fading when the next part of the programme begins at 4.15 p.m.—a concert of incidental music to plays by Shakespeare, Crowe, Barrie, Elroy Flecker, Ashley Dukes, and Edward Percy, to be sung and played by Kate Winter (soprano) and the B.B.C. Orchestra (Section E), under the conductorship of Norman O'Neill. This will be followed by a recital of Christmas songs by John Coates (tenor), and some poetry reading.

Most listeners with valve sets will do a bit of searching between this part of the programme and when the B.B.C. transmitters start up again at 8 p.m. to relay a religious service from Winchester Cathedral. Later comes an appeal on behalf of the British Wireless for the Blind Fund and an orchestral concert.

The News Bulletin will be read at 9 p.m., and stations will close down at 10.30 p.m. without any dance music, thus preserving, as the majority of people wish, the real character of the English Sunday.

Radio Pantomime.

The lighter side of broadcast entertainment will be available in plenty on the Monday and Tuesday which have now been declared public holidays. From mid-day until midnight, Christmas will be on the air in studio and outside broadcasts, with features at 7.30 p.m. by Bransby Williams, the well-known Dickens' impersonator, and then a radio pantomime "Jack and the Beanstalk" written and composed by Ernest Longstaffe.

Mr. Longstaffe's pantomimes are always "top-notchers," and his "Jack and the Beanstalk" will be no exception, since the cast includes Miriam Ferris, Wynne Ajello, Elsie Otley, Harman Grisewood, Leonard Henry, Philip Wade, John Armstrong and Foster Richardson. Dance music starts an hour earlier than usual, at 9.35 p.m., by Henry Hall and the B.B.C. Orchestra, and is continued by Ambrose's Blue Lyres from the Dorchester Hotel. Unfortunately it will be switched off at midnight, which is perhaps a mistake in view of the appreciation of the extension given last year.

Tuesday, December 27th, has more dance music in a programme of tangos and waltzes played by Troise and the Mandoliers during the early evening, before the Wireless Military Band takes over at 8 p.m. with Leonard Gowings (tenor). It is only right that "highbrow" listeners should get a look in somewhere, and so the last part of the programme will consist of chamber music played by the Brosa String Quartet.

A Thrilling Play.

Other interesting programmes for the week include another of the popular opera series of broadcasts, arranged by Gordon McConnel, and an orchestral concert, both on Wednesday, December 28th. This orchestral concert was to have been conducted by Mr. Percy Pitt whose tragically sudden death occurred on November 23rd. The same evening will also bring a performance of William Archer's thrilling play "The Green Goddess," the action of which takes place in a remote region at the back of the Himalaya Mountains.

EASY PAYMENTS

"There's no place like HOLMES." The first firm to supply Wireless parts on easy payments. Eight years advertiser in "Popular Wireless." Thousands of satisfied customers.

We unhesitatingly recommend—

EPOCH 4/10

20th CENTURY Deposit 7 payments of 4/10
P.M. Speaker The best in its Class.

Any Epoch Speaker supplied on Hire Purchase

LISSEN SKYSCRAPER KIT	Deposit	Monthly Payments
89/6 8/3	11 of 8/3	
TELSEN AJAX 3 KIT	61/6 6/9	9 of 6/9
R.R. 303 KIT with Valves	78/- 7/9	9 of 7/9
LOTUS KIT	39/6 5/5	7 of 5/5
COSSOR KIT 334	£67/6 10/-	11 of 11/10
EXIDE H.T. Accum. 120v.	£3 6/-	9 of 6/8
BLUE SPOT 66R & CHASSIS	£2/2/6 5/6	9 of 4/6
BLUE SPOT 100U	32/6 4/6	7 of 4/6
CELESTION M.C. Speaker	47/6 5/3	9 of 5/3
EPOCH MINOR P.M.	27/6 5/1	5 of 5/1

Parts for any Kit Set. Any make of Speaker.
New Goods Obtained for Every Order.
Send us a list of the parts you require and the payments that will suit your convenience, and we will send you a definite quotation. Anything Wireless.
H. W. HOLMES, 29, FOLEY STREET, Great Portland Street, London, W.1.
Phone: Museum 1414.

A CONE CHASSIS THAT FITS ANY SPEAKER....



The special patented Universal mountings marked "A" and "B" in the illustration below enable this Chassis to be used with any type or make of Speaker driving Unit without drilling or other alteration. Like all worth-while inventions it is a very simple device yet most efficient. Saves time, trouble, and expense.
(Patent No. 366821.)

6/6 EACH

MADE BY... **BURTON** PROGRESS WORKS WALSALL · ENGLAND

KNIFFY PIN

THIS XMAS.

9 for 6d

Christmas Decorations, holly, mistletoe, those attractive, pleasing little coloured lights—

All these and many other things can be quickly and easily fixed in any position neatly, by simply pressing a Kniffy Pin into wood, wall or ceiling.

Ideal for hook-ups, temporary wiring to lamp standards, etc.

KNIFFY PIN

From your dealer, or send 7d. stamps to. **Kniveton Cable Works** Queensway, Ponders End · Middlesex

Fix it with a 'KNIFFY'

Make **The DAILY SKETCH**
YOUR Picture Paper.

EXPRESS EASY PAYMENT SERVICE

Prompt Delivery Guaranteed. Price List Free on Request.

