

OUR SECOND DOUBLE SHOW NUMBER—92 PAGES

MAKING A B.B.C. SPEAKER BAFFLE

# Amateur Wireless

and  
Radiovision

Usual  
Price 3<sup>d</sup>

Vol. XXI. No. 533

Saturday, August 27, 1932

HOW TO BUILD THE MOST UP-TO-DATE  
SET YET!

*Percy  
Harris's*

ADVANCE  
FOUR

FULL  
DETAILS





153

REMEMBER THIS NUMBER —

it's the

LEWCOS<sup>REGD.</sup>

STAND NUMBER

on the Mezzanine Floor

AT OLYMPIA

Make a special point of seeing the large model of the new Lewcos Potentiometer on view at our stand.



PRICE  
ONLY  
3/-

The several advantages of this component over other makes will be demonstrated on request. Only Lewcos could produce a component of such conspicuous superiority at such a low price.

Among the well-known makes of Lewcos Wires, for use in Radio construction the following group is increasingly popular.

**1 LEWCOS SPAGHETTI RESISTANCES.** Manufactured in Resistance Ohms ranging from 300 to 1,000 at 9d. each; 2,000 to 10,000 at 1s. each; and 15,000 to 100,000 at 1s. 6d. each.

**2 GLAZITE COLOURED CONNECTING WIRE.** Available in 10 ft. coils. 18 SWG, 6d. per coil. 20 SWG, 4d. per coil, and in the following colours: Red, Blue, Green, Yellow, Black, White.  
BEWARE OF IMITATIONS!

*Be sure to visit us,*  
and see for yourself the  
World's finest array of  
Modern Radio Com-  
ponents & Wires

The acknowledged pre-eminence of LEWCOS Radio Products, as used by innumerable amateur constructors and manufacturers of receivers, was first achieved by using only the finest raw materials and the skill of trained craftsmen. By the continuous use of these two elements, backed by scientific research, LEWCOS still lead the way to better reception and present at the Exhibition the proof of this statement.

WE ARE EXHIBITING AT



AUGUST 19-27

STAND No. 153

LEWCOS RADIO PRODUCTS FOR BETTER RECEPTION  
THE LONDON ELECTRIC WIRE COMPANY AND SMITHS LIMITED  
CHURCH ROAD, LEXTON, LONDON, E.10

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



# Put in 1/4d. worth of Power



# Take out 1/- worth of H.T.

## EKCO H.T. UNITS

Model	Current Output	Voltage Tappings	Price	EASY PAYMENTS	
				Initial Payment	11 Monthly Payments of
A.C. 12	12 m/A	S.G.; 80; 120/150	£2.15.0	6/6	5/-
A.C. 18	18 m/A	S.G.*; 50/80*; 120/150	£3. 7.6	7/9	6/2
A.C. 25	25 m/A	S.G.*; 50/80*; 120/150	£3.17.6	8/9	7/1
A.C. 15/25	15 or 25 m/A	S.G.*; 50/80*; 120/150	£1.19.6	6/-	3/8

## Combined H.T. & L.T. Charger Units (for A.C. Mains)

Model	Current & Voltage	L.T. Output (for charging accumulators)	Price	EASY PAYMENTS	
				Initial Payment	11 Monthly Payments of
K. 12	Current Output and Voltage Tappings same as Model A.C.12, A.C.18 and A.C.25.	1/2 amp. at 2, 4 or 6 volts	£3.19.6	9/-	7/3
K. 18		1/2 amp. at 2, 4 or 6 volts	£4.12.6	10/3	8/5
K. 25		1/2 amp. at 2, 4 or 6 volts	£5. 7.6	11/9	9/10

Tappings marked \* are adjustable.

An H.T. battery can only give you a farthingsworth of H.T. for a farthing. An EKCO Unit will give you fifty times as much—over a shillingsworth!

A 3-valve set needs on an average four batteries a year costing approximately fifty shillings. An EKCO Unit runs your set for one shilling a year—one fiftieth of the cost!

There is an EKCO Unit for every type of radio set or portable, and all are obtainable by Easy Payments. Choose the Unit suitable for your set from the table above, or post coupon for full details.

*Based on 1000 hours' use of an average 3-valve set.*

## Olympia Stand No. 65.

To: E. K. Cole, Ltd., Dept K.17, Ekco Works, Southend-on-Sea.

Please send me full details of Ekco Power Units, Consolettes and Radio-Grams.

Name .....

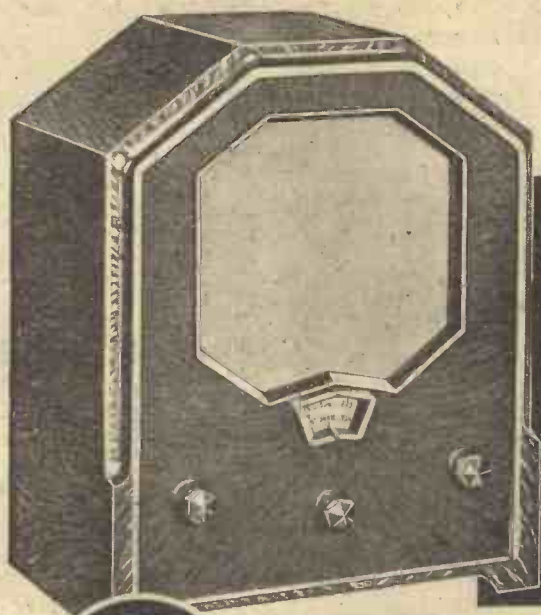
Address .....

.....

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







# S.E.C. Radio

**SUPREMACY  
IN RADIO**

**A REVOLUTION IN  
HOME CONSTRUCTORS' KITS—**

**ENTIRELY  
SELF-CONTAINED—  
NEW AND IMPROVED  
RADIO TECHNIQUE**

# Osram

**THIRTY-THREE**

**MUSIC MAGNET**

The new OSRAM "THIRTY-THREE" MUSIC MAGNET is a great advance on any kit set you have yet seen. It is full of improvements in technique, design, appearance, performance and construction—entirely self-

contained, with built-in loud speaker of latest design and room is provided for batteries and accumulator.

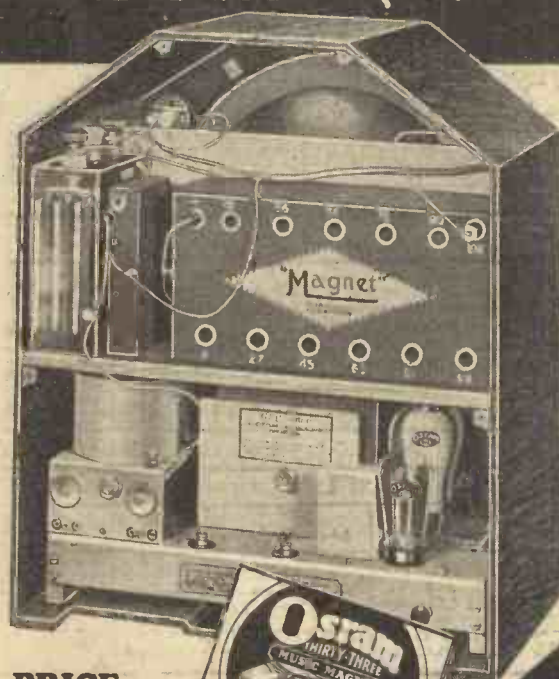
A wide range of stations can be tuned in with the greatest ease at full loud speaker strength. Tuning is effected with one knob only.

### SPECIAL FEATURES

- 1** A complete table model receiver with built-in loud speaker.
- 2** Batteries housed inside cabinet—no external battery connections.
- 3** Two metallised OSRAM screen-grid valves and latest type OSRAM power output valve.
- 4** Screen-grid detector gives great sensitivity.
- 5** Tuning by one knob only.
- 6** New magnetic loud speaker chassis with floating cone ensures highest quality reproduction.
- 7** Unit assemblies make home construction the essence of simplicity.
- 8** Latest OSRAM valves (battery type) with the Wembley filament.
- 9** Handsome one-piece cabinet in moulded Bakelite—walnut graining.

### POST COUPON TO-DAY

for the full-size Constructor's Instruction Chart. The clear instructions given in this chart will convince you that this is the world's best circuit and assembly kit. **SEND FOR A COPY TO-DAY.**



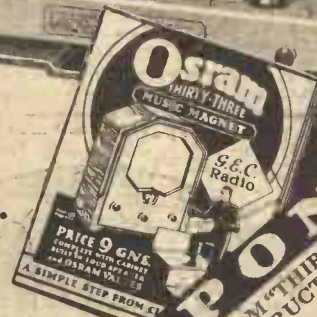
### PRICE

**9 GNS.**

Including cabinet, built-in loud speaker and OSRAM valves.

**HIRE PURCHASE**  
Deposit £1 and 12 monthly payments of 15/-

Made in England  
Sold by all Wireless Dealers.



**COUPON**  
Please send me the OSRAM "THIRTY-THREE" MUSICMAGNET INSTRUCTION CHART

Names \_\_\_\_\_ Address \_\_\_\_\_

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

**A SIMPLE STEP FROM CHART TO SET**

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

Cut out and paste on Postcard, or enclose in unsealed envelope.  
Halfpenny postage in either case.

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



# SEE WHAT THE PRESS SAYS ABOUT..

## PERTRIX

"EVENING STANDARD" — JULY 1, 1932

When taken off discharge for recuperation it showed good recuperative quality... Voltage distribution throughout was very even... After test the Battery was broken open... the zincs were in good condition... No apparent sign of bursting or corrosion

co  
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"WIRELESS TRADER" — JULY 9, 1932

a watt hour capacity of 1.73 for a cell of this size under the condition of test is very good, particularly in view of the fact that the price of the battery is very low. The Pertrix is very well made and can be recommended as very good value for money

"THE BROADCASTER" — MAY 28, 1932

The zincs were found to be in perfect condition... The battery is excellently designed while the ingredients are well graded and mixed... the battery should give a consistent performance. We can recommend it as an attractive proposition at the reasonable price.

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"AMATEUR WIRELESS" — JUNE 18, 1932

Very competitive price... attractive for performance... Really very good for so cheap a battery... Well in excess of our arbitrary standard... They are well up to Pertrix Standard.

"MUSIC SELLER" — JUNE, 1932

The battery has good staying power... it has been carefully designed to provide that extra output which makes for Sales Records... The battery is well constructed and high class materials have been used. The zincs were found to be quite free from corrosion... It represents very good value for money and has the Music Seller O.K.

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# DRY BATTERIES & ACCUMULATORS

Advt. of Britannia Batteries Ltd., 233, Shaftesbury Avenue, London, W.C.2. Telephone: Temple Bar 7971 (5 lines)  
BRANCHES: Manchester, Bristol, Glasgow, Dublin, etc. Works: REDDITCH (Worcs).

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



# INSIST ON "PROVED PERFORMANCE" WHEN BUYING GRID LEAKS & RESISTANCES

Though they are the smallest components in a Wireless Set, grid leaks and resistances are as vital as the largest part. It pays, therefore, to exercise the same care in their selection—the performance of your Set depends on their performance. You run no risks when you choose the new Dubilier Grid Leaks and the now well-known Dubilier Metallized Resistances. Millions are now in use. They have been proved by critical technicians to be unmatched in their performance—and absolutely reliable. Yet they cost no more than components of less repute. You can buy the new Dubilier Grid Leak for only 1/-, while the Dubilier Metallized Resistances cost only 1/- per watt.

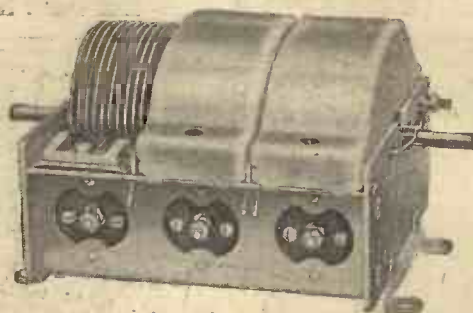
## DUBILIER METALLIZED RESISTANCES AND GRID LEAKS



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

**1/-  
EACH**

## POLAR ★ CONDENSERS



### "STAR" GANG CONDENSER

again emphasises the superiority of 'Polar' **ACCURATE SPACING** of vanes obtained by precision machine assembly. This entirely eliminates the possibility of error in spacing.

**MATCHING ACCURATE** to within  $\frac{1}{2}$  of 1 per cent., plus or minus, 1 mmfd.

**ALL-STEEL FRAME** and rigid construction ensures that this accuracy will never vary.

**STRONG SPRING JOURNAL BEARINGS** give absolute freedom from shake or end play.

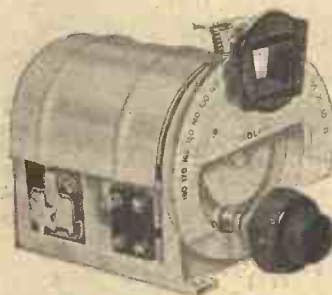
**TRIMMERS** conveniently operated from top.

3 X .0005 ... ..	25/6
Super-het. type. ... ..	27/6
4 X .0005 ... ..	34/-

*All prices include covers.*

POLAR DISC DRIVE ... ..	5/-
POLAR DRUM DRIVE ... ..	7/6

From the "Wireless  
Trader" test report:  
"... remarkable accuracy  
in matching has been  
obtained. This is un-  
doubtedly one of the best  
gang condensers on the  
market ..."



### THE "UNIKNOB"

The most outstanding feature of this popular two-gang is the solid dielectric trimmer of 35 mmfd. variation. This is in parallel with the front section of the condenser, but is controlled by a small knob situated concentrically with tuning knob. This greatly simplifies the final tuning adjustment necessary to secure maximum signal strength. Minimum trimmer on rear section. Slow motion disc drive. Lampholder supplied.

2 by .0005

**19/6**

*Price includes cover.*

**STAND 129 OLYMPIA**

## POLAR CONDENSERS

**CATALOGUE OF FULL RANGE, FREE**

*Correspondence in all languages.*

*French representative: W. A. Swift, 6, Rue Deguerre, Paris XI.*



Wingrove & Rogers, Ltd., 188-9, Strand, London, W.C.2

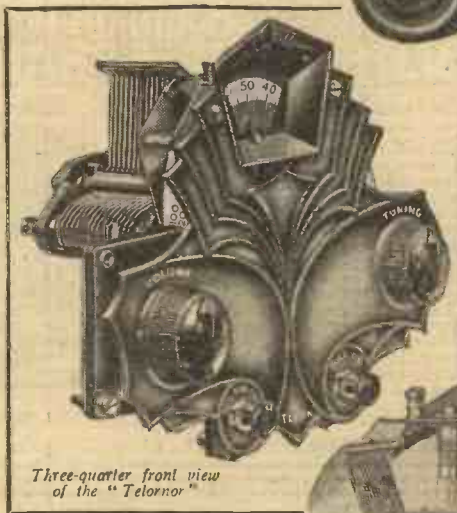
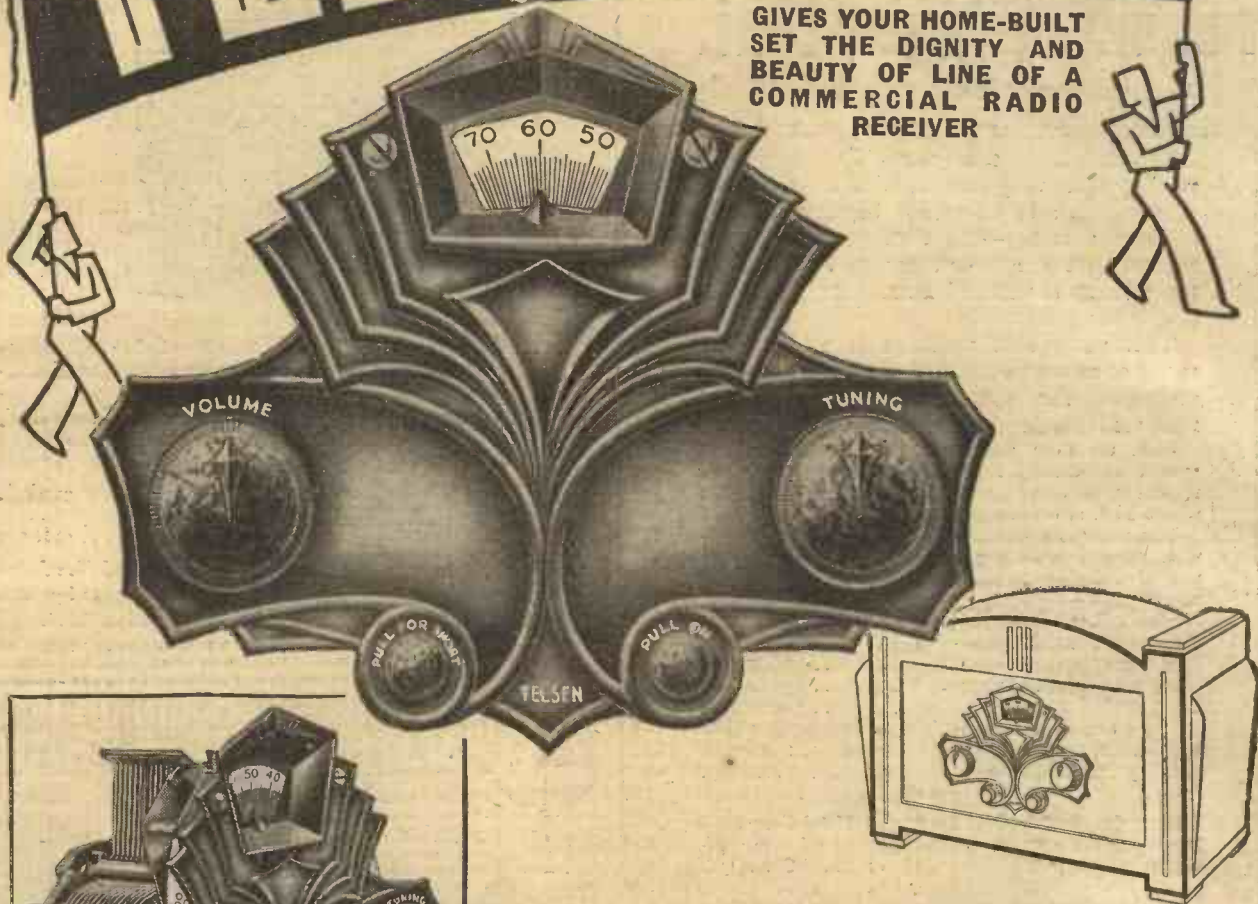
*You will Help Yourself and Help Us By Mentioning "A.W." to Advertisers*



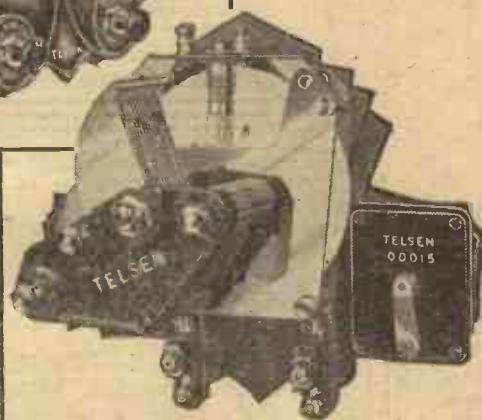
TELSEN

TELORNOR

GIVES YOUR HOME-BUILT  
SET THE DIGNITY AND  
BEAUTY OF LINE OF A  
COMMERCIAL RADIO  
RECEIVER



Three-quarter front view  
of the "Telornor"



Back view of the "Telornor"  
showing how the components  
can be mounted.

