

LISTEN TO ECKERSLEY FROM LISBON (See Page 7)

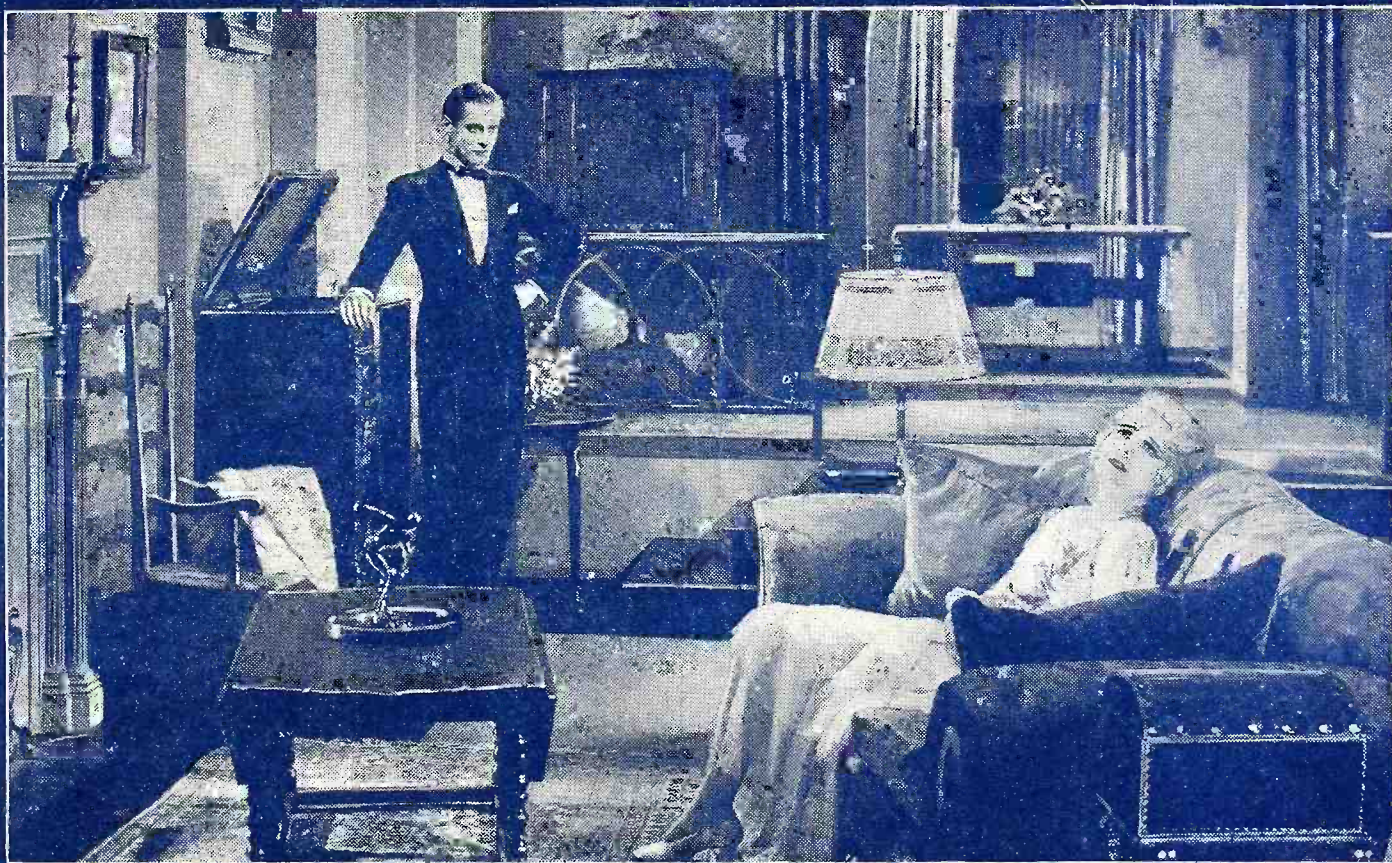
Popular Wireless

Every Thursday
PRICE
3d.

No. 511. Vol. XXI.

INCORPORATING "WIRELESS"

March 19th, 1932.



Robert Montgomery and Anita Page enjoying a little radio from a big set during an interval between "shots."

FULL DETAILS OF THE SPECIAL "P.W." PROGRAMME FROM CT 1 A A ARE GIVEN INSIDE ALSO SEVERAL IMPORTANT "COSMIC" ARTICLES FINDING FOREIGNERS OUR SINGLE DIAL SUPER A TALK WITH A JAPANESE LISTENER

READY RADIO

Official Blueprint Kits

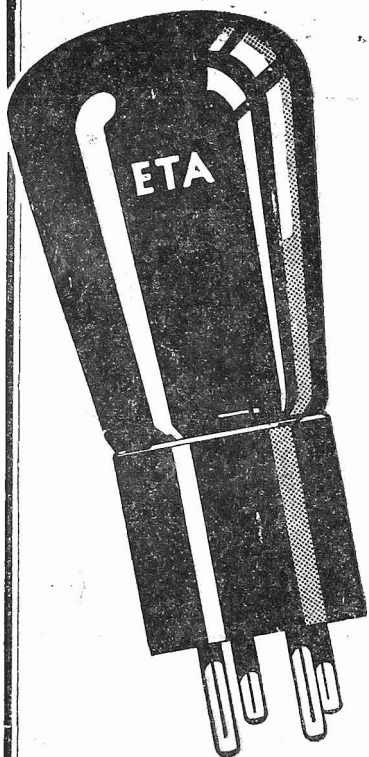
For Cash or by
Easy Payments

See Page 23

COSMIC STAR

(Ad. 1.)

PRICES reduced



Increased sales and increased production have enabled us to reduce the prices of all types of ETA, the international valve

THE ELECTRICAL TRADING ASSOC. LTD., Aldwych House, Aldwych, London, W.C.2.

ETA

THE
INTERNATIONAL
VALVE

NEW
REDUCED PRICE
FROM

6/3

ARE YOU STARVING YOUR RADIO



Model A.K.22,
CASH PRICE 77/6

Model D.C.15 25,
CASH PRICE 39/6

**10/-
DOWN
AND BALANCE
IN EASY
MONTHLY
PAYMENTS**

● ● ● Your receiver can only enjoy the full efficiency of modern valves if supplied with an ample reserve of H.T. power. Dry batteries giving the necessary 150 volts are expensive and last but a few months. Power from the Mains with an "ATLAS" Unit costs less than a penny a week and lasts for ever. Your dealer will gladly demonstrate the model for your set, but be sure to insist on "ATLAS," winners of the Olympia Ballots in 1930 and 1931. No others can offer such value, economy and generous output.

**P.C. Models from 15/-.
A.C. Models from
52/6. Guaranteed
12 months.
Westinghouse
Rectifiers.**

"CLARKE'S" ATLAS MAINS UNITS

H. CLARKE & CO.
(M/cr.) LTD.,
OLD TRAFFORD,
MANCHESTER.

Phones:
Trafford Park 1744-5-6.

Southern Offices:
BUSH HOUSE, W.C.2.

Phones:
Temple Bar 3362 & 7130.
Glasgow Office:
24, Oswald Street.
Phone: Central 5119.

POST THIS COUPON NOW!

H. CLARKE & Co. (M/cr.), Ltd., Old Trafford, Manchester.

Please send me FREE copy of your booklet "Power from the Mains."

Name

Address

30/19/3

BUY YOUR RADIO FROM US FOUNDERS OF CONSTRUCTOR KITS

**C.O.D.
CASH
or
H.P.**

Any parts for Kits advertised in this Page supplied separately. If order value over 10/- sent carriage paid or C.O.D. Post charges paid.

PILOT SUPER-HET SHORT-WAVE ADAPTOR

A genuine Ready-built Kelsey
Adaptor—NOT A KIT.

Designed by Mr. G. T. Kelsey for use with All Mains sets and battery sets incorporating H.F. amplification. Connected in two seconds without alteration to your present set. Tunes in short-wave stations from all over the world. Ordinary broadcasts still available when desired. Sent complete ready assembled with full operating instructions.

CASH OR
C.O.D.

44/6

Or 20/- deposit and 5 monthly payments of 5/6
Any standard detector value is suitable.

GRAHAM FARISH AMAZING 3

As advertised by the manufacturers. Immediate delivery. Supplied less valves and cabinet.

6/-

CASH PRICE £1 : 18 : 6 WITH ORDER

Balance: 6 monthly payments of 6/-

COSSOR ALL-ELECTRIC MELODY MAKER

(Type 235). For A.C. mains. With Valves and Cabinet. CASH PRICE, £9 19 6. Balance in 11 monthly payments of 18/3.

COSSOR EMPIRE MELODY MAKER 234

With valves and cabinet. CASH PRICE, £6 15 0. Balance in 11 monthly payments of 12/6.

READI-RAD METEOR 3

Less valves and cabinet. CASH PRICE, £3 15 0. Balance in 11 monthly payments of 6/11.

V.3 RADIO FOR THE MILLION

Screen-grid. Detector and Power. With valves, less cabinet. CASH PRICE, £5 17 6. Balance in 11 monthly payments of 10/10.

FORMO ECONOMY 3

With coils, less valves and cabinet. CASH PRICE, £1 19 6. Balance in 7 monthly payments of 5/6.

COSMIC

As described in "Popular Wireless" February 13th, and February 20th, 1932.

KIT-BITS

Selected Components

CASH or C.O.D.

You pay the postman. We pay post charges on all orders over 10/-

SPECIAL PETO-SCOTT COIL OFFER FOR COSMIC SETS

Complete set of Cosmic Coils comprising Peto-Scott Dual Range Coil, Peto-Scott Short Wave Coil and Peto-Scott Moderator Coil. Officially approved and made to fit the Blueprint. CASH or C.O.D. **12/6** Sent Post Free **2/9**

COSMIC III

CYLDON Extender, with disc drive slow motion, Type Ex.5 16 6
Set of "Cosmic" Coils, comprising Dual Range, Short Wave and Moderator Coils 12 6
Set of Specified Valves £1 10 6
Cabinet as specified 17 6

COSMIC III STAR

1 ReadiRad Duotune Extender 18 6
Set of "Cosmic" Coils as specified 12 6
Set of specified Valves £1 10 6
Cabinet—to specification 17 6

COSMIC III FINISHED INSTRUMENT

Factory wired and assembled from specified components. Broadcast tested. Complete with valves and cabinet and including royalties. CASH or C.O.D. **7 GNS.** or 21/- down and 11 monthly payments of 12/6

COSMIC III STAR FINISHED INSTRUMENT

Factory wired and assembled from specified components. Broadcast tested. Complete with valves and cabinet and including royalties. CASH or C.O.D. **£8 : 0 : 0** or 25/- down and 11 monthly payments of 13/6

COSMIC III

KIT "A" Author's Kit, less valves and cabinet.
CASH or C.O.D. **70/-**

EASYWAY:
12 monthly payments of 6/5
Valves as specified, £1 : 10 : 6
Cabinet, 17/6.

KIT "B" Author's Kit, with valves but less cabinet.
CASH or C.O.D. £5 : 0 : 6
EASYWAY:
12 monthly payments of 9/3

KIT "C" Author's Kit complete with valves and cabinet.
CASH or C.O.D. £5 : 18 : 0
EASYWAY:
12 monthly payments of 10/10

COSMIC III STAR

KIT "A" Author's Kit, less valves and cabinet.
CASH or C.O.D. **87/6**

EASYWAY:
12 monthly payments of 8/-
Valves as specified, £1 : 10 : 6
Cabinet, 17/6.

KIT "B" Author's Kit, with valves but less cabinet.
CASH or C.O.D. £5 : 18 : 0
EASYWAY:
12 monthly payments of 10/10

KIT "C" Author's Kit complete with valves and cabinet.
CASH or C.O.D. £6 : 15 : 6
EASYWAY:
12 monthly payments of 12/5

FOUNDERS OF CONSTRUCTOR KITS

PETO-SCOTT

Established 1919

CO. LTD.

77, CITY ROAD, LONDON, E.C.1. Telephone: Clerkenwell 9406-7-8. 62, HIGH HOLBORN, LONDON, W.C.2. Telephone: Chancery 8266

Messrs. PETO-SCOTT & CO. LTD. 77, City Rd., London, E.C.1
Please send me C.O.D./CASH/H.P.:

for which I enclose £ s. d. CASH/H.P. Deposit.
NAME.....
ADDRESS.....

P.W. 19-3-32.

LOOK OUT FOR IT! THE APRIL NUMBER OF THE WIRELESS CONSTRUCTOR

NOW ON SALE. PRICE 6d. OBTAINABLE EVERYWHERE

Commencing in the April number of "The Wireless Constructor" is a magnificent new feature entitled

FROM MY ARMCHAIR

—By John
Scott-Taggart

In this—the first of a unique series of articles—the great radio expert talks interestingly and intimately about the radio tendencies of to-day.

*Delightfully Informal
and Informative!*



In addition to his new series "From My Armchair" Mr. Scott-Taggart contributes a vital article:

"IS BAND-PASSING A CRAZE?"

and also constructional details for

**GRAMOPHONE
MUSIC ON
YOUR S.T.300**

and other striking features.

An unusually comprehensive list of how-to-make articles is a very strong feature of the April "Wireless Constructor," and among the items are

THE UNI-AMP

An extremely handy dual-circuit single-valve amplifier.

REMOTE CONTROL

Full details for making a simple "switch-at-a-distance" unit.

FITTING A PENTODE

An easily constructed "filter" for using a pentode to the best advantage.

ALSO IN THE APRIL "CONSTRUCTOR" THE S.T.300 FOR A.C. MAINS

By John Scott-Taggart

MAKING RADIO READABLE
ROUND THE DIALS
FIVE-CHANNEL TELEVISION

PUSH-PULL DETECTION
THE MONTH ON SHORT WAVES
CHOOSING A LOUDSPEAKER
ON THE GRID, ETC., ETC.

WITH PICK-UP AND SPEAKER
QUEER QUERIES
A PRACTICAL MAN'S CORNER

THE WIRELESS CONSTRUCTOR

SIXPENCE

APRIL NUMBER NOW ON SALE. GET IT TO-DAY.

EVERYTHING RADIO

THE NEW EASIWAY

Yours for 6/- Down
SPEAKERS . . . ELIMINATORS . . .

6/- Down

Speakers

R. & A. "100" P.M. MOVING-COIL SPEAKER. With multi-ratio input transformer. (Cash price £2 17s. 6d.)
 Balance: 11 monthly payments of 5/2.

AMPLION MOVING-COIL SPEAKER TYPE M.C.6. Permanent magnet, with output transformer. Complete. (Cash price £3 7s. 6d.)
 Balance: 11 monthly payments of 6/2.

BLUE SPOT SPEAKER UNIT 66R. With Major Chassis and cone (37 cm.) (Cash price £2 10s. 0d.)
 Balance: 11 monthly payments of 4/5.

EPOCH A2 PERMANENT MAGNET MOVING-COIL SPEAKER. Fitted with multi-ratio input transformer. (Cash price £3 3s. 0d.)
 Balance: 11 monthly payments of 5/9.

ULTRA IMP PERMANENT MAGNET MOVING-COIL SPEAKER. Complete with input transformer. (Cash price £2 15s. 0d.)
 Balance: 11 monthly payments of 5/-

CELESTION PERMANENT MAGNET MOVING-COIL SPEAKER. Type R.P.M.3, with 8 in. reinforced diaphragm. Excluding input transformer. (Cash price £3 10s. 0d.)
 Balance: 11 monthly payments of 6/5.

MAGNAVOX PERMANENT MAGNET MOVING-COIL SPEAKER. Type D.C.142, (Cash price £2 17s. 6d.)
 Balance: 11 monthly payments of 5/2

CELESTION P.P.M. PERMANENT MAGNET MOVING-COIL SPEAKER. With impregnated diaphragm and dual impedance input transformer. (Cash or C.O.D. £2 7s. 6d.)
 Balance: 7 monthly payments of 6/8.

BLUE SPOT SPEAKER UNIT AND CHASSIS. Type 100 U. (Cash price £1 19s. 6d.)
 Balance: 7 monthly payments of 5/3.

W.B. PERMANENT MAGNET MOVING-COIL SPEAKER. TYPE P.M.3. With 3 Ratio input transformer. (Cash price £2 12s. 6d.)
 Balance: 11 monthly payments of 4/9.

W.B. PERMANENT MAGNET MOVING COIL SPEAKER. TYPE P.M.4. With special transformer. (Cash price £2 2s. 0d.)
 Balance: 7 monthly payments of 5/9.

B.T.H. MINOR PERMANENT MAGNET MOVING-COIL SPEAKER. (Valve. £2 10s. 0d. Cash or C.O.D.) Balance: 11 monthly payments of 4/5.

Eliminators

ATLAS A.C. ELIMINATOR, TYPE A.C.244. 3 tappings, S.G., detector and power. Output, 120-v. at 20 m/a. (Cash price £2 19s. 6d.)
 Balance: 11 monthly payments of 5/5.

RECENTONE W.I.F. H.T. ELIMINATOR. Tapped 60/70 v. S.G., and 120 at 12 m/a. (Cash price £2 7s. 6d.)
 Balance: 11 monthly payments of 4/2.

ATLAS D.C. ELIMINATOR TYPE D.C. 16. (For D.C. Mains) 2 fixed tappings at 120 v. and 150 v., one variable 0-150 v. Output 150 v. at 25 m/a. (Cash or C.O.D. £2 17s. 6d.)
 Balance: 11 monthly payments of 5/2.

RECENTONE MODEL W.1.07 (For A.C. Mains). Three tappings—two adjustable and one power. 120-150 volts—20 m/a. (Cash or C.O.D. £3 10s. 0d.)
 Balance: 11 monthly payments of 6/5.

Accessories

BLUE SPOT PICK-UP AND TONE-ARM with Volume Control. (Cash or C.O.D. £3 3s. 0d.)
 Balance: 11 monthly payments of 5/9.

GARRARD INDUCTION GRAMOPHONE MOTOR. Model 202. For A.C. Mains. Mounted on 12-in. Nickel Motor Plate with fully automatic electric starting and stopping switch. (Cash price £2 18s. 6d.)
 Balance: 11 monthly payments of 5/3.

B.T.H. SENIOR PICK-UP AND TONE-ARM. Complete. (Cash or C.O.D. £2 5s. 0d.)
 Balance: 8 monthly payments of 5/4.

7/6 Down

PILOT PERMANENT MAGNET MOVING-COIL SPEAKER. In handsome solid oak cabinet, with multi-ratio input transformer. (Cash price £3 15s. 0d.)

Balance: 11 monthly payments of 6/10.
EKCO H.T. UNIT, TYPE A.C.25. For multi-valve sets requiring up to 25 m/a. 3 tappings, S.G., detector and 120/150 volts. For A.C. Mains. (Cash or C.O.D. Price £3 17s. 6d.)
 Balance: 11 monthly payments of 7/-.

VOXKIT 1932 OAK CONSOLE. (Radio only.) Overall: 37 in. high x 22 in. wide x 15 in. deep Panel (Fret) 12 in. x 7 in. Baseboard 18 in. x 12 in. Front panel fretted or drilled to customers' specification. (Cash Price £3 15s. 0d.)
 Balance: 11 monthly payments of 6/10.

EKCO K.12. H.T. ELIMINATOR AND L.T. TRICKLE CHARGER. Delivers 12 m/a. Tapped at 80 v (S.G.), 120/150 v. Charges 1 amp. at 2, 4 or 6 v. (Cash price £3 19s. 6d.)
 Balance: 11 monthly payments of 7/3.

10/- Down

B.T.H. SENIOR PERMANENT MAGNET MOVING-COIL SPEAKER. (Valve. £5 12s. 6d. Cash or C.O.D.)
 Balance: 11 monthly payments of 10/3.

EXIDE 120-VOLT W.H. TYPE ACCUMULATOR, in crates. (Cash price £4 13s. 0d.)
 Balance: 11 monthly payments of 8/4.

RECENTONE W.1A H.T. UNIT. For A.C. Mains. 3 tappings. S.G., variable and power. 120/150 v. at 25 m/a. (Cash price £3 17s. 6d.)
 Balance: 11 monthly payments of 6/10.

ATLAS ALL-MAINS UNIT MODEL A.C.188. 3 tappings, 2 variable, 1 fixed. L.T. Trickle Charger at 2, 4 or 6 v. at 5 amp. (Cash price £6 0s. 0d.)
 Balance: 11 monthly payments of 11/1.

FOUNDERS OF CONSTRUCTOR KITS

PETO-SCOTT

CO. LTD.

77, CITY ROAD, LONDON E.C.1. Telephone: Clerkenwell 9406-7-8. 62, HIGH HOLBORN, LONDON, W.C.1. Telephone: Chancery 8265

Messrs. PETO-SCOTT CO. LTD., 77, City Rd., London, E.C.1
 Please send me C.O.D./CASH/H.P.

I enclose

(Cross out amount not required.)

6/- first deposit for

7/6

10/-

NAME

ADDRESS

P.W. 19-3-32

When your friends ask you, as a radio expert, which is the best Wireless Receiver remember what the Press has said about **HIS MASTER'S VOICE** MODEL 435 — PRICE 20 GUINEAS

"This is one of the best sets we have tried this season. Its many technical points will interest the enthusiast and its wonderful performance will thrill the ordinary listener . . . Model 435 incorporates many requirements not found in the usual straight set. . . . One could not wish for better selectivity." *Wireless Magazine*

"It would be difficult to overdo praise for this excellent table-console set, which has a great many points that distinguish it from the ordinary run of sets. . . The quality of reproduction from the self-contained moving coil loudspeaker is simply great. The deep rich bass and the clear-cut treble combine to give a balance of tone not often found in table-sets."

Amateur Wireless

"Practically every modern feature likely to enhance the performance of the set and simplify its operation has been incorporated. Sensitivity is well above the average for a receiver of this type. Separate tuning scales are provided for both wavebands . . . We found the calibration quite accurate and very helpful. All scales are illuminated by concealed lamps."

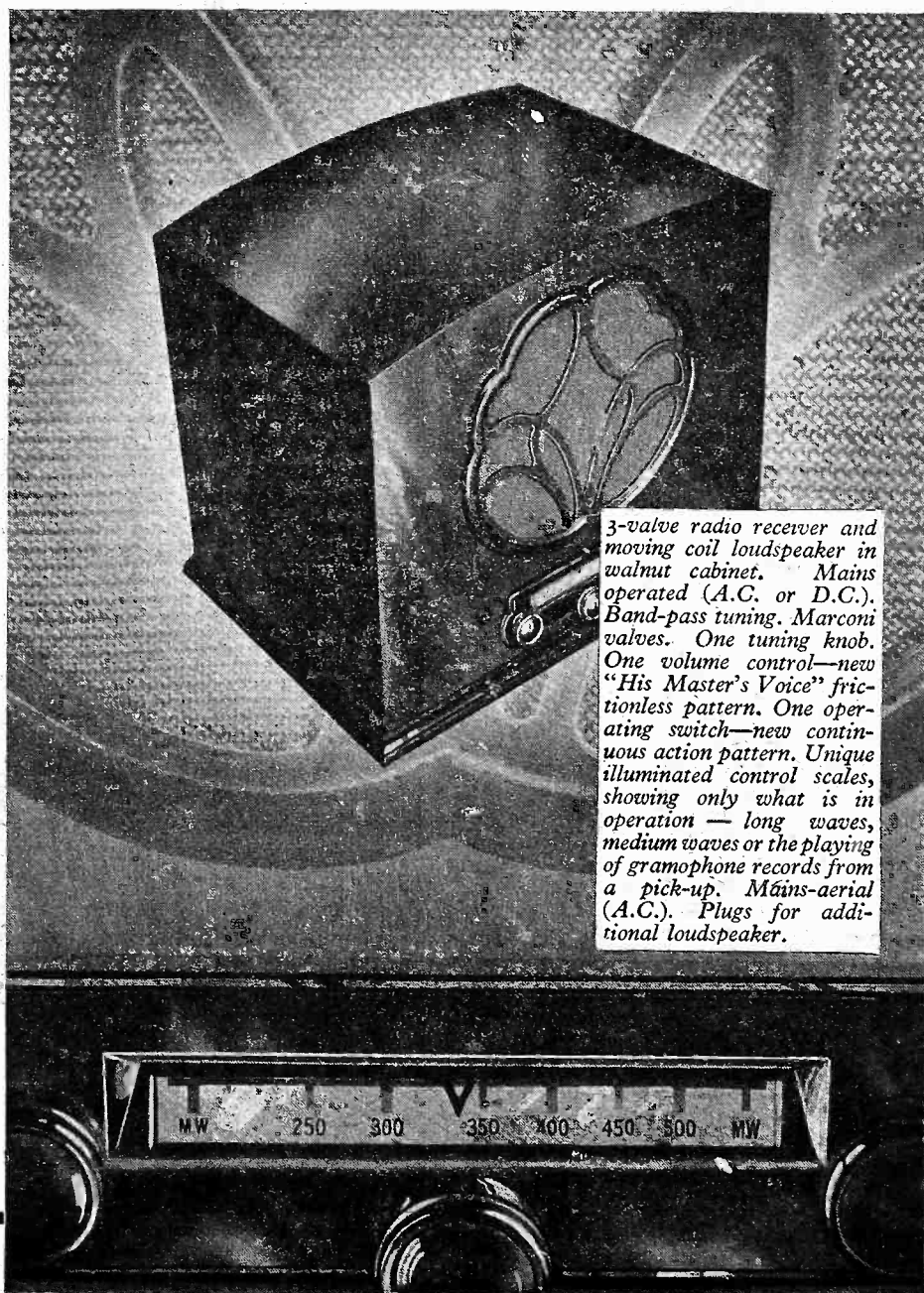
Wireless World

His Master's Voice



Above price does not apply in Irish Free State.

The Gramophone Co. Ltd., London, W. 1



3-valve radio receiver and moving coil loudspeaker in walnut cabinet. Mains operated (A.C. or D.C.). Band-pass tuning. Marconi valves. One tuning knob. One volume control—new "His Master's Voice" frictionless pattern. One operating switch—new continuous action pattern. Unique illuminated control scales, showing only what is in operation — long waves, medium waves or the playing of gramophone records from a pick-up. Mains-aerial (A.C.). Plugs for additional loudspeaker.

Popular Wireless

LARGEST NET SALES

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.
Assistant Technical Editors:
K. D. ROGERS, P. R. BIRD,
A. JOHNSON RANDALL.

LAI D ASIDE
"ON APPRO."
HENRY HALL
NEW ITALIAN

RADIO NOTES & NEWS

A FAILURE
HIGH SPOTS
TOOTH - PASTE!
THE "DOOMP"

Laid Aside.

AS I write these Notes I am in full enjoyment of the well-known fore-taste of the Bad Place—just emerged from the paradise of the flu. My cough could be broadcast as an imitation of a bull singing "The King's Horses" in Wapping Tunnel. The knobs of the set are too cold to twiddle, and 'baccy tastes like smouldering "plimsolls."

I glance out of the window at the aerial and observe that the lilac trees are putting forth little green shoots of leaves, as though to tantalise me with visions of the spring; they and the cats which are fighting on my rarest rock-plants are apparently the only living things in the garden.

Boy, bring forth my short-wave set and make it oscillate horribly. It may warm me!

"Cosmic."

IN a way it is warming to ponder upon our great All-Wave Wonder Wireless Work, known as "Cosmic" for short. Anyone who constructs this receiver accurately may be certain that he has the "last word" in such apparatus, and that he is equipped for world-wide listening. Take my tip and begin on the "Cosmic" now, while copies of "P.W." and blueprints are available for "it is the goods"; to which testimony you may add the more important judgment of the "trade." Look at the support given to "Cosmic" by the trade. Unprecedented in my experience.

Sets "On' Appro."

FOR your information be it recorded that radio dealers are now permitted by the Post Office to issue receivers on approval for fourteen days without a licence being taken out in respect of such; either by themselves or the prospective customers; but a list of the transactions must be kept by dealers.

When a customer agrees to buy a set, which has been installed on approval he must at once get a licence if he does not already possess one. It is, however, still necessary for dealers to hold licences in respect of their own premises.

Canadian Radio.

LATEST statistics show that on December 31st, 1931, there were 548,342 licensed radio sets in Canada, which is about twice the number recorded in 1929; this works out roughly to one set for every four homes. As to individual towns, Toronto heads the list with 75,240, Montreal is second with 68,150 and Vancouver third with 27,574.

cymbals, triangle, and those hanging metal tubes for bell effects. Perhaps the drummer will deal with such odd jobs in his spare time.

New Italian Station.

THE latest step in the reorganisation of the Italian broadcasting system is the opening of the new station at Florence. This station, made at Chelmsford by Marconi's, is rated at 20 kilowatts (new rating), and modulation can be effected up to 100 per cent. The normal wave-length is 500.8 metres (599 k.c.), but can be varied between 250 and 550 metres. It is working at present on a temporary aerial, but when the final aerial, a quarter-wave "T" type on two 100-metre masts, is ready, Florence should be one of the favourite European stations.