- MANUFACTURERS' KITS.**
- NEW LISSEN "SKYSCRAPER" KIT** including Valves. Cash Price, £4/9/6. And 11 monthly payments of 8/3. **With order 8/3**
- S.T. 400" KIT, COMPLETE SET OF PARTS, EXACTLY TO SPECIFICATION LESS VALVES AND CABINET.** Cash Price, £4/19/6. And 11 monthly payments of 9/1. **With order 9/1**
- S.T. 400" KIT INCLUDING VALVES.** Cash Price, £6/18/6. And 11 monthly payments of 12/9. **With order 12/9**
- READY RADIO, "METEOR" S.G.3 KIT.** including cabinet, valves and moving-coil unit. Cash Price, £8/17/6. And 11 monthly payments of 16/8. This Receiver also tunes to Ultra-short Waves. **With order 11/-**
- TELSEN "JUPITER" S.G.3 KIT, complete kit less Valves.** Cash Price, £3/17/0. And 11 monthly payments of 7/-. **With order 7/-**
- TELSEN "AJAX 3," complete kit less Valves.** Cash Price, £3/1/6. And 11 monthly payments of 5/8. **With order 5/8**

ACCESSORIES

- NEW BLUE SPOT 99 P.M. MOVING-COIL UNIT** Cash Price, £2/19/6. And 11 monthly payments of 5/6. **With order 5/-**
- ATLAS ELIMINATOR, A.C.244, 3 H.T. Tappings, 20 MA output.** Cash Price, £2/19/6. And 11 monthly payments of 5/6. **With order 5/-**
- 12 EXIDE W.H. HIGH TENSION ACCUMULATORS, (120 Volts, 5,000 M.A.)** The cheapest and best High Tension Supply where Mains are not available. Cash Price, £3/15/0. And 11 monthly payments of 7/-. **With order 7/-**
- NEW EPOCH 20c PERMANENT MAGNET MOVING-COIL UNIT.** Cash Price, £1/15/0. And 6 monthly payments of 5/6. **With order 5/6**
- Rola Speakers Supplied on Similar Terms. All above carriage paid.
- To avoid delay, will customers kindly send first payment with order.
- Goods ordered C.O.D. are dispatched by return of post. Post charge paid by us.

The **LONDON RADIO SUPPLY COMPANY** ESTD 1925

11, Oat Lane, Noble St., LONDON E.C.2

Phone NATIONAL 1977

"RED DIAMOND" DETECTOR

RD40 **2/-**



Can be mounted on brackets or through panel. Once set, always ready. Not affected by vibration. Each one is tested on broadcast before despatch.

By insured. Post 2/3 or 2/9 with shield.

Of all high-class Radio Dealers or Sole Makers:

JEWEL PEN CO., LTD., (Radio Dept. '6), 21-22, Great Sutton St., LONDON, E.C.1

CABINETS for the home constructor

For Speakers, Sets, Radiograms... elegant cabinets which are designed to give the finest acoustic results and to add to the furnishing scheme of any room.

Send for lists

RADIOCABINETS (WALSALL) LTD.

THE LISTENER'S NOTEBOOK
(Continued from page 766.)

prepared to give less obviously good turns a trial. The most boosted things aren't always the best. At least, that is my experience. The "Radio Times" is much too prone to excessive adulation. In fact, it overdoes it to such an extent that I am becoming more and more distrustful of it.

No Standardisation.

I find this particularly with its musical notes. Those of the Elgar Festival are a case in point. I have observed the same thing on other great occasions, and when I have not experienced those feelings that I was told so emphatically I ought to experience, there have been rather disquieting effects.

Surely, music will react differently on different people; there cannot be any standardisation of experiences. Thus, I would rather decide for myself what to listen to, and then draw my own conclusions as to the merits or demerits of what I've heard. It seems to me that this is more conducive to intelligent listening.

It is because I hold this conviction that I appreciate such talks as that Mr. J. O. M. Rorke gave us on "Discovering Beethoven." The personal touch throughout was very marked, and the chief value of the story lay in the fact that the adventurer—unlike so many speakers on music—did not approach the microphone in the rôle of a music professor, armed with all the accepted musical explanations. Talks of this type are much more stimulating than the other, I find.

One notices that variety, still in the experimental stage, is always offering something novel. It is to be hoped that, eventually, something will be evolved out of it all. I must say, however, that an "All Male Bill" doesn't suggest that the desired end is in sight yet. Anyhow, I am quite happy to leave variety alone until it has made good, and established itself as an acceptable radio item. I was sympathetic with variety pioneers until that non-stop stuff came along, but that did for me completely.

Still Rather Dull.

I am more grateful than ever to Mr. G. K. Chesterton for his fortnightly talk on books. He has introduced something into the manner of these book talks that was sadly missing in the past. His colleagues with whom he alternates may deliver the goods all right, but it is the delivery itself that I find sometimes so uninspiring. Some may like it, in fact, I know many who do, but I prefer a delivery with a glow about it. Gilbert and Sullivan fans must have rejoiced that the 2nd Act of "The Mikado" was to be relayed last Saturday from the Savoy Theatre. I would have thought that, the present G. and S. season being such a significant one in the history of the D'Oyly Carte Co., there would have been more of these relays during the season.

It is rather late in the day to comment on the Sunday production of "Romeo and Juliet," but the fact remains that it made that Sunday a red-letter day, and that subsequent Sundays have seemed dull in contrast. True, Sunday programmes aren't what they were, but the improvements effected aren't quite substantial enough to save them from being still rather dull. An occasional Shakespeare play on a Sunday would do the trick, I'm certain, for Shakespeare broadcasts as well as any plays I know

THE WORLD'S BEST

20 AC M.A. AT 120v MAINS 200-250v **45'**

50% CHEAPER 25% BETTER than any other make.