**G**IVE your home-built set the dignity of an expensive commercial radio receiver with the new Telsel "TELORNOR." It makes better sets easy to build! The handsome silver oxidized escutcheon plate, embodying an illuminated variable ratio, slow motion Disc Drive, adds immensely to the "good looks" of your set and permits, with the minimum of trouble, a very effective grouping of your Volume, Tuning, Push-Pull and On-Off controls. Ask your dealer to show you a "TELORNOR." It will make your set a set to be proud of—in appearance as well as in performance.

No. W. 206

7'6

TELSEN

RADIO COMPONENTS

GOOD RADIO IS A JOY FOREVER

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

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



# ACCURACY GUARANTEED TO 1 m.m.f. or $\frac{1}{2}$ per cent. (whichever is the greater)

British Radiophone ganged Condensers are used by discerning amateurs and Set designers in preference to all others because of their extreme accuracy—the trimmers being first adjusted, we guarantee accuracy between any two sections to within 1 m.m.f. or  $\frac{1}{2}\%$  whichever is the greater.

This unequalled precision is achieved by virtue of sound mechanical construction which maintains the electrical characteristics at fixed values under the most exacting conditions.

Built up from sheet steel and treated with a special anti-corrosive medium, the cases resist all tendency to distort or rust—an important factor where high and lasting accuracy is concerned.

The rotor bearings are designed so that any end-wise movement of the spindles is effectively prevented and smooth silent action is ensured during rotation.

The values of British Radiophone Ganged Condensers are as follows:—

Minimum Capacity .. ..	26 m.m.f.
Total variation of trimmers .. ..	50 m.m.f.
Total variation in capacity .. ..	510 m.m.f.

The maximum capacity is therefore greater than 500 m.m.f. according to the amount of minimum capacity introduced, ensuring knife-edge selectivity.

## PRICES:

- 2-Gang Condenser, 15/-; Dustproof Metal Cover, 2/6
- 3-Gang Condenser, 25/-; Dustproof Metal Cover, 3/-
- 4-Gang Condenser, 30/-; Dustproof Metal Cover, 3/6
- Drum Drive, 8/6.

Oxidised silver escutcheon and drive assembly, complete with pilot lamp attachment, 5/-.

Write for details.

## RADIOLYMPIA STAND 93

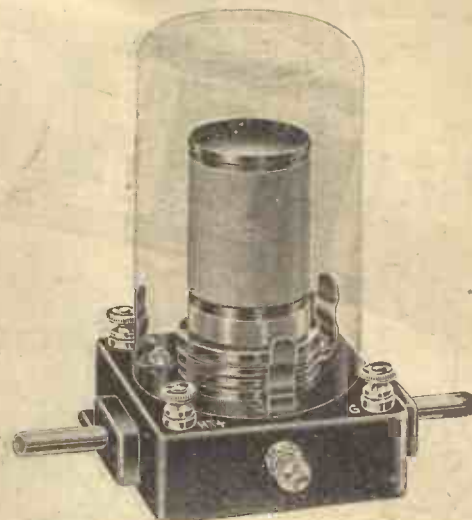


## RADIOPHONE GANGED CONDENSERS

THE BRITISH RADIOPHONE LTD., Aldwych House, Aldwych, W.C.2.

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

## 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**

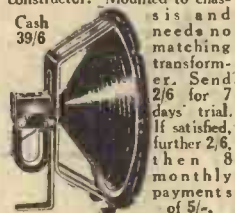
British General Manufacturing  
Co., Ltd., Brodley Works,  
London, S.E.4.

ONLY  
**2/6**  
DOWN

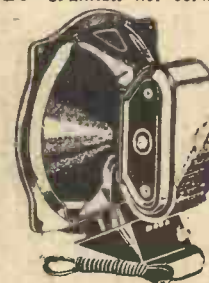
## FOR THIS SPLENDID NEW 1933 "BLUE SPOT" SPEAKER

N.W. 1933 PERMANENT MAGNET SPEAKER No. 99PM.

The new "Blue Spot" Speaker 100U is ideal for the amateur constructor. Mounted to chassis and needs no matching transformer. Send 2/6 for 7 days' trial. If satisfied, further 2/6, then 8 monthly payments of 5/-.



The chassis is an outstanding example of first-class workmanship and the unit, with its heavy permanent magnet containing a high percentage of cobalt, is wonderfully sensitive. From any set this new "Blue Spot" Speaker will reproduce every detail of speech or music to perfection. Send only 2/6 deposit for 7 days' trial. If satisfied, pay further 3/6 at once, then 8 monthly payments of 7/6 (Cash in 7 days, 59/6). For further details of this speaker see the "Blue Spot" advertisement on cover 3 of this issue.



F. J. HERAUD LTD., DEPT. A.W.9, NUMBER ONE, EDMONTON, LONDON, N.18  
and at Tottenham, Walthamstow, and Enfield Wash. Estab. 33 years.



British Made

THE RELIABLE BECOL EBONITE FORMER which has stood the TEST OF TIME and tested before despatch. Prices LOW.

EFFICIENCY COUNTS!!!

LOOK FOR TRADE-MARK. SOLE MAKERS

THE BRITISH EBONITE CO., LTD.  
HANWELL, W.7

HERE IT IS  
EXACTLY WHAT  
YOU REQUIRE FOR  
SHORT WAVES



# And Now MARCONI

## A new Variable-MU V.S.2

### Valve for Battery Receivers

**VS2** is the latest link in the long chain of Marconi developments in valve technique. It combines the high mutual conductance of 1.25 MA per volt with the typical advantages of the Variable-Mu valve, providing long range, improved selectivity and quality of reproduction and, if desired, a smooth and entirely distortionless control of volume.

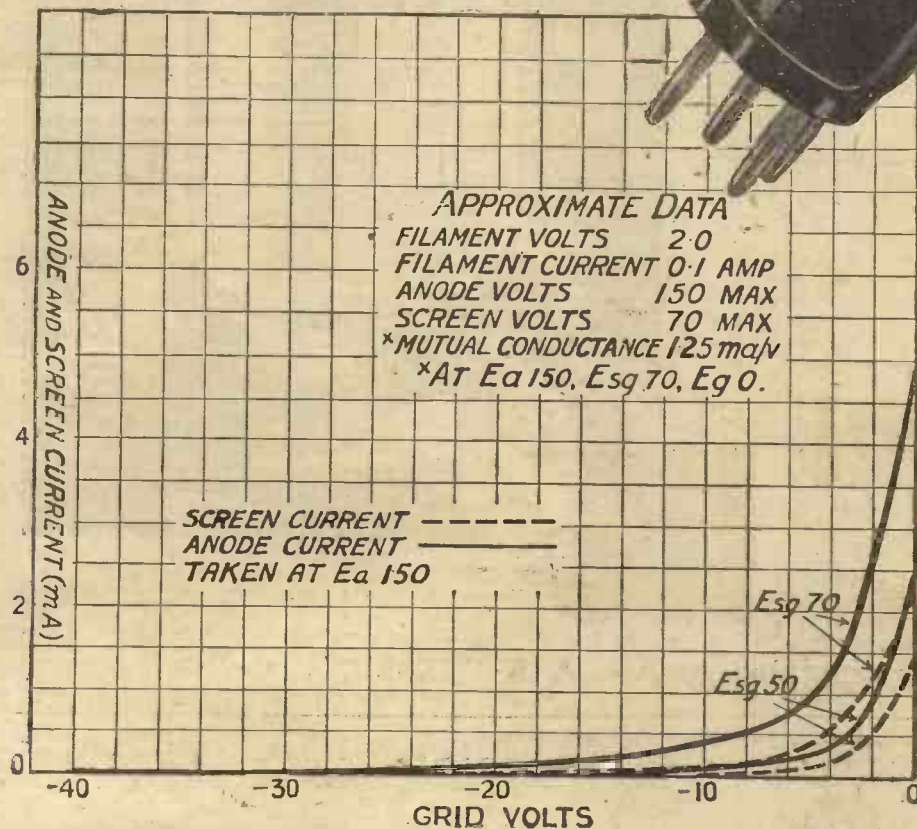
If your receiver was designed for an ordinary S.G. valve, Marconi VS2 will give a far better all-round performance. If you are building a new set incorporate VS2 and the necessary grid bias circuit from the start and obtain the perfect volume control **Price** which only a Variable-Mu valve will give. **16/6**



### THE MARCONI 2-VOLT RANGE

- \*VS2 Variable-Mu Screen Grid 16'6
- \*S22 Screen Grid (Single stages) 16'6
- \*S21 Screen Grid (Multi stages) 16'6
- \*H2 High Magnification . . . 7'-
- \*HL2 Medium Magnification . . 7'-
- HL210 Medium Magnification . . 7'-
- LP2 Power . . . . . 8'9
- P2 Super Power . . . . . 12'-
- PT2 Pentode . . . . . 17'6
- DG2 Double Grid . . . . . 20'-

\* Available metallized if desired



# MARCONI VALVES

THE MARCONIPHONE COMPANY LTD. 210-212 TOTTENHAM COURT ROAD, LONDON, W.1



# "Say TRANSFEEDA"

Wherever a low-frequency transformer is in use in your present set, or indicated in the set you are thinking of building, put in a BENJAMIN TRANSFEEDA and take advantage of this latest development in low-frequency amplification.

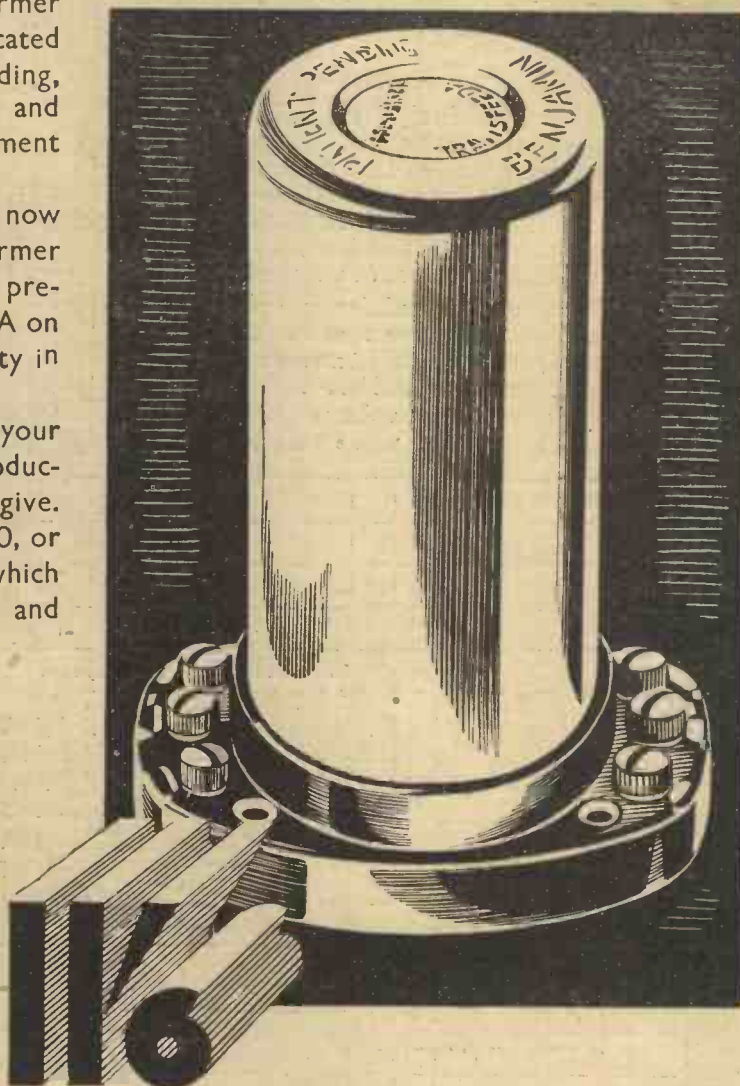
All prominent set-designers are now specifying resistance-fed transformer units and the great majority have preferred the BENJAMIN TRANSFEEDA on account of its outstanding superiority in design and performance.

Follow their lead and ensure for your set the purity and volume of reproduction that only the Transfeeda can give. See the TRANSFEEDA at STAND 40, or let us forward you List 1292 which describes it fully and gives circuits and diagrams.

**STAND  
40**

**BENJAMIN**

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



*Note these reduced prices*

CLEARERTONE



~~2/6d~~ 1/6d

PUSH-PULL SWITCH



~~1/3d~~ 9d

VIBROLDER



~~1/6d~~ 10d

FIVE-PIN



~~1/6d~~ 1/3d

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

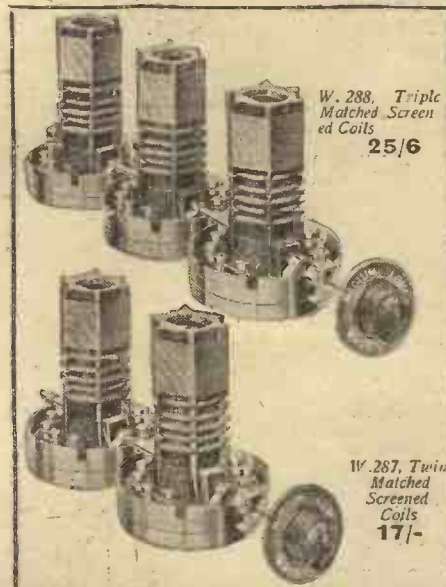


TELSEN

## SCREENED TUNING COILS

TELSEN  
COIL SWITCH  
KNOB ASSEMBLY

Specially designed for use with the Telsen Screened Tuning Coils. The extension on the knob spindle fits over the switch rod supplied with the Coils, a firm coupling to the rod being ensured by tightening the small screw provided. The assembly is suitable for mounting to any standard thickness of panel, and includes a neat disc escutcheon. The knob is of the push-on type in Black Bakelite. No. W.218 1/-



W.288, Triple  
Matched Screen  
ed Coils  
25/6

W.287, Twin  
Matched  
Screened  
Coils  
17/-

TELSEN COIL SWITCH  
COUPLING ASSEMBLY

When it is desired to mount two or more of the Telsen Screened Coils in a line parallel to the panel, and to control the wave-change switching by a single knob on the panel, this switch coupling assembly will be found indispensable. The link arms of the coupler are fitted over the switch rods of the coils, and adjusting slots are provided in the link bar to allow for the spacing of the coils varying from 3 in. to 6 in. The whole assembly has a neat nickel-plated finish, is perfectly smooth and positive in action, and free from backlash. No. W.217 6d.

