

A GIFT FOR EVERY READER THIS WEEK

Popular Wireless

Every Thursday
PRICE
3d.

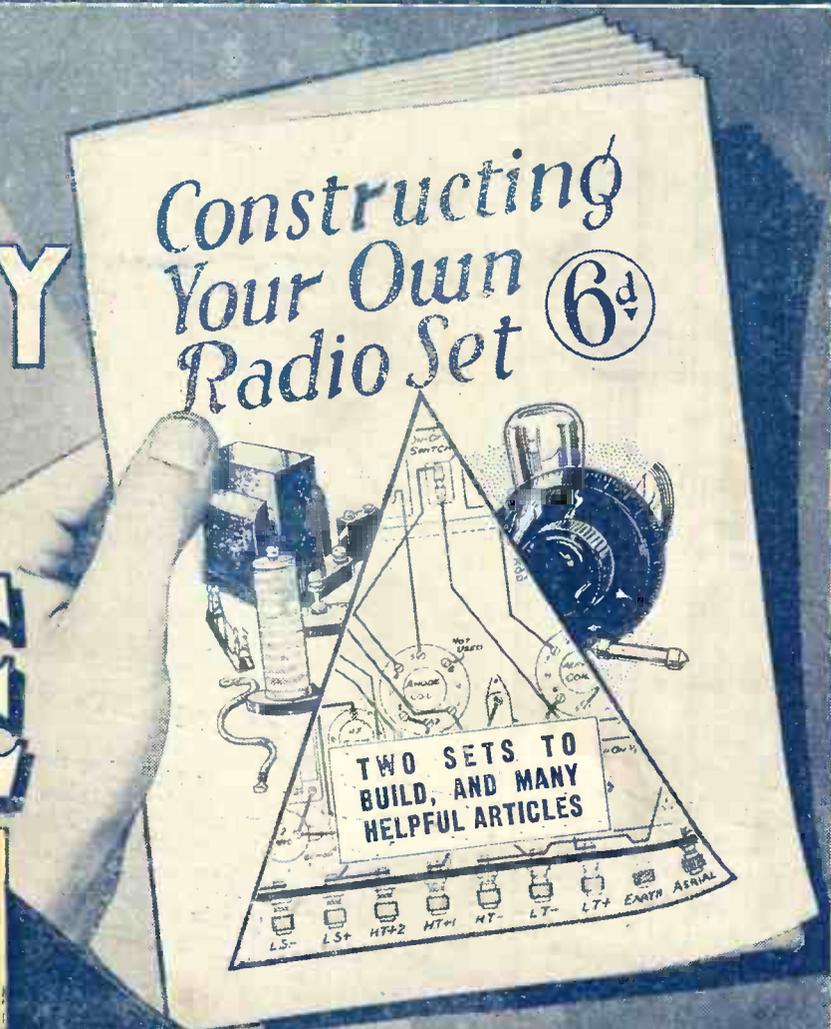
No. 537. Vol. XXII.

INCORPORATING "WIRELESS"

September 17th, 1932.

This
**SIXPENNY
BOOK
FREE**

FULL DETAILS OF
THE "FLEX-FEED" TWO
and
FIXING A FILTER
Etc., Etc.



Constructing
Your Own Radio Set 6d

TWO SETS TO
BUILD, AND MANY
HELPFUL ARTICLES

**See special FREE offer
on page 31**

IN THE HANDS OF RADIO EXPERTS



The leading electric wire manufacturers for over 50 years, Lewcos have been in the van of Radio progress from the commencement. Lewcos Components are indispensable for perfect reception.

Write for leaflets with these reference numbers:

COMPONENTS OF EVERY DESCRIPTION.

- L.F. and H.F. Transformers
- L.F. and H.F. Chokes
- Potentiometers
- Band Pass Filters
- Spaghetti Resistances
- Glazite Connecting Wire.

- Leaflet - Ref. Nos. P 76.
- " " P 76 & 78.
- " " P 79 & 81.
- " " P 73A.
- " " P 78.
- Silk and Covered Wires.

Lewcos

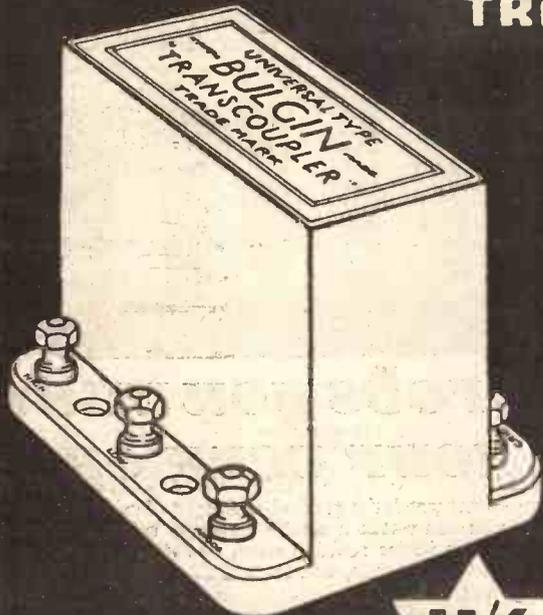
REGD

LEWCOS RADIO PRODUCTS FOR BETTER RECEPTION

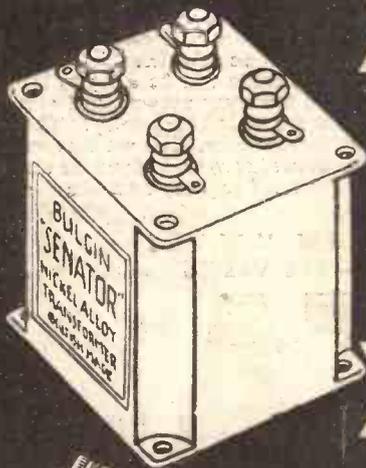
THE LONDON ELECTRIC WIRE COMPANY AND SMITHS LIMITED, CHURCH ROAD, LEYTON, LONDON, E.10

THE FAMOUS 'TRANSCOUPLER'

TRADE MARK



11/6



6/9



SEND FOR
NEW
80-PAGE
CATALOGUE

ENCLOSE
2d. POSTAGE

The New Era of L.F. AMPLIFICATION

The introduction of the Bulgin Transcoupler in MAY last marked the beginning of a new era in L.F. Amplification.

The "Straight-line" amplification of Resistance Coupling; the step-up to a 3-1 Transformer; a combination of this would approach ideal, we thought. And so the "Transcoupler" was born, first in the "Better Quality by Uniform Amplification" movement.

We made it simple to use, so that everyone could take advantage of this wonderful possibility, by designing it for use with any and every set.

Thousands of constructors have fitted it already, have you? Do you know what you're missing?

Glorious amplification from lowest bass to highest treble, quality of reproduction never before obtained, *and without any SACRIFICE OF VOLUME WHATSOEVER*

Would you like to know more about this wonderful component which gives far better results than L.F. Transformers at three times the price? We shall be pleased to send you leaflets. Write to us now.

The "Transcoupler" is a complete parallel-fed transformer unit with included coupling condenser and tapped anode resistance (for perfect matching with any valve) assembled in a handsome bakelite case ready for connection in any set in place of your present L.F. transformer.

At the request of many, we have latterly introduced the "SENATOR," a nickel-alloy-core transformer intended for parallel-feed, etc. This will appeal to those constructors who wish to make up their own L.F. Coupling, a la Transcoupler; the Coupling condenser should be 0.5mF.

Now, before you overlook it, write to us for FULL details.

ALWAYS BUILD WITH

STOP PRESS

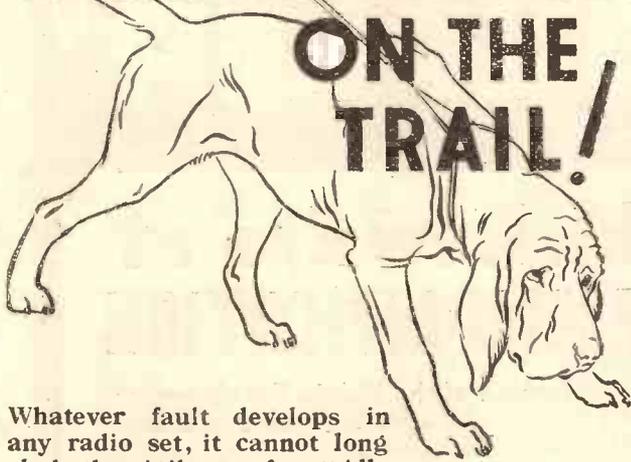
THE
TRANSCOUPLER
SPECIFIED
AGAIN

See page 29 in
this issue.



A F BULGIN & CO LTD ABBEY RD BARKING ESSEX GRANGEWOOD 3266

PUT THE TROUBLE TRACKER ON THE TRAIL!



Whatever fault develops in any radio set, it cannot long elude the vigilance of an "All-in-One" Radiometer. Simply connect each component in turn to the "All-in-One" Radiometer and instantly the sensitive finger of the wonderful instrument points where the trouble lies.

With the aid of this ever reliable trouble-tracker you can keep your set in 100% condition at all times.

Get an "All-in-One" Radiometer to-day and become the master of your radio. Ask to see it at any radio dealer's or electrician's. If in any difficulty, write direct to:—

PIFCO Ltd.,
High Street,
MANCHESTER.



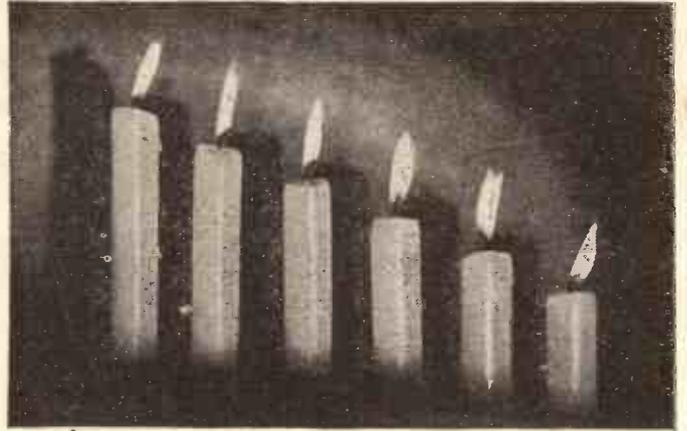
Standard Model "All-in-One" Radiometer for Battery Sets only, as shown here. Price **12/6**

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

£2 . 2 . 0

PIFCO
ALL IN ONE
RADIOMETER

unseen, unheard, unsuspected



/It robs you under your very eyes!

You cannot watch the gradual onslaught of valve deterioration as you can watch a candle gradually being consumed. Probably you notice nothing until, one day, you suddenly realise that your set is, somehow, failing to give you the same pleasure as before.

Fortunately the remedy is simple. Fit a set of ETA valves and your set will be as good as, or even better than, it was when new. ETA valves will restore its original purity and richness of tone, its selectivity, its clarity, and every item of every programme will be a joy to listen to. There is an ETA valve for every purpose and every set. ETA valves are famous for their high quality. They give and maintain perfect reproduction. And yet they cost less than valves that are no better in any way. If you are uncertain which ETA valves your set requires send the coupon below.

**YOU NEED NEW VALVES.
GOOD VALVES — ETA VALVES**

ETA
THE INTERNATIONAL VALVE



Prices from **5/6**

SERVICE COUPON

To the **ELECTRICAL TRADING ASSOCIATION LTD.,**
Aldwych House, Aldwych, London, W.C.2.

A. Please let me know the correct type of ETA valves to replace my present valves which are as under

1..... 2..... 3..... 4..... 5.....
(Insert type letters and number)

B. Please advise me which ETA valves to use for the following receiver or circuit.

Specify Type No. and Name.....

Name.....

Address.....

P.W. 17/9/32.....

NOW CONVERT YOUR SET TO A RADIOGRAM

Transform your Set to a thing of beauty with this Modern Walnut Cabinet that is the craftsman's last word in style and appearance. Decorated with carefully matched inlaid walnut veneers of contrasting colour. Hand french polished to reveal the hidden beauty of grain only to be found in the finest Walnut, while bringing to perfection the acoustic properties of the correctly proportioned speaker compartment. **Gives a new and better tone to your Set; adds beauty to your home at minimum cost.**

1933 ADAPTAGRAM

This 3 Guinea Cabinet makes your Set look worth 30 Guineas.

MODEL A Never before such a clever and conveniently designed Cabinet for the instant conversion of your existing Set to a Radiogram. Comes to you with vignnetted front as illustrated and motor board, ready to take your own Set, Gramophone Motor and Pickup. No skill or expensive tools are required to transform your Radio into a combination instrument, presenting the professionally finished appearance of the most luxurious Radio Gramophone money can buy. Suitable for all popular Sets such as the Olympus Four, S.T.300, etc., etc., described in "Popular Wireless," "Wireless Constructor," "Modern Wireless," and all other leading technical journals. Dimensions: Height, 38½ in.; width, 21½ in.; depth, 15½ in.; panel size: 18 x 8 in.; baseboard depth, 14 in.; Speaker Compartment, 17 x 19½ in.; Clearance between motor board and underside of lid, 4 in. Ready fitted with back. Baffle Board 3/6 extra if required.

- Designed by Peto-Scott—foremost for Cabinets since 1919—originators of the "Adaptagram Principle" in 1928.
- With Standard Vignette and shelf taking any Set of panel-size not exceeding 18 in. wide, 8 in. high and baseboard 14 in. deep.
- Generous accommodation for Super H.T. and L.T. Batteries or full mains equipment.
- Constructed with room for mounting any type of Speaker behind the modern silk-covered fret.

If you do not already possess motor, pick-up etc., then we refer you to Model B or Model C as detailed below.



BUILT LIKE A FINE PIANO

**IT COMES TO YOU
DIRECT from our FACTORY**

Carriage and Packing 2/6 extra England and Wales.

MODEL "A"

63/-

CASH or C.O.D.
or **12** monthly payments of **5/9**

IMMEDIATE DELIVERY

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

Dear Sirs, Please send me CASH, C.O.D. or H.P.

1933 ADAPTAGRAM { Model A 63/-
Model B 6 Guineas.
Model C 7 Guineas.

for which I enclose £ s. d. Cash/Deposit

Name.....
Address.....
.....P.W. 17/9/32.

MODEL B SPRING MOTOR

Standard 1933 ADAPTAGRAM Garrard Double Spring Motor. 12" Plush covered Turntable. Automatic Stop. B.T.H. Tone-Arm with Pick-up, and Volume Control complete. Automatic Needle Cup that delivers new needles one at a time to your finger tips.

Model B

Fitted as described above—ready to convert your existing Set to a Radiogram.

Cash or C.O.D. **6 Guineas** or 12 monthly payments of

12/-

MODEL C ELECTRIC MOTOR

Standard 1933 ADAPTAGRAM CABINET. Collaro Induction Electric Motor with Tone-Arm, Pick-up and Volume Control in one Unit. 12" Plush covered Turntable. Automatic Stop. Automatic Needle Cup that delivers NEW needles one at a time to your finger tips.

Model C

(For A.C. Mains 100-130 and 200-260 volts 25-100 cycles.) Fitted as described above—ready to convert your existing Set to a Radiogram. Details of D.C. Model on application.

Cash or C.O.D. **7 Guineas** or 12 monthly payments of

13/9

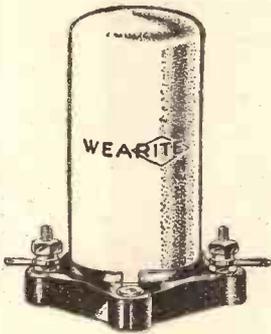
GRAMO FITTINGS FITTED FREE

"QUALITY" COMPONENTS

for

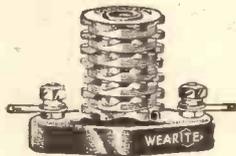
"QUALITY" RESULTS

NO matter the efficiency of the circuit—no matter the care in assembly—the components themselves must be above question for "quality" results. That is why Wearite insist on stage-by-stage test in the manufacture of their every product. Be it coils, switches, chokes, transformers, resistances, etc., before they can leave the works they must have passed their several tests—they must have proved their worthiness to bear the name "Wearite"—the first name in radio.



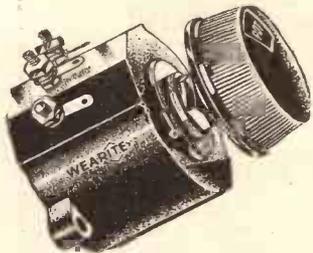
THE H.F.P. H.F. CHOKE

A screened choke, giving effective operation between 15 to 2,500 metres. Price 3/6. See also latest type H.F.P.A. with armoured "pig-tail." Price 4/-.



THE R.D. RESISTANCE

A series of scientifically designed decoupling resistances. In all values from 50 ohms to 50,000 ohms. Prices from 1/- to 2/9. Plug-in type, complete with baseboard socket, 3d. extra.



THE Q.V.C. VOLUME CONTROL

Made in all values from 600 to 100,000 ohms. Up to 50,000 ohms price 4/6; above 50,000 ohms price 5/6. Ganging attachment, 1/- extra.

HAVE YOU GOT YOUR COPY OF WEARITE'S NEW ILLUSTRATED BOOKLET ?

If not, write NOW. It contains full details of one of the most comprehensive ranges of components available. Whatever set you are building—before you start have the New Wearite Booklet by you. Write NOW!

Remember, too, Wearite answer your technical queries FREE. If you have any problem, write to "Service Department."

WEARITE

WRIGHT & WEAIRE, Limited,
740, HIGH ROAD, TOTTENHAM, N. 17
PHONE: Tottenham 3847/8 and 3015.

NO OTHER PART EXCHANGE FIRM CAN OFFER ADVANTAGES LIKE THESE

- 1 Prices paid for second-hand apparatus are the **LARGEST PAID BY ANY WIRELESS PART EXCHANGE FIRM.**
- 2 A firm quotation given without any charge or obligation on **DESCRIPTION OF APPARATUS ALONE.** This quotation is subject only to description proving accurate and goods being in reasonable condition.
- 3 **NO RESTRICTIONS AS TO AMOUNT OF NEW PURCHASE.**
- 4 **NO RESTRICTIONS AS TO KIND OF APPARATUS ACCEPTED.** Commercial receivers, home-built sets, assembled or dismantled—components, valves, tuning coils—everything.
- 5 Second-hand apparatus taken in part exchange for second-hand apparatus.
- 6 **SECOND-HAND APPARATUS TAKEN AS FIRST PAYMENT ON NEW GOODS.** The balance can be spread over six, nine or twelve months.

WHAT WOULD YOU ALLOW ME FOR:—

I AM THINKING OF BUYING:—

ON CASH OR H.P. TERMS.
Cross out whichever does not apply

Name.....

Address.....

Post to-day to:—Co-Radio Ltd., Dept. P.W.6, 78, Neal Street, W.C.

THIS PUTS ME UNDER NO OBLIGATION.

CORADIO

Showrooms: 78, Neal St., Shaftesbury Avenue W.C.

IN "FLEX-FEED" TWO

the Designer has specified:—

- 1 Sovereign Midget Type Wire-Wound Resistance, 320-350 ohms 1/3
- 1 Sovereign Midget Type Wire-Wound Resistance, 750 ohms 1/3

There is a full range of Sovereign Components. Use them as much as possible in building this set.

We are pleased to announce publication of the Third (1933) Edition of our famous Components Catalogue which will be forwarded (free) together with our latest Blueprint for building the Sovereign Ambassador and Viceroy Receivers upon receipt of a postcard. Send to Dept. "P.W."

SOVEREIGN PRODUCTS, LTD., SOVEREIGN HOUSE, ROSEBERY AV., E.C.1



Model Aeroplane Chat

If you are interested in model aeroplanes and wish to keep right up to date in all aeroplane matters, you must write to The MODERN BOY about it. Full particulars of what you have to do are given in this week's fine issue. Make sure of your copy Now.

The MODERN BOY

Buy a copy TO-DAY - - 2d.

FOR EVERY SET — there's a PILOT AUTHOR KIT

CASH — C.O.D — or H.P.

EVERYTHING RADIO Manufacturers' Kits

- COSSOR MELODY MAKER.** Model 335. Complete with valves, speaker, and cabinet. Cash Price, £7/7/6. Balance in 11 monthly payments of 14/10. **Send 10/- only**
- COSSOR ALL-ELECTRIC MELODY MAKER.** Model 336. Complete with valves, cabinet and speaker. Cash Price, £11/15/0. Balance in 11 monthly payments of 21/7. **Send 21/7 only**
- RADIO FOR THE MILLION "STATION MASTER 3"** (Model A.). With valves and cabinet. For battery use. Cash Price, £5/11/0. Balance in 11 monthly payments of 10/2. **Send 10/2 only**
- "STATION MASTER 3"** (Model B.). With valves, speaker and cabinet. For battery use. Cash Price, £5/11/0. Balance in 11 monthly payments of 14/-. **Send 10/- only**
- SLEKTUN SCOUT S.G.3.**—S.G., Detector and Power. Pilot Author Kit "A" (less valves and cabinet) Cash or C.O.D. £4/8/6. Balance in 11 monthly payments of 8/1. **Send 8/1 only**
- OSRAM "THIRTY THREE," MUSIC MAGNET.** Complete Kit comprising all components, including valves, cabinet, with self-contained speaker. Cash Price, £9/9/0. Balance in 11 monthly payments of 17/6. **Send 15/0 only**

THIS YEAR'S WINNER

- LISSEN "SKYSCRAPER 3."** Chassis model with (Lissen) S.G., Detector and Pentode valves. Cash Price, £4/9/6. Balance in 11 monthly payments of 8/3. **Send 8/3 only**
- READY RADIO KENDALL-PRICE S.G. 4,** S.G., detector, L.F. and Power. Complete Kit less valves and cabinet. Cash Price, £4/6/6. Balance in 11 monthly payments of 8/-. **Send 8/- only**
- READY RADIO 303,** 3-valve kit (Det., 2 L.F.) with valves, cabinet and permanent magnet moving-coil speaker. Built in 20 minutes! Cash Price, £6/17/6. Balance in 11 monthly payments of 12/7. **Send 12/7 only**
- READY RADIO "METEOR" S.G.3.** 3-valve screened-grid receiver with valves, cabinet and permanent magnet moving-coil speaker. Covers short, medium, and long waves without coil changing. Cash Price, £8/17/6. Balance in 11 monthly payments of 16/3. **Send 16/3 only**
- TELSEN "AJAX 3"** Complete Kit less valves and cabinet. Cash Price, £3/1/6. Balance in 11 monthly payments of 5/8. **Send 5/8 only**
- TELSEN "JUPITER" S.G.3.** Complete Kit less valves and cabinet. Cash Price, £3/17/0. Balance in 11 monthly payments of 7/-. **Send 7/- only**

ULTRA 1933 TIGER RECEIVER. A.C. or D.C. Mains. S.G. detector and Pentode. Moving-Coil Speaker Complete with Mazda Valves ready for use. Cash Price £15-15-0. Balance in 17 monthly payments of 20/-. **Send 20/- only**

"HOW TO BUILD 4 SHORT-WAVE SETS"

Edited and written by Mr. G. T. KELSEY the famous Short-Wave Expert, "Popular Wireless". The only book exclusively devoted to Short Waves. Describes 4 efficient sets with full working instructions and operating notes. 48 pages and 4-colour cover. Sold in thousands at Olympia. Obtainable from all Bookstalls and Shops, W. H. Smith & Sons or direct.

1/-

FLEX-FEED TWO

As described in this week's issue. EXACT TO SPECIFICATION.

KIT "A" Author's Kit of specified components including ready drilled panel and terminal mounts but less valves and cabinet.

CASH or C.O.D. **£8:16:0**

or 12 monthly payments of 16/2

KIT-BITS

Selected C.O.D. Lines for "Flex-Feed Two." You pay the postman—we pay post charges on orders value over 10/-

- | | |
|---|--------|
| 1 Peto-Scott Panel 18" x 7" and baseboard 10" x 18" | 5 6 |
| 1 Colvern Canned Coil (Type T.D.) | 8 6 |
| 1 Bulgin Trans-Coupler L.F. Transformer | 11 6 |
| 1 Peto-Scott H.F. Choke | 3 6 |
| 2 L.F. Chokes (1 Ferranti B.I. (1) Wearite H.T.32 | 2 0 |
| 1 Tunewell Mains Transformer (MR/28/200) | 1 5 0 |
| 2 Valves as specified | 1 11 0 |

OLYMPUS FOUR

As Described in Popular Wireless 20/8/32. EXACT TO SPECIFICATION.

KIT "A" Author's Kit of specified components including ready drilled panel and terminal strips but less valves and cabinet.

CASH or C.O.D. **£4:12:6**

or 12 monthly payments of 8/6

LONG RANGE 3

Described in "P.W." Wireless Booklet. **KIT "A"** Author's Kit with Ready Drilled Panel less Valves and Cabinet.

Cash or C.O.D. **£4-7-6**

or 12 monthly payments of 8/-

W.L.S. SHORT WAVE 2

Described in "P.W." Wireless Booklet. **KIT "A"** Author's Kit with Ready Drilled Panel less Valves and Cabinet.

Cash or C.O.D. **£3-16-6**

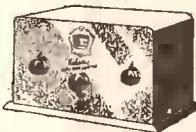
or 12 monthly payments of 7/-

Full Retail list of Parts upon application.

1933 KELSEY SHORT-WAVE ADAPTOR

Tune-in the Short-wave Stations on your present set. Plug the Kelsey Short-wave Adaptor—it fits without any alteration. No extra valve required; no extra apparatus. Ready for immediate use and sold complete with Dial Calibration Chart and simple tuning notes. "How to Hear the Short-Wave Stations," specially compiled by an expert.

Tunes in the World's Short-Wave Stations on your Existing Set.



CASH or C.O.D. **45/-** Or 9 monthly payments of 5/6

EVERYTHING RADIO Speakers & Accessories

- EPOCH "SUPER JUNIOR"** Type MM Permanent Magnet Moving Coil Speaker with 5-ratio transformer. Cash or C.O.D. £1/7/6. Balance in 5 monthly payments of 5/-. **Send 5/- only**
- R & A "VICTOR" PERMANENT MAGNET MOVING-COIL SPEAKER DE LUXE.** With 6-ratio input transformer and protecting grill. Cash Price £3/10/0. Balance in 11 monthly payments of 6/5. **With 6/5 order**
- R & A "BANTAM" PERMANENT MAGNET MOVING-COIL SPEAKER.** With 3-ratio input transformer. Cash Price, £1/7/8. Balance in 5 monthly payments of 5/-. **With 5/- order**
- EPOCH "20 C" PERMANENT MAGNET MOVING-COIL SPEAKER.** (New Edition.) With 3-ratio input transformer. Cash Price, £1/15/0. Balance in 5 monthly payments of 6/8. **Send 6/6 only**
- ULTRA 1933 IMP PERMANENT MAGNET MOVING-COIL SPEAKER,** with input transformer. Cash Price, £1/17/6. Balance in 5 monthly payments of 6/10. **Send 6/10 only**
- W.B. PERMANENT MAGNET MOVING-COIL SPEAKER.** Type PM4. Complete with transformer. Cash Price, £2/2/0. Balance in 7 monthly payments of 5/8. **Send 5/9 only**

EASIWAY

NO DEPOSIT. Strict Privacy. No third party collections. We deal with you direct

- BLUE SPOT SPEAKER UNIT AND CHASSIS.** Type 100U. Cash Price, £1/19/6. Balance in 7 monthly payments of 5/5. **Send 5/5 only**
- ATLAS ELIMINATOR.** Type A.C.244. Three tappings. S.G., detector and power. Output: 120 volts at 20 m/a. Cash Price, £2/19/6. Balance in 11 monthly payments of 5/6. **Send 5/6 only**
- REGENTONE D.C.T. H.T. ELIMINATOR** for D.C. Mains, tapped S.G. Detector and 120/150v, at 25 m/a. Cash Price £1/19/6. Balance in 5 monthly payments of 5/8. **Send 5/8 only**
- GARRARD INDUCTION GRAMOPHONE MOTOR.** For A.C. Mains. Model 202. Mounted on 12-inch Nickel Motor Plate with fully automatic electric starting and stopping switch. Cash Price, £2/10/0. Balance in 11 monthly payments of 4/7. **Send 4/7 only**

● **IMPORTANT** Part Kits, miscellaneous components or accessories are available under our own Easy Way H.P. System. Send us list of your wants. We will quote by return without any obligation.

IMMEDIATE DELIVERY FROM STOCK

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

Dear Sirs,—Please send me C.O.D./CASH/H.P. for which I enclose £ s. d. CASH/H.P. Deposit. Send me your FREE 1933 Catalogue

NAME

ADDRESS

P.W. 17/9/32

Buy by Post — it's Quicker

Get YOUR FREE COPY of this Book today!



★ Thousands have literally snapped it up—and are making this outstanding set

Every day more thousands send for this free book of the "Scout S.G.3." Thousands who own average receivers are now making this sensational set. Those who have made it are enthusiastic in their reports of its performance, simplicity and moderate cost.

Most definitely there has never before been such a cleverly designed home constructor's set—for the "Scout S.G.3" is the result of a united effort by leading component manufacturers to design a specialist's set that even a novice can construct—at a cost that brings it within reach of the most modest purse.

The set is a sensation. It has created a sensation. The tremendous demand for the Free Book and Blueprint proves how outstanding it is. Get your copy to-day.

The SLEKTUN SCOUT S.G.3

Take the coupon below to your dealer for the Free Book and Blueprint of the "Scout S.G.3," or, if more convenient, post it to us with a 1d. stamp affixed.

- One-knob tuning—fifty stations at full loudspeaker strength.
- Extreme selectivity. "The Broadcaster" says: "Even with a large aerial at ten miles from Brookmans Park, the local stations were easily separated."
- "Simplicity is one of the outstanding features—"
- "The constructional details are very explicit, and we can imagine no difficulties."

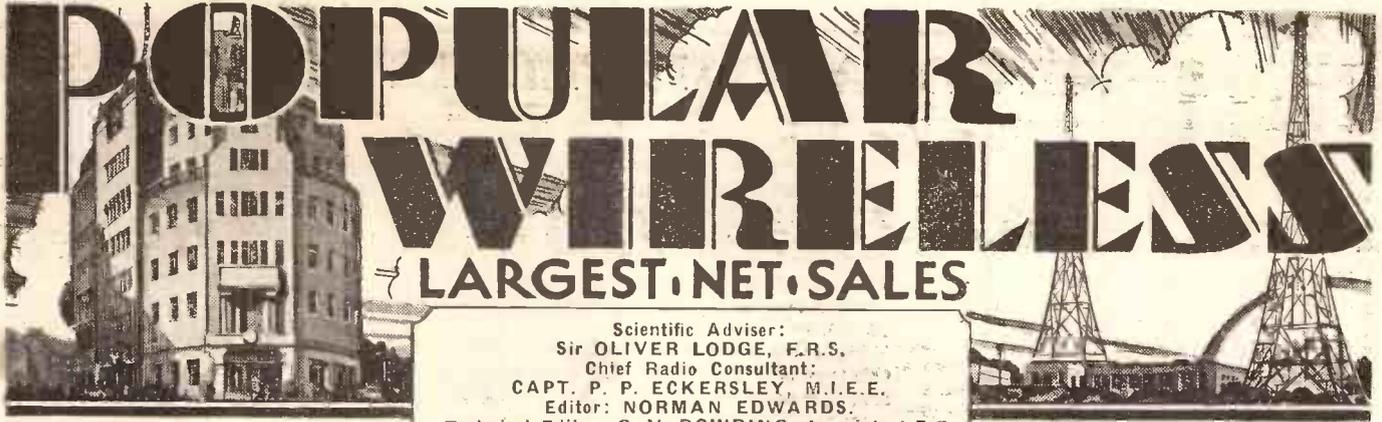
Messrs. SLEKTUN PRODUCTS LTD.,
21, Douglas Street, WESTMINSTER, S.W.1

Please send me the FREE illustrated Book of the SCOUT S.G.3, together with the full-size Blueprint. I enclose 1d. stamp to cover cost of postage.

Name.....

Address.....

P.W.3.....



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.

**GOOD OLD "P.W."
 MORE GIFTS!
 "IN FOR IT."
 WHAT'S A WATT?**

**OUR FARMERS.
 COWARD!
 NUTSHELL HISTORY.
 CHEAP WORK.**

RADIO NOTES & NEWS

Good Old "P.W."

MANY of you will say "Good old "P.W.," or words to that effect, when you note the grand gift book tucked inside your "P.W." this week. And it is not only a gift—it is an omen; for many more good things are to follow.

More Gifts to Readers.

Next week, two sixpenny blueprints, total face value one shilling. Free! And that is not all!

For after that we shall be giving away — But perhaps I had better not say exactly what. Only that never before has even "P.W." planned such an extremely attractive series of gifts to readers.

And as a pal, I would say just one word to you—order your "P.W." in advance if you don't want to "miss the boat."

For there will be some rush for these numbers, believe me! And if you're wise you'll take Uncle Ariel's tip and be in the forefront of it!

Future Events.

BEFORE the Queen's Hall concerts have got into their stride—the B.B.C. broke down for ten irredeemable seconds in Brahms' 1st Symphony, last movement—the B.B.C. announces the winter season of Symphony Concerts, beginning on Oct. 19th. Behold, a scintillating list of artistes; behold, conductors such as Sir H. Wood, Sir Landon Ronald, Adrian Boult and Elgar!

Also M. Ernest Ansermat. With all respect to Ernest—I know what to expect on his night, and I shall go and see Greta!

German Radio Reforms.

WITH a view to the reorganisation of the whole German system of broadcasting under State control the German government is to cancel all existing concessions for broadcasting in Germany, on Sept 30th. Sounds drastic, I know, but it does not imply a stoppage of service, and you will probably notice little more than superficial differences.

You will note, of course, that this is yet another instance of the adoption of unified control after a trial of other methods.

Dearth of Radio Dramatists.

THOSE of the B.B.C. who are especially concerned are said to be complaining that radio dramatists, especially writers of comedies, are woefully scarce. I suppose they know, but nevertheless we seem to have had quite a lot of good plays, including some by a chap called Shakespeare.

Perhaps the explanation is that for men like Wodehouse the rewards offered by the B.B.C. are not tempting. I was talking recently to the literary agents of an author and poet of world-wide fame and I asked why "—'s stuff was not broadcast." "They pay such small fees," he replied.