Definitions of Ether.

I AM indebted to the "Scientific American" for recalling that Lord Salisbury once defined the ether as a word designed to provide a nominative case for the verb "to undulate." That always tickled me, and it sounds finer the more one ponders upon it. Dr. W. F. G. Swann, of the Franklin Institute has now Americanised this as follows: "The ether is a medium invented by man for the purpose of propagating his misconceptions from one place to another. Of all suitable fluids invented for the stimulation of the imagination, it is the only one which, so far, has not been prohibited." Very happy, that!

A Great Little Book.

ONE of the most wonderful publications for amateurs that has come my way is the "Radio Amateur Call Book Magazine," the Winter Number of which Mr. F. T. Carter, Flat A, Glencogle Mansions, Streatham, London, has been kind enough to send to me. No keen amateur can get his claws on to this book and guarantee to go to bye-bye at a reasonable hour. The annual subscription is 18/6; single copies, 5/6, post free anywhere. Write to Mr. Carter about it; he compiles the Great Britain section. I'll wager that

(Continued on next page.)

LOOKING-IN ON THE SHORT WAVES



This young lady is giving the short-wave fraternity in Chicago a surprise, for she is "tuning" one of the new television transmitters, just placed on the market there at \$50 a time. There are over 30,000 licensed short-wave transmitting stations in the U.S.A., and it will be interesting to see if the idea of sending pictures instead of 'morse appeals to any large proportion of the owners.

Henry Hall's Dance Orchestra.

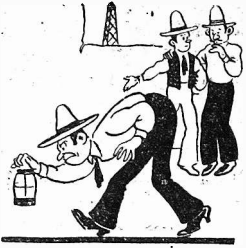
THE fourteen accomplished members composing this orchestra were selected by Mr. Hall out of some seven hundred applicants. The orchestra is made up of four saxophones, two violins, and one each of the following: trumpet, oboe, trombone, piano, guitar, drum, together with string bass and a vocalist. But what about

NEWS—VIEWS—AND INTERVIEWS (Continued)

once you see a copy you will want to learn Morse, make a DX set, and, probably, want to become an amateur transmitter. Well, you'll see! In any case, you will want to have a S.W. long-distance set on the amateur band. Swelp me!

A Suggestion.

ON reading the Argentine radio papers and realising the discontent which is rife there, it seems to me that there might be an outlet for British talent in the most go-ahead



South American republic if the aforesaid talent could adapt itself to the Spanish-American mentality—and language, which, by the way, is very easily learned.

I note a recent cartoon depicting two men looking at a third who, bent double, has a lantern. "This chap, being a proprietor of a broadcasting station, has gone mad." "What is he doing with that lantern?" "He is looking for a artist."

Failure of a "Try On."

ALL-MAINS' users in particular and radio folk in general will rejoice in the defeat of the electricity department of the Grimsby Town Council, which some time ago brought forward a pretty little proposal to charge four shillings a year to owners of radio sets using "eliminators." The Council rejected the idea by a heavy majority. A fine precedent would have been set up, and no mistake, had the matter gone otherwise. I did not see what arguments the department produced, but whatever they were, I do not understand why a Grimsby man can't do what he likes, within the law, for current which he pays for.

"High Spots on the 8.55."

I KEEP my ears open as I journey to the City, and the 8.55 swears by the following B.B.C. "features." Christopher Stone and his grammy, Elsie and Doris



Waters, Haver and Lee, Vernon Bartlett, Leo Henry and his chuckle, Jack Payne & Co., Jeanne de Cassalis as "Mrs. Feather," Mabel C., of course.

Dean Inge, because of his "well-off" voice; it is Oxford "swank" in excelsis. Ron Goulay, his pluck and skill. A. J. Alan is a godling, but, like Halley's Comet, only rarely on show. Gillie Potter, who ought to be bound by law to appear once a week; and H. G. Wells.

Finally, the whole carriage hates Foundations of anything, and simply loathes Fat Stocks.

"Now Then, 'Ariel'."

UNDER this provocative title there appeared a long letter on page 734 of "P.W." November 28th, from my esteemed business pupil, Mr. W. Werner. I wish I could devote to my reply the space which his letter deserves. He has got the original subject, "whether radio advertising pays," dreadfully mixed with irrelevant points. However, to tackle the main matter—I have already told him that the reason why business firms in the U.S.A. continue their radio ads. is because each is afraid to drop them. I am not surprised that he failed to get his statistics, but I am amazed that he was innocent enough to ask for them.

Tooth Paste and Sentiment.

I DOUBT whether my grandpa used tooth paste, but I certainly see no reason why I should use a particular kind because the maker pays certain comedians to broadcast. Am I to buy a cloth which I

SHORT WAVES.

Recent atmospheric conditions are said to have had the effect of making clocks and watches slow, thus causing late arrivals at the office.

Office clocks are, of course, unaffected by atmospheric conditions.—"Punch."

The following advertisement recently appeared in a contemporary: "Condensers '0005 Vernier and Ortona 3 Coil toners."

We should be pleased to receive these new lines for review.

What is the difference between a native of Aberdeen and an accumulator?

The accumulator can be overcharged.

It was recently reported that it had taken two engineers three weeks to communicate with each other by wireless. It might have been almost as quick to use the telephone.

OH, THOSE TALKS!

Talk! Talk! Talk!

Till the brain begins to swim.

Talk! Talk! Talk!

Till the eyes are heavy and dim.

Recitals, the weather and news.

Topical talks and such themes,

O'er highbrow stuff I fall asleep,

To syncopate them in my dreams.

A Few Odd Points.

AS for my never missing a chance to "take a crack at things American," well, I do not think I miss a chance of doing that at anything—I am so international-minded, you know! If America supplies me with so many chances, that is due to her genius for providing matter for comedy. However, I fully agree that, as W. W. suggests, American radio is bewildering, though I dissent from the accusation that I belittle the efforts of my fellow

"fans." What have they to do with sponsored tooth-paste? All the best, W. W.! May radio advertising—in America—never stop; for if it were to do so, where would you be? Why, on might even have to pay a licence fee and buy tooth-paste on logical principles!

Coals of Fire!

AFTER having written the above paragraphs about the value of radio advertising, it felt to me like "coals of fire" on my head to receive from W. W. a card of greetings showing half a sun and a head of parsley perched a-top of half a beetroot, the whole representing, in metaphor, the sun and flora of California.

Well, hard words break no bones, and there is no ill feeling, bo! California is a darned fine place to think about, but England is the place to live in. The happy medium, old son!

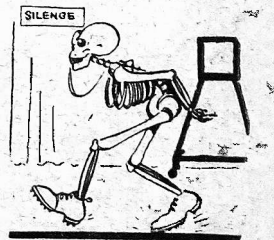


More About Dials.

ON February 6th I palmed off on you a second-hand, but perfectly good, joke about a lady who S.O.S'd because her dial had slipped. Hence I was seized with hysterical laughter, a few days after I wrote the paragraph, when I received a letter from a lady relation which ran, in part, as follows: "What do the lines on my dial mean?" (Bless'er art, she hasn't a wrinkle!) "Do the long ones mean long waves and the shorter ones short waves? Aren't they rather dreadfully mixed up? The man who brought the radio set said they were 'arbitrary,' but I think he was trying to show off. Please explain all this terrible mystery, for all we hear is something very German in the background. Do the knobs move themselves, or must I touch them?" Oh, baby!

The Changing "Doomp."

I FANCY that the B.B.C.'s ghostly interval signal has changed; the ghost has taken off his goloshes and seems to walk with a firmer tread. In fact, it sounds to me as though he is partially materialised and has some meat on his ribs. Or, perchance, he has got his goloshes wet and is walking on linoleum instead of bare boards along an empty corridor. Unless my ears deceive me, the signal now has less "doomp" and more "ponk." Ever read Poe's ghastly yarn about the "Tell-Tale Heart," which began to beat after its owner, murdered, had been put under the flooring? Well, the B.B.C. must know about it, for the "doomp" is IT, to the tick! ARIEL.



"P.W.'s" SPECIAL PROGRAMME FROM —

ESTACÃO RADIO

CT1AA

THE "GARDEN OF EUROPE" STATION

TO-MORROW (Friday) evening I rather imagine that there is going to be more of a concerted movement of L.T. switches than there has ever been before on short-waves!

For to-morrow evening is the occasion of the special "Cosmic" broadcast from Lisbon, and at ten "pip-emma" a programme is to be radiated from CT1AA—the famous Portuguese short-wave station—for the special benefit of "P.W." readers.

This special programme, the full details of which are given on this page, will continue for two hours, and, judging by the conditions prevailing at the time of writing, there is every prospect that the transmission will be received in this country at excellent strength.

Ever since our preliminary announcement that a special short-wave transmission for "Cosmic" owners was to take place, a tremendous amount of interest has been shown by "P.W." readers all over the country, and we should like to take this opportunity of thanking all those who have sent good wishes for the success of the broadcast.

An Acknowledgement.

We should also like to take this opportunity of tendering on behalf of "P.W." readers our thanks to Signor Abilio

By G. T. KELSEY.

To-morrow (Friday) evening is the occasion of the "Cosmic" broadcast from Lisbon, and every reader of "P.W." is cordially invited to participate in this highly interesting experiment. The final details concerning our programme, which includes a talk by Captain Eckersley, are discussed in this article, and an interesting announcement is made regarding "P.W.'s" original "Cosmic" record.

Nunes Dos Santos for the efforts he has made at the Lisbon end to ensure the complete success of the broadcast.

As for the programme itself, well, every

item promises to be one of unusual interest, and, of course, the real tit-bit of the evening follows immediately after "P.W.'s" greetings to its readers, when Captain Eckersley will "say a few words" as only Captain Eckersley could say them!

For that reason alone, even if there were no other, we are confident that not a single reader with, or within reach of, a short-wave receiver, will want to miss this special programme, for the merits of our Chief Radio Consultant as a microphone personality are already too widely known to need repetition here.

So make sure that your set is "short-waving" all right at ten p.m. to-morrow evening!

The "P.W." Research Department has made elaborate arrangements for the establishment of listening posts in quite a number of districts, and a comprehensive report of the results obtained will be published in due course.

Reports Welcomed.

But we want to make it much more of a combined effort than that, and so we are going to ask every reader to consider himself for the purposes of this test as a "P.W." listening post.

We know that all "Cosmic" owners will be tuned to 42.9

(Continued on page 40.)

THE "P.W." PROGRAMME

10.00 p.m.—Opening Announcement by Signor Abilio Nunes Dos Santos, followed by an Opening March.

10.05 p.m.—A pot-pourri of Popular Music.

10.15 p.m.—A short address to the world in the world's universal language, Esperanto.

10.30 p.m.—"P.W." Readers are introduced to the Music of Portugal with Pianoforte Selections.

10.35 p.m.—"P.W.'s" Greetings to its Readers, followed by an Address by our Chief Radio Consultant, Captain P. P. Eckersley.

10.45 p.m.—Something out of the

ordinary, "The Eldest Ally," by Doctor Penha Garcia, Director of the Lisbon Agricultural Society.

11.00 p.m.—The Portuguese Fados.

11.15 p.m.—The Popular Songs of Portugal. (Every reader is invited to join in the choruses!)

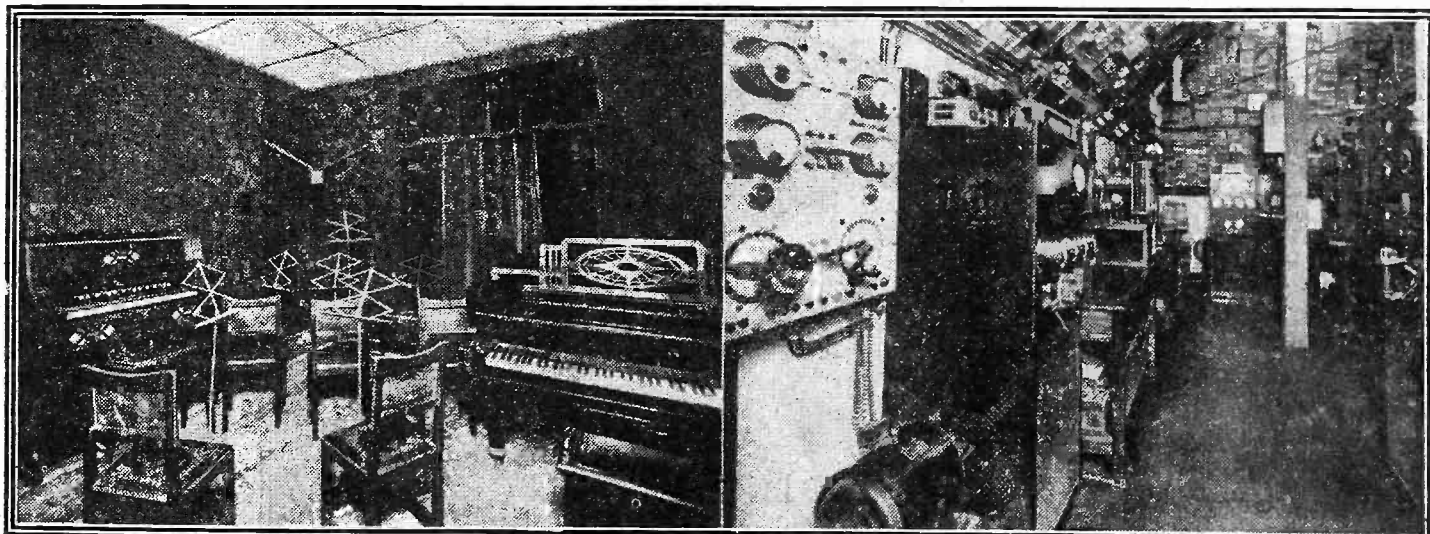
11.30 p.m.—English and Portuguese Literature by "N."

11.40 p.m.—The Giant Adamastor—Luis de Camoes (The Luziadas).

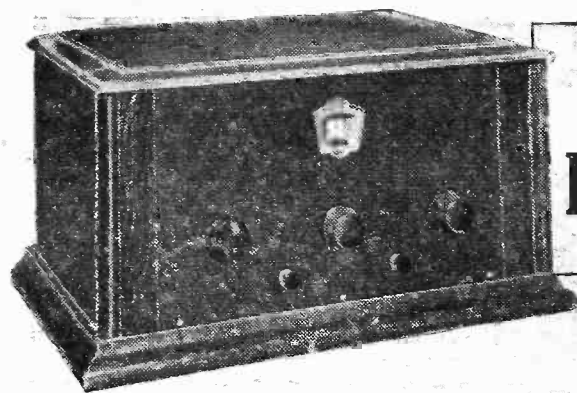
11.45.—In the Sunny South—A Popular Feast.

12 midnight.—God Save the King and "A Portuguesa" (The Portuguese National Anthem).

TWO VIEWS OF THIS POPULAR PORTUGUESE BROADCASTER

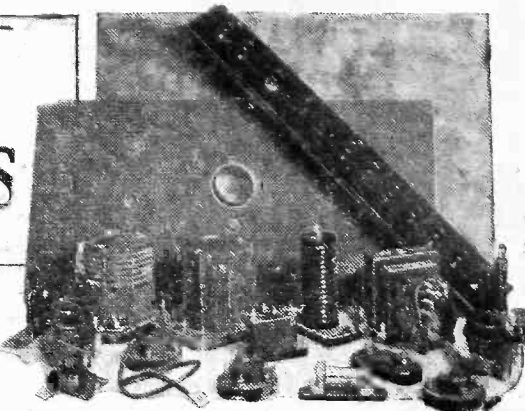


"Hello, Everybody!" This is CT1AA calling to "Popular Wireless" readers! And here we see two interesting views of the station from which our programme is to be radiated. On the left is No. 2 studio at Lisbon, from which the musical items will be broadcast, and the right-hand picture shows part of the elaborate transmitting gear at CT1AA.



FINDING FOREIGNERS

"Cosmic" owners and other searchers of the long and the short waves will find below many practical hints on receiving famous foreign stations.



THE first programme at the bottom of the long-wave dial is Leningrad, on 1,000 metres. This station would more often be picked up in this country but for the fact that its programme is generally lost behind a barrage of Morse from many direction-finding stations—useful for navigation, no doubt, but of no earthly use to listeners!

A little above them, and well received in Northern England, comes Oslo, on 1,083 metres, and just above it Kalundborg, Denmark, "the Great Dane." Both of these announce frequently and clearly.

English Talks From Russia.

The Moscow Trade Union station works on 1,304 metres, and as much of its programme is of a propaganda nature it is given in several languages, including English. Quite long talks in English are to be heard, usually of a strongly political nature.

Lack of space forbids us enlarging upon these activities, so we must pass over this.

Motala radiates the Stockholm programme and generally closes down about 10 p.m. A little higher on the dial we come to Warsaw, Europe's most powerful long-waver, on 1,411 metres.

Men and women announcers are employed, and the name sounds like "Varshova." This station comes over so well that it can often be heard in daylight, but is very close in wavelength to its neighbour, Eiffel Tower, on 1,445 metres.

"Tour I-Fell."

Eiffel Tower, of course, is too well known to need much introduction, and all we need say about it is that the name as pronounced sounds like "Tour I-Fell."

On 1,554 metres is Daventry National, which, by the way, is to be greatly gingered up by the B.B.C. in the near future, and immediately above it comes Königswusterhausen, the long-wave Berlin relay. A degree or so above that, again, is Radio-Paris, on 1,725

metres, famous for its Sunday afternoon gramophone record concerts, and a useful station to remember when the clock stops overnight, for it sends out a time signal at 8 a.m.

The Upper Limit.

Finally, right at the top of the dial, we have Huizen, Holland, which up to the end of March is radiating the Hilversum programme. By a special arrangement these two transmitters change studios every three months, so until April 1st the actual Huizen programmes go out from the Hilversum station, on 298.8 metres.

English is sometimes used from here, but the Dutch announcements are so clear that there will never be any difficulty with these stations if their habit of swapping wavelengths is remembered.

Although in the foregoing account a great many stations receivable on the "Cosmic" have necessarily been passed over, the listing of medium- and long-wave programmes is child's play compared to those which may be received on the short waves. For the short-wavers are notoriously variable, and an American station which may be coming in very strongly one evening may fade away to almost inaudibility a few days later.

Moreover, short waves are liable to dull periods, when reception seems poor in all parts of the world; but, on the other hand, when they *do* wake up you never know whether it will be America, the Dutch East Indies, or even Australia that may come in like a local!

On short waves, too, the time at which transmission is carried out is very different from medium- and long-wave stations, all of which are better at night than by day. So that short-wave enthusiasts are reminded of last week's article. They should also watch W. L. S. in "Short-Wave Notes" for up-to-the-minute reports on reception possibilities, and as he cannot possibly say all the interesting things that are to be said about this truly fascinating field, here are a few hints about getting America, which provides one of its greatest thrills.

Regular Announcements.

Unlike the rest of the world, the American stations break off the programmes and give their call-signs at each hour and at each fifteen-minute interval between. Thus, if you pick up an American station at five minutes past ten, you must hang on for ten minutes to hear the call at ten-fifteen. If you miss it you must hang on for another quarter of an hour, to hear it at ten-thirty.

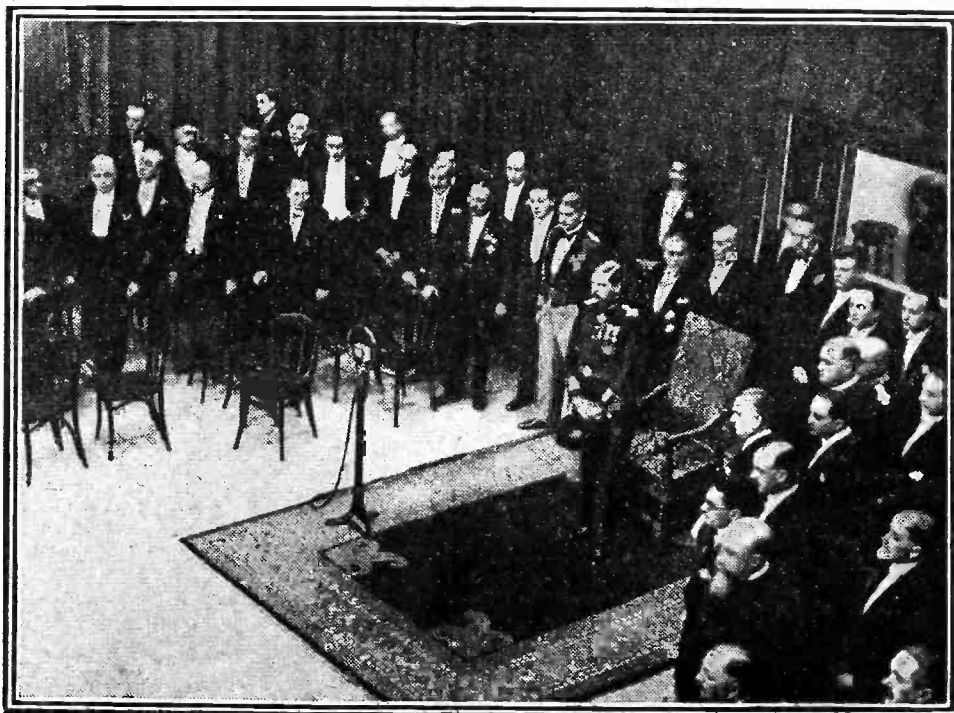
No devotee of the talkies will have any difficulty in identifying the language, but there is one peculiarity of American pronunciation that is worth while calling attention to. The Americans do not recognise the letter Z.

A Difference.

They pronounce it "Zee," so it is very easily mistaken for P or B or D, unless this is remembered. In announcing Springfield, Massachusetts, for instance, on 31.35 metres, the American will say "This is station WIXA Zee," where an Englishman would say "This is WIXAZ."

It is a point well worth remembering.

KING CAROL BROADCASTING FROM BUCHAREST



Here is the historic scene at the opening of the Bucharest Broadcasting Station, which works on 394 metres. It uses a metronome that ticks 160 to the minute.

ON THE OTHER SIDE



A TALK WITH A JAPANESE LISTENER

THROUGH a B.B.C. man I met a Japanese student now over here in London to study modern subjects, broadcasting included.

He had been back in Nagoya less than a year ago, so he knows all the latest news about Japanese radio. I had previously imagined that radio in the sunny land must be primitive, but in conversation I learned otherwise.

"I suppose the trouble with China," said this student, "has shown you British listeners that our broadcasting is quite in line with yours."

"Before telling you about our elaborate system of simultaneous broadcasting all over the Japanese islands, I should explain that prominent Western concerns have been responsible for some of the stations, Marconi's, Standard Telephones, and others."

Great Progress.

"Progress in radio manufacture has got so far that there are three firms making valves, even transmitting valves, and there are, I should think, about forty competent radio manufacturers. The chief demand is for crystal sets, but I will deal with this point later."

"A big organisation, Annaka, builds transmitters, and one of these is used as a standby in Tokyo."

"Our broadcasting has been in existence since about 1924. In fact, immediately the B.B.C. was in full going order and press reports began to reach Japan regarding your early Covent Garden opera broadcasts and news bulletins, our Government decided that something must be done to find a Japanese Broadcasting Corporation."

A Government Concern.

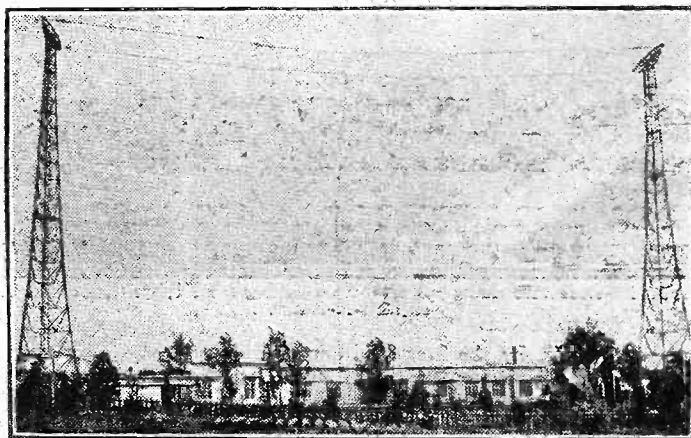
"The late Count Goto, a Governmental leader, was responsible for starting the Nippon Hoso Kyokai (Broadcasting Corporation), and he sent a representative over to England to study the way the B.B.C. were doing things. Count Goto realised

Our Special Correspondent interviews a Japanese radio enthusiast who gives some interesting sidelights on radio reception to-day in sunny Japan.

that a semi-private enterprise like the old British Broadcasting Company was no use to us, and he started the Hoso Kyokai much in the same way as your present Corporation."

"The Hoso Kyokai started in 1925, and there was the usual Government Charter which settled licence fees and so on."

THE GREAT "J O A K" OF JAPAN!



This is the high-power Tokyo station, which rejoices in the letters J O A K for its call-sign. Its technical equipment is thoroughly up to date and efficient.

"The idea was that the Corporation shouldn't work for profit and that the one yen a month (about two-shillings) collected from all-listeners should go towards station upkeep. Many of the programmes are provided free. Some of the news bulletins, for instance, are given by the local papers, which get publicity out of it."

"We started off with three 1-kilowatt stations. Japanese engineers were given the job of erecting these, but as the Government was very anxious to get the transmissions started, and there was no Japanese

plant available, they put the contract in British hands."

"The great volcanic eruption which caused a national calamity very soon after the start of broadcasting was a setback; but, to cut a long story short, the damaged buildings were repaired and the country benefited by the news service, which was kept going all through the disaster. Now there are seven big stations, and independent stations on the Island of Chosen, and at Taiwan and Davien."

"How many listeners are there?" I asked.

"There are about 70,000 licensed listeners, and the small monthly fee is collected by Government officials. There aren't any figures for 'pirates' yet, but probably there aren't many, because people in the country districts, who know so little about wireless that they can't even build crystal sets, go to local wireless centres for advice, and pay their licence fee as a matter of course!"

Many Crystal Sets.

"Why crystal sets?"

"There are far more crystal sets than valve sets because valves cost eight or nine yen. This is a lot of money for the country folk, and they can make a crystal set complete for two or three yen."

"We estimate that there are about seventy-six per cent of crystal sets in the whole country, and it is only in the chief towns like Tokyo that there is a great proportion of valve-set users."

"The reason for that is that there are three stations at Tokyo, two of which are generally working, and more than crystal-set selectivity is needed. It will be worse when some of the new relay stations start up."

"What will they do?"

"There are to be five relay stations taking their programmes on the buried telephone cable which runs the whole length of the main island. These will be crystal controlled, and at least two of them."

(Continued on next page.)

A TALK WITH A JAPANESE LISTENER

(Continued from previous page.)

will be working on synchronised wave-lengths."

"How do you fare for wave-lengths?"

"There are no wave-length troubles, and the only interference is from shipping. Some owners of big sets manage to hear the American programmes, and one friend of mine in Nagoya has a short-wave super-het. which picks up Chelmsford!"

"The Japanese Broadcasting Corporation has a testing laboratory just outside Tokyo, and Mr. Yokoyama, the Chief there, has a short-wave outfit which they are trying to make stable enough for occasional B.B.C. relays."

Relayed From London.

"When the speeches of the Japanese delegates at the Naval Disarmament Conference two years ago were broadcast, it was a short-wave super-het. at Mr. Yokoyama's laboratory which relayed the speeches. I was in England at the time."

"I heard that it wasn't a great success, as it was in the early morning and there were too many atmospheric. When your new Empire stations start up it may be possible to get regular B.B.C. relays."

"This will help the Japanese Broadcasting Corporation, which is going all out to teach English. All the stations on the Tokyo-Nagoya land-line circuit give daily three-quarter-of-an-hour English talks. Your English word 'radio' is in popular use in Japan."

Incidentally, my student friend pronounced it "radd-yo."

"All the stations open at about nine in the morning, and most of them shut down by ten o'clock at night. There is still a sort of curfew order in force with regard to evening entertainment."

"How do they choose your programmes?"

"Mr. K. Iawahara, the President of the Japanese Broadcasting Corporation, has set up a committee of six experts, and they decide the programmes for the chief stations about a month ahead."

The Children's Hour.

"What are they like?"

"Generally, the morning is taken up with practical home talks, which appeal to the modern women of the 'new Japan,' and with light orchestral music. There is a Children's Hour at six on very British lines."

"You know, proverbially, how children are revered in Japan and how special Feast

days are set apart for them, when there is a general flying of kites. The broadcast Children's Hour is therefore more important than you would at first think, because it is one link with the old customs of Nippon."

"There is a big American influence in Japan, and this applies strongly to any modern things like broadcasting. In some ways this is fortunate. We have copied the National American game of baseball, and Outside Broadcasts of baseball and *sumo* games are given every week-end."

Occasional Television Transmissions.