THE result of much research and experiment, these coils embody the ultimate efficiency attainable in a perfectly shielded inductance of moderate dimensions. Provided with separate coupling coils for medium and long waves, they are suitable for use as aerial coils or as anode coils following a screened grid valve, giving selectivity comparable only with a well-designed band-pass filter. The coils are fitted with cam operated rotary switches with definite contacts and click mechanism, and are supplied complete with aluminium screening cans, bakelite knob, and handsome "Wave Change" escutcheon plate, finished in oxidised silver. 8/6

Telsen Screened Coil. No. W.216

# TELSEN

RADIO COMPONENTS

## GOOD RADIO IS A JOY FOREVER

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

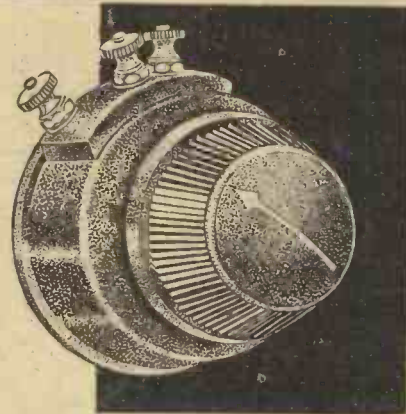
Please Mention "A.W." When Corresponding with Advertisers





## LOGARITHMIC VOLUME CONTROL

The IGRANIC Logarithmic Volume Control is wire wound and fitted with a specially graded resistance track. It has been evolved to afford a uniform control of volume where a valve or valves of the Variable Mu type are employed in the circuit. The graded resistance makes the volume control obey the same law as the valve. Sizes: 5,000, 10,000, 50,000 ohms, and they can also be supplied with combined switch. Price 5/6 (with switch 7/6).



# IGRANIC

# COMPONENTS WILL

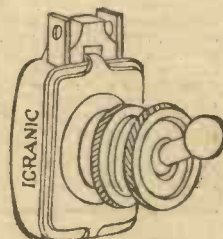
# BE THE MAKING

# OF YOUR SET.

### OLYMPIA STAND 36

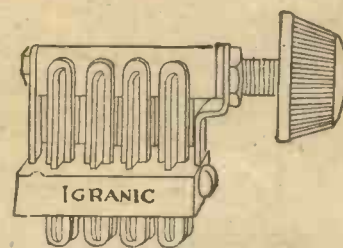
#### IGRANIC MIDGET RADIO SWITCH

A neat compact component specially suitable for switching filament current "on" and "off." Moulded bakelite with heavily plated metal front—one hole fixing. 1 amp at 250 volts. 3 amps at 125 volts. Prices, with terminals, 1s. 8d., with soldering tags, 1s. 6d.



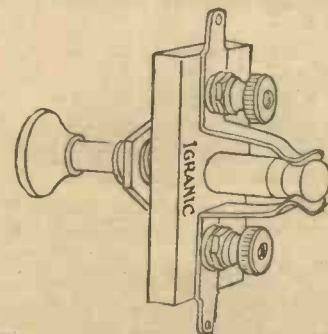
#### IGRANIC ANTI-CAPACITY SWITCH

For use in all circuits where self capacity in a switch must be reduced to a minimum. Excellent springs ensure positive contact. Well spaced soldering tags. Semi-rotary movement. One hole fixing.  
2 way Change-over switch 1/9  
3 " " " 2/-  
4 " " " 2/6



#### IGRANIC PUSH-PULL SWITCH

Smooth action and positive contacts. Terminals and soldering tags on ebonite strip. All metal parts nickel plated, reducing resistance to a minimum. One hole fixing. Price 9d.



Advt. of the Igran Electric Co., Ltd. 149 Queen Victoria Street, London, E.C.1

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

CVS—15



FOR EVERY SET — there's a

# PILOT AUTHOR KIT

CASH — C.O.D. — or H.P.

**EXACT TO SPECIFICATION**

## ADVANCE FOUR

### DOMINATING FEATURES . . .

- Complete down to the last screw and piece of wire.
- Panels and Terminal Strips ready drilled to specification.
- Chosen and first specified by the Technical Editor and actually as used by the Author in each case.
- Officially approved by an established technical authority you can trust implicitly.
- Enables Author's sets to be duplicated in every respect.
- Backed by Peto Scott with 13 years' Radio experience and a world-wide reputation.

### . . . VITAL TO 100% SUCCESS

### ● IMPORTANT

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

**EVERYTHING RADIO  
CASH — C.O.D. — H.P.**

### HERE ARE THE PARTS THE AUTHOR USED

1 Peto Scott ply-wood baseboard, 22 in. by 10 in.	1 9
1 Red Triangle ready drilled ebonite panel, 22 in. by 7 in. by 1 in.	9 0
1 Keystone piece aluminium foil, 21½ in. by 9½ in.	2 0
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1 Colvern Triple Coil unit and special "Advance Four" extension rod, 1 KGO; 1, KGC; 1, KGR	1 8 6
1 Telsen pre-set condenser, .0001-mfd.	1 6
3 Dubilier 1-mfd. fixed condensers, type 9200	8 3
2 Telsen 2-mfd. fixed condensers	6 0
2 Dubilier .01-mfd. fixed condensers, type 670	4 0
1 Lissen .0001-mfd. fixed condenser	1 0
1 Dubilier .0001-mfd. fixed condenser, type 670	1 0
4 Telsen valve holders	2 0
1 Varley L.F. choke (Nichoke II)	10 6
1 Tunewell 50,000-ohm variable potentiometer	5 6
1 Wearite four-pole rotary changeover switch	4 6
5 Sovereign terminal blocks	2 6
10 Belling & Lee marked terminals	2 1
2 Microfuses: 1, 50 m/A.; 1, 100 m/A.	1 0
2 Wearite 800-ohm decoupling resistances	3 0
3 Wearite 1,000-ohm decoupling resistances	6 0
1 Lewcos 30,000-ohm spaghetti resistance	1 6
1 Lissen disc type high-frequency chokes	4 0
1 Sovereign vario choke	3 6
1 Lissen L.F. transformer Tone-control and special potentiometer	1 2 6
4 Belling-Lee plugs, marked: G.B.—1, G.B.—2, G.B.—3, G.B.—4	8
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2 Belling-Lee screen-grid valve anode connectors	8

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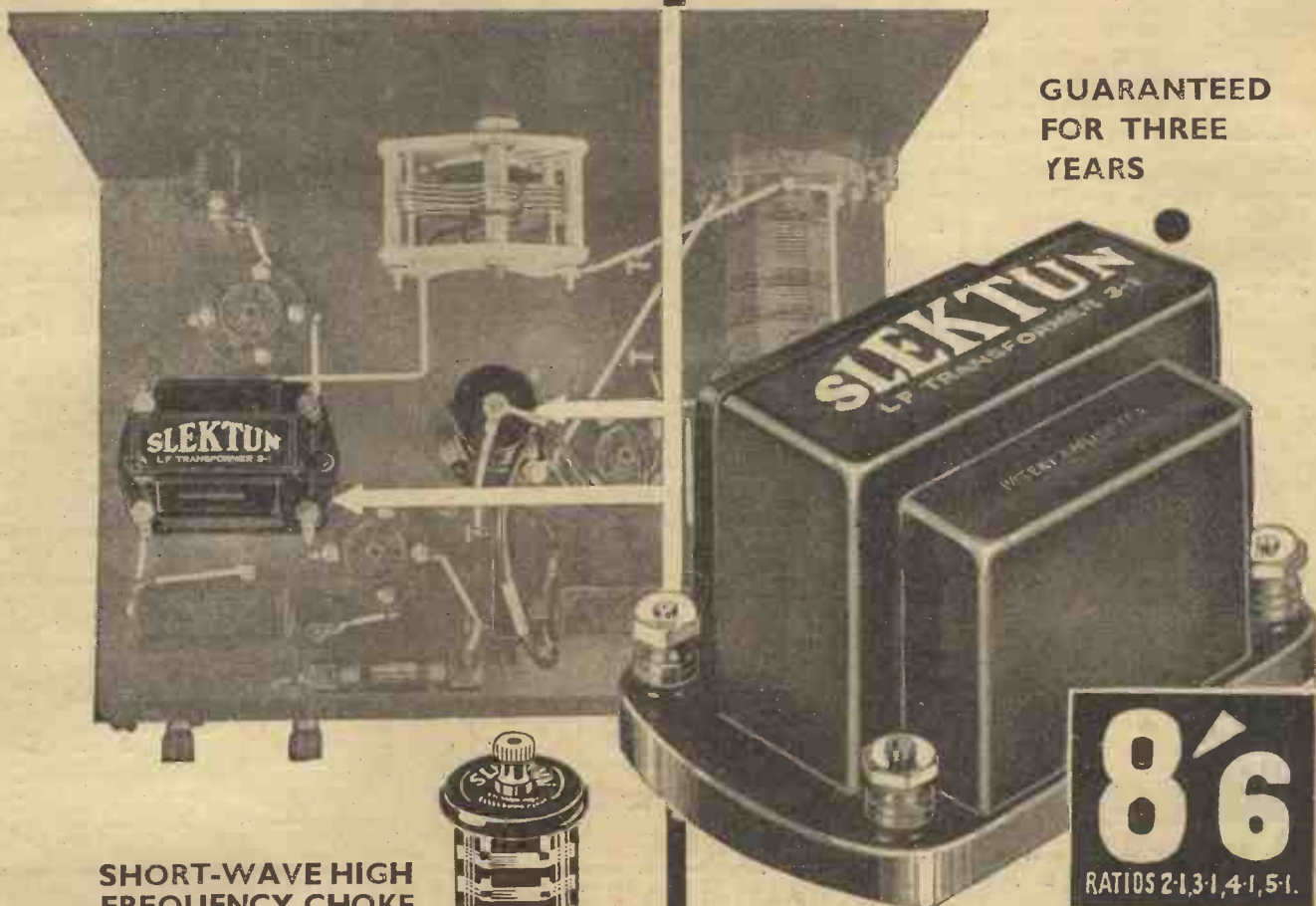
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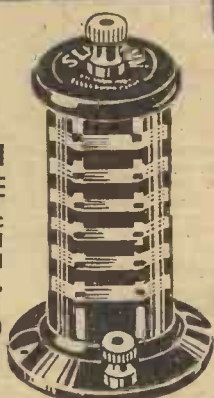


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## NEWS & GOSSIP OF THE WEEK

### THE SEASON STARTS

**N**OW that Olympia is in full swing and the new season's products have been revealed the new radio season is fully launched. Go to Olympia if you possibly can as you will then be able to inspect all the latest lines. If this is not possible, then use **AMATEUR WIRELESS**'s full account of the new sets and parts as your guide to the new season's productions. If you go to Olympia then please pay **AMATEUR WIRELESS** a visit—Stand 7.

### DROITWICH SITE FIXED

**T**WO and a half miles north-east of Droitwich is the village of Wychbold. It is on high ground. There is a population of 1,117 souls—at the time of writing. There is a Post and Telegraph Office. Near by is a country seat. Can you guess what is coming? Nothing less than the new super-power long-wave B.B.C. station. True to tradition, the B.B.C. has chosen, for its site for Daventry's successor, a

village with a tongue-twisting name. Lloyd James and the Pronunciation Committee may rest in peace, though, for the new station will be known as Droitwich.

### AT THE MADRID CONFERENCE

#### Hopes of the Broadcasting Authorities

**S**IR Charles Carpendale, Noel Ashbridge, and Mr. L. H. Hayes will leave, on September 1, for the Madrid Conference. The date of the Conference has been put forward to September 3. Our B.B.C. representatives will also attend as members of the International Broadcasting Union. Their views should therefore carry weight with the gathering. It will be a hard fight for wavelengths. And a long fight, too. There are 610 pages of propositions, and 15 supplements almost as long as the propositions. Talk will go on and on, right up to December, so they suggest.

### ABOUT WAVELENGTHS

**I**N addition to discussing the possibility of handing over to European broadcasters two or three long wavelengths now used by other services, Madrid will have to concern itself with the allocation of the ultra-short waves below 10 metres. It will be interesting to see how far down the allocation will go. Whatever the decisions of the Madrid Conference may be, it is thought highly probable that in January, 1933, a conference of the Post-Office administrations of Europe will be called to alter the Prague Plan to fit the new arrangements.

### LOOKING AHEAD!

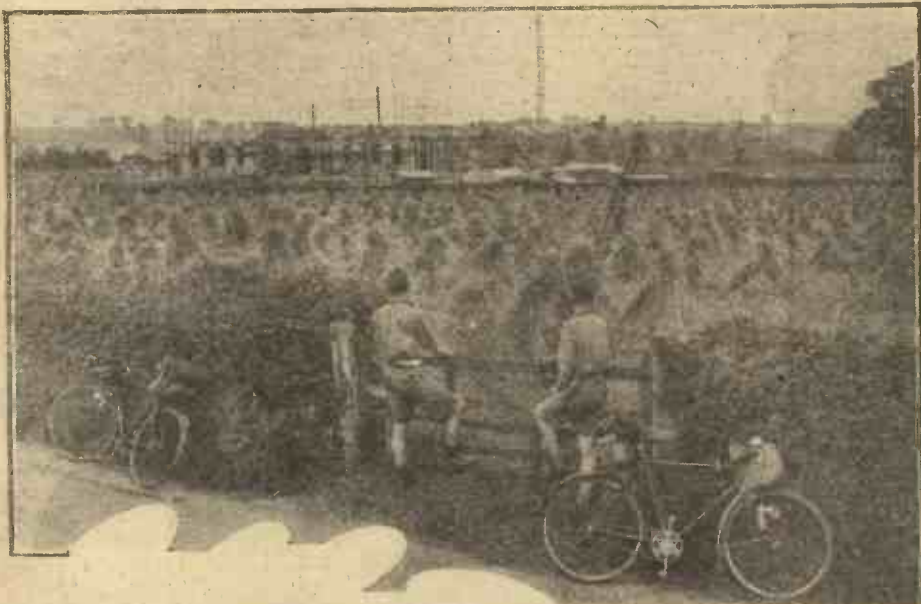
**T**ALKING of the wavelength situation, there seems to be a growing feeling that when Droitwich gets going with its 120 kilowatts with a long-wave National transmission the existing and projected medium-wave Nationals will be quite unnecessary. There is every possibility that London and North National, at least, will eventually be closed down, and the wavelengths so released used to meet the demands of Welsh Wales and the North of Scotland. Nor must we overlook the eventual wavelength needs of television, when that infant science gets out of its experimental stage.

### WEST REGIONAL NOTE

**J**UST back from a visit to Bristol, the Chief Engineer of the B.B.C. is optimistic about the premises he has been looking over for the erection of a large orchestral studio to meet the programme needs of the West Regional station, now in course of construction. Next spring—Watchet!

### POPULAR BERTINI

**A**CCORDING to a Blackpool correspondent, we Southerners do not realise the immense popularity of Bertini and his band, now being relayed once a week by the B.B.C. while most of the West End bands are on holiday. Normally the Tower Ballroom, from which the broadcasts are made, closes at 10.30 p.m., but on radio nights it keeps open until midnight.



Local interest is growing in the new West Regional station at Washford Cross, and as you can see from this photograph the building is nearing completion.

**"YOUR HOME RADIOGRAM" - a fine cheap battery-driven radio-gram - NEXT WEEK**



# NEWS & GOSSIP OF THE WEEK —Continued

## TELEVISION MAKE-UP

**A**DVICE on how to make up for television broadcasting was recently offered to artistes by the famous "Willie" Clarkson, who was invited to Portland Place to help the televised subjects to "get over" the new medium. His advice was: "Heavy," which presumably means that the grease paint will be laid on with a trowel. Stout efforts to make the most of the present state of television detail are being made by the B.B.C. productions people. The latest idea is to put over a shadow play on the "Mickey Mouse" idea. Dancers, cartoonists, and old-time comedienues will also figure in future broadcasts.

## NEW "O.B." AMPLIFIER

**T**HOSE indefatigable lads of the "O.B." department of the B.B.C. were seen by our hawk-eyed correspondent the other day transporting a coffin like box across to Queen's Hall. Asked what was in the box an engineer said: "Sh! It's a mains amplifier, and if it works we shall be able to do away with some of our accumulator amplifiers."

## ULTRA-SHORT WAVES

**S**OME bright genius has suggested that as the ultra-short waves are free from atmospheric interference and do not fade, they might easily be used instead of land-lines between B.B.C. stations, or, at least, between O.B. points and the nearest stations. Something may be done about this, but owing to the frequent interference caused by man-made atmospherics—particularly from car magnetos—such ultra-short wave links would hardly be more than stand-bys for the existing land-lines. What a saving it might mean if interference could be eliminated!

## TYRANNY OF THE TIME TABLE

**C**HANGES in the time table of regular broadcasts will be made in the late

autumn to get away from the present deadly monotony characterising the make-up of the B.B.C. programmes. Much the same material will be broadcast, only in a different and variable sequence.