A VOICE OUT OF THE NIGHT



Making adjustments prior to a night test of "the flying loudspeaker." Fixed to the wing of an aeroplane this speaker can be heard over nearly a square mile, when the machine is flying at about 1,000 feet, and tests of its advertising value are being carried out in Germany.

They Are "In for It."

ON September 16th the Mayor of Lichfield, founder of the "Johnson Society," is to broadcast a talk on Samuel Johnson. Not long since, the "Radio Times" described the great literary critic, author, poet, clubman and philanthropist, Johnson, as "half-mad." Tackled about it, they replied, in effect, "Well, Macaulay said so." As though Macaulay were unassailable! I asked the "Johnson Society" about it—the president is an American—and the reply was so cruel

and pungent that it seemed a shame to pass it on to the timid coverers behind Macaulay. However, I'm hoping his worship will do justice to Johnson in no uncertain manner.

Radio Advertising.

THE Advertising Association has set up a "Committee on the Possibilities of Radio Advertising," under the chairmanship of Mr. Percival Marshall, from which we shall probably get the truth about this matter, as a great quantity of material has been gathered from the U.S.A. and other countries where "sponsored" programmes operate. One fact, mentioned by the "World's Press News," is that forty per cent of the firms who began advertising by radio in the U.S.A. dropped it "within a comparatively short period." Well, William of San Diego? I reckon you won't take that one lying down.

What Started the Watt?

FIFTY years ago, Dr. C. W. Siemens, in his presidential address to the British Association, recommended that there should be named a unit indicative of the power "conveyed by a current of an ampere through the difference of potential of a volt." And as James Watt was the first man who was known to possess a clear physical conception of electrical Power, and gave a rational method of measuring it, it was suggested that the proposed new unit be named after him. And it was so. Whence we get Volts x Amperes = Watts.

What is the Pronunciation of Joule?

BUT what is a Watt? Continuing my lecture, the unit of Energy is the Erg; that is a very small unit, and so we use another, called the Joule, which is equivalent to ten million ergs. Now, when Energy is expended, Work is done. (E.g. man rolling lawn.) Hence it is laid down that an expenditure of one Joule per second equals one Watt. For some occult reason, the B.B.C. professes to be stumped about the

(Continued on next page.)

NEWS—VIEWS—AND INTERVIEWS (continued)

pronunciation of the word "Joule." Let me help them! *Jool.* That's all, and it's an easy one.

B.B.C. and the Farmers.

I AM glad to learn that the B.B.C. is concentrating attention on the farming industry in order to find out in what way radio can help to advance the interests of farmers. These beefy, well-fed members of the community are ruined more times per annum than any other traders (except brewers), and so they deserve a large share of the "mike."



To begin with, the B.B.C. is addressing a series of questions to farmers, the replies to which will, it is hoped, be of guidance in the building-up of future features for the help of our agriculturists. ("Are turmuts, in your opinion, wot they was in '86?")

First Practical Radiotelephony.

ACCORDING to a contemporary, the first application of radiotelephony to practical work was made at Put-in Bay, Lake Erie, when the yacht "Thelma" reported over a distance of four miles the regatta of the Interlake Association in 1907. If anyone can let me know whose system of radiotelephony was used on that occasion, and the means by which the "carrier"-wave was set up, I should be vastly interested. What percentage of modulation was applied?

Coward!

IT appears that in America they have official dog catchers, men with large nets on poles, who have to detain any dogs running masterless.



I believe that the dogs are kept for a certain period and are then destroyed unless claimed (for a fee) or bought. Report says that a dog-catcher of Hammond, Indiana, has equipped his wagon with radio, so that if a jolly old tyke, passing on his lawful occasions, should stop for a moment, to smell the music, bang goes the net and he is Hoover's captive.

Valve Facts.

MY modest nutshell history of valves has been noted with interest by Mullards, who have sent me some notes illustrating a small historical exhibit of theirs. I, in turn, am interested to note that this well-known firm made "R" valves as far back as 1919, and small-power transmitting valves in 1920. It is also worthy of mention that Mullards introduced the first British pentode, the famous P.M.24.

"Ariel's" Nutshell History.

TRANSMITTING valves date no farther back than the last year or two of the Great War, and with a few exceptions were intended to be "hard," i.e. high vacuum valves. Beginning with fairly low anode voltages, they were soon pushed up to 10,000.

The early types were all air-cooled, and this type is still largely used. They need a lot of air nowadays, too! If they don't get enough ventilation they soften.

The temperature of the glass should not permit "softening" at its hottest point, which will probably be at the bulb's shoulder, under the supporting device. The early air-cooled valves were of glass; Marconi's used lead glass and the Americans used hard glass.

The Admiralty used silica containers and still do so, but these are costly and fragile, and as the glass-to-metal joint has been evolved, the anode being part of the container, it looks as if glass valves, air- or oil-cooled, will persist.

"SHORT WAVES"

In a court case it was stated that a wife had thrown a portable wireless set at her husband. That's the worst of portable wireless sets; they are so portable. "Punch."

WATTS IN A NAME?

An electrician named Wire recently married a young lady named Amp. "Pictorial Weekly."

"Would you recommend solid *derelict* condensers to be used in this set?" writes a correspondent from Ealing.

No, certainly not.

"Daphne always seems to be changing her hairdresser. I wonder why?"

"Well, she says she can never get the right wave-length."

Using a wireless set of his own make a Nottingham boy tuned-in America the first time he used it.

It is hoped it will be a lesson to him. "Punch."

Miss Newly-engaged: "Daddy, it was sweet of you to buy me this nice wireless set and loudspeaker. And can I really take it with me when I get married?"

Father: "Of course, my dear, but don't broadcast the fact too much, it might spoil your chances."

A Bit More History.

THESE transmitting valves all had filaments of thoriated tungsten until a few years ago, but latterly there has been an admixture of silica or alumina to encourage the growth of crystals with jagged formation, which interlock; a wire with a matt surface is a better heat radiator than one with a smooth surface, and therefore, given the same filament wattage, there will be lower temperature and less emission with the matt surfaced filament.

(Good-bye, chicks, till I swat up some more.)

Challenge to "Cosmics."

THOSE who are hovering on the verge of short-wave work should take note of the experience of one of our readers who is a very capable set constructor. His O-V-2 being due for rebuilding and improvement, he decided on a "grand

slam and swan song"; so he kept watch until the small hours of Sunday, July 31st, conditions being "only very moderate."

His bag consisted of sixteen stations in Italy, Germany, Egypt, Spain, U.S.A., Canada, Russia, and Holland. The aerial used was a 55-ft. wire under the roof!

Cheap Work.

THE King of the Radio Underworld has been neglecting his Edgar Wallace, I fear. He has been putting out cheap work. He'll have to get rid of his business manager and employ a guy who looks after details.

Why, the Trade has come to such a pretty pass that a gink has actually been arrested for breaking into a radio shop in Leeds — on the strength of fingerprints on a bottle. Come! Pull yourself together! This is mere common Ker-rime!

Why, bless me—anybody knows that the villain mustn't touch bottles without first donning gloves. Don't you ever read detective stories?



"Pips."

I CONTINUE to receive support in my campaign against the B.B.C.'s interpolation of the Greenwich "pips" no matter what item may be in progress. The musician's, the dramatist's work is still made the palimpsest of the astronomer or chronologist.

J. F. A. W. (Cardenden, Fifeshire), a coal miner, says that my aim coincides with the desire of a "critical majority of music-loving listeners." He adds that "P.W." is a very pleasant alternative to the B.B.C. programmes. Thanks! And our name ought to be inscribed, in *Latin*, on the wall of Broadcasting House.

Well, we shall persevere, although, being modest, we feel that we are beating walls of brass with a mere feather.

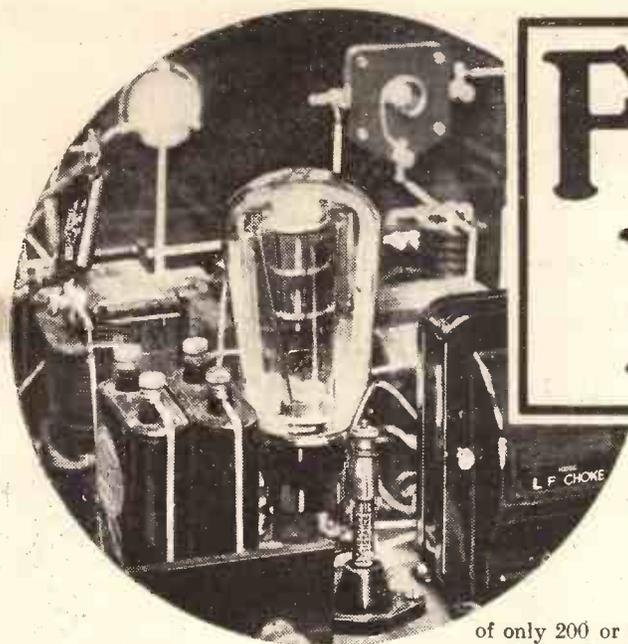
Workaday Wireless.

THIS is how wireless affects real life. Behold the Hull trawler, "St. Mervyn," fishing off the Murman coast, when bang goes her tail-shaft.

Does she drift on to the ice of the White Sea and perish? Not a bit! She radios to another trawler, gets a tow to Tromsø; later she gets a new tail-shaft from her owners and in a few days is fishing again like blazes.

Does a mackerel or a cod, or even a haddock, stand a fighting chance? I should say not! Even a shark ought to insure against radio these days, let alone whales!





FIXING A FILTER

The "Olympus" Four, which we described in our Show numbers, has already achieved amazing popularity, so there will be many readers greatly interested in these details of a further refinement. We deal with the adding of an output filter to the "Olympus" Four in such a way that those constructors who wish to build output filters into other sets will be able to do so from the instructions given.

THERE are two kinds of output filters. In the one the only component required is a transformer of suitable type. In the other, an L.F. choke and a fixed condenser are used.

A filter in the set is unnecessary if you employ a loudspeaker having an input transformer built in it, and the leads to the loudspeaker are short, say, not more than a yard or two in length.

Removing the Steady Current.

But the fact that there is an output filter in the set does not make it impossible to use a loudspeaker with a transformer. It can be said that the output from the set is, from this point of view, quite unaltered by the insertion of a filter.

We call the arrangement an "output filter" simply because it filters the varying electrical energy, which operates the loudspeaker, from the steady H.T. current flow.

There are numerous advantages in this. Probably the most important is that the H.T. is confined to the set and does not wander out through the loudspeaker leads. If long loudspeaker leads are installed, a filter is almost essential for this reason.

Saving Volts.

Without it, as much care must be paid to the loudspeaker and its connections as any other high potential point in the receiving outfit. When the H.T. is confined to the set by the filter, the loudspeaker leads can be of thin cotton-covered wire, and no precautions of a special nature need be taken in their insulation.

The second benefit conferred by the filter is that it saves H.T. power. The primary of an output transformer or an L.F. choke of approximately correct specification will have a comparatively low resistance. Instead of, say, 2,000 ohms (the resistance of the average loudspeaker), a resistance

of only 200 or 300 ohms will be imposed on the anode circuit of the last valve.

And when we point out that as many as 30 volts, or even more, may be lost in a resistance of 2,000 ohms with only a medium-sized power valve, the economy of a filter will be at once appreciated.

Thirdly, better quality follows the employment of a filter. The magnetic system of a loudspeaker of the average high-resistance type (that is, any one which does not normally call for the use of a transformer) is apt quickly to saturate. That inevitably means distortion. The prime cause is, of course, the comparatively heavy H.T. current which flows through it. Filter this away and the speaker is at once given the chance to work efficiently.

No Saturation of Choke.

The transformer or choke, with its more generous windings and core, can accom-

modate even more H.T. current than is normally used, without the slightest distress.

We are going to discuss the choke type of filter, for which an L.F. choke and a fixed condenser of 2 mfd. capacity are needed.

How To Connect Up.

The choke takes the place originally occupied by the loudspeaker in the circuit. The connections are: plate of last valve to one terminal of the L.F. choke (instead of loudspeaker), the other terminal of the L.F. choke to H.T. plus.

The one terminal of the 2-mfd. fixed condenser is connected to that terminal of the choke which joins to the plate of the valve (anode terminal of valveholder), and the other terminal of the 2-mfd. fixed condenser is joined to one loudspeaker terminal. The remaining loudspeaker terminal is then taken to L.T. negative or any other convenient point such as H.T. negative or earth which may be in direct connection with it.

If you are able to follow the circuit of this scheme in your mind, you will note that here are two paths running in parallel between the plate of the power valve and its filament ("filament" corresponds with H.T. negative, L.T. negative and earth).

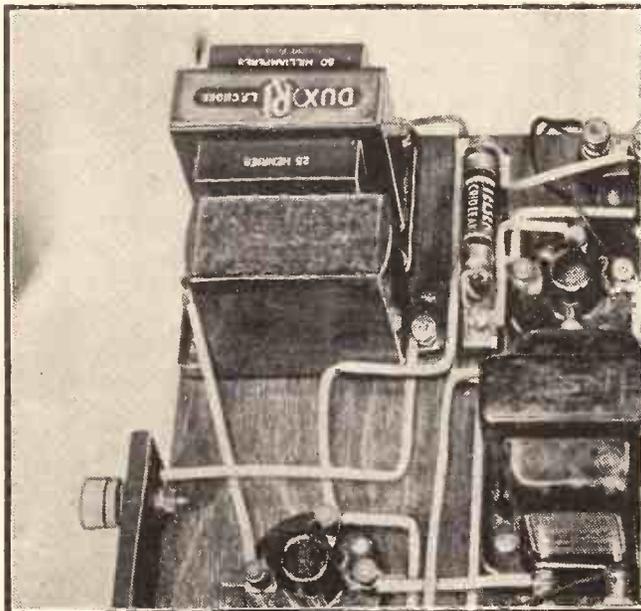
Parallel Paths.

The one path comprises the H.T. battery (or mains unit) and the L.F. choke, and the other a fixed condenser and the loudspeaker. Through this latter only currents of a fluctuating kind can pass, the fixed condenser offers an impassable barrier against the steady H.T.

On the other hand, the fluctuating currents prefer the condenser-speaker path because of the high impedance offered them in the L.F. choke. And so a perfect filtering action takes place. The above mention of mains unit reminds us that those who use such devices on D.C. must employ a filter, or they will have mains

(Continued on next page.)

A WORTH-WHILE ADDITION



Many benefits result from fixing a choke-condenser filter, and the two new components required are of an inexpensive nature.

FIXING A FILTER

(Continued from previous page.)

current walking out into the loudspeaker and its leads—a most unhealthy practice.

There is sufficient accommodation for a filter in almost any set. If there isn't room on the baseboard, then the components concerned can, perhaps, be screwed on to the inside of the cabinet at the back or at the side. Alternatively, it is possible to make up a small self-contained unit and connect this up externally.

We deliberately left room in the "Olympus" Four for a filter, and those of you who have built this set will find adequate space for any of the makes of choke and condenser which are specified in the accompanying list.

Component Specifications.

It is very advisable to purchase a fixed condenser of the high-voltage-test type. The choke must have adequate inductance and current-carrying capacity. An inductance of 25 henries and a current-carrying capacity of at least 25 milliamperes should be aimed at.

In regard to the latter, the point is that the choke should be able to carry the H.T. current taken by the power valve (or any larger power valve you may install in the future) without its inductance falling off seriously.

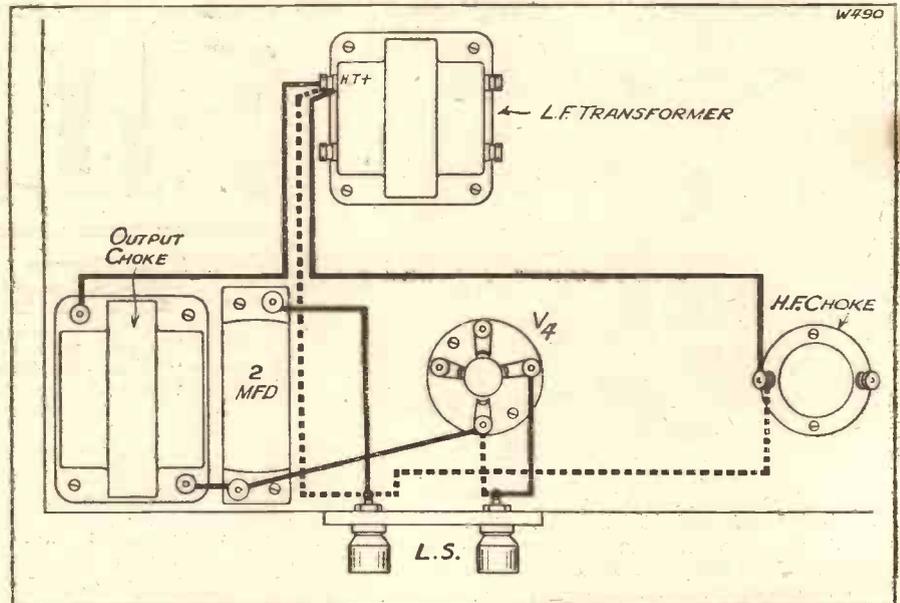
If the details are available take note of the inductance of the choke at a current somewhere around about the H.T. current of your power valve. In a good make such as the ones we recommend, the falling off will not be sufficiently serious to warrant attention.

The R.I. "Audirad," for instance, drops only a henry or two when as much as 30 milliamperes is passed through it. There are one or two chokes to be encountered which manage to achieve high inductances

carrying capacities, and these are quite unsuitable for our present purpose.

It is possible to add a filter so that none of the wiring of the set is interfered with in any way. But this necessitates the addition

ONLY A SLIGHT WIRING MODIFICATION NEEDED



Here are the alterations required in the case of the "Olympus" Four. The dotted lines indicate wires which have to be removed, and the full lines new wires that have to go in.

at negligible current but which give a poor showing at quite ordinary currents.

It is essential that an "output" choke is used. Many chokes are these days of a universal character, but there are special chokes for intervalve coupling that have moderately high resistances and low current-

of new loudspeaker terminals which may be either on the set or embodied in an external filter unit.

However, by altering just a few of the existing connections, it is possible to make the original loudspeaker terminals on the set continue to serve their original purpose.

Just Six Fresh Leads.

If you refer to the accompanying wiring diagram, which is for the "Olympus" Four, you will see that there are three dotted lines. These indicate the existing wiring leads which need to be entirely removed from the set.

The new leads which are required are shown in heavy black lines. They are exactly six in number.

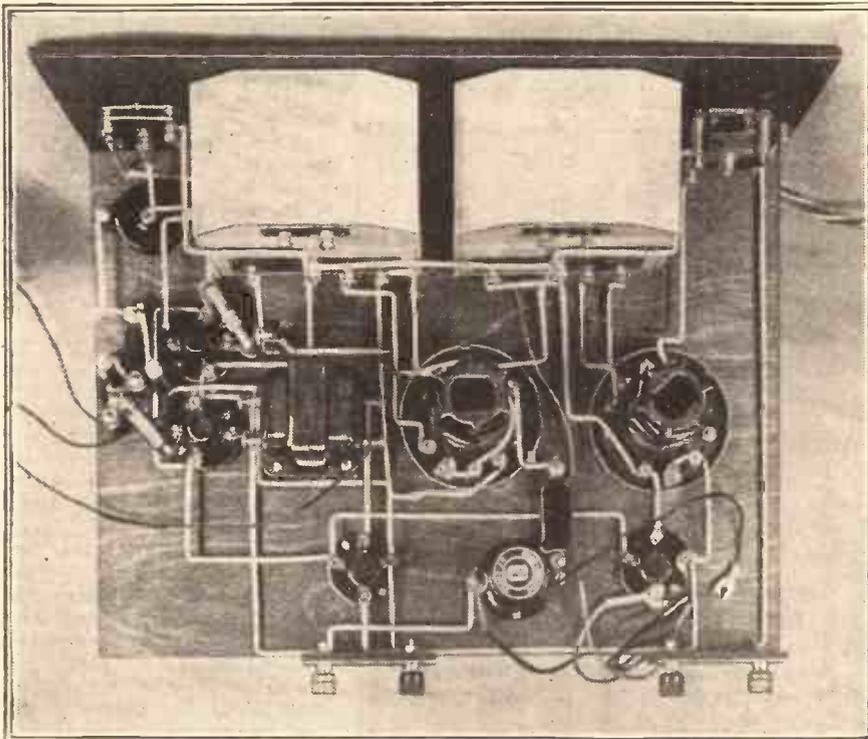
THE NEW COMPONENTS YOU WILL NEED

- 1 L.F. choke (R.I. Audirad, Telsen, Lotus, Ferranti B.8, Varley, Igranic, Wearite H.T.5).
- 1 2-mfd. condenser (Telsen, Lissen, Dubilier, T.C.C., Ferranti).

You must not expect to find similar old leads or to have to do exactly the same new wiring in every set into which you require to build a filter. But if you can follow and understand the implications of the filter, facts we presented earlier in this article, you should have no difficulty at all in applying the principles to any receiver.

There is one additional fact of vital importance that should be noted. Where a pentode valve is used in the output stage of a set, it is highly desirable to employ a special pentode output choke or transformer,

BEFORE THE FILTER WAS FITTED



Space was deliberately left in the "Olympus" Four for the filter components, so that there should be no difficulty in fitting them in after the set was made.

OUR NEW THREE- DIMENSION PICTURES

By
G. V. Dowding
ASSOCIATE I.E.E.



AS I announced last week, our intention is to publish stereoscopic pictures of radio interest in future issues of "P.W." Most of these three-dimension illustrations will probably deal with our sets, for stereoscopy is of great value to the constructor as it enables him to see the sets he builds in their true perspective and not merely as flat, two-dimension photos.

I have already described how various types of viewers can be easily made for next to nothing, and the details of the *de luxe* model will be given again shortly for the benefit of those who missed its first description. (By the way, although *de luxe* in its operation and results, this model costs a mere sixpence to make!)

It should also be noted that commercial viewers which are suitable for our True-Views are obtainable very cheaply from Messrs. Peto-Scott.

Probably of greater general interest than our receiver True-Views will be the True-Views of new components and other apparatus which will be published from time to time. One such appears this week, and it makes it possible for owners of True-Viewers to look into the component depicted and see its interior with uncanny clarity. Indeed, its apparent solidity is amazing.

Much Clearer.

I have been asked why it is that, quite apart from the striking realism of True-Views, they seem to be so much clearer and the paper on which they are printed so much whiter than when they are looked at without any kind of viewer.

This is quite simply

Make yourself a True-Viewer at a cost of sixpence, or less, and you will be able to see all modern radio apparatus in stereoscopic solidity. Last week we told you how the viewers could be made, and this week we provide further fascinating details concerning its use.

explained. The clearness is due to the superimposition of the two images. Remember, they fuse together so that the inevitable tiny flaws and irregularities in the one are corrected by the other, and vice versa. Further, one's vision is concentrated on the pictures and all irrelevant light rays are cut out because of the limiting field of the viewer.

This also accounts for the apparent greater whiteness of the paper.

When I first started experimenting with stereoscopy with a view to applying this venerable art to new uses in radio, I

suffered from a serious handicap, although I did not realise it for some time. This was that my eyes possess a relatively high degree of tolerance.

I can look at a pair of stereoscopic pictures and get the full stereoscopic effect with little effort, without using any artificial aid whatever. It requires only fractional concentration.

A Finger Test.

There will probably be many readers of "P.W." who can do likewise. You can easily test your powers of stereoscopic vision. Hold two fingers, separated by about two inches, ten or twelve inches from your eyes and on a level with them.

Look at them steadily, and if you see three fingers instead of two (only one will be clear, the others being quite ghostly) then you are gifted with strong stereoscopic powers. You should be able to see our True-Views merely by holding a hand up between your eyes to act as a separating screen and so assist the individual eyes to see only the True-View sections intended for them.

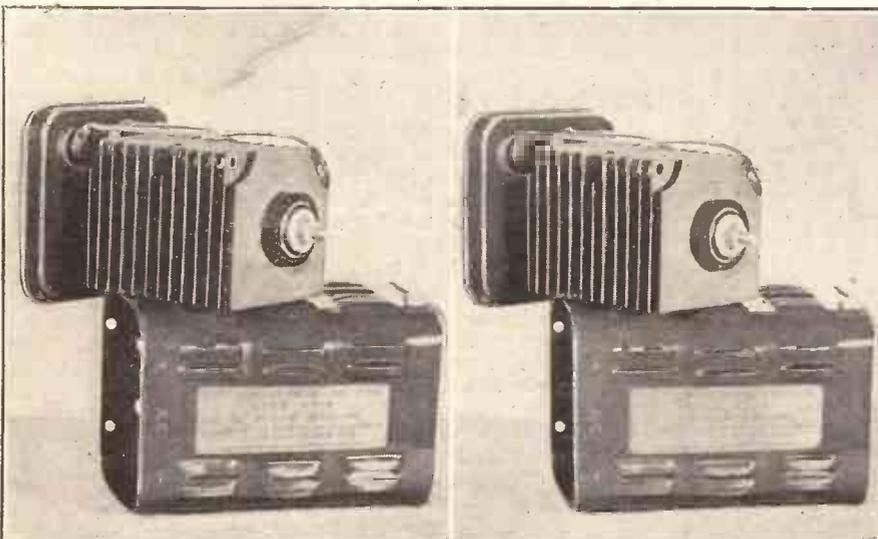
But the effect will not be as good by a long measure as when a proper viewer is used. In the first place there will be no magnification, and, secondly, there will be no restriction on your field of vision.

Graduated Scale.

However, when I discovered my above-mentioned "handicap," I searched for someone whose eyes constituted the complete antithesis of mine from a stereoscopic point of view. I soon found a good

(Continued on next page.)

SEE THIS PICTURE AS A TRUE-VIEW



Looked at through a "Popular Wireless" True-Viewer, this double picture merges into one surprisingly solid representation of the "innards" of a Westinghouse Metal Rectifier.

OUR NEW THREE-DIMENSION PICTURES

(Continued from previous page.)

"subject." Later, by testing every one I could recruit for the purpose, I acquired a kind of graduated scale of "subjects" whose stereoscopic powers ranged from good to extremely bad.

This group of willing co-operators proved invaluable, and their existence largely explains why I devised about six different kinds of viewers of varying degrees of simplicity of construction—and effectiveness. And it wasn't until I managed to fashion a viewer which enabled the whole lot to see True-Views properly at once and without concentration or effort of any kind, except one or two preliminary adjustments, that the scheme was O.K.'d.

Vital Separation.

And now every one who can see fairly clearly in the ordinary way can join in the True-View scheme with this *de luxe* viewer (at a cost of sixpence!).

With the simpler ones, some may need to practise a little before they get results.

It will be obvious that people who have very faulty vision cannot expect to "see solid." Both eyes must have fairly equal sight for that. Bad short sight or very long sight will not interfere so long as the eyes are equal in either respect.

That is why I impressed upon readers the importance of keeping spectacles on while viewing if these are constantly worn. And those with badly balanced eyes or with astigmatism or other defects ought to wear spectacles, anyway!

The separation between the two pictures which make a True-View is a vital factor in their make-up. Therefore they should not be separated but should be cut out in the one piece and pasted on cardboard to keep them stiff.

The separation to which I have referred is the separation between any two similar points on the two pictures and not the distance between their inner borders. I have fixed upon a maximum separation which is not directly based upon the distance between one's eyes, (seldom less than $2\frac{1}{2}$ in.) but which seems to be a separation that makes it easy for all to see the True-Views, even the "hard cases," with our *de luxe* viewer.

Looking Outwards.

If the distance were decreased a little, most would not need lenses of any kind, but the pictures would, of course, be smaller. The greater the separation factor fixed upon the bigger we can make the pictures.

You see, the eyes normally focus on the same point, and in stereoscopy we have to make them look outwards. This is not a natural condition and the greater the picture separation the more we depart from normal eye action.

It is a purely muscular action and when you attempt it there is no serious eye strain. There is none at all when the *de luxe* viewer (or any good commercial type) is used. No harm can possibly be done to the eyes.

As I explained last week, the lenses are swivelled so that a prismatic effect is achieved, and the light rays from the pictures are bent and your eyes restfully maintain their normal functioning. There is no "looking-outwards" effort to be made.

When you have once adjusted the lenses for comfortable viewing, they can be left "set" for all future occasions. If you share your viewer with anyone else, or if on occasions others use it, it is a simple matter for you to make calibration marks so that you can at once swing the lens into that position which suits your own eyes. The same applies to the focusing.

outwards movement will be necessary. But do not make violent ones. Move each lens in turn about a sixteenth of an inch.

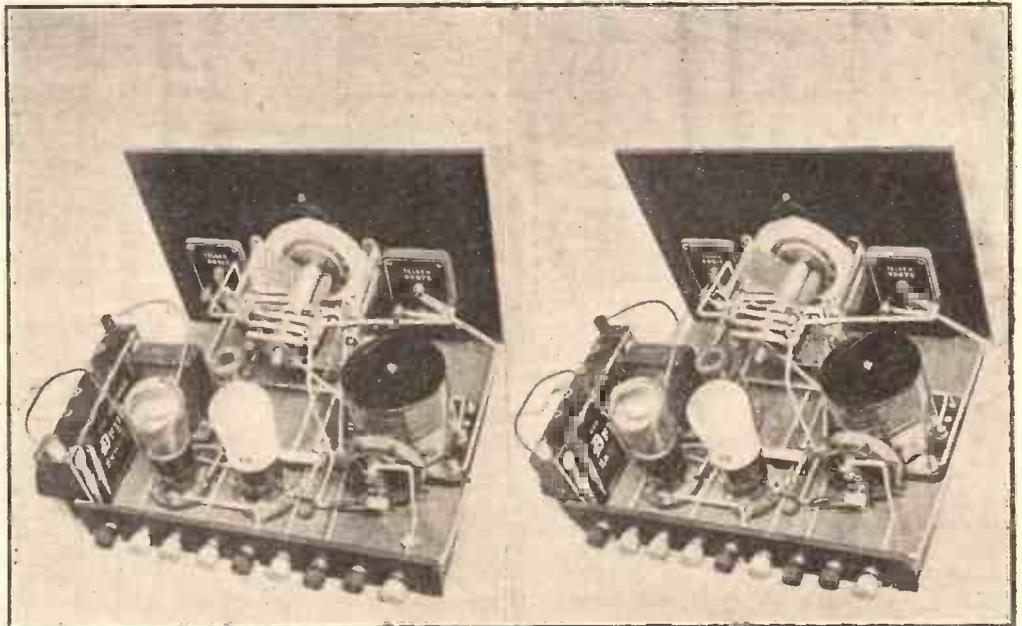
You are now increasing the prismatic effect by looking through the outer sections of the lenses instead of through their centres.

It doesn't matter a scrap if you have to swing the lenses out half an inch or more, though you may have to tinker with their suspensions in order to make them retain such positions. If you are a solo operator on the instrument, you could permanently fix them in place.

Try For Equal Lighting.

You will not get good results if one of the sections of the True-View is in a shadow; both should be well lighted. It is sometimes no easy matter to do this when the viewer is held horizontally. But there is no reason why you should not hold it vertically and

OF INVALUABLE ASSISTANCE TO CONSTRUCTORS



A True-View of the "1933" Two (which was described in "P.W." last week). You can have no conception of the details it shows in true perspective unless you see it through a Viewer.

I find that it is better for most to move the lenses equally; if the one is moved out a trifle, the other should be moved to a similar but opposite position.

Adjusting the Viewer.

This is the way you should proceed to make the adjustments to the *de luxe* "P.W." viewer. First cut out the True-View and paste it on to cardboard. Then stand or fix it vertically on the focusing carrier, making sure that the pictures are central with the lenses, neither too high nor too low, and are not crooked.

Place the lenses centrally to start with, and then apply your eyes to them. Look first with the one eye and then with the other to make sure that each eye can see its appropriate picture. If necessary, shift the focusing carrier very slowly backwards or forwards until the pictures are sharply in focus.

Then look with both eyes. Many of you will at once obtain the full stereoscopic effect; those who do not should make a lens adjustment. Generally speaking, an

look down into it, your head and eyes assuming the positions which they would if you were looking down at your feet or something on the floor a little in front of them.

In this way, equal lighting can be given to the pictures in the most awkward circumstances. I should add that I invariably look at stereoscopic pictures in this way. In the evening I stand right under the light and thus obtain very brilliant views.

It may be necessary for the focusing carrier to be fixed in position. On my own *de luxe* viewer I have lipped over the two sides, which are of aluminium, so that they go under the baseboard. Therefore the carrier can only be removed by sliding it right off the end, and this is normally prevented by a small screw.

The carrier fits rather tightly so that it cannot slide down when the viewer is held vertically.

Finally, let me remind you that the central partition must fit closely up against the viewing screen and run up to as near the True-View as possible. Any big gap results in overlapping of the pictures.

KIT KRITICISMS

THIS WEEK: The Ready Radio '303'

By Mr. PETER SIMPLE.

THE Ready Radio constructor's kit which I have built up this week raises a rather controversial point, which I had hoped to avoid!

Why does anyone buy a kit set in preference to any other type of receiver? Is it because he wants a set that will give him the performance of commercially-built circuit, but which will cost him a few shillings less? Or is it so that he may, by putting his own set together piece by piece, learn something about the mysteries of radio construction?

Personally, I am inclined to the latter view. I think that the whole joy of a kit set lies in knowing just where every component is and where every wire runs. I treat it rather like a "grown-up" version of Meccano which "teaches while it amuses."

Simplicity Itself.

However, I am quite ready to admit myself mistaken. In fact, the immense popularity of the Ready Radio '303' is definite proof that there are a great number of people who feel that such an outfit provides quite a lot of amusement and, at the same time, doesn't leave much chance of anything going wrong through inexpert construction.

I am obliged to bring up this point because the Ready Radio designers have so simplified things for the home constructor that he can build the '303' simply by mounting four components on the chassis and fixing five wires!

The height of easy construction, indeed! How are these rather amazing results achieved?

In the first place the circuit—a straight Det., 2 L.F. affair—has been so arranged that the components are cut down to an absolute minimum without impairing the efficiency of the set.

Three Controls In One.

As an example of this it is interesting to note that the single control knob on the high-efficiency coil does the jobs of at least three of the separate knobs on the older type of receiver. It controls the on-off switch, it acts as a wave-change control, and it provides an almost unlimited command of selectivity on the medium waves.