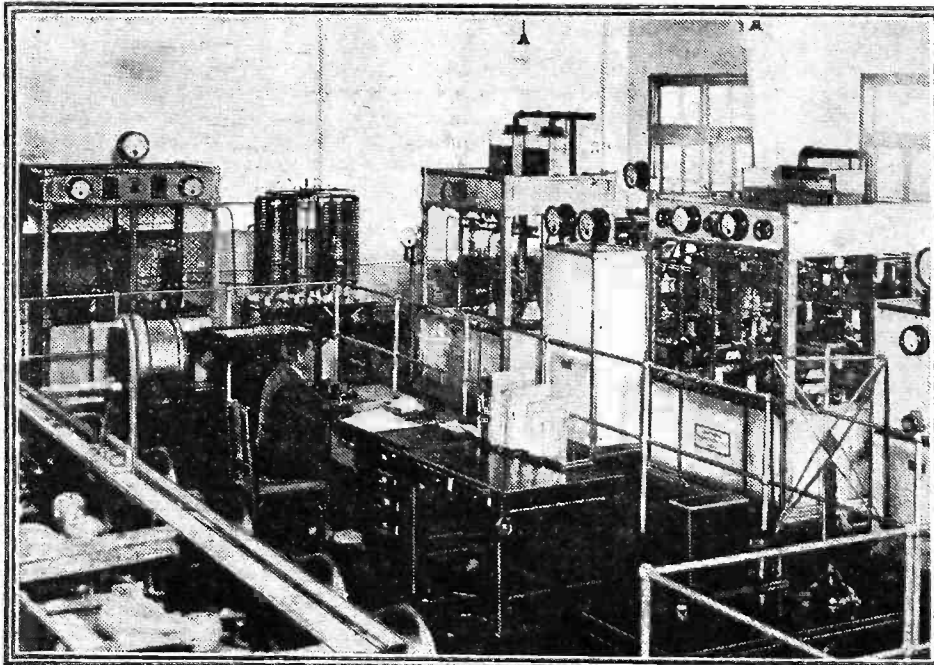
"An American television concern has started a branch in Tokyo, more with the idea of carrying out long-distance tests with the Chicago Headquarters than with the object of interesting Japanese listeners."

"Occasional television transmissions are given with an ordinary rotating disc system. I should think it highly improbable that any television sets have been sold, but it is this American system which is always demonstrated at Fair times."

"What about wave-lengths? Could we hear your stations?"

"There is a big British Marconi broadcaster in Tokyo and a 10-kilowatt station

INSIDE A BIG JAPANESE BROADCASTING STATION



A picture of the British-made transmitting gear in the main building of the Tokyo station, with the Japanese engineer-in-charge.

built by the Standard concern. They have picked wave-lengths of 345 metres and 375 metres. Similar stations at Osaka and Nagoya work on wave-lengths just above and below these."

"These stations serve the country districts, and the Hoso Kyokai has started a travelling service van which goes out to help any listener who writes into the station and says that he is in trouble with his set."

"They will probably have to continue this scheme for a few years until the present people have become more accustomed to the *Amerikya* idea of broadcasting!"

EDITOR'S NOTE.

The next article in this fascinating series will be "A Talk with a Dutch Listener."

RECEPTION REMINDERS

H.F. Grid Bias—Using Compression Condensers—Setting a Trimmer, etc.

The absence of proper negative grid bias on an H.F. valve is a frequent cause of flat tuning.

Generally speaking it is not advisable to use a compression-type condenser connected between filament and plate of a detector valve for bypass purposes, unless a fairly large fixed condenser is joined in series with it (about 0002 mfd. or more will do).

Usually the trimmer on a band-pass condenser should not be set all out, or all in, but in an intermediate position.

When using old valves, remember that although the valve makers give data for certain types, it occasionally happens that the types themselves sometimes change considerably while retaining the old number, etc. So unless this point is watched the valve-maker's own recommendation may be wrong for the old valve in question.

A deficiency in high-note response is sometimes due to the employment of very long loudspeaker leads of twisted flex, the self-capacity of which is enough to give rise to the effect named above.

Unsatisfactory reaction, especially on short waves, can sometimes be remedied by including a fairly high resistance in series with the reaction coil.

When a set employs one H.F. valve it is a good plan to occasionally check if this is "pulling its weight" by transferring the aerial to the anode terminal of the H.F. valve, thus converting the set to a plain Detector-L.F. arrangement. (A small fixed condenser should be inserted in the aerial lead for this test.)

When adjusting trimmer condensers it is a good plan to have a milliammeter in the detector's plate circuit and to tune accurately by the aid of this before adjusting the trimmers, or what appears to be better balance may prove to have been readjustment of slight mistuning by the trimmers.

A good idea of the efficiency of the aerial can be obtained from a set with reaction on the anode of the H.F. valve by picking up a carrier-wave without the aid of the first tuning adjustment, and then carefully noting the effect of bringing aerial circuit into tune.

When D.C. mains are used to supply H.T. to a radiogram, it is often an advantage to "isolate" the pick-up, in the same way that a loudspeaker output is filtered.

CAPT. ECKERSLEY'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 Capt. Eckersley; a selection of those received by the Query Department in the ordinary way will be answered by him.

The Alternative Earth.

D. J. (Barking).—"As I am unable to obtain a good earth connection unless a long lead to the receiver is used, I have been considering using two separate earths. One of these would be connected to a water cistern and would require only a short lead, and the other would consist of a long lead connected to a metal plate buried in the earth."

"Do you think that connecting both these earths to the receiver would be any improvement over using only one or other?"

I don't know! It's impossible to be definite on a subject like this, there are so many variables.

I should say, however, that your best plan is to connect a single earth to the water-pipe. If that doesn't give good results there's no harm in trying the other scheme, but you must in the end decide which is better. Sorry!

A Lead Plate for Earth.

G. B. F. (Hull).—"Is there any reason why a sheet of lead should not be employed as an earth plate—so far as I can discover this would be practically indestructible and also far cheaper than copper?"

For the purposes of broad-casting receiver earths, lead is just as good. Because although lead has a smaller conductivity than copper, earth resistance, within limits, is not very important in deterring the strength of signal. But in a transmitting station the earth resistance is very important, and one has to use copper because of its superior conductivity.

So a lead plate is good for receiver work. Bury it as deeply as you can, and choose a spot where the earth is nice and moist. Make two or three different connections to it, and then, should one come off, you will not have to dig the hole again.

Crystal Detector Following an S.G. Valve.

S. N. (Birmingham).—"I am building a new wireless set and I want to employ as few valves as possible. Is there any objection to my using an S.G. stage, followed by a crystal detector and one L.F. stage. It seems to me that a crystal will enable one valve to be eliminated with a consequent saving in current."

Yes, it's all right I suppose to use a detector of the crystal type following an S.G. valve, but (a) a crystal is apt to give unreliable service; (b) a crystal is apt to get overloaded by the strong signals given it by an S.G. valve; (c) a crystal may be spoiled if the S.G. valve causes oscillation.

But there's nothing theoretically wrong with the idea—it's purely a matter of practical difficulty.

High Frequencies and Low.

D. I. (Ilford).—"I have been reading some articles on wireless, and have encountered two expressions—high frequency and low frequency. Are these two related and when is 'low frequency' sufficiently high to be called high frequency?"

on 300 metres, then it creates currents in the receiver aerial having a frequency of 1,000,000 a second. This is the high frequency.

But they put on that filthy tuning note, say, and this modulates the intensity of the million a second frequency up and down about 1,000 cycles a second. This is a "low frequency."

Your detector cuts out the high frequency (one million) and passes on the low frequency (one thousand) to your loudspeaker. Thus low frequencies are sound frequencies, and may use from 30 to 20,000 (but we usually take 10,000 as the upper limit), high frequencies may be as low as 20,000 cycles with very long waves *never used in broad-casting*.

Thus high-frequency currents are aerial currents, and in wireless practice may use anything from three hundred million (wave-length 1 metre) to 20,000 cycles per second (wave-length 15,000 metres). The latter not much used.

Low-frequency currents are power-circuit currents (50 cycles per second for usual electric light and power distribution alternating-current systems), and speech and music currents for modulating and working loudspeakers, and in this case may have frequencies from 30 to 20,000 cycles per second, but the usual gamut is 30 to 10,000 cycles per second.

A Glowing Fuse.

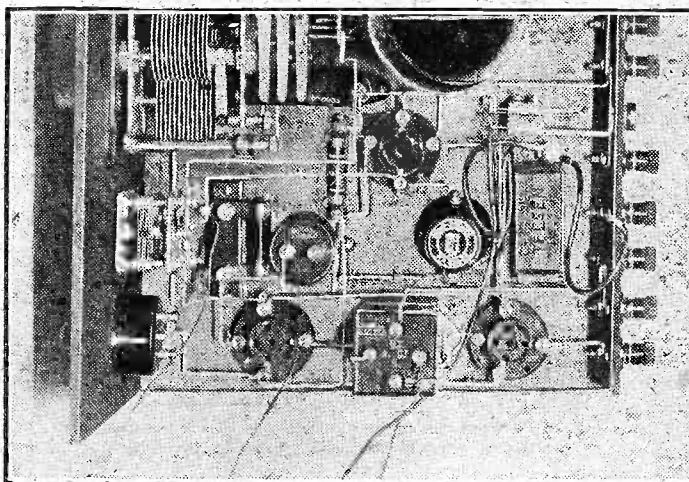
B. T. (Eltham).—"My receiver is of the type with a Det. and two L.F. stages, and has a 60-milliampere fuse connected in series with the H.T.—lead. I have noticed that occasionally

when heavy music is being received the fuse bulb glows dimly, and I cannot understand why this should be, as the valves used should only take about fifteen milliamps with the grid-bias voltages used."

Look at it this way. A loudspeaker takes power to work it, and a great deal of power too, compared with what some people estimate.

In my opinion, the last valve of a good set should give a peak power of about 2 watts! Now all this power has to be fed from the high-tension supply, and in your case through the fuse. The fuse glows when lots of power is being passed, particularly if overloading takes place.

PROVIDING FOR A PICK-UP



It is quite an easy matter to reproduce your gramophone records electrically, but the extra wiring should be short if instability is to be avoided. One very neat and successful arrangement is to use a jack mounted on the terminal strip, as shown (top right) in this three-valver.

High frequency and low frequency are somewhat ambiguously used terms. In general, all "wireless" currents are "high frequency," all speech and music currents are "low frequency."

Suppose you have a station transmitting

ONLY IN "P.W."

can you read Capt. Eckersley's replies to listeners' own problems.

AND REMEMBER—

Captain Eckersley's technical articles appear only in

"POPULAR WIRELESS" and "MODERN WIRELESS"

FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found—?



Of more limited interest, but no less praiseworthy in its way, is the new Bulgin Potential Divider. This is a 20,000-ohm resistance able to carry 30 m/a, and has 11appings. A compact, serviceable component, it costs 3s. 6d.

TWO BULGIN PRODUCTS.

THERE are some people who seem to take a delight in craftsmanship pure and simple. They will perform the most arduous tasks in order to accomplish the unusual, the ultra-tricky, the hyper-intricate in a display of amateur engineering.

For example, they will scorn an easy-to-handle material like ebonite and use plate glass for their set panels! Fancy cutting condenser escutcheons out of plate glass! Yet there are enthusiasts who do such things.

USEFUL ITEMS



Constructors will welcome these two new products—particularly "Quickwyre."

Good luck to them! say I. Let us admire their patient skill. But most of us are prepared to undertake only the easiest of mechanical operations in the building of radio sets—the easier the better!

And the tougher the insulation on the wire we use for connections and the harder it is to bare the ends . . . the more we wish we had bought bare wire or that untidy, soft cotton-covered stuff.

So our enterprising friends Messrs. Bulgin, who seem to have the power to read the hearts of constructors, have weighed in with "Quickwyre," which deserves a place of honour on every workbench and kitchen table in the land.

It has an elastic and entirely neat fabric insulating covering. Snip off the right length, push the covering back with the fingers, solder or screw up the bright wire end which is revealed, slip back the insulation, and the job is done—and done as neatly as a factory finish.

No scraping about with a knife, no frays, 6d. per 10-ft. coil in red and black—a pretty big sale . . . unless I'm badly mistaken.

ROUND THE TRADE.

The Junit Manufacturing Co., Ltd., inform us that they are now able to give delivery of the components required for the Midget Power Unit in kit form.

PLEASE NOTE.

Manufacturers and traders are invited to submit radio apparatus of any kind for review purposes. All examinations and tests are carried out in the "P.W." Technical Department with the strictest of impartiality, under the personal supervision of the Technical Editor.

We should like to point out that we prefer to receive production samples picked from stock, and that we cannot, in any circumstances, undertake to return them, as it is our practice thoroughly to dissect much of the gear in the course of our investigations!

And readers should note that the subsequent reports appearing on this page are intended as guides to buyers and are, therefore, framed up in a readily readable manner, free from technicalities unnecessary for that immediate purpose.

Tekade Radio & Electric, Ltd., say it has been brought to their notice that certain retailers are showing moving-coil and inductor type loudspeakers, which are claimed to be "Motor" speakers, but in actual fact although a "Motor" moving-coil speaker is in production it is not yet in distribution, and neither a "Motor" speaker nor unit of the inductor type has yet been produced.

TESTING YOUR SET.

Every listener should possess a meter. I say "listener" advisedly, for there seems to be an impression that meters are used by or, rather, are useful to only the experimenter.

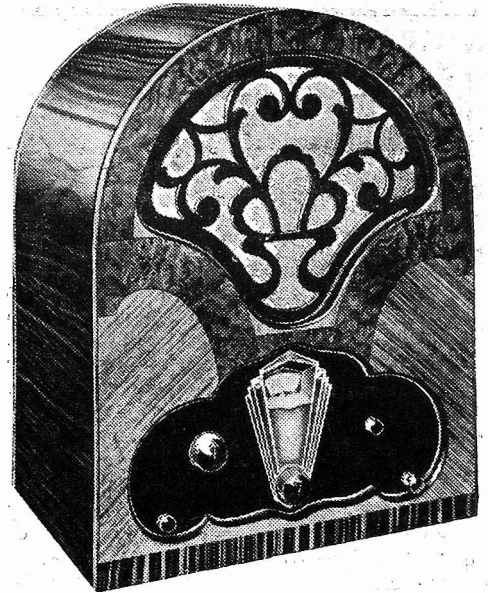
But no radio set, particularly if it is of the battery-driven type, can be maintained properly unless the user is able to test the condition of at least his G.B., L.T. and H.T. batteries.

Fortunately, there are combination instruments able to test the voltages of all such batteries. They are not, and can hardly be, precision instruments of the nature used by scientists in laboratories.

But accuracy to an umpteenth point is not necessary and, anyway, few could pay the price for such even if it were needed.

An excellent example of practical versatility is provided by the Wates Universal Test Meter. This inexpensive device enables you to test voltages between 0 and 6, and 0 and 150 volts, and current between 0-30 milliamperes. Additionally, you can take direct readings of resistance from 0 to 2,000 ohms.

FOR A TELSEN SET



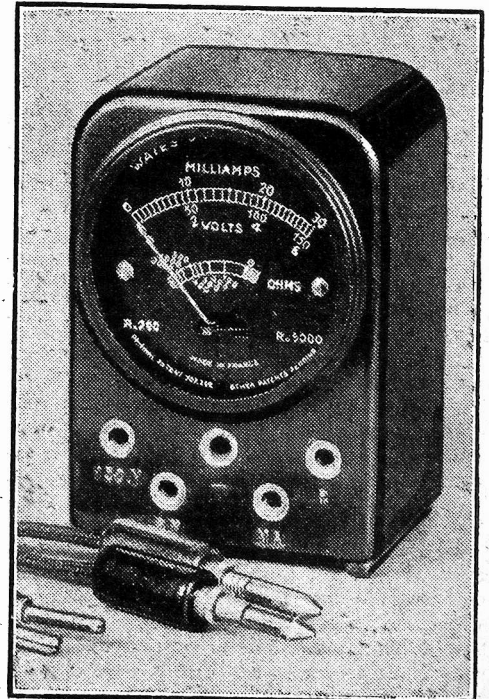
This handsome cabinet was specially designed by Radiocabinets Ltd. for the Telsen Triple Three.

So, besides being able to test accumulators and H.T.'s, it provides for all ordinary "servicing" tests.

Instructions are included showing how these can be done without the need of expert knowledge.

It is quite a small device, and on test I found it to be perfectly satisfactory. Messrs. Wates should do very well with this latest product of theirs, for their potential customers are limited only by the number of listeners in the land.

A COMPLETE TESTER



You can test practically anything with this Wates Universal Meter.



PRESENTATION PROBLEMS

By VAL GIELOUD.

THE present situation of the broadcast play is rather a curious one. On one side there is a certain amount of evidence to prove that there is a steadily increasing number of listeners who listen and enjoy listening to radio drama, and a corresponding tendency in broadcast programmes to allot more time to and to enlarge upon the importance of broadcast play production.

"Why Try?"

On the other, there remains a very large number of people, including many intelligent people and many constant listeners, who persist in treating the broadcast play either as a very indifferent substitute for the theatre or—still more discouraging—who say flatly that it is ridiculous to try to broadcast plays; drama cannot be broadcast, and why do we continue to attempt the impossible?

In various talks and articles, I have done my best to deal with the point of view which regards the broadcast play as second-rate theatre.

The broadcast play is not an attempt to compete with the stage. Producers at Savoy Hill are not trying a fall with Mr. Cochran or Sir Gerald du Maurier on their own grounds. And for the most part writers and producers of radio drama are not aiming at the same audience which visits the theatre.

The Die-Hards,

The die-hard opponents of the broadcast play in all its forms are for the most part to be found among those people who believe that the West End of London is not only the centre of the world, but also the world itself; and who forget that there are very many persons, leaving out of account invalids, elderly people and the very young, who live in circumstances which prevent them from ever going near a theatre, and whose experience of drama, apart from broadcasting, must be confined to the reading of plays.

I might perhaps argue that the fact that the audience for radio plays is increasing is sufficient justification for their production or, alternatively, I

"The way that things are put—what a difference it makes!"

You may thoroughly enjoy a "Conversation in the Train," though a talk on the same subject would leave you cold. In this interesting contribution the B.B.C.'s Director of Productions shows how the broadcast play has tended to improve radio showmanship.

might maintain that practice in this particular medium, not only in its production by those who handle it, but also in listening to it by those who hear it, is improving the standard of broadcast plays so considerably that every day they are getting nearer to the point at which they can, purely as a form of entertainment, issue a direct challenge in their own line, either to the films or to the stage.

I think that, to some extent, this last contention is true, but I am diffident about insisting upon it when the inevitable implication is that I am crying my own wares and even possibly blowing my own trumpet.

I would prefer to say something here about a contribution to broadcasting which, in my view, has been made by broadcast drama, and which is, for the most part, either ignored or simply not realised. The broadcast play as a medium for the expression of drama has, with all its faults, given a certain amount of entertainment, provided a certain amount of familiarity with certain classics, and provoked a certain degree of controversy; and all these things are in their way good.

"Presented by—"

But the broadcast play has made one contribution of the most vital importance to programmes as a whole. I suggest that it is to the development of the broadcast play that an appreciation of the importance of "presentation" as applied to most broadcast work is due. Let me explain a little further.

Do not for a moment suppose that I am claiming that this contribution is due to any outstanding brilliance, capacity or even common sense on the part of the members of the department most immediately concerned. It has nothing to do with individuals. It merely has to do with inevitable circumstances.

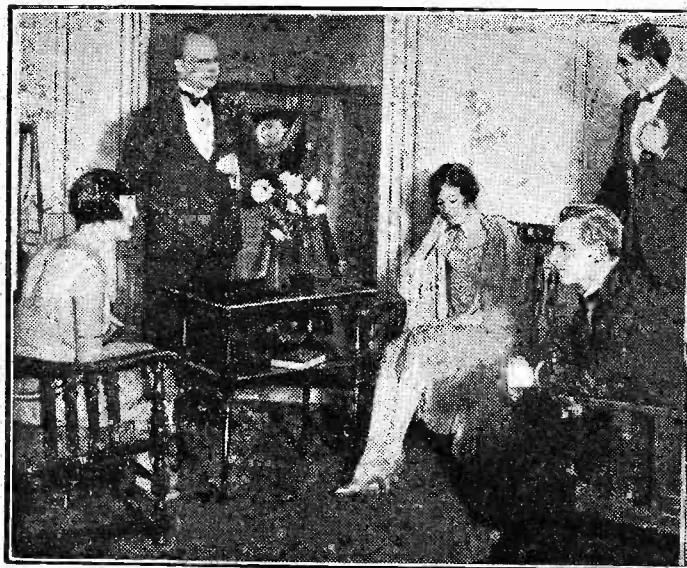
Any student of broadcast programmes will realise what I am talking about at once when he thinks of certain programme items that appear in the lists of B.B.C. output that cannot, by any flight of fancy, be called plays, and yet owe not only the success they may achieve but even the framework on which they are built, to this word "presentation."

"Songs from the Shows."

As examples, I might quote the "Conversations in the Train," which are "presented" talks, "Songs from the Shows" which are "presented" programmes of popular songs and, of course, such special programmes as those which celebrate New Year's Eve, Empire Day and Armistice Day, or programmes of the type of "Crisis in Spain" or "The Hundred Days."

It can be seen from these
(Continued on next page.)

THE VOICE MUST SHOW THE CHARACTER



In a radio play, the only way of "getting the characters across" is by means of the voice, so each player must be distinguishable from the others immediately he speaks. This is a scene from a radio play broadcast from Manchester.

PRESENTATION PROBLEMS

(Continued from previous page.)

examples that there is a continually increasing tendency for this "presentation," which is simply one aspect of the technique of production, the technique of showmanship, to spread from the realm of the simple straightforward broadcast play into many other fields of broadcast output.

Why should this idea of presentation have originated with the broadcast play? The answer is extremely simple. When broadcasting began it was naturally not considered, in the first instance, as a new medium at all. The microphone was thought of simply as a way of eavesdropping upon other mediums.

Just Eavesdropping.

If you are broadcasting a concert, or a speech from a public banquet, the idea of any special presentation of that programme item to the microphone is, on the face of it, quite unnecessary. You are, after all, only hearing in your own home what you would, but for a change of place, be hearing in the concert hall or the banquet room.

And in the first instance the same method was applied to the radio play. Microphones were put close to a stage, and the audience heard what it could. It was, however,

MR. VAL GIELGUD



A recent portrait of the author of this article. It is largely due to developments made under his supervision that the present high quality in radio plays has been attained.

soon discovered that while, by putting a microphone into a concert hall, provided your technicians knew their job, you could hear your concert perfectly well, if you did the same thing in a theatre you got an extremely unsatisfactory result.

The eavesdropping method simply did not do, and therefore it was necessary to transfer the whole problem of broadcasting drama away from the eavesdropping microphone in the theatre and to put it into a studio.

From that point the following stages of two studios, a dramatic control panel, effects, and all the rest of the elaborate apparatus which now makes up the art of radio drama, followed perfectly naturally, simply and inevitably.

Drama, in short, came to be specially presented to the microphone because in no other way could drama be broadcast satisfactorily. All this happened, I repeat, not because the people responsible for broadcast drama were unusually intelligent, but because unless some solution of this sort had been discovered their job could not have been done at all.

The Taste for Drama.

But if this matter of presentation had stopped short in achieving its success—and I say advisedly its limited success—with broadcast plays, its contribution to broadcasting would have been small. For however fascinating and however interesting the broadcast play may be, it is doubtful if it can ever appeal to the majority of licence-holders.

A taste for drama is by no means universal, as theatrical managers have learnt to their cost. But those responsible for broadcast programmes as a whole have been quick to realise that this art of presentation is one that need by no means be confined to broadcast drama; that not only is the broadcasting of plays a special medium, but that the broadcasting of practically everything is a special medium, and that if it is worth while to treat drama in a particular way because it is being conveyed to its audience through the microphone, it is probably also sound to consider whether other items do not require and deserve special treatment of the same kind on their long road from the brain of the programme builder to the ears of the listening audience.

Running Commentaries.

It would, of course, be nonsense to pretend that some of the greatest pleasure and many of the greatest successes achieved by broadcasting are not those that arise from bringing the listener into the closest possible contact with something that is actually happening.

The Cup Final, the Schneider Trophy, the Ceremony of the Keys, the relays from Covent Garden, or a speech by the Prince of Wales, have an immediate appeal and a programme value which need a minimum of qualification by presentation however skilful; though in parenthesis one might refer to various types of running commentaries as one rather elementary method of special presentation.

But once a programme item leaves the sphere of actuality and enters that of a studio, it is not only advisable, but almost imperative, that "presentation" should take a hand, and broadcast showmanship, in the best sense of those words, be called upon to give that programme item its best opportunity and its widest appeal.

The New Art.

The opera or concert that is broadcast from the studio, the talk or the discussion that is broadcast from a studio, are in this sense affected by the same circumstances as the play which is broadcast from a studio. They are, in the first place, handled not for the benefit of people looking on and listening in the same room, but for people who are hearing at a distance, and it is

the duty of those who present any programme item broadcast from a studio to think of that item in those terms.

Plays had to be treated thus, and that they were so compelled is their principal contribution to the whole art of broadcasting, in so far that they have brought special presentation into the limelight and proved its value.

HAVE YOU HEARD HIM?



This is Sidney Kyte, whose band has recently been added to those which broadcast. They are heard playing from the Piccadilly Hotel.

STOPPING THAT HUM.

A useful reminder and a hint about electrolytic condensers.

ALTHOUGH the permanent-magnet moving-coil loudspeaker appears to be gradually ousting all other types, there must still be a large number of those instruments which required a six-volt accumulator to provide the magnetising current. Some of them took as much as 1 ampere, and, needless to say, it was no easy matter to keep an accumulator going which was capable of feeding such a hungry monster.

These loudspeakers can be supplied with current very conveniently and economically by a suitable dry rectifier, or perhaps a mercury arc rectifier, but in many cases a very disturbing hum is experienced. Owing to the large current flowing, the addition of a fixed condenser of 4 mfd. or so across the output of the rectifier is of little use as a cure.

Use One of These!

Fortunately, however, there are several very good low voltage electrolytic condensers on the market, with a capacity of about 2,000 mfd. If one of these is connected across the output of the rectifier, in nine cases out of ten every trace of hum will disappear. Great care should be taken to see that it is connected up the right way, otherwise damage will result.

The positive terminal of the condenser should be joined to the positive terminal of the rectifier. And, of course, the negative to the negative of the rectifier.

A FILTER FOR THE "COSMIC"



By
A. S. CLARK

MANY readers who have made up a "Cosmic" Three set will remark on seeing the title of this article: "Good! Just what I want." They will be those who are used to working with an output filter.

But others will want to know, "Why should I fit an output filter? What shall I gain by doing so?" and then, after pausing to consider for a moment, "Surely, if one were really necessary, it would have been incorporated in the original designs."

A Desirable Addition.

All of which constitutes the right attitude to bring to radio. Our explanation is that a filter is not *essential*, but is *very desirable*; and before you get the chance to say, "Why?" we will "step on the gas" and get along with the advantages of this little refinement to the finest all-round set ever designed. Sticking right out from the rest is "improved quality." Yes, I know what you want to tell me; you want to inform me that your quality is already jolly good. Of course it is, isn't the set the "Cosmic"? But that's no reason why you should not make it even better, in fact, it's every reason why you *should* go one better and get it as near perfect as possible.

Before going any further, let me tell you that the extent to which you will notice a difference depends (a) upon the quality of the speaker you are using, and (b) upon the degree to which the things overcome by a filter are extant at the present in your particular combination of conditions and accessories.

Improved Quality.

Take (a), the better the loudspeaker you use, the bigger the difference a filter circuit will make. A poor speaker has no reason to sound much better on a good input than on a bad input, but change a good speaker from a good input to a bad one and it will immediately emphasise all the defects.

But enough of that. What about (b)? If we deal with the reasons why the choke and condenser improve quality, we shall at the same time be pointing out the "things" which are mentioned under (b) as being possibly extant in the set.

First of all, there's voltage on the plate of the last valve, a power valve, requiring from 5 to 20 millamps of current according

Do you use a mains unit for H.T.? Have you long extension leads for the loudspeaker? Or are you a stickler for getting the very best quality possible? These questions are all bound up with the use of an output filter, and this article tells you how easy it is to fit one to your "Cosmic" receiver.

to its class. Everyone knows that voltage must be kept well up if the full power handling capabilities of the valve are to be retained, and unfortunately, H.T. volts are more easily lost than gained, particularly where dry batteries are concerned.

Yes, and a loudspeaker can cost you 40 whole volts, too! That is, if it is connected directly in the anode circuit.

With a filter, the choke takes the place of the loudspeaker and only wants a meagre few volts off the H.T.

This has nothing to do with getting wet, but a piece of cloth soaked in water forms a good analogy.

You can't make a saturated piece of cloth carry any more water, and no more can you make a magnetically saturated piece of iron carry any more magnetism, or magnetic lines of force.

Protecting the Speaker.

The anode current from the valve may saturate the speaker's magnets, consequently the varying audio-frequency currents will not have their proper effect on the magnetism, consequently the speaker will not emit sounds in accordance with the "speech" currents, consequently we get distortion.