## THIS ENGLAND!

**L**ISTEN to a very pretty tale, wherein one Government Department actually helps another to keep this green and pleasant land fit for non-advertisers to live in. Some firm wanted to hire a land-line to Paris to put over a sponsored programme for the benefit of English listeners. *The P.O. refused.* There is obviously an understanding between the B.B.C. and the P.O. to thwart would-be sponsors in every way. Yet there is a certain piquancy in the situation, for we do not hear of organisations hiring the transatlantic 'phone from the P.O. and studios from the B.B.C. to send talks and so on to America? And are not such programmes capable of being heard on short-wave sets by English listeners? It's all very confusing.

## PROVINCIAL STUDIOS

**A**S we mentioned weeks ago, the Glasgow studios are being entirely redesigned, the walls being treated with the latest acoustic material. Cardiff, not to be outdone, is fitting up a double-decker studio in preparation for West Regional. Leeds will have its new studio in action by October. Sheffield studio is also to be renovated.

## JACK PAYNE AGAIN

**T**HOSE who sigh for the good old days of Jack Payne will be glad to hear that the ex-B.B.C. dance band leader has another broadcast "date" for October. By the way, Jack has made a film called *Say It With Music* at the Elstree studios of British and Dominion. The film lasts 1 hour 20 minutes and should be worth seeing—and hearing—when it is eventually released.

## NATIONAL CHORUS—THE FACTS

**W**E are able to deny the recent rumour that the B.B.C. National Chorus was about to turn professional. The truth is that in the autumn Dr. Boulton will take over the conducting of the Chorus, and Stanford Robinson, who has until now been the conductor of the Chorus, will devote his time to the production of light musical broadcasts.

## TO SEE—AND HEAR!—OURSELVES

**D**ID you by chance notice that extraordinary interruption in the broadcast of the play "To See Ourselves?" What happened was that a member of the B.B.C. staff, showing some friends round the studios, walked past the red light in one of the Effects studios and started to explain how the various effects were done. His explanation, to the horror of the producer at the "D.C." panel, was broadcast for quite half a minute!

## NIGHTLY EPILOGUES!

**A**SINGULAR victory for the highbrow element at Portland Place would seem to be indicated in the proposal to broadcast some form of epilogue every night, in addition to the religious epilogue on Sundays. The idea is a 3- or 4-minute concoction of music and poetry, to be broadcast by some soulful announcer at the end of the usual programmes. Do we really want this sort of thing?

## B.B.C. RESEARCH DEVELOPMENTS

**O**WING to the amount of work now handled by the B.B.C. Research Department at Clapham it has been found necessary to find additional premises. An old house in Nightingale Lane has therefore been taken over.

## VENTILATING NUMBER 10

**A**S the B.B.C. has received intimations from the L.C.C. that the Wharf Studio near Waterloo Bridge is not likely to be wanted for at least six months it has been decided to make one or two much-needed improvements. The biggest task will be the installation of modern ventilating plants.

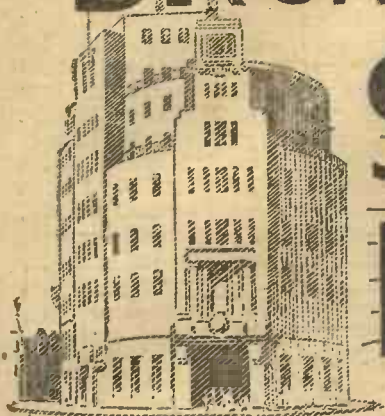


Newcastle police are getting busy with portable sets which police Headquarters. main police station and the portable receivers





# BROADCASTING HOUSE SPEAKER BAFFLE



Full constructional details of a new type of baffle first introduced into this country by the B.B.C. to enable natural bass-note reproduction to be obtained with a convenient size of box instead of a large and unwieldy baffle board

WHEN Broadcasting House was opened some months ago we were greatly interested in the type of loud-speakers installed in various studios. The quality of the bass-note reproduction was especially good, in spite of the comparatively small

an appreciable improvement in the bass-note output. The early experiments merely emphasised the known fact that for maximum response of the low frequencies a massive baffle, not at all suitable for either the home or the broadcasting studios, seemed to be a first essential.

Fortunately, it was later found that a box of moderate size could be made to give just as good results as a large flat baffle. As a B.B.C. wag put it, a baffling problem was eventually solved! If a box is made up with the front 18 in. square and not less than 10 in. deep, with the back open, it is found that the distance a sound wave has to travel from the back of the diaphragm to the front is

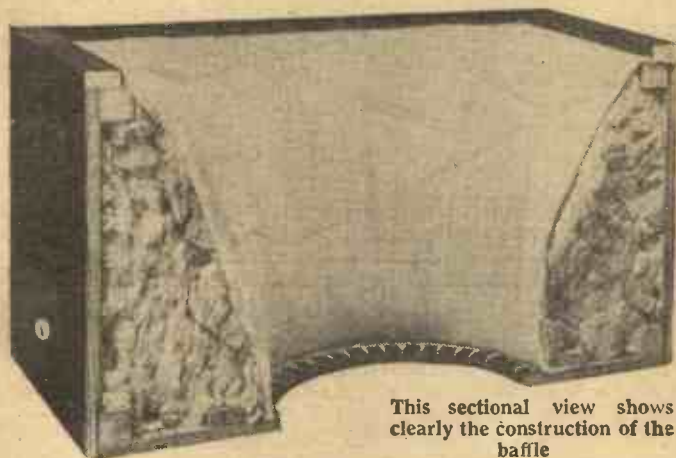
that the box baffle *simply as a box* cannot be considered satisfactory. It must be treated, as B.B.C. engineers found, to avoid certain inherent disadvantages. Owing to the natural resonance of the air confined in the box the output would be greatly emphasised around the 150-cycle mark. As many moving-coils already have a marked resonance around this frequency the result would be an unpleasant "boom" in the reproduction.

## Preventing Boom

As a matter of fact this boominess is all too common in certain cabinet moving-coil loud-speakers. The effect is to make music irritatingly resonant, and speech cannot be endured for a very long period. As the B.B.C. engineers have found, the boom of the box can be cured by treating the inside of the box with some form of sound absorbing material.

The most useful material so far discovered is known as rock or slag wool, a commercial by-product marketed for use in heat insulation. This rock or slag wool is composed of a mass of vitreous fibres. If carefully packed into the back of the box it will eliminate all trace of boom.

As the actual construction of the box baffle is not very easy to put into words,



This sectional view shows clearly the construction of the baffle

size of the cabinets containing the loud-speakers. There was a full and natural bass-note response devoid of all trace of that "boominess" one usually finds in small cabinet-type reproducers.

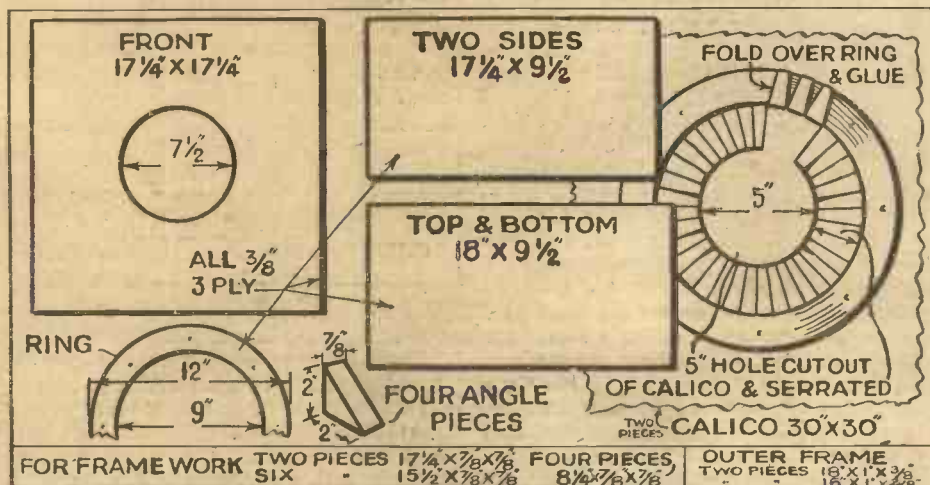
We found that the B.B.C. was making use of an idea not generally adopted in amateur circles. The idea is the box baffle, around which we have now designed the loud-speaker cabinet shown by the illustrations.

It is, of course, widely known that for good low-note response from a moving-coil a large baffle is essential. The small 2-foot baffle boards sometimes used in the home cannot effectively reproduce anything so low as 50 cycles, even supposing these frequencies could be dealt with by the loud-speaker itself.

The B.B.C. engineers carried out extensive experiments to see how this deficiency of the small and convenient sized baffle might be overcome. Many interesting and useful facts came to light. With suitable wood it was found that increases in the size of the baffle up to 5 feet square made

the same as for a flat baffle of 4 ft. square.

Such a box has obvious advantages in ordinary domestic use compared with the large flat baffle, but it must be emphasised



Here are the dimensioned pieces of wood required



## A BAFFLE THAT WILL IMPROVE THE TONE OF YOUR SPEAKER (Continued from preceding page)

we strongly advise intending constructors to make a careful study of the illustrations. The basis of the design is a box 18 in. square by 10 in. deep. Strengthening pieces are fitted at each corner. There is no back.

In the model photographed a centre hole of  $7\frac{1}{2}$  in. diameter is cut in the front of the box. This should suit the average moving-coil chassis on the market, but before embarking on the cutting of the



A rear view of the baffle showing one of the new Rola speakers fitted

hole the diameter of an existing speaker should, of course, be checked up.

With the Weedon kit made by the Weedon Link Power Radio Company, of 185 Earham Grove, Forest Gate, E.7, or that made by F. McNeill & Co., Ltd., 16 Lamb's Passage, Bunhill Row, E.C.1, everything for the construction of the box baffle illustrated is supplied at an inclusive price. If the wool is required separately it can be obtained from the same firms.

The best type of ply wood, as used in this kit, is pine  $\frac{3}{8}$  in. thick, with a thick centre lamination that will take nails without splintering.

### Packing the Slag Wool

To take the slag wool a lining of linen has to be made, as shown by the illustrations. The fixing of this lining is best carried out according to the following procedure. First take the wooden ring supplied with the kit; this is used to fasten the linen to the front of the cabinet, by means of tacks and glue.

In the model described this wooden ring has an inside diameter of 9 in., the width of the ring being  $1\frac{1}{4}$  in. The exact size of the ring depends on the size of the loud-speaker, but the idea is to make the ring of such a size that the linen wall will just clear the edge of the speaker when this is finally mounted behind the front of the box.

With a double thickness of the material a 30 in. square is cut out and then a hole is cut out of the centre of this linen square, the diameter of this hole being  $2\frac{1}{2}$  in. less than the internal diameter of the wooden ring.

From the hole at the centre cut slits to a depth of about 2 in. every  $1\frac{1}{2}$  in. round the entire circumference. Then lay

the material face down on the table and glue and tack the slit section of the linen to the wooden ring in such a way that the inside edge of the material coincides with the outside edge of the wooden ring.

The next procedure is to tack and glue the ring, with its attached material, to the back of the box, so that the linen wall eventually forms a sort of tunnel with the opening coinciding with the hole in the front taking the loud-speaker chassis.

Then comes the packing of the slag wool into the linen. To do this we strongly recommend the constructor to use leather gloves; otherwise the fibres may make the hands rather sore. The packing of the wool should be carefully done, so that it is fairly tightly shaped into the material in such a way that the linen slopes gently to the back of the box. This can be seen quite clearly by the illustration.

At this stage the material has to be fixed to the back of the box to keep the wool in position. Firstly, though, the material should be tacked to the batten provided with the kit. The batten can then be fixed to the back of the box, thus drawing the linen tightly into position and holding the wool in position inside the linen.

A finishing piece is then tacked to the back of the box to make a neat job of the assembly. Lastly the whole box structure is covered with leatherette. The loud-speaker chassis can then be mounted in position behind the hole provided in the front of the box.

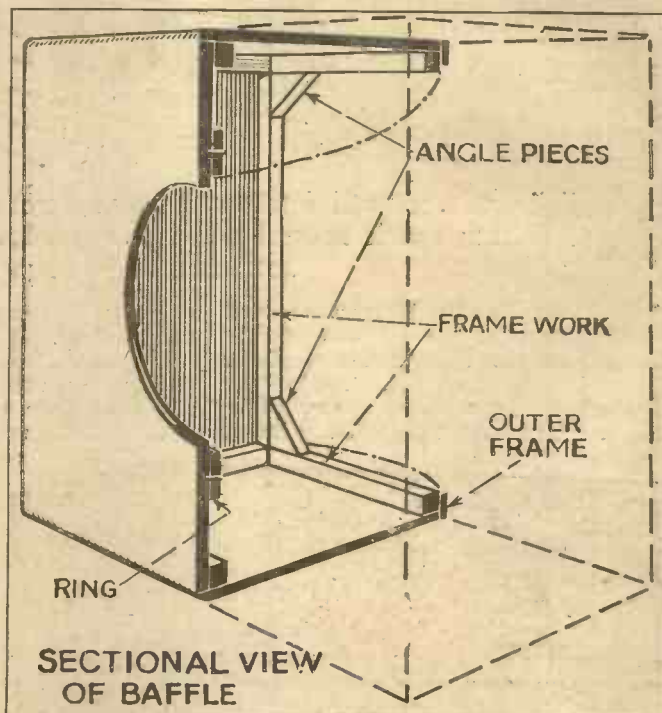
The completed assembly will give excellent reproduction of low notes without any trace of boom. It is well worth making up this box baffle, and the better the moving-coil the more marked will be the improvement over ordinary small flat baffles or resonant cabinets.

### SEE THIS SPEAKER BAFFLE on the "A.W." STAND

A vaudeville programme will be broadcast from the Birmingham studios for Midland listeners on September 5 with "Those Three" in syncopated vocalism and Compton Long in a new skit, "Some Rural Rides." Popular musical comedy songs will be given by Evelyn Over and Janet Joye will give some imitations.

### THE SYMPHONY CONCERTS

The Promenade Concert season is only a few weeks old, but already plans for the season of Symphony Concerts which starts on October 19 are well advanced. Artistes already engaged are: Backhaus, Harriet Cohen, Cortot, Myra Hess, Huberman, Lamond, Harold Samuel, Schnabel, Adolf Busch, Casals, Arthur Catterall, Mischa Elman, Albert Sammons, Muriel Brunskill, Elena Gerhardt, Elisabeth Schumann,



A perspective sketch showing the assembly of the woodwork

Elsie Suddaby, Arthur Cranmer, Roy Henderson, Dennis Noble, and Walter Widdop. The B.B.C. Symphony Orchestra, led by Arthur Catterall, will play at each concert, and Adrian Boult will conduct rather more than half of each series. Sir Henry Wood, Sir Landon Ronald, and Ernest Ansermet will also conduct during the season and one or two eminent composers, including Sir Edward Elgar and Arnold Schonberg, will appear in the role of conductor to direct performances of their own works.

### LIVELY BROADCAST POLITICS

ON Fridays, in the new autumn talks arrangements, it is proposed to devote the time to politics. Some lively broadcasts seem certain, for such names as Winston Churchill, James Maxton, and Lord Lloyd have already been mentioned in connection with the series. We understand that the present intention is to let such prominent men of affairs broadcast statements of the facts and to follow up these broadcasts by debates on the statements made the week before. It all sounds terribly controversial!

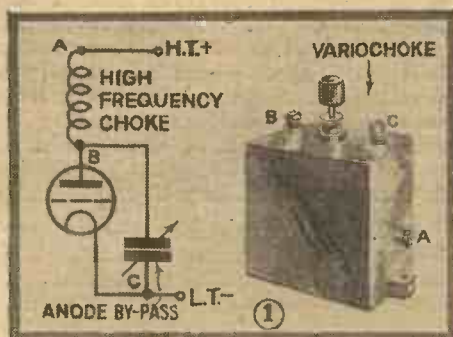
The Horwich R.M.I. Band and the Bury Athenaeum Musical Circle will broadcast from Manchester on August 28.



# COMPONENTS THAT WILL MAKE A DIFFERENCE

In this up-to-the-minute article ALAN HUNTER outlines the circuit applications of some of the season's components.

**K** EEN amateurs are always on the lookout for new gadgets to fit into their sets. Several of the latest components are sure to attract widespread interest among amateurs, especially those for low-frequency coupling. In addition to tone-correcting gadgets for the low-frequency side of the reception there are one or two novel gadgets likely to find favour on the high-frequency side.



The Vario-Choke combines a high-frequency choke with a variable pre-set type of condenser. Here on the left is shown a simple application, high-frequency current at the detector being by-passed to earth.

In this article I will limit myself to the more adaptable components featured at the Radio Exhibition, but I should like to make it quite clear that my selection is by no means exhaustive.

## A New Choke

Shall we make a start with something new in high-frequency chokes? This is the Sovereign Vario-Choke. As its name implies, this is really a gadget providing us with a variable choking effect. There is a surprisingly large number of applications for it.

The Vario-Choke has the adaptability that always comes from sheer simplicity. It consists of an efficient high-frequency choke connected to a pre-set type of variable condenser, these two components being mounted in a neat bakelite moulding, with three terminals brought out for external circuit connections.