ONE VARIABLE AND 3 FIXED

WIRE-WOUND RESISTANCES ONLY



ALL BAKELITE CASES

RUNNING COST 1D. PER MONTH

OTHER MODELS

- | | | |
|--------------|--|-------------|
| A.C.2 | Same as A.C.1, but with Trickle Charger. | 60/- |
| A.C.3 | 150v. 30mA. 4v. Raw A.C. | 60/- |
| A.C.4 | Same as A.C.3, but with Trickle Charger. | 75/- |
| A.C.5 | 200v. 50mA. 4v. Raw A.C. | 70/- |
| D.C.2 | 140v 35mA. One Variable, three Fixed | 35/- |

WESTINGHOUSE

METAL RECTIFIERS

- D.C.1** 25mA. OUIPUT 10. 150v. or 230v. Mains. **22/6**
- 10'** Deposit and balance monthly, will secure any Bullphone Eliminator. Ask your local dealer for particulars, or write direct to address below.

NIGHTINGALE 3-VALVE RECEIVER

We have only a limited number of these famous receivers for disposal at this price. All bakelite base, size 18 x 9 x 9. Make sure of being one of the lucky owners of this receiver—undoubtedly the greatest prize at our price ever offered in radio. Ask your dealer or send cash direct—but don't miss it. Usual Price 80/- To clear—**45'-** Cash refunded if not satisfied.



The Technical Staff of "Popular Wireless" highly recommend Bullphone Eliminators and components for all their circuits. Don't be put off with any other make. There is no other as good, not a double the price. If your dealer cannot supply send direct.

BULLPHONE RADIO

NEW NORTH RD, BARKING, ESSEX PHONE CHIGWELL 162

LINK YOUR GRAMOPHONE TO YOUR SET WITH THE



All the delights of a fifty guinea radiogram for 1/- DOWN. Play your records through your loud speaker. Volume to fill a concert hall. Booming bass instruments and high violin notes (impossible to gramophones) amplified with force, crystal clearness and absolute purity with Handco Electrical Pick-up. Guaranteed Cobalt Magnet. Nothing like it—Amazing! Terms: 1/- deposit, 2/- weekly (11/- in all), or 10/- with order.—P. W. HAND & Co., 284, High Holborn, London, W.C.1.

ENGINEERS (all grades).

Have you seen the latest edition of "ENGINEERING OPPORTUNITIES"? In this 250-page book Professor A. M. Low tells of the opportunities Engineers of all descriptions are missing. The book also gives details of A.M.I. Mech. E., I.E.E., M.I.M.T., G.P.O. and all other Exams., and outlines Modern Home-Study Courses in all branches of Civil, Mech., Elec., Aero., Radio, Motor and "Talkie" Engineering. We alone guarantee "NO PASS—NO FEE." You cannot afford to neglect this offer. Send for free handbook now.

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY, 40J, Shakespeare House, 29-31, Oxford Street, London.

LOUD SPEAKERS REPAIRED, 4/-

(Blue Spot a Speciality, 5/-) Transformers 4/-, Headphones 4/-, all repairs magnetico free. Eliminator Repairs quoted for 24 Hours Service. Discount for Trade. Clerkenwell 9069. E. MASON, 44, EAST ROAD, LONDON, N.1

Famous Makers' Offer! **£5** Radio Gram Cabinet for **65/-** IMPROVES PERFORMANCE 50%

10/- monthly if desired. Polished Oak, Piano Tone Cabinet (42 in. high, 24 in. wide). ON APPROVAL at Makers Prices 1/-. You may return at our expense if you wish to part with it 3,000 clientele, B.B.C. Radio Press. All Models from 35/- to £15.



PICKETTS Piano Tone Cabinets (P.W.) Albion Rd., Bexleyheath, Kent. PATENTS, TRADE MARKS. "Advice Handbook" and Consultations FREE.—B. T. KING, C.I.M.E., Regd. Patent Agent (G.B., U.S. and Canada) 146a, Queen Victoria Street, London, E.C.4. 45 years' references. Phone: Cent 1682.

TRANSFORMERS. Large quantity of genuine Ericson Transformers. New and guaranteed. List price 17/6 each. Ratios 2-1 and 4-1. Our price 3/3 each. **SPEAKERS.** Genuine "Six-Sixty" Speaker Units, brand-new and guaranteed. Limited number only. Original cost, 6/6; to clear, 1/9 each. **ETA.** General-purpose valves. Type BY1814. List price, 5/6. Max. 9/ volt 2.0-v., 51. cur. 0.12-amp., max. anode vol. 150-v., ampl. factor 18. Imped. 14,000 ohms, mut. cond. (slope) 1.5-m., s/v., aver. anode current 3 m.a. (for 150-v. anode current and —2.5 G.B. Limited number only for quick sale. Each 2/6. Don't waste time. Save money whilst you can! Carriage paid U.K. Cash with order. Trade enquiries invited. **PIONEER Radio Manufacturing Co. Ltd.,** Coptic St., New Oxford St., W.C. Museum 9607.

ELECTROCETS
SOLIHULL, BIRMINGHAM,
wish all their Club Members
and "P.W." Readers
A Merry Xmas and a
Prosperous New Year.
Xmas Sales Competition result will
be in "P.W." dated December 31st
in this space. :: Watch for it!