Secondly, the valve panel is supplied ready wired and complete with all the terminals necessary for batteries, earth and speaker, and for bringing the other four components into the circuit.

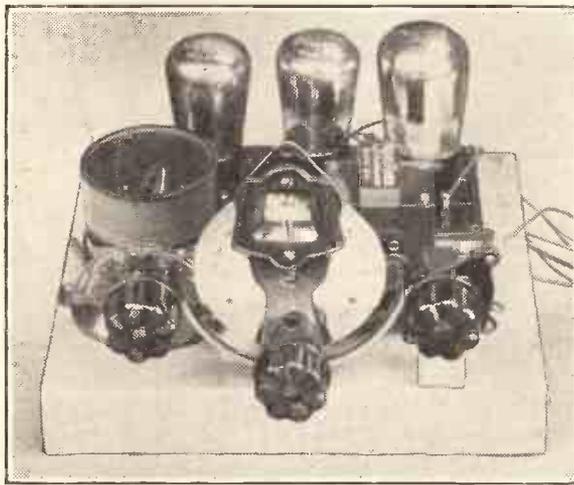
The various resistances and fixed condensers are also attached to the underside of this panel.

Such an arrangement certainly makes things very easy all round, especially as the coil unit, condensers and transformer need only eight fixing screws between them.

By using the special wire provided with the kit, it is not even necessary to remove the rubber insulation before wiring up, since the terminal screws are provided with sharp points which pierce the covering and make good contact.

I was particularly struck with the

WITH THE LID OFF!



This novel view shows the completed set all ready for testing, before being finally installed in its cabinet. A very excellent idea is obtained of the compact arrangement of valves and components.

excellent and, may I say, unusually thoughtful design of the cabinet, which is carried out in walnut, the finishing touch being given by a modern and most attractive speaker fret. There are few sets on the market which can beat the '303' for good looks!

The cabinet is constructed to contain all the batteries as well as the permanent-magnet, moving-coil loud-speaker, which is one of the outstanding features of the kit.

I have two small criticisms of the design. I found that the aerial terminal, which forms part of the coil unit, is too inaccessible when one wants to move the set or to try another aerial.

Since the terminal is only just behind the panel, it means removing the detector valve and groping in the innards of the cabinet.

Also, the two screws which fasten the chassis to the base of the cabinet could not be approached

with any screwdriver in my workshop. In fact, I fail to see how they could be driven home with anything measuring more than about 3 inches!

Despite these little troubles, however, I found that I was able to complete the set in less than twenty minutes—a result which could be achieved by anyone knowing not the first elements of radio.

Well Up To Expectations.

On test the receiver came well up to my expectations. As I have mentioned before, I have what are probably the worst reception conditions of anyone in London. Consequently a test on my aerial is very useful in so far as it proves the very minimum of which a set is capable.

So often I hear of tests being conducted by manufacturers under the most ideal conditions, with the result that inexperienced constructors are disappointed when their own results are not up to the makers' reports.

With the Ready Radio '303' London Regional and National covered only three degrees each on the dial, a result of which the designer may well be proud.

Despite a small amount of "backlash," the more powerful foreigners came in well after dark, but I was particularly struck with the quality of the reproduction. The volume, too, was just right for any ordinary room.

The Ready Radio '303' is a set which can hold its own with almost any other commercial set on the market as regards appearance and simplicity both of construction and operation.

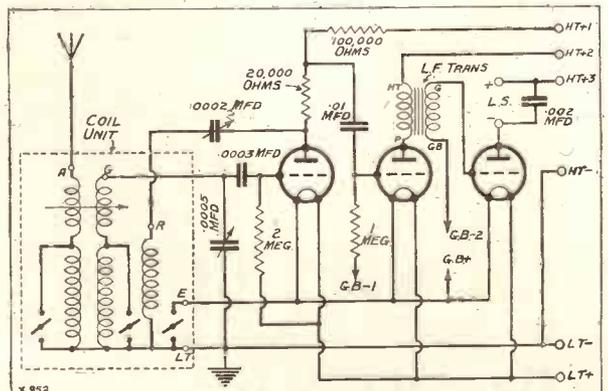
But when you consider its extremely low price, it is undoubtedly a triumph for a firm whose chief aim is to study the needs of the home-constructor.

A Moderate Outlay.

To get down to details, the price of the kit—which includes the cabinet, the moving-coil loudspeaker, the three recommended Mullard valves, and the necessary royalties—is £6 17s. 6d. Not an unreasonable outlay for a set that includes such a comprehensive range of accessories.

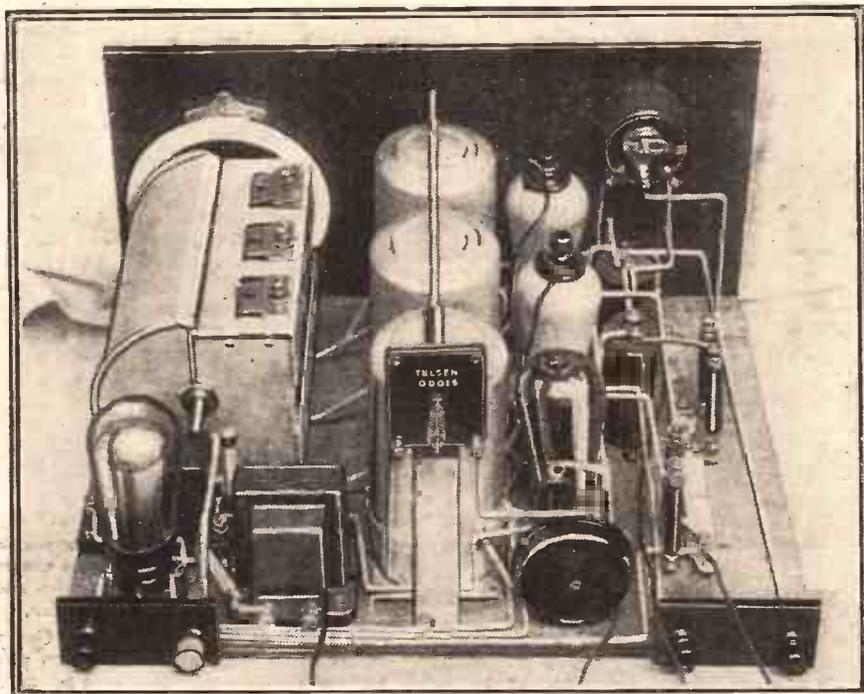
In addition, The Ready Radio Company tell me that they will be only too pleased to send to any constructor—in return for a 1½d. stamp—an excellently got-up book which gives minute details of the "303" and other receivers in their new list.

A UNIT WITH MANY USES



The unusual coil unit is the most interesting part of this circuit. Note how the aerial, earth and L.T. terminals, as well as the wave-change and on-off switches, are all included in the one unit.

FREE
 WITH EVERY COPY OF
POPULAR WIRELESS
NEXT WEEK
TWO 6d. BLUEPRINTS



**THE
 "SPACE-
 BREAKER"**

A magnificent one-knob-tuning receiver employing two S.G. H.F. stages and capable of colossal distance - spanning properties.

An illustrated article in the same issue covers very fully all the constructional details.

AND

THE "L.G." TWO

A very easy-to-build detector and low-frequency set, employing leaky-grid detection. Fully dealt with in a special illustrated article in the same number.

ORDER YOUR COPY AT ONCE

POPULAR WIRELESS

ON SALE SEPTEMBER 22nd.

PRICE THREEPENCE



ON THE OTHER SIDE

A TALK WITH A SOUTH AFRICAN LISTENER

AN old school pal of mine went out to "Jo-burg" several years ago, on administrative work connected with the South African railways. When it is dull and foggy here I get a letter from him written in the blazing heat (to him) of a Christmas Day!

But he is a radio enthusiast, and so the tables are turned. While I am having a cosy midday meal I can picture him sitting far into the chill of a South African night, listening for the faint strains of music from 5 S W!

Recently I wrote asking for his impressions of his local broadcasting, and this is the reply I received.

Short Wave Channels.

"Short waves have been the salvation of broadcasting in South Africa. Owing to the heat, fading and static are most noticeable during the day on the medium waveband.

"Practically every set here is adaptable for the short waves. In fact, super-hets. with three-range oscillator coils covering the short, medium, and long wavebands are getting very popular, although parts are not cheap.

"Most of the stations which have a medium wavelength of between 300 and 450 metres have also a short-wave channel. The new 'J.B.' (Johannesburg), for instance, works on 450 and 49.4 metres. There are five stations in South Africa, some of them being only relays.

"Pretoria relays on 350 metres, and the Bloemfontein station, which was opened at the end of last year, relays Johannesburg in the evenings on a wavelength of 510 metres; that is, when it is most difficult for listeners there to receive Johannesburg direct.

A Pioneer Station.

"These relay stations are a great help to the poorer class of farmers—the backvelder in up-country, for example, who cannot afford expensive short-wave plant.

"Johannesburg was one of the pioneer stations in S.A., and the papers were full of radio enthusiasm when it started up with its present high power—twenty times as powerful as the previous 'J.B.' plant. The new station is not far from Maraisburg, on the West Rand, about nine miles from the centre of the city.

"It is a fine site for transmission, being the second highest point on the Witwatersrand. The engineering side of it was built by a British firm.

"Programmes come from a studio in the station office in Johannesburg and there

Conditions for broadcasting in South Africa are very different from anything we experience in this country. With the high licence fees, tropical atmospherics and few receivable stations, listeners have to be very keen indeed!

Below you can read an illuminating account of broadcasting in that far-off land.

From Our Special Correspondent.

is an overhead 'phone line running out to the transmitter on the Witwatersrand.

"The Durban station is comparatively an old one. It started up, I remember, at the very end of 1924, and a large number of prominent people were connected with it. Mr. Lyle Taylor, for example, was the musical director.

"In 1926, the small Durban plant, which was then almost amateur-run, came under the direction of the African Broadcasting Co.

"This complete control by the African Broadcasting Co. meant that there was a

better programme service all round, because relays were started and there was a kind of regional scheme in existence even then. The station engineers made use of trunk telephone lines 350 and 800 miles long to Johannesburg and Cape Town respectively. With this extensive linking-up system they can now get a really fine service.

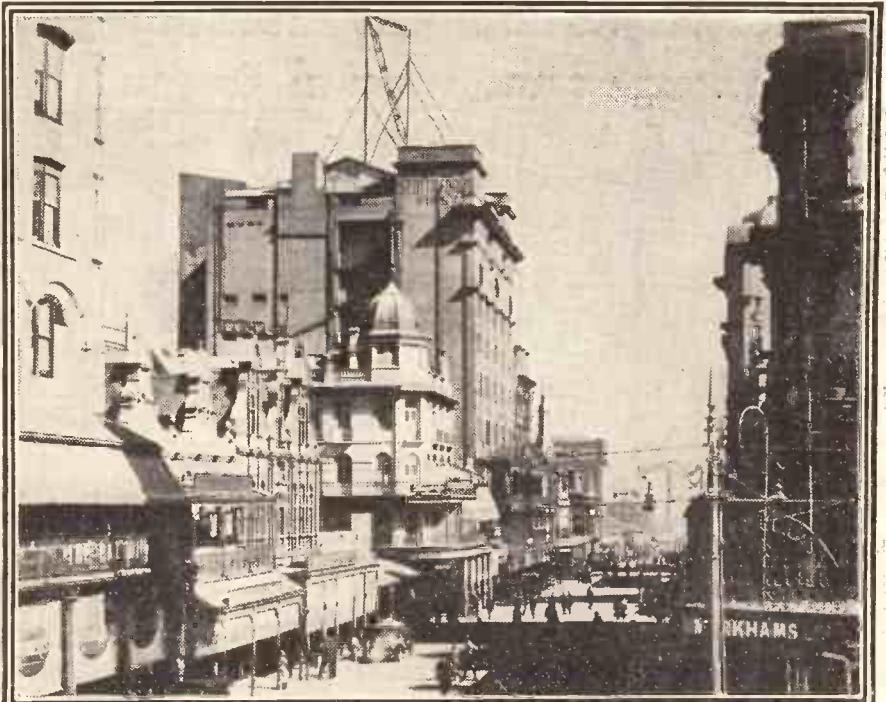
"I understand that the 6-kilowatt Marconi plant at Durban has been received in Papua, which is nearly 7,500 miles away! That shows you how the S.A. stations reach out; but, then, Durban, like 'J.B.', is at an excellent spot for transmission.

Paying by Results.

"Licences are a bit expensive, but at least we cannot grumble at the scheme which has been made out so that those who get most pay most! I believe South Africa was the first broadcasting country to introduce the zoning system of grading listeners' fees according to the distance from local stations. The rating was not quite fair at first, and towards the end of 1930 a new zoning system was arrived at.

(Continued on next page.)

THE HOME OF THE OLD "JO-BURG" STATION



Johannesburg's old station was located in the centre of the city, the aerial being erected on the roof of one of the highest buildings. It was an ideal site for local broadcasting, but the new station covers a much wider area and is just as efficient for town listeners.

A TALK WITH A SOUTH AFRICAN LISTENER

(Continued from previous page.)

"We now pay £1 15s. if within 100 miles of the station, and £1 5s. if between 100 and 250 miles from a station. Those outside that radius pay a flat rate of £1. These figures have all been increased in the new zoning system.

"Previously a listener at a considerable distance from a station only paid about 5s. or 7s. 6d. The scheme is very fair for us, but I understand that disappointing results were obtained in fees from Transvaal listeners, following the opening of the high-power 'J.B.'

Suggestion Turned Down.

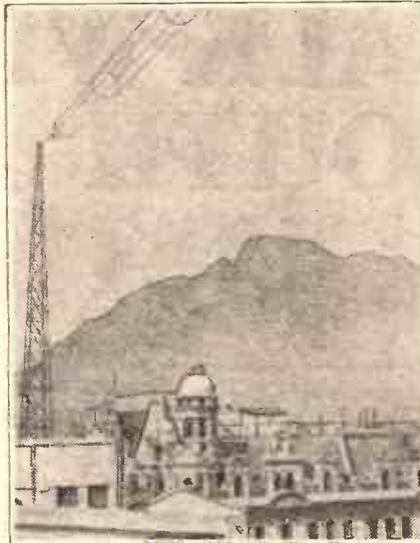
"At Cape Town, where most of the listeners are within 40 miles of the city and where any ring drawn around the city covers an area of about three-quarters of water, the licence revenue is, of course, disappointing. All the same, the zoning system is a good idea.

"An American concern came out in the daily press recently with an offer to put up a station on 343 metres to broadcast advertising sponsored programmes. There was to be no monopoly, even in this off-shoot of broadcasting, but the authorities turned down the suggestion.

"We have really nothing much to grumble about in the programmes, although I suppose they do not compare with yours. The engineering side of my local 'J.B.' is particularly keen, and frequent outside broadcasts are made.

"Racecourse broadcasts are popular, and an outside broadcast is made of that popular event known as the 'South African Derby.' On the other side of the programmes, church services are very good. Outside broadcasts are made regularly from the

CAPE TOWN CALLING



The Cape Town aerial boasts a pair of very substantial-looking masts, and with Table Mountain picturesquely placed in the background the station has a most imposing appearance.

leading churches, and they try to cover the chief denominations.

"There is not too great a 'highbrow' interest. Some very good talks are given by Professors of the Natal Technical College. Other educational people, sports 'stars' and clergymen give talks, each in their own sphere, and these are often relayed over the 800-mile trunk lines.

Mainly European.

"The programmes are mainly European, but talks are given occasionally in Hindustani and Tamil. The hospitals have done a lot to help wireless, and most of the leading hospitals are fitted up with wireless.

"There is a fair amount of American apparatus in the shops, but Marconi, Mullard and Philips' valves are among the British apparatus available, while Columbia

sets are popular. Many of us get our wireless stuff from British traders, in spite of the duty. British circuits are popular and British wireless papers are on sale in Johannesburg, Cape Town and other places.

"It is early yet to say what use the African Broadcasting Co. will make of the new Empire transmissions, but owing to the high standard of our short-wave technique it is certain that they will run at least through one or two stations a continuous 24-hour service of your new British station.

Empire Station Interest.

"This may be re-transmitted here on one channel, such as Pretoria's 300 metres, so that those who have no short-wave plant can get the British programmes, while keen amateurs with long-distance sets and short-wave super-hets. can get Daventry direct on the short waves.

"We here in 'Jo-burg' closely follow the latest information given by the B.B.C. about the Empire station. Every little detail such as the question of news copyright on a 24-hour programme, the arrangement of the short-wave aerials, the steel-tape apparatus used for recording programmes for later broadcasts, and so on, are of interest, and our newspapers are keeping up this interest in the British transmissions to a high pitch.

MAGNIFICENT "P.W." GIFTS

THIS WEEK

A book on practical radio including amongst its articles full constructional details of

A 'W.L.S.' Short Wave Two

and

The Long-Range Three

NEXT WEEK

Two 6d. Blueprints

of two more fine receivers, which will be fully described and illustrated in "P.W."

PRESENTED FREE

"I can't overstress the importance of Johannesburg, Cape Town and Durban broadcasting to the backveld. Special market bulletins are given for his benefit, and although the farmers are very conservative and have not until recently gone in much for wireless, they now make good use of it. They buy expensive sets on hire-purchase arrangements from travelling dealers, and they are guided entirely by the market reports.

"Previously all the leading farmers had brokers in the towns who controlled the prices and handled the farm produce. Now the farmers handle their own sales, and send word when to sell and at what prices.

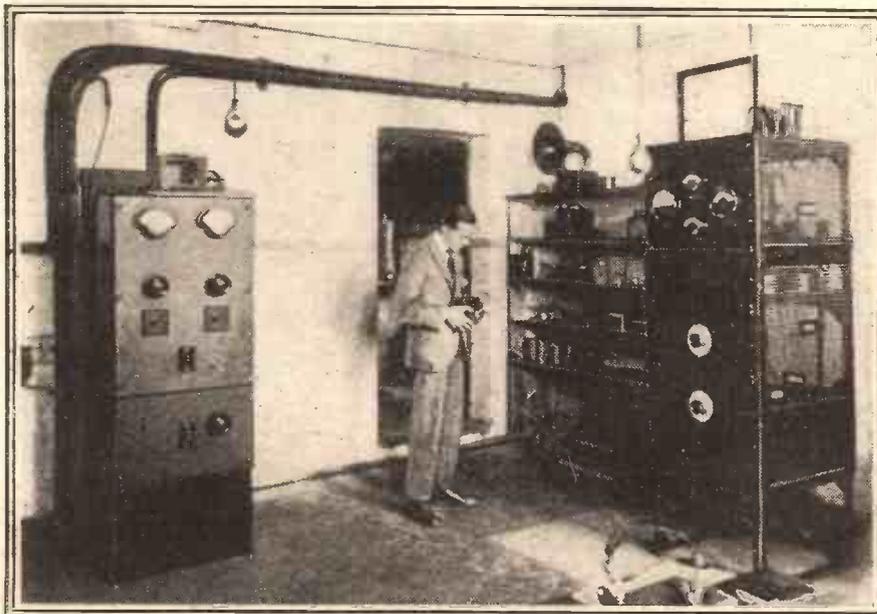
A Studious People.

"The Boers are by nature studious people, and as life in the South African backveld is necessarily quiet, they have plenty of time to listen to the wireless talks.

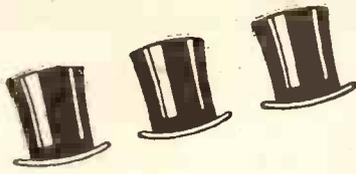
"If they alone were to be considered, and not the townspeople, broadcasting would hardly pay its way because of the lack of revenue. But they are the keenest listeners.

"Just imagine, if you lived in a place where the 'daily' papers were brought three days late on a mule cart, which brings the goods supplies, and if you had to judge the world by events which had happened a week or so ago, how thankful you would be for the voice of the 'J.B.' announcer giving the latest news direct to the backveld homestead!"

TAKING A CHECK ON THE WAVELENGTH



An engineer at the Johannesburg station checking up the wavelength with a small portable wavemeter. Accurate wave-keeping is not nearly so important as it is in Europe, owing to the fewer stations operating, but nevertheless the engineers always pride themselves on the accuracy achieved.



The Speaker that did the Olympia hat-trick . . .

Three years in succession Ferranti Speakers have won first place in the "Wireless World" Olympia ballot for the best speaker—a success due to the unique facilities and experience of Ferranti in Speaker design and construction.

U U U For instance, in the Type M1 speaker:—The unusually free suspension results in the sound output being due mainly to the moving coil drive, and cone resonance is not relied on to increase the sensitivity artificially. The cone moves equally and freely, forwards and backwards, at all frequencies down to 25 cycles, resulting in almost entire absence of "Second and third Harmonic distortion."

U U U The M1 takes an A.C. input of up to 6.5 watts without distress, at all frequencies from 50 to 8,000 cycles.

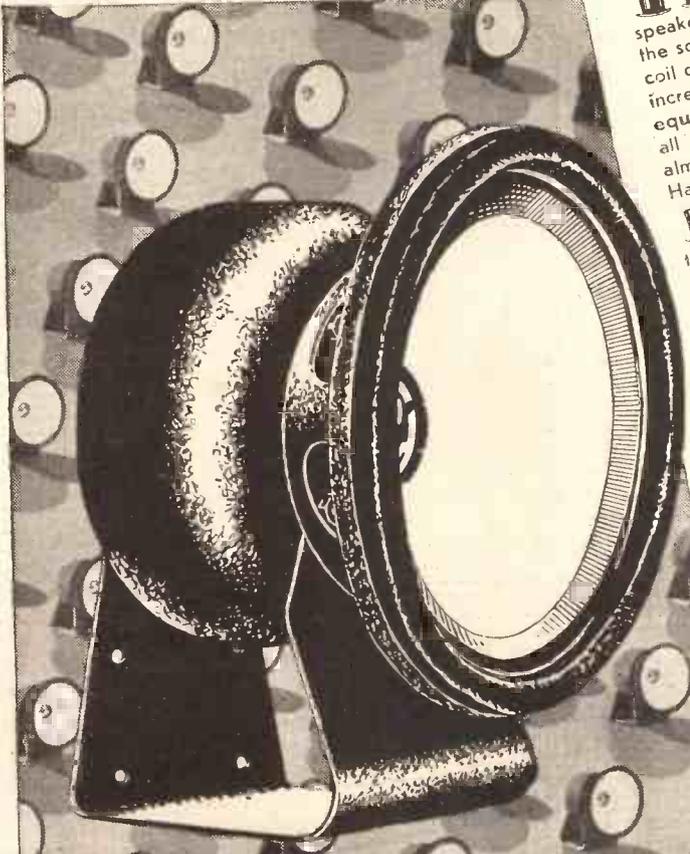
U U U Its exceptionally light and rigid cone enables transient notes such as those of the Tympani, Cymbals and similar instruments to be reproduced almost to perfection—sounds which many speakers fail entirely to reproduce.

U U U The magnets are cadmium plated to prevent rust or possibility of flaking metal. This ensures long and satisfactory service. Ferranti have been pioneers of Magnet design for nearly 50 years.

U U U Unparalleled frequency range—the whole Musical Scale, from 25 up to 15,000 cycles per second—makes this Speaker the finest reproducer ever devised for the home.

Illustrated is Moving Coil Speaker Type M1. Chassis only, **£8 18. 6.**

There are also types
M2 **£5 5. 0.** M2T **£5 15. 0.** M4T **£2 15. 0.**
D3 **£2 0. 0.** D3T **£2 10. 0.**
Types M2T, M4T and D3T have built-in 3:1 ratio Output Transformers.
Cabinet **£2 0. 0.** extra.



FERRANTI MOVING-COIL SPEAKERS

THE MIRROR OF THE B.B.C.

By O. H. M.

PROGRESS AT MADRID

THE PRESS AND EMPIRE BROADCASTING—BIRTHDAY WEEK PREPARATIONS—SOME BRIGHT SPOTS.

NOT much news has come through yet from Madrid, but I understand that some progress has been made in the interests of broadcasting. This does not mean, however, that the B.B.C. will necessarily benefit.

It is one task for the broadcasters of the world to secure more elbow room in the ether for their services. It is another task, and perhaps a more difficult one, to determine which broadcasters are to receive the fruits of a general triumph.

My view is that broadcasting will gain, but I am not so sure that the B.B.C. will succeed in the subsequent European scramble. Already there are signs that Continental broadcasters will make capital of the argument that under the present Regional scheme several of the frequencies allotted to the B.B.C. are not adequately employed.

It will be a serious test of B.B.C. statesmanship to increase the present allotment. It may be, of course, that the unrivalled prestige of British broadcasting will again come to the rescue. I sincerely hope so, because there are the important minority problems in Wales and the north of Scotland which must be solved.

The L.S.O.

The announcement that Sir Hamilton Harty will be the permanent conductor for the London Symphony Orchestra during the coming season suggests a new and particularly intriguing rivalry in the musical world. Only the other day, Sir Thomas Beecham was reported to be negotiating for the inclusion of the L.S.O. in a new amalgamated orchestra in direct opposition to the B.B.C.

Then, from Germany, came the story that Sir Thomas had abandoned the L.S.O. and was proposing to create a new international orchestra which he hoped would not only capture London, but make the B.B.C. orchestra antiquated. Sir Hamilton now appears to have stepped into the field as much in rivalry with Sir Thomas as with the B.B.C.

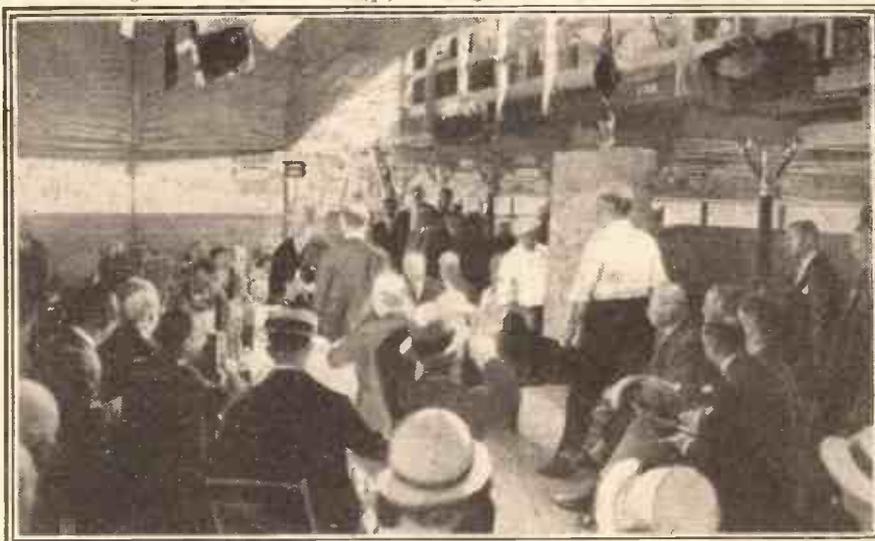
There is this difference, however, that Sir Hamilton, although he "strafes" the B.B.C., does not do so with the same seriousness that characterises the methods of Sir Thomas. It seems to me that if these various ambitions are realised, Dr. Adrian

Boult can afford to maintain the calm serenity which has carried him through much more difficult situations in the past.

The Press and Empire Broadcasting.

Something in the nature of a crisis is promised by the attitude of Dominion newspapers to the B.B.C. Empire Broadcasting Service. It has been discovered that even if the B.B.C. maintains its arrangement to accept its news from the agencies of the United Kingdom, and to transmit for the Empire only a limited service, this may cut across vital contracts between Dominion newspapers and world news agencies. The situation is developing.

THE BRITISH EMPIRE IN NEW YORK



Lord Southborough laying the corner stone of the British Empire Building in New York. Many important personages attended the ceremony, and a speech was made by John D. Rockefeller, Junior.

Birthday Week Preparations.

The equivalent to a fortnight's continuous day and night rehearsals will be put in before the second week of November, in preparation for the special programmes now being arranged to mark the tenth anniversary of the formation of the B.B.C. Birthday week is to be really outstanding, as an event showing in a brief seven days the remarkable degree of efficiency which radio entertainment has reached.

It is, of course, much too early to go into details, but I understand that the attractions will include all-star vaudeville and music-hall programmes staged in the concert studio, an adaptation by Tyrone Guthrie of "The Three Musketeers" which will be broadcast in two parts on successive evenings, a performance of "Romeo and Juliet," a "Songs from the Shows" programme devised by John Watt, and a very special type of entertainment to take the form of a tour of all the twenty-two studios of Broadcasting House.

There will, of course, be many other features to celebrate the completion of the B.B.C.'s first ten years of wonderful

history and the opening of Broadcasting House, which has not yet been done so far as the actual programmes are concerned. I shall have a lot more to write about Birthday Week as time goes on.

Some Bright Spots.

Olive Groves, Beatrice Gilbert, Hermione Gingold, Doris Woodhall, John Rorke, Geoffrey Gwyther and Harold Scott are in the cast of Lance Sieveking's musical comedy, "Money for Nothing," which has a place in the London Regional programme on Monday, September 19th. Look out for this—it should be good.

THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

I DARESAY there are a large number of listeners who share my disappointment at not having heard Maurice Chevalier over the air since his return to France from Hollywood. On enquiry, I find that he was encouraged by the 1,800 dollars paid him by the National Broadcasting Co. of New York for each appearance before the mike, to ask the French Broadcasting authorities for an even more fantastic fee.

The result is, I suppose, we shall continue to look in vain for Chevalier's name in the French programmes till one or other gives in. Chevalier is alleged to have remarked when his offer was turned down, that "The French have no eye for business."

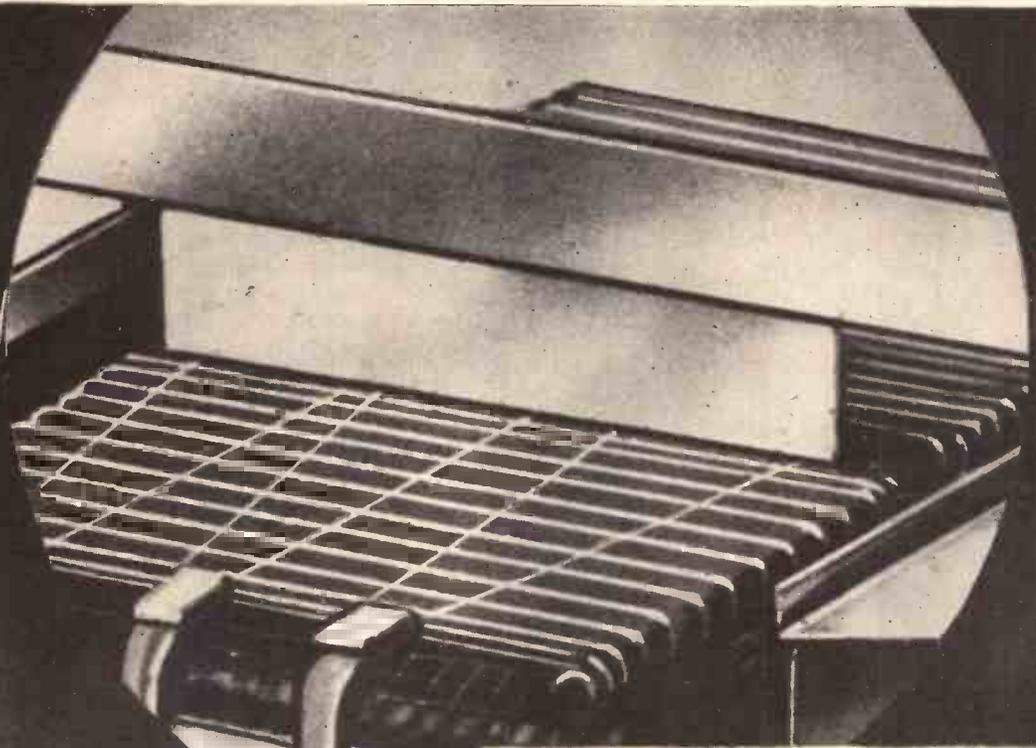
Publicity for Moderns.

Modern composers must feel grateful to the B.B.C. for the amount of publicity it gives their works week after week. If in the end we still cannot "appraise the new music," or prevent it from "incurring our suspicion," the fault will not rest with the B.B.C.

At the same time, I think it strangely odd that for a period extending well over seven days, no place was found in the programmes for a single work of Schönberg or Stravinsky, who, to quote again, are "the recognised leaders of the so-called revolutionary movement of to-day." Perhaps this was just a coincidence.

(Continued on page 52.)

IT'S PERFECTLY SIMPLE



So simple and yet so efficient. One discovery, the Mullard "non-vibrating filament," has made the greatest advance in modern valve construction — microphony has been overcome.

This new construction is incorporated in the P.M.1HL — further, the low anode consumption of this remarkable detector eliminates distortion due to transformer saturation and allows maximum stage gain to be obtained.

P.M.1HL — the valve for trouble-free reception.

PRICE 7/-. MADE IN ENGLAND.

Mullard

THE · MASTER · VALVE

Honour

HOW STUDIO SOUNDS
ARE PRODUCED



The clash of swords—steel hissing on steel—this effect is produced by sharply drawing one spoon against another. That is how realism is introduced into radio. You can retain this realism if you use a Lissen High Tension Battery.

No power better for *volume*—no power better for *tone*—no power at all so pure and long lasting as the current of a Lissen H.T. Battery. All radio dealers sell it. Ask firmly by name of Lissen.

LISSEN H.T. BATTERY

lasts longest and provides a pure high tension current that will give stage realism to your radio drama!

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.

SPEED OF RADIO WAVES—REACTION POINTS—GAUZE SCREENS—MAINS TRANSFORMERS—SET LAYOUT.

An Interesting Point.

H. M. (Chelsea).—"I read some time ago that a short-wave listener in Australia wearing headphones, would hear the orchestra broadcast by 5 SW from the Queen's Hall sooner than would a person sitting at the back of the hall itself. Why was the phrase 'wearing headphones' italicised. Cannot 5 SW be heard on a loudspeaker in Australia?"

Ha, ha! That's rather a good one. Sound travels 1,100 feet per second, and wireless waves at 186,000 miles a second.

Look at the sketch: Q is the Queen's Hall. We show a section. O is the orchestra, M the microphone, and P a "person" at the back of the Queen's Hall.

Now, the distance O P is, say, 110 feet, so that P hears the orchestra $\frac{110}{1100} = \frac{1}{10}$ of a second after it has played.