One terminal provides a common connection for one side of the choke and one side of the condenser, while the other two terminals are for the "free" ends of the choke and condenser.

Six applications of this device are suggested by the makers, and there are others. Included among the applications that

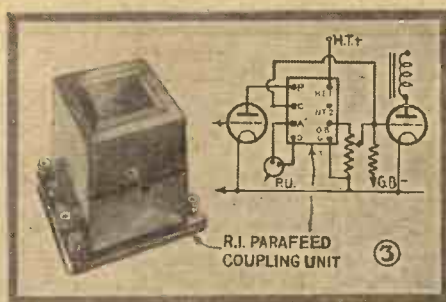
appeal to me are: high-frequency stopping in the low-frequency stage; high-frequency filter in the second detector anode circuit of a super-het type of set; differential reaction control; and high-frequency stopping in a short-wave set.

As will soon occur to the amateur, this vario-choke could also be used very conveniently as a normal choke and anode by-pass condenser in the average detector circuit, the amount of high-frequency by-passing being adjusted so as not to cut the high notes in the audible scale. (See Fig. 1).

## Novel Control Ideas

In many other directions we shall find that two or more existing components have been combined to produce a "unit" component that can be put to a great variety of uses in the amateur's home-built set. Take, for example, the new Lissen Twin Gang control, which is more than a two-gang tuning condenser, since under the one dial it incorporates coil and battery switching.

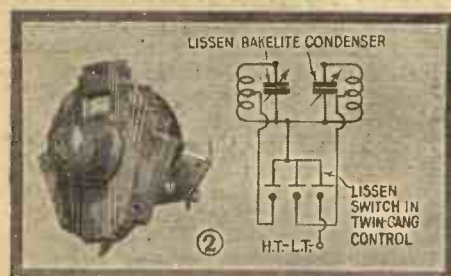
The two condenser units consist of .0005-microfarad bakelite dielectric units, each provided with fixed and moving plated terminals, though the moving spindle connection is common to both. The condensers can be operated together, and then the upper or super-imposed knob can be worked as a final trimmer. This is the best compromise between ease of control and efficiency—in fact with the trimmer adjustment there is virtually no loss of efficiency, even though the tuning is



The R.I. Parafeed unit is typical of the new range of low-frequency couplings combining transformer coupling condenser and resistances in a single moulded case. A novel application of the Parafeed unit is shown here, the transformer used as a pick-up isolating device and the remaining components used to provide resistance capacity coupling.

reduced to what practically amounts to one-knob control.

The lever at the base of the dial has three positions for medium and long waves and battery-off connections. The diagram Fig 2 is the simplest way of explaining the contacts on this Lissen Gang Control, which should find a ready application in



Combined in the Lissen Twin Gang control are two bakelite dielectric variable condensers and switching for coils and power supply. In this diagram the simplicity of the connections is made clear.

sets designed for simple yet efficient control.

## L.F. Coupling Improvements

Among low-frequency components there is obviously scope, in these days of decoupling and parallel feed, for combinations of small parts into what I am terming "unit" components. We have a very good example of a low-frequency unit component in the new R.I. Parafeed coupling unit, designed to simplify the many applications of the original and highly successful Parafeed low-frequency transformer. It will be recalled that this is specially designed for the parallel-feed method, whereby the direct anode current is diverted from the primary winding of the transformer by means of an anode resistance. The low-frequency voltages are passed on to the transformer through a coupling condenser, the value of which is carefully chosen to give the right frequency response.

When the original Parafeed transformer was introduced in the spring of last year amateurs had a great time trying out different values of coupling condensers and resistances, but since that time parallel feed has become established on so firm a basis, being standardised by many of the leading set makers, that the experimental phase is past, and we now have to consider the numerous applications of the method in modern set building.



## NOVEL COMPONENTS AT THE SHOW THAT WILL IMPROVE YOUR SET (Continued from preceding page)

The Parafeed unit consists of the standard Parafeed low-frequency transformer, which has the very high primary inductance of 100 henries, two resistances, and a coupling condenser, all housed in a bakelite moulding with eight terminal connections.

No less than ten different ways of using the Parafeed unit are detailed by the makers. As in the original transformer, this unit enables alternative ratios of 2, 3, and 4 to 1 to be obtained, thereby permitting the stage gain to be adjusted to suit the output valve.

In addition to the usual resistance-capacity coupling connections for this transformer being made available in one compact unit, the new combination component can be used for pick-up work, the connections for which are shown by the Fig. 3 diagram.

Here it will be seen that the resistances and condenser of the unit are used for resistance-capacity coupling, while the Parafeed transformer is used as a pick-up isolating transformer. This is only one of the several unexpected applications of the Parafeed unit, which, I think, will be very popular during the coming season.

Just one further point that will be of special interest to readers who have studied Mr. Percy Harris's remarks on low-frequency stability. In the Parafeed unit is a complete metal screen, with provision for earthing. This is yet another proof of the careful design that has gone into the production of the new component.

### Selectivity and Quality

While on the subject of low-frequency couplings I must draw attention to the new Varley Rectatone transformer, which is really one of the most advanced productions of the season.

As most readers will know by this time, there is a distinct tendency to readjust ideas on the question of good quality selectivity. Everyone knows that the demands for great selectivity and good quality are to a large extent antagonistic. Until band-pass tuning came along really high degrees of selectivity could be obtained only at the expense of the quality, the sharpness of the tuning resulting in loss of high notes due to side-band cutting.

### Tone Compensation

Band-passing is still, in the view of many engineers, the best practical compromise between selectivity and quality, but there is such a great increase in the general cry for sharp tuning, owing to the rapidly increasing congestion of the ether, that some of the quality is being wilfully sacrificed at the tuning end of the set in order to obtain real separation between the adjacent high-power stations.

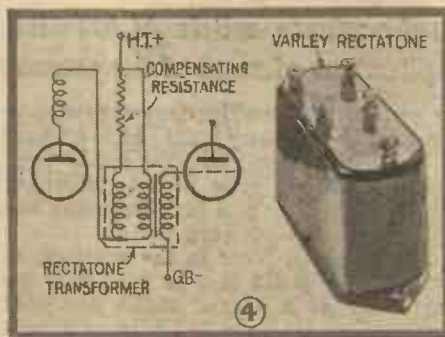


Fig. 4. One of the most outstanding advances in low-frequency coupling is the tone compensating transformer; the Varley Rectatone is shown here as a coupling between a detector and output valve, the only extra component being a resistance, which may be fixed or variable.

This sacrifice of quality is not allowed to affect the final output, because the low-frequency stage is "doctored." The loss of high notes resulting from excessively sharp tuning is made good by what is now generally referred to as tone compensation.

There are various ways and means of increasing the high-note output, but it would be difficult to think of anything easier than the method made possible by the introduction of the new Varley Rectatone transformer. This new transformer,

which is illustrated in picture and circuit by Fig. 4, compensates for high-note losses by deliberately accentuating frequencies above 1,000 cycles, reaching a maximum rise in the characteristic at 4,500 cycles, which is now accepted as the most practicable cut-off point for both radio and gramophone reproduction.

The amount of tone compensation needed depends entirely on the amount of high-note loss, which in turn depends on how selective the tuning circuits are made to give station separation. It is obvious that the various reception conditions met with in the course of an evening at the set necessitate a variable form of tone control.

This is readily provided in the new Rectatone transformer. As will be seen from the circuit diagram, there is a variable resistance connected in series with the primary winding of the transformer. A 5,000-ohm resistance will cover the whole range of tone compensation required, but to avoid excessive amplification of the very high frequencies a 2,000-ohm fixed resistance can be connected in series with the variable.

If a fixed amount of tone compensation is wanted, a 2,000-ohm fixed resistance should be used for high-note emphasis, with 3,000 ohms for normal reproduction and 4,000 ohms for low-note emphasis.

### A Component of Many Uses

As the makers point out, this new transformer has a variety of uses in addition to the more revolutionary idea of tone compensation of highly selective circuits. It is suggested, for example, that this transformer would be very useful in gramophone reproduction, where lack of brilliance, due to the characteristic of the pick-up, could readily be remedied. And with loud-speakers somewhat weak in the higher register this new component would again help to balance up the tone. By leaving out the compensating resistance the Rectatone is a good straightforward low-frequency transformer, giving straight-line-frequency response for sets that are neither skimping nor emphasising any part of the audible frequency scale.

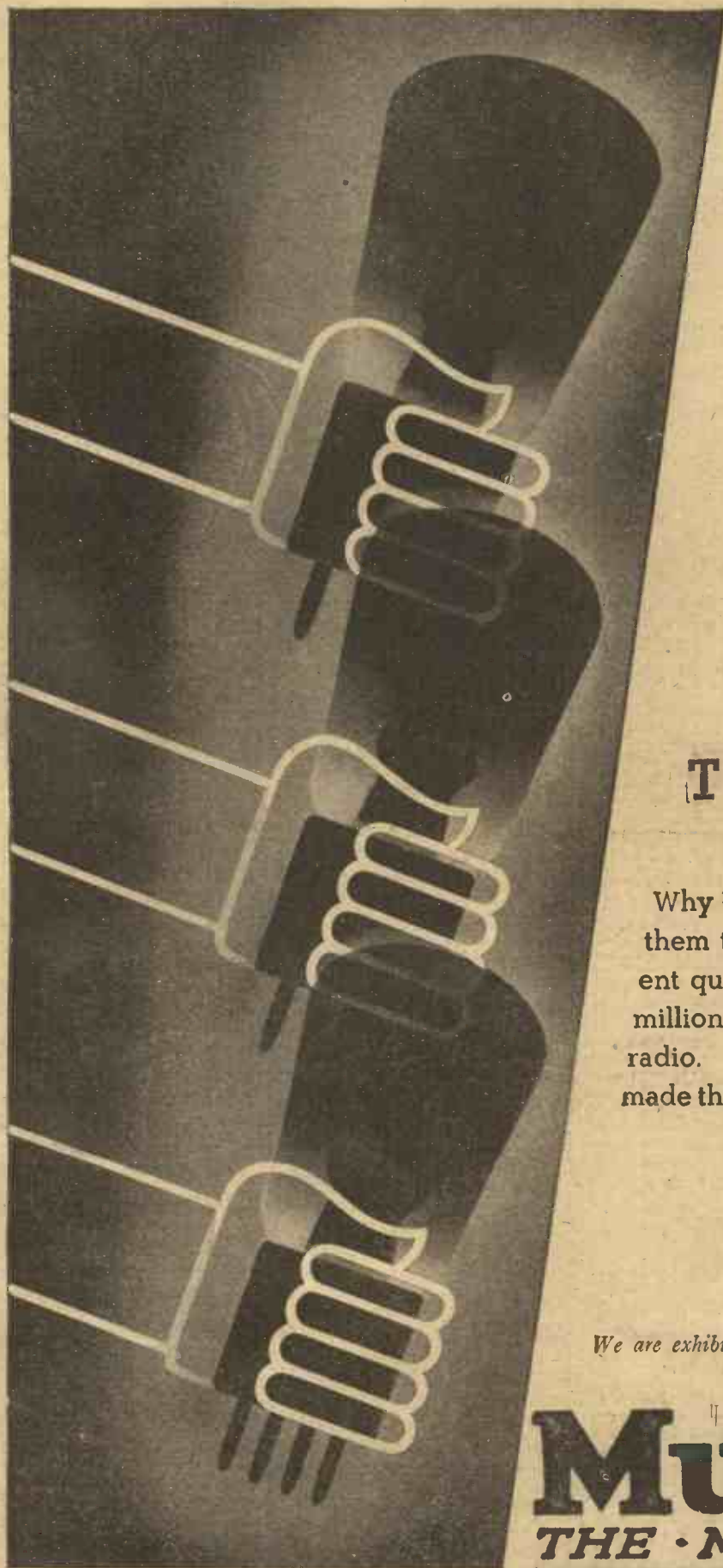
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## PERSONALITIES IN THE WEEK'S PROGRAMMES







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1 P.M.1 LF

1 P.M. 2A

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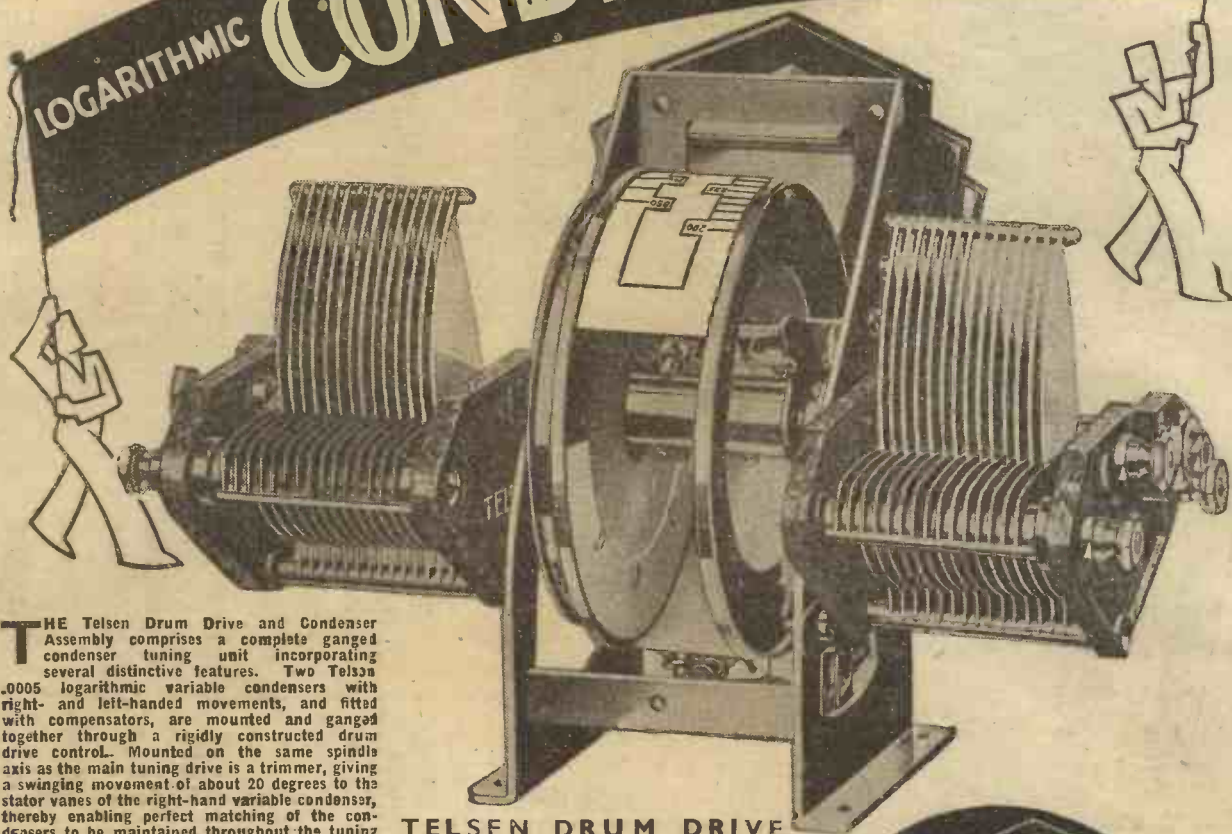
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Price

17'6

### TELSEN DRUM DRIVE

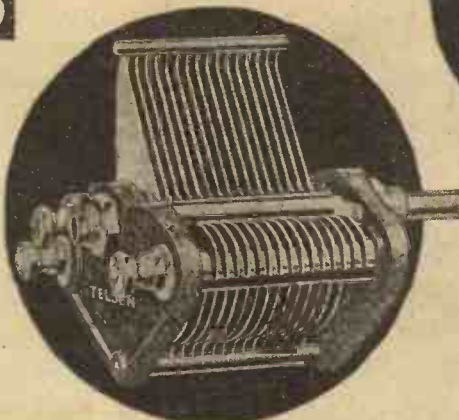
Follows standard practice generally, but embodies several detail refinements, among which may be instanced the cord drive, arranged to reduce wear to a minimum and to prevent over-run, and the rocking stator trimmer, which gives a variation of 20°, and visual indication of setting. For use with Telsen screened coils, an extra scale, marked in wavelengths, is supplied free of charge. Illustration shows escutcheon, handsomely finished in oxidized silver. No. W.255.

8/6

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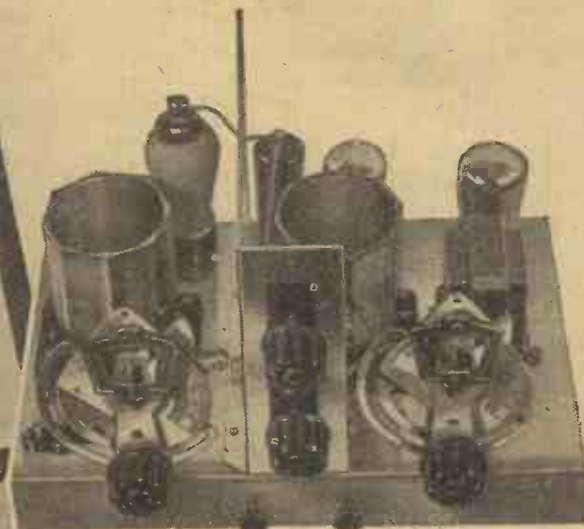
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# On Your Wavelength!