TECHNICAL NOTES

Some diverse and informative jottings about interesting aspects of radio technique.

By Dr. J.H.T. ROBERTS, F. Inst. P.

Choosing the Valve.

I SAID something in these Notes a week or two back about the anode-bend method of rectification and in reply to a number of enquiries on this point I should say that the type of valve which is used is really very important. You cannot just assume that any ordinary valve will serve properly for this purpose. It is necessary to use a valve which has a characteristic curve with a very definite lower bend and a relatively long straight portion. The bias used should be such as to bring the valve down on to the lower bend and the anode voltage used should generally be about the middle of the limits specified by the manufacturers of the valve.

Ganging Condensers.

People often tell me that they have difficulty in adjusting the ganged condensers in their sets, and that they are continually having to readjust these and trim up the capacities.

There are a number of reasons why this may be the case and one of them is that the axle of the condenser may be loose or there may be play or "lost motion" at some point. Another cause of the trouble is that the condenser may be badly or loosely fastened on to the baseboard and it may wobble or shift slightly when operated. A third reason why the adjustment sometimes goes wrong is that the screens or components of the set are shifted or altered in some way and naturally this necessitates some readjustment of the balance of capacity. You should make quite certain that the gang condenser is properly fitted in the first place, so that when you adjust it you do not have any looseness or backlash and also that the parts are properly secured together and, having done this and adjusted the trimmers, you should leave well alone.

Parallel Feed.

Inter-valve coupling units embodying the up-to-date method of low-frequency transformer with parallel feed are now becoming popular and in one of these units on the market the coupling condenser is half a microfarad capacity whilst 25,000 ohms is used for the anode resistance, and one of the small-size nickel-alloy transformers having a normal inductance of about 40 henries.

A very interesting feature of this particular inter-valve coupling unit is that there is a rising characteristic at the lower part of the response curve, whilst at the upper part the effect is suppressed to some extent in order particularly to deal with high-frequency interference such as the needle scratch in gramophone reproduction and heterodyne whistle in radio reception.

A step-up ratio of about ten is obtained and if the feed resistance is replaced by a 100-henry choke an amplification of over 200 can be obtained.

(Continued on next page.)

DRY BATTERIES SUPERSEDED

INTERESTING FREE BOOKLET TELLS HOW TO SAVE MONEY WITH THE BATTERY THAT LASTS FOR YEARS

It costs nothing to know how to get better results with

STANDARD

Leclanché Self-Charging PERMANENT H.T. BATTERY

We provide personal attention and show even bigger savings on your battery expense. Install the Standard which lasts for years, because it re-charges itself when the set is shut down. This PERMANENT saving is enjoyed by thousands of enthusiasts. Ample level current brings in difficult stations without background. Eventual replacements merely a matter of changing cartidges at a few pence each. Such great promise deserves your investigation. DO IT NOW.

STANDARD BOOKLET POST FREE

Popular Type Battery for Ordinary Sets.

Any voltage, Any capacity.	Model H5, milliamp capacity, 126 volts, 84 cells.	No. 3 size, 12,500	12,500
5/-	Price complete without trays	37/8	

Tray containers extra if required.

Other capacities 2,000 to 25,000 milliamps.

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

"PURATONE"
H.F., L.F., DET., R.C.
VALVES 3/9
Power - - - 5/3
Super-Power - 6/3
Screen-Grid - 7/6
BRITISH MADE : FULLY GUARANTEED
From your dealer or direct from the makers:
RUBON LTD., 189, New King's Rd., London, S.W.6

LOUD SPEAKER REPAIRS
Any make Unit, Transformers, etc., from 3/-; Blue Spots, 5/-; Moving Coils, Eliminators, etc., from 5/-. Repairs guaranteed laboratory tested and returned, C.O.D. post Special trade terms or by contract.
WEEDON POWER LINK RADIO CO., 165, Earls Grove, London, E.7. (Phone: Maryland 4344).

RADIO SUPPLIES
Send your list of Radio needs for our quotation: Kits, Parts, Sets, etc. Everything in Radio stocked, prompt delivery, 7 days' approval. Catalogue free Taylor & Standard Wet H.T. replacements stocked.
P. TAYLOR, 57, Studley Rd., Stockwell, London.

GRIPSO PATENT NAMED PLUGS & SPADES LISTS FROM MAKERS THE **GRIPSO COY.** 32 VICTORIA ST., LONDON, S.W.1
PLAIN OR NAMED
GRIPSO
1/3 EACH

TECHNICAL NOTES

(Continued from previous page.)

Pick-up Adjustments.

I have often noticed people using electric pick-ups with their records which were far too heavy and caused considerable wear on the records. This is a point which ought to be watched very carefully, because the electric pick-up, unlike the ordinary gramophone tone-arm and sound-box, is very frequently fitted by the owner himself, the gramophone tone-arm being more usually fitted by the manufacturer of the machine.

This means there is a great liability for amateurs to fit the pick-up without due regard to the necessary adjustments. On the other hand, I have sometimes seen a pick-up, fitted with a counter-balancing weight or a spring, the adjustment being such that the pick-up was riding only very lightly on the record, barely touching at all.