Therein lies point No. 2. With a filter the steady current goes through the choke and only the fluctuating current through the speaker. So there is no possibility of speaker magnetic saturation.

It can be shown (we needn't bother how) that the output from the last valve depends upon the impedance in its plate circuit. Within limits, the higher the impedance the greater the power.

Effect on Impedance.

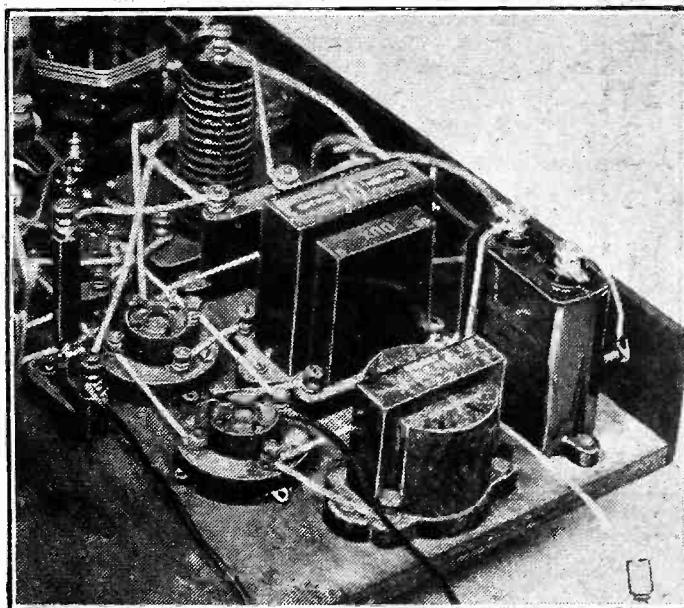
The plate impedance in the case of the power valve is the impedance of the loudspeaker, no matter whether a filter is in use or not. But there is this difference: without a filter the impedance is less, because a steady current through a choke (which is what the speaker constitutes) lowers its impedance.

The impedance being less, the mag. is less, and as volume goes down, so the apparent volume of the base in relation to the high stuff gets less. So quality is spoilt by lack of bass. That is

point No. 3.

(The reason for the varying ratio of bass to high stuff is too complicated to go into (Continued on next page.)

SEE HOW NEATLY THEY FIT IN



The L.F. choke and large fixed condenser in the foreground of this photograph of the low-frequency end of the original "Cosmic" Three, are the only components necessary to incorporate an output filter.

Point No. 1: We can get more power without distortion due to the filter.

Next we come to loudspeaker saturation when used directly in the plate circuit.

A FILTER FOR THE "COSMIC"

(Continued from previous page.)

here. It is largely bound up with that abstruse item known as a decibel.)

Finally, Point No. 4. Feed-back in a set may cause distortion quite apart from whether it produces the well-known low-frequency howl.

It is due to the L.F. or "speech" fluctuations in a plate circuit causing corresponding fluctuating voltages across the H.T. supply, due to a high internal-resistance battery or not-too-good mains unit.

Saving the Situation.

This fluctuating voltage gets applied to the anode of a preceding valve and hence back to the grid of the valve under consideration, and instability is caused by low-frequency reaction.

Actually, this point, so far as mains units are concerned, is one of the cases where an output filter can prove most useful. As a matter of fact, it is likely with some mains units that passable results cannot be obtained until a filter is fitted.

An output filter keeps the fluctuating anode current of the last valve out of the H.T. supply, thus avoiding this type of distortion when the supply is not all it might be so far as internal resistance and decoupled-tappings are concerned.

Other advantages of an output filter, apart from quality considerations, concern long loudspeaker leads and possible shocks when mains units are in use. In the first case, voltage drop in the extension wires is avoided, and also possible leaks to earth. In the second, the H.T. supply is isolated from the speaker leads.

Well, if you have read as far as this, it is safe to assume you have decided to fit a filter, so without more ado we will get on to the necessary details. You will need two extra components—an L.F. output choke of about 20 henries, and a 2-mfd. fixed condenser. The choke should be one rated to carry the current that your power valve passes.

Two Extra Components.

These two components apply whether the set is the original "Cosmic" or the "Cosmic" Star. We will deal with the former first.

There is ample room for the two components on the corner of the baseboard near the loudspeaker terminals, and one of the photographs show them in place. You will have to move the grid-bias battery clip, but if you happen to be using a small power valve that does not require more than 9 volts G.B., there will still be room for the battery on the baseboard, but nearer to the panel.

If, on the other hand, you wish to accommodate a long battery, you must fit it to the back of the cabinet, on the inside, of course. You will find it is just as convenient in this position.

Mount the condenser parallel with the terminal strip, and next to it. The choke comes next to the condenser, but mounted longwise parallel with the edge of the baseboard.

Changing Over.

The wiring alterations are quite easy, but before you commence putting on the new leads there are two of the old ones that must be removed. These are as follows:

The lead joining the plate of the last valve to the L.S. negative terminal, and the wire from the L.S. positive terminal to H.T. plus 2.

ALL YOU NEED

1 small output choke (about 20 henries) (B.I. Andrad, Igranic Midget, Ferranti B.S. Wearie H.T.S. Telsen, Varley, Graham Farish).

1 2-mfd. fixed condenser (Telsen, Dubilier, T.C.C., Lissen, Hydra, Helsby, Igranic, Ferranti, Graham Farish, Sovereign).

The new connections are as follows: Join the plate of the last valve to terminal of the choke nearer to the panel and also to the terminal of the fixed condenser farther from the end of the baseboard. The other side of the choke goes to high-tension positive 2, and the remaining side of the fixed condenser to the terminal marked L.S. negative, and L.S. positive goes to H.T. negative.

Incidentally, the loudspeaker terminals will no longer be positive and negative, and it will not matter in which way the speaker is connected up. The reason why loudspeaker terminals are marked when

the magnets it may actually do so in the long run, with the result that the speaker will lose its sensitivity.

Since the use of a filter removes the steady current from the speaker, there is no need to worry how the latter is connected up.

Now for the alterations in the case of the "Star" model. These are a little more comprehensive, but are, at the same time, just as simple, two similar components being required.

The "Star" Model.

A glance at the second photograph shows that space is a little more limited, and the parts have to be rather packed. The grid-bias battery in the case of this model is not normally housed on the baseboard, so that the question of moving it does not arise.

But instead it will be necessary to move the low-frequency transformer a little in most cases. Some of you may find that you have just enough room without moving this component; it will depend largely upon the make of the transformer and the make of choke that you use.

If you have to move it, undo the two screws that hold it to the baseboard, but do not take off any of the connections, as these will be long enough for the small movement necessary. Just push the transformer towards the .01 fixed condenser, and then screw it to the baseboard again.

Similar Components.

The two new components have to go between the third valve holder and the terminal strip, but before you can fit them in place the .001 condenser across the output will have to be moved. This has to go round to the other side of the third valve holder, and is eventually arranged to be still across the output.

There are four wires that you will have to take off, and it is as well to move them before unscrewing the .001 condenser. They are as follows:

The lead from anode of third valve to the .001 fixed condenser and also from this condenser to the L.S. negative terminal. Then there is the lead from the other side of this condenser to the filament terminal of the valve holder and, last of all, the L.S. positive to H.T. plus 2.

Wiring Up.

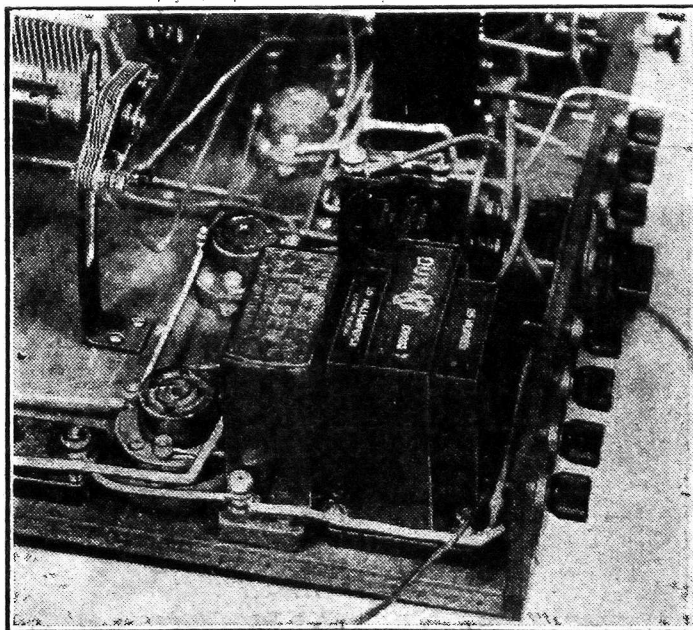
The flex lead on one terminal of the .001 condenser should be left in place. It will still act as the G.B. plus connection. When you screw this condenser in its new position arrange it so that the flex lead is on the terminal nearer to the panel.

The condenser—that is to say, the extra one—and the choke are screwed down parallel to one another. The choke being nearer to the terminal strip, as shown.

Now for the new connections. Rejoin the terminal of the .001 that has the flex attached to the filament of the third valve holder, and the other terminal of it to the nearer terminal of the 2-mfd. condenser.

(Continued on page 35.)

A REFINEMENT FOR A FINE SET



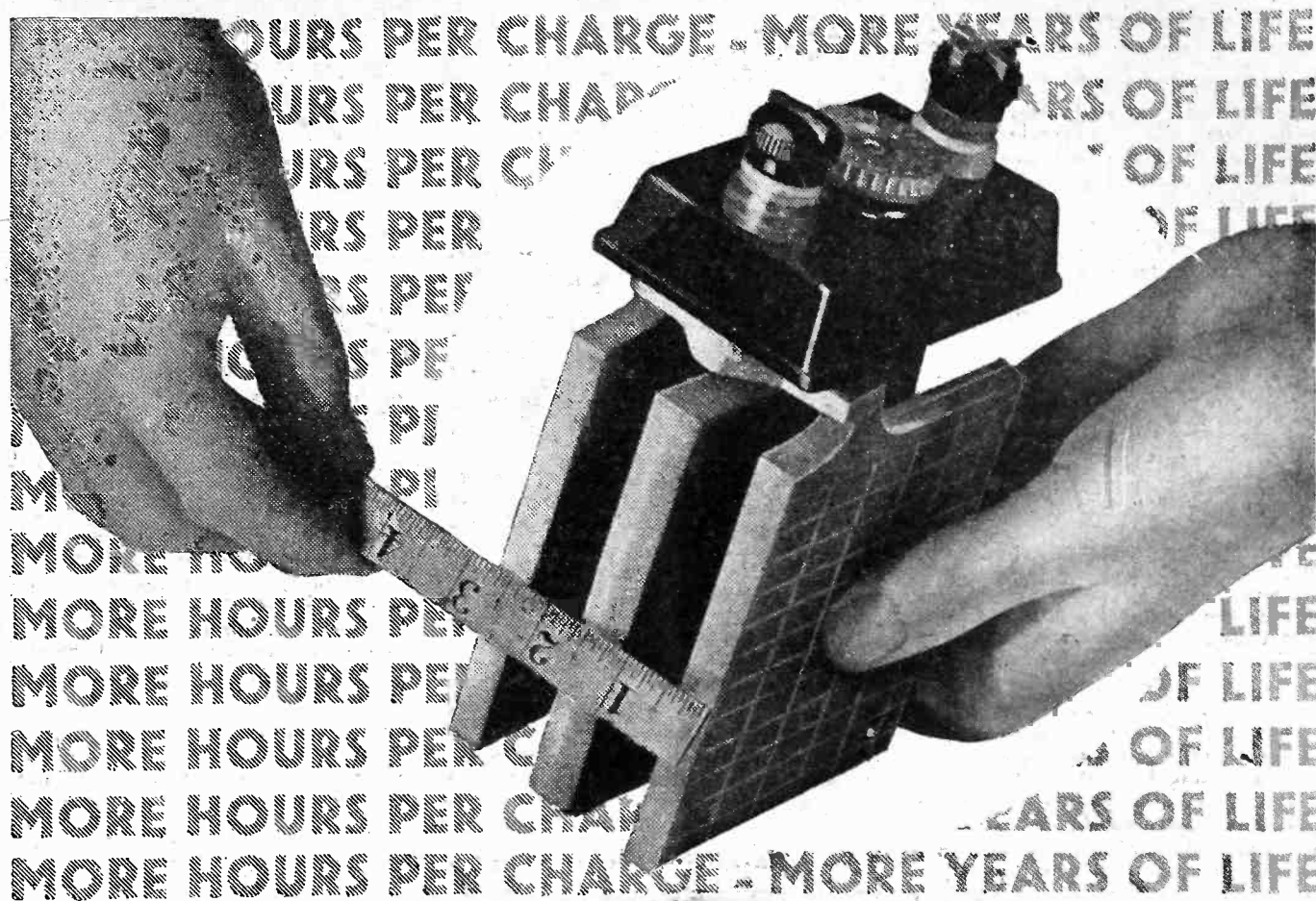
This is the filter corner of the "Cosmic" Star receiver, showing the output choke and 2-mfd. condenser in place. The alterations to fit these two components are very simple, and can be done in a few moments.

there is no filter is so that the steady current that flows through the speaker will be in the right direction.

Don't Spoil Your Speaker.

The magnets in the speaker are semi-permanent, and often the steady current tends to magnetise them more, or to reduce their magnetism according to which way it flows. If it flows so that it tends to weaken

• MAMMOTH PLATES •



PRACTICAL TESTS with modern wireless sets over long periods under normal conditions have established the infinite superiority of Mammoth Plates. Fuller Super Accumulators for low discharge service are fitted with these exceptionally long-lived plates in addition to all the other unique Fuller features—micro-porous paste, double

grease-cup terminals, moulded polarity signs, safety carrying handle and patented life-preserver. Fit a Fuller now and benefit by—less frequent recharging, longer battery life, rapid recuperation, low losses during idle periods. You cannot buy a better battery at any price—and it is British made and comes to you efficiently dry charged.

Actual photograph of plates from a Fuller L.D.G.H. Accumulator. 2 v. 60 a.h. Price 9/6 Dry charged. (Other sizes for low intermittent current service). Full list of H.T. Dry Batteries and L.T. and H.T. Accumulators on request.



SUPER H.T. DRY BATTERIES
Machine made and tested throughout... long life... emission up to 20 m/amps. From 60 to 120 volts. Prices 5/3 to 15/3. Also complete ranges of Standard, Triple, Portable and Grid Bias Dry Batteries, etc. list D.3.

FULLER

SUPER BATTERIES

FULLER ACCUMULATOR CO. (1926) LTD., CHADWELL HEATH, ESSEX. 'Phone: Seven Kings 1200
'Grams: "Fuller, Chadwell Heath." * * * Contractors to British and Overseas Government Departments, Railways, etc.

THE MIRROR OF THE B.B.C.

By O.H.M.

HENRY HALL TAKES OVER

DAVENTRY TO DROITWICH — FUTURE OF THE CHILDREN'S HOUR.

HENRY HALL is now in complete command of the new B.B.C. Dance Orchestra, and it is perhaps permissible for me to say that in the past two months during which the change-over has been in process of development there have been several critical stages, at any one of which the present situation might well have been imperilled.

This is no fault of Mr. Jack Payne. It was the last stand of those interests aiming at "song plugging" from within the B.B.C. I am sure that there is no danger of the new regime falling foul on this account.

My only regret is that the B.B.C. does not seem to have had the courage to make Henry Hall responsible for clearing "plugging" from the outside dance band programmes. Anyway, good luck to Henry, so far as I can give it to him.

Daventry to Droitwich.

It was characteristic of the B.B.C. that it should have apparently purposely evaded the opportunity of major publicity provided by the decision to move Daventry to Droitwich. No doubt this was carefully calculated, and I think I can see a certain element of leg-pulling in it.

Because, while some popular newspapers were "spreading" apocryphal news of changes in Sunday programmes and dramatic representations of Titanic disasters, the B.B.C. quietly intimated one of the most important moves in its history. That 5 X X and 5 G B will go from Daventry to Droitwich does not mean that Daventry will be abandoned.

I am now giving exclusive authoritative advance information that in future Daventry with all its equipment and more to come will be the British Empire Short-Wave Round-the-Clock Broadcasting Station.

Future of the Children's Hour.

I gather that there is some question as to whether the Children's Hour will be carried on so far as London is concerned. My view is that it might be carried on

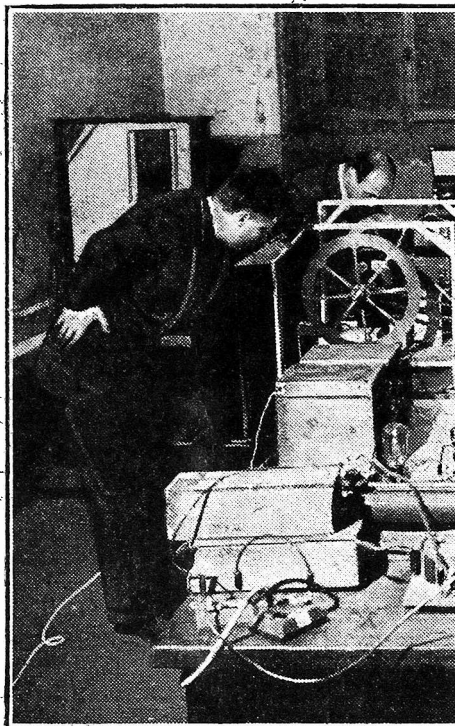
provided it is handled with the true professional touch.

Uncles and Aunts might still appear, but not under amateur auspices, and I believe this would be a considerable advantage.

* * *

We all know that the broadcast programmes on Good Friday are different from

"MOVIES" ON THE AIR.



It's bad enough when an ordinary set develops a fault, but how would you like to look for trouble in a "set" of this kind? It is used for televising cinema films, and has given some very promising results around Milan, where it is installed.

those of any other day of the year, and that they are appropriate to the solemnity of the day. Very few people would wish them otherwise, and it is the unquestioned acceptance of this long-continued policy that stamps British broadcasting and the service it gives as the highest and finest in the world.

Apart from the short daily service at 10.15 a.m., and the time signal and weather forecast, British stations will remain silent until the afternoon, when the Royal Air Force band is giving a concert for National listeners, with a programme by Reginald King's Orchestra as an alternative on the London Regional wave-length.

The Victor Olof Sextet and the Theatre Orchestra are afterwards providing the National programme until 6.30 p.m., when a service will be relayed from St. George's Chapel, Windsor. For some years a "Parsifal" concert has been broadcast from Queen's Hall on Good Friday evening, and Sir Henry Wood is again conducting, Muriel Brunskill (contralto) and Harold Williams (baritone) being the solo artistes. The concert will be divided at 8.30 p.m. for the reading of what news there may be, after which it goes on until 11.30 p.m.

Jack Payne Again.

London Regional listeners have a concert by the City of Birmingham Orchestra at 4 p.m., and an early evening programme by the Wireless Military Band until 8.30 p.m., when there is a reading. An hour's recital by Solomon (pianoforte) and Margaret Elwes (mezzo-soprano) finishes at 10 p.m., when the transmitter closes down.

Back to normal on Saturday, March 26th, there is a vaudeville entertainment, a concert of students' songs, and an orchestral programme on the National wave-lengths, with chamber music by the London Wind Quintet, and a relay of vaudeville items from the Argyle Theatre, Birkenhead, for Regional listeners.

Jack Payne's Dance Band pays a return visit to the studio on Easter Monday evening to give an hour's "show" for London Regional listeners, which I understand he is planning on rather original lines.

(Continued on page 36.)

THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

"FOREIGNERS GALORE"

—and all at loudspeaker strength," says an enthusiastic Bradford reader who has just built a "Cosmic."

The Editor, POPULAR WIRELESS.

Dear Sir,—I built your "Cosmic III" for a friend of mine, and we both agree, and also everybody that has heard it, that it is absolutely the best three-valve set yet heard. I put a temporary aerial and earth-up to test it, and received "foreigners" galore, and the best part about it is that they are all full loudspeaker strength. It will cut Moorside Edge out here in Bradford by simply turning the reaction knob; and the moderator tuning unit is absolutely the goods, just like adding a couple of valves to the set when you operate it.

My friends were that enthusiastic about it that they have got me to write this letter in appreciation of your wonderful circuit, and you may use it in any way you wish.

Yours respectfully,

E. BESWICK,

Bradford, Yorkshire.

I RECENTLY drew attention to the way lecturers and others were pouring out profuse thanks for the congratulatory letters they had received. Now, we have a broadcaster, Mr. Gerald Heard, appealing for some sign of appreciation (or otherwise). Well, in this case, I think a pat on the back is well merited, but I hope Mr. Heard will not cut down his most interesting remarks by giving up his time to thanking Mr. Blank of Round the Corner for his postcard.

* * *

Then came the unexpected revelation by James Agate that it was seriously contemplated cutting out the Theatre Talk, and that the decision depended upon the words "yes" or "no," whichever one figured most on postcards. Remembering

the part the theatre has played in our national life, and allowing also for the inroads of the Cinema, I cannot imagine that the proposed elimination of a talk on the theatre is going to meet with approval.

To my mind, there should never have been any idea of such a thing, but maybe, attention might be given to the subject-matter, with a ringing of the changes on the talkers. Mr. Agate was not at his best with Julius Caesar.

* * *

Talking of postcards reminds me that Moscow extends a hearty invitation to all and sundry, whatever their politics or creed, to send picture postcards of their native town, in return for which the sender

(Continued on page 34.)

How to use a POWER PENTODE

YOU can use a Lissen Power Pentode in any battery-driven two-valve set, or any set employing only one L.F. stage, and *double the volume without adding to the running costs.* You can get the foreign stations, that before were but whisperers in your loudspeaker, at fine strength; or you can have a torrent of pure sound from your local station that will make every item enjoyable. There is no need to alter your receiver at all. Simply replace your power valve with a Lissen Power Pentode according to the instructions given inside the carton in which the valve is packed. The *economy* Power Pentode this Lissen valve is called, because it only takes 7 m/A. of H.T. current—no more than an ordinary power valve. Therefore, you can use it with your present battery and enjoy the extra volume and brilliant tone that "Pentode Output" gives to a set.

Ask for a Lissen Power Pentode; P.T.225. Price

12/6

THE VALVE FOR LIVELIER DETECTION & BIGGER RANGE

The Lissen Detector Valve—H.L.210—liven up your tuning, gives you extra range, greater sensitivity. It is so responsive that it brings in the foreigners like magic. Not only this, but it passes a crisper, more powerful signal on to the L.F. stage of your receiver, and you get louder, clearer radio altogether. Ask for Lissen H.L.210. Price

5/6



P.T. 225.

12/6

LISSEN
economy
POWER
PENTODE



CONDITIONS for long-distance reception continue to be very fine indeed as regards both the number of stations obtainable and the volume at which they can be received. I am glad to be able to report, too, a noticeable decrease in the amount of heterodyne interference that has occurred on the medium wave-band. Last week heterodyning had begun to assume formidable proportions, and at one time it seemed as if we were in for a return to chaos on the medium wave-band.

American stations continue to be received quite well shortly after midnight. If there are no atmospherics about and conditions are found to be otherwise good, earlier in the evening, it is always worth while to try for U.S.A. stations if you happen to be sitting up late.

Medium-Wave Americans.

Amongst those which I find it easiest to receive at present are WIOD, WTIC, WPG, and WBZ. On especially good nights many others can be heard with a set that has reasonably good high-frequency amplification.

On this side of the Atlantic the long waves remain as good as ever, and there has been less trouble from the heterodyne of Russian origin that was at one time marring Radio-



Some practical distant-programme notes compiled by a special contributor who nightly searches the ether in order to obtain really up-to-the-minute information for "P.W." readers.

Paris's programmes. Zeesen is at the top of his form just now, whilst magnificent reception is obtainable from both Kalundborg and Oslo at almost any time.

Frankfurt and Budapest.

On the medium wave-band a station which has shown extraordinary improvement of late is Frankfurt. The heterodyne, which used to be such a nuisance, has very seldom been noticed on recent evenings, and Frankfurt comes through with remarkable volume and quality. Make a note of him, for he is worth attention.

Let me bring to your notice also Budapest, who was particularly good on many nights. He is not absolutely reliable; you may find on some nights that he is quite weak. On others, though, he will give you all the volume that you want.

This station's programmes are so good that it is always worth while to tune to his wave-length to see if he is coming in well. Vienna sees considerable variations. Partial jamming has occurred on a good many

occasions, but, like Budapest, he has his nights!

Completely reliable stations towards the top of the band are Brussels, Prague, and Langenberg. Beromünster, who has been off colour for some little time, has now returned to form, and I don't think

that you will have any complaints to make if you tune him in.

Both Rome and Stockholm generally supply excellent reception. We cannot call Dublin exactly a foreign station, but I mention him in my list, since he is outside the B.B.C. group. The Irish station has shown splendid strength on many occasions recently.

More Recommendations.

Katowice is usually first rate, though he suffers from an occasional weak night. Toulouse is always to be found. Lwow is excellent when he has a chance, but you may find on certain nights that interference spoils reception.

Hamburg has very much improved. Don't forget to tune in Stuttgart if you are operating the set at a time when the London Regional is silent.

I have heard Barcelona much better recently than for some time past, and Strasbourg, too, has furnished remarkably good volume and quality.

THIS season of the year seems to be dedicated to the breaking of short-wave (and other) records. Here we have our old friend F. N. B. again, claiming to have heard all continents within *eleven minutes*.

It is not a true "H.A.C." as that applies to broadcast only, but he certainly has heard an amateur in each of the six continents within that time. The eleven minutes were between 8.50 p.m. and 9.1 p.m., and all stations were on 40 metres except the "Yank" who was on 20.

"Choose the Weapons."

F. N. B. now feels so truculent that he has issued a challenge to all the more rabid of "P.W.'s" following of short-wave fans. M. S., of Harlow, is particularly mentioned as one with whom F. N. B. would like to try conclusions. M. S. (or anyone else accepting this) is to "choose the weapons," and W. L. S. is to fire the starting gun—presumably by means of his chronometer.

We could make quite an interesting contest out of this, the idea being to see who finds, for instance, the greatest number of West-Coast Canadians, or East Indian stations during one week-end. More of this later.

J. B. M. (Glasgow) mentions, for the first time, a station signing LSL (Buenos Aires) on about 30 metres. This has been logged at 11 p.m.

My recent remark to the effect that I never remember having heard an Australian on 'phone has brought forth a letter from

SHORT-WAVE NOTES



News and views regarding an exciting and fascinating wave-band.

By W. L. S.

E. J. L. of Streatham. He heard the famous contact between Messrs. Simmonds (G2OD) and MacLurean (VK2GM) in March, 1926.

Both stations worked 'phone on that occasion. The wave-length was 40 metres, and the input at the Australian end 250 watts. I imagine that very few Australians now use that power. Many thanks, E. J. L.

Those Nine Yanks.

I was somewhat pained to receive a letter from D. T. (Ipswich) that rather indicates that the said gentleman doesn't trust me. He thinks the results of the competition should have been given in full, and doesn't like W. H. R. (the winner) to be described as having heard "Nairobi, Chi-Hoa, Sydney, nine Yanks, and several

others." As a competitor himself he doesn't think this is fair play.

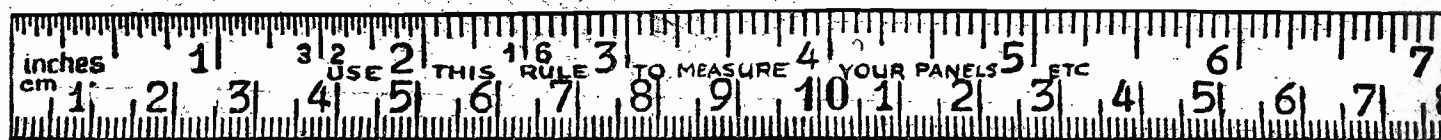
Well, D. T., if I *had* published the list you still wouldn't have been any better off; besides, the Editor has more important stuff on hand than mere lists of short-wave stations.

W2XAD and W2XAF.

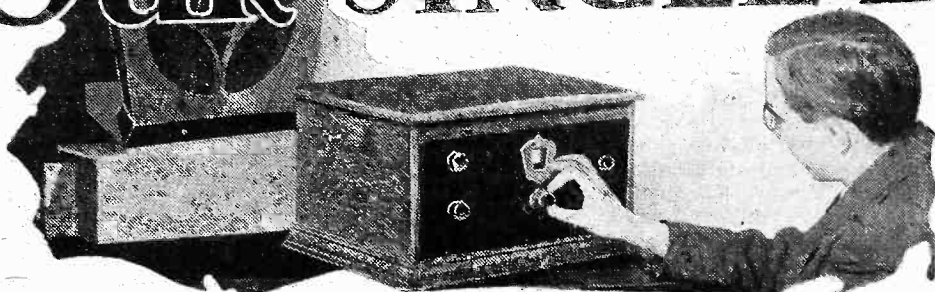
There has been a lot of talk about "bad conditions" during the past winter and this spring, but when I look back it seems to me that this had not been at all a bad season for those able to read morse, whatever it may have seemed to the telephony-only men.