The microphone is 11 feet away (say), and so the microphone picks up the sound $\frac{11}{1100}$ of a second after its origination. Now it takes $\frac{1}{10}$ of a second for the wireless waves to get from the microphone in England via the aerial A E and the Australian aerial A A to a listener, L₁, in Australia with headphones. Total time $\frac{1}{10}$ of a second.

But another listener, L₂, is sitting 22 feet from a loudspeaker. So the sound takes $\frac{22}{1100}$ of a second from O to M, $\frac{1}{10}$ of a second from England to Australia, and $\frac{22}{1100}$ of a second from the Australian loudspeaker to the listener.

This is $\frac{1}{100} + \frac{1}{100} + \frac{22}{1100} = \frac{1}{10}$ of a second delay in all for the Australian loudspeaker listener, which is equal to the time delay for the man at the back of the Queen's Hall.

If the Australian loudspeaker listener sat a bit farther from his loudspeaker his delay would be the greatest, but the headphone man still has the least delay!

It's a rather amusing job in quantities.

Concerning Reaction.

J. N. K. (Southsea).—"In the common capacity-controlled reaction circuit of a leaky-grid detector valve, either a large reaction coil and a small (low capacity) reaction condenser are used or alternatively a small coil and a large condenser.

"Is there any reason why one arrangement should be adopted in preference to the other and is there any appreciable difference in

efficiency of the detector circuit assuming, of course, that the coil and condenser values are determined correctly?"

I do not think there is much difference. The retroaction system exists to adjust the phase of the impulses fed back from anode to grid. The phase is determined by the product of capacity and inductance—given a certain effective resistance—so that if the one is large and the other small, or vice versa, it makes little difference.

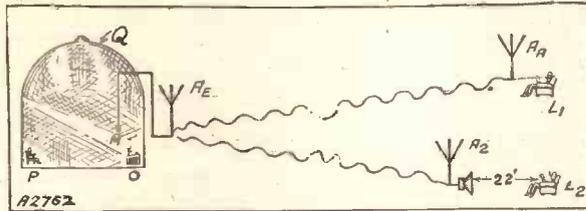
* * *

Copper Gauze for Screening.

R. T. O. (Orpington).—"I am constructing a receiver requiring fairly extensive screening, and to avoid the difficulty of building screens out of copper or aluminium sheet, would like to use copper gauze of fairly fine mesh. The type I propose to use is that which resembles a thin sheet with holes drilled at regular intervals, not the wire type.

"Would this material be as effective as a screen as a sheet?"

WHO HEARS FIRST?



Capt. Eckersley's explanation of why a listener in Australia may actually hear a broadcast before another person who is in the concert hall from which the broadcast takes place.

No; not so effective, but very probably effective enough. I really cannot be dogmatic on this subject.

If your circuit requires "perfect" screening, the mesh will not do. But in my opinion it will do well enough for most purposes.

By the way, why do you want to use gauze? Simply because you happen to have some? If you haven't bought any, don't.

Eliminating H.F. Disturbances.

P. L. H. (Sidecup).—"I am building an A.C. mains-operated receiver with two H.F. stages, and am offered a choice between two different mains transformers. These transformers are identical so far as voltage outputs are concerned, but one transformer is equipped with a screen between the primary and the various secondary windings, whereas the other transformer is not so fitted.



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.

"My dealer informs me that with the transformer equipped with the screen any trouble due to interference from H.F. currents from the mains will be prevented, whereas with the unscreened transformer some difficulty of this nature may be met due to the fairly high overall magnification of the receiver. I should be very pleased if you would give me advice on this point."

The point is theoretically sound; a screened transformer helps to eliminate high-frequency disturbances which may be set up in the mains. To what extent such disturbances are in fact deleterious and/or if such disturbances do in fact exist, I have never found out.

These questions are more easily replied to quantitatively, and life is too short unfortunately to measure everything.

By the way, screening one transformer does not screen everything.

* * *

The Importance of Design.

C. C. (Nottingham).—"Why is it that designers so often stress the importance of following the specified layout? Is it really essential to place the various components in certain positions relative to each other, and do small divergences make much difference?"

Taking it all in all, it is better to follow the designer's layout, although sometimes there would be no harm in departing from it.

With a complete screening arrangement for high-frequency circuits there is no harm in using almost any layout of the components, but it's so difficult to get perfect screening in simple sets that the placing of components is important.

Low-frequency speech transformers may couple with the power supply circuits in a surprising way, and no iron screening will eliminate the trouble. So placing again is important, and cannot be disregarded or departed from with impunity.

Best follow the designer—or become one yourself.

THE DIARY OF A WIRELESS OPERATOR AT SEA



Dealing with the Customs—A visit to Freemantle—Our stay at Melbourne—The new Thermionic Valves.

FREEMANTLE. JANUARY 16TH, 1919.—This evening, once the doctor was aboard we were all lined up and carefully examined for any incipient symptoms of influenza. Having successfully presented a clean bill, we were allowed to pull down the quarantine flag and enter the port.

The gentlemen of the Customs proved a little more obdurate. They calmly ransacked each cabin for contraband, and then locked up all our cigarettes and spirits, informing us that if we wanted to use the former we must pay duty at the rate of 11s. for 400 cigarettes.

This little law is for the encouragement of trade in Australia.

An Exchange of Compliments.

There was some trouble at the docks about the arrangement of the coal chutes for the bunkers, and for five minutes the coal foreman and the Chief Engineer exchanged compliments of an extremely choice, but unprintable, nature. The female element on the wharf poked lady-like fingers in their ears, and withdrew to a more isolated position, leaving the males gathered in an appreciative group near the ship.

When the Chief and the coal foreman had both exhausted their breath and their stock of invective, and, believe me, both were pretty considerable, an Australian soldier who was standing near by yelled out:

"I've heard you both, and though I don't swear myself, I declare it a—draw."

After dinner a little party of us went

ashore. The town reminded me of Sydney, Cape Breton, and partly of Durban. All the shops were well lighted, and everything was very cheerful and gay.

We Split the Company.

Arrived at the corner of the High Street, we came to a halt, and there we were forced to split company. Three of our party of seven suddenly felt faint—or, at least, two said they did; the third was more honest, admitting outright that he wanted a drink.

There were two pubs in sight, each flanking a corner of the street, and for some time we all stood round listening to a heated discussion on the respective merits of "Union Beer" and "Commonwealth Whiskey." Beer eventually won the day, and we left the thirsty trio at the doors of the Newcastle Hotel, with sundry admonitions about the sin of intoxication.

Just as the three were about to push open

the door, a sedate-looking man stopped them and started to give a mild temperance lecture.

"Oh, my friends," he said, "do not enter there. It leads to hell, and hell is nothing but whiskey and divorce." The second officer pretended to take him seriously and got involved in an argument, but the others went in to investigate the merits of "scotch."

Long-Distance Record.

JANUARY 20TH.—Last night, and this morning, for it is now 3 a.m.—has been rather a busy one for the wireless department. Our orders have been changed now, and we are going to Melbourne instead of Sydney.

I have just made a record in long-distance transmission with this plant. The normal range for the transmitter (it is a 1 kw. Telefunken quenched spark set) is about 200 miles, but I have just been in communication with Melbourne and Esperance.

Melbourne is 375 miles away and Esperance about 900, our position at the moment being something like 250 miles south of Adelaide.

This long range is not due to freak action, but to the wonderful sensitivity of the new valves used in the receiving sets, which are fitted up in the main Australian wireless stations.

MELBOURNE. JANUARY 30TH.—There is not a great deal to say about our stay in Melbourne, because soon after we arrived an influenza epidemic broke out and all places of amusement, etc., were closed by order of the Government.

A Busy Railway Station.

Melbourne is said to be one of the finest cities in the world, and it is claimed that the Flinders Street railway station has more people pass through it than any other railway station in the world. I am rather inclined to doubt this.

What I saw of the city and surrounding country convinced me that of all the places in the world, Australia is more like Utopia—

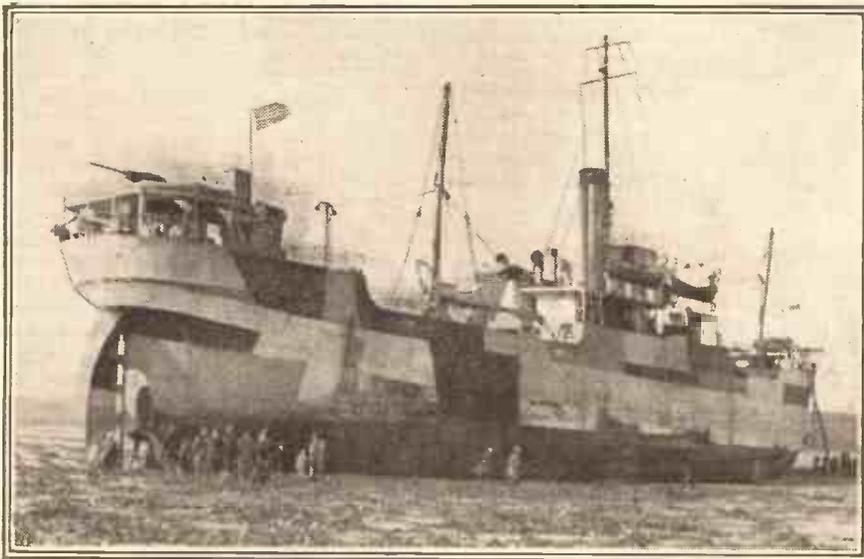
in regard to weather, situation, construction of towns, etc.—than any other place I have ever seen.

One Sunday afternoon I went to the Botanical Gardens and looked in on the wireless operator who is in charge of the Melbourne Wireless Station, which is located in a part of the gardens. There I had the unique experience of hearing the Eiffel Tower sending out her daily press message.

These new thermionic valves are certainly marvellous, and the operator tells me that since they were installed he has found it possible to read messages sent out from the big stations in England.

(To be Continued.)

ASHORE ON THE SANDS AFTER MISSING THE MINES



During the war submarines and mines were not the only dangers with which merchant vessels had to contend. As this picture indicates, there was always the risk of running ashore, a risk that was greatly increased by the fact that all lighthouses and lightships were out of commission.

The **TELSEN**

JUPITER S.G.3



FULL SIZE 1/- BLUEPRINT OF THIS AMAZING CIRCUIT GIVEN FREE WITH THE NEW AND ENLARGED EDITION OF THE **TELSEN RADIOMAG**



Build the Telsen Jupiter S.G.3—the Telsen Radiomag tells you how! Devised by Britain's leading radio technicians, and utilising the latest Telsen Matched Components, this outstandingly brilliant Telsen circuit is one which every keen home-constructor will want to build. For it gives a performance immeasurably ahead of anything previously achieved—not only in its extreme selectivity, its exceptionally wide range, and its tremendous amplification, but also in its really superb quality of reproduction. Complete constructional details, together with a full-size 1/- Blueprint, are contained in the new Telsen Radiomag Issue No. 3. Packed with valuable information, this biggest and best issue also tells you all about the improved and now all-embracing range of Telsen

Radio Components, at the revised prices only made possible by Telsen's enormous sale—the largest in the world! Get your copy now, price 6d., from your radio dealer or newsagent.

TELSEN

RADIO COMPONENTS

TOTAL COST OF TELSEN MATCHED COMPONENTS

77/-

FOR BUILDING THE JUPITER S.G.3

including panel, baseboard, terminals, battery cords and all accessories.

DRUM DRIVE CONSTRUCTOR'S OUTFIT



Contains all the necessary requirements for the construction of the TELSEN "JUPITER S.G.3," but the constructor will find the outfit of great value in the building up of any receiver circuit employing the drum drive condenser assembly. No. 219

3/6

The Outfit Contains the Following :

- | | | |
|--|---|--|
| 1 Metal Panel with attractive crystalline finish, specially cut and drilled for mounting the Telsen Drum Drive, and other panel-mounted components normally required in a ganged condenser receiver. | 7 Wander Plugs mounted in holder. | 1 Volume Escutcheon, 1 "On-Off" Escutcheon. |
| 1 Baseboard 14 by 10 in. | 2 Spade Tags. | 2 Height Plinths for the matched screened Coils. |
| 1 Aerial and Earth Terminal Strip. | 1 8-way Battery Cord | 1/4 in. of 3 mm. Sleeving (black). |
| 1 Loudspeaker Terminal Strip. | 1 Cord Clip. | 1/4 in. of 3 mm. Sleeving (red). |
| 2 Red Terminals complete and mounted in holder. | 2 Large Insulating Washers. | 20 feet of 1 1/2 mm. Sleeving (green). |
| 2 Black Terminals complete and mounted in holder. | 1 Small Thick Insulating Bush. | 21 feet of 22 S.W.G. tinned Copper Wire. |
| | 1 Small Thin Insulating Bush. | 1 Double-ended Spanner for lock-nuts. |
| | 2 Spacing Nuts for the reaction and aerial series condensers. | 1 Four-way Spanner. |
| | 2 Spacing Nuts for the "On-Off" Switch. | Assortment of 1/4-in., 3/8-in., 1/2-in., 5/8-in. and 1 1/2-in Wood Screws. |
| | 1 Wave-Change Escutcheon with two screws and nuts. | |
| | 1 Separator Escutcheon. | |

Get your copy of the new **TELSEN RADIOMAG, Issue No. 3**

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

"ATLAS" AGAIN.



NOW
ALTERNATIVE
OUTPUTS OF
12, 18 & 25m/A
at 150 Volts

**MODEL
A.C. 300**

The first unit
to give true
output voltage
regulation . . .

10/-
DOWN
AND BALANCE
IN EASY
MONTHLY
PAYMENTS

... Just as "ATLAS" last year improved the Olympia Ballot Winner of 1930, so have they improved the 1931 Ballot Winner: adding, amongst other refinements, the new "ATLAS" regulated output to ensure correct voltages irrespective of the milliamps consumed.

The new A.C.300 gives two variable H.T. Tappings of 0/100 and 0/120 volts and one fixed of 150 volts. Four C.B. Tappings. L.T. Trickle Charger for 2, 4 and 6 volt Accumulators. Tapped Input. Safety Charger Switch. Westinghouse Rectifiers. Fully guaranteed for 12 months. Cash £6 10 0. Ask your dealer for a demonstration now.

"CLARKE'S" "ATLAS" MAINS UNITS

H. CLARKE & CO. (M/CR) LIMITED,
George Street, Patricroft, Manchester.
London Offices: BUSH HOUSE, LONDON, W.C.2.
Sole Scottish Distributors:—
G.E.S. CO. LTD., 38, Oswald Street, GLASGOW.

Messrs. H. CLARKE & CO. (M/CR) LTD.,
George Street, Patricroft, MANCHESTER.

Please send me Folder 68, describing "ATLAS"
Mains Units and Components.

Name.....

Address.....

**POST
NOW!**

30/17/9.

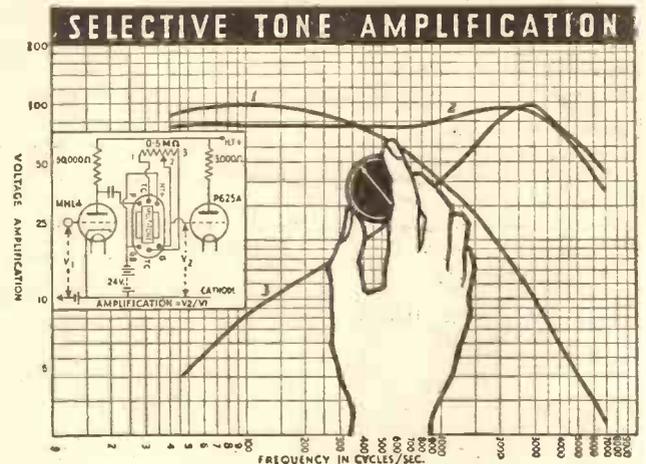
TRUE TONE CONTROL

THE MULTITONE WILL CORRECT THE TONE OF ANY SET

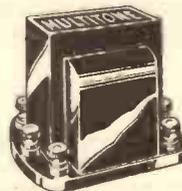
The Multitone Tone Control Transformer has no equal, but it has many imitations. No other method of tone control can claim to do what it has been proved the Multitone most definitely does.

By means of a Multitone Transformer you can amplify low tones, middle tones, and high tones at will; that is, you have "two-way tone control," which has never before been available.

The Multitone will correct the tone of any radio set or radio-gramophone.



By changing the setting of a Potentiometer, the response-curve of the Multitone Transformer is progressively altered from a falling (1) through a level (2), to a rising characteristic (3). The limiting responses and an intermediate level-response are shown by these curves. When the response is level the transformer ratio is 4:1. True Two-way Tone Control is immediately at your disposal on any set. In use all that is necessary is to turn the Potentiometer until the desired overall response is obtained.



Any good Potentiometer exceeding 0.5 megohms can be used with the Tone Control Transformer, but the best results are obtained with the Multitone Graded Potentiometer (price 3s. 6d.) which has been specially designed for this purpose.

17/6

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

MULTITONE TONE CONTROL L.F. TRANSFORMER

Multitone Electric Co., Ltd.

95/98, White Lion St., London, N.1. 'Phone: North 5063



THIS is going to be a radio-gramophone year. So say all the prophets, and I should not be surprised if they were right. This type of instrument is the logical development of radio and electrical gramophone recording, and the convenience and efficiency of the radio-gramophone must be heard to be appreciated.

Naturally such a "set" costs more than a plain radio receiver in the first place, but it does not cost any more to run, except such expenditure as may be made on records.

Much More Volume.

It has been said repeatedly that the radio-gramophone must essentially be a mains-driven instrument; that the battery type is useless, or nearly so. This is not strictly true, though it must be admitted that the mains type will give very much more volume and, in a way, realism, but this does not mean that it is essential to have mains before you can operate a radio-gram.

The original idea of the electrically-reproduced record was to obtain better quality. This has to some extent been lost sight of, and nowadays one is liable to look upon this instrument as a means of getting more volume of sound than is given by the acoustic machine.

The battery model will definitely not provide as much noise as will the acoustic gramophone, but properly handled and well designed it will give very much better balance of reproduction.

Thumping bass and shrill trumpets need plenty of power for their fullest reproduction, but with an ordinary battery radio-gramophone which has a good pick-up and good speaker one can get a miniature picture, as it were, that is complete in nearly every detail.

Interesting Tests.

But whether it be a battery- or a mains-driven model it is always interesting to carry out tests on a radio-gramophone; in the case of a ready-made one before it is purchased, and in the case of the home constructed type so that alterations can be made if the tests do not turn out satisfactorily.

We can take it that the radio tests are passed, and that it is the record section

The radio-gram is coming into its own, and increasing numbers of set owners are becoming interested in this modern combination of radio receiver and gramophone. The following notes will be of value to listeners and home-constructors alike.

to which attention is to be turned. In this case we must pick out a few records that will sufficiently put the pick-up through its paces, and show up any weak points in the system.

Don't forget that in most cases of record playing the volume control cannot be turned fully on, except at the very quiet passages. It is not meant to be, for the idea of the control is not to enable the loud passages to be made still louder so much as to enable the volume limit to be so varied that on the loudest parts the set is within its limit of undistorted output,

that is, it does not overload and thereby cause distortion.

With a soft record it is possible sometimes to have the instrument "all out," but in most cases distortion due to overloading takes place before that state of affairs is reached. There is a certain maximum volume up to which one can go on each radio-gramophone (it varies with each) and it cannot be exceeded without distortion occurring no matter where the volume control is set.

This is a very important point to remember, especially when one is considering the battery-operated set, with its naturally limited valve output power. It is hopeless to try to exceed that limit.

Try Speech Records.

In carrying out tests of a radio-gramophone it is not essential for a rough idea of how the set is behaving to get scientific records like gliding tones and so on; a small collection of general discs will do excellently. Such records as the second "Hungarian Rhapsody" of Liszt, played by the Philadelphia Symphony Orchestra, some of Ambrose's records, William Murdoch playing Sibelius' "Valse Triste" on the piano, and so on, do extremely well.

Boyd Senter's Enial Blues on Parlophone give a fine opportunity for studying the results of the clarinet as reproduced on the radio-gram in question. Get a few speech records and listen for the S's, P's, K's and T's. One can get records of separate musical instruments, but they do not tell you much, for it is the combination of many instruments that the machine has to reproduce; a much more complicated affair of fundamentals, harmonics and transients.

Careful Analysis.

Listen for undue pick-up chatter, for reluctance on the part of the needle to follow every groove, even the very low bass note grooves, accurately, and listen for resonant points in the reproduction, especially the low points that make it sound boomy and boxy.

It is only by careful analysis of the results that one can find what is wrong; and afterwards put it right.

RECORDS TO REMEMBER

VOCAL.

O Lola (Cavalleria Rusticana) *H.M.V.*
RICHARD CROOKS.

Credo *H.M.V.*

CHALIAPINE.

Between the Devil and the

Deep Blue Sea *Zono*

QUEENIE LEONARD AND EDWARD

COOPER.

Making an Omelette *Zono*

ORCHESTRAL.

Praeludium *H.M.V.*

ROYAL OPERA ORCHESTRA (Covent Garden)

Dollar Princess Waltz *H.M.V.*

MAREK WEBER AND HIS ORCHESTRA.

DANCE NUMBERS.

The "Oi" Song *H.M.V.*

AMBROSE AND HIS ORCHESTRA.

Miss Hannah *H.M.V.*

McKINNEY'S COTTON-PICKERS.

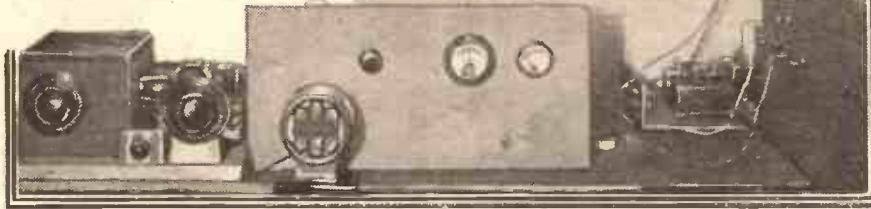
If You Were Only Mine *Zono*

BLUE LYRES.

Underneath the Arches *Zono*

TERRY MACK AND HIS BOYS.

Short-Wave Notes *By W.L.S.*



THE records of the eclipse tests are not yet complete enough for me to tell readers much about them, except that the variation in conditions during the actual eclipse was generally noticed, although it affected different localities in different ways. I was listening for the whole time to the running commentary broadcast from the N.B.C. network, sometimes from W 2 X A D on 19.56 metres, sometimes from W 3 X A L on his 16-metre wave, and sometimes from W 8 X K on 13.9 metres.

I was trying to observe simultaneously the behaviour of the three stations during the 100 seconds for which the total eclipse lasted. As zero hour arrived, however, I decided that I had not enough hands for the job, and settled down on "X A D." Immediately afterwards I listened on the 20-metre amateur band and noticed a good crop of U.S.A. "Hams" who had not been there twenty minutes before.

Full Details Later.

Full details of the findings of "P.W." readers will be published as soon as I have time to tabulate them all. Three more readers qualify for "H.A.C." by having heard all continents: "K. H." (Marlborough), "C. S. P." (Shortlands), and "F. D. T." (Redhill). In two cases my single-valver was the culprit.

"K. B. C." (Totton) says his little piece in no uncertain manner. He is somewhat surprised to find that a set like the aforementioned single-valver should be described in "P.W." as, in his own words, "anyone with a grain of savvy could have designed the set."

The Novice.

Agreed, "K. B. C.," but you'd be surprised to find how many people are *not* in possession of the requisite "grain of savvy."

You should see some of the sets I have seen, and the attempts of the home-constructor to duplicate even a simple affair like the one-valver.

After all, "P.W." has always catered for the man whose laboratory is the kitchen table, and whose tools comprise just pliers and screwdriver. If you want a complicated set, you, in turn, are catered for from time to time, but I definitely don't agree with unnecessary complications in short-wavers.

From the pen of our popular short-wave expert, these notes will keep you "au fait" with what is happening on this fascinating wave-band. Week by week W. L. S. deals with stations that are coming over well, wavelength changes, reception conditions and anything of interest to the enthusiasts.

As for the statement that the one-valver is "not hot enough," there is an article in the Editor's hands on the subject of "gingering it up" a little; but even that is not everybody's meat. It seems obvious to me that you haven't tried it.

Straight Sets Best.

It is an unfortunate fact nowadays that a set bristling with original ideas and clever modifications generally proves to be very, very ordinary when it comes to performance. This makes it very hard for the designer (particularly where short-wave sets are concerned), for he simply has to design a straightforward set, and then is quite rightly accused of being unoriginal.

The only original or unconventional idea

BUILT BY THE SCHOLARS OF STOURBRIDGE



A complete amateur transmitting station designed and built by the scholars at King Edward VII School, Stourbridge. Microphone, transformers, chokes, etc., were all made in the school workshops.

that has ever attracted me for a short-wave set is one with which I am playing at the present moment. It is a "band-spread" set, capable of covering just the four short-wave broadcast bands (round about 19, 25, 32 and 49 metres), each band occupying as nearly as possible an entire swing of the tuning condenser.

With a set of this type in the hands of readers, we should not hear the usual wail that "it's all Morse"! One would be

certain of finding the broadcast stations and very little else.

Of course, that particular set wouldn't suit some readers at all. Those to whom the breath of life is to sit down and identify hitherto unheard of stations prefer to have a wide tuning range. The wider the better, in fact.

The "band-spread" idea is fine for really keen short-wave broadcast listeners, but the set would need careful copying, especially the coils, which would have to be specially wound to cover a given range with a given condenser. It would be a minor tragedy if someone were to make the set and find that he had four ranges, all full of Morse and nothing else! A slip of one metre would give this effect, naturally.

A "Single" at Sea.

An interesting letter from "W. J." (Wallasey) brings us back to the one-valver again. But it is not about the set itself that he talks, so much as the exploits through which it has gone. He made it in an hour on a ship, first night out. A five-foot length of flex brought in G 5 S W and Radio Colonial at once. The latter was still heard in the Indian Ocean, together with Moscow.

The Indian Ocean is reported as poor, the Red Sea better, and the Mediterranean distinctly good. "W. J." thought Zeesen, Skamlebaek and W 2 X A D were strong enough to work a loudspeaker round about 22.00 on August 14th in the Mediterranean!

Thanks, "W. J.," I am standing by with the proverbial biscuit for the first reader to take the "single" round the world.

Here are the usual five stations to fish for: Bombay (V U B) on 49 metres: Mondays, Wednesdays and Fridays, 5-6.30 p.m.

B. S. T. Bogota, Colombia (H K C), on 48.35 metres. London, Ontario (V E 9 B Y), on 46.67 metres. Guatemala City (T G X), on 33.5 metres, early mornings only. Pittsburg (W 8 X K), on 13.92 metres.

Keep a Log.

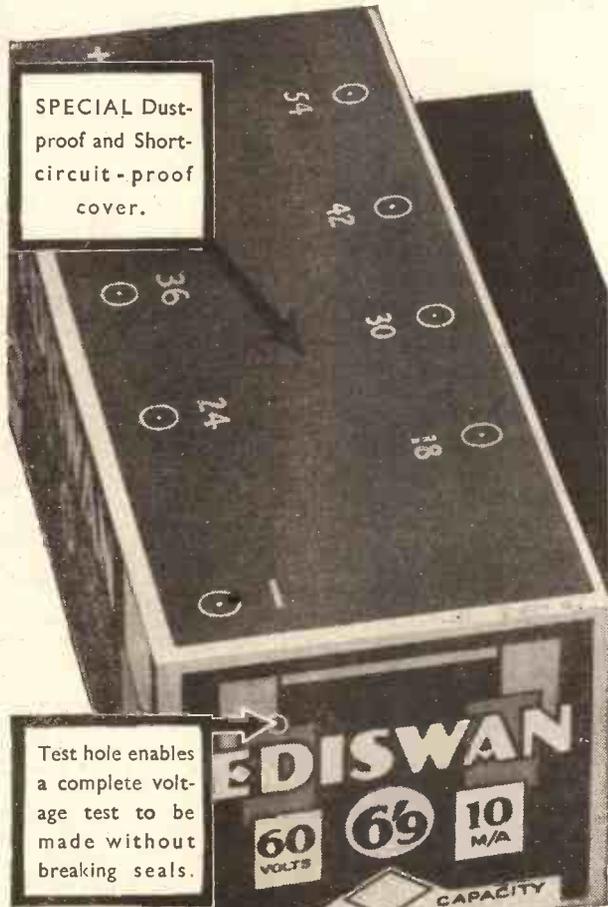
If readers who find that they are receiving most of these groups of stations will keep a log of just what they do get, and forward it to me occasionally, I shall be interested and grateful.

Before closing I might mention how well some of the American stations are coming over just now, W 2 X A D on 19.56

metres being particularly brilliant. On a recent evening it was possible to hear him on headphones with the reaction control at minimum, and on a two-valver at that. Can anybody beat it?

By the way, if there are any readers who get trouble with bad body-capacity effects while wearing headphones they should try an H.F. choke in each phone lead. I have found this a complete cure in many very obstinate cases.

"RADIO ENTHUSIASTS CAN PURCHASE THEM WITH EVERY CONFIDENCE"



The Edison Batteries are giving the first-class service expected of them. Radio enthusiasts can purchase them with every confidence. Their outputs are above the average and they give a clean, steady output . . .

says the Technical Editor of "Popular Wireless"

Settle the H.T. Battery problem once and for all—take no more risks buying batteries "on spec."—it is unnecessary, for Edison H.T. Batteries are now GUARANTEED against failure to give completely satisfactory service. Every single cell in every Edison Battery must successfully pass four tests before it leaves the factory, and special precautions are taken to ensure perfect internal insulation between cells.



Standard Capacity. Where the anode current required does not exceed 10 M/a these batteries will give highly satisfactory service. If super-power valves are used, the super-capacity type should be used.

Super Capacity. These batteries have twice the capacity of the standard type, and, owing to their large reserve of power, last nearly three times as long when used as replacements to standard capacity batteries.

Look for the Edison Authorised Dealer sign when you buy!

Send for your FREE copy of "How to get the most out of your H.T. Battery." Full of useful data, hints and tips.

Guarantee

The Edison Swan Electric Co. Ltd. guarantee that Edison Batteries are of full voltage and capacity. Should any Edison Battery fail to give satisfactory service, we undertake to deal with the customer's complaint within 24 hours of receipt of the defective battery.

EDISWAN Guaranteed RADIO H.T. BATTERIES

THE EDISON SWAN ELECTRIC CO. LTD.



PONDERS END, MIDDLESEX

B.174

WE are certainly in the thick of things so far as foreign station reception is concerned, and at a date far earlier than has occurred for many years past. I have never known such amazing reception as has been possible on recent evenings.

On the evening before these notes were written, thirty-three stations were obtained at full loudspeaker volume with a four-valve set and an indoor aerial. Many others were heard, but such was the selection of real "fat" transmissions that no account was taken of the smaller fry.

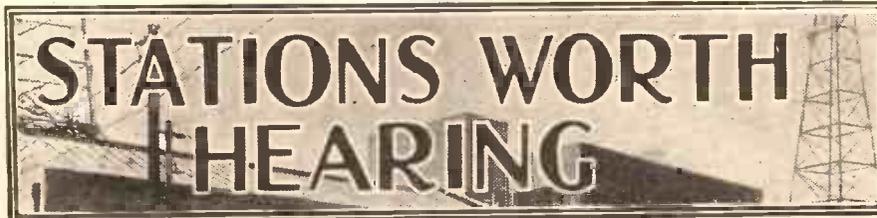
Exceptional Conditions.

These wonderful conditions affect both the long and the medium waves. On the long waves, for example, I can record good reproduction of Reykjavik's programmes for the first time for nearly a year.

This station has seldom been well received in the southern part of our country, at any rate, since he came into operation, and probably he figures in the logs of very few readers. Now is the time to capture him.

Another station whose reception is something of a feast is Vienna Experimental. For a long time past he has been difficult to hear, but now he is coming in remarkably well on many evenings.

There is, unfortunately, a certain amount of interference now on the long waves, mainly through Russian stations. Warsaw



Realising the importance of providing listeners with up-to-the-minute news about long-distance stations and conditions, "P.W." publishes every week the notes of a Special Correspondent who nightly searches the ether in order to provide a log that is really up to date.

has been a casualty on certain recent evenings, and Oslo, though normally very good, is occasionally badly jammed.

On the medium waveband, readers have now full opportunity of testing the selectivity of their receiving sets. During the summer months, when the field strength of distant stations is on the small side, most sets with any pretensions to selectivity will separate, say, Breslau and the Poste Parisien, or Katowice and Sottens, or Strasbourg and Brno, to name three pairs of wavelength partners.

But just now some of these stations are coming in so strongly that there is noticeable "spread," and with the set whose selectivity is not of the knife-edge order, separation is becoming increasingly difficult.

"Volume-Control" Strength.

Most readers will have marked with real pleasure the return of Budapest to fine volume. On several recent evenings he has reached what I call "volume-control" strength, which means that it is the volume

something of Riga and Sundsvall, though neither is yet enormously strong.

Both the Brussels stations and Langenberg continue to provide full-volume daylight reception, and that gives you some idea of what they are like after dark. Florence is now a "regular," and Prague is as easy a station to receive as you can wish for.

Heterodyne Troubles.

Beromunster, though normally excellent, is heterodyned on rare occasions, Rome is tremendous and Stockholm is very nearly as good. Berlin Witzleben is lifting up his voice once more, Katowice is generally well heard, and Sottens is always worth attention.

Frankfurt is rapidly becoming a first-rate transmission, Hamburg is returning to his best volume, and Toulouse is a never-failing friend. Strasbourg and Brno are there for the asking, but Milan is sometimes disappointing.

The Poste Parisien is another good well received station. R. W. H.

NEWS comes to me of important plans for orchestral activities in both Scotland and Ireland.

In Belfast the B.B.C. maintains an excellent symphony orchestra and during the autumn and winter it will frequently play in public. This is the only full B.B.C. orchestra in the provinces and it owes its continued existence to the unsatisfactory landline link between Belfast and London.

It has become an essential part not only of local broadcasting but of Belfast social life. The enthusiasm of its following may be realised from the fact that there was an average audience of well over a thousand at the public concerts held in the spring in the Ulster Hall.

Series of Public Concerts.

This hall will again be the scene of a series of public concerts, starting in November, in co-operation with the Belfast Corporation; and there will be another series in conjunction with the Y.M.C.A., commencing in October.