This, of course, is going to the other extreme and whilst it may obviate any serious wear on the record, it has other disadvantages. For one thing, unless the needle rides firmly in the sound tracks you will not get proper reproduction from the record, and also if it is riding too lightly upon the record it will tend to bounce and chatter if not, in fact, to lift up at odd moments and go out of engagement with the record altogether. So you see it is essential to have a certain amount of pressure between the needle point and the record if you are to get proper reproduction, but at the same time this pressure should not be excessive.

Try a Counterbalance.

Generally speaking, I think the average pick-up and arm, without some sort of counterbalancing weight or spring, is on the heavy side and usually I have found it best, unless a counterbalancing force is already provided by the makers, to fit a spring or a weight, the weight being naturally on the opposite side of the support.

The spring arrangement is the neatest because it can be incorporated in the pick-up arm and made practically invisible, but the counterbalance weight, which can be shifted in position on a prolongation of the pick-up arm on the opposite side of the support, has the advantage that it can be adjusted very accurately.

A New Transformer.

We have heard for some time past of transformers with a core consisting of iron filings or finely divided iron particles mixed up with some insulating compound and moulded into shape. I mentioned in these Notes a little time back the process by which such transformer cores were being made.

We also have the very successful nickel-iron parafeed transformers which have become very popular and fill a real need.

Parallel-Feed Unit.

Now we have what is stated to be an entirely new and revolutionary low-frequency transformer which uses a special core known as micronetic alloy. This transformer is to be marketed by Magnacore Limited, 57, James Street, Camden Town, London, N.W., and by the use of the special alloy it is stated that highly efficient transformers can be produced at a much smaller cost than previously.

(Continued on next page.)

"A definite advance..."



says Mr. H.J. Barton Chapple **Wh. Sch. B.Sc. (Hons)**
D.I.C. A.M.I.E.E.

This well-known radio and television authority pays striking tribute to the new W.B. "Mansfield" Speaker Magnet System.

"... The ultimate result is a really astonishingly high flux density for the size of the magnet used... fidelity of tone of outstanding merit... sensitivity very noteworthy, comparable in many respects with externally energised types without the necessity for mains or batteries. The Speaker will handle an input more than sufficient for quite a large room and yet can be worked satisfactorily from a small two-valve set.

"My conclusions... this new P.M.4 speaker is a definite advance in the permanent-magnet class."

The Revolutionary
"MANSFIELD"
Moving Coil Speakers



Write for copy of Mr. Barton Chapple's full report. The "Mansfield" (patent) Magnetic System is a revolutionary development. It makes possible a magnet 30 per cent. more efficient than a good cobalt steel magnet of same weight and 10 per cent. more efficient than a chrome steel magnet of three times the weight. It enables a steel chassis to be used without magnetic loss. It eliminates the bug-bear of loss of magnetism. Ask your dealer for a demonstration—you will be AMAZED.

- "Mansfield" Senior (Improved P.M.4), complete with 3-ratio transformer - - **42/-**
- "Mansfield" Junior (P.M.5), complete with 3-ratio transformer - - - **27/6**
- "Mansfield" Cabinet in well-finished oak (for P.M.4 or 5) - - - **25/- extra.**

Whiteley Electrical Radio Co., Ltd., Dept. D, Radio Works, Mansfield, Notts.
London Office: 109 Kingsway, London, W.C.2. Phone: Holborn 6714.
Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin.

GRIP



1 1/2

NEW
'BOWSPRING'
WANDER PLUG

Strong spring and wide self-adjustment. Side entry with Belling-Lee patent grip for flex. 12 indications and 6 plain colours.

The "BOWSPRING" gives strong pressure over a far wider range of diameters than any plug we have so far tested.

Write for "Radio Connections"

BELLING-LEE
FOR EVERY RADIO CONNECTION

Advt. of Belling & Lee, Ltd., Cambridge Arterial Road, Enfield, Middlesex

VALVES LESS than Half-Price!



MANUFACTURER'S FULL GUARANTEE!

Improve your Set with the **BRITISH-MADE "ION"** Valves, backed by 10 YEARS' Manufacturing Experience. These valves are used by the most prominent Set makers. Satisfaction guaranteed or money refunded.

H.F. & Det. (2 & 4 volts)	2/11
L.F. & Det. "	2/11
Det. & R.C. "	2/11
Power "	3/6
Super-Power "	4/6
Screen Grid "	7/6

Also A.C. Mains Valves
Postage and packing, 4d.
C.O.D. Extra.
SYNERGY SYNDICATE
43, Johnson St., Westminster, S.W.1

TAYLEX WET H.T. BATTERIES

Give long service, improved volume and tone, very economical.
Replacements for Taylex or Standard batteries at low prices, details post free; also Bargain List.
Radio Kits and parts at lowest prices.

P. TAYLOR, 57, Studley Rd., Stockwell, London

GRIPSO
MIDGET
WANDER PLUG
THE PATENT SIDE SPRING
STRONG GRIP! ANY SIZE
BATTERY - 12 TITLES!
EACH 1 1/2
THE GRIPSO COY.
32 VICTORIA ST. LONDON, S.W.1

TECHNICAL NOTES

(Continued from previous page.)

In addition to the usual types of low-frequency transformer employing this special core, a parallel-fed transformer combined with condenser and resistance is also to be placed upon the market, this to be called the Magnacore Passfeeda unit.

I am afraid I cannot give you further details of these at the moment, but I understand that full details will be announced very shortly and if the preliminary information which reaches me proves to be correct, it would seem that something very interesting and possibly very useful in the way of transformers is about to be launched.

Coupling Arrangement.