From combined evidence coming from readers' reports and my own observations, it appears that W2XAD (19.56 metres) is now coming over quite well at almost any time between noon and 10 p.m. The fact that the 20-metre American amateurs were coming in later than usual sent me down a few degrees one evening recently, and at 8.30 p.m. I found W2XAD quite as loud as I have ever heard him. On the "Four" he was positively dangerous to the windows, and on the "One" he was a really comfortable headphone strength.

I should say that by the time you read this W2XAD will be the star station right up to 11 p.m. W2XAF, on the other hand, can only be described as "fair." He varies somewhat, and never appears to be really strong.



OUR SINGLE DIAL SUPER



An interesting account of some of the experiments conducted by the Research Department in an attempt to evolve a really successful one-dial tuning super-het. set. These experiments were completely successful

and full constructional details of the final and perfected receiver will appear in our NEXT ISSUE.

THE FIRST PRACTICAL STEP

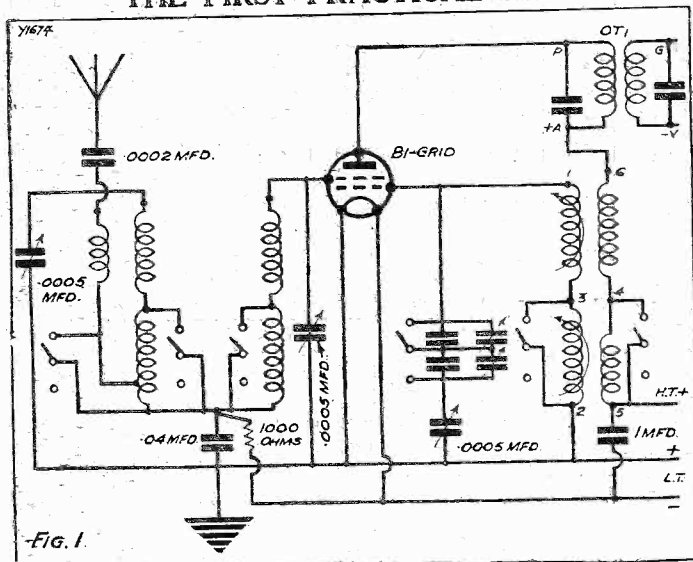


Fig. 1.

The initial tests were carried out with a bi-grid valve and tuned-grid windings, as above.

THERE is a saying "the proof of the pudding is in the eating," which in radio equivalent is as good as stating that a theoretical calculation is not conclusive until it has been proved practically. Thus, the purely technical considerations put forward in the article published in this journal on February 6th ("P.W." No. 505) can hardly be appreciated without reference to the practical experiments.

It should be borne in mind that the object of the tests and calculations was to devise a circuit arrangement whereby the oscillator tuning on a super-het. could be coupled mechanically with the aerial tuning system to allow for single dial tuning.

A Choice of Coils.

Whereas the aerial circuit (either of the band-pass or "plain" type) tunes to the incoming signal, the oscillator must resonate at so many kilocycles above the fundamental, the "difference" in the two frequencies corresponding to the chosen intermediate frequency. Various schemes based on extensive research with super-hets. in general were put forth as being of practical value.

The ultimate aim has been to design an oscillator arrangement which could be used in conjunction with a standard band-pass aerial coil, but which could nevertheless be so adjusted that without alteration it could be employed with many commercial makes of aerial coils.

So far the only single-dial super-het. described has achieved its object by making

use of three special coils carefully matched by the makers. With the oscillator coil designed by us, provision has been made for varying the inductances of the medium and long-wave tuned sections, and with the addition of the series-paralleled condensers remarkably accurate "ganging" is possible, despite variations in the commercially made band-pass coils available for use with the oscillator.

The reader will see therefore that only one

special coil is required, and its construction is such that it may be made by any careful constructor, and probably it will be marketed complete at a later date.

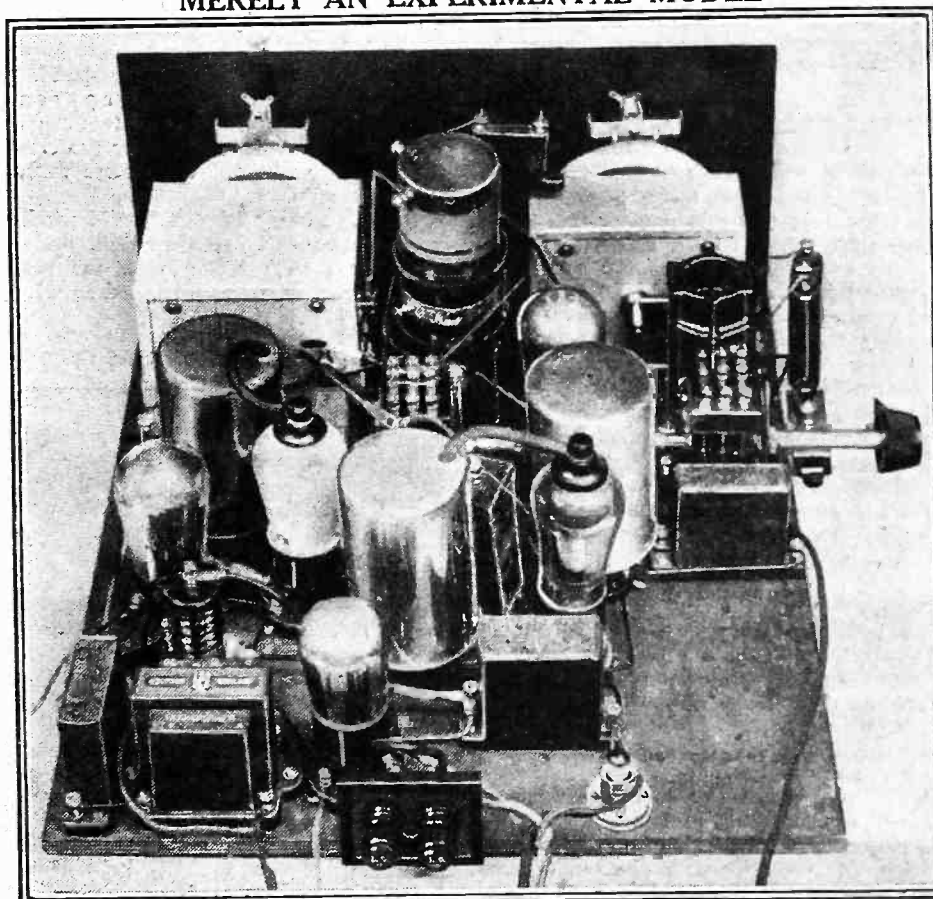
Before proceeding to describe the experiments, it would be as well to enumerate the facts governing the design of the oscillator system. It has already been mentioned that the oscillator operates so many kilocycles above the fundamental frequency, the exact number depending on the intermediate frequency of the band-filters.

The "Difference" Frequency.

Furthermore, in the last article it was made clear that this "difference" frequency remained constant over all wavebands. The oscillator coil, owing to its higher frequency response has, in terms of metres, a lower wavelength range, and

(Continued on next page.)

MERELY AN EXPERIMENTAL MODEL!



This very excellent super, which gives a most impressive performance, was built up in order to try out the possibilities of the new principles to be embodied in "P.W.'s" one-dial instrument.

Build the COSMIC STAR

THE ALL-PURPOSE, ALL-EFFICIENT, ALL-WAVE SET

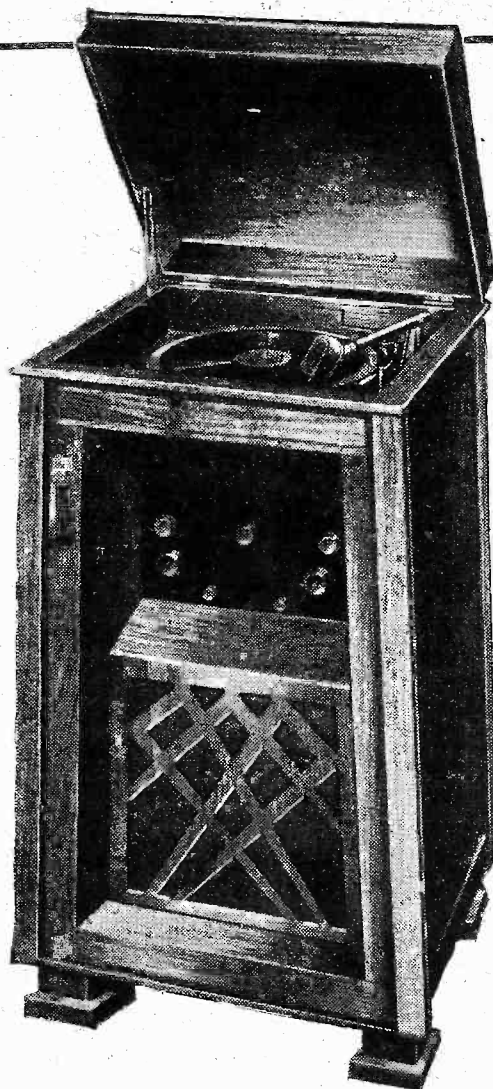
The Ready Radio "Duotune" Extenser

The Readirad DUOTUNE is essential for the "Cosmic" and for every modern all-wave receiver. It is the only condenser of its kind. Not only does it provide automatic switching from medium to long waves (on the famous Extenser principle) but also at the flick of a switch it is converted from a '0005-mfd. condenser to a '00025-mfd. condenser.

Fit a DUOTUNE in place of your present condenser and bring your set right up to date.

READIRAD DUOTUNE 15/6

(Extenser Model. Patent Pending)



READY RADIO RADIOGRAM CABINET.

With this beautiful cabinet you can convert your present set to a Radiogram of the most modern and artistic design. This cabinet is a highly polished walnut with lift-up lid, automatic support and a needle cup. Overall size 3' 3" x 22" x 17". Suitable for any receiver having a panel not exceeding 12" x 7" and a baseboard 16" x 10".

PRICE £3:7:6

or deposit of 15/- and 6 monthly payments of 10/-.

READY RADIO

KIT "A"

Complete Kit of Components together with panel (ready cut and drilled), baseboard, Jiffilink for easy non-soldering wiring and free blue print.

89/6

OR BY EASY PAYMENTS

10/3 down and 9 monthly payments of 10/3

KIT "B" £5:17:0

Complete Kit of Components as Kit "A" together with specified Mullard valves and free blue print.

OR BY EASY PAYMENTS

11/- down and 11 monthly payments of 11/-

KIT "C" £6:18:0

Complete Kit of Components as Kit "B" together with beautiful Table Cabinet and free blue print.

OR BY EASY PAYMENTS

12/9 down and 11 monthly payments of 12/9

Write for details of
'Cosmic' Radiogram
Kits obtainable for
Cash or by Easy
Payments.

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

TO OVERSEAS CUSTOMERS.—Everything Radio can be supplied against cash. In case of doubt regarding the value of your order, a deposit of one-third of the approximate value will be accepted and the balance collected by our Agent upon delivery of the goods. All goods are very carefully packed for export and insured, all charges forward.

READY RADIO KITS

FOR THE FAMOUS

S.T. 300

KIT A less valves and cabinet £3:18:6

OR BY EASY PAYMENTS

7/3 down and 11 monthly payments of 7/3

KIT B with valve less cabinet £5:17:6

OR BY EASY PAYMENTS

10/9 down and 11 monthly payments of 10/9

KIT C with valves and cabinet £6:16:0

OR BY EASY PAYMENTS

12/6 down and 11 monthly payments of 12/6

CASH or COD ORDER FORM

To: READY RADIO, LTD.

Eastnor House,
Blackheath, S.E.3.

Please dispatch to me at once the following goods.....

for which (a) I enclose (cross out line) £
(b) I will pay on delivery (not applicable)

Name.....

Address.....

P.W. 19/3/32

To: READY RADIO, LTD.,

Eastnor House,
Blackheath, S.E.3.

Please dispatch to me the following goods.....

for which I enclose first deposit of £.....

Name.....

Address.....

P.W. 19/3/32

EASY PAYMENT ORDER FORM

DUAL-PURPOSE REACTION CONDENSERS

A FEW weeks ago I gave details of how two components could be combined so as to be controlled by one knob, simplifying the operation of a receiver and at the same time helping to clean up the panel appearance. The two components in question are to be found on most receivers, and are the reaction condenser and the volume control—two items that most logically should be combined.

The method explained requires a special component. Consequently it is not a scheme with which the constructor can experiment, unless, of course, he has a very well-equipped workshop, is a good mechanic, and is prepared to turn out the special component for himself.

A Combined Control.

But at the same time, the idea of going progressively from maximum volume to controlling reaction, with the one knob, is very attractive. So here is another way of accomplishing the same effect which anyone can try out quite easily, and in most cases on present receivers.

Actually it has one very big advantage over the original scheme; it enables volume controlling to be carried to a much lower limit, and in most cases to a complete zero. Another point is that reaction is obtained by the differential method instead of with a single "plain" capacity.

Put briefly, the idea is to so arrange the input connection that the differential reaction also acts as a differential volume control. First of all let me explain the arrangement with the aid of the circuit shown on this page, and then I will tell you how to try it out in practice.

To consider the reaction control part we just ignore the two wires that are marked input. There is the ordinary grid coil and reaction coil coupled to it, and one set of fixed vanes on the differential reaction condenser goes to L.T.— and one to reaction coil.

Perfectly Straightforward.

The moving vanes go to plate as usual, but are taken via a compression-type condenser instead of direct. This condenser simply serves the purpose of altering the effective capacity of the differential condenser so far as reaction is concerned.

It is set so that the receiver will just oscillate with the differential condenser adjusted for maximum reaction (moving vanes fully meshing with the F_1 fixed), and the tuning at the position where the most reaction is required to make the set oscillate.

Describing an ingenious circuit arrangement which enables you to make one component serve two distinct purposes.

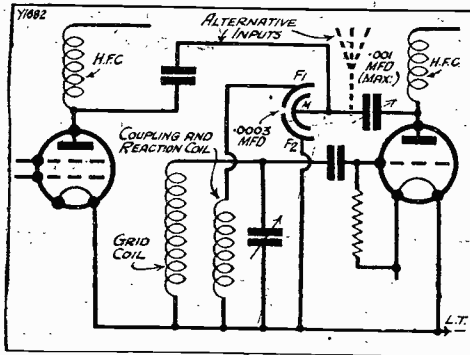
Maximum reaction can therefore be obtained on any wave-length.

Now to consider the volume control part. For the time being we will suppose the set has no reaction, and so we ignore the compression-type condenser and the connection via it to the valve's anode.

What have we left. Why, a straightforward differential input condenser. When the moving vanes are fully in mesh with the F_1 fixed, the input circuit is simply straight through the condenser capacity and reaction coil (now acting as coupling coil) to earth.

If, on the other hand, they are fully meshed with the F_2 fixed vanes, the input is passed directly to earth via the capacity,

SEE HOW IT'S DONE



The differential reaction condenser controls volume as well as feed-back.

and no coupling is obtained with the coil, so volume will be at its minimum. Stray capacities usually prevent this from being absolutely zero.

In the opposite position volume is at maximum. At intermediate positions, some coupling takes place and some by-passing, so that intermediate values of volume are obtained according to the setting of the moving vanes.

In practice both these effects, differential volume control and differential reaction will take place at the same time. When we are at minimum volume (moving vane meshed with F_2 fixed) we are also at zero reaction. Which is only right, because minimum volume means that the station was coming through too loudly, and so no reaction is wanted.

At the other end of the scale we have just the opposite. Volume controlling is at maximum volume, and at the same time we get maximum reaction, both necessary with really weak transmissions.

A cursory consideration may suggest that we have the apparent drawback that reaction begins before volume controlling is at its maximum volume setting. In reality, on the contrary this is somewhat of an advantage.

Constant Selectivity.

It has the result of keeping the degree of selectivity fairly constant over the whole movement of the condenser. So in turning up volume we are not increasing the risk of interference from unwanted transmissions.

Due to the use of the compression condenser, reaction will not really become operative until the differential condenser is well round towards the F_1 "end." But by suitably choosing the value of the differential condenser this position can be well up the volume controlling scale.

As the knob is turned towards maximum volume and reaction, selectivity tends to become less because of the closer coupling of input to the input-reaction coil. At the same time it tends to become greater because of the increase of reaction; thus the balancing effect.

As the circuit shows, the input may come from either the aerial or a preceding H.F. stage. So you can try the scheme with a detector and low-frequency set using differential action, or with a parallel-fed H.F. set using differential reaction on to the detector's grid coil.

Well Worth Trying.

You will have to connect a compression condenser in the lead from the plate of the valve to moving vanes of reaction condenser, and it may be suitably of the .001 max. type. Any value of differential reaction condenser can be tried, but for good results one about .0003 or more is desirable.

While the amount of reaction is variable by means of the compression condenser, the maximum coupling is fixed by the size of the reaction coil, and it may not be big enough for best results. Naturally it is wound with reaction in view and not coupling.

Anyway, this is a drawback to the adaptation and not a fundamental lacking in the scheme, for a coil specially wound for the job could be suitably proportioned. If you try it, I can promise you at least a very interesting experimental experience.

A.S.C.

THE FERRANTI

CONSTRUCTORS' BAND-PASS 3 RECEIVERS

A new standard in Set construction

Every part carefully designed and beautifully finished

The Triple Ganged FERRANTI Tuning Condenser supplied calibrated in conjunction with FERRANTI Band-Pass Coils, is provided with a unique 3-point suspension of its chassis, thus preventing distortion of the chassis which usually occurs in mounting. It is sealed and adjusted to plus or minus 000000125 M.F. at minimum capacity, and to plus or minus 00000075 M.F. at maximum, providing correct Band-Pass operation when the Set is assembled; a result not previously ensured in any Constructor's Set.

The band width is approximately constant, and with no reaction is 10 kilocycles on the medium waves, and 8 kilocycles on the long waves.

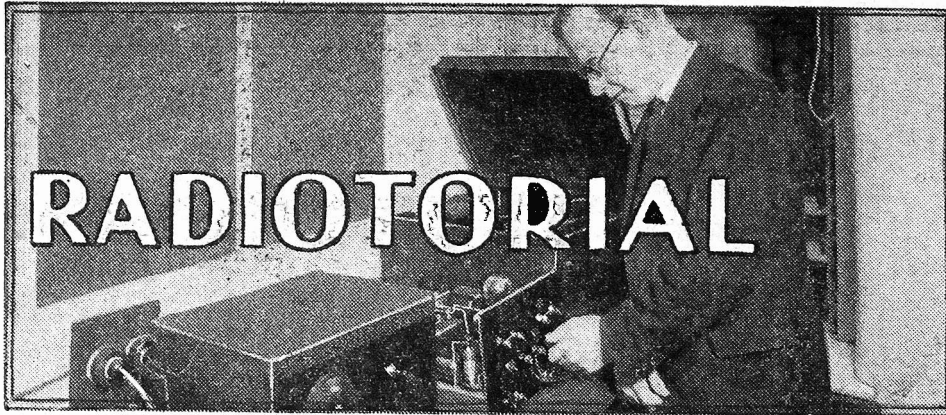
Battery and A.C. Mains types are available, and constructional charts may be obtained from your dealer, or direct from us.

A.C. Mains Kit, including Marconi Royalty (exclusive of Valves, Cabinet, Panel and Baseboard)		£11 3 6
With Panel and Baseboard	£11 8 6	With Cabinet, Panel and Baseboard £12 13 6
Battery Kit, including Marconi Royalty, without Valves, Panel and Baseboard		£7 7 0
With Panel and Baseboard	£7 12 0	With Cabinet, Panel and Baseboard £8 17 0
Band-Pass H.F. Stage only; suitable for either A.C. Mains or Battery Set, including the conversion of any Set of the Screen Grid Three type to meet present-day requirements in selectivity and quality		£3 13 6

This H.F. stage comprises :—1 FERRANTI Triple-Ganged -0005 Tuning Condenser with slow motion illuminated dial. 1 FERRANTI Band-Pass Input Unit with Wave-Change Switch. 1 FERRANTI H.F. Transformer and Detector Unit, complete with Detector Valve Holder, Grid Leak and Grid Condenser and Wave-Change Switch. 1 FERRANTI Screened Grid Valve Screen with 5-pin Valve Holder. 1 FERRANTI non-inductive Band-Pass Coupling Condenser, Type C11 : .06-mfd. 1 FERRANTI H.F. Volume Control Condenser with cut-out contact. 1 FERRANTI hand-capacity plate for Reaction Condenser, and 1 FERRANTI H.F. Filter.

Full details for building either the A.C. or Battery Model are given in the constructional charts, which may be obtained from your dealer, or direct from us on receipt of your request accompanied by a 1½d. stamp for each chart.

FERRANTI LTD. CONSTRUCTOR'S DEPT., HOLLINWOOD, LANCASHIRE.



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. Lile, 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 specialties 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

CHARGING FROM D.C. MAINS.

M. R. (Ilford).—"I am told it is possible to use the electric light supply to charge a small accumulator by connecting the latter in series with the house supply. I do not understand this. How can this be done?"

Properly fitted by a qualified man, such an arrangement is perfectly safe and satisfactory, but we must remind you that an electric light company nearly always makes it a condition of the supply that they are notified if any such alteration to the house connections are carried out.

Generally no objection is made if a qualified electrician is employed, and probably he will understand exactly what to do if you explain your requirements.

HOW ARE YOUR RESULTS NOW?

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 scales of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

A postcard 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 Tallis House.

One simple arrangement is to employ a double-pole double-throw switch of a suitable protected type, the centre contacts being joined in series with that electric light main which is earthed. Two of the switch's outer contacts are joined together, so that when thrown over in this position the ordinary mains connection is restored and the circuit is exactly as formerly.

The other two contacts on the D.P. D.T. switch are taken to two insulated terminals, to which the battery to be charged will be connected. The negative of the battery must go to the negative side of the leads, and when the switch is thrown over to this position the current which is being used in the house for lighting, etc., passes through the accumulator and "trickle-charges" it.

The running cost is negligible because there is no difference at all in the amount of current you are taking, but only a very slight diminution in the brilliance of the lighting.

A GOOD SUGGESTION FROM A READER.

We have often commented on the very helpful way in which "P.W." readers pass on good tips and hints to one another, and we are indebted to an Edinburgh reader for the following excellent idea.

His letter speaks for itself. He says:

"Dear Sir,—I was interested in your reply to H. L. in the February 6th issue of 'P.W.' May I suggest an alternative scheme, which gives great satisfaction on a 'Comet' Four?"

"Parts required—One double-throw double-pole switch (panel control), one non-inductive resistance, 100,000 ohm or 50,000 ohm. Mount the switch on the panel, cut the positive filament wire to the screen-grid valve, connect one end to the centre pole of switch nearest the panel, and the other to the right pole nearest panel.

"Connect the other centre pole of the switch to the grid end of the first tuning condenser, and the left pole farthest from panel to the grid side of the second tuning condenser, using a flexible resistance. (If a non-flexible resistance is used, connect left pole farthest from panel to one end of resistance, and the other end of the grid side of second tuning condenser.)

"On switching one way the circuit is four valves as before, and switching the other way it becomes a three-valver with a poor copy of the Eckersley Tuner. However, it gives a much reduced volume and freedom from interference on the local, without moving the aerial wire.

"Wishing further success to POPULAR WIRELESS, of which I have been a reader since you published the 'P.W.' Combination Set some years ago.

Edinburgh. "Yours faithfully,
"J. R."

WINDING COIL QUOITS.

S. O. S. (Paisley).—"Re coil quoits, to be used with 'P.J.' coils, will you let me know winding method for both types—i.e. aerial coil and inter-valve? Number of turns, wire used and usual connections (earth, reaction, etc.)."

The beginning of the wire (30 D.S.C.) is fastened to the coil quoit in the usual way, by threading it two or three times through small holes in the coil quoit until it holds fast. (About 6 or 8 in. should be pulled through the hole first, and will be used later for making the connections.)

First coil quoit has no reaction winding, being a plain 150-turn coil, with taps at the 30th and 60th turn from the earth end. So the commencement of the winding should be labelled "Earth," and then 30 turns are neatly wound on. Do not break the wire at this point, but twist a neat loop in it, about $\frac{1}{2}$ in. in length,

This loop will be allowed to stick out from the winding, and when its insulation has been scraped off the wire, it enables a crocodile clip to make connection at the 30th turn.

The scraping of the insulation is best left till the coil is made. During the winding you simply make the loop at the 30th turn, and then carry on the winding in the same direction as before.

At the 60th turn another loop must be made, and then 90 more turns must be put on (still winding in the same direction) before the end is fastened off.

This fastening is done by cutting the wire and drawing it through small holes in the coil quoit, exactly as at the start of the winding. And, as before, 8 in. or so should be left with which to make the connections to the coil.

(So that these ends should not get in the way, it is a good plan to wind them round and round a pencil, and then tuck the small coils so made inside the coil quoit, until they are wanted for the wiring.)

Carefully scrape off the insulation of the wire at the tapping points with a knife, and lay the coil aside till it is to be mounted. This is done by fastening it to the baseboard with a couple of screws through a shaped wooden block fitted inside the coil quoit.

(Another method is to lay a wooden strip across the top of the coil quoit, and drive a long screw through the centre of it into the baseboard below.

The Inter-Valve Coil.

The second or inter-valve coil quoit is exactly like the one already described, except for its extra 50 reaction turns. It is made exactly as before, but with this difference:

The 50 reaction turns must go on the coil quoit first, so the commencement of the winding is labelled "Reaction." When 50 turns have been wound on, don't break the wire, but bring out a long loop, and label it "Earth." The rest of the coil is then wound exactly as before, with tapings at its 30th and 60th turns.

All the winding must be done in the same direction, and provided that is done, your coil quoits will be found to be highly efficient in action.

On most "P.W." diagrams in which coil quoit figure, the connections are marked (1), (2), (3) and (E). (E) or "Earth" we have already described; (1) is the connection to the 30 (or 60) tap, whichever gives better results on your set; (2) is the point

TECHNICAL TWISTERS

No. 105.—POWER.

CAN YOU FILL IN THE MISSING LETTERS?

The unit of electrical power is the

It is the product of and

Thus, a set employing 2-volt valves, and taking a total filament current of .25 ampere would represent an L.T. power of

If a 100-volt H.T. battery supplied 5 milliamps, the total H.T. power would be

For convenience a larger unit is commonly used—namely, the kilowatt, which represents watts.

Last week's missing words (in order) were: Solenoid, Cylindrical Series. Binocular. Solenoid, Screening.

where you finish; and (3) is the beginning of the reaction winding. (You will remember we marked this "reaction" when commencing to wind the second coil quoit.)

Erecting an Aerial.

G. F. G. (Essex).—"Since settling down out here in the country I have altered my ideas about wireless, to which I was quite indifferent when living in London. But being a sixty-four-year-old reader I am young enough to learn, and have become greatly interested in your 'Cosmic'."

"My first step, however, is to get an aerial up, and I find very little is said about this sort

(Continued on page 32.)

PERTRIX TRADE MARK JUNIOR

A NON-SAL-AMMONIAC BATTERY
AT A POPULAR PRICE

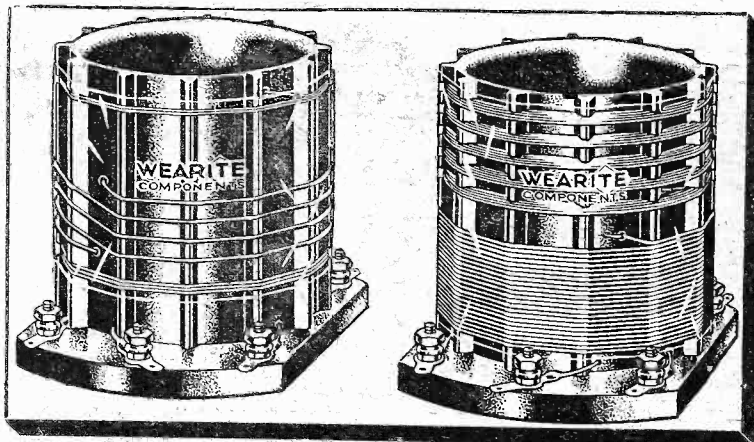
Never before has there been a battery so low in price that gives the life or possesses the same capacity as the PERTRIX JUNIOR. Like all Pertrix batteries, the PERTRIX JUNIOR is a non-sal-ammoniac battery. This means it has infinitely longer shelf life, positively longer active life, gives clear reception and has high recuperative powers. At its price there is no other battery to equal the PERTRIX JUNIOR. Get one to-day.

All the skill and the high quality chemicals that go into the more expensive Pertrix batteries also go into the PERTRIX JUNIOR. Quality has not been sacrificed to price. That is why you get more from a PERTRIX JUNIOR, although you pay no more.

MADE AT REDDITCH BY
BRITANNIA BATTERIES
LIMITED.



60 VOLTS
5/6
100 VOLTS 120 VOLTS
9/- 11/-



USE 'WEARITE' COILS IN YOUR "COSMIC"

—and get the performance
that the designer intended

These WEARITE components will help
you to better results.