The conductors will include Sir Henry Wood, and among the soloists who have been engaged are Laelia Finneberg, Elsie Suddaby, Jelly d'Aranyi, Harold Williams, and William Murdock.

In Scotland the opening of the Scottish National transmitter during September will free the Regional wavelength for

NOTES FROM IRELAND & SCOTLAND
By Our Special Correspondent.

greater local activities. The B.B.C. has come to an agreement with the Scottish Orchestra to broadcast five concerts, two in Glasgow and the remainder in Aberdeen, Dundee and Greenock. It is understood that they offered £100 each for these concerts.

The B.B.C. is anxious to diffuse these activities into as many centres as possible, and Inverness, Perth, Ayr, and Galashiels, as well as Edinburgh, will be the scene of a series of broadcast concerts by the Scottish Philharmonic Orchestra.

This does not exhaust Mr. Cleghorn Thomson's plans. The Reid Orchestra, playing in Edinburgh, will be heard by Scottish Regional listeners on a dozen occasions.

The project for forming a Scottish National Orchestra with the support of the B.B.C. is still the subject of negotiations.

Turning from orchestral to dramatic work, we again find both these provincial regions active.

Belfast has broadcast on every second Monday a series of plays performed by the

famous Abbey Theatre Players, who make the journey from Dublin to the Belfast studios specially for each performance; the last of the series, on September 19th, will be relayed in the London Regional programme.

Scotland presents on September 20th a play specially written by the Scottish novelist, Christine Orr, as one of the principal radio celebrations of the Sir Walter Scott Centenary. This play will be relayed in the National programme.

The above arrangements typify the policy of the B.B.C. as regards provincial activities—an encouragement of local talent, a stimulation of local interest, and an exchange of outstanding features between the provinces and London.

B.B.C. Policy.

The opening ceremony of the Belfast Wireless Exhibition was broadcast from the Ulster Hall on September 14th, the speakers including the Marquis of Londonderry. The B.B.C. exhibit is the model of Broadcasting House recently on view at Radiolympia.

The B.B.C. is also exhibiting at the North East Trades Exhibition at Aberdeen. A broadcasting studio has been erected at the Exhibition and the public will be able to watch broadcasting in progress, the walls of the studio being of sheet glass.



The "FLEX-FEED" TWO



DESCRIBED BY A. S. CLARK.

Only two valves—but what results! Full loudspeaking on record or radio, near and far stations—with perfect quality, all-mains working—and yet it is as simple to make and operate as a battery set.

"I'M thinking of going over to the mains."

It's amazing the amount of doubt most people manage to cram into those few words when they utter them!

They might almost be thinking of giving away a super-het. set and buying a crystal receiver, so worried do they seem about whether it is a right step. Probably it's all a matter of living down old prejudices, such as complications, shocks and expensiveness.

Striding Ahead.

If it is, the "Flex-Feed" Two is going to do a lion's share of the "living down." It is the very antithesis of these one-time inseparable items from mains working.

As a matter of fact, mains receiver technique has advanced so rapidly during recent times, that battery set users who have mains laid on have failed to keep pace

with it. Otherwise they would not be using battery sets, except, of course, in a few understandable cases.

All the sting—or perhaps one should write "shock"—has been taken out of mains receivers for home construction. They are every bit as safe, easy to build, and simple to operate as battery sets of to-day. There may be a little more of them, but that is simply because everything is *inside* instead of there being some *external* items such as accumulator and H.T. battery.

Two valves is the minimum number (barring, perhaps, in the case of a few specialised circuits) which will give loud speaker results. But if they are in a mains

set—and particularly if that mains set is the "Flex-Feed" Two—what loudspeaker results they give!

Plenty of Volume.

You can get all the volume you want for home use, and the foreign stations come in jolly well, and the quality is the real goods, and you can use a pick-up for record reproduction. On top of that there is the feeling connected with a two-valver, that each stage is working properly, and quality is not being spoilt by inaudible but nevertheless damaging feed-back.

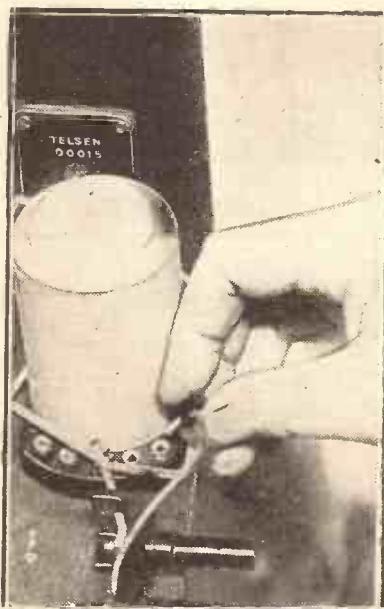
But perhaps you don't get that impression of simple efficiency. Anyhow, it

(Continued on next page.)

MAKE IT WITH THESE PARTS—WORK IT WITH THESE ACCESSORIES

- 1 Panel, 10 in. x 7 in. (Peto-Scott, Goltone, Permeol, Becol, Wearite, Lissen).
- 1 Baseboard, 10 in. x 18 in. (Peto-Scott, etc.).
- 1 .0005 Variable condenser (Lissen, Polar, J.B., Cyldon, etc.).
- 1 Slow-motion dial (Igranic Indigraph).
- 1 Canned coil (Colvern, T.D.).
- 1 .0001-.00015-mfd. differential reaction condenser (Telsen, Ready Radio, J.B., Polar, Cyldon, Graham Farish, Lissen, Peto-Scott, Igranic, Tunewell).
- 1 Volume control potentiometer, 500,000 ohms (Ready Radio, Tunewell, Igranic, Lewcos, Sovereign, Radiophone, Graham Farish, Wearite, Watmel).
- 1 2-mfd. condenser (Dubilier 9200, Telsen, Lissen, Ferranti, Igranic, T.C.C.).
- 3 2-mfd. condensers (Telsen, etc.).
- 3 4-mfd. condensers (Lissen, Dubilier, T.C.C., Ferranti).
- 1 .0001-mfd. fixed (Dubilier Type 670, T.C.C., Lissen, Ready Radio, Ferranti, Igranic, Goltone, Sovereign).
- 2 5-pin valveholders (W.B., Benjamin, Clif, Telsen, Lissen, Ready Radio, Igranic, Wearite, Bulgin).
- 1 Bias resistance (see text), (Sovereign, Dubilier, Colvern, Tunewell, Wearite, Lissen, etc.).
- 1 Bias resistance, 750 ohms (see text) (Sovereign, etc.).
- 1 L.F. coupling unit (Bulgin TransCoupler, Benjamin "Transfeeder," R.I. Parafeed Coupler, Formo "Multicoupler").
- 1 H.F. choke (Peto-Scott, Tunewell, Ready Radio, Lissen, Telsen, Wearite, Sovereign, Watmel).

SELECT YOUR SELECTIVITY



You can choose a degree of selectivity to suit your particular circumstances by plugging into one of four sockets with the lead from the aerial terminal.

- 2 L.F. chokes to carry 40 milliamps (Ferranti B1, Wearite H.T.3.; Tunewell, R.I., see text).
 - 1 Mains transformer (Tunewell M.R.28/200 for 200-250 volt mains. For other voltages consult makers).
 - 1 Metal rectifier (Westinghouse type H.T.7).
 - 1 On-off rotary switch (Bulgin, Ready Radio, Tunewell).
 - 1 Radiogram rotary switch (Ready Radio, Bulgin, Tunewell).
 - 1 Fuse and holder, 150 m.a. (Belling-Lee single, Bulgin).
 - 2 Switch brackets, 1½ in. high (Wearite).
 - 1 Double terminal mount (Belling-Lee, Goltone, Sovereign, etc.).
 - 2 Banana plugs and sockets (Belling-Lee, etc.)
- LOUDSPEAKERS.**—Ormond, Celestion, H.M.V., Marconiphone, Blue Spot, R & A, B.T.-H., Epoch, Lanchester, Cossor.
- RECOMMENDED AERIAL AND EARTH EQUIPMENT.**—Electron "Superial," Graham Farish "FILT" earthing device.

RECOMMENDED VALVES.

Make	Def.	Bias Res. ohms.	Power	Bias Res. ohms.
Mullard	354V.	1,000	054V.	1,200
Mazda	A.C.2/H.L.	750	A.C./P.1	1,500
Cossor	41M.H.F.	1,000	41M.P.	320-350
Marconi	M.H.4	800	M.L.4	350
Osram	M.H.4	800	M.L.4	400
Tungsram	A.R.410	600	A.P.495	1,000
Eia	D.W.4023	800	—	—
Six-Sixty	4G.P.A.C.	1,000	S.S.49.P.A.C.	1,200
Lissen	AC/HL 500.	—	—	—

THE "FLEX-FEED" TWO

(Continued from previous page.)

doesn't matter; if you are wanting a two-valve set for those A.C. mains you need not look further, it's got all those little "somethings" that the others haven't got!

If you are one of those fortunate people to whom a theoretical circuit diagram tells all there is to know about the set, it is there for you to study. If you are not—well, it doesn't matter; you don't have to know all the whys and wherefores of the "Flex-Feed" Two to get the best out of it.

Compact Design

In spite of the number of components necessary for such a design, quite a small panel is used. It is only ten inches wide and seven inches high, and has been made possible by the use of a deep baseboard eighteen inches from front to back.

There are just the main controls on this panel—that is to say, those which are likely to be necessary during ordinary tuning operations. In the centre is the

simple scheme of which we shall have more to say later when the construction of the set proper has been fully dealt with.

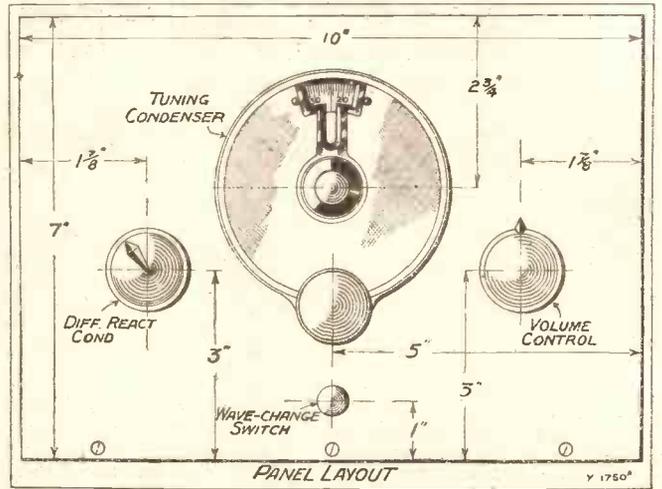
Attached to the aerial socket just mentioned is a flex lead terminating in a wander plug for insertion into one of four sockets on the dual-range tuning coil. This provides a means for varying the selectivity of the receiver to suit local conditions, and in conjunction with the flex supply from the mains and flex-leads from the pick-up, accounts for the set was christened.

An automatic function in the set is the provision of grid bias by means of the voltage drop caused across a resistance

when the anode current of the valve flows through it.

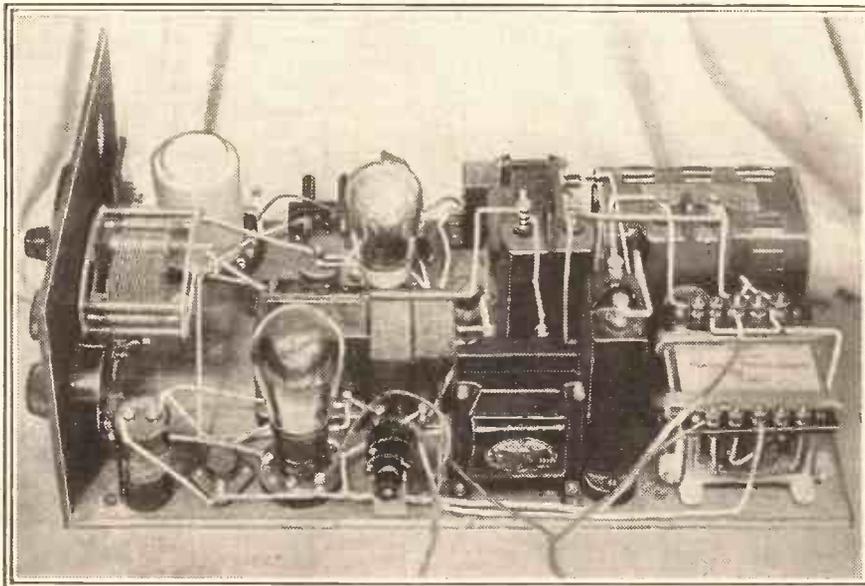
As you know, the anode current of valves

AN APPEARANCE WITH AN APPEAL



The panel which carries the main controls has a most attractive layout.

EVERYTHING GOES INSIDE THE CABINET



Compactness is one of the features of the "Flex-Feed" Two, but it is compactness with accessibility, for the wiring-up is quite simple in spite of the fact that no baseboard space is wasted.

knob for tuning with the wave-change switch at the bottom; to the left of it there is the differential reaction condenser knob and on the right the volume control.

The two switches, one for turning the set on and off and the other for changing from radio to records, are to be found to the sides of the set a little under half-way from the front. And just behind the radio-gram switch on the left side is a mount carrying two sockets—one for the aerial and one for earth.

Home-made Cabinet

You may be a little puzzled as to how the two switch spindles are to be arranged to protrude through the sides of the cabinet. The explanation is that the cabinet is home-made and designed on a specially

depends upon the current which they pass, and for this reason the values for the two G.B. resistances are not given on the diagrams. The values to use for these two resistances depend upon the valves you use, and so suitable resistances are given after the alternative valve types in the list of accessories.

Grid-bias Resistances

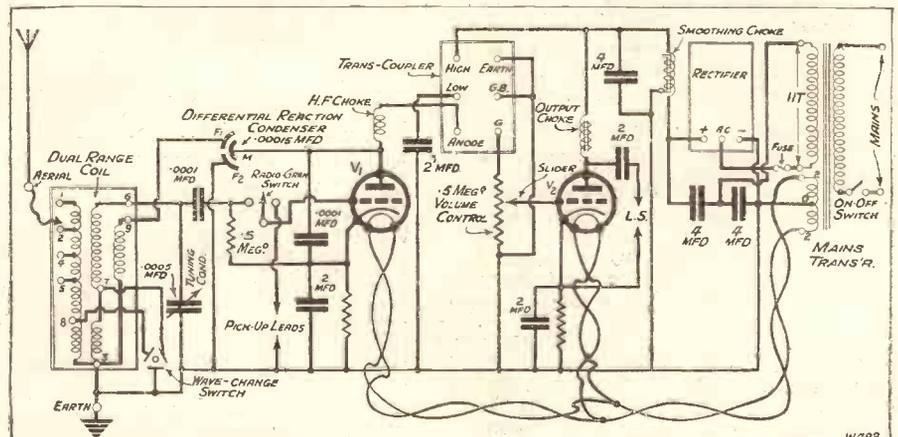
You can soon spot the two resistances in question, on the wiring diagram, as they are shown as circles with "RES" inside them on a square base. The one next to V2 is the output valve resistance and the other, near V1, is for the detector valve.

Incidentally, the radio-gram switching is so arranged that the G.B. on the detector valve only comes into operation for record work when this valve is used as an amplifier. At other times the valve is unbiased.

An interesting point about the mains part of the set is what is known as voltage "doubling," a scheme by which a voltage much higher than that given by the mains-transformer secondary is available for H.T.

(Continued on page 32.)

MOST MODERN METHODS IN MAINS DESIGN



All the latest ideas in mains circuit design are incorporated, including parallel feeding for the interval transformer. A switch is provided in the detector grid circuit to change from radio to record reproduction.

Convert your set to the KENDALL-PRICE 3

The new high efficiency multi-purpose coil employed in this receiver, combined with its remarkable selectivity and ease of operation, make this set far superior to the ordinary type of Detector-2 L.F. Set.

Free

Mr. G. P. Kendall, B.Sc., the designer of many famous sets, and his assistant, Mr. H. D.

Price, the famous short-wave experimenter, have written a book containing complete instructions, photographs and diagrams of ten modern circuits both battery and mains-operated. It shows you how, at a cost of a few shillings, you can bring your present set right up to date. At its published price of 1s. it represents remarkable value-for-money.

Full-sized dimensioned Blueprints of these ten wonder circuits are also available at the exceptionally low price of 1s. for the set of ten. Send 1s. in stamps with coupon below and we will also send you a FREE copy of the "Kendall-Price" Book. Post coupon now!

READY RADIO

The Kendall-Price Book is packed full of useful information which will prove invaluable to you, whatever type of set you are using. Even if you are satisfied with your present set you should read this wonderful book.

To : READY RADIO LTD. (Book Dept.), Eastnor House, Blackheath, S.E.3.

I enclose 1/- for the ten full-sized blueprints. Will you also send me—FREE—a copy of the Kendall-Price Book of Ten Circuits.

Name

Address

P.W.4

**POST
COUPON
NOW!**

THE "FLEX-FEED" TWO

(Continued from page 30.)

It is a form of full-wave rectification in which alternate cycles charge up separate condensers which are in series so far as their output is concerned. (Being in series their voltages naturally add together.)

Decoupling.

To ensure efficient decoupling for the anode currents, a parallel-fed transformer is used between the valves and an output filter is fitted to the output valve. The former is obtained by means of a combined unit which in the "Flex-Feed" contains transformer coupling condenser and resistance, and decoupling resistance. The 2-mfd. condenser for the decoupling is the only external component necessary.

The cabinet is of the "lid" type, that is to say it consists of two sides, a top and a back, and after being placed over the set it is screwed to the baseboard.

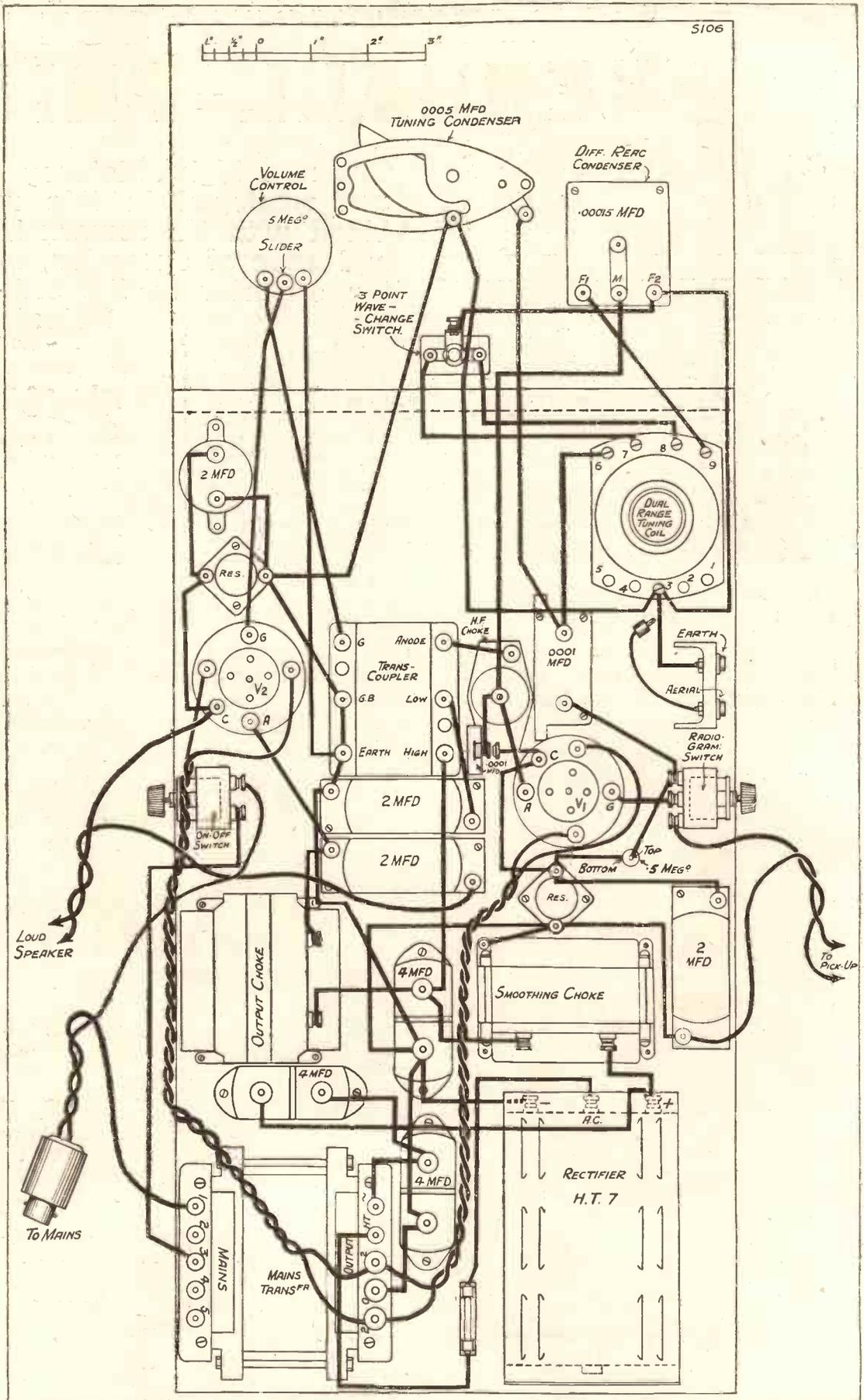
The construction of such a cabinet is so simple that it is unnecessary to give a diagram. Use wood not more than one quarter of an inch thick, or the spindles of the components will not be long enough.

A Reminder.

By the way, don't forget to cut slots in the sides of the cabinet for the spindles, and also one to allow access to the aerial and earth sockets. The two switches are mounted on the baseboard by means of small brackets.

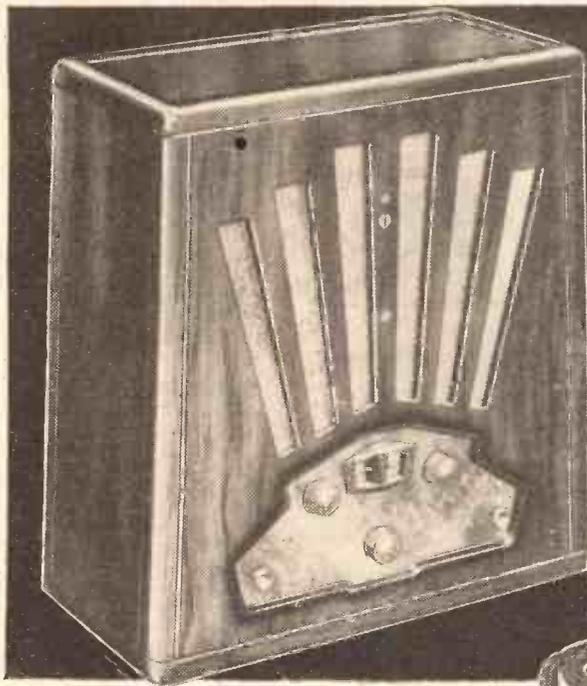
Holes or further slots should be cut for the three twin flexes, one to the mains, one to pick-up, and one to loudspeaker.

When testing for the best tap for the aerial plug, you should try all four positions and decide on the one which gives best results, taking into account both volume and selectivity.



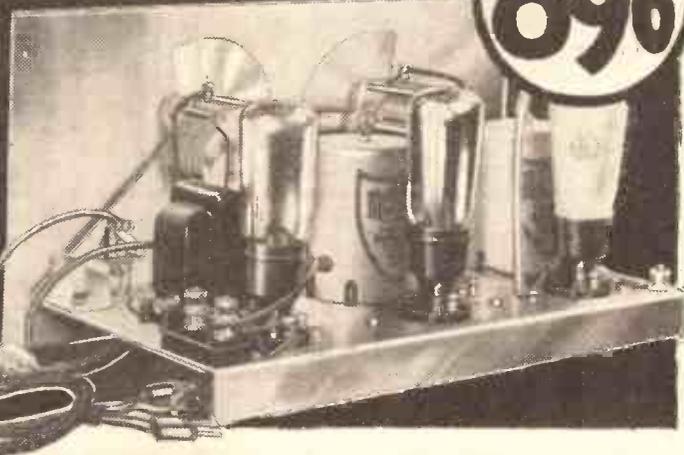
When wiring-up use twin flex where the connections are shown twisted together:

How to build yourself a better set - and **SAVE POUNDS!**



**Kit complete with Valves -
Metallised S.G. High Mu Detector
and Economy Power Pentode**

89/6



Here's the only Kit you can build yourself employing such **HIGH POWER Valves!** **YOU CAN'T GO WRONG!**

THIS new LISSEN SKYSCRAPER KIT SET is the **ONLY ONE** on the market that you can build yourself employing a Metallised Screen Grid Valve, High Mu Detector, and Economy Power Pentode Valve. Around these three Valves LISSEN have designed and produced a *home constructor's kit* the equal of which there has never been before. It is the only battery set delivering such power—yet the H.T. current consumption is far less than the average commercially designed 3-valve set. And the LISSEN SKYSCRAPER is made simple for you to build—such detailed instructions are given to you, and so clearly, in the **FREE** Lissen Constructional Chart, that *everybody*, with no technical knowledge or skill, can build it quickly and with complete certainty of success.

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

1/- CONSTRUCTIONAL CHART—FREE

Lissen have published a 1/- Constructional Chart, giving the most detailed instructions ever printed for the building of a wireless set. Every part, every wire, every terminal, is identified by photographs. Everybody, without technical knowledge or skill of any kind, can **SAFELY** and with **COMPLETE CERTAINTY** undertake to build this most modern of all radio receivers from the instructions given and the parts Lissen have supplied. **THERE IS A FREE COPY OF THE CHART FOR EVERYBODY—GO AND ASK YOUR DEALER FOR YOURS—**or fill in the coupon below.

You buy the Lissen Skyscraper Kit complete with valves—a Lissen Metallised S.G., a High Mu Detector, and a Lissen Economy Power Pentode Valve—and the price complete is only 89/6. You can start straight away and build it, using, if you like, any existing batteries and any suitable cabinet.

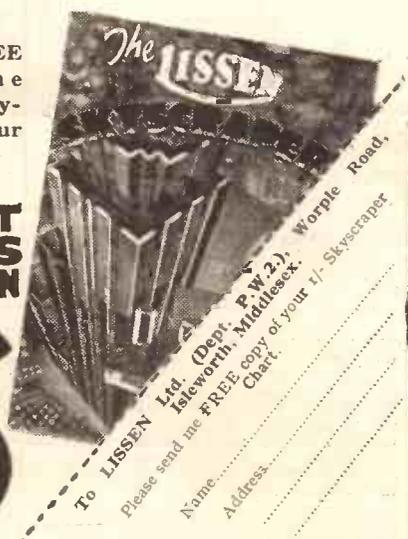
Or you can buy the Lissen Walnut Console Skyscraper Cabinet and Loudspeaker combined, as illustrated. It holds all the Batteries, and Accumulator and Loudspeaker as well as the Skyscraper Kit—it makes everything self-contained. A special Lissen Pentode Matched Balanced Armature Loudspeaker of great power is supplied with the cabinet, and the price of the Skyscraper Kit complete with Valves and this Cabinet and Loudspeaker is only £6 5 0. For this you will possess a receiver which has no equal.

COMPLETE CONSTRUCTIONAL CHART FREE!

TELLS YOU EXACTLY WHAT TO DO WITH EVERY SINGLE NUT & SCREW

to "Popular Wireless" readers

There is a **FREE COPY** of the **CHART** for everybody—ask your dealer or



POST THIS COUPON

3

LISSEN

SKYSCRAPER KIT

To LISSEN Ltd. (Dept. P.W.2.),
Ipsleworth, Middlesex.
Worpole Road,
Please send me **FREE** copy of your 1/- Skyscraper
Name.....
Address.....

COLVERN -T.D. COIL FOR THE "FLEX-FEED" TWO

(Described in this issue)

AN UP-TO-DATE COIL WITH UP-TO-DATE FEATURES

TYPE T.D., an entirely new COLVERN COIL, designed to give super selectivity on both long and broadcast wave-bands.

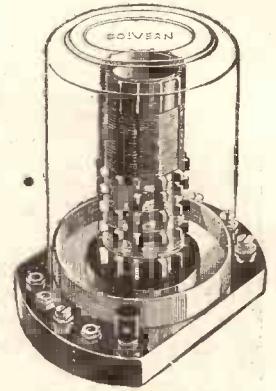
The coil is completely screened, giving a very neat appearance, and incorporates tapped aerial coupling and reaction, while the four alternative aerial tappings are arranged as sockets with a wander plug.

The first two tappings give aerial couplings similar to those normally employed but with greatly increased selectivity.

Nos. 4 and 5 give a high degree of selectivity with weak aerial coupling—suitable for use in a "swamp" area.

A most important feature of this coil is that there is no break through on the long wave-band from B.B.C. stations.

Our 1933 Booklet Radio List No. 10 is now available and free on request.



TYPE T.D.

PRICE

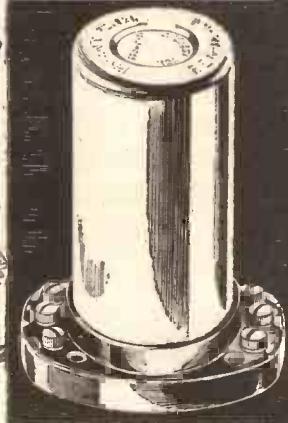
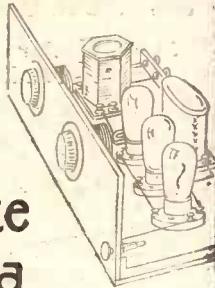
8/6

COLVERN LIMITED

MAWNEYS RD., ROMFORD, ESSEX

Don't scrap
your old set—

Bring
it up-
to-date
with a



BENJAMIN "TRANSFEEDA"

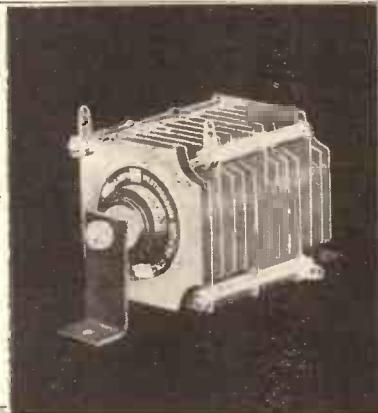
The heart of a radio receiver is its Low Frequency transformer. Put new life into your old set, and secure the high-class reproduction you expect in 1932 by supplanting your old transformer with a BENJAMIN TRANSFEEDA—the original resistance-fed transformer. Each Transfeeda carton contains complete instructions for wiring up in any set, you can't go wrong. Get a Transfeeda today and give your old set a new lease of life. May we send you our fully descriptive leaflet No. 1292?

PRICE

11/6

THE BENJAMIN ELECTRIC LTD., TARIFF ROAD, TOTTENHAM, N.17

L.T.4
Westinghouse
Metal
Rectifier



Output
6 volts, 1 amp.
Price
13/-

BUILD your trickle-charger with a **Westinghouse Metal Rectifier** and keep your batteries up to scratch always. A rectifier, transformer and resistance are all that is necessary to charge from A.C. mains, and the total cost should not exceed 30/-.

Full details, circuits and prices are given in the new and enlarged 1933 edition of "The All Metal Way." The attached coupon and 3d. in stamps will bring you a copy.

WE ARE EXHIBITING AT STAND 73, MANCHESTER RADIO SHOW.
THE WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD.,
82 York Road, King's Cross, London, N.1.

COUPON

Westinghouse Publicity, 82 York Road, King's Cross, London, N.1.
Please send me a copy of the 1933 edition of "THE ALL METAL WAY,"
for which I enclose 3d. in stamps.

NAME.....

ADDRESS.....

P.W 17/9/32

FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found-?



automatically earths to a foil-covered baseboard on a chassis, through two slightly projecting nuts.

A well-written brochure illustrated with numerous diagrams is given with the coupling unit, and this shows how it can be easily connected in ten different ways, in order to suit any condition. Three ratios, viz., 1-2, 1-3 and 1-4 are obtainable merely by altering the wiring to the terminals.

This R. I. coupling unit should prove very popular indeed among constructors. We

NEW L.F. TECHNIQUE

ONE of the great, but often overlooked, advantages of parallel-fed L.F. transformer-coupling is that the scheme has flexibility. With an ordinary transformer-coupling one is to some extent bound down by initial restrictions, although it must be admitted these do not make it impossible to get excellent results.

But parallel feeding has many of the advantages of resistance-coupling, for by varying circuit connections and component values, a whole range of efforts is possible, thus enabling not only "straight-line" magnification to be obtained, but, in addition, compensation for defects at other points in the receiving system.

Messrs. R. I. have compacted all the vital elements of the methods into one small unit, and have brought the appropriate component points to terminals, so that none of its flexibility is lost.

COMPACT AND INEXPENSIVE

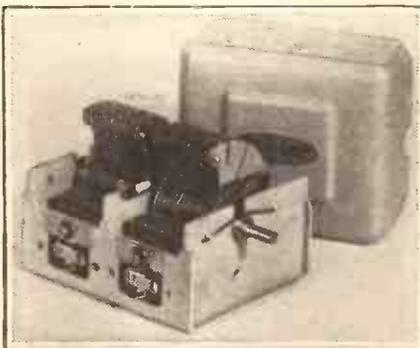


This unit has eight terminals, enabling several different circuit connections to be made.

The "Parafeed" Coupling Unit is built into a finely-moulded bakelite case, but beneath this there is metal shielding which

This new R. I. product is known as the "Parafeed" Coupling Unit, and, of course, it derives its name from that famous little transformer which was, we believe, the very first transformer to be designed especially for parallel-feeding.

FOR ONE-DIAL TUNING



A Radiophone ganged condenser with its cover removed. Note the shielding between the sections and, on the side, the two efficient trimmers.

have tested it carefully and have no hesitation in endorsing the claims made for it.

A RADIOPHONE GANGED CONDENSER

The need for very great accuracy in the construction of ganged condensers is clearly and interestingly outlined in a leaflet describing the British Radiophone Gangs.

"A simple argument will show what limits of accuracy are required," it reads. "Suppose, for instance, that we are receiving a programme on 1,000 kilocycles (300 metres). A sharply tuned circuit will show a definite drop in response if it is 10 kilocycles (1 per cent) off tune. This corresponds to a total error of 2 per cent in the inductances and capacities making up the tuned circuits. Thus an error of

not more than 1 per cent is desirable in a variable condenser."