Talking about the nickel-iron parafeed transformer, by the way, these, as most of you know, need to be "parallel fed" because the battery current must be kept out of the primary winding so as not to reduce the inductance of the latter. If the inductance were reduced the impedance would also be reduced and this would interfere with the reproduction of the bass audio frequencies.

There are various ways of using parallel-fed transformers, but one simple way of coupling by means of such a transformer is to connect the anode of a valve to the primary of the transformer through a series condenser, whilst one terminal of the secondary is connected to the grid of the next valve in the usual way. The remaining two terminals, one of the primary and one of the secondary, are connected together and to grid bias.

Decoupling.

We hear a great deal about decoupling in these days, as indeed we are bound to, because with modern highly efficient circuits, decoupling becomes not only useful but actually essential. Nevertheless, I have from time to time had readers telling me that they did not understand exactly what decoupling meant and why it was necessary.

Speaking quite generally decoupling, as the name implies, means isolating or separating (electrically) one circuit from another—or, if you like, one part of the whole of the receiving circuit from another part—so that they shall not have any relationship with one another other than the intended relationship.

Remember that you have direct current flowing in certain parts of the circuit and oscillatory currents (usually in addition to the direct currents) in other parts of the circuit.

You want these oscillatory currents to do their job in the intended place, but you do not want them to wander off into other places where they will cause trouble, so to keep them all in their right sphere you erect at different points the necessary barriers, which are known as decoupling devices.

Separating the Currents.

Perhaps the simplest way to explain decoupling is to take as an example the current flowing from the high-tension battery through the primary of the transformer and to the anode of the valve.

When the valve is in operation we have not only steady current but also variable current in this part of the circuit, and if this passes into the H.T. battery, and the battery is common to this valve and other valves, it is obvious that these varying currents will almost certainly get into the other valve circuits, where they are not wanted.

If so, they will give rise to interference and probably motor-boating. Therefore, we want to have some means of keeping these variable currents in this circuit and to pass them out of the circuit only via the transformer, which is the proper means.

Keeping L.F. in its Place.

If we introduce a fairly high resistance into the high-tension supply and then bridge across from the end of this resistance nearest to the anode of the valve and to H.T. negative by means of a condenser of fairly large capacity, we shall have accomplished our object.

The high resistance acts as a "stopper" to the varying currents getting back into the H.T. battery, whilst, on the other hand, the large capacity condenser invites these same currents to stay in the original circuit. Therefore, the variable currents have not only one door shut against them but at the same time another door opened for them.

An Easy Path.

The same sort of thing applies if the varying currents are in an adjoining circuit and are trying to get into the part of the circuit we have been considering above. The high resistance will tend to prevent them entering this circuit, whilst any available current which does get through the high resistance will find an easy path in the condenser, and so will slip back to its own circuit without troubling to traverse the second circuit.

Suitable Values.

So you see that this decoupler works not only to conserve the variable currents in the first circuit, but also to keep out variable currents from adjoining circuits. I forgot to mention that the resistance should be fairly high, say 10,000 to 15,000 ohms, although 20,000 ohms is often used, whilst the condenser should have a capacity of 1 or 2 microfarads. Some people favour a higher resistance than that mentioned above, but this should not be increased so much as to overshadow the impedance of the valve itself.

Short-Wave Hook-Ups.

Owing to pressure of space in this Special Christmas Number, W.L.S.'s article of the above title has unavoidably been held out this week.

OSTAR-GANZ HIGH VOLTAGE MAINS VALVES

Incorporating the most recent development in valve design—full mains voltage indirectly heated filament. These valves work direct off either A.C. or D.C. supply. No mains transformers or breakdown resistances required. Considerably lower current consumption than any other mains valves. Remarkably free from mains hum. A520 (G.F.), W310 (R.C.), U920 (L.F.), 1776: L1525 (Power), 18-; Rectifying Valves: EG50 m.a., 14/6. EG100, 125 m.a., 15/6. Descriptive leaflet on request.

UNIVERSAL RECEIVER AND AMPLIFIER KITS

British components. All instructions complete, ready for assembly. Highly efficient, yet cheap, because of the Ostar Universal High Voltage Valves. Work off either A.C. or D.C.
1-Valve Receiver with Rectifier £6/10/-
2-Valve Amplifier with Rectifier £4/4/-
3-Valve Receiver with Rectifier £9/9/-
3-Valve Amplifier with Rectifier £5/5/-
Mains Energised Loud-speaker Kit with Ostar-Ganz Valves, £2/5/-.

CAPTURE the spirit of Yuletide from all Christian countries. Listen to Denmark, Germany, France, Poland, Italy, Spain, Czecho-Slovakia, America, Australia, and other Short-Wave Stations, for which SUPERIAL is specially adapted, observe this happy festival of good cheer for all men.

Let SUPERIAL bring Christmas Greetings from all nations of the world to your own fireside. SUPERIAL—the new Electron's Super Aerial, with its extra heavy vulcanised insulation, strongly-braided and compounded, made like a cable, thoroughly waterproof from end to end. No insulators necessary. Easy to fix, proof against leakages, and practically everlasting. Specially adapted for long-distance reception.

SUPERIAL—the only aerial with £100 Guarantee against Lightning. No lightning switch required, SUPERIAL is your protection.

Obtainable from your local dealer. Complete the coupon below, or one that he will supply, returning it to us, and our official cover note for two years will be issued by return.

£100 Guarantee

NO LIGHTNING SWITCH NECESSARY.