WEARITE H.F. CHOKE

An efficient choke
working from 10
to 2,000 metres
without marked
resonances.

List No. H.F.S.

PRICE 6/6

WEARITE ON-OFF SWITCH

A single pole self-
cleaning push-
button action switch
of compact de-
sign.

List No. G. 22.

PRICE 1/-

WEARITE 4 PIN VALVE HOLDERS

Soundly built
holders with
spring sockets.
Of highest quality
bakelite.

List No. S.1.

PRICE 1/3

With such an efficient receiver as the "Cosmic" the
tuning circuits *must* be above suspicion. Make certain
of the performance of your "Cosmic" by using
"WEARITE" coils — coils
that are backed by a repu-
tation second-to-none.

9/- per pair

or 5/6 for the Dual-range, and 3/6 for
the Ultra Short-Wave range.

THE FIRST NAME IN
RADIO COMPONENTS

WEARITE

COMPONENTS

If you have any
difficulty in
obtaining your
Wearite com-
ponents, write
to us direct
quoting the
name of your
dealer.

Write for Special Lists applicable.
USE THIS WEARITE EARTH TUBE!



No Screws
Just a Match

No Solder

PRICE 3/6

WRIGHT & WEAIRE, LTD., 740, High Road, Tottenham, N.17.
Telephone Tottenham 3847/8/9.

142

All who prefer
Quality in
Cigarettes

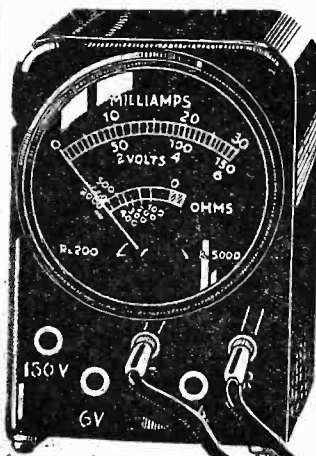
Say
Player's
please



N.C.C.86.

Note The CLEAR READINGS ON WATES

Universal Test Meter



Four readings on one dial, precise
and clear, including direct
measurement of resistance. The
'Universal' is a really scientific
instrument within the reach of
all. Quickly saves its cost and
keeps reception perfect. Fitted
with battery for valve and circuit
testing. Readings: (1) 0-150
volts for H.T.; (2) 0-6 volts for
L.T.; (3) 0-30 milliamperes for
current; (4) Resistances 0-2,000
ohms. Interesting pamphlet on
Set Testing with each
instrument - **12/6**

Of all Radio dealers or direct from
us. Explanatory leaflets Post Free.

STANDARD BATTERY CO.
184-8, Shaftesbury Avenue, W.C.2
LONDON

BRITISH MADE



Can I use an H.T. mains unit with the "Cosmic"?

CERTAINLY, but in a high-efficiency tri-band set such as the "Cosmic" an H.T. unit of sound design and construction must be used, and a rough hook-up of choke and condenser is not likely to serve satisfactorily. Any cheap H.T. unit can be used, but you can be certain that if the accessory introduces noticeable hum on the ordinary broadcasting waves (as many do) the interference will be markedly worse on the short waves.

The Three Essentials.

However, there are numerous units of sound design available at very reasonable prices, and on test a selected number of these gave uniformly good results with the "Cosmic." There are three essentials you should bear in mind when choosing your model: (1) That the device was designed in strict accordance with the I.E.E. recommendations. (2) That it can provide sufficient current, with about thirty per cent to spare, for the valves you are using. (3) That there is a variable tapping for the detector valve.

When you employ a mains unit it is highly desirable that there should be an output filter in the set on the lines of the one described elsewhere in this issue.

Can I use a "so-and-so" valve for the Detector stage?

To most queries of this nature the only answer is—you can, but WE do not recommend any other type than that one definitely specified.

The detector stage in the "Cosmic" has more work to do than in most receivers, and the characteristics of the detector valve have a vital bearing on such all-important matters as reaction control.

Smooth reaction is quite essential for the satisfactory reception of short-wave stations, and this can be obtained only by using a valve of the type specified.

My results are excellent on short and long waves—poor on medium. The moderator condenser controls volume and selectivity on long waves, but seems to have no effect on short waves. On medium waves the results

By G. V. DOWDING, Associate I.E.E.

We have selected a few of the more generally asked questions concerning "Cosmics" from a very large postbag, and it should be noted that the answers, in many cases, also apply to other types of sets.

are poor at maximum moderator, but very bad at any other setting.

This would point to a disconnection or wrong connection in the moderator circuit. The first thing to do is carefully to check the wiring and to ascertain that the moderator plug is making proper contact with the moderator coil sockets.

A Broken Wire?

The disconnection may be in the coil itself, though this is not very likely. Anyway, it is a definite fault of the above nature and should not take long to trace, providing you go about the job methodically.

But it should be noted that the moving of the moderator coil, as suggested in the "Selectivity and Power" article ("P.W." March 5th), will not cover up a definite fault of this kind. It must be remedied.

I get very good results, but am unable to get full moderator control. The London National is very good with the moderator condenser at minimum, but I feel it could be better. Is this so, or am I expecting too much?

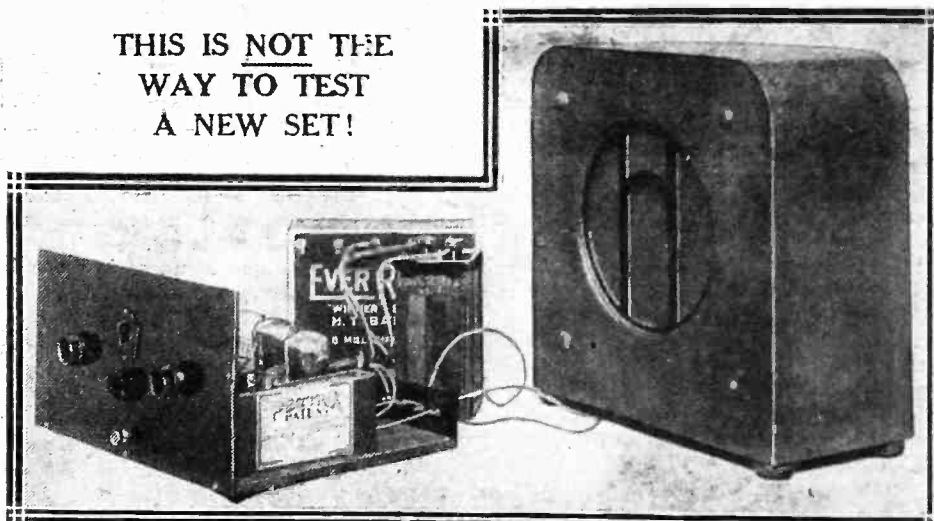
We should think it probably could be much better. You should be able to "run through" the point of greatest volume. That is to say, the turning of the moderator condenser control ought to bring you to a point of greatest loudness, while there is still a further travel of some few degrees during which the volume decreases.

"Tuning Through."

The decrease might be very slight, but so long as it is perceptible against critical listening, you have the satisfaction of knowing you are able to command maximum power. Are you sure you have tried the lowest moderator coil tapping? If so, and you still cannot "tune through," it would seem either that you have abnormally long or high capacity aerial, or that your moderator coil is incorrectly wound. Try reducing its turns. Strip one turn off at a time until, with the lowest tap in use, you are able easily to tune through the London National on the moderator condenser. A

(Continued on next page.)

THIS IS NOT THE WAY TO TEST A NEW SET!



No receiver can operate to the best advantage in such conditions as are illustrated above—untidy battery and speaker wiring, and the loudspeaker placed so that its sound-waves impinge on the unprotected valves.

COSMIC QUERIES

(Continued from previous page.)

wearisome little job—but you will find it worth while, we think. Don't forget that this tuning through will not apply to the long waves.

I only just bring up to full volume the London National and Regional on the central moderator coil tapping. If I want the North Regional I must change the tapping. Surely this is a bad point?

An extremely bad point. But it isn't one against us! Scowl at your moderator condenser, for there is little doubt but that is the culprit.

A capacity of .00075 mfd. is quite ample to provide a full "moderating" effect from below the London National to well above the North Regional, let alone the London Regional.

The Moderator Plug.

I reckon on at least 250-500 metres—which is enough for all ordinary purposes—anyway, the bottom and top fringes are, in such normal circumstances, well on board

Such queries as this one do not arrive from regular readers of "P.W."—for these know that there are two distinct groupings of "Cosmic" coils, each group having its own special numbering.

Coil Numbers.

The reason is that some manufacturers are using existing coil mouldings for "Cosmic" coils. That means cheaper coils for the "Cosmic," so we hope readers will keep for reference that little table which appeared in our February 20th issue.

Obviously, we cannot keep repeating it. However, we believe all coil-makers are now sending out full details for connecting up their various coils.

Can two loudspeakers be used?

Yes—and three or even four if you want to, and can afford to buy the necessary instruments. Join them up in series, i.e. make a chain of them so that the energy from the set runs through each separate speaker in turn.

I will give the connections for three. Join the one terminal of the first loudspeaker to the one terminal of the set, the second terminal of the first speaker to the one terminal of the second speaker, the remaining terminal of the second speaker to the one of

I agree—it is extraordinary. But yours is by no means a unique experience. And similar results have been obtained on other sets than the "Cosmic" as well.

"THE REAL GOODS."

Another Compliment for the "Cosmic"!

March 7th.

The Editor, POPULAR WIRELESS.

Dear Sir,—I feel I must write to compliment those responsible for the production of the "Cosmic III." I have followed the articles with the greatest interest and an ever-growing desire to have a go at what appeared to be the "real goods." Suffice it to say that my "Cosmic" was completed at 10 a.m. on Saturday last, and in a few minutes we were listening to the morning service.

On Sunday evening I logged more European stations than I had believed possible. I am quite raw at the short-wave business, but I picked up a station announcing London Regional news at 12.10 a.m. Sunday morning—at first switch-over to short waves, but no idea where it was.

I am afraid that with Mr. Kelsey I am going to lose some sleep over this set.

Good luck to your journal!

Believe me, Yours faithfully,

Wicken.

STANLEY J. GRANFIELD.

In actual fact you are using something of an aerial, even if it is only the piece of wire which runs from the set to a water-pipe, or some of the connecting leads (and the coil) inside the set. And after all, such items will have natural wave-lengths decidedly closer to the wave-lengths of the short-wave stations than a long suspended outdoor aerial which, if it introduces serious damping, may actually be doing more harm than good!

I have no grumbles about my "Cosmic," it brings in scores of stations, but I am wondering whether I ought to be getting the loud hum I do with a "——" mains unit I have just bought.

We should think that much of the hum is quite unnecessary. Of course, there will be a slight hum on the short waves even with a good mains unit—that is quite unavoidable as, among other things, you will be working so close on the edge of reaction all the time.

However, on medium and long waves there need be no hum at all in all ordinary circumstances. Many people do not object to a slight hum when there is no music or speech coming through, so long as it does not make itself apparent during programme items.

But if the hum interferes with, or is easily audible through speech or music, then there is something badly wrong—probably with the unit.

How many stations do you guarantee on the "Cosmic" Three?

"How many miles an hour can you guarantee on this car?" asked the motorist's friend. "Not very many when I'm stuck in a traffic block, but an awful lot when I'm travelling down-hill on a wide straight road," replied the motorist.

No, we won't guarantee even twelve. The number of stations receivable on any set so largely depends upon local conditions and the skill of the operator that it is foolish to be dogmatic.

But we should not be at all surprised if many well-handled "Cosmics" bring in over 100 stations, including short-wavers, under really good conditions! (An indication of such a possibility is provided by the letter from Mr. S. J. Granfield, which is reproduced on this page.)

TRYING TO TELEWISE "TOOTLES"



Three New York ladies and their prize pet dogs formed the subject of a recent Television experiment. But why trouble about the dogs?

for all practical purposes. It should certainly not be necessary to change the moderator coil plug once you have it nicely set.

But if the moderator condenser, though marked .00075 mfd., has, in fact, only, say .0005 mfd. capacity, its control will naturally be somewhat restricted. We do not think there are a lot of sub-capacity moderator condensers in existence, though unfortunately we know there are some, for we've met one or two ourselves!

My "Cosmic" coil terminal numberings do not agree with those shown in your wiring diagram.

the third speaker, and the second terminal of the third speaker to the remaining loudspeaker terminal on the set.

The order of the speakers is quite immaterial—I referred to them as 1st, 2nd and 3rd merely for descriptive purposes. If you intend to have very long loudspeaker leads, a filter output is advisable.

I get several short-wave stations on my "Cosmic" without using an aerial, though I do not hear any stations on medium and long waves unless I connect up my aerial. Is this not extraordinary, as the short-wave stations are hundreds of miles farther away?

Astonishing VALUE in Radio Batteries

British Made
throughout

60 Volts	5/6	120 Volts	11/-
99	9/-	9	G.B. 1/-
108	10/-	16½	G.B. 1/9



SIEMENS
"Cadet"
The New
FULL O'POWER

Now you can get a
"Full O'Power" quality
battery at the same price
as an ordinary battery.

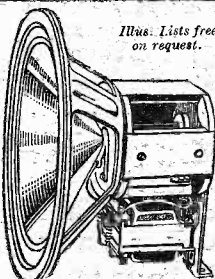
ADVT. OF SIEMENS ELECTRIC LAMPS & SUPPLIES, LTD., 38-39 UPPER THAMES STREET, LONDON, E.C.4

The LATEST ORMOND SPEAKER

**MOVING
COIL**
PERMANENT MAGNET

After years of patient research, the famous British firm of Ormond have evolved a Permanent Magnet Moving Coil Speaker worthy of their great name, and the well-known Mail Order House of E. J. Heraud is privileged to offer it on easy monthly terms. Remarkable fidelity, high sensitivity, and correct tone balance are outstanding features. It will handle heavy input without distress. The special Magnets are of *Darwin Cobalt Steel*, and a Speech Transformer is incorporated. The construction is very robust, the whole being mounted as a complete chassis. Size: width 10½ ins., height 11 ins., depth 3½ ins. Sent on 7 days' trial for only 2/6 deposit; if satisfied, pay further 2/6 at once, and complete purchase by 9 monthly payments of 7/6. (Cash Price, 65/-.) Send to-day and try this wonderful speaker

ONLY
2/6
DOWN



Illustrations free on request.

E. J. HERAUD

(Dept. P.W.1.)

Number One, Edmonson
London, N.18.

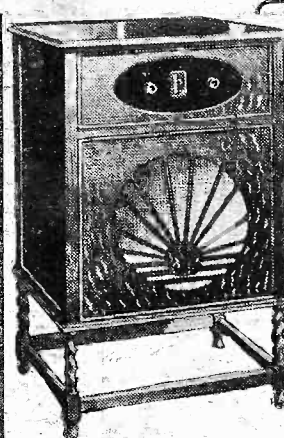
Branches at Tottenham,
Walthamstow and Enfield
Wash. Estab'd 32 years.

THE ORMOND FOUR POLE

ADJUSTABLE L.S. UNIT.

No. 1. Capable of handling great volume without chatter. Easily mounted in any cabinet or chassis by 2 screws. On 7 days' approval for 1/- deposit; if satisfied, pay further 3/- at once. Complete purchase by 3 monthly payments of 2/6. (Cash, 12/6.)

ONLY
1/-
DOWN



Another
OSBORN
RADIO CABINET

for the
"POPULAR WIRELESS",
"COSMIC" THREE

Model No. 197. Jacobean Radio Cabinet in Figured Oak, 3 ft 6 ins. high, 2 ft. wide, 1 ft. 4 ins. deep. Real twisted legs. Opening at back and top. Takes panel 21 ins. by 8 ins. or smaller. Baffle board 1 ft. 9 ins. by 1 ft. 6 ins. Ample room for any type of batteries in cabinet.

PRICES:

Machined Ready to Assemble, £1.15.0.
Assembled Ready to Polish, £2.10.0.
Assembled and Polished, £3.5.0.

All Models carriage paid.

The Regent Works, Arlington St., London, N.1. Telephone: Clerkenwell 5095. And at 21, Essex Road, Islington, N.1. Telephone: Clerkenwell 5634.

Made by
Craftsmen
for particu-
lar people.

SEND 3D. IN
STAMPS FOR
NEW 1932
BEAUTIFULLY
ILLUSTRATED
CATALOGUE.

CHAS. A. OSBORN
(Dept. P.W.1.)

"NEW SETS FOR OLD"

BE UP-TO-DATE WITH 1932 ALL-MAINS OR BATTERY SET, YOUR OLD SET BEING TURNED INTO MONEY AND TAKEN IN PART EXCHANGE. Any make of Radiogram, Set or Kit supplied, balance in Cash or Hire Purchase. Home-made sets accepted, but not parts or components.

**BEST ALLOWANCES GIVEN
FOR SETS ONLY**

Send for testimonials from satisfied clients from all parts of the world, enclosing 1d. stamp for reply.

RADIALADDIN LTD.

THE LARGEST RADIO EXCHANGE DEALERS IN THE U.K.
(Dept. P.W.), 47, Berners Street, London, W.1.
Telephone: Museum 1821.

Please forward this ENQUIRY FORM (without obligation).

I am interested in purchasing the undermentioned Radio Receiver:

Make.....Model and List Price.....

Present Set: Make.....

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.....

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 26.)

of thing in POPULAR WIRELESS, as everybody is supposed to know! Could you give me some hints on this, so that the decks are more or less cleared for action when my son comes down to help me make the set?

"The question of the mast will not be of much trouble because there is a fir tree in the garden about 50 feet away from the house, and although I am not much good at estimating

seems to be the way most of these aerials are fixed. Is there any special wire to use, how many of the insulators do I need to put at each end, and can you give me any other hints about what should be done?"

Use Enamelled Wire.

Any good aerial wire will serve your purpose, and the kind known as 7/22 (seven turns of No. 22 gauge, twisted together) will be perfectly satisfactory. You should get enamelled wire as you are near the coast.

You will probably find that your nearest wireless dealer sells this, and you will need the usual length, which is about 100 feet. Be very careful when putting it up that you do not unnecessarily kink it, for such kinks represent weak places which may in time break and give rise to crackling noises, which a little more care in erection would have prevented.

To measure out, first fix one end of the wire to the ground about 10 feet from the tree, and then pay the wire out from the coil in the direction in which it will be suspended until you are within a yard or so of the house. Two insulators will be needed at the tree end and two more at the house end, these latter being on a length of wire fixed to the gable.

On no account cut the aerial wire, but pass it (through the outermost of these house-end insulators) so that it runs from the tree, through the hole in the house-end insulator, and continues on without a break for a length long enough to come right down to the ground.

The idea is to keep the aerial in one piece as far as possible. So it is better instead of running it to one end of the lead-in tube, and then taking a short lead from this to the set, to run it actually through the tube. Thus the aerial wire is all in one piece, from the far end at the tree right to the aerial terminal on the set.

You can use similar wire for the earth lead, which should come direct from the earth terminal

on the set and then out through the window or a grating to an earth plate, buried underneath the lead-in.

For safety's sake it is a good plan to use an aerial earthing switch so that the aerial is connected to earth when it is not in use. And, of course, this switch will always be over to "earth" during thunder, for at that time there is a certain amount of danger near any elevated wire, and in any case reception is spoilt by the loud crackles which accompany lightning.

A good arrangement for a switch of this type was illustrated by a photograph in the "P.W." Book given away a few weeks ago. It was called "501 Radio Questions Answered," and from this you will be able to see exactly how the switch should be arranged. Alternatively, a switch can be bought complete with instructions.

Keep the lead-in right away from any iron gutters or drain pipes. The length of the wire fixed to the gable should be arranged so that it holds the aerial wire at least a yard away from the wall at the top, and lets it slope down to the lead-in at such an angle that it will not approach too close to any of the outer surfaces.

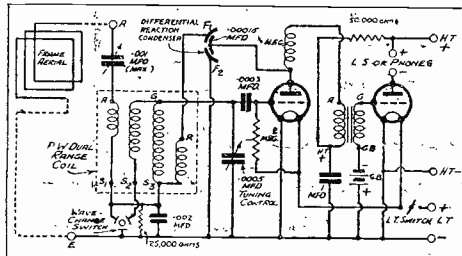
BUNCHING THE WIRING.

L. G. E. (Tottenham, London, N.). A curious thing that I do not understand about the working of a short-wave adaptor is the breaking of the rule about spacing the wires. Many, many times I have read the warning about keeping wires well spaced, especially in a short-wave set. Yet the plug for a short-wave adaptor carries three wires in one cable or twist, running side by side all the way from the plug to the valve holder. If it is so

(Continued on page 34.)

MISSING LINKS No. 30

A SIMPLE TWO-VALVER



Here is the complete diagram of the set which was given last week with two "components" missing. It will be seen that these were the decoupling condenser (1 mfd.) and the decoupling resistance (50,000 ohms).

height, I can tell you it is pretty tall. I am sure we can manage to throw a cord over it and anchor a wire near the top.

"At the other end I could get a ladder and fix it to a gable on the house, and then there is a straight run down to the window, which

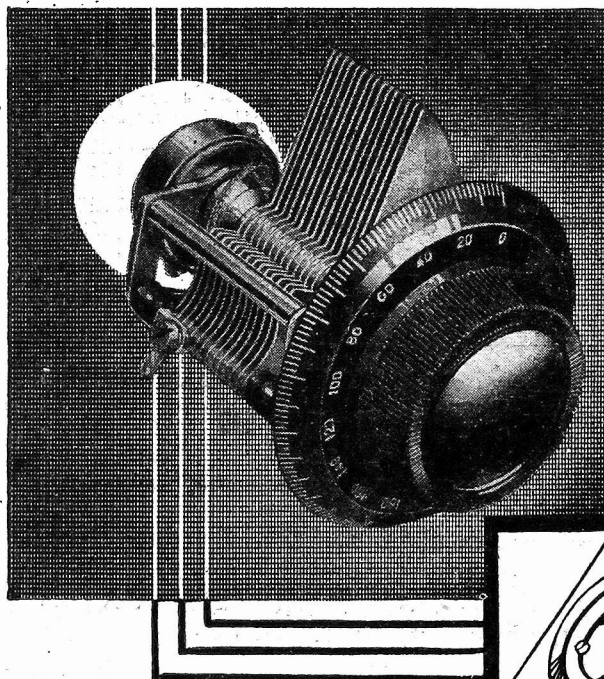
"P.W." PANEL, NO. 63. INDIRECTLY-HEATED VALVES.

The symbol standing for an indirectly-heated valve in a theoretical diagram is often "wired" by twisted lines to its heater terminals. The idea of this is to emphasise that the heater is not the cathode, to which earth, H.T., etc., are connected; and the twisted lines are derived from the twisted (flex) wire usually employed for heater connections.

When 5-pin valve holders are employed the true cathode makes connection via the central valve-leg.

In the case of an indirectly-heated rectifier valve the cathode is connected to the heater winding inside the valve itself, so a 4-pin valve holder can be used.

An inside view—



The New J.B. "POPULAR" CONDENSER is an outstanding example of value for money, yet a typical J.B. product in its sound design and thorough finish.

It is supplied in two models—Plain and Slow-Motion—fitted with rigid brass frames, vanes of extra heavy gauge brass, and end-plates highly finished in nickel plate. High-grade ebonite insulation is used and a very high electrical efficiency obtained.

SLOW MOTION TYPE

as illustrated, ratio 35/1, complete with 3-inch dial and knob:

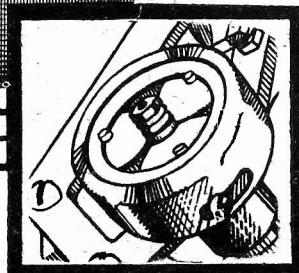
•0005	8/6	•0003	8/3
•00025	8/-	•00015	8/-

PLAIN TYPE

Prices without dials:

•0005	6/-	•0003	5/9
•00025	5/6	•00015	5/6

4-inch dial 1/6 extra



In this illustration the end cap has been cut away to show the Epicyclic Friction Drive, which is smooth and sure in action and absolutely silent.



PRECISION

INSTRUMENTS

IT'S SIMPLY MARVELLOUS

You can't conceive, until you've actually heard it, how simply wonderful is the performance of BLUE SPOT 100U.

The difference between Inductor Type 100U and other speakers is as the difference between night and day. Every word, every note, is clear with the crystal clearness of reality. 100U is more than an achievement, it's a marvel. Hear it, hear it to-day and nothing else will satisfy you.

100U is the perfect speaker for all the popular Kit Sets.

Write for Catalogue
P.W. 31U.

100 U
LOUDSPEAKER
UNIT

Price complete mounted
to chassis

39/6

BRITISH MADE



THE BRITISH BLUE SPOT COMPANY LTD
BLUE SPOT HOUSE 94/96 ROSOMAN STREET • ROSEBERY AVENUE • LONDON • E.C.7
Telephone: Clerkenwell 3570. Telegrams: "Bluospot, Isling, London."

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

Hutcheonad

IN THE P.W. SINGLE DIAL SUPER 'SQUARE PEAK' REGD. TRADE MARK

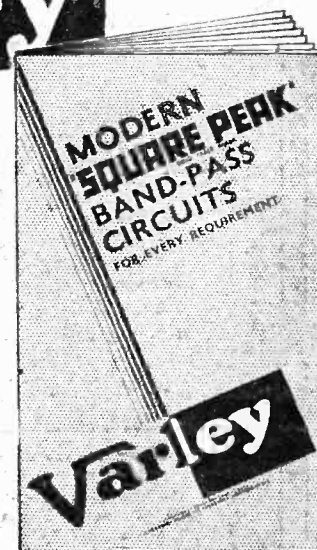
Britain's unbeatable Band-Pass Coils. The ideal pre-selective tuning device for any set—S.G. Reacting Detector or Super-Het. All the advantages of super-selective Band-Pass Tuning, with ample volume and faithful reproduction.

Specified in the "P.W. Single Dial Super," Varley "Square Peak" Coil, Model B.P.7. 15/-.

Varley

The new FREE "Square Peak" circuit booklet shows you how to build modern band-pass receivers—S.G. Sets, simple Detector Sets and Super-Hets.

Fill in the coupon below and post it to-day.



To Messrs. VARLEY, Kingsway House, 103, Kingsway, London, W.C. 2.

Please send me, free and post free, the "Square Peak" circuit booklet entitled MODERN "SQUARE PEAK" BAND-PASS CIRCUITS FOR EVERY REQUIREMENT.

Name
Address
Date
P.W. 2.

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 32.)

dangerous, especially in a short-wave set, how can it be recommended for an adaptor which is used for short waves and short waves only? I do not deny that the adaptors work all right. As a matter of fact, I have had one working to-night, with good results from W 2 X A D (America). But why say spacing is so important and then use a lead which is really three leads in one?"

It certainly does look queer at first sight, L. G. E., but when you examine it closer you will see there is a perfectly good reason for not worrying about the lead to a short-wave adaptor, although it carries three wires at once.

The reason is that all the "short-wave" working takes place in the adaptor itself, and the three wires in the lead from the plug are really just glorified battery leads, passing L.T. and H.T. to the adaptor.

All the tuning, all the reaction, and all the detection takes place in the well-spaced adaptor itself, and a short-wave H.F. choke is inserted in the H.T. lead to the plug which stops any tendencies to wander away from the adaptor proper. Thus there is no H.F.—which it is so important to space properly for—in the leads to the plug.

All the two filament leads do is to carry L.T., and the other lead carries H.T. and the low-frequency, very much the same as the leads in a pair of telephones.

JAMMING ON 300 METRES.

"SHIPS THAT PASS" (Canterbury).—"Can you explain why interference by ships' Morse travels worse in the day than at night? I have frequently noticed this and proved it conclusively when kept indoors recently by a spot of gastric 'flu. During daylight 300 metres and all round Hilversum's wave was often quite spoilt by messages, and yet later in the evening, when the longer-distance broadcasting stations came in strongly the Morse jamming was no trouble at all. Why?"

The reason that the interference is not heard so powerfully after dark is not that it travels less easily then, but that it tends, like the broadcasting programmes, to travel much better! So much better, in fact, that it would spoil broadcasting in very large areas near the coasts, and therefore it has been agreed that ships shall not use the 300 or the 450-metre wavelength after dark.
That is why you don't hear them!

THE "COSMIC STAR" BLUE PRINT.

F. L. W. (no address).—"I think there is an error in the 'Cosmic Star' blue print. There should be an H.T. negative in place of H.T.

NEXT WEEK

HOW TO BUILD OUR SINGLE-DIAL SUPER

A TALK WITH A DUTCH LISTENER

ORDER YOUR COPY OF "P.W."
NOW!
ON SALE NEXT THURSDAY

positive, joining the L.T. negative. No doubt you have found out before, but I write because it would have an amateur really puzzled."

In an article appearing at the same time as the blue print was given away, we pointed out that Ready Radio, Ltd. had informed us that a number of the blue prints were marked in this way, but the actual wiring was quite O.K. The only difference is that the terminal which is joined to L.T. negative should be marked H.T. "negative" instead of H.T. "positive."