## WHAT'S YOUR CHOICE?

**N**OW that you have had a look round the Exhibition (or, if you haven't, you have read all about it in *AMATEUR WIRELESS*), what do you think is the most striking development in wireless this year? To me it seems that there is only one answer to the question, and that is tone control, which has made its appearance in a good many forms. In some cases there is a fixed compensating device; in others there is a special tone-control circuit or circuits; in others, again, low-frequency intervalve transformers in association with variable resistances do the trick.

Tone control became more and more necessary as selectivity was pushed farther and farther towards its limit. In "straight" sets selectivity is obtained partly by band-pass methods and partly, as a rule, by the use of reaction. In some sets special arrangements are used to enable a much greater degree of reaction coupling to be employed than was possible some years ago. In the super-het we have a combination of band-pass methods and of sharply tuned I.F. stages. The result in all cases is the same: there is a distinct tendency for the high notes to be lost, particularly if you are using knife-edge tuning for long-distance work. I remember some time ago listening to an American station with a smallish set which relied very largely upon reaction. To obtain any kind of volume it was necessary to work close to the oscillation point, and the result was interesting. When a band was playing absolutely nothing but the bass could be heard. You will find much the same effect if you try to work up a little distant station, such as one of the distant relays, to full loud-speaker volume.

## WHAT HAPPENS

**W**HAT takes place in such circumstances is not a complete cutting out of the sidebands, but a big reduction of the response of the set to those corresponding to frequencies more than about an octave or an octave and a half above the middle C. The deep note sidebands, on the other hand, are not attenuated at all; so that the bass is brought out at full power. The result: the bass swamps the treble, though the latter is there all the time. By tone correction the bass is kept within bounds and the treble comes back. I find particularly interesting the various tone-correcting transformers, for these can be used in almost any existing set.

It is a revelation to make a little experiment on the following lines. With an ordinary three-valve set of the S.G., detector, and power-valve type, rig up a four-pole change-over switch so that you can put either an ordinary transformer or one of the compensating kind into circuit between the detector and the output valve.

Tune in a Continental station of moderate strength and work it up to full volume with reaction. Use, first of all, the tone-control transformer and turn its knob until you get reproduction of really pleasing quality. Now quickly switch over to the plain transformer, and you will be astonished at the difference.

## REALLY WORTH WHILE

**A**FTER trying several of these transformers I am convinced that they constitute one of the biggest advances that wireless has made for a long while. One of my chief reasons for saying so is that they enable us to remove the only real snag in long-distance listening. With a good set containing plenty of H.F. the nearer and more powerful Continentals can be brought in at something very close to local-station quality, even without a tone-correcting circuit. We don't have to use much reaction for them and, owing to their very power, they have sufficient spread to prevent any important attenuation of their sidebands. But the smaller fry and the more distant big stations have suffered, and most of us have realised that it was difficult to make the reproduction of their programmes anything better than barely worth listening to. Tone control gives us the means of making poor reproduction good and good reproduction better still.

## ON THE SHORT WAVES

**T**HERE is a good deal of short-wave apparatus at Olympia, though not quite so much as I expected to see, for I am quite sure that when the Empire short-wave station comes into operation, towards the end of the year, there will be a tremendous boom in this side of wireless reception. There are a few sets which will work on long, medium, and short waves, and these are very handy. Personally, I rather favour the super-heterodyne adaptor type of short-wave gadget. If you have one or, better still, two stages of H.F. amplification in your "broadcast" set, one of these adaptors is a first-rate thing to have. You simply stick it on in front of the set, switch over to the long waves, and tune what were the high-frequency valves to a good high wavelength. The arrangement then becomes a superheterodyne very easy to work and giving remarkably good results.

If you don't possess a set with H.F. stages there are excellent little adaptors fitted with a plug which goes into the

detector valve holder of the set. All tuning is then done with the condensers of the adaptor, which are of much smaller capacity than those normally used in the ordinary receiving set. There is so much to hear on the short waves that it is well worth while having either a special short-wave set or an adaptor which will enable an ordinary set to be used for this kind of reception.

## THE MIDDLE WAVES

**O**N the medium waveband all sorts of stations are reappearing after their summer period of temporary silence, whilst those that have remained through the season of longer days and shorter nights as rather small voices are now quickly gaining in strength. Another very encouraging sign is that a whole lot of stations whose reception became patchy during the summer time are now coming back as regulars. By patchy reception I mean that you may hear certain stations well on two or three nights during the week and on the others either not hear them at all or only just be able to pick them up. Notable come-backs are those of Budapest, Vienna, Katowice, Berlin Witzleben, Sotens, Breslau, Gothenburg, and Leipzig. On the whole, the Continent is doing us wireless folk pretty well just now.

## TIT FOR TAT

**B**UT equally we are doing the Continent pretty well, though in a rather different way. One of the problems facing the authorities just now is that of programme borrowing. It appears that quite a few little stations which cannot afford to spend much on their programmes have installed first-rate receiving apparatus and have made the necessary arrangements for relaying. As evening comes along the operator makes a tour over the wavebands to find which stations are coming in best. He selects one whose programme seems attractive and then proceeds to push this out from his own aerial. Since the British programmes are, on the whole, amongst the best and the quality obtainable from our stations is remarkably good, it is only natural that our transmissions should frequently be chosen for this somewhat doubtful compliment. If progress continues at its present rate, particularly in the matter of short-wave wireless, the time may come when a station in any part of the world will be able to send out fine programmes without possessing so much as a studio.

## PIEZO-ELECTRIC SPEAKERS

**I**SEE that one of the latest American sets—a six-valver listed as a midget—is fitted with a piezo-electric speaker instead of the standard moving-coil instrument. The actual "drive" is a crystal of Rochelle salt which

## Blueprints for Set Builders

Home-constructors should note that full-size blueprints of the "Advance Four" and the "World-range Short-wave 3" are available at the Blueprint Dept. of *AMATEUR WIRELESS*, 58-61 Fetter Lane, E.C.4. The prices are 1s. 6d. and 1s. each respectively, post free.



## On Your Wavelength! (continued)

alternately expands and contracts under the influence of the applied L.F. currents and so impulses a diaphragm. The new instrument is said to give very satisfactory results considering its light weight and exceptionally compact construction, though I should hardly expect it to compete with the moving-coil on the lower notes. In one sense, the crystal-operated speaker provides an interesting alternative to existing instruments and, like the electrostatic type, may prove particularly useful in connection with the new fashion for dual-speaker sets. At the same time, it can scarcely claim to be an entirely new development, as piezo-electric microphones and telephone were both known—at least, in the experimental stage—long before the days of broadcasting.

### "FIXING" THE TUNING CONDENSERS

**A** PROPOS of midget sets and the general tendency to restrict even super-het receivers to the smallest possible size, designers find themselves up against some peculiar problems, particularly in connection with microphonic feed-back. It stands to reason that when one fits a powerful moving-coil speaker in the same small casing as the valves and tuning-components there is bound to be a possibility of trouble, due to the effect of the mechanical vibrations set up by the speaker. So far as the valves are concerned, microphonic reaction can be prevented by a suitable design of the valve electrodes. But it is found that the tuning-condensers are also liable to be affected, slight vibrations in the vanes and in the ganging spindle giving rise to small variations of tuning which may be sufficient to spoil reception. To eliminate this source of disturbance the chassis is mounted on soft rubber blocks and the condenser spindle and vanes are braced wherever possible by means of special partitions which hold them firmly against flexural movement.

### A METER PROBLEM

**T**HE other day I wanted to run a little gadget off my car, and I found on the dashboard two sockets which I assumed would be connected to the battery. In order to make quite sure, I thought I would connect a meter across these two points. The only meter I had handy at the time was a little pocket testing meter reading up to 6 volts, but I decided to use this, since I only wanted an indication that the circuit was live. Actually, of course, I expected the pointer to go right off the scale; and when I tried it, it did so.

Unfortunately, it read in the wrong direction, as a meter nearly always does when you first connect it up. I therefore reversed the connections and found that it still read in the wrong direction. Reversing the connections back again the meter now read correctly. In fact, to cut a long story short, I could make the meter read in

which ever direction I liked, irrespective of which way I connected the terminals.

Now, it was incredible that the battery in my car should be changing its polarity every two seconds, and I began to wonder whether these two terminals really were connected across the battery or whether they were taken in some curious manner to the cutout, thus giving me the apparent reversal of the voltage. Even that did not seem to me to meet the case, and I was very puzzled to understand what was happening.

### DON'T BE MISLED

**I** HAD a sudden brainwave, however, and got hold of a better meter, capable of reading up to 30 volts and of the moving-coil type. When I connected this across the terminals I obtained the proper reading of 12 volts; the reading was also quite steady, one of the terminals being minus and the other plus the whole time. I then began to remember some curious effects I had experienced before with moving-iron meters. This little pocket testing meter, of course, was of the moving-iron type, and the application of a very strong force to the moving mechanism is just as likely to send it in the wrong direction as in the right.

The movement is only a very lightly pivoted piece of soft iron and it is so balanced as to be just ready to get off the mark. Consequently, a really strong force will sometimes set it off the mark in the wrong direction.

### A QUESTION OF SPEED

**T**O obtain the best reproduction from modern records with a radiogram, it is essential that the speed of the turntable shall be exactly right. Most records demand a speed of seventy-eight revolutions a minute, though some require a little more and some a little less. The best speed, in any case, is nearly always indicated on the label of the record; if it isn't, you can take it that seventy-eight will be right. But remember that this means the speed of rotation when the pick-up is travelling over the record. I have often seen people count the turntable revolutions with the pick-up placed on its little rest. The motor is thus running light and the speed

may be considerably in excess of that obtained under the load of the pick-up. Here is a simple way of making sure that the turntable speed is what it should be. On to the label on a record stick a little piece of white paper. Place the record on the turntable, start up, and bring the pick-up into action. Sight between the front edge of the pick-up and the centre pin of the turntable and count one every time that the piece of white paper passes in front of your eye. Get a friend to act as timekeeper and ask him to stop you at fifteen seconds. If the speed is correct you should have made a count of nineteen (a quarter of seventy-eight is  $19\frac{1}{2}$ ) just before the fifteenth second is reached. It is as well to check over once or twice, and you can finish by counting for a full half-minute, in which case thirty-nine revolutions should be registered.

### A "PORTABLE" TIP

**A** GOOD many people, I find, don't quite know how to turn a portable, or any other set containing a built-in frame, or even the frame by itself, in such a way as to obtain the maximum signal strength. Most of them do it purely by hit-and-miss methods, simply making movements until the strength appears to be at its best. The car is notoriously deceptive when it comes to deciding whether a signal, already fairly loud, is or is not just a little bit louder with this adjustment or that. Here is a very much better way. Having tuned in a station, rotate the apparatus until you find a position where strength is at its minimum. This is not, as a rule, at all difficult and, except in the case of a very strong transmission, you are likely to be able to discover a position in which almost or entire silence occurs. Having done this, point your first finger straight at the middle of the cabinet of the set or of the frame. Now turn until the edge of the cabinet or the windings of the frame are directly opposite the pointing finger. In this way you make certain of ensuring that the apparatus is correctly orientated.

### ADDING ONE ON

**I**N spite of my frequent advice to readers to the contrary, I have just been adding a valve to one of my own sets. But I haven't really broken my own rule, for I didn't try to increase the number of amplifying stages; my additional valve was required because I converted the output stage to push-pull. I am very glad that I did, for the results have exceeded my expectations. I don't think that any battery output valve used in single harness can give the results that you obtain from push-pull. You don't get any more noise, but it's much nicer noise. Should you want to improve the quality of an existing set, I can recommend this scheme to you as one that is worth thinking about.

THERMION.

## A CONSTRUCTIONAL NUMBER NEXT WEEK

Next week's issue of "A.W." will feature TWO fine sets: The "IDEAL REGIONAL TWO" and "YOUR HOME RADIOGRAM."



# WHY NOT USE A SHORT-WAVER?

## BUILD THE



# WORLD-RANGER SHORT-WAVE 3

Nobody who is interested in short-wave reception can afford to miss the constructional description of a fine three-valver specially designed for reception below 100 metres. An introduction to this new short-wave outfit was given in last week's issue.

THE "World-Ranger Short-wave 3," first details of which were given in last week's issue of "A.W.," is a simple job to build although it is so efficient. The layout is well spaced, components are not cramped together so that wiring is difficult and the special inverted chassis method of construction adopted results in a tidy "professional"-looking set.

The first job is to check up the parts with the components list and to see that you have parts of the correct electrical values. The first specified parts in the components list are those used in the actual set described and illustrated by the accompanying photograph.

The set is described as having an inverted chassis and the photograph above will show you just what this means. The baseboard is a box-like formation carrying the grid-bias battery beneath it and much of the straightforward wiring. The terminal strip carrying the loud-speaker, aerial, and earth terminals, forms the back of this box formation.

On top of the baseboard box are the main parts, such as valve holders, decoupling condensers, low-frequency transformer, H.F. choke, series aerial condenser, potentiometer and the rest. The tuning condenser, reaction condenser and coil are carried on the panel. This latter component is mounted in rather an unusual position on account of the wave-change switching. The coil is fitted flush against the three-position switch which controls the various sections of the coil to cover the three separate wavebands between 12 and 85 metres.

The reaction condenser is actually beneath the baseboard box, although it is mounted on the panel and part of the plywood of the actual baseboard is cut away to clear the vanes.

The first constructional job to be done is the making up of the baseboard box and the drilling of the panel and terminal strips. A full-size blueprint of the set is available, price one shilling, post free, from the Blueprint Department, AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4.

This shows all the wiring and gives the exact layout of the parts on the panel, and the baseboard box; it also shows the wiring beneath the baseboard, so that it is a great aid when you come to the constructional work.

The accompanying panel shows all the parts needed to build up the "World-Ranger Short-wave 3."

Now the panel can be drilled for the two condensers, the coil switch and the on-off switch. There must also be six holes for

woodscrews which secure the panel to the baseboard box.

Using stout ply wood, make up the baseboard. The three pieces of wood can be nailed, or better still, screwed together and the long terminal strip which can be drilled,

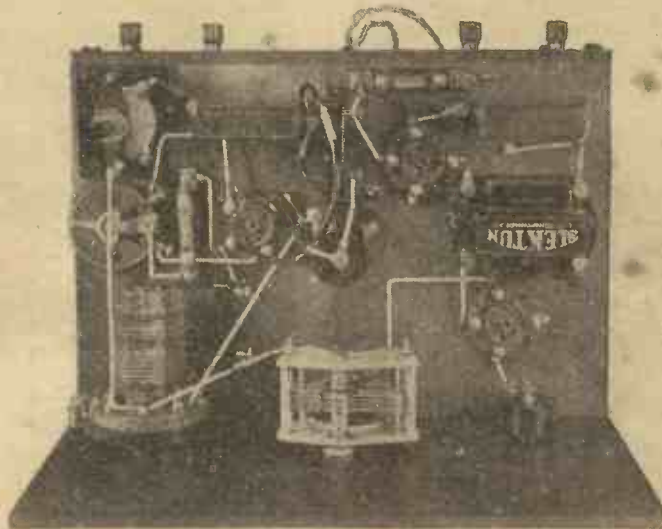
(Continued on page 394)

### COMPONENTS REQUIRED FOR THE "WORLD-RANGER 3"

Ebonite panel, 12 in. by 8 in. (Peto Scott, Becol, Goltone).  
 .0002-mfd. variable condenser (British Radiophone, Utility, Goltone, Ormond, Stratton, Formo).  
 On-off switch (Bulgin rotary, Lissen, British Radiophone, Becker, Igranic, Graham Farish, Sovereign, Claude Lyons, Telsen, W.B.).  
 Triple-range short-wave coil with switch (Lissen).  
 Three valve holders (Telsen, Lissen, W.B., Lotus, Stratton, Wearite).  
 Two 1-mfd. fixed condensers (Telsen, Dubilier, Lissen, T.C.C., Goltone, Ferranti, Wilburn).  
 .0002-mfd. fixed condenser (Lissen, Telsen, Dubilier, Goltone, T.C.C., Ormond).  
 .006-mfd. fixed condenser (Lissen, Telsen, Dubilier, T.C.C., Ormond).  
 2-megohm grid leak (Dubilier, Lissen, Telsen, Sovereign).  
 3-megohm grid leak (Dubilier, Lissen, Telsen, Sovereign).  
 Two grid-leak holders (Readi-Rad, Lissen, Goltone).  
 Neutralising condenser (Peto-Scott, J.B., Igranic).  
 400-ohm baseboard-mounting potentiometer (Lissen, Igranic, Sovereign).  
 Two spaghetti resistances, 20,000-ohm and 40,000-ohm (Lewcos, Lissen, Telsen, Bulgin, Graham Farish, Goltone).  
 Low-frequency transformer (Slektun, Lissen, Varley, Telsen, Atlas, Lotus, R.I., Goltone).  
 Short-wave high-frequency choke (Slektun, Lissen, Stratton, Igranic, Goltone, Lewcos, Wearite).  
 .0003-mfd. reaction condenser (Peto Scott, Polar, J.B., Utility, Lissen, Telsen).  
 Five wander plugs, marked: H.T.—, H.T.+, G.B.—, G.B.—1, G.B.—2 (Clix, Belling-Lee, Ealex, Goltone).  
 Four terminals, marked: A, E, L.S.—, L.S.— (Clix, Belling-Lee, Ealex, Bulgin, Goltone).  
 Two spade terminals, marked: L.T.—, L.T.— (Clix, Belling-Lee, Ealex).  
 Ebonite strip, 12 in. by 2 in. by 1 in. (Peto Scott).  
 Wood for baseboard assembly as per blueprint.  
 Pair of grid-bias clips (Bulgin).  
 Connecting wire (Glazite, Lacoline).  
 Two yards of thin flex (Lewcoflex, Goltone).