We, the New London Electron Works, Ltd., hereby guarantee to pay damages up to £100 to any purchaser of SUPERIAL (Electron's New Super Aerial) with its extra heavy vulcanised insulation, should it be struck by lightning, thereby causing damage to the Set. Buy now and get covered at once!

ATTRACTIVELY BOXED IN THE FOLLOWING LENGTHS:—

100ft. 3/6 75ft. 2/6
50ft. 1/9 25ft. 1/-

ON SALE EVERYWHERE

Satisfaction Guaranteed—or Cash refunded by

The NEW LONDON ELECTRON WORKS Ltd.
19, EAST HAM, LONDON, E.6

Telephone: Grangewood 1408-9-1363. Telegrams "Stannum," London.



“D—!!!—!!!”

these
ELECTRON AERIALS they're
 everywhere!

GET COVERED NOW

FOR THE £100 GUARANTEE AGAINST DAMAGE TO YOUR RECEIVER BY LIGHTNING

Fill in this form and post it with your empty carton and our official cover note will be sent immediately. Post to:—

THE NEW LONDON ELECTRON WORKS, LTD.,
 19, East Ham, London, E.6.

NAME (block letters).....

ADDRESS.....

Where did you purchase SUPERIAL?
 (Retailer's name and address).

This Guarantee covers you for a period of 2 years from date of purchase.

Date purchased..... Length.....

BRITISH BROADCASTING REVIEWED

Some notes on the B.B.C.'s recently-published 1933 Year Book.

THIS year's publication of the B.B.C. Year Book is even a better production than last year's, and certainly every listener should secure a copy, price 2s. It may be only imagination, but the Year Book for 1933 seems to be a bigger as well as a better production, with more information of a diverse character.

It is interesting once again to look at the table of licensed listeners. In December 1923, the licence figures stood at 580,380; in 1924, 1,140,119; in 1925, 1,645,207; in 1926, 2,178,447; in 1927, 2,395,174; in 1928, 2,628,392; in 1929, 2,956,736; in 1930, 3,411,910; in 1931, 4,330,735; and in 1932, it was estimated at 5,000,000.

Concerning Control.

There is an interesting contribution to the Year Book by Lord Allen of Hurtwood, dealing with the B.B.C.'s constitution. Lord Allen points out that in the Corporation we have a nationally owned and controlled activity, with Parliament reserving to itself ultimate power in case of need to take over the direct control of broadcasting, in accordance with other experience of the working of the British constitution, should necessity arise.

So far, these rights have rarely been exercised, and, as a matter of fact, the independent authority of the B.B.C. has been left practically unfettered since the inception of the British Broadcasting Corporation.

Art of Government.

Lord Allen considers the B.B.C. a new illustration of the clever and skilful manner in which people of this country develop the art of government. The unwritten British constitution, with the King at its head, has grown from stage to stage without logically and rigidly exerting its legal powers and rights, and this is exactly what has happened in the case of the new government experiment of a nationally-owned constitution for broadcasting.

Although Parliament actually retains the final power through the Government to control the B.B.C. in just the same way as the King has theoretical powers in the State, yet in neither case has practice permitted a red tape carrying out of the constitutional authority which actually and technically exists.

That Advertising.

In a pungent little article, Sir Charles Higham, the well-known publicist, states emphatically that: "I am entirely opposed to sponsored broadcasting;" while Mr. Filson Young, in another contribution,

declares that: "All broadcasting is advertising in the high sense of the word for it is the making known as widely as possible of what the broadcaster has to impart, whether it be entertainment, spoken thought, or argument, information, opinion or creative art in the form of music or literary composition."

The Editor of the B.B.C. Year Book has allowed one or two caustic comments on the "unusually ignorant and ill-informed agitations against some forthcoming broad-

having been written at the time, and the author having publicly stated that the actual sinking of the ship did not figure in the play.

"This protest was all the more remarkable in that some of the most successful broadcasts of the past have been plays like 'Journey's End' and 'Brigade Exchange,' which must have aroused many more sorrowful memories than the sinking of the 'Titanic.'"

Why "Escape" was Postponed.

In this case the B.B.C. decided to abandon the projected broadcast, as it felt that the play might be prejudiced by the misrepresentation which had appeared in the press. Nevertheless, the B.B.C. point out that they have made postponements of B.B.C. plays on their own initiative. For example, the postponement of Galsworthy's "Escape." The reason for this postponement was because of the Dartmoor mutiny.

There is a wealth of statistical information in the Year Book which should prove a real eye-opener to the student of the progress of broadcasting.

For example, there are 10,500 separate works in the orchestral library, excluding dance music; and to an orchestral work belongs anything from 10 to 80 or 90 separate pieces of printed music for the members of the orchestra.

While to this number must be added the score used by the conductor, and the second score needed for use in the Control Room.

Plenty of Music.

The Military Band music library contains about 2,500 works, while there are other sections of the music library, including Operas, Oratorios, Cantatas, etc. There are about 3,000 vocal works in the library; while, including scores for the B.B.C. Chorus, etc., there are altogether some 32,000 vocal scores and albums in store. Of Chamber Music there are about 600 separate copies.

In the technical section of the Year

Book there are some interesting articles on ultra-short-wave broadcasting, the power rating of transmitters, acoustics of the studios, microphones, electrical interference, developments of simultaneous broadcasting, television, and a long and interesting article on the design and working arrangements of Broadcasting House, the new headquarters at Portland Place.