After which it goes on to point out that the British Radiophone ganged condensers are guaranteed accurate in ganging to within $\frac{1}{2}$ m.mfd. plus or minus $\frac{1}{2}$ per cent.

They are fine productions, and in both design and manufacture are as good as, if not better than, anything of a like nature that I have seen.

The frame is robust and rigid and there are patent bearings which contribute a perfectly smooth movement and which "take up" any slackness which might otherwise develop in the course of time—a failing which spoiled all too many of the earlier ganged condensers.

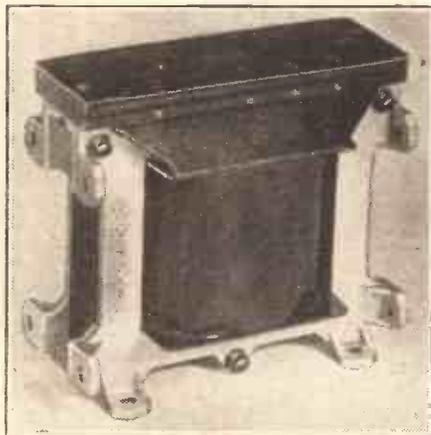
We shall be using Radiophone ganged condensers as occasions arise and opportunity permits, for they are first-class in every way.

THE DAVENSET MAINS TRANSFORMER

It has seldom been my good fortune to encounter so much of what I consider to be really excellent gear as I have done during the past week, despite the fact that the general standard of design and workmanship has this year gone up to hitherto undreamt of heights.

And I have had unusual, even piquant confirmation that my opinion of the soundness of the Davenset mains transformer is right. My sample of this product of Messrs. Partridge & Wilson was lying on a side table when the chief of another firm, noted for the quality of its mains apparatus, happened to call.

PROTECTED TERMINALS



There are no "live" points exposed on the Davenset mains transformer.

He picked up the Davenset transformer casually, then glanced at it with real interest and finally said, "That is a well-made piece of work."

I have tested the Davenset transformer and find it excellent in every way.

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.

NOTES FROM THE NORTH

A monthly review and criticism of events in that important region north of the Trent.

By OUR NORTHERN CORRESPONDENT.

NORTHERN listeners who take an intelligent interest in broadcasting and in the B.B.C. will welcome the appointment of Mr. Lindsay Wellington as encourager of programme activities in the Regional centres outside London.

More "Character" Wanted.

Whilst there are provincial listeners who hanker after centralisation—probably more out of disappointment at the shortcomings of Regional programmes than anything else—the majority of listeners and radio journalists whom I have met feel that improvement and stronger "character" in the North Regional programme are likely to be obtainable through the free development of local programmes; not by throwing up

although de-centralisation is a good policy, it does not mean that each region should be a watertight compartment. Experience of the Regional Scheme has already shown how valuable programme interchange between the North, Midland, Scottish and London Regions can be, for each area has some special feature or features in which it excels (or would excel given proper encouragement).

Maintaining a Balance.

Hitherto, Mr. Wellington has been stationed in London, where his main concern has been the maintenance of a suitable balance between the National programme and its alternatives. His new duties are additional.

NORTHERN LISTENERS AT RADIOLYMPIA



Listeners in northern districts are eagerly looking forward to the Manchester Radio Exhibition, and judging by the way they patronised Olympia there is every prospect of record attendances at the City Hall.

the sponge and centralising B.B.C. programme activities before de-centralisation has had a genuine chance to show its capabilities.

Fostering Local Activities.

It will be Mr. Wellington's work to foster local activities, and he will not only help the North Region, but will be continually visiting the headquarters of other regions, and acting also as liaison between the provinces and London. Thus the exchange of suitable programmes between the regions will be efficiently developed and the National programme will be more generously enriched with appropriate material from outside London.

In this function, also, Mr. Wellington will have the support of listeners, for

Experiments in wireless reception in coal mines are being undertaken by Mr. J. Bentham, a consulting engineer who lives near Wakefield, Yorkshire. The owners of the Manor Haigh and Roundwood Collieries, where the experiments are to take place, are not directly interested, having merely placed colliery facilities at Mr. Bentham's disposal.

Radio in Mines.

"It is a private idea of my own, in connection with safety in mines," Mr. Bentham told me recently, and he stated that a quarter-kilowatt telephony transmitter on the surface at Manor Haigh will communicate with a receiver in the workings of the two collieries, which are some two miles apart.

At the time of writing, I understand that a Post Office licence for the transmitter has not yet been issued, but arrangements are going ahead. The communication will be one-way, and whether transmission simply from the surface to the underground is any value for safety purposes has yet to be proved: also, Mr. Bentham states that a short wavelength, probably round about 20 metres, will be used, and the question arises of how effectively this wave will penetrate the earth.

The Truth About Newcastle.

Conflicting statements have been made about the alterations carried out by B.B.C. engineers at Newcastle. What they did actually, apart from changing the wavelength, was to rebuild, as far as possible, the whole of the transmitter to bring it into line with modern practice.

Quality of reproduction and depth of modulation are now similar to that of a modern Regional transmitter. There is no change in the power input to the transmitter.

Here, also, is the truth about television for the North. No definite arrangements for television transmissions from the North Regional station have ever been made, but at one time hopes ran very high and experiments were actually made.

Television Prospects.

Vision was transmitted over the landline from London to Moorside Edge, as an engineer's private test. This was done on two occasions, but the results revealed considerable technical difficulties in the relaying of vision over such a long line.

So, for the time being at any rate, Northern television is "off."

FOREIGN STATIONS NEWS

Some interesting facts concerning European broadcasters.

The tune played when Motala is closing down (on 1,348 metres) is the Swedish National Anthem, "Du Gamla, Du Fria."

The 7 p.m. time signal from Oslo, on 1,083 metres, takes the form of a series of 25 "pips" from an oscillating valve (commencing at 30 seconds to the hour), followed by a 5 seconds' pause and a final flut-like note commencing at the exact hour.

The Paris Ecole Supérieure programme on 447 metres is relayed by twelve other French "P.T.T." stations.

The reason that Radio Paris sometimes omits the "Marseillaise" when closing down is that on these occasions there is no band in the studio.

The opening signal of the Rome station is a chord in A major, played on a harmonium!

Strasbourg, being situated on the Franco-German frontier, announces in French and in German. (Wavelength 345.2 metres.)

Kalundborg's new transmitter, shortly due on the air is to have a power of 60 kw., as compared with the present station's 7.5 kw.

Denmark has more listeners per 1,000 inhabitants than any country in Europe, the latest figure giving the number at 134.

FACTS YOU SHOULD KNOW ABOUT THE MAZDA D.C. MAINS RANGE...



The Mazda D.C. mains valves are the only completely satisfactory solution to D.C. mains receiver operation. They overcome all the disadvantages of high running cost and low efficiency previously associated with D.C. receivers.

The new Mazda indirectly heated 0.1 amp. valves enable D.C. users to enjoy, at last, the range and quality given by A.C. receivers. No other D.C. mains valves are so economical.

The Range comprises:—

THE DC 2/SGVM a variable-mu screened grid valve giving results fully equal to its A.C. counterpart.

THE DC 2/SG is for those who wish to use an ordinary screened grid valve.

THE DC 3/HL for the detector stage.

THE DC 2/P or DC 2/Pen for the output stage.

Full details of these and other useful Mazda types will be found in the Mazda catalogue, sent FREE on request.

Mazda valves are fitted by all the leading receiver manufacturers. All good radio dealers stock them.

LOOK FOR "EDDY" IN YOUR DEALER'S WINDOW



The amazing

MAZDA THE BRITISH VALVES

EDISWAN RADIO

100% BRITISH—Designed by British Engineers

The Edison Swan Electric Co. Ltd.



155 Charing Cross Rd. London. W.C.2

Mazda Radio Valves are manufactured for The British

Thomson-Houston Co. Ltd., London and Rugby

V. 165

**There's
sure to be
something
you need
in the**

SPECIAL ARTICLES

- for
The Gramophone Enthusiast
The Long-Distance Listener
The Set Builder
The Home Handyman
The Technically Minded
The "S.T." Fan

in fact — for YOU!

WIRELESS CONSTRUCTOR

October number—price sixpence—on sale September 15th

An up-to-date receiver—built on the ever-popular "Detector and 2 Low-Frequency" arrangement—is presented under the title of
The "DOUBLE-TUNE" THREE



Designed and described by
VICTOR KING

There are the usual brilliant articles by

**JOHN
SCOTT-TAGGART**

A.M.I.E.E. F. Inst. P.

who contributes, in this number:—

- "RADIO OF TO-DAY"
- "FROM MY ARMCHAIR"
- "VARIOUS MUSINGS ON THE VARIABLE-MU"

And other intriguing contributions include:—

- YOU NEED S.Gs. FOR DISTANCE
by Herbert K. Simpson
- THE PROS AND CONS OF TONE CORRECTION
- THE "GERMAN NEWS BULLETIN"
- A PRACTICAL MAN'S CORNER
- THE MONTH ON SHORT WAVES

etc., etc., etc.

"NEW RADIOS FOR OLD"

**RADIALADDIN
EXCHANGE SERVICE**

THE SUCCESS OF OLYMPIA

All orders placed at the Radio Exhibition are being dealt with in strict rotation.

YOU MUST have that new set this year at practically half price through us. We take your old set at a most generous allowance.

Just write for particulars of our amazing exchange offer, enclosing 1d. stamp, naming your old set which we buy, and the new set you fancy. A free quotation will follow. Balance payable in cash or Hire-purchase. **FREE** Wireless Set to introduce the Radialaddin Club:

Please forward this ENQUIRY FORM (without obligation).

I am interested in purchasing the undermentioned Radio Receiver:

Make..... Model and List Price

Present Set: Make..... Batteries or Mains.....

Date of purchase..... Original cost of Set.....

Balance of purchase price would be payable by me as follows:

Plan A. Whole of balance in cash. Plan B. Whole of balance over Six, Nine, Twelve* months.

*Delete unwanted words.

NAME, in Full (Block Letters).....

ADDRESS

RADIALADDIN, Limited,

LARGEST RADIO EXCHANGE IN THE UNITED KINGDOM.
(Dept. P.W.), 47/48, Berners Street, London, W.1. Museum 1821.

ANOTHER SUCCESS!

"GOLTONE" SCREENED DUAL RANGE COILS

exclusively used in the
"LONG RANGE 3"

The effective performance and excellency in finish of GOLTONE components lead to their specification in all "POPULAR WIRELESS" circuits. Each coil is supplied complete with metal can, slotted disc-base, tinned copper foil under-base and four-page folder with circuits and useful data.

5'9
EACH.



★
 Illustration shows Coil TYPES GBS & GBA.

NOTE
 Two Coils Type GBS are required for the "LONG RANGE 3"

★

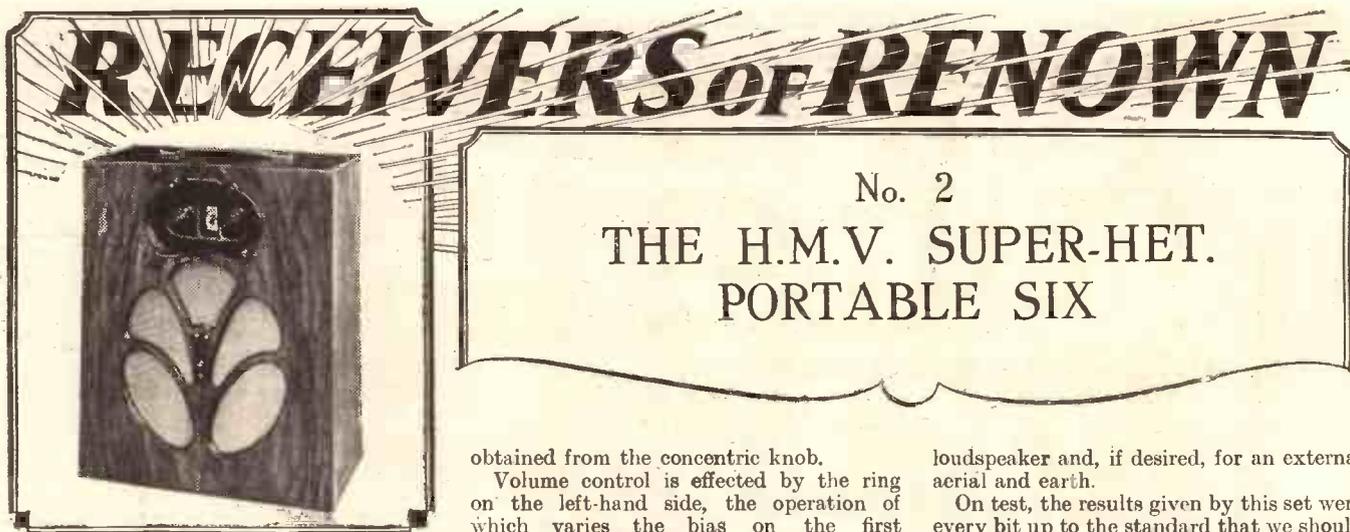
OTHER "GOLTONE" COMPONENTS USED IN THE SETS DESCRIBED

- 1 "GOLTONE" 2-point Push-Pull Switch R26/744 10½d.
- 1 GOLTONE Binocular H.F. Choke R3/36 2/6d.
- 2 .0001 mfd. Condensers R15/70 5d. each

Obtainable from all First Class Radio Stores.
 Refuse substitutes—If any difficulty write direct.

For Ebonite Panels and complete range of GOLTONE Radio Components see new Catalogue sent FREE on request.

Ward & Goldstone
 PENDLETON. MANCHESTER



No. 2

THE H.M.V. SUPER-HET. PORTABLE SIX

THE first battery-operated receiver and, incidentally, the first portable radio set to bear the famous trade mark of H.M.V., is an instrument of which the Gramophone Company can justly be proud.

It is a six-valve super-het. which, at first sight, would appear directly to negative the claim that it is either portable or suitable for battery operation.

But when we tell you that the receiver itself, with all the necessary batteries and an excellent balanced-armature speaker, is contained in a cabinet approximately 18 in. by 15 in. by 8 in., and that the total consumption of the set is the astonishingly low figure of 10 milliamps, you will appreciate all the more why this new H.M.V. Super-het. Portable Six must be regarded as among the most outstanding of the new season's designs.

Compactness with Efficiency.

But even compactness and economy are not the only features which lead us to this general conclusion.

Whereas in any ordinary circumstance such remarkable compactness is only obtained at the expense of efficiency, we are convinced as a result of our extensive tests that it would be well-nigh impossible to find a six-valve super-het. which gives a better performance than does this one. More than that there is no need to say.

The circuit of this new H.M.V. production is an orthodox super-heterodyne arrangement of somewhat advanced design. The separate oscillator (V2) is preceded by a fully-tuned radio frequency amplifier (V1), and is followed by a screened-grid first detector (V3), a stage of intermediate-frequency amplification (V4), second detector (V5), and pentode output (V6). It is interesting to note that separate frame aerials are provided for medium and long waves.

Conveniently Grouped Controls.

All the controls are conveniently grouped on a neat escutcheon plate above the loudspeaker fret, and the operation of the set, despite the fact that it is a super-het., is about as simple as could be imagined.

The four controls have been so arranged that they are operated on two pairs of concentric shafts, these terminating in pairs of knobs and rings. The right-hand ring controls the main three-gang condenser and wavelength dial, while fine tuning is

obtained from the concentric knob.

Volume control is effected by the ring on the left-hand side, the operation of which varies the bias on the first high-frequency amplifying valve. The concentric knob on this side provides the combined on-off medium- and long-wave switch, and it is clearly marked to indicate its three positions.

The circuit itself is very fully decoupled in a way which ensures complete stability without any form of earth connection, and by a series of dropping resistances the H.T. current—which is obtained from a super-capacity 120-volt battery—is fed via a

loudspeaker and, if desired, for an external aerial and earth.

On test, the results given by this set were every bit up to the standard that we should reasonably expect from a six-valve super-het. In daylight, and in the centre of London, we found it possible to receive numerous distant stations on the medium broadcast band in addition to the English Regionals and Nationals.

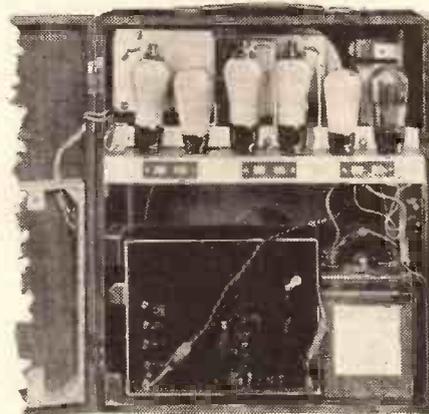
Splendid Range.

That alone is significant of its general sensitivity, for such a claim cannot be made for anything but the most powerful receivers. And our preliminary impression of great sensitivity was fully confirmed in later tests which were conducted under more favourable conditions.

After dark, and in a locality approximately fifteen miles south-west of Brookmans Park, stations in all parts of Europe could be received at loudspeaker strength with the greatest of ease on the medium broadcast wavelengths; while on the long waves there were upwards of half a dozen programmes, all of which were received at excellent strength.

We commend the Gramophone Company upon their wisdom in entering a vast potential market which, in our opinion, is

ON PARADE!



The H.M.V. Super-het. Portable Six is an outstanding example of the modern trend for compactness without loss of efficiency. The cabinet is only 18 x 15 x 8 ins. yet it contains the set, the speaker and the batteries!

at present very inadequately covered, and we congratulate them upon the instrument by which their entry has been made.

Without a doubt, the H.M.V. Super-het. Portable Six represents a worthy addition to their already famous range.

(Continued on page 42.)

TECHNICAL SPECIFICATION

CIRCUIT DETAILS:—Six valves. S.G.; Oscillator; S.G. 1st detector; S.G. I.F. amplifier; 2nd detector; Pentode.

CONTROL ARRANGEMENTS:—Four controls. Two for tuning; one for volume control; one for wave-changing and "on-off" switching.

SPECIAL FEATURES:—Local-distance switch; balanced-armature speaker; provision for pick-up; especially low consumption.

BATTERIES:—L.T. 2-volt 28-amp.-hour accumulator (consumption 0.6 amps.). H.T. 120-volt super-capacity dry battery (consumption 10 milliamps).

MEASUREMENTS:—Height 18 in., width 15 in., depth 8 in., weight 34 lb.

PRICE:—17 guineas, including valves and royalty.

single positive and negative connection. The grid bias for all valves is obtained automatically from this common source.

The L.T. supply is obtained from a 2-volt 28-ampere-hour accumulator, and, since, according to our measurements, the total L.T. consumption is rather more than 6 amperes, the set should operate for approximately 40 hours on each charge.

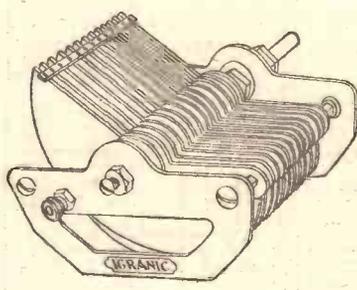
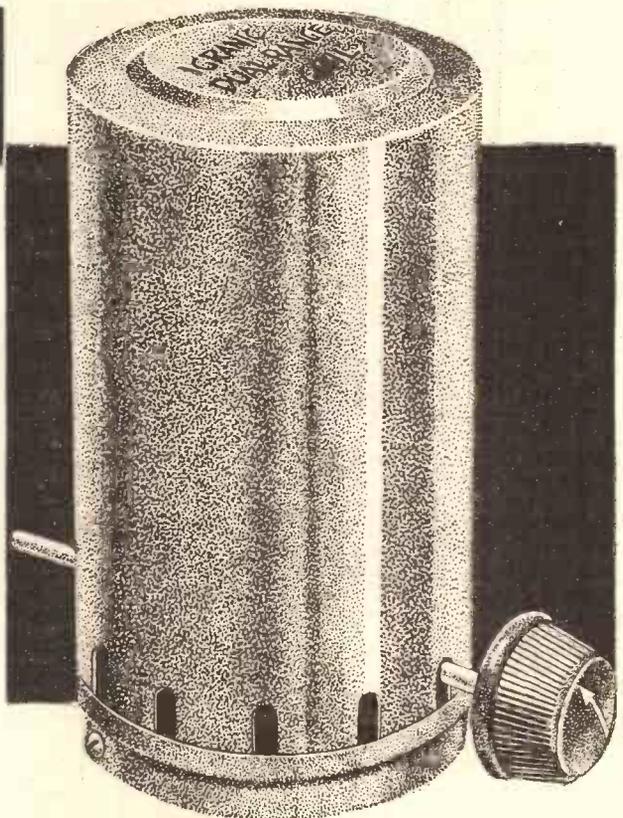
The total weight of the set, complete with batteries, is 34 lb; and the cabinet, which, incidentally, is of the high finish that one always associates with H.M.V. productions, is fitted with a ball-bearing turntable.

At the top of the cabinet a neat but strong "Packawa" handle is recessed into the wood for facility in transporting the instrument.

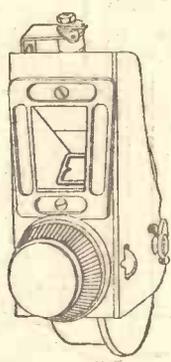
We are impressed with the amount of thought and careful design that has been put into the Super-het. Portable Six, evidence of which is to be found at the back, where provision is made for the connection of a gramophone pick-up, for an alternative

IGRANIC TUNING DEVICES

IGRANIC tuning devices—like all Igranic components—are built to the highest standards of efficiency and precision as this new Dual-wave Coil exemplifies. These screened coils, with self-contained wave-change switch, have been designed to give maximum efficiency on the medium and long-wave bands, covering a range of 200-500 metres and 1,000-2,000 metres when tuned with a .0005-mfd. variable condenser. A notable feature is the wave-change switch spindle, which protrudes on either side of the coil base, enabling any number of these coils to be ganged and operated by one movement. These coils are eminently suitable either for aerial tuning, with or without reaction, or intervalve coupling to S.G. or H.F. valves. PRICE 12/6



SINGLE VARIABLE CONDENSER
Supplied in capacities .0003 mfd. and .0005 mfd. Designed on the mid-log law principle to ensure a better and more equal separation of frequencies over the tuning scale. One-hole fixing, 1/8 in. diameter spindle. PRICE, .0003 mfd., 5/3 .0005 mfd., 5/6



SLOW MOTION DRUM DIAL
A new illuminated drum drive of novel and simple design. Friction-driving mechanism ensures positive action and eliminates backlash. PRICE 8/6

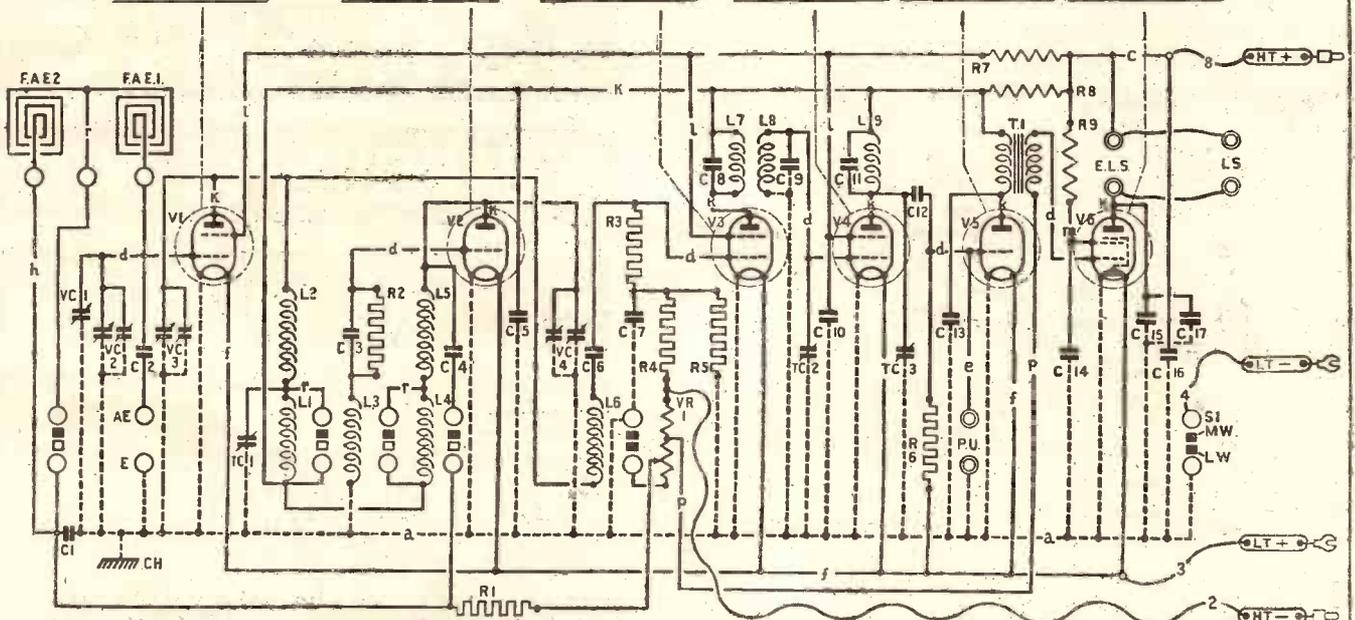
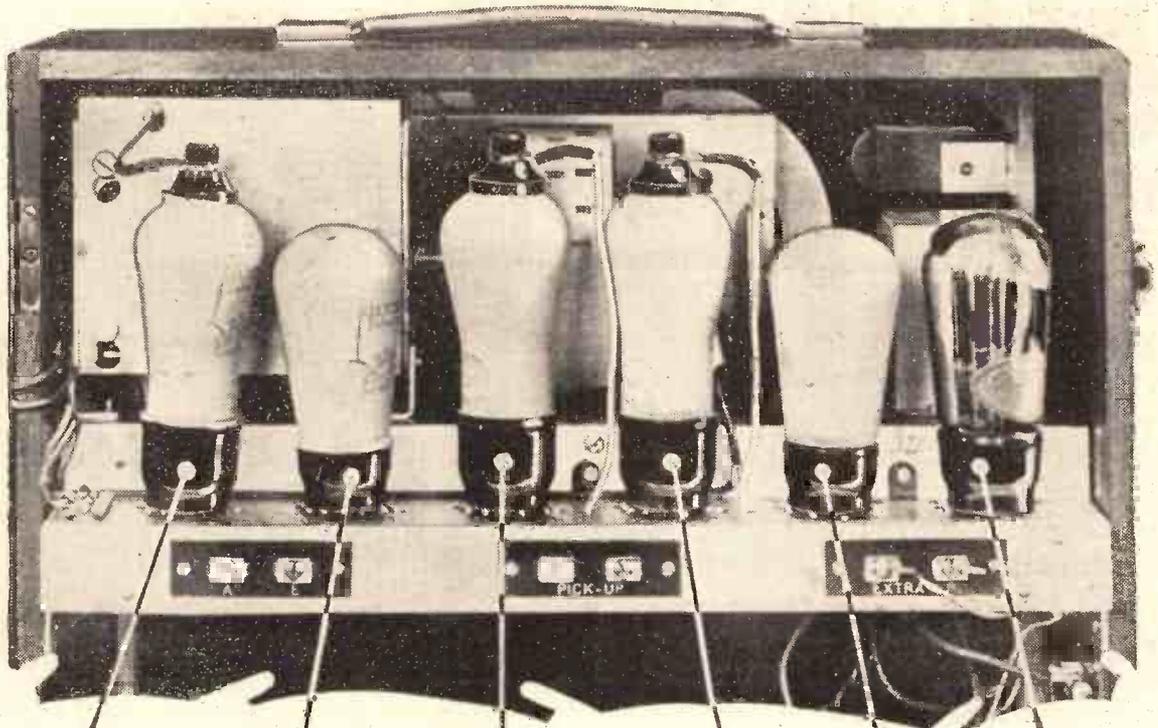
Write for Catalogue R.166 to
Igranic Electric Co., Ltd.,
149, Queen Victoria St., London,
E.C.4

IGRANIC COMPONENTS WILL BE THE MAKING OF YOUR SET.



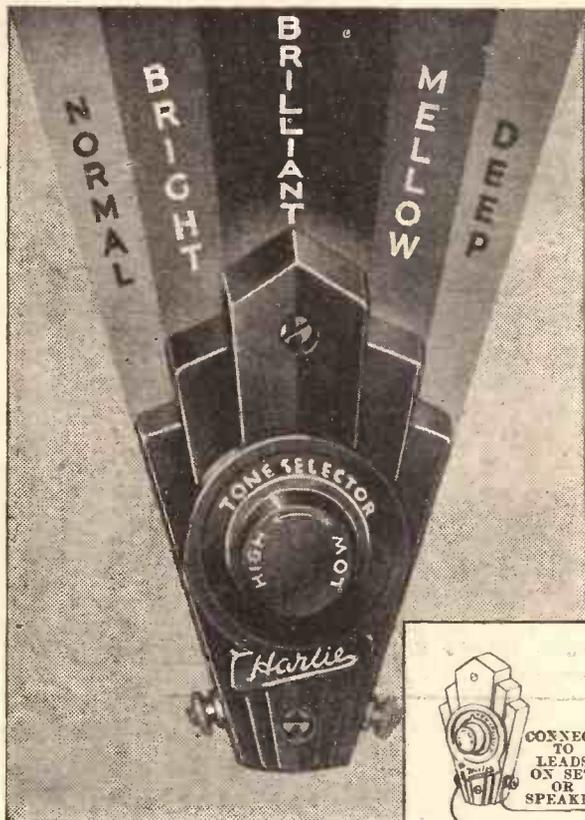
THE H.M.V. SUPER-HET. PORTABLE SIX.—(Continued from page 40.)

IN PRACTICE AND THEORY—THE CIRCUIT ANALYSED.



This novel and interesting layout makes it possible to link up the circuit diagram with the actual set. The dotted lines in the theoretical diagram lead up to their respective valves in the set photograph above. For reasons of circuit simplification, the local-distance switching arrangements, which are a feature of this instrument, have purposely been omitted from this diagram.

'50 guinea TONE' for



4/6 CASH
or
1/- DOWN

And further 1/- in 7 days and 2 monthly payments of 1/6

On this page you will see one of the most revolutionary inventions ever associated with Radio reception and Radio reproduction of gramophone records. It is the new and improved HARLIE Tone Selector and Scratch Filter, which actually gives you a choice of different tones and astonishingly improves the quality of reproduction by "balancing" your set with your speaker. It gives that rich Tonal clarity hitherto associated only with sets costing upwards of fifty guineas, yet it costs only 4/6, or 1/- down and a further 1/- in 7 days and 2 monthly payments of 1/6 — "50-Guinea Tone" for 4/6! It reduces undesirable noises, too, and eliminates needle-scratch when playing records through a gramophone pick-up. Everybody says "Marvellous." You will give it three loud cheers. Fill in and post the coupon below!

NOW—by simply turning the Harlie Tone Selector Knob any owner can instantaneously adjust his Set to speech; symphony music; jazz, or if he should happen to be in a noisy location, he may cut down the noise and enjoy the programme in a way never before possible.

"BRIGHT" "BRILLIANT" "MELLOW" OR "DEEP" shades of tone are now at his finger tips.

Harlie

Cambridge Arterial Rd.,
Enfield, Middlesex.

PLEASE FORWARD:—

FREE BOOKLET
TONE SELECTOR
DE LUXE PICK-UP

Cross out items not wanted.

For which I enclose P.O. value..... (no stamps).

NAME.....

ADDRESS.....

P.W.3



2/6 DOWN
Further 2/6 in 7 days and 5 monthly payments of 5/-.

DE LUXE PICK-UP
CASH PRICE 27/6

Complete with Tone-Arm and built-in Volume Control. Finished throughout in Brown Bakelite. Pick-Up head swivels in order to facilitate needle-changing. Ball-bearing movement of tone-arm enables the needle to follow the record grooves with extreme accuracy, ensuring perfect parallel tracking and eliminating record wear. Special twin-spring balance suspension controlled by tensioning knob, permits of feather-weight adjustment, so that weight of Pick-Up on record is under complete control.

Harlie Products can be supplied on our H.P. Terms by Registered Dealers.



RADIOTORIAL

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 specialities described may be the subjects of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

QUESTIONS AND ANSWERS

THE SPARKING CONDENSER.

"SPARKING" (Cleckheaton).—"Quite by accident I have discovered that the large condenser (4 mfd.) I use in my choke output system will give a very large spark even some hours after the set has been switched off.

"I always take the H.T. negative plug out when attending to wiring, etc., or checking over my leads, etc., and feeling quite safe on this account I accidentally put a screwdriver across and discharged this condenser, and got a really large spark. Quite startling!

"It was such a tremendous crackle that I became curious when I discovered that the H.T. + plug was out, so preparing myself for the shock I tried a screwdriver again. Nothing happened.

"I have found since that it only happens once when the set has been on, but even hours after it has been switched off I can get one fat spark by touching the terminals. Is it O.K.?"

Perfectly O.K., and an indication that this condenser and the rest of your insulation are in good condition.

As you are using a really big condenser it will hold quite a large charge which is sufficient to produce a surprisingly large spark some hours after the charging current (in your case that of the anode circuit) has been removed, providing that the insulation of the condenser and its associated apparatus is good.

Your spark, instead of pointing to something wrong actually proves that the insulation is thoroughly satisfactory.

CHECKING DISTORTION.

H. P. R. (Farnham, Hants).—"I should appreciate some hints on how to connect a

(Continued on page 46.)

WHAT'S THE MATTER WITH THE SET?

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.

THEY COMPLETELY CAPTURED "Radiolympia"



"Mansfield Senior"

(The Improved P.M.4.)

42/-

COMPLETE with 3-ratio transformer

The new



"MANSFIELD"

PERMANENT MAGNET Moving-Coil Speakers

Write NOW for the art booklet, "Speaking of Speakers," giving full information on all the new W.B. moving-coil speakers. They caused intense interest at Olympia. W.B. are and always have been Pioneers and Leaders in this field. Makers also of the famous valveholders, switches and the new Mansfield Kit—the only Kit with a moving-coil speaker. Ask also for special leaflet of Mansfield 3-v. M.C. Kit.



Fits any of the W.B. Cabinets.

"Mansfield Junior" (P.M.5.)