THE LISTENER'S NOTEBOOK

(Continued from page 18.)

will receive a similar one of Moscow. The invitation doesn't stop at postcards, either.

Posters will be equally welcome, and a Soviet poster will be sent in exchange for an English one. This offer comes at an opportune time now that the question of wallpaper is being settled in so many households. Moscow's invitation came after a very interesting talk (in English) on "The Fight of the U.S.S.R. for Independence."

* * *

Musical criticism may not appeal to everyone, but I am certain that Mr. Ernest Newman's talks are popular. What is more, they are not solely for the highbrow. Anyone can understand them. He gave German composers a bit of a dressing-down recently, and many listeners must have enjoyed his outspoken comments on the much-talked-of New Concerto of M. Ravel.

* * *

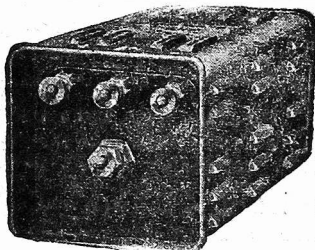
How did you enjoy Jack Hylton's Hour? Great, wasn't it? There's no doubt about the proud position this band occupies among dance bands. It certainly has no equal, in my opinion. I am not certain, however, that he doesn't overdo the staccato stuff, nor am I sure that he is right in playing so many noisy numbers. I noticed this latter feature in a broadcast he gave from Radio Paris a week or so ago. But on that occasion I thought he was catering chiefly for his French audience.

(Continued on next page.)

WESTINGHOUSE

AN AID TO FOREIGN RECEPTION

STYLE
H.T.5.
METAL
REC-
TIFIER



OUT-
PUT
120 v.
20 mA.

Price 12/6d.

The first step towards improving your reception of foreign programmes is the provision of an adequate high-tension supply. Why not run your set from the A.C. mains, using an eliminator incorporating

THE WESTINGHOUSE METAL RECTIFIER

It will give you the steady, ample and permanent current necessary to strengthen your reception and improve your quality; and will enable you to make the maximum use of the capabilities of your set.

"The All-Metal Way" contains full particulars of Westinghouse Metal Rectifiers, and includes circuits and constructional details for building eliminators. The attached coupon and 3d. in stamps will bring you a copy.

COUPON

WESTINGHOUSE PUBLICITY, 82, York Road, King's Cross, London, N.1. Please send me "The All Metal Way," for which I enclose 3d. in stamps.

Name.....
Address.....

P.W. 10.3.32

The WESTINGHOUSE BRAKE & SAXBY SIGNAL Co. Ltd.
82, YORK Rd., KING'S CROSS, LONDON, N.1

Give your Set a GLORIOUS VOICE ..

BRITISH
MADE

Until you have heard this latest MoToR masterpiece, you have not heard the highest peak of loudspeaker perfection. Impressive moving coil "punch" and tonal richness are combined with unusual sensitivity to produce an output that will make you marvel at the enriched performance of your own set.



70'-'

Complete with
Transformer

TRANSFORMER RATIOS: Pentode Type, 30:1.
Power Type, 3 tappings, 25:1, 20:1, 15:1.

MoToR MOVING COIL SPEAKER

Write for fully descriptive pamphlet.

TEKADE RADIO & ELECTRIC LTD.
147, FARRINGTON RD., LONDON, E.C.1

Telephone: Clerkenwell 2486.

Overall Diameter 10 1/2 ins.
Overall Depth - 5 ins.
Cone Diameter - 8 ins.

THE LISTENER'S NOTEBOOK

(Continued from previous page.)

I have been so outspoken over the presentation of certain plays that I hasten to show that I am always ready to give praise with both hands when it is due. The play which I wish to single out for special distinction is "Ann and Harold." If perfection has ever been reached on the radio in connection with a playlet, this surely is the event. Harold Warrender and Ann Trevor made a wonderful pair. Two such voices, so clear, so charming to the ear, were bound to be a big asset to any producer, but the work of the play by Louis Goodrich was also of a high class.

The noise effects were so skilfully handled, and never allowed to interfere with the dialogue, that I began to wonder whether criticism on this point was at last having some effect. However, on listening to the rest of the new series of Tower of London broadcasts, I soon realised that I had been too optimistic, for the fanfares were more ear-splitting than ever, and even the deep voice of Clinton Baddeley was at times overshadowed. The narrator, by the way, was rather mechanical. I should like this duty undertaken by one with a higher and better-pitched tone.

I didn't think the Palladium turn of Teddie Brown and his xylophone matched the standard set by the artistes of the two previous weeks. (I am still chuckling over Wee Georgie Wood's last request to his newly-discovered step-her: "Then take off my boots!") Teddie Brown is undoubtedly an extremely clever xylophonist, but on the saxophone, or as a singer, he is very ordinary. Moreover, the saxophone is not a solo instrument, out of place in a dance band, and the London Palladium orchestra is certainly not that.

A FILTER FOR THE "COSMIC"

(Continued from page 16).

This side of the 2-mfd. is also joined up to the L.S. negative terminal. The plate terminal of the third valve holder goes to the unconnected terminal of the 2-mfd., and then on to the nearer terminal of the choke, the other side of which is joined up to the H.T. plus 2 terminal. That leaves the more connection, namely, the one from the L.S. positive terminal to the H.T. negative terminal.

For "D.C." Users:

Now, before I close there is one small point concerning the use of the output filter with a D.C. mains unit. Sometimes the positive main is earthed, and in this case the loudspeaker would not be completely isolated from the positive main by the electrolytic condenser.

However, this can be remedied as simply as anything by means of another 2-mfd. electrolytic condenser, and it should be connected between the loudspeaker lead that goes to the loudspeaker positive terminal—rather, what was the positive terminal— and that terminal.

New Times Sales Co

OFFER THE EASIEST TERMS FOR EVERYTHING YOU WANT IN RADIO

W.B. PERMANENT MAGNET MOVING COIL SPEAKER Type P.M. 4. With special transformer. Balance in 7 monthly payments of 5/9.

With 5/9 order

ULTRA IMP PERMANENT MAGNET MOVING-COIL SPEAKER. WITH 5/- ORDER
Complete with input transformer. CASH PRICE £2:15:0
Balance in 11 monthly payments of 5/-

BLUE SPOT SPEAKER UNIT AND CHASSIS. Type 100 U. Cash price £1 19s. 6d. Balance in 7 monthly payments of 5/5.

With 5/5 order

BLUE SPOT SPEAKER UNIT 66R with Major Chassis and Cone (37 cm.) Cash price £2 10s. 0d. Balance in 11 monthly payments of 4/7.

With 4/7 order

AMPLION MOVING-COIL SPEAKER, TYPE M.C.6. Permanent magnet, with output transformer. Complete. Cash price £3 7s. 6d. Balance in 11 monthly payments of 6/2.

With 6/2 order

EPOCH PERMANENT MAGNET MOVING-COIL SPEAKER. Type A.2. Cash price £3 3s. 0d. Balance in 11 monthly payments of 5/9.

With 5/9 order

W.B. PERMANENT MAGNET MOVING-COIL SPEAKER, TYPE P.M.3. With 3-ratio input transformer. Cash price £2 12s. 6d. Balance in 11 monthly payments of 4/10.

With 4/10 order

CELESTION PERMANENT MAGNET MOVING-COIL SPEAKER. Type R.P.M.3, with 8-in. reinforced diaphragm. Excluding input transformer. Cash price, £3 10s. 0d. Balance in 11 monthly payments of 6/5.

With 6/5 order

CELESTION P.P.M. PERMANENT MAGNET MOVING-COIL SPEAKER with impregnated diaphragm and dual impedance input transformer. Cash or C.O.D. £2 7s. 6d. Balance in 7 monthly payments of 6/8.

With 6/6 order

R & A "100" PERMANENT MAGNET MOVING-COIL SPEAKER with multi-ratio input transformer. Cash Price £2 17s. 6d. Balance in 11 monthly payments of 5/4.

With 5/4 order

ATLAS A.C. ELIMINATOR, TYPE A.C.244. Three tapings, S.G. Detector, and Power. Output, 120 volts at 20 m/a. Cash price £2 19s. 6d. Balance in 11 monthly payments of 5/6.

With 5/6 order

REGENTONE W.5A COMBINED H.T. ELIMINATOR AND TRICKLE CHARGER. One adjustable S.G., 1 variable and 1 fixed tapings for H.T. L.T. charging for 2 and 6 volts. For A.C. mains. Cash price £4 12s. 6d. Balance in 11 monthly payments of 8/6.

With 8/6 order

REGENTONE W.I.F. H.T. ELIMINATOR. Tapped 60/70v S.G., and 120v. at 12 m/a. Cash Price £2 7s. 6d. Balance in 11 monthly payments 4/4.

With 4/4 order

EKCO K.12 H.T. ELIMINATOR AND L.T. TRICKLE CHARGER. Delivers 12 m/a. Tapped at 80 v. (S.G.), 120/150 v. Charges 1-amp. at 2, 4, or 6 v. Cash price £3 19s. 6d. Balance in 11 monthly payments of 7/2.

With 7/2 order

EKCO H.T. UNIT Type A.C. 25. For multi-valve sets requiring up to 25 m/a. 3 tapings, S.G., detector and 120/150 volts. For A.C. Mains. Cash or C.O.D. £3 17s. 6d. Balance in 11 monthly payments of 7/1.

With 7/1 order

GARRARD INDUCTION GRAMOPHONE MOTOR Model 202. For A.C. Mains. Mounted on 12-in. Nickel Motor Plate with fully automatic electric starting and stopping switch. Cash price £2 18s. 6d. Balance in 11 monthly payments of 5/4 only.

With 5/4 order

EXIDE 120-VOLT, W.H. TYPE ACCUMULATOR, in crates. Cash price, £4 13s. Balance in 11 monthly payments of 8s. 6d.

With 8/6 order

NEW B.T.H. "SENIOR" PICK-UP AND TONE-ARM. Complete. Cash price £2 5s. Balance in 11 monthly payments of 4s. 2d.

With 4/2 order

COSSOR MODEL 235 ALL-ELECTRIC

S.G., Detector and Power. Complete With Valves and Cabinet. Cash Price £9 19s. 6d. Balance in 11 monthly payments of 18s. 3d. 18/3 order

COSSOR 234 EMPIRE MELODY MAKER

Screened Grid Detector and Power. With Valves and Cabinet. Cash price £6 15s. 0d. Balance in 11 monthly payments of 12/6. 10/- order

GRAHAM-FARISH AMAZING 3

As advertised by the manufacturers. With immediate delivery. Supplied less valves and cabinet. Cash price £1 18s. 6d. Balance in 6 monthly payments of 6/- 6/- order

V.3 RADIO FOR THE MILLION

With Valves less Cabinet. Cash price £5 17s. 6d. Balance in 11 monthly payments of 10s. 10d. 10/- order

READIRAD METEOR 3

Less Valves and Cabinet. Cash price £3 15s. 0d. Balance in 11 monthly payments of 6s. 11d. 6/11 order

FORMO ECONOMY 3

With Coils less Valves and Cabinet. Cash price £1 19s. 6d. Balance in 7 monthly payments of 5/6. 5/6 order

OSRAM NEW MUSIC MAGNET FOUR

With Valves and Cabinet. Cash price £10 15s. 0d. Balance in 11 monthly payments of 19/8. 19/8 order

C.O.D. orders over 10/- value sent post and C.O.D. charges paid.

TO NEW TIMES SALES CO.
56, Ludgate Hill, London, E.C.4

Please send me

for which I enclose first payment of

£.....s.....d.

Name

Address

P.W. 19/3/32

MIRROR OF THE B.B.C.

(Continued from page 18)

Mr. Payne is also bringing his Band to the studio on the following Wednesday evening to give a half-hour's programme from National transmitters. In other respects the London programme on Easter Monday includes many of the usual week-day features in outside broadcasts and a concert by the Wireless Military Band.

The Ridgeway Parades.

Philip Ridgeway and his "Parade" company are also paying return visits to the studio, first on Easter Monday to entertain National listeners, and on the following night to repeat their programme for London Regional. Mr. Ridgeway still calls his entertainment a "new song and dance show," and doubtless it will be very much on the lines of what we are accustomed to getting from this well-known producer of the light and cheerful kind of programme.

I hear, by the way, that Mr. Ridgeway's recent theatre tour of the country was a great success, and that at Huddersfield his company drew the largest audience ever present at the Theatre Royal during its fifty years' existence.

AND STILL THEY COME!

Some further "Cosmic" Appreciations

The Editor, POPULAR WIRELESS.

Dear Sir,—About a month ago I was seriously thinking of making a new set, and every new set I saw advertised attracted me, including the "Cosmic III"; that is the set I have built.

I am not going to romance about the wonderful things I've received, as I haven't even tried on the short wave, but I had dance music all last Sunday, February 28th, and so far I've been able to get what I wanted with a little patience, and at present I am only using 100-volt H.T. Exide wet battery: I have another 20 volts coming.

Thanking you in anticipation of many hours' entertainment with a "Cosmic."

Westerham, Kent.

CHARLES BARKER.

SOUTH AMERICA ON MEDIUM WAVES!

The Editor, POPULAR WIRELESS.

Dear Sir—I have carried out exhaustive tests and experiments with the "Cosmic III Star," and am extremely well pleased with the results.

On the medium and long waves the volume and selectivity are exceptionally good. My best piece of reception on these waves is of a South American station with a wave-length a little below Glasgow. On short waves conditions vary considerably. So far I have heard W8XD, W2XAD, W9XAA, W2XAF, PLE, REN, CT1AA, 12RO, and Zeoson. These are all on the loudspeaker.

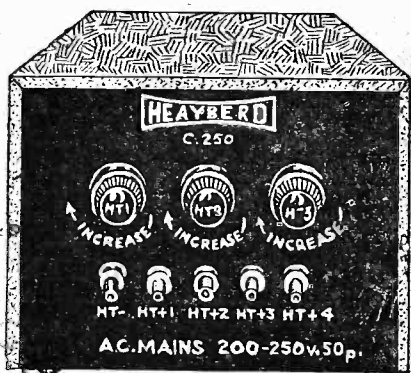
On the amateur bands I have heard W. Dists. 1, 2, 3, 4, 8, and 9; VE Dists. 1 and 4; K4, T1, VS3; and PK, as well as nearly every European country. These will show that the set is all that "P.W." claimed for it.

Yours faithfully,

Muthill, Perthshire.

ALEXANDER CROSS.

EDITORIAL NOTE.—The amateurs referred to by Mr. Cross include Costa Rica, Malay Straits, Dutch East Indies, Porto Rico, U.S.A. and Canada (Manitoba), which with W8XK (Pittsburg), W2XAD (Schenectady), W9XAA (Chicago), W2XAF (Schenectady), PLE (Bandong, Java), REN (Russia) and CT1AA (Lisbon), etc., is a very excellent log.



Know your Unit!

Heyberd C. Mains Units are already assembled and require wiring-up only—thus enabling you to thoroughly know your unit.

Model C.250. Complete in metal case. Bakelite Panel, Westinghouse Rectification. Outputs: 200v. or 250 volts, alternative, at 60 ma. Tappings: 60/80v. Var. S.G., 0-150v. Var., 100-200v. Var., and 250v. fixed. Covered by the Heyberd Guarantee: **150/-**

Send 3d stamps for instructive lists, with diagrams, incorporating Heyberd Mains Transformers.



10, FINSBURY ST., LONDON, E.C.2.
(One minute from Moorgate Und. Stn.)



KAY'S CABINETS
The "Ashley," 36" high, 21" wide, 14" deep, with hand-carved paw feet and 1" hinged top. Vignette cut to suit control knobs of set, or 14" x 6" oval, as shown. Speaker chamber 18" square, fitted with 7-ply sub-baffle. Hole cut to suit type of speaker used. Grill backed with art silk. French polished Mahogany or Walnut finish. Price **30/-**. Illustrated lists of 60 Cabinets free. **H. KAY, Cabinet Manufacturer, Mount Pleasant, R. London, N 17.** Phone: Walthamstow 1626.



WET H.T. BATTERIES
Solve all H.T. Troubles

SELF-CHARGING, SILENT, ECONOMICAL
JARS (waxed), 21" x 11" sq. 1/3 doz. ZINCS, new type 10d. doz. Sacs 1/2 doz. Sample doz. (18 volts), complete with bands and electrolyte, 4/1, post 9d. Sample unit, 6d. Illus. booklet free.

Bargain list free.
AMPLIFIERS, 30/-, 3-valve set, £5.
P. TAYLOR, 57, Studley Road, STAMFORD, LONDON

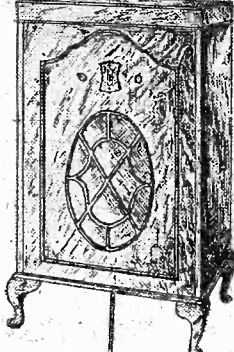
The ACME of CRAFTSMANSHIP
High Grade RADIO GRAMOPHONE CABINET

of exclusive modern design, hand-made and polished on Queen Anne legs.

Figured Oak, £4.12.6.
Figured Walnut or Mahogany, £5.10.0

carriage paid.
Illus. Catalogue Free.
Cabinets made to order a speciality

GILBERT
Cabinet Maker,
SWINDON
Estimates Free. Est. 1866.



CLIX

NEW

Chassis Mounting VALVEHOLDER

with Terminals



THIS is a sturdily built, skeleton type valveholder for mounting on metal, wood or ebonite. Terminals allow for speedy and secure connections.

The turned Resilient Sockets provide maximum surface contact with every type of valve pin, solid or otherwise. Insertion is easy as the crescent-shaped slots in the plate allow the sockets to move laterally and centre themselves to the valve pins.

Centre socket of the 5-pin type is made 1/4" longer to facilitate connection.

LOW LOSS. HIGHEST EFFICIENCY.
4-pin, 8d. 5-pin, 9d.

From all dealers.

Technical press congratulates Clix on the design and efficiency of this new chassis type of valveholder.

Cheapest PERFECT Contact

Lectro Linx Ltd., 254, Vauxhall Bridge Road, S.W.1

ENGINEERS! Here is a straightforward proposition. Will you give us the chance to prove that you can earn £300, £400, £500 per year and more? It will cost you nothing to investigate, and you are bound to benefit. A postcard will bring our 200-page Hand-Book, "ENGINEERING OPPORTUNITIES," which outlines many unusual chances of well-paid, permanent, and pensionable employment. Among other things, the book also contains details of A.M.I.Mech.E., I.E.E., B.Sc., Matric., G.P.O., etc., Exams, and outlines Home-Study Courses in all branches of Elec., Mech., Motor, Aero, Radio and Talkie Engineering, Building, etc. You owe it to yourself to read our enlightening hand-book—Free of obligation. Send for it to-day, stating branch of most interest.

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY,
401, Shakespeare House, 29/31, Oxford Street, London.

LOUD SPEAKERS REPAIRED, 4/-

(Blue Spot a Speciality, 5/-)

Transformers 4/6, Headphones 4/6, all repairs magnetised free. Tested, guaranteed, and ready for delivery in 24 hours.

Discount for Trade. Clerkenwell 9069
E. MASON, 44, EAST ROAD, N.1.

EXACT TUNERS

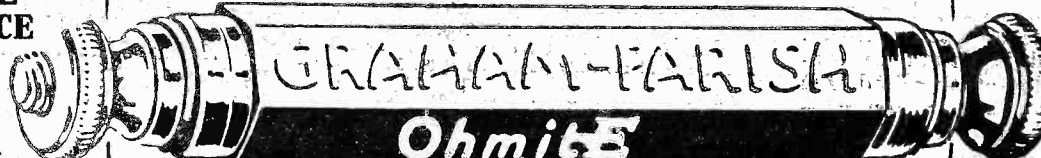
250 to 2,000 metres
Thousands of these tuners are in use, and we can strongly recommend them. No further coils are required. Send P.O. for particulars and circuits—FREE

THE EXACT MANUFACTURING CO.,
Croft Works, Priory Street, Coventry.

OHMITE RESISTANCE

All values from 300 ohms to 5 meg-ohms.

1/6 "Ohmite" Holder 6d.



Made by
GRAHAM-FARISH,
Bromley,
Kent.

"BETTER THAN WIREWOUND!"

TECHNICAL NOTES

Some diverse and informative jottings about interesting aspects of radio reception.

By Dr. J. H. T. ROBERTS, F. Inst. P.

Operating Skill.

A GOOD deal is said about tone and quality of reproduction as being dependent on the components used in the set, the layout of the circuit, and various other matters connected with the receiver. These, of course, are very important and, if there is any inherent defect in the set, it is obvious that no amount of operating skill will entirely overcome it. But at the same time, I think bad quality is much more due to bad operation of the receiver than to defects of the instrument itself.

The most flagrant example of this, of course, is the misuse or excessive use of reaction. It very often happens that a set will, in proper hands, give excellent quality of reproduction, but in the hands of an unskilled or careless user give just the opposite.

Relying on Reaction.

I do not think it is necessary to say much about the use of reaction, because in these days everyone knows that reaction is to be regarded as a sort of medicine, only to be used sparingly and not to be relied upon as a regular thing. When listening for distant or weak stations you will generally have to use some reaction, and you are very apt to get in the habit of relying upon the reaction and using far too much of it when receiving local or fairly strong stations.

Remember that even quite a small amount of reaction, or perhaps I should say of unnecessary reaction, will have the effect of cutting down the higher notes and also probably of sharpening up the tuning and making the set still more difficult to control. It is almost an axiom nowadays that if you have to rely upon a large amount of reaction to get the desired signal strength, especially on nearby stations, there must be something wrong with the set or with the operation of it.

If it is the operation that is wrong it is most probably the tuning, but at the same time you should take a careful look over the coils to make sure that there is no undue loss there, and also be certain that losses are not occurring due to high resistances in the aerial circuit.

Controlling Volume.

As regards the tuning, this also is one of the most fruitful sources of distortion many listeners making a bad habit of using the tuning for the purposes of volume control. Strictly speaking, a set should be accurately tuned always and any variations, either in quality or quantity, which you want to make should be carried out independently of the tuning.

In other words, the tuning control should be used for tuning and nothing else. If the set is particularly selective—as most sets are in these days—the distortion brought about by improper tuning of the main circuits will be all the greater.

(Continued on next page.)

AIR-GAPS ELIMINATE LEAKAGE

IN the old type H.T. accumulators, electrical leakage is inevitable—moisture settles on their unbroken tops, forming a film which provides a direct connection between the positive and negative terminals. And serious waste is the result. But in the Lively 'O' Accumulator, each cell is separated by an air-gap—air is a most effective insulator—thus electrical cell-to-cell leakage is definitely eliminated. There is no 'falling off' in voltage due to leakage—no self-discharge—no waste. The Lively 'O' gives pure, smooth current in abundance—just what your Set needs. Your Dealer stocks the Lively 'O.'



Above you see how the current can creep along the smooth unbroken top of the old-type H.T. Accumulator. Compare with it the separate air-spaced cells of the Lively 'O' (right). Note also that additional means are now provided for using ordinary wander plugs for tappings.



MADE IN TWO SIZES:

Type HT
Standard 10 volt Unit
(2,750 Milliamps)

5/6

each

Type LHT
Extra large capacity
10 volt Unit (5,500
Milliamps)

6/9

each

The
Lively 'O'
MADE BY
OLDHAM
H.T. ACCUMULATOR.

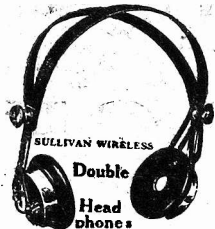
Oldham & Son, Ltd., Denton, Manchester, and at London, Glasgow, Belfast and Dublin. Makers of Dry Batteries and Accumulators. Established 1865. Contractors to British and Foreign Governments, Railway Companies, etc.

ELECTRADIX

No. 2 BRITISH GOVERNMENT BARGAINS
LOWER PRICES THAN EVER.

Continued from March 5 issue.

More of this useful apparatus is listed below, for others see special Bargain Sale List, post free.
AUTOMATIC CUT-OUTS. Electromagnetic, for 12 to 100 volts, 10 amps., auto cut-in-out with vibrator volt regulator combined. Cost pounds. To clear at absurdly low price of 7/6.



SPEAKERS AND TELEPHONES. Sullivan's 120-ohm, with headbands, sacrificed at 3/6. 8,000 ohms, 4/6, cost 35/-. Brown's Reed, 1,500 ohms, 12/6 per pair; 120 ohms, 7/6 per pair. Single Receivers, make fine **Loud Speaker Units**, 750 ohms, 7/6; 60 ohms, 4/6. Single Phones, Western or Ericsson, 1,000 ohms, 2/6 each with Cord. Single

Receiver Magnets, bobbins and case for conversion to **Gramophone Pick-ups**, 1/-. Soft Rubber Earpiece Cushions, 2d. pair, or 1/6 doz. pairs. D.H.I. Field Phones, L.R. leather head-band and cords, 2/6 pair. Brown's Swivel Headbands, 1/8 pair. G.P.O. Long Magnet receivers, price 2/- only. 5-way outdoor Telephone Wire, cheap, 3d. per yard. Indestructible Phone Cords, 1/-. Moving-Coil Speakers, with input Transformer, Jensen 6v. for Battery Sets, 25/-. Dynoplus, 6v., 30/-. B.T.H. R.K., 220v. D.C., 40/-. Jensen A.C. 110/250v., with input and mains transformers and rectifier, list £5 10s. Sale 55/-.
HOUSE TELEPHONES. Micro-télé., hand-comb., Unbreakable Metaphone sets. For operation on existing bell circuits. Micro and Phone receiver on one handle, fitted auto-switch. Ideal for boudoir to kitchen or garage. Fitted in 5 minutes. Half price at 12/6 per pair.

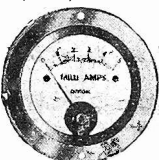
SWITCHES. 5 amp. Tumbler, 6d. Rocker on-and-off, 6d.; 2-way do., 8d.; 3-way, 10d.; 5-way, 1/-; 6-way, 1/2. Rx. and Lucas 3-way and 5-way, 3/-; 8-way, 3/6. Extra H.T. 2-pole, 2-way, oil-filled, 10/6. Also a lot of heavy switch gear, fuses, and resistances. All cheap. 2-hole Plug Sockets on base for battery mike, or phone or mains, 2d. Phone Cords, 9 ft., 1/-. Porcelain H.T. 4-116 stand, 11. Insulators, 2/-. Ceiling Roses, porcelain, 6d. Indicating on-off Mains Switches, 1/3. Mains Plug and Sockets, shock-proof, safety red and black, 1/- pair.

TRANSFORMERS. Intervalve, Marconi, Eric, sq. type, very compact and efficient. List 12/6. Sale, 2/6. Sifam Power-amplifier Trans., new in box, 4/9. 12 months' guarantee. Western Electric Output Trans., 2-1 ratio, 2/6. Sterling, 1 to 1, 3/-. **A.C. MAINS.** Stock of Transformers too numerous to list, so please specify wants.

WIRELESS RECORDERS. Morse Inkers, in new condition. Magnificent British Workmanship. Solid brass case, fine finish on base, with tape reel. Cost £30. Sale, £4 10s. to £7 10s.

FULTOGRAPHES. 45/-. Complete Kits, 27/6. Recorders only, 19/6. Prices for March only.

SUNDRIES. 1/2 cwt. Cord and Pulley, 28 yds. best 4-lay 3 in. manilla rope, with galv. pulley block and swivel snap-hook, worth 10/-. Sale, 5/6. **Artillery Electric Pocket Torches**, with new "Ever-Ready" Battery, 2/6. Airship Safety Lamps, 7/6. 2-volt Accumulator, 5/-. 25 volts to 220 volts Candle Lamps, 6d. Radiator 250-watt 110-volt Lamps for charging, 2/6. 3-amp. Wall Plugs for mains, 9d. 2/6 for 5 bobbins of 36g. enam. copper wire, 300ft. each, total 1,500ft. 250 ohms for 2/6, post 6d. Polarity Indicators, 3/6. Helio Mirrors for television, 54in. diam. 1/6. Relays for Selenium cells, 12/6. Battery Hydro-meters, 9d.



METERS, for A.C. moving-coil, 2 1/2 in. flush panel, 0-1 1/2 amps., with inside rectifier, 25/-; 0-6 amps., 27/6; 0-9 amps., 30/-. Hot Wire Ammeters, 5 amp., 5/-; 1 amp., 6/-; 1 1/2 amp., 6/6; 2 amps., 7/6, adj. zero.