In short, for 2s. the reader has a wealth of interesting and fascinating information about British broadcasting which is certainly remarkably good value.



WHEN THE NATION LISTENS

Broadcasting reflects all the great national events, and here are two typical scenes in connection with the Armistice Day relay from the Cenotaph.



cast, of which there was a crop at the beginning of 1931."

"In every case the B.B.C.," states the article, "while taking full notice of the protesting opinions, made its decision on what seemed to be the merits of the case.

"There was Patrick Hamilton's play 'Rope,' for instance, which was broadcast, and successfully, in spite of strong protests before the event. Then there was Filson Young's play 'Titanic,' the protests about which were remarkable as they referred purely to the subject, the play itself not

FOR CHRISTMAS...



the Gift Supreme

There is no gift so all-embracing as that of a Blue Spot Receiver. It is personal and yet gives pleasure to all. It is a constant and pleasurable reminder of the giver, and an abundant corroboration of his desire to give the best—and only the best.

THE BLUE SPOT BATTERY FOUR

This very modern receiver is outstanding in conception and design. It brings the stations of Europe pouring in one after the other—but each one distinct and separate from its neighbours. In this, and still more in its ability to let you *hear* every item of every programme as fully and pleasurably as if it were the only one being broadcast, the Modern Blue Spot is unique. Never before has wireless reproduction seemed so real, so lifelike. Never before has the very presence and personality of the artists been so completely captured. You are at your fireside, yet you are in the studio—your armchair becomes a stall at the opera, the best seat at a concert, or a table near the band. The Modern Blue Spot is the modern marvel, the nearest to perfection ever achieved.

SPECIAL FEATURES

2 Screened Grid Variable-Mu Valves. • Detector and Power Output (or Pentode.) • Remarkably selective. • One knob control. Most important stations named. • Aerial compensator to ensure 100% efficiency. • Notable saving in H.T. • Blue Spot Speakers. • Plug and jack for pick-up.

PRICES:—
K252
 in walnut, as illustrated
12 gns.
R336P
 pedestal model in walnut, with Pentode Valve & Output Filter
£17 8. 6.



THE BLUE SPOT ALL-MAINS FIVE

For those who have the advantage of "electricity laid on" there is no quality and certainly no value to equal this wonderful modern receiver designed for A.C. mains of 100/200 volts 40/100 cycles.

The use of an extra screened grid valve plays an important part in securing abnormal range and hair line selectivity. 30-40 stations are received with ease—and each is clearly separated from all others. The enormous reserve of power available ensures that even the most distant stations are heard at full programme value.

In view of the forthcoming tremendous increase in the power of European broadcasting stations, only highly modern super selective sets like Blue Spot will give completely satisfactory performance. Write for catalogue PW.60 R and get full particulars.

W400
 in oak or walnut
12 gns.
WS400
 in oak, as illustrated
14 gns.
TABLE GRAND
 in walnut
16 gns.



BRITISH MADE

ASK FOR A DEMONSTRATION AT YOUR DEALERS — IF ANY DIFFICULTY, WRITE TO US. DO NOT BE PUT OFF.

THE BRITISH BLUE SPOT COMPANY LTD

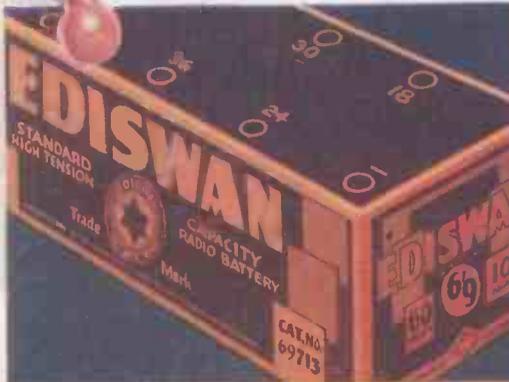
BLUE SPOT HOUSE · 94/96 ROSOMAN STREET · ROSEBERY AVENUE · LONDON · E.C.1
 Telephone: Clerkenwell 3570. Telegrams: "Bluespot, Isling, London."

Distributors for Northern England, Scotland and Wales: H. C. RAWSON (Sheffield and London), Ltd., 100 London Road, Sheffield; 22 St. Mary's Parsonage, Manchester; 44-46 High Bridge, Newcastle; 37, 38, 39 Clyde Place, Glasgow.



Eddy

ADVISES



H.T. Battery 60 v. Standard Capacity
Price 6/9



B.T.H. Senior A.C., R.K. Reproducer
Price £7.15.0



"Extra - Life" Accumulators
Prices from 4/3 to 15/6



MAZDA Radio Valves
Prices from 7/- to 25/-



B.T.H. Minor Pick-up and Tone Arm. Complete
with Volume Control - - - Price 25/-



B.T.H. Senior Pick-up and Tone Arm. Complete
with Volume Control - - Price £2.2.0



Minor R.K. P.M. Model— Prices: "Arundel"
model—Fumed Oak £2.17.6; Walnut £3.3.0

... and Eddy knows! Continue success and applause from radio enthusiasts all over the country have long convinced him of the high reliability of Edison Swan radio apparatus. He has, therefore, no hesitation in suggesting it to you and to your radio-minded friends as the ideal Christmas present. Your dealer will gladly help you in the task of selection.

EDISWAN RADIO for Christmas



THE EDISON SWAN ELECTRIC CO. LTD.
155 CHARING CROSS RD., LONDON, W.C.