### ACCESSORIES

Cabinet (Peto Scott).  
 120-volt H.T. battery (Lissen, Drydex, Ever Ready, Siemens, Fuller, C.A.V.).  
 9-volt G.B. battery (Lissen, Drydex, Ever Ready, Siemens, Fuller, C.A.V.).  
 2-volt accumulator (Lissen, Exide, Drydex, Ever Ready, Siemens, Fuller, C.A.V.).  
 H.T. unit (Lissen, Ekco, Regentons, Atlas, Heayherd).  
 Loud-speaker (R. & A., British Rola, W.B., Epoch)



This plan view shows that the construction is simple and that few components are required

SEE THIS SET ON THE "A.W." STAND (No. 7) AT THE EXHIBITION



# Radiolympia

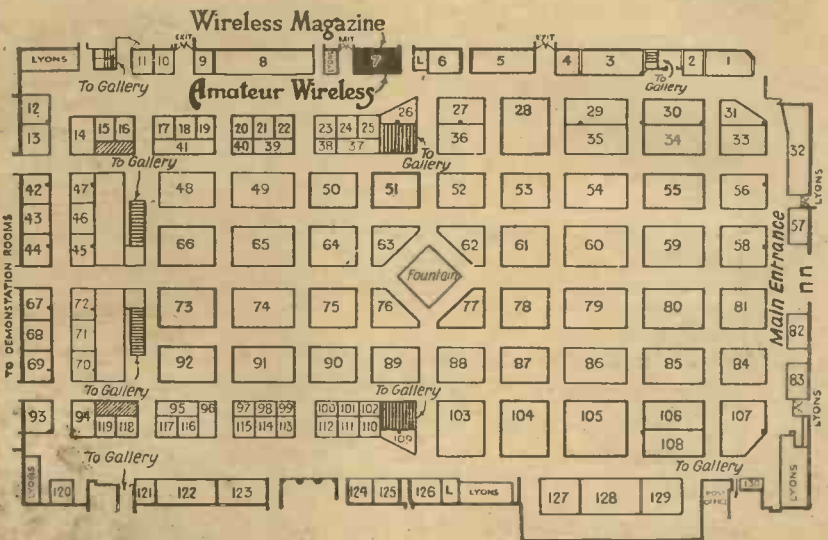
DAILY, 11 a.m. to 10 p.m.

ADMISSION 1/6

A CONCISE GUIDE

FRIDAY, AUGUST 19, to  
SATURDAY, AUGUST 27

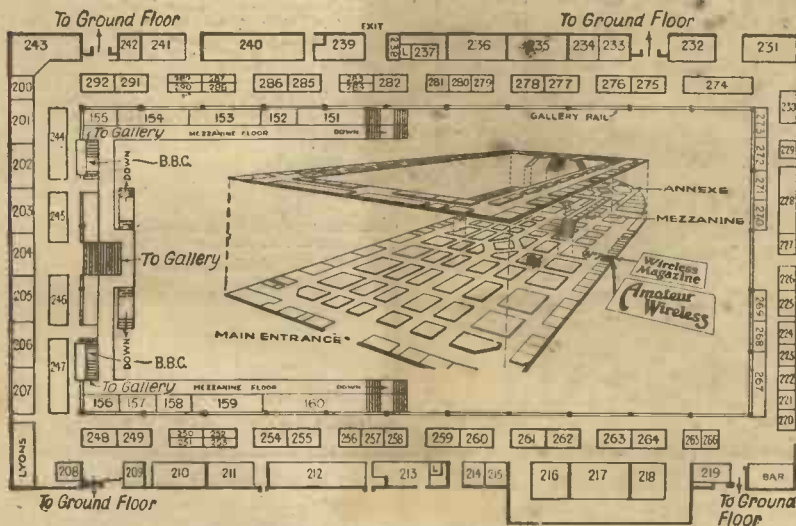
Name	Stand No.	Name	Stand No.
Ad-A-Grams	113	Dew & Co., Ltd., A. J.	217
Adey Portable, Ltd.	259	Dibben & Sons, Ltd., Wm.	77
Alliance Radio, Ltd.	19	Dubilier Condenser Co. (1925) Ltd.	84
Amalgamated Press, Ltd.	8	Dulcetto Polyphon, Ltd.	235
Amph'n (1932) Ltd.	63	Dyson & Co. (Works) Ltd.	67
Apollo Gramophone Co., Ltd.	214		
Automatic Coil Winder & Electrical Equipment Co., Ltd.	203		
Baker, A.	83	Farle Engineering Co., Ltd.	33
Balcombe, Ltd., A. J.	128	Eastick & Sons, J. J.	239
Bell Piano Co., Ltd.	3	East London Rubber Co.	211
Belling & Lee, Ltd.	154	"Econasign" Co., Ltd.	239
Benjamin Electric, Ltd.	45	Edison Bell, Ltd.	27
Benn Brothers, Ltd.	281	Edison Swan Electric Co., Ltd.	75, 239
Bernard Jones Publications, Ltd.	7	Electrical & Radio Products, Ltd.	47
Birt & Sons, Ltd., S. S.	158	Electro-Dynamic Construction Co., Ltd.	157
Bowyer-Lowe & A. E. D., Ltd.	158	Electrical and General Distributors, Ltd.	278A
Brider & Co., R. O.	280	Enston, Ltd.	212
Britannia Batteries, Ltd.	138	Epoch Radio Mfg. Co., Ltd.	41
Brit'ish Acoustic Films, Ltd.	119	Erie Revisor, Ltd.	6
British Blue Spot Co., Ltd.	35	Ever Ready Co. (G.B.) Ltd.	61
British Broadcasting Corporation, Ltd.	155A		
British Ebonite Co., Ltd.	2	Fandels, Ltd.	231
British General Mfg. Co., Ltd.	23	Fay Home Recorders, Ltd.	255
British Goldring Products, Ltd.	27	Ferranti, Ltd.	73
British G. W. Z. Co., Ltd.	282	Film Industries, Ltd.	281
British Hard Rubber Co., Ltd.	223	Five Point Products	253
British Ideal Patent, Ltd.	72	Flinders (Wholesale) Ltd.	241
British N.S.F. Co., Ltd.	18	Formo Co.	103
British Pix Co., Ltd.	49	Fox Publications, Ltd.	278
British Radiophones, Ltd.	63	Fraser Radio, Ltd.	253
British Reola Co., Ltd.	43	Fuller Accumulator Co. (1926) Ltd.	73
British Thomson-Houston Co., Ltd.	119	Fulton, Ltd.	203
"Broadcaster"	6		
Brown Brothers, Ltd.	240	Gambrell Radio, Ltd.	21
Brownie Wireless Co. of Gt. Britain, Ltd.	62	Garrard Engineering & Mfg. Co., Ltd.	122
Bulgin & Co., Ltd., A. F.	151	General Electric Co., Ltd.	105, 109
Burgoyne Wireless (1830) Ltd.	98	Gilbert & Co., Ltd., O.	232
Burns, Ltd.	46	Gothic Electrical Supplies, Ltd.	201
Burton, C. F. & H.	1	Graham Farish, Ltd.	61
Bush Radio, Ltd.	119	Gramophone Co., Ltd.	65
		Gripco Co.	223
		Grosvenor Electric Batteries, Ltd.	43
		Gutta Percha Co. (Telegraph Construction & Maintenance Co., Ltd.)	257
Cadisch & Sons, R.	213		
Carrington Manufacturing Co., Ltd.	123	Hacker, H. & Sons	37
Celestion, Ltd.	127	Halford Radio, Ltd.	117
Cellgrave Co.	293	Hambling, A. W., Ltd.	224
Chloride Electrical Storage Co., Ltd.	61	Hampton Radio, Ltd.	12
Churchmans, Ltd.	288	Harlie Brothers (Edmonton), Ltd.	31
Cifel Products, Ltd.	285	Harwell, Ltd.	281A
City Accumulator Co.	243	Haynes Radio	17
Charlton Radio Valve Co.	130	Hayward, F. C. & Co.	13
Clarke & Co. (M.C.) Ltd., H.	91	Hellesens, Ltd.	221
Climax Radio Electric Ltd.	81	Henderson Wireless & Electric Service	215
Cole, Ltd., E. K.	25, 65	Henley's Telegraph Works Co., W. T., Ltd.	18
Columbia Graphophone Co., Ltd.	88	Hillman Brothers	219
Colvern, Ltd.	245	Hobday Brothers, Ltd.	243
Concordia Electric Wire Co., Ltd.	203	Hulton, Ltd.	271
Consolidated Radio Co., Ltd.	34	Hunter Simpson & Webb, Ltd.	39
Coscor, Ltd.	69		
Dallas & Sons, Ltd., J.	202	Icaric Electric Co., Ltd.	33
Danipad Rubber Co., Ltd.	113	Iliffe & Sons, Ltd.	6
Darwins, Ltd.	70	Itonia, Ltd.	218
Dayrite, Ltd.	203		
De La Rue & Co., Ltd., T.	227		



PLAN OF THE STANDS ON THE GROUND FLOOR EMPIRE HALL

Any Exhibitor can be located by reference to the list and the plans. A complete Guide to the Exhibition was published in last week's issue.

Name	Stand No.	Name	Stand No.
Jackson-Bell Distributors, Ltd.	11	Ratcliff (Metals), J. F., Ltd.	269
Jackson Brothers	204	Ready Radio, Ltd.	106
Jewel Pen Co., Ltd.	97	Redfern's Rubber Works, Ltd.	124
Johnson Talking Machine Co., Ltd.	228	Regent Radio Supply Co.	51
Junk Mfg. Co., Ltd.	39	Reproducers & Amplifiers, Ltd.	69
		Roberts, John	272
Kalsky (Aldgate), S., Ltd.	236	Rotor Electric, Ltd.	233
Kenwell Radio, Ltd.	121		
Keith Prowse & Co., Ltd.	292	Selecta Gramophones, Ltd.	219
Kolster-Brandes, Ltd.	54	Selbridge & Co., Ltd.	274
		Siemens Electric Lamps & Supplies, Ltd.	88
Lampugh, S. A., Ltd.	99		
Lancashire Dynamo & Crypto, Ltd.	111	Six-Sixty Radio Co., Ltd.	52
Lawson & Raphael	270	Sleekton Products	235
Lectro Linx, Ltd.	225	Slingshot & Sons, S. (Motor Accessories) Ltd.	22
L.E.S. Distributors, Ltd.	233	Smurthwaite, F. W.	133
Linsen, Ltd.	39	Soverekn Products, Ltd.	152
Lock, W. & T., Ltd.	101	Spencer Radio, Ltd.	14
Loewe Radio Co., Ltd.	223	Stafford Sinclair	277A
London Electric Wire Co. & Smith, Ltd.	153	Standard Battery Co.	28
Lotus Radio, Ltd.	64	Standard Telephones & Cables, Ltd.	107
		Stratton & Co., Ltd.	23
M.P.A. Wireless (1930) Ltd.	95	Sun Electrical Co., Ltd.	231
Marnavox (G.B.) Ltd.	24	Swift Levick & Sons, Ltd.	112
Mains Radio Gramophones, Ltd.	102	Stanbace, Ltd.	256
Manufacturers Accessories Co. (1926) Ltd.	237	Stam Electrical Instrument Co., Ltd.	283
Marconiphone, Ltd.	74	Standard & Pettey, Ltd.	287
McMichael, L., Ltd.	56	Smith, Arthur, (Radio), Ltd.	251
Montague Radio Inventions & Development Co., Ltd.	49	Sylvex, Ltd.	289
Mitard Radio Valve Co., Ltd.	70, 248		
Murphy Radio, Ltd.	28	Tannoy Products	44
		Telegraph Condenser Co., Ltd.	33
N. Siona Accumulator Co., Ltd.	244	Telsen Electric Co., Ltd.	68
National Radio Service Co.	200	Terrystone Radio Products, Co., Ltd.	289
Newnes, George, Ltd.	114	Thompson Diamond & Butcher	207
New London Electron Works, Ltd.	43	Trade Chronicles, Ltd.	10
		Tunewell Radio, Ltd.	96
Oldham & Son, Ltd.	85		
Ormond Engineering Co., Ltd.	87	Ultra Electric, Ltd.	73
Osborn, Chas. A.	32	Union, Ltd.	250
Oversas Trading Corporation	291	Univolt Electric, Ltd.	115
		United Radio Manufacturers, Ltd.	155
Percuss, E.	238	Umello, Ltd.	125
Partridge & Mee, Ltd.	67		
Partridge, Wilson & Co.	159	Vandervell, C. A., Ltd.	246
Peto Scott & Co., Ltd.	247	Varley (Oliver Pell Control, Ltd.)	163
Pegasus, Ltd.	94		
Phillips Lamps, Ltd.	104	Waimel Wireless Co., Ltd.	23
Portadown Radio, Ltd.	56	Westinghouse Brake & Saxby Signal Co., Ltd.	83
Powerstone Products	213	Whiteley Electrical Radio Co., Ltd.	108
Prestley & Ford	229	Wilkins & Wright, Ltd.	118
Primus Manufacturing Co.	15	Wingrove & Rogers, Ltd.	129
Pyre Radio, Ltd.	80	Wireless League	285
Philomel Radio Equipment	279	Wireless Retailers Association of G.B.	288
Practical Radio Publishing Co.	254	"Wireless Trader"	9
		Wright & Weaire, Ltd.	82
R. C. Radio Electric, Ltd.	222	Whiteley, Wm., Ltd.	287
Radiolux, Ltd.	277	Wego Condenser Co., Ltd.	284
Radio Gramophone Development Co., Ltd.	92		
Radio Instruments, Ltd.	90	Yagerphone, Ltd.	233
Radio Society of Great Britain	242	Zetavox Radio & Television, Ltd.	103

PLAN OF THE STANDS IN MEZZANINE AND GALLERY, AND  
(INSET) GENERAL VIEW

SEE THE "ADVANCE FOUR" AND THE SPEAKER BAFFLE ON THE "A.W." STAND



# "HIS MASTER'S VOICE"

at Olympia, STAND NO **55**  
(GRAND HALL)

In addition to the four new instruments illustrated, "His Master's Voice" will show at Olympia the following range of models for the new season:—

	PRICE
MODEL 501 Transportable Radiogram	25 guineas
MODEL 435 De Luxe Radio Four	17 guineas
MODEL 174 Super-Power Speaker	£7. 10. 0
MODEL LS7 Universal Speaker	£4. 15. 0
MODEL 116 Record Player	7 guineas
MODEL 117 Auto-Record Player	12 guineas
MODEL 553 Auto-Electrogram	42 guineas

Current models which have proved so enormously popular during the past season, and which have established a new standard in the reproduction of broadcast and recorded music, will also be continued.

Visit the "His Master's Voice" Stand—see and hear these instruments . . . examine the many improvements in the range. And whatever else you do, you must see the pre-release showing of the most wonderful industrial 'talkie' yet made. Demonstration Room D18. Free tickets will be obtainable at Stand No. 55.



## His Master's Voice RADIO — "True to Life"

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



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



## THE B.B.C. GETS DOWN TO TELEVISION



This composite photograph shows the arrangements that have been made in the Dance Band studio for the new series of television transmissions

**A**FTER many delays the B.B.C. should have actually started its television broadcasts on Monday, August 22. Extensive plans have been formulated at the B.B.C. headquarters for a thorough attack, both technically and artistically, on the general problem of television.

During the next few months there should be every inducement for keen listeners to participate in the television broadcasts. As we have already announced, four nights a week will be devoted to television under the new B.B.C. régime.

Simultaneous sound and vision will be sent out Mondays, Tuesdays, Wednesdays and Fridays. The sound signals will come from Midland Regional and the vision signals from London National. This plan is in the nature of a compromise, for if a listener is in the recognised service area of one of the stations he will be outside the service area of the other.

Experience has shown that the Midland Regional can be quite well heard in most of the area covered by the London National station, and with a good set it should not be very difficult for Midland listeners to tune in the London National signals. The arrangement does to some extent favour London area listeners, since it is easier to get Midland Regional in London than it is to get London National in the Midlands. Still, there will be a wide and densely-populated area over which some sort of television service will be available.