MILLIAMMETERS. 20 mA. 1 1/2 in. Midget, 7/6. 2 in. B.T.H. 50 mA., 8/6. Best 1st Grade

MC 100 mA., 25/-; 500 mA., 27/6. Special Bargain, 1,000 mA., 30/-. All panel 2 1/2 in. Range. MC Meter, 0-5 mA. with shunts for 50, 100, 150 and 250 mA., as illus., 25/-. Weston Microammeters, 900, 45/-.
VOLTMETERS. A.C. 2-range panel, 0-250v. and 0-500v. A.C. or D.C., 35/-. A.C. pocket 5-range test set for mA., volts and amps., 49/-. D.C. Mov. Coil Cell Testers, 3-0.3v., 20/-. 2-range circscale 0-3 and 0-30v., 25/-. Weston 301 on 4 1/2 in. desk stand, 0-30v., with 5 terminals and push; cost £4 10s., 30/-. Panel 0-30v. and 0-300v., 35/-. 2 1/2 in. Electrostatic Voltmeters, 500/2,500 volts, for H.T., 40/-.
AMMETERS. 2 1/2 in. moving coil, 1st grade, 0-1 1/2 amps., 25/-; 0-5 amps., 25/-; 0-10 amps., 25/-. Central zero ditta, 20-0-20 or 50-0-50 amps. Turner with shunt, 25/-.
Bargain hunters should send addressed envelope at once, for new Sale List just printed. It is impossible to repeat these goods.

ELECTRADIX RADIOS,
218, Upper Thames St., London, E.C.4
Telephone: CITY 0191.

TECHNICAL NOTES

(Continued from previous page.)

It follows from this that the more sharply the set tunes the more important it is to have fine control of the tuning, which means that a slow-motion dial is absolutely essential for the main tuning. Some people say that fine control is not necessary for reaction, but, personally, I prefer to have coarse and fine adjustments, even for the reaction control.

If you find that the fine control is not necessary in any particular case, you are not bound to use it.

With a selective band-pass or super-het arrangement it is especially important to get accurate tuning, otherwise you will run into sideband distortion, of which we hear so much lately.

Sidebands.

Perhaps a few words on this cutting-off of sidebands may not be out of place. When the tuning circuit is of very low resistance and the tuning correspondingly sharp, the high notes, as I mentioned above, are very liable to be cut off if there is any error or inaccuracy in the tuning.

The reason for this is that when the circuit is adjusted for a particular frequency it receives not only that frequency, which is the fundamental frequency of the station which we are picking up, but also a number of other frequencies close to the fundamental frequency. Now if the tuning circuit picks out any particular frequency very sharply, there is a tendency for these adjacent frequencies to be cut off and this tendency is greater the sharper the tuning.

The consequence is that if the sidebands are unduly sacrificed the reproduction is distorted and the speech becomes less clear, or "crisp," as it is sometimes called, and other sounds, such as music, become emphasised in the lower frequencies. I should perhaps add, for the benefit of more advanced readers, that there has been a good deal of controversy recently on the precise theory of sidebands and their influence upon quality and selectivity.

Some people have gone so far as to deny the existence of sidebands altogether. This controversy, however, may be regarded—at any rate so far as the amateur is concerned—as rather a theoretical matter concerned more with the method by which the result is produced than with the actual result itself. Whether we subscribe to the sideband theory or not, there is no doubt that in actual practice we get the results indicated above, and to avoid distortion we have to take the precautions indicated.

Quality and Selectivity.

Selectivity and good quality do not in the ordinary way run together. They are to be regarded, in fact, as rather opposing factors and in the result we must generally be content with some sort of a compromise.

To get good quality as well as good selectivity it is really necessary to have a number of tuning circuits. If only a limited number of tuning circuits can be used, these individual circuits must not be made unduly selective if we are aiming at good quality.

It is generally considered that at least three tuning circuits should be used if good selectivity is wanted without loss of quality. Most ordinary sets with any pretensions to selectivity have at least two tuning circuits,

whilst on the other hand, for good selectivity and good quality, many people go to the length of using as many as four tuned circuits.

One of the objections urged against the ordinary three-valve set having a single stage of H.F. amplification is that with only two tuned circuits, good quality must to a large extent be sacrificed to selectivity.

Band-Pass Tuning.

I should say that by means of the popular system known as band-pass tuning, the number of tuning circuits can be increased without an extra valve, so that this aids in selectivity without loss of quality. The essence of the band-pass tuning arrangement is the use of two loosely-coupled circuits prior to the first valve, and this has the advantage that it avoids, at any rate to a large extent, the suppression of the sidebands which, as I indicated above, are so important for preserving faithfulness and quality in the reproduction.

There is such a cry for selectivity these days that often people are tempted to overdo things and to go out for a degree of selectivity which is far in excess of what is required in the conditions. You will see from the above that all the time you are increasing the selectivity of the set you are laying up trouble for yourself with quality.

Therefore, pay particular regard to the conditions in which your set has to be operated and do not sacrifice quality which you want, for extra selectivity, which you may not want. In this connection, it is often a good plan to use the pre-set condenser in the aerial lead, which I mentioned a little time back.

The Output Circuit.

Whilst on the subject of operating the set for best quality, I should not forget to mention the use of an output filter circuit, but as I have said something about this particular subject once or twice lately in these Notes, there is no need to go into it again just now. But that does not mean it is not a very important factor in the whole outfit if you are looking for quality.

The tapped output transformer, which I mentioned recently, is also a very great help in matching up the speaker with the output of the set.

Loudspeaker Extension Leads.

There is one point, however, which I have not mentioned, and that is the earthing of the loudspeaker leads. If you are using long leads and find that these have a detrimental effect on quality you might try earthing one of the speaker leads (when using an output transformer).

Sometimes you will find the earthing connections indicated on the instrument itself. Note, however, that this applies to transformer output. With a choke output arrangement generally one lead is connected to H.T. plus or L.T. minus, and this point should be noted with an all-mains set, especially if you are using long loudspeaker leads.

H.F. Control.

Volume control is a very necessary feature in these days, and no set can be regarded as complete without it. To reduce strength on the H.F. side a rheostat in the negative lead of the screen-grid valve is useful.

(Continued on next page.)

TECHNICAL NOTES

(Continued from previous page.)

Remember not to put this in the filament circuit of the detector. By the way, if you are using a pick-up, obviously the control of the H.F. valve is no use when the pick-up is working. In such a case you will need a volume control on the low-frequency side.

The reaction control, as I think I have already indicated, should not be used for the purpose of a volume control in the ordinary sense.

You will notice that whilst a rheostat can be fitted quite easily in the case of a battery-driven set, it cannot be used with an all-mains receiver, so that so far as control of H.F. volume is concerned the rheostat is in this case out of the question; a pre-set condenser in the aerial lead will, however, generally meet the case.

Sensitivity of Pick-ups.

Although we hear so much about sensitive pick-ups, we do not always realise that a good deal of distortion is caused by the output from the pick-up being actually too great and overloading the grid of the first valve.

One obvious way to overcome this is to connect a potentiometer between the pick-up and the grid circuit of the first amplifying valve so as to act as a volume control on the pick-up.

Also, if the output of the pick-up is too great, the first valve in the amplifier should be given a suitable negative bias, the amount of which you can easily find out by actual trial.

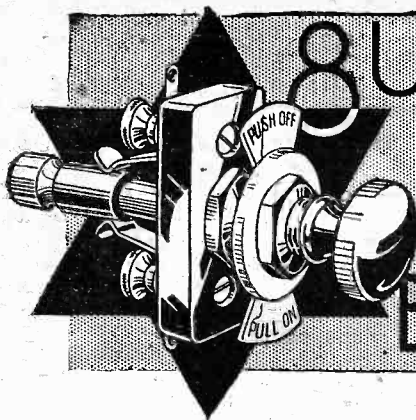
Grid Damping.

There are a good many amateurs who still have a leaning to anode-bend detection, notwithstanding that the ordinary grid-leak detector arrangement can now be operated in such a way as to involve really very little distortion indeed. One reason for the continued popularity of the anode-bend detection system is that, since the grid is negatively biased, so that there is no grid current flowing through the tuning coil in the grid circuit of the detector, the damping of the grid is avoided.

Better Selectivity.

The effect of this is to improve selectivity and, as most of my readers know perfectly well, this may in some cases make all the difference to the ability of the set to cut out a particular station.

When using the anode-bend detector a fairly high impedance should be used in the anode circuit. Incidentally, if the resistance feed method is used, it is often quite satisfactory to use an L.F. transformer of only comparatively low primary impedance, operating with an anode-bend detector.



8 UNIQUE FEATURES THAT PROVE THE SUPERIORITY OF THE BULGIN $\frac{1}{2}$ 22 SWITCH

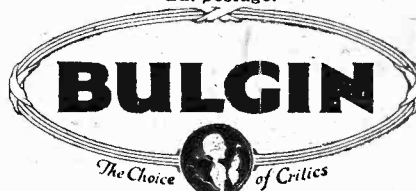
1. Definite snap action—you know when you are "on" or "off."
2. The springs are not under tension in the "off" position.
3. Highly finished throughout in keeping with the most elaborate panel layouts.
4. Transparent indicating plate gives the appearance of direct engraving on the panel.
5. An occasional turn of the knob ensures self-cleaning contacts.
6. Pure Nickel Silver Springs.
7. Long heavy bearings and spindle assembly.
8. Guaranteed for at least 2 years. Will last ten.

THE culmination of 7 years' experiment and unrivalled experience in switch manufacture. This switch has been specified in practically every leading circuit and is giving satisfaction to thousands.

1/6

Brown or Black knobs.

Have you got our famous 75 pp. Catalogue? 2d. postage.

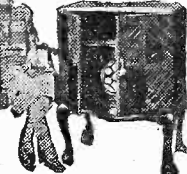


A. F. BULGIN & CO. LTD.
Abbey Road, Barking, Essex.
Telephones: Grange Road 3266 & 3267.
London Showrooms: 3, 10, 11, Curzon Street,
Chancery Lane, E.C.4 Telephone: Holborn 2072.

Specify Bulgin Quality Components

Famous Makers' **£5** Radio Gram **65/-**
Offer: **7 DAYS FREE TRIAL.**

Polished Oak Piano Tone Cabinet (43 ins. high 24 ins. wide) at makers prices. Delivered FREE British Isles. PHOTO-GRAPHS and LISTS FREE. All Models from 35/- to £15



PIANO TONE

Acoustic chamber yields mellow, rich, full volume that your speaker is really capable of. 3,000 clientele. Radio-Press, B.B.C. List Free from makers:—

P.CKETTS Piano Tone Cabinets (P.W.), Albion Rd., Bexleyheath, Kent.

It pays you to ask your Retailer for genuine guaranteed

WAVEMASTER

Variable Condensers and Extensers for all the latest circuits

WEBB CONDENSER CO., LTD.
42 Hatton Garden, London, E.C.1.

PLEASE be sure to mention "Popular Wireless" when communicating with Advertisers. Thanks!

EASY PAYMENTS

"There's no place like HOLMES."

The first firm to supply wireless parts, on easy payments. Seven years' advertiser in "Popular Wireless." Thousands of satisfied customers.

	Deposit	Monthly Payments
TELSEN VICTOR 3 KIT	39/6	5/5 7 of 5/5
COSSOR KIT	£6/15	10/- 11 of 12/8
OSRAM KIT	£10/15	19/6 11 of 19/8
METEOR 3 KIT	£3/15	6/10 11 of 6/10
EXIDE H.T. Accum. 120v.	£3	6/- 9 of 6/8
BLUE SPOT 66R & CHASSIS	£2/2/6	5/6 9 of 4/5
BLUE SPOT 100 U	39/6	5/8 7 of 5/4
AMPLION M.C.6	67/6	7/5 9 of 7/5
CELESTION M.C.	47/6	5/3 9 of 5/3
EKCO Eliminator A.C. 18	67/-	7/5 9 of 7/5

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.

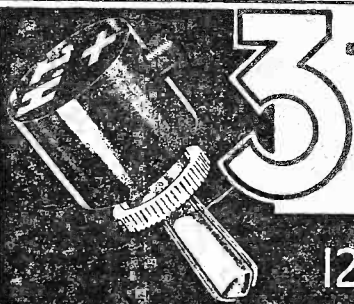
H. W. HOLMES, 29, FOLEY STREET, Great Portland Street, London, W.1.

'Phone: Museum 1414.

Make

The DAILY SKETCH

YOUR Picture Paper



3-prong Spring Grip

BELLING-LEE WANDER PLUG.

Stays put, even in portables under vibration. Side-entry: the whole flex gripped—copper, rubber and braiding. Loaded without tools. Resilient hard drawn spring wire prongs (not soft brass). Grips every battery socket: each plug tested in sockets smaller and larger than any known H.T. battery socket.

Write for complete list of Radio Connections.

12 PERMANENT INDICATIONS

BELLING-LEE
FOR EVERY RADIO CONNECTION

EELEX TREBLE-DUTY TERMINALS

This new Eelex Treble-Duty Terminal is just what you have been looking for. It enables you to make three different connections—the indicating tabs—Earth—Aerial—H.T.—L.T.—etc., are all interchangeable, but the screw top is non-removable, therefore cannot be lost. A Revolutionary Terminal, it will pay you to use them when you build your next set.

PRICE **4½d.**

BYLDURONE CABINETS

Here are the cabinets which appeal to the discriminating amateur set constructor. Their distinctive appearance and the ease with which they can be built have made them the most popular cabinet on the market. Test "Byldurone" for yourself when you build your next set.

Write for List A20.

J. J. EASTICK & SONS

Eelex House, 118 Bunhill Row,
London, E.C.1.

'Phone: Metropolitan 0314/56.

INVENTORS. Your ideas may be worth royalties if submitted to manufacturers—but apply for your PATENT first. Write for my FREE "INVENTORS' POCKETBOOK" explaining how to patent inventions. Submit particulars in confidence for free expert advice. EDWIN P. AXE, A.I.M.E., 27, Chancery Lane, London

TRAINED MAN WANTED AT ONCE. Do not be left behind. Get into the Radio or Talkie industry quickly by training at home with the R.T.I. (Gr. Br.). A student writes:—"Although I have only started your Course this month I already regard it as the best investment I have ever made to ensure an enjoyable and prosperous future."—(Signed) R. S. Closs, Westcliff-on-Sea. Send for our booklet "Progress" and employment form. Post Free. No obligation is incurred. **RADIO TRAINING INSTITUTE OF G.T. BRITAIN** 10 Union Bldgs, St. John St., Newcastle-on-Tyne.

Non-discolouring

SPECIFIED FOR THE
"COSMIC" THREE STAR

The only Ebonite guaranteed **never** to spoil your set by discolouring.

Black, Mahogany or Walnut finishes with an amazing mirror polish. Easy to cut and drill and costing only 4/6 for 7" x 18" panel.

Ask your dealer or write to us for list. Any panel size cut. Cash or C.O.D. by return.

BRITISH HARD RUBBER CO., LTD.,
PONDERS END, MIDDLESEX

PERMCOI

PLEASE be sure to mention "Popular Wireless" when communicating with Advertisers. Thanks!

"P.W.'s"

SPECIAL PROGRAMME FROM "ESTACAO RADIO CT1AA"

(Continued from page 7.)

metres to-morrow night, because, after all, this is primarily a "Cosmic" test. But we do not want you to infer from that that there is anything exclusive about it!

On the contrary, we extend a cordial invitation to every one to participate, for apart from the general interest necessarily associated with a programme such as this, the opportunity of hearing Captain Eckersley is much too good to be missed!

Where to Find Him.

Remember, the wave-length is 42.9 metres, which for "Cosmic" owners will be between about 160 and 170 degrees, and the time is ten "pip-cmma" precisely! And we shall be glad to hear how you get on.

Now, there is just one thing to which I want to refer by way of conclusion, and that is concerning the special record of Captain Eckersley which has been made by the H.M.V. people for the occasion of our Lisbon broadcast.

Naturally, it's rather a valuable record, because it is the only record of Captain Eckersley that is available, and, of course, even this one will not be on sale to the general public.

Well, I have been having a chat with the Technical Editor as to what is to be done with this original record when the broadcast is over, and he has put forward the excellent suggestion that it might be handed on to one of you fellows autographed by Captain Eckersley as a sort of historical souvenir.

Then, of course, the problem arises as to who is to have the record, for much as we should like to break it into thousands of little bits, that is hardly a practical way out of the difficulty!

So I think the best way of settling it is to get everybody who is interested to send in a fifty-word description of what you think of the Lisbon broadcast idea. The record will be given to the reader who sends in what, in our opinion, is the best effort.

"Write on a Postcard."

And, in order to give everybody a chance, I'm not going to confine this offer only to those who participate in the broadcast. It is open to every reader of "P.W." who submits an entry, and let me hasten to add that efforts will not be judged on literary ability.

Just write on a postcard your own personal views, whether humorous or otherwise, of our special broadcast idea, and send it along to me at Tallis House, Tallis Street, E.C.4, so as to reach me not later than the first post on Thursday, March 24th, and, as I anticipate that rather more than a few of you will be keen to get this record, I'm going to ask you to limit your description to fifty words! To give you plenty of latitude, perhaps we had better make it not less than thirty, and not more than fifty words. So now it's up to you!

Don't forget the address: G. T. Kelsey, Tallis House, Tallis St., London, E.C.4.

When did you
last examine
your "EARTH"?

**SATURATE
it
NOW
with**

TERRA-VIVER
REGISTERED
the CONDUCTIVITY
Chemical

A Good Aerial
is spoilt with
a Bad Earth—

So do Not Neglect
Yours
for **ONE SHILLING**

SENSITIVITY
Definitely
Increased
within **24 hrs.**

From all Radio Dealers or
ERIC J. LEVER (TRIX), LTD.,
8/9, Clerkenwell Green, E.C.1.

LOW-TENSION CHARGER for A.C. MAINS

55/- Complete. THE "N.P." (Novice Proof.)
The most efficient unit yet produced.

Passed by eminent electrical authorities.

Variable output 2, 4, or 6 volts at 5 to 2 amps. You can charge your friend's battery with your own at no extra cost. Will do up to four 2-volts at one time in 8 hours. Cost of running negligible. Trial 7 days given.

55/-
Send for Lists. State Mains Voltage.

Mfrs.
NASH PRODUCTS Ltd. (Agents Wanted)
93 Victoria Road
Stechford, Birmingham

Improve: VOLUME TONE CLARITY

with Tonax, the cone adaptor which grips securely the reed of ANY unit and makes a snug fitting with ANY cone.

SINGLE CONE TYPE 1/-
DOUBLE CONE TYPE 1/6

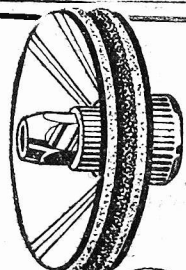
Price includes: Three chucks, linen, felt, and both deep and standard metal washers.

Quickly and easily fitted. Ask for 1932 model.

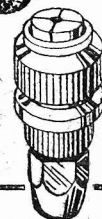
TONAX
IMPROVED CONE ADAPTOR

Garratt Stores (Dept. P), 193 Garratt Lane, S.W.18

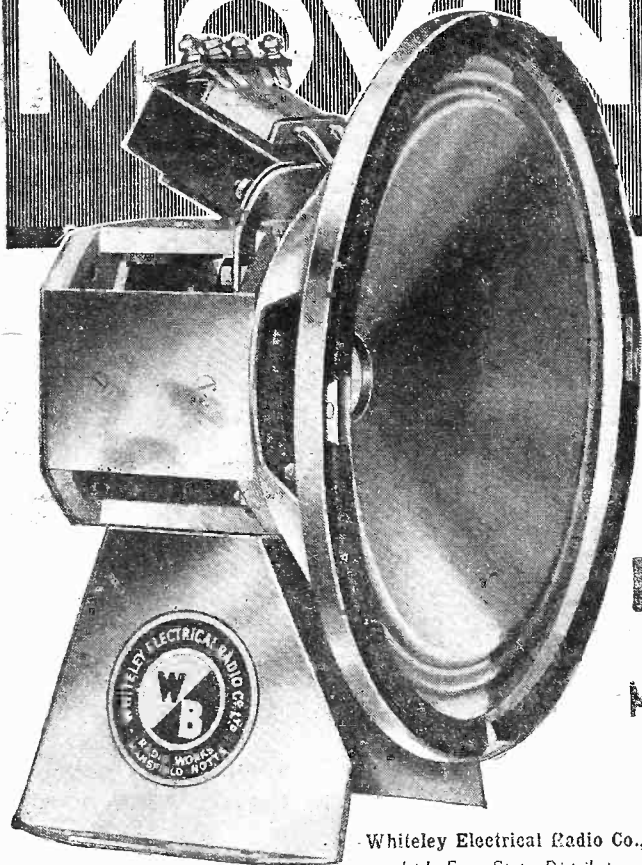
REMEMBER! "POPULAR WIRELESS" has the largest sale of any WEEKLY WIRELESS JOURNAL.



From all
dealers or
direct Post
2d. extra.



MOVING-COILS FOR THE MILLION

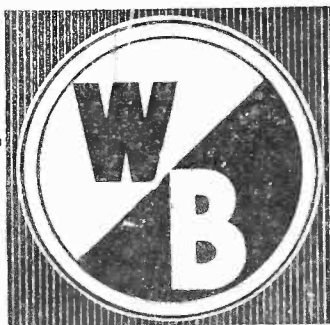


This entirely new "W.B." model P.M.4 is an event in British radio. Brings true "moving-coil," glorious reproduction within easy reach of all. Hear it at your dealers. You will be astonished, delighted. Great sensitivity. Works brilliantly from ANY 2-, 3- or multi-valve set. Sheffield-made cobalt steel magnet, weight 4½ lbs., guaranteed 5 years. Write for leaflets.

35/- Without Transformer

42/- Complete with output transformer mounted on top.

**PERMANENT
MAGNET**
Moving Coil Speaker
P.M.4



Whiteley Electrical Radio Co., Ltd., Nottingham Road, Mansfield, Notts.
Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin



Be-
tween
SHOTS—

they all take a look at FILM PICTORIAL. Here is Nora Swinburne, who, like everybody else, can't resist the attraction of this new super paper of the films.

FILM PICTORIAL is printed entirely in photogravure, with special pages in COLOUR. There is all the news of the stars and of forthcoming films. There are exclusive photographs and studio gossip. There are . . . but we can't mention them all.

Film Sufficient to say that FILM PICTORIAL is a Super Paper of the Films. Now be quick and get a copy.
Every Thursday PICTORIAL 2^D.

"POPULAR WIRELESS" ADVERTISEMENT RATES

Whole Page £40 Quarter Page £10
Half Page £20 Eighth Page £5

Narrow Column Advt. (3 cols. to page) per inch 30/-
Minimum Space accepted half inch 15/-

NO SERIES DISCOUNT. ALL COPY AND BLOCKS MUST BE IN HAND 11 DAYS BEFORE DATE OF ISSUE TO ENSURE PROOF.

ALL communications respecting ADVERTISING must be made to:—

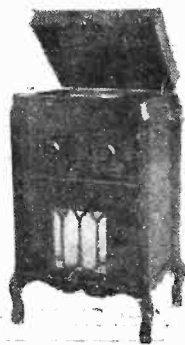
JOHN H. LILE, Ltd., 4, Ludgate Circus, London, E.C.4.
Telephone: City 7261.

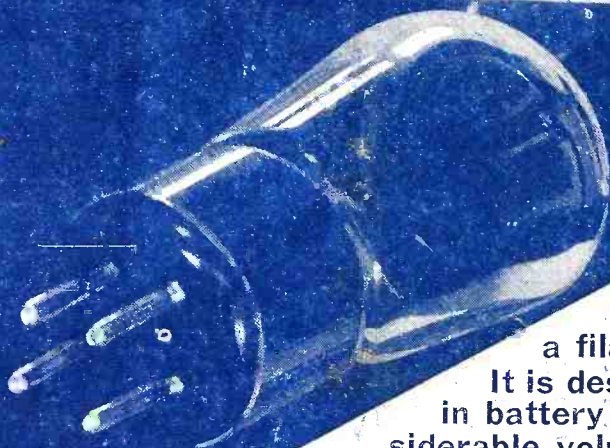
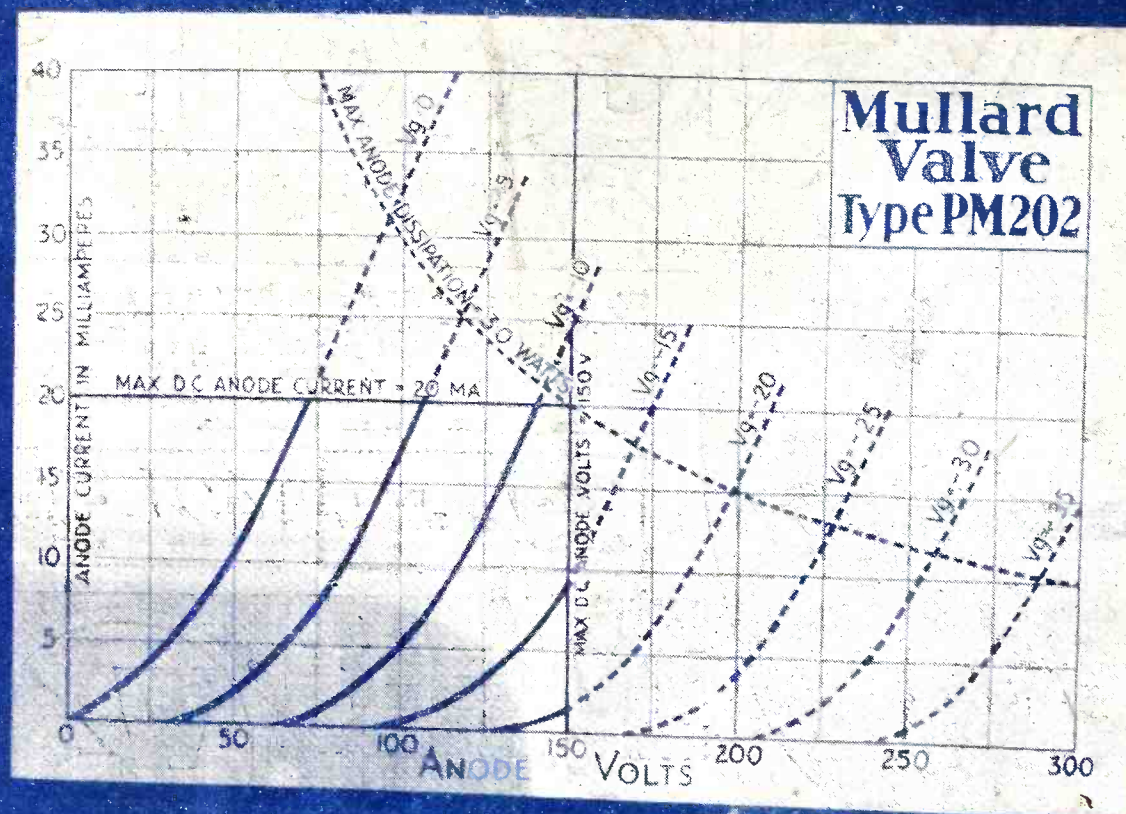
2 GNS Still Buys Our HANDSOME !!!! RADIO-GRAM CABINET OF EXCELLENT DESIGN AND QUALITY

These Cabinets are soundly constructed in selected OAK, etc., and polished a rich Jacobean shade.
SIZES: 3' 3" HIGH 22" WIDE 19" DEEP
Gramophone 3½" CLEAR FOR PICK-UP
Compartment: 3½" MOTOR
Wireless For PANEL up to 18" x 7"
Compartment: BASEBOARD 14½" deep.
Speaker 20" x 15" x 14" allowing ample room for speaker and batteries.
Compartment AND AT THE ASTOUNDING PRICE OF 2 GNS.!! PACKED FREE CARR. PAID Cash with Order or C.O.D.

W. S. WILKIN,
Cabinet Manufacturer, 12, Nelson Mews, SOUTHEAST-ON-SEA, ESSEX. Trade Enquiries Invited.

Illustrated Name.....
Catalogue Address.....
Post Free. Address..... PW 1.





**P.M.
202**

**SUPER POWER OUTPUT
with ECONOMICAL CONSUMPTION**

A super power valve consuming a filament current of only 0.2 amp. It is designed for use as an output valve in battery operated receivers where considerable volume is required and where the available signals are greater than can be handled without distortion by a valve of the power class.

OPERATING DATA

Max. Filament Voltage 2.0 volts
Filament Current - 0.2 amp.
Max. Anode Voltage - 150 volts

CHARACTERISTICS

(At Anode Volts 100 : Grid Volts Zero)

Anode Impedance 2,000 ohms
Amplification Factor - 7.0
Mutual Conductance 3.5 mA/v.

MADE IN ENGLAND

PM202 Mullard

THE MASTER VALVE

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

ARKS

Printed and published every Thursday by the Proprietors, The Amalgamated Press, Ltd., The Fleetway House, Farringdon Street, London, E.C.4. Advertisement Offices: Messrs. John H. Lile, Ltd., Ludgate Circus, London, E.C.4 (Telephone: City 7261). Registered as a newspaper for transmission by Canadian Magazine Post. Subscription Rates: Inland and Canada, 17/4 per annum; 8/8 for six months. Abroad (except Canada), 19/6 per annum; 9/9 for six months. Sole Agents for Australia and New Zealand: Messrs. Gordon & Gotch, Ltd.; and for South Africa: Central News Agency, Ltd. Saturday, March 19th, 1932. S.S.