27/6

COMPLETE with 3-ratio transformer

NOTE—The prices of W.B. Valveholders and Switches HAVE NOT BEEN RAISED. The world-famous quality, precision and reliability is higher than ever. They are used to-day in all the leading experimental laboratories in Britain.

Your H.T. for 1/- a year



How long does one shilling-worth of H.T. run your set? A week—or a year? If you run from batteries you spend at least 50/- annually on upkeep; replace your battery with an Ekco Unit and your yearly cost is one shilling only.* All you have to do is plug into the electric light or power socket and switch on—that's all!

Whatever the type or size of your radio set, there is an Ekco Unit for it.

See your dealer about it, or post coupon below.

*Based on 1000 hours' use of average 3 v. Set.

All Ekco Units are obtainable by Easy Payments.

Housed in solid drawn steel case, oxidised copper finish. Connecting plugs recessed below surface of case.

Size:— 9" x 5" x 3 1/2"

(K.25 and 25 cycle models 9 3/4" x 5 3/8" x 3 3/4")



D.C. Units 39/6 ; A.C. Units from £2 . 15 . 0

To E. K. COLE, LTD. (Dept. A.20.),
Ekco Works, Southend-on-Sea.

Please send me details of EKCO Electric Power Units, Consolettes, Consoles and Radiograms.

Name.....

Address.....

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 44.)

milliammeter to the last valve, to check distortion."

Bear in mind that the anode current must enter at the negative terminal of the milliammeter and leave at the positive terminal. Consequently, having disconnected the H.T. supply from the anode you should connect the supply to the positive terminal of the milliammeter, then connect the negative terminal of the instrument to the anode of the valve.

In this way the instrument will read the actual current passing in the anode circuit of the last valve.

DO YOU KNOW—

the Answers to the following Questions ?

There is no "catch" in them, they are just interesting points that crop up in discussions on radio topics. If you like to try to answer them, you can compare your own solutions with those that appear on a following page of this number of "P.W."

- (1) What electrical terms are denoted by the following letters—R, Z, I ?
- (2) Which are Europe's two most powerful broadcasting stations ?
- (3) Which short-wave station opens and closes its programmes with the sacred words "Laudatur Jesu Christus" ?
- (4) Are the masts on Broadcasting House, London, only for ornament, or for use as well ?
- (5) Who was the B.B.C.'s first Chief Engineer responsible for its amazing growth up to and including the Regional Scheme ?

When no transmission is being received the needle of the milliammeter should, of course, remain steady, and it should also remain reasonably steady even when a programme is coming through. If it kicks about a good deal or flickers on loud passages, the set is distorting.

Generally you may take it that if the incoming of a loud passage causes the needle to kick to a higher value, the negative grid bias on the last valve is too high, whilst if the needle kicks down to a lower value the grid bias is too low.

When adjusting the value of the grid bias to the last valve, you should also bear in mind that the grid bias to the other valves may not be correct and may consequently require adjustment at the same time. The instrument should be provided with a slanting or short-circuiting switch.

If these alterations do not have the effect of steadying the needle, it is probable that the set is being overloaded, in which case, of course, it is necessary to reduce strength.

Remember that alterations to the grid bias of the last valve must never be made whilst the set is "on," but the L.T. supply should always be disconnected first, by means of the filament switch.

FITTING A DECOUPLER.

R. T. L. (Plymouth).—"At present the set is very good, but it seems to want to motor-boat or 'pop-pop-pop-pop' after I have had an H.T. battery on for about a month. I have heard of a similar case which was cured by fitting decoupling, whatever that is.

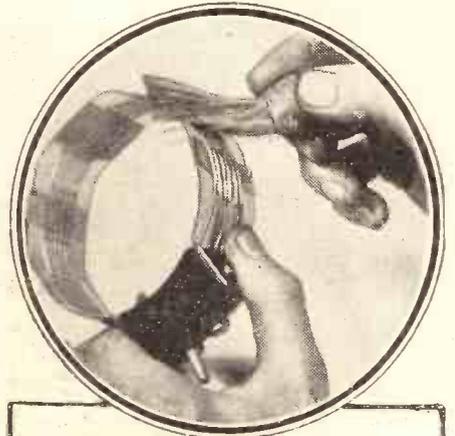
"Could I do this to my set, and, if so, what parts would be needed and how should I wire them ? I should be very glad if I could, for it is very unpleasant at the present time, and far too expensive for the comfort of my pocket."

It is quite easy to insert a decoupling device. The extra parts required are a fixed resistance of from 20,000 to 40,000 ohms, one of the spaghetti type being quite suitable, and a large fixed condenser, preferably 4 but not less than 2 mfd.

The procedure is as follows: The lead which goes from the H.T. plus terminal that supplies the detector valve to the primary of the low-frequency transformer should be broken. The resistance should be inserted between this H.T. terminal and the low-frequency transformer primary.

(Continued on page 48.)

WHAT'S WRONG ?



THE CARE OF SHORT-WAVE COILS

Coils of the short-wave type always need rather careful handling, owing to the desirability of the manufacturers using as little supporting materials for the turns as possible.

Such coils should be stored away carefully where the turns will not be bent, and should be kept free of dust.

Always hold a coil by the base, as shown, so as not to strain the actual winding.



The R & A "BANTAM"

PERMANENT MAGNET MOVING COIL REPRODUCER

The thousands of visitors who listened to the amazing performance of the "Bantam" at Olympia acclaimed it in no uncertain terms. And justly so. They marvelled at the clarity of speech and music, the even response over the whole audible range. The volume and sensitivity exceeded expectations for so low priced an instrument. The "Bantam" is truly the small reproducer with the big performance, designed, manufactured and finished with characteristic R & A thoroughness. Ask your dealer to demonstrate.

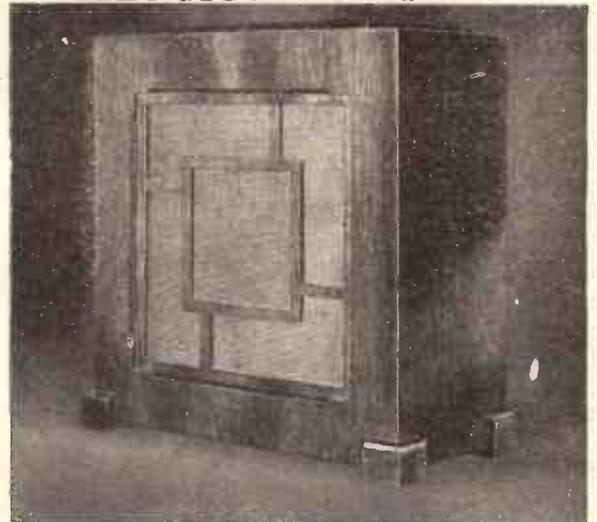
Insist on R & A and refuse a substitute.
Write us for Illustrated Descriptive Leaflet.

REPRODUCERS & AMPLIFIERS LTD., WOLVERHAMPTON.

27'6

The R & A "Standard" Cabinet is produced to worthily accommodate the "Bantam". It is a cabinet you will be proud to own: a piece of furniture at once distinctive, dignified and low priced. Matt walnut is the vogue. The "Standard" Cabinet is a tasteful example.
Dimensions 16" x 16" x 8" deep.

25'-



PUT POWER IN YOUR SET!



These new British General Dual Wave Coils enable you to achieve remarkable results in regard to both power and selectivity.

The ordinary cheap receiver, with these coils incorporated, can be converted into a strikingly effective modern set.

Full details and wiring diagrams supplied.

Price 9/6, Aerial and anode models (suitable for ganging).

From all dealers or direct from the manufacturers.

BRITISH GENERAL

BRITISH GENERAL
MANUFACTURING CO., LTD.
Brackley Works, London, S.E.4

QUALITY *and* QUANTITY

—the wonderful
blend that makes

*Player's
Please*



Solve your Player packets for the Imperial Tobacco Company's POSTER COMPETITION. IN CASH PRIZES

£20,000

Ask your Tobacconist for particulars

5 FOR 3^D
10 FOR 6^D
20 FOR 11¹/₂^D

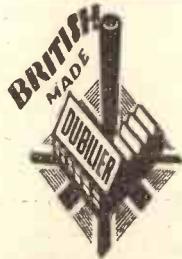
M.C.1308

WHEN
YOU
CAN
BUY A

**DUBILIER
GRID
LEAK**

1/2

FOR
**Why trust to
unproved GRID
LEAKS?**



Have you seen the new Dubilier Components Booklet, "Choosing your Condensers and Resistances"? Ask your dealer for a copy or write direct to us.

In the past you may have been tempted into buying Grid Leaks and Resistances of unproved efficiency by the prospect of saving a copper or two. But with the arrival of Dubilier Grid Leaks and Resistances you need never again imperil the performance of your set with components of unproved merit. For the Dubilier Grid Leak costs only 1/2. The famous Dubilier one watt Metallized Resistances sell at the same price. Both are unmatched in performance and their dependability has been proved alike by technicians and public.

Use only Dubilier Grid Leaks and Resistances in your Set. You will never find better.



DUBILIER CONDENSER CO. (1925) LTD.
Ducon Works, Victoria Road, North Acton, W.3

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 46.)

From the side of the resistance which is now joined to the primary terminal a lead is taken to one side of the large fixed condenser. The other side of this condenser is connected to H.T.— or to the earth, or some point connected to earth.

If preferred, the scheme can be employed externally to the set if the latter has a separate H.T. terminal for the detector, and in this case the resistance would be inserted between the H.T. positive lead of the H.T. supply and the H.T. positive on the terminal strip. One side of the condenser must then be connected to the H.T. positive terminal on the set and the other side to the H.T. negative.

WHAT THE MILLIAMMETER SHOWS.

F. J. C. (Normanton).—"Looking back at an old 'P.W.' I noticed what Captain Eckersley said about putting a milliammeter in the plate lead to the detector valve. (At the time it first came out I did not try this stunt, because, as a matter of fact, I did not possess a meter then. But now I do, and I have tried it.)

"The results seem all wrong. In fact, at first I thought I must have connected the meter round backwards when I found it showed that the current passing gets less when a programme is being listened to.

"But further rummaging amongst 'P.W.' articles brought to light the fact, mentioned in an answer to a reader, that the ordinary grid-leak detector does take less current when detecting than when it is waiting for something to come in. So I knew the milliammeter was working all right, but still I could not understand the effect of reaction.

"According to all I had ever heard and understood about reaction it was one sure way of causing the set's batteries to run down quickly. But in practice, what do I get but the opposite effect ?

"As soon as I turn the reaction condenser on a bit, and reception gets louder, the detector current drops a bit. Especially on the weak stations, where I get a small drop in current as I put the set in tune, and then drop the

THE ANSWERS

TO THE QUESTIONS ASKED ON
PAGE 46 ARE GIVEN BELOW.

- (1). R = Resistance. Z = Impedance. I = Current.
- (2). Warsaw No. 1 (1,411 metres) and Prague (488.6 metres). Both use 120 kilowatts.
- (3). The Vatican City Station (50.26 and 19.84 metres).
- (4). They are being used in connection with the B.B.C.'s ultra-short-wave experiments.
- (5). Captain P. P. Eckersley, M.I.E.E. now "P.W.'s" Chief Radio Consultant.

DID YOU KNOW THEM ALL?

current still more by increasing reaction and bringing the programme up stronger.

"That is the puzzling part—stronger programme, smaller current. I suppose there is some explanation for it, but it certainly puzzled me more than a little."

The idea that reaction causes "a drain on the batteries" was a fallacy that was exploded long ago. In nearly all cases it does nothing of the kind.

"P.W." PANELS. No. 89. BASLE, SWITZERLAND.

The Basle broadcasting station operates on low power on a wavelength of 244.1 metres. But the Basle programmes are well received in this country because they are repeated on high power by Schweizerischer Landessender, on 459 metres.

Basle itself is 441 miles from London. The Schweizerischer Landessender station is at Beromunster (489 miles), and both these names are given in the call, followed by "Programme von Basle" for Zurich, or Berne, whichever station originates the programme.

A man announcer is employed, and the language used is German.

When the ordinary "leaky grid," or a power-grid detector is used, the plate current of the detector valve drops during the operation of detection. For a weak station the drop is small; for a powerful programme the drop is comparatively large.

Remembering these two facts, what will be the effect of applying reaction? We know that in a general sense it will turn the weak programme into a strong one. So we might expect that it will increase the drop in plate current of the detector, for such a drop is always greater in the case of the more powerful station.

This is exactly what happens. A sensitive milliammeter will show that a weak programme will cause a small drop in the detector's plate current, and a stronger programme, or the same programme strengthened by reaction, will cause a greater drop in the current, which is, of course, that supplied by the H.T. battery. The application of reaction, therefore, results in drawing slightly less, and not more, current from the H.T.B.

CRYSTAL SET RESULTS IN THE TAUNTON DISTRICT.

D. M. (Taunton).—"A new wireless station is being erected by the B.B.C. at Washford, between Minehead and Taunton.

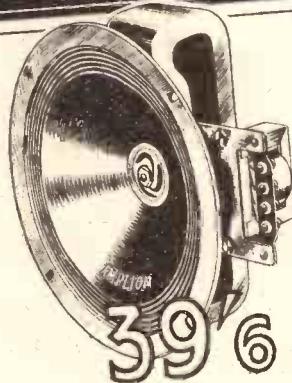
"When this is completed, could a party having a crystal set with an amplifier get good results at Taunton?"

Yes, certainly. At short distances from these powerful new "Regional" stations the strength on a crystal alone is good, and with an amplifier it will be enough for any ordinary purpose at anything within thirty miles.

The strength will be incomparably better than anything now obtainable in the areas around Taunton and Exeter.

NO MAINS

YOU do not require to have electric light in your house to enjoy the full rich volume and life-like reproduction of a moving coil speaker. The Amplion "M.C.22" is fitted with a powerful permanent magnet and a universal input transformer. Just connect it to your existing valve set, using a suitable baffle or cabinet and you will be delighted with its pure tone, and it is every bit as powerful as a mains energised speaker.



**M.C.22
PERMANENT
MAGNET
MOVING COIL
SPEAKER**

AMPLION

AMPLION (1932) LTD. 82/84 ROSOMAN ST., LONDON, E.C.1.

7 vital radio accessories in 1

I get you've never heard stations heard before!

I arrest lightning!
I cut out atmospheric

A well-made super-efficient lead-in that incorporates a perfect lightning arrester and a tubular variable condenser, so providing volume and selectivity control, a static eliminator, and an ideal aerial cut-out. The Cop cannot fail to improve vastly the performance of any set with an outdoor aerial. And—it carries a £100 FREE Insurance Policy. From your local radio dealer, or send P.O. for 2/6 direct to the manufacturers:

CLIFFORD O. PRESSLAND
(SALES) LTD.,
84, Eden Street,
Kingston-on-Thames.

£100 FREE INSURANCE POLICY

PRICE **2/6**

POST FREE

6" Size 2/6
9" " 3/6
12" " 3/6

COP

Direct Radio

159
BOROUGH
HIGH
STREET

A REALLY CHEAP & EFFICIENT MAINS RECEIVER—AT LAST! FLEX-FEED A.C.2.

	£	s.	d.
1 Panel 10" x 7"	2	8	
1 Baseboard 10" x 18"	0	9	
1 '0005-mfd. variable condenser Ormond S.M.	6	6	
1 Colvern T.D. canned coil	8	6	
1 Ready Radio '0001-'00015- mfd. diff. reaction condenser	2	6	
1 Lewcos 250,000-ohm volume control potentiometer	4	6	
4 Dubilier 2-mfd. condensers 9200	15	0	
3 Peak 4-mfd. condensers	16	6	
1 Dubilier '0001-mfd. fixed, type 670	1	0	
2 5-pin valve holders	1	4	
1 Colvern bias resistance 320/350 ohms	1	9	
1 Colvern bias resistance 750 ohms	1	9	
1 R.I. Parafeced L.F. transformer	8	6	
1 Westinghouse H.T. 7 rectifier	17	6	
1 Ready Radio H.F. choke	1	6	
2 R.I. Audirad L.F. chokes	17	6	
1 Tunewell M.R. 28/200 mains transformer	1	2	6
1 Bulgin on-off switch S.102	1	3	
1 Bulgin radiogram rotary switch	1	9	
1 Bulgin F.12 single fuse and holder	1	0	
2 Switch brackets 1 1/2" high		6	
2 Telsen terminal mounts with terminals		1	0
1 Bulgin twin plug strip P.30		9	
	£6	16	6
1 Mazda AC2/Hr valve	13	6	
1 Cossor 41 MP valve	15	0	
1 Cabinet	15	0	

KIT (less valves and cabinet)	£6.16.6
No. 1 or 12/6 down and 11 monthly payments of	12.6
KIT (with valves less cabinet)	£8.5.0
No. 2 or 15/- down and 11 monthly payments of	15.0
KIT (with valves) and cabinet	£9.0.0
No. 3 or 16/6 down and 11 monthly payments of	16.6
Complete Kit , with Valves, specially designed Veneered Walnut Console Cabinet, and R. & A. Bantam Moving Coil Speaker.	£10.17.6
No. 4 Or initial deposit of £1 and 11 further payments of	£1.0.0

Recommended Accessories.

1 R. & A. Bantam Speaker	£1. 7. 6
1 Bowyer-Lowe A.E.D. pick-up	£1. 10. 0
1 Special Console Cabinet	£1. 5. 0

Ajax Three Valve Cabinet Kit £4 15 0. 15/- down and 11 monthly payments of 8/6.
Jupiter Three Kit £3 17 0. 10/- down and 10 monthly payments of 7/6. Jupiter Three Valve Kit £5 18 0. 15/- down and 11 monthly payments of 10/6. Jupiter Three Valve Cabinet Kit £6 0 0 20/- down and 11 monthly payments of 10/6. With Special Cabinet. Free Blueprints

"RADIO FOR THE MILLION" Stationmaster Three Sealed Kits. Battery Model "A" with Table type Cabinet and Valves £5 11 0. Deposit 15/- and 11 monthly payments of 10/-. Battery Model "B" with Console type cabinet, Valves and Celestion Speaker, £7 10 0. Deposit 20/- and 11 monthly payments of 13/-.

READY RADIO KITS. Meteor S.G.3 Kit (with valves) £5 7 6, or 10 monthly payments of 12/6. Cabinet Model (as above with Cabinet and Moving-coil Speaker) £8 17 6 or 12 monthly payments of 17/-.
303 Kit (with valves) £3 10 0, or 7 monthly payments of 11/9. Cabinet Model (as above with Cabinet and Moving-coil Speaker) £6 17 6, or 12 monthly payments of 16/-.

★ P.W. BOOKLET CIRCUITS.

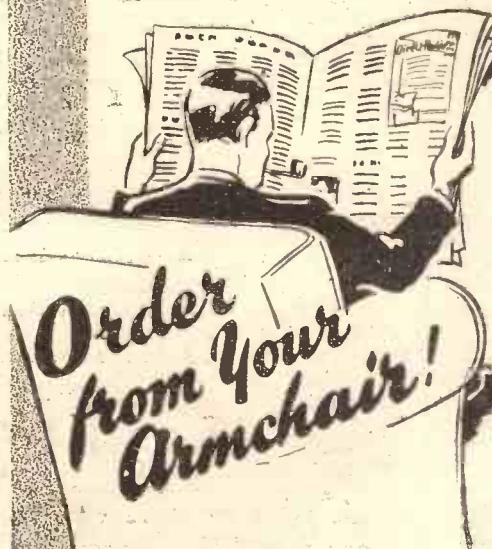
W.L.S. SHORT WAVE 2.	
Kit or deposit of 8/- and 7 further payments of	£2:16:6
No. 1	8/-
Kit or deposit of 10/- and 7 further payments of	£3:12:1
No. 2	10/-
Kit or deposit of 10/6 and 8 further payments of	£4:5:0
No. 3	10/6

S.G. 3.

Kit or deposit of 8/- and 9 further payments of	£3:11:8
No. 1	8/-
Kit or deposit of 9/6 and 11 further payments of	£5:3:9
No. 2	9/6
Kit or deposit of 11/- and 11 further payments of	£6:0:0
No. 3	11/-
Complete Kit with valves, Console cabinet, R. & A. M/C speaker, Siemens batteries, Oldham accumulator, Selectanet aerial and earth.	
Kit or deposit of 17/- and 11 further payments of	£9:2:6
No. 4	17/-

TELSEN Kits to Manufacturers' Specification—

Ajax Three Kit £3 16. 10/- down and 8 monthly payments at 7/6.
Ajax Three Valve Kit £4 4 3. 10/- down and 11 monthly payments of 7/6.



CASH, C.O.D. AND EASY PAYMENT ORDER FORM

To : Direct Radio Ltd., 159, Borough High Street, London, S.E.1.

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

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

NAME.....

ADDRESS..... Popular Wireless, 17/9/32.

You can of course buy your favourite accessories direct from Direct Radio. Write us for lowest quotations and suggestions.

Your Set needs

constant H.T. voltage



— how to ensure it

Smooth, unvarying H.T. voltage is vital to your Set. Fluctuations in the H.T. supply mean shortened range, distorted tone and reduced volume. The only way you can definitely ensure steady, constant H.T. voltage is to use an H.T. Accumulator. And the most efficient H.T. Accumulator you can use is the Lively 'O'.

Why the Lively 'O' H.T. Accumulator gives constant voltage

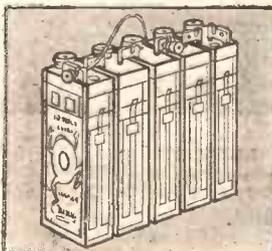
Because each 2-volt cell is "air-spaced" from its neighbours the Lively 'O' H.T. Accumulator is leak-proof. As a result it gives all its power to work your Set. Cell-to-cell leakage is eliminated. It is full of life and vitality right up to the time when it needs recharging (every 3 or 4 months). It gives your Set the constant voltage that it needs. Every Wireless Dealer sells the Lively 'O'.

TWO TYPES:

Standard 10 volt unit capacity 2,750 milliamps. **5/6**

Extra large capacity 5,500 milliamps (10 volt unit). **6/9**

BRITISH MADE by Oldham & Son, Ltd., Denton, Manchester. Est. 1865 and at London, Glasgow, Belfast and Dublin.



The Lively 'O'

H.T. ACCUMULATOR

PUT THE LIVELY 'O' INTO YOUR RADIO

TRADE JOTTINGS

By G. T. KELSEY.

A BOOK that has just been published by the Edison Swan Electric Co., Ltd., under the title of "The Amazing Mazda Valves," is one that is likely to be of interest to all "P.W." readers.

Primarily, it is intended as a guide (and a very comprehensive one at that) to the Mazda range of valves, but interspersed with the valve details are numerous interesting circuit diagrams with complete technical specifications.

Readers are advised to make early application for a copy of this book to the above-named firm at 123-5, Queen Victoria Street, London, E.C.4.

Almost everything of interest to the radio enthusiast from spade tags to ultra-modern screened coils is included in the latest Goltone catalogue, a copy of which is obtainable free on request to Ward & Goldstone, Pendleton, Manchester.

The index contains no less than 204 separate entries, and it covers such a wide range of subjects that it constitutes a ready reference of value to all who are interested in home construction.

We are advised by Messrs. J. J. Eastick, Eelex House, 118, Bunhill Row, London, E.C.1, that they are prepared to send a copy of the Eelex Short-Wave Converter booklet to all "P.W." readers who apply mentioning this journal.

The booklet is well worth having, for, in addition to a most useful list of the world's short-wave stations, it contains articles on the general principles of short-wave reception and a detailed description of the super-sonic circuit.

A New Publication.

Full details of current outputs and number of voltage tappings for the complete range of Ekco H.T. eliminators are contained in a new publication of this enterprising Southend concern.

The booklet (for which, when applying, our readers should mention publication "S.B./2") is extremely well prepared, and it includes complete technical specifications and illustrations of their new season's range of radio receivers and radiograms.

Ekco publication "S.B./2" is beautifully printed on art paper, and a copy will be sent to all "P.W." readers who apply to E. K. Cole, Ltd., Ekco Works, Southend-on-Sea.

Until comparatively recently the battery-operated set market has, in my opinion, been covered very inadequately by commercial set manufacturers, and I am therefore very glad to observe that a firm of such high standing as the Blue Spot Company have decided to include two particularly attractive battery models in their new season's range of receivers.

A special leaflet has been produced to describe the Blue Spot K 252, a battery-operated table model which sells complete with loudspeaker for 12 guineas, and the R 336, a handsome pedestal model which appears to be remarkable value at 16 guineas. A copy of this leaflet will be

(Continued on next page.)

TRADE JOTTINGS

(Continued from previous page.)

sent to all who are interested in battery-operated receivers on application to The British Blue Spot Company, Ltd., Blue Spot House, 94-96, Rosoman Street, Rosebery Avenue, London, E.C.1.

"Choosing Your Condensers and Resistances" is the title of a useful booklet that has just been produced by the Dubilier Condenser Co., Ltd., Ducon Works, Victoria Road, North Acton, London, W.3.

It describes the Dubilier range of condensers and resistances, and it gives some valuable information concerning the working voltages and the current-carrying capacities of the components in question. Copies may be had on application to the Dubilier Condenser Company, Ltd., at the address given above.

Twenty-four interesting circuit diagrams are included in the Colvern catalogue describing their new season's range of components.

The book contains a wealth of information of use to all home constructors, and it includes articles on modern receiver design, band-pass filters, the modern super-heterodyne, volume control, and a number of other interesting subjects.

Readers of "P.W." who would like a copy of this book, which is well worth having, can obtain one free of charge on application to Colvern Limited, Mawneys Road, Romford, Essex.

Well Worth Having.

Those readers who were unable to go to the recent radio exhibition will be interested in a new broadsheet that has just been produced by Messrs. Lissen, Limited. It describes their complete range of components for the season 1932-33, and, from the point of view of the home constructor, it is a publication that is well worth having.

Everybody is familiar with the better-known products of Messrs. Lissen, but did you know that they make gramophone needles? Did you know that they make waterproof covers for portable receivers? Did you know that their range includes such things as jacks and plugs, loudspeaker leads, turntables for portable receivers, trickle chargers, and numerous other useful things?

You will find details of all these things, together with prices, in this new Lissen catalogue, and you can obtain a copy free of charge on application to Messrs. Lissen, Ltd., Lissenium Works, Worple Road, Isleworth, Middlesex.

Messrs. Ready Radio, Ltd., who have for so long been associated with home constructors' kits, have recently sold their mail order business to Direct Radio, Ltd.

Henceforth, the policy of Ready Radio will be to distribute their goods through the usual trade channels, and all existing products, as well as the new lines that have recently been introduced, will therefore be available through local dealers.

The aim of Direct Radio, Ltd., will be to continue and to expand all the old-established kit traditions of Messrs. Ready Radio. They will feature in kit form all the sets that are from time to time described in "P.W.," and an efficient after-sales service is one of the creditable aims of the newly-formed organisation.



We supply all good quality Receivers, Loudspeakers and Accessories on convenient Easy Terms. All orders are executed promptly. Our aim is your satisfaction.

Receivers

NEW MURPHY A3A ALL-MAINS 3-VALVE A.C. RECEIVER. One of the finest sets on the market. **With 39/-**
Cash Price £19/19/0.
And 12 monthly payments of 33/-. order

WE ARE APPOINTED MURPHY DEALERS

PHILIPS 4-VALVE A.C. RECEIVER. Model 830A. This is very fine value. **With 30/-**
Cash Price £16/16/0.
And 11 monthly payments of 30/-. order

NEW PYE "K" 2-VALVE A.C. RECEIVER. **With 22/6**
Cash Price £12/12/0.
And 11 monthly payments of 22/6. order

Manufacturers' Kits

NEW COSSOR MELODY MAKER. Model 335 (just released). Complete Kit of Parts, Valves, and Loudspeaker and Cabinet. **With 10/-**
Cash Price £7/17/6.
And 11 monthly payments of 14/10. order

COSSOR MELODY MAKER, MODEL 334. Complete with cabinet and valves, less loudspeaker. **With 10/-**
Cash Price £6/7/6.
And 11 monthly payments of 11/10. order

NEW OSRAM "33" MUSIC MAGNET. A first-class Kit, including Valves, Loudspeaker and Cabinet. **With 20/-**
Cash Price £9/9/0.
And 12 monthly payments of 15/-. order

NEW TELSEN JUPITER S.G.3 KIT. Complete set of Components less Valves. **With 7/-**
Cash Price £3/17/0.
And 11 monthly payments of 7/-. order

NEW LISSEN "SKYSCRAPER" 3 KIT. **With 8/3**
Cash Price £4/9/6.
And 11 monthly payments of 8/3. order

NEW TELSEN AJAX 3. Complete Set of parts for Det., 2 L.F. Receiver, less valves. **With 5/8**
Cash Price £3/1/6.
And 11 monthly payments of 5/8. order

READY RADIO "METEOR" S.G.3 KIT, including cabinet, valves, and moving-coil unit. **With 11/-**
Cash Price £8/17/6.
And 11 monthly payments of 16/8. order

This Receiver tunes to Ultra Short Waves.
READY RADIO 303 KIT. Cabinet Model, including moving-coil unit and valves. **With 10/-**
Cash Price £6/17/6.
And 11 monthly payments of 12/9. order

Loudspeakers

NEW ORMOND PERM. MAGNET MOVING-COIL L.S. UNIT (just released). **With 5/4**
Cash Price £1/18/6.
And 7 monthly payments of 5/4. order

NEW R & A "CHALLENGER" PERM. MAGNET MOVING-COIL UNIT. **With 5/-**
Cash Price £1/15/0.
And 6 monthly payments of 5/8. order

NEW EPOCH 20C PERMANENT MAGNET MOVING-COIL UNIT **With 5/7**
Cash Price £1/15/0.
And 6 monthly payments of 5/7. order

NEW BLUE SPOT 99 P.M. MOVING-COIL UNIT. One of the finest Units available. **With 5/-**
Cash Price £2/19/6.
And 11 monthly payments of 5/6. order

NEW R & A "VICTOR" PERM. MAG. MOVING-COIL REPRODUCER DE LUXE with 6-ratio Transformer and Cadmium plated Grill. **With 6/5**
Cash Price £3/10/0.
And 11 monthly payments of 6/5. order

BLUE SPOT 100U INDUCTOR UNIT. **With 5/5**
Cash Price £1/19/6
And 7 monthly payments of 5/5. order

MOTOR MINOR MOVING-COIL UNIT. **With 5/5**
Cash Price £1/19/6.
And 7 monthly payments of 5/5. order

Eliminators

ATLAS ELIMINATOR, A.C.244. 3 H.T. Tappings. 20 M/A output. **With 5/-**
Cash Price £2/19/6
And 11 monthly payments of 5/6. order

HEAYBERD ELIMINATOR KIT, G.290, complete kit of parts in steel case for making a first-class eliminator. Three H.T. tappings. 50 M/A output and 4 V 5-amp. L.T. tapping for A.C. valves. **With 8/-**
Cash Price £5/7/6.
And 11 monthly payments of 10/-. order

HEAYBERD ELIMINATOR KIT, C.150, 3 H.T. tappings, 25 M/A output. **With 6/6**
Cash Price £3/16/0
And 11 monthly payments of 7/-. order

ATLAS A.K.269, 3 H.T. tappings and trickle charger 2-4-6-volts. **With 8/3**
Cash Price £4/10/0
And 11 monthly payments of 8/3. order

EKCO A.C. 25, 3 H.T. tappings, 25 M/A output. **With 7/1**
Cash Price £3/17/6.
And 11 monthly payments of 7/1. order

EKCO A.D.18, 3 H.T. tappings, 18 M/A output. **With 6/3**
Cash Price £3/7/6.
And 11 monthly payments of 6/3. order

To avoid delay, will customers kindly send first payment with order.

All above carriage paid.

The **LONDON RADIO SUPPLY COMPANY**
11, OAT LANE · LONDON · E.C.2
Established 1925 Phone National 1977

PPM
SOUNDEX

27¹/₆

INCLUDING TRANSFORMER

The Celestion P.P.M. Soundex is truly amazing! For such a compact speaker the volume is extraordinary—the tonal quality is perfect, being free from mush or distortion, giving a rich, deep note without boom or vibration. Truly a speaker of which Celestion can be justly proud, a speaker that will amaze you because of its realism.

Whatever your set, the Soundex will improve its quality.

Insist on your local dealer demonstration the P.P.M. Soundex or write to Celestion for illustrated list.

Only 27/6 including universal transformer.

CELESTION
The Very Soul of Music

Celestion Ltd., London Road, KINGSTON-ON-THAMES.
London Showrooms: 106 Victoria Street, S.W. 1.

THE LISTENER'S NOTEBOOK

(Continued from page 18.)

A Good Idea.

I think that the suggestion that we should be given in advance some details of the records that are going to be played in a gramophone recital is a good one. These recitals, popular as they are, aren't always of equal merit. In fact, I can recall some that have been distinctly disappointing.

We listeners have certain definite likes and dislikes, but at present, without anything to help us, we are at the mercy of Christopher Stone, who, although he is generally discriminating, is sometimes capable of an excessive leavening of such music as happens to suit his own particular mood that day.

Not Quite the Same!

Such a practice if adopted might give itself to abuses but never, I think, to such a one as was recently revealed across the Channel.

A private transmitting station had announced in its programmes a record of some airs by Gustave Charpentier, entitled "Louise." Unfortunately it was not discovered until the time of the recital that this particular record was broken, and so couldn't be played. What did they do?

Without offering a word of explanation or apology, they gave instead a record entitled "Ma Louise," a song created by Maurice Chevalier and quite a different thing from "Louise." The substitution displeased Gustave Charpentier, who brought an action against the authorities of the station in question. Judgment was passed in his favour, and damages amounting to 3,000 francs were awarded him.

Importance of Atmosphere.

After listening to most of the concert parties that have been broadcast this season, I've come to the conclusion they are a different proposition when one is listening to them either from a deck chair at the seaside or from a seat in the stalls. They seem out of place, somehow, when one is ensconced in an easy chair in a sitting-room. There's a lot to be said for the right atmosphere.

All the companies I've listened to seemed to rely on old-time concert-party methods, nor did they despise such well-worn songs as "And the Green Grass Grew All Round, etc."

The "Oxford Blazers" were unique in that they wrote all their stuff themselves, but although this stuff caught the public fancy in more suitable environment, it wasn't so convincing via the loudspeaker.

A One-Man Show.

Were it not for fear of doing the profession some harm I would suggest that a radio thriller could be done just as efficiently by one man as it is now by a cast of ten or more, for such a play is hardly anything more than a thrilling story by the central character, with an occasional grunt by one or other of the cast.

The one man with a little practice could quite easily execute the grunt, or a variety of grunts, in a voice alternately feminine, basso, piping, drawling, well-offish, stand-offish, etc., etc., according to the requirements of the part.

TECHNICAL NOTES

Some diverse and informative jottings about interesting aspects of radio technique

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

That Pre-Set Aerial Condenser.

IF you use a pre-set aerial condenser you will generally find that whilst this is advantageous on medium wavelengths, it may be of little use, or, in fact, a positive disadvantage, when it comes to long wavelengths.

The purpose of the pre-set aerial condenser is to give extra selectivity, and this it does mostly on the medium wavelengths. Consequently many people find it a good thing to have an arrangement by which the pre-set can be thrown out of action when tuning in long wavelengths.

It is a very simple matter to cut out the pre-set condenser, and all you require is a shorting switch connected across the terminals. For medium waves you leave the switch open, whilst for long waves you close the switch and so throw the pre-set condenser out of action.

A Question of Selectivity.

Of course, if you happen to be using the set in conditions which do not call for very special selectivity—for instance, if you have used the pre-set condenser to get away from a powerful local station and you happen to be using the set in some other position altogether, where conditions are different—you might find it an advantage to do away with the pre-set condenser altogether.

Too Efficient Circuits.

Most people suppose that when using a screened-grid valve, provided the coils and condensers are well and truly shielded, there will be no danger of oscillation; but in point of fact oscillation will sometimes be set up, notwithstanding adequate shielding.

When this happens it is usually owing to the coupling between the grid and anode in the valve itself. In a good type of screened-grid valve this anode-grid capacity will be extremely small, but it is there nevertheless.

If there are no other couplings, that is to say, if the batteries are properly decoupled and the various parts of the circuit are efficiently screened, you might assume that the strength of signals applied to the grid would be independent of the H.T. supply to the screen and anode circuits.

Grid-Anode Interaction.

In actual practice this is not so, and the voltage applied to the grid circuit will vary when the anode circuit is tuned, showing that there is a definite influence of the anode circuit upon the grid circuit.

If now the two tuned circuits connected to the anode and grid happen to be especially efficient, you may reach a point where the stage will go into oscillation. This is just one of those cases where efficiency may be overdone and where safety lies in making judicious use of a certain degree of inefficiency.

(Continued on next page.)

TECHNICAL NOTES

(Continued from previous page.)

From other considerations it seems that you want all your circuits as efficient as possible, but you may get them so good and your coils so good that you run into instability. Slightly less efficient coils will, however, get you out if you find yourself in this particular trouble.

Scratch Filters.

Although one so often sees articles on scratch filters for cutting out surface noise in the reproduction of a gramophone record, I have been surprised to find how many people there are who have not yet adopted them. Perhaps the reason is that modern gramophone records have been so very much improved in respect of surface noise that scratch filters are not so necessary as they were when electrical reproduction was first introduced.

A good deal depends on the pick-up used. There is no doubt that some pick-ups give far more scratch than others, and it is also a question of how much of the scratch is electrically reproduced through the amplifier and how much comes direct from the pick-up itself—through the air.

Robbing the Higher Frequencies.

One very simple way of reducing surface scratch is to use some form of volume control; for instance, an adjustable resistance connected across the pick-up. This, however, gets rid of the scratch by getting rid also of some percentage of the whole volume and particularly of the higher frequencies, so that it is objectionable in that it interferes with quality.

It is a very simple matter to reduce the higher notes. A resistance of, say, 50,000 ohms will generally make a very noticeable difference to the higher frequencies, but if this resistance is increased to 100,000 ohms the cutting out of the higher frequencies will be much less.

But a few tests with any simple form of high-frequency cut-out you will be able to find a value which will appreciably minimise the scratch without seriously robbing the reproduction of the necessary high frequencies.

Filament Control on S.G.'s.

There are all kinds of dodges for volume control and these may be applied at almost any part of the circuit. What I am thinking of at the moment, however, is the use of a filament resistance with a screened-grid valve. If you reduce the filament current you can often get to a point where the selectivity is much better; the amplification being, of course, somewhat reduced. A filament resistance used in this way often makes a very handy adjustment both for selectivity and volume.

It is rather curious that whereas not so many years ago it was the custom to put in a separate filament resistance with every valve, nowadays filament resistances, at any rate, used in that way, are practically a thing of the past.

Valve Standardisation.

This is largely due to the standardisation of valves to particular voltages, 6, 4, and 2 volts, especially the latter, and also, of course, to the increasing use of indirectly-heated mains valves.

(Continued on next page.)

Graham Farish (The Wireless Pioneer.) Says:-



Mr. Graham Farish is no newcomer to the Radio World, the Graham Farish Products having been famous since the earliest days of Wireless. Ask your dealer.

**“Don't blame the valves or the battery—
fit **FILT**
the percolative earthing device”**

You may save the expense of buying new valves, and improve your reception tenfold, by fitting **FILT** percolative earth.

The great majority of wireless troubles arise from faulty earth connections. The symptoms are so varied that you suspect everything but the right thing—the earthing device.

Many attempts have been made to produce a satisfactory earthing device, but I honestly believe the percolative properties of the wonderful chemical in **FILT** to be as big an advance as electricity is over candlelight. When you have fitted **FILT** your set will far outshine its previous best in volume, tone, and above all, **PURITY**.

Your set will never give you the fullest enjoyment of which it is capable until you have fitted the **FILT** percolative earthing device.



Simply bury the copper receptacle containing the wonderful **FILT** chemical, which at once begins to spread through the earth, attracting moisture and making a **PERMANENT** highly conductive area to the depth of several feet. **FILT** keeps moist and highly conductive. It spreads like a tentacle, earthing your set perfectly and, giving you every ounce of power, range and purity, no matter what set you use.

GRAHAM FARISH
FILT
PERCOLATIVE EARTH

Get a **FILT** today from the nearest radio dealer or direct (post free) from the sole manufacturers.



GRAHAM FARISH LTD.
181, Masons Hill,
Bromley Kent.

ELECTRADIX BARGAINS

See Sept.-Oct.
Sale List

ELECTRADIX RADIOS,
218, Upper Thames St., E.C.4.

Telephone: CITY 0191.

ADVERTISEMENTS As far as possible all advertisements appearing in "P.W." are subjected to careful scrutiny before publication, but should any reader experience delay or difficulty in getting orders fulfilled, or should the goods supplied not be as advertised, information should be sent to the Advertisement Manager, "Popular Wireless," 4, Ludgate Circus, London, E.C.4.

THE PICTURE PAPER WITH THE MOST NEWS
SUNDAY GRAPHIC
and Sunday News

WIRELESS AS A CAREER

Whether you are already engaged in the radio industry and wish to improve yourself, or if you wish to obtain employment in this interesting profession, we can help you. Write now for Booklet describing our Home Study Course. Sent post free.

NORTHERN COUNTIES WIRELESS SCHOOL,
57, Guildhall Street, Preston.

Radio Cabinet Specialists
REDRUP & SON (P. W. Dept.),
178 ALBERT ROAD, SOUTHSEA.
Send 2d. stamp for Illustrated Catalogue.

TAYLEX WET H.T. BATTERIES

Give long service, improved volume and tone, very economical. Replacements for Taylex or Standard batteries at low prices; details post free; also Bargain List, Radio Kits and parts at lowest prices.
P. TAYLOR, 57, Studley Rd., Stockwell, London.

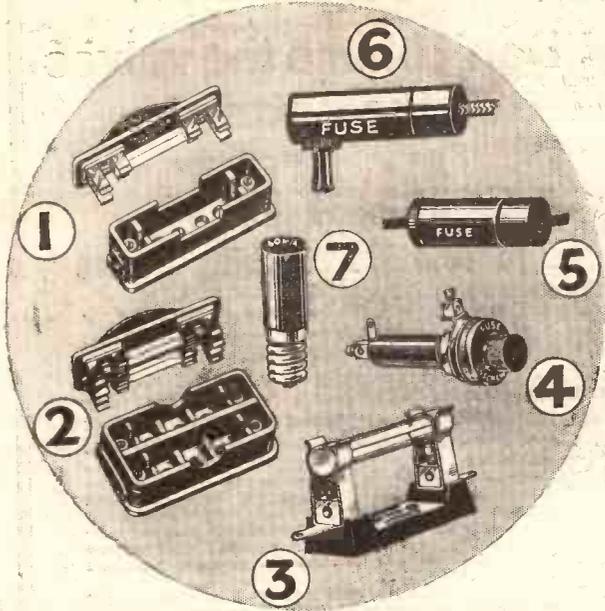
ADVERTISERS PLEASE NOTE!

The Rate for a one-inch single Column Advertisement is **30/-**

Minimum Space Accepted:
Half-an-inch .. **15/-**

Send Remittance with instructions to
JOHN H. LILE, LTD.,
4, LUDGATE CIRCUS, LONDON, E.C.4.
Telephones - City 7261.

FUSE HOLDERS AND FUSES



- 1 SINGLE SAFETY BASEBOARD FUSE-HOLDER. Fuse carried on lid, making shocks impossible. Complete with 1 amp. fuse .. 1/6
 - 2 TWIN SAFETY BASEBOARD FUSE-HOLDER. Fuses carried on lid rendering shocks impossible. Complete with two 1 amp. fuses .. 2/6
 - 3 SINGLE OPEN FUSE-HOLDER. With 1 amp. fuse 9d.
 - 4 PANEL FUSE-HOLDER. For panel mounting. With 1 amp. fuse .. 1/6
 - 5 FLEX FUSE-HOLDER. With 1 amp. fuse .. 1/-
 - 6 WANDERFUSE. With 150 m/a. fuse .. 1/-
 - 7 "SCRUFUSE," Not bulb, not cartridge, yet both! .. 6d.
- 5 different colour-coded ratings 60 to 750 m/a.

SPARE FUSES, LONG FUSE. 60, 150, 250, 500, 750 m/a., 1, 2 or 3 amp.
 SHORT FUSE (For Wanderfuse only) 60, 150 and 500 m/a.
 All ratings and sizes 6d. each.
 Each rating a different colour avoiding possibility of error.

BELLING-LEE

Advert. of Belling & Lee Ltd., Cambridge Arterial Road, Enfield, Middlesex.

TECHNICAL NOTES

(Continued from previous page.)

Another reason why filament resistances are scarcely ever necessary is because the filament current consumption has been so very much reduced of late years and the operating temperature of valve filaments of the very dull emitter variety has been more accurately standardised.

In the old days, the operating temperature of the filament was a matter almost entirely for the taste and fancy of the user and was liable to be varied between enormously wide limits. Nowadays the filament operates at or about a particular temperature and there is neither the occasion nor the opportunity for departing seriously from the specified conditions.

Battery v. Mains Receivers.

I am often asked by readers who use battery-operated sets and who contemplate going over to mains receivers whether mains valves are more efficient than battery valves and, if so, why they should be more efficient.

The fact is that with a mains valve—let us take a screened-grid with indirectly-heated cathode, for instance—you may get an amplification factor of 1,000 and upwards, whereas with a battery valve of the screened-grid type, 200 to 300 will be a corresponding figure.

There are a number of reasons for this and one of them lies in the fundamentally different arrangement of the filament, or perhaps I should say, for the sake of comparison, the cathode. In the case of a battery valve the cathode and the filament are one and the same thing, whilst in the case of an indirectly-heated mains valve the filament forms the heater, whilst the cathode, which is the electron emitter, is electrically distinct from the filament.

Potential Variation in Cathode.

The fact that the cathode in the mains valve is electrically separate from the filament and has no current (or practically no current) passing through it enables us to keep it at virtually a single potential throughout its whole length.

In the case of the battery-heated filament carrying heating current, there is a considerable variation in potential as we pass from one end of the filament to the other. This variation in potential at different parts of the filament in relation to the grid and anode makes a considerable difference to the efficiency and amplification factor of the valve.

Another point, of course, is the very high emission which can be obtained from the cathode of an indirectly-heated valve.

How Much Punch?

It is funny what different ideas people have as to how loud a wireless set ought to be. Some people like a tremendous lot of punch, say a big moving-coil speaker with giant voice which they can not only hear but positively feel, whilst other people think this is horrible and blaring and prefer a gentle conversational tone, perhaps even quieter than the original.

Those of you who visited the radio show had plenty of opportunity of noting the reproduction of loudspeakers operated under almost every conceivable condition,

(Continued on next page.)

TUNEWELL'S 2 BIG OLYMPIA HITS!

★ Amazing interest was shown at Olympia in the new range of Tunewell Super-Radio Components, which have removed the price-bar to quality radio. Whatever set you intend to build, there are Tunewell Components to improve reception—and save you money! Get the "Guide to Super Radio" which gives details, and includes 8 FREE BLUE PRINTS (Kit Eliminator, All-Mains Band Pass 3, etc.).

The new Tunewell A.C. All-Electric Radio-Gramophone also made a great hit. ★ This instrument has given Tunewell the lead in Radio-Gramophones. Its greatest features are wonderful fidelity and purity of tone. Send now for the illustrated Brochure.

TUNEWELL

STOP PRESS!
TUNEWELL
MAINS TRANSFORMER
 MR28/200 Price 25/-
SPECIFIED FOR
THE "FLEX-FEED" 2
 described in this issue.

To Tunewell Radio Ltd., 54, Station Road, New Southgate, London, N.11

Please send me
 * (a) "Guide to Super Radio."
 * (b) Radio-Gramophone Brochure.

NAME.....
 ADDRESS.....
 * Cross out if not required. P.5

TECHNICAL NOTES

(Continued from previous page.)

for there must have been literally hundreds of speakers on the stands, all going at once.

Some people told me that they thought the average speaker was not loud enough; some thought that many of the speakers were much too loud, whilst one or two people confessed that they were glad to get away from all the noise and wanted a week's rest before they heard a speaker again.

But actually, although at first you might think the show was a unique opportunity for comparing speakers of every kind, it was really nothing of the sort. It was quite impossible to judge a loudspeaker intended for average home use in the conditions in the main hall at Olympia, especially when there were twenty or thirty other speakers all within earshot at the same time. For one thing, it takes a clever man to know which particular speaker he is listening to and often enough you have to put your ear up against different ones to make certain where the sound is coming from.

Conditions for Judging a Speaker.

So I would advise any of you who may have formed an opinion about any particular speaker at Olympia, whether that opinion was good or bad, to reserve judgment and take the opportunity of hearing the speaker alone and in proper conditions.

I know of one amusing case where a visitor to the Exhibition was getting very delighted with the reproduction from a speaker near to which he was standing, when it turned out that that particular speaker was not working at all and the sound was coming from another speaker on the next stand.

Fortunately this discovery was made before the people on the first stand booked the order, but it serves to show how important it is not to judge speakers in conditions similar to those appertaining in the main hall at Olympia.

Watts Output.

This question of volume and quality is really also related to the question of battery-driven sets as against mains-operated sets. One of the many advantages—if this particular feature be an advantage—of the mains set is that you do not have to worry about how much current you are using and consequently, if you particularly want to go in for enormous volume, you can do so with impunity, or at any rate with economy, whereas with a battery set you always have to have one eye on the next date for recharging.

Quality and Quantity.

But if you prefer quality to quantity (as all good listeners do), then I do not think you have anything very much to lament if by force of circumstances you are obliged to use a battery-driven set. Provided very great volume is not required, it seems to me that the battery set will give you every bit as good results as the mains set—certainly as good quality.

With some of the battery valves you can quite easily handle half a watt or even a watt of output without needing more

(Continued on next page.)

New Times Sales Co

NEW 1933

RADIO
ON EASIEST OF
EASY TERMS

QUICKEST DELIVERY

MANUFACTURERS' KITS

LISSEN "SKYSCRAPER 3." Chassis Send
model with (Lissen) S.G., Detector and
Pentode valves. Cash Price, £4/9/6. 8/3

Balance in 11 monthly payments of 8/3 only

COSSOR MELODY MAKER. Model With
335. Complete with Valves, Speaker 10/-
and Cabinet. Employs Cossor Variable-
Mu S.G. H.F. stage, Detector and
Power. Cash Price £7/17/6 order

Balance in 11 monthly payments of 14/10

OSRAM "THIRTY-THREE" MUSIC
MAGNET. Complete Kit, comprising
all components including Valves, 15/-
Cabinet with self-contained Speaker. With
Screen-grid H.F., Screen-grid Detector
and Power output. Single-dial tuning,
wave-length calibrated. order

Cash Price £9/9/0

Balance in 11 monthly payments of 17/6

ACCESSORIES

COLLARO ELECTRIC GRAMOPHONE
UNIT. For A.C. Mains. Complete with
12" Plush Covered Turntable; Com- 7/4
bined Tone Arm, Pick-Up and Volume
Control; Automatic Stop: all built into
one easily mounted unit. order

Cash Price £4/10/0

Balance in 11 monthly payments of 7/4

B.T.H. SENIOR PICK-UP, complete
with Arm and Base. 3/10
order

Cash Price £2/2/0

Balance in 11 monthly payments of 3/10

ULTRA BLUE FOX. For A.C. or With
D.C. Mains. 2 valves, detector and
power. Moving-coil speaker, with 13/6
Mazda valves, ready for use. order

Cash £10/10/0

Balance in 17 monthly payments of 13/6.

FIRST WITH
EASY TERMS
in 1924 and
Still leading
BIGGEST STOCKS

Strictest Privacy Guaranteed

R & A "VICTOR" PERMANENT
MAGNET MOVING-COIL SPEAKER
DE LUXE. With 6-ratio input trans-
former and protecting grill. 6/5
order

Cash Price £3/10/0

Balance in 11 monthly payments of 6/5

R & A "BANTAM" PERMANENT
MAGNET MOVING-COIL SPEAKER. 5/-
With
3-ratio input transformer. order

Cash Price £1/7/6

Balance in 5 monthly payments of 5/-

BLUE SPOT SPEAKER UNIT AND
CHASSIS, Type 100U. 5/5
order

Cash Price £1/19/6

Balance in 7 monthly payments of 5/5

W.B. PERMANENT MAGNET MOV-
ING-COIL SPEAKER, Type P.M.4. 5/9
With
Complete with Transformer. order

Cash Price £2/2/0

Balance in 7 monthly payments of 5/9

EPOCH "20 C" PERMANENT MAG-
NET MOVING-COIL SPEAKER. With
3-ratio input transformer. This speaker
will handle up to 5 watts. 6/6
With
order

Cash Price £1/15/0

Balance in 5 monthly payments of 6/6

EPOCH MM. PERMANENT MAGNET
MOVING-COIL SPEAKER with 5-ratio
input transformer. Cash Price £1/7/6. 5/-
Balance in 5 monthly payments of 5/- only

Cash Price £2/19/6

Balance in 11 monthly payments of 5/6

ATLAS A.C. ELIMINATOR, Type
A.C.244. Three tapings, S.G., Detec-
tor and Power. Output, 120 volts
at 20 m.a. Cash Price £2/19/6

Balance in 11 monthly payments of 5/6

Any items advertised in this journal sent
C.O.D. If value over 10/- sent all C.O.D.
charges paid.

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

Please send me (a) 1933 Lists

(b).....for which I enclose first

payment of £.....d.....

Name.....

Address.....

P.W. 17/9/32

RADIO SUPPLIES

Send your list of Radio needs for our quotation;
R.H.s. Parts, Sets, etc. Everything in Radio
stocked, prompt delivery. 7 days' approval. Cata-
logue free. Taylex & Standard Wet H.T. replace-
ments stocked.

F. TAYLOR, 57, Studley Rd., Stockwell, London.

ENGINEERS

Sit down and think this over. We believe that our
200-page handbook, "ENGINEERING OPPOR-
TUNITIES," will show you the way to well-paid,
permanent and progressive employment. In any
case, the handbook costs nothing, and it will at
least show you various surprising possibilities
about which at present you know nothing. Can
you, can any man, who cares a hoot about his future,
afford to allow this opportunity for a worth-while
job to pass unheeded? Think it over. Can you?
We want you to read "ENGINEERING OPPOR-
TUNITIES." Among other things it gives details
of all recognised Examinations (A.M.Inst.C.E.,
A.M.I.Mech.E., I.E.E., G.P.O. etc.) outlines
modern home-study courses in all branches of Civil,
Mech., Elec., Motor, Radio, Aero and Talkie Engi-
neering, and explains the unique advantages of our
Employment Department. The book is quite free.
Send a post-card for your copy NOW. We promise
that it will be a moment of your time well spent.

THE BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY
401, Shakespeare House, 29/31, Oxford St., London, W.1.

LOUD SPEAKERS REPAIRED, 4/-

(Blue Spot a Specialty, 5/-)
Transformers 4/-. Headphones 4/-. all repairs magnetised
free. Eliminator Repairs quoted for. 24 Hours Service.
Discount for Trade. Clerkenwell 9069.
D. MASON, 44, EAST ROAD, LONDON, N.1.

Famous Makers' Offer! £5 Radio Gram
CABINET for 65/-

IMPROVES PERFORMANCE 50%

10/- monthly if desired

Polished Oak, Piano Tone Cab-
inet (42 in. high, 24 in. wide).
ON APPROVAL at Makers'
Prices!! You may return at
our expense if you wish to part
with it. 3,000 clientele. B.E.C. Radio Press.
All Models from 35/-
to £15.

PIANO TONE

Patent 8123. Users ob-
tain 50% to 100% greater
volume. The rich, mellow
tone brings a fine thrill.

PHOTOGRAPHS AND
LISTS FREE.

PICKETTS Piano Tone Cabinets (P.W.).
Albion Rd., Bexleyheath, Kent

Mains Power — for your Radio

Finish with the trouble, expense and inefficiency of batteries for ever, run your Wireless set from the Mains. Heyberd offer you an unequalled choice of Mains Units. No matter what type of Receiver you have—Heyberd can supply a Mains Unit to suit it.

MODEL HDC.150 for D.C. MAINS

OUTPUT: 50 m/a at 150 volts.
TAPPINGS: 60/120 v. Var., 0/150 v. Var., and 150 v. fixed. The great advantage of this D.C. unit is its convertibility. Mounted on a standard chassis, with ample room in the metal case, this model can be altered to work off A.C. mains in one hour, simply by the inclusion of a Heyberd Mains Transformer and Westinghouse Rectifier. Ready to switch on for 55/-.

MODEL D.150 for A.C. MAINS

OUTPUTS: 25 m/a at 150 v. or 20 m/a at 120 v. Alternative.
TAPPINGS: 60/120 v. Var., 0/150 v. Var., and 150 v. fixed. This very adaptable Mains Unit for A.C. Mains includes the Heyberd Mains Transformer and Westinghouse Rectifier. Complete for 86/-. For 8/- extra it can be fitted with an L.T. winding for A.C. Valves, or for 27/6 extra a Trickle Charger 2, 4 or 6 volts at 1/2 amp.

Both the above models are supplied complete in handsome bronze-finished metal cases. Smoothing is perfect—comprising double constant inductance Chokes and 16 mfd. Block Condensers. They are both covered by the Heyberd Comprehensive Guarantee.



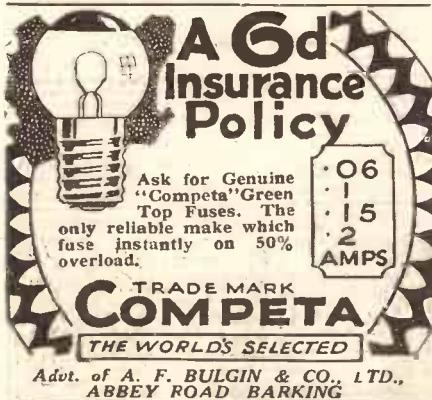
Post Coupon
for Heyberd handbook on Mains Working

I enclose 3d. stamps for New Handbook of Mains Equipment. Packed with Technical Tips, Service Hints and diagrams

Mr. _____
Address _____

F.C. HEYBERD & Co.,
10 FINSBURY STREET, LONDON, E.C.2
One minute from Moorgate Stn

CRUISER S.G.3 KIT (S.C. Det. & Power)
Metal Chassis, Screened Coils, Ganged Condensers and all Parts (less Valves & Cabinet) **69/6**
Full Particulars, Assembly Instructions and Cash or C.O.D.
Test Report post free on request.
Desk 22, Monomark House, High Holborn, London, W.C.1.



A 6d Insurance Policy

Ask for Genuine "Competa" Green Top Fuses. The only reliable make which fuse instantly on 50% overload.

TRADE MARK
COMPETA
THE WORLD'S SELECTED

Advt. of A. F. BULGIN & CO., LTD.,
ABBEY ROAD BARKING

TECHNICAL NOTES

(Continued from previous page.)

than, say, 150 or 180 volts H.T., or without using more than, perhaps, 20 to 25 milliamps anode current. Of course, I know that 25 milliamps is quite a fair amount for a battery set, but I am assuming that you are really pushing things to the limit and trying to compete, as it were, with a powerful all-mains receiver.

Detector Bypass.

An H.F. bypass used with the detector generally renders the detector more efficient, and for this reason readers have sometimes asked me why it is that the set should not be more stable without the bypass than with it. You might think that, since a bypass increases the efficiency of the detector, it would also increase the danger of instability and *vice versa*. On the other hand, we know that in practice the set is often unstable *without* a bypass, and begins to behave itself when the bypass is introduced.

H.F. in the L.F. Stages.

The reason for this seeming anomaly is that, in the absence of a detector bypass, there is H.F. wandering about in the detector anode circuit, and this is what causes the instability. When a bypass is introduced, notwithstanding that the efficiency of the detector is thereby increased, the elimination or reduction of this wandering H.F. tends to greater stability. This is still further emphasised by the fact that sometimes, even when a bypass is used, it may not be sufficient to reduce sufficiently the stray H.F. so as to ensure stability.

The tendency to instability from unwanted H.F. is greater when the transformer has a high primary capacity, the reason being, of course, that this capacity has an opposite effect to that of the bypass itself. In a case of this kind, however, all you need do is to put an H.F. choke in the anode lead between the bypass condenser and the transformer.

Use a Choke, Too.

I should mention that some people think that an H.F. choke is not necessary when a bypass condenser is used. This is sometimes true, but not always. Now that set designers are going in so much for high-frequency amplification, and also in view of the improvements in low-frequency transformers, the tendency for H.F. to get into the low-frequency part of the set needs very careful watching.

This is just one of those cases which you meet with so often in radio practice where improvements and refinements in one direction make corresponding precautions necessary in others. I need hardly say that in the above case the high-frequency choke must be of good quality and must not itself suffer from too high a self-capacity.

CLIX "MASTER" PLUG



Test this against all others—we are confident you will choose 'CLIX'

The technical press congratulates 'Clix' on the design and efficiency of the 'Clix' "Master" Plug.

POPULAR WIRELESS says: "Radio enthusiasts who have experienced trouble from soft pronged or too rigid plugs and tapered H.T. Battery sockets will welcome the CLIX 'MASTER' PLUG."

1 1/2 D.

Supplied with long or short shanks and insulators.

Metal to metal contact, firm grip, full surface contact with any H.T. or G.B. battery sockets.

Full range of markings.

Send for Illustrated Folder 'P' of all 'Clix' products.



Cheapest PERFECT CONTACT

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

AMPLION SIX Walnut Table Cabinets. Outside width, 16 1/2"; height, 22"; depth, 10". Price 10/6, carriage 2/-. DITTO, pedestal model, price 15/6, carriage 2/6.

K.B. Walnut Set Cabinets, curved top, moulded edges, panel bored for Telsen illuminated dial, switch, reaction coil. Outside width, 15"; height, 10 1/2"; depth, 10". Price 3/9, carriage 1/6. Call or write—

EXCESS PRODUCTS CABINET STORE, 129, Newington Causeway, London, S.E.11. Available by all routes to Elephant and Castle.

10,000 GRAMO-MOTORS FROM STOCK

BIG CASH DISCOUNT ALLOWED
Make a Gramophone or Radiogram Order loose kits and assemble them at home. Get for 3d. our new 64-page catalogue with scale drawings and instructions how to make them. We sell motors from 7/6, tone-arms, soundboxes, 1/6, pick-ups, big volume horns, loudspeakers, radio kits, complete receiving sets, gramophones, radiograms. Established 1923.
THE BEGENT FITTINGS CO., P.W. 120 OLD STREET, LONDON, E.C.1.



PLEASE be sure to mention "POPULAR WIRELESS" when communicating with Advertisers. THANKS!

Make **The DAILY SKETCH** YOUR Picture Paper

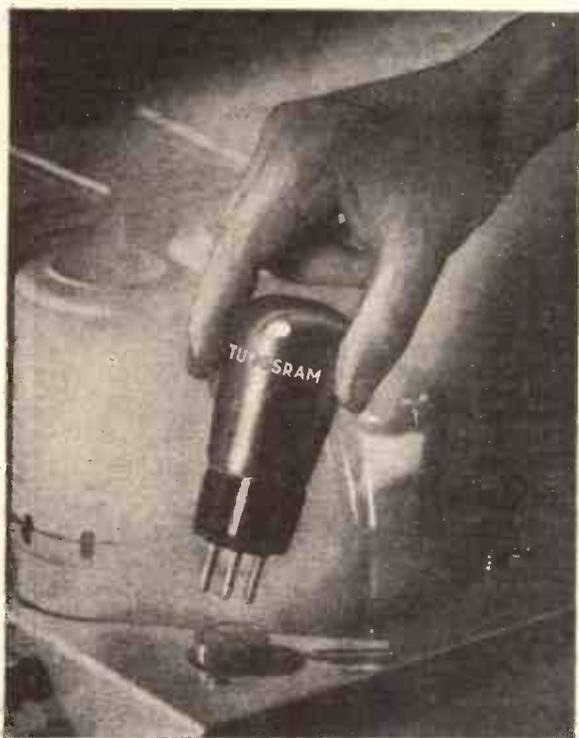
OHMITE RESISTANCE



Graham Farish Ohmite

Better than Wirewound
All values from 300 ohms to 5 megohms. Accurate and Constant 1/6 each. Holder 6d.

Made by **GRAHAM FARISH** Bromley Kent.



**A NEW SET...OR A
RENEWED SET**
*at a fraction of
the cost*

Perhaps your radio reception is on the downward path. Fewer stations; less volume; worse tone. Your set is not to blame. Your set is as up-to-date to-day as it was a year ago. It's your valves; they are not pulling their weight.

Renew your set throughout with Tungram Valves. Make it as good or even better than when you bought it or built it. More stations; increased volume; perfect tone. But it must be Tungram! For this reason: Tungram Valves are the most efficient that modern science has so far produced. Tungram Valves are used by 61 British Set Manufacturers. But they cost very much less than the price you're used to paying. You cannot get Tungram quality in any other valve even by paying twice the Tungram price!

Insist on Tungram. Don't be put off. Go to a Tungram dealer; take nothing but Tungram!

RENEW YOUR SET WITH

TUNGSRAM

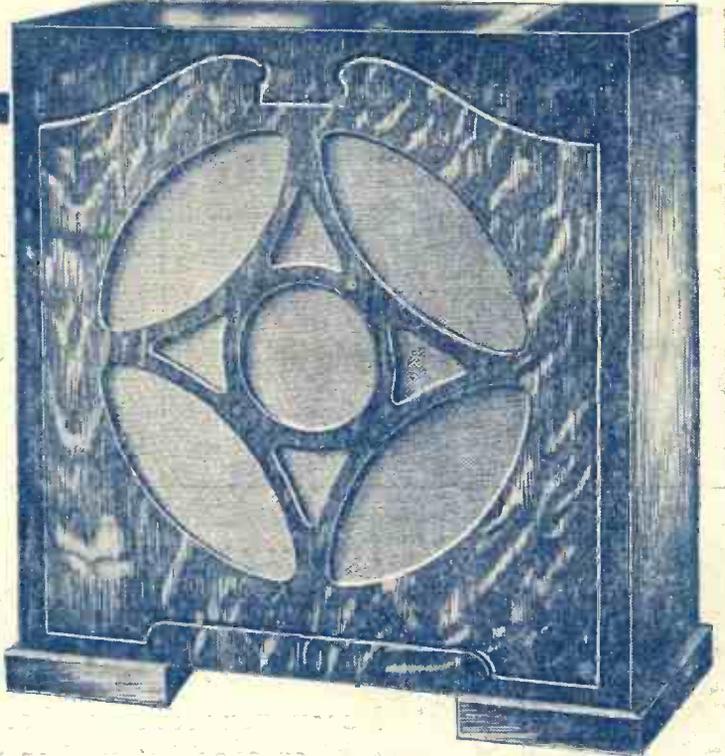
Tungram Electric Lamp Works (Gt. Britain) Ltd.,
Radio Dept., S.T.3, Commerce House, 72, Oxford St., London, W.1

BARIUM VALVES

The best Speaker Value in the World

31K 31/6

BRITISH MADE



EVERYBODY remembers the world famous Blue Spot 66K Unit and how much it did to improve radio reproduction.

An improved model of this remarkable unit is used in the Blue Spot 31K cabinet speaker. 31K will be one of the outstanding features of this season, both from the point of view of value for money and superb performance.

31K reproduces every sound with clarity and sweetness. It makes wireless a pleasure to listen to, so delightfully "real" is the standard of its performance. Singers, speakers, and all kinds of

music are reproduced with effortless ease and with never a sign of distortion to mar their beauty.

Aside from its performance 31K is a really well made, handsome piece of furniture. Its rich dark oak cabinet looks well in any surroundings. Ask your dealer to demonstrate 31K for your pleasure and judge it for yourself. Write for Catalogue No. P.W. 50S.

66K

—UNIT ONLY—the improved model of the world famous 66K
15/-



66KC

—unit mounted to specially designed chassis ready for screwing to baffle board or cabinet, 19/9

THE BRITISH BLUE SPOT COMPANY LTD.
BLUE SPOT HOUSE · 94/96 ROSOMAN STREET · ROSEBERY AVENUE · LONDON · EC1

Telephone: Clerkenwell 3570.

Telegrams: "Bluspot, Isling, London."

Distributors for Northern England, Scotland and Wales: H. C. RAWSON (Sheffield and London), Ltd., 100, London Road, Sheffield; 22, St. Mary's Parsonage, Manchester; 44-46, High Bridge, Newcastle; 37, 38, 39, Clyde Place, Glasgow.