The time chosen for these broadcasts is 11 to 11.30 p.m., at which period the two stations involved are normally closed down.

One of the very latest Baird television

transmitters has been installed at Broadcasting House for the new series of experiments. Scanning is done on the mirror drum system, with  $12\frac{1}{2}$  images per second. Both close-up and extended-screen transmission will be possible.

The installation and subsequent operation of the television apparatus will be under the control of the Assistant Chief Engineer, Mr. H. Bishop. He will be specially assisted by Mr. D. C. Birkinshaw, another B.B.C. engineer. Later on it is possible that modifications may be made in the transmitter, but this depends entirely on the experimental results obtained during actual broadcasts.

It is of interest to note that the present television transmissions are entirely under the control of B.B.C. men. The Baird people are working independently on short-wave transmissions around the 6-metre band, transmissions being sent out almost daily at odd times from the short-wave aerial at Long Acre, London.

As no special provision was made for television when Broadcasting House was designed—a singular lack of ordinary vision!—the B.B.C. has had to make do with one of its existing studios for the present transmissions. The dance-band studio, known as studio BB, is the one being used.

As a matter of fact, in fairness to the B.B.C., it ought to be mentioned that a television studio does not, in the present state of the science, demand anything more than an ordinary studio of medium size can provide. The only addition to the BB studio when television is in progress is a large white screen, used as a background for the televised subjects.

Another point is that the television apparatus can be conveniently housed in

the listening rooms adjoining most of the studios in the control tower at Broadcasting House. In Studio BB there are two such listening rooms, one under the clock at one end of the studio and the other under the little balcony at the other end. It is the balcony room that is being used just now to house the television transmitter, with the projector scanning device poking through the window into the studio.

### New Technique

As many listeners will already know, "Productions" at the B.B.C. is a department ably guided by the genial Val Gielgud, who is to be finally responsible for the development of the television broadcasts from the artistic point of view.

Under Mr. Gielgud is a newcomer to Portland Place, Mr. Robb, late of the Vocalion Company, who will devote considerable time to the arrangement of the television subjects in studio BB.

According to Mr. Gielgud the early broadcasts of television from Broadcasting House will not attempt anything very ambitious. He thinks that caricaturists will specially lend themselves to the new medium, but such subjects as instrumentalists and singers will be frequently projected.

Later on, as the limitations and peculiarities of television broadcasting become known, better use will no doubt be made of the apparatus installed. There is no immediate intention of putting over elaborate song-and-dance shows involving considerable movement and change of scene.

It is something that the B.B.C. has finally got down to this television business. The extensive weekly broadcasts must accelerate the progress not only of the technical side but of the artistic production side. Mr. Bishop and Mr. Gielgud can be relied upon to make the most of the opportunities now offered to them by the recent Baird installation.

A. S. H.

### NAVIGATING BY INFRA-RED RAYS

**T**HE photo-sensitive cell or "electric eye" is finding almost as many ingenious applications as the thermionic valve. For instance, in marine navigation it is now possible to make use of infra-red rays for "taking a sight" at the sun in cloudy weather. Even the best of sailors is liable to get a little astray in his bearings if he cannot take a sextant reading of the sun or stars for days on end. Infra-red rays, however, pass through the heaviest clouds in sufficient quantity to enable an "invisible" sun to be accurately located with the new device, which consists of a delicate thermocouple and photo-cell combination, carried on a sextant and connected up to a valve amplifier. The whole arrangement is compact and easily portable, and should play a useful part in long-distance air flights as well as at sea.

B. A. R.

The Castilian Prize Glee Singers will sing in a Welsh programme from the Cardiff studio on August 25.

### SECURING YOUR FLEX LEADS

Take flex leads direct from the parts on the baseboard to the batteries, then clamp the flex group so that if the batteries



are moved, none of the wiring will be pulled loose. A useful U-shaped clamp is illustrated.



# LISSEN SHIELDED COILS

**TWO-GANG 17/6**





**THREE-GANG 26/6**



## Single - Two Gang - Three Gang

A fine basis for the most selective sets of 1933

Lissen Shielded Coils have been produced to meet the demand for a range of coils of universal utility, high efficiency, and matched to unusually close limits. Selectivity is of a very high order, and "break-through" on the longwave band is almost entirely eliminated. Damping losses are exceptionally low, shielding is particularly complete. All the Lissen Shielded Coils are laboratory matched in inductance to within 1 per cent.

*No need to keep on buying new coils for every circuit you build—just get a set of these Lissen Coils and you can adapt them to any circuit.*

### TWO-GANG AND THREE-GANG INCORPORATING WAVE-CHANGE AND FILAMENT SWITCHES.

Wave change switches are an integral part of the Lissen Ganged Coils, the switches being actuated by a knob protruding through the front of the panel.

It is bad design practice to incorporate a switch in single shielded coils. Therefore there is no built-in switch in the Single Lissen Shielded Coil. When single coils are used it is better to allow the designer of the circuit to arrange the switch in a suitable position on the panel so that the coil can also be positioned to suit the circuit.

When the switch is part of the coil it is often difficult to arrange a suitable position for both coil and switch. On the two-gang and three-gang coils it is of course necessary to have the switch built integral with the coil.

In addition to the wave-change switch, each Lissen Shielded Ganged Coil is provided with a further switch position intended for operating the filament circuits, so that all the switching control of the receiver is actuated by one knob.

LISSEN SINGLE  
DUAL RANGE  
SHIELDED COIL,

**6/6**

TWO-GANG LISSEN  
SHIELDED COIL,

**17/6**

THREE-GANG  
LISSEN SHIELDED  
COIL,

**26/6**

# LISSEN SHIELDED COILS

LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX

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





**T**HIS is, without a doubt, a moving-coil season so far as loud-speakers are concerned. The array of inexpensive moving-coils at Radiolympia clearly shows how great has been the swing-over from all other types of reproducer. For years the moving-coil has been acknowledged to be the finest possible type of loud-speaker for the reproduction of the full range of audible frequencies.

It just shows what mass production and faith in the public's buying powers can do; here we are now surrounded with really effective moving coils at prices that are cheap anyway, and when considered in relation to performance are simply wonderful. In a year not very notable for sensations, the moving-coil development stands out as one of the high lights of the Exhibition.

Practically all the commercial sets have some form of moving coil; some battery portables have adopted such speakers. In addition to this wholesale evidence of the supremacy of the moving coil we have a host of chassis available to the amateur constructor.

While there is no question that the moving coil is likely to be the most popular type of loud-speaker in use during the coming season, we ought, in fairness to several excellent firms who know what they are talking about, to remember that such types as the inductor-dynamic, introduced last year, and certain improved forms of balanced-armature moving-iron speakers, still have applications.

The inductor-dynamic, for example, is

now made just as sensitive as the moving-iron, thus overcoming one of the few objections to an otherwise excellent development. The inductor, properly designed, as it is in several makes on show at Radiolympia, gives quite a good bass-note response and appreciable high-note reproduction. Moreover, there is little or no background with this type of loud-speaker, and the reproduction has a "clean" timbre that appeals to some listeners in a way the average moving-coil cannot. That states the case as fairly as possible for the inductor, which has lost ground only because the moving-coil has so greatly advanced in the popular price market.

Similarly with the moving-iron. Ceaseless research goes on, even now, with this simple type of speaker, so that to-day we can get an overall response which would have seemed theoretically impossible a few years ago. The moving-iron still has an application in small portables, where there is neither room to house nor power to work a moving-coil.

This brings us to the interesting point about the new loud-speaker marketing tendency. Nowadays it seems that we buy chassis and use our own discretion about the type of cabinet or baffle. Compared with the great number of moving-coil chassis shown at Olympia there is a very small number of cabinet speakers.

Perhaps this is to be expected, since the amateur will want a chassis for his home-built console or pedestal cabinet, and the manufacturer, who incidentally by his large orders for speakers to include in factory-

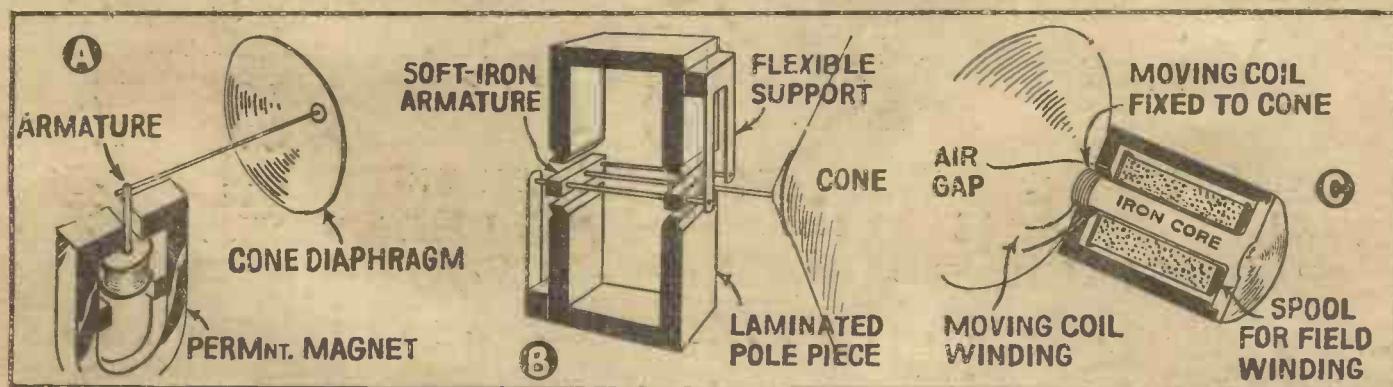
assembled sets has "rationalised" the market, naturally does not want a box round his chassis.

This change in marketing entails a certain amount of discretion on the part of the purchaser. Disappointment may be caused by unsuitable housing for the chassis. Moreover, poor reproduction may be caused by inaccurate matching, caused by inattention to the ratio of the transformer in the chassis.

Most of the chassis have some sort of incorporated output transformer, so that no matter what kind of set may be used, the reproduction can be made good by altering the ratio of the primary to secondary winding. Even the cheap chassis have these matching transformers, some with multi-ratios and others designed specifically for pentodes, small power valves, of moderate impedance, or large power valves of very low impedance.

This question of matching should therefore be fully dealt with when making a purchase of one of the new chassis. Fortunately most makers are alive to the situation, and will willingly quote the type for any given power valve.

On the question of the cabinet or baffle less information is forthcoming. The guiding rule is to use as large a baffle board as possible, not less than 3 ft. square anyway, and preferably larger. If a cabinet is used, care should be taken to see that it has no pronounced resonance. If it has, the objectionable "boom" may be removed, as in the loud-speaker on show at the AMATEUR WIRELESS stand, by carefully packing the cabinet with slag wool.



The three types of loud-speaker shown diagrammatically—A, the moving-iron; B, the inductor; C, the energised moving-coil



The only **FULL  
SIZE** Condenser  
selling at **6<sup>D</sup>**



The only Condenser  
selling at 6<sup>d</sup> that  
requires  
**NO SOLDERING**  
into circuit

**LISSEN  
GRID LEAKS**

Now, too, you can get the finest, most reliable grid leaks at half the price you had to pay before. Lissen Fixed Grid Leaks are resistances that never vary; they are absolutely silent in use. Use them in every circuit. All values 6d. each.

**NOW  
ALSO**

**6<sup>D</sup>**



These are exactly the same Lissen Mica Condensers for which you were paying 1/- each before. They are Leak-proof. They deliver all their stored-up energy. They are guaranteed accurate within 5 per cent. of marked capacity.

And remember—Lissen are the only **FULL SIZE** Fixed Mica Condensers you can buy for 6d. each, the only condenser selling at 6d. that has standard terminals and requires no soldering into circuit.

**LISSEN FIXED MICA CONDENSERS**

Up to  
.002 mfd.

**WERE**

Over .002 mfd. were 2/-  
and 1/6, reduced to 1/-

**\* NOW**

**6<sup>D</sup>**

**EXACTLY THE SAME LISSEN CONDENSERS  
AND THE SAME LISSEN GRID LEAKS  
FOR WHICH YOU PREVIOUSLY PAID 1/-**

**LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX.**

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



# THE B.B.C. AT OLYMPIA

Interesting details of a section of the Show which no visitor should miss

ON the B.B.C. stand is located the apparatus used to supply programmes of music and speech to all loud-speakers operating in the Exhibition. The programmes thus distributed are obtained either from the B.B.C. headquarters at Broadcasting House or from the small studio near the stand.

The programmes originating from Broadcasting House are identical with those being radiated either by the London Regional or the London National transmitter at Brookmans Park. Wireless link, however, is not employed, the apparatus on the stand being connected directly to the amplifier at Broadcasting House through the medium of the G.P.O. telephone lines, special circuits being used for the purpose.

In the small studio on the B.B.C. stand are a microphone and a gramophone with an electrical attachment by means of which a programme of suitable music is distributed when the broadcast transmissions are not available.

With regard to the apparatus on the stand, to the left of the main amplifier unit will be seen a small rack upon which is mounted the input equipment, comprising five stages of resistance-capacity coupled low-frequency amplification. The

output from this rack is fed to the power amplifier, which consists of two stages of push-pull resistance-capacity coupled amplification. The high-tension and low-tension supplies for the latter are derived from the motor-generator set which may be seen on the right-hand side of the stand. This machine delivers about 40 amperes at 17 volts to the filaments of the four large valves employed in the output stage, while approximately  $1\frac{1}{2}$  kilowatts at 3,000 volts

## SPEAKER UNIT MOUNTING

It is a mistake to mount a speaker unit on a frail support. Wooden battens used in construction behind a speaker baffle-board should be very stout, so that there is no risk of vibration being transferred



through the framework to the cone. The adjusting knob of the unit should clear the back batten and not touch it, for otherwise it may upset the rigid mounting of the unit.

is dissipated at the anodes of these valves. The loud-speakers are fed in parallel, through a number of separate circuits which supply the various parts of the Exhibition.

## The Model of Broadcasting House

The model of Broadcasting House, which is on view next to the B.B.C. amplifier equipment, is a sectional scale model of the new B.B.C. headquarters in Portland Place. On one side will be seen the exterior elevation of the building, on Portland Place. On the other, a section through the centre of the building, and a plan of the sub-basement showing the arrangement of the air-conditioning and ventilating equipment.

By studying this model it will be seen how every corner of this elaborate building has been utilised to full advantage.

Many listeners are often mystified as to what happens in the fraction of a second between the sound being picked up by the microphone in the studio and the reproduction of that same sound by their loud-speaker at home.

To try to put this extremely complicated procedure into as simple a form as possible, illustrated charts are on view, which show, both photographically and diagrammatically, the different stages through which the signals picked up by the microphone pass. One deals with "broadcasting," that is, the stages from microphone to transmitting aerial, the other with "reception," the stages between the listener's aerial and loud-speaker. Visitors studying this exhibit should begin at the left-hand side.

B.

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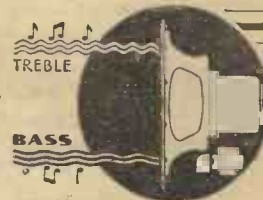
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## HOW THE PROBLEM OF SELECTIVITY IS BEING TACKLED

Some Notes on Filtering and Shaping Circuits—By MORTON BARR

CONDITIONS in the ether threaten to force the broadcast listener to adopt fresh standards of selectivity, particularly if the prevailing congestion continues to increase as time goes on. It will be no longer worth while trying to tune in this far-away station or that, when experience shows that the result amounts more often than not to very inferior quality on a background of mush.

Up to the present selectivity and sharp tuning have always gone hand in hand, in the sense that the more stations there are in operation the more highly resonant the receiving circuits must be in order to separate one programme from the other.

It is, however, possible to push this argument too far, because although a sharply tuned input is certainly effective

in shutting out interference, the point comes when the "entrance" to the set is made too narrow to admit the sidebands which carry the higher frequencies and overtones so essential to true reproduction.

There is not much advantage in robbing Peter to pay Paul, and once the struggle for selectivity reaches the point where quality is deliberately thrown overboard, it becomes profitable to look for other ways and means of solving the problem.

Amongst these is the so-called band-pass filter circuit, which may be inserted either between the aerial and the first valve, or as a coupling between the high-frequency stages, or may be used in both positions. Apart from its proved success in meeting the demand for selectivity with quality,

the band-pass circuit represents an interesting development in the art of tuning.

In the first place it may be classed as an anti-resonant circuit, in the sense that its response curve is flat-topped, as shown at A in Fig. 1, in contrast with the corresponding curve B of the sharply-tuned circuit, which has a narrow peak. One passes both the carrier wave and the essential side-bands, whilst the other strips most of the side-bands away.

If it was possible to design a perfectly resonant circuit it would respond only to one definite frequency, i.e. the carrier wave, so that progress in this direction leads to razor-edged selectivity with little or no quality. This conclusion is, however, subject to one important reservation, which is dealt with later.

On the other hand the perfectly designed band-coupling accepts a definite width of frequencies—say five kilocycles on each side of the carrier-wave—and gives an abrupt cut-off outside these limits; so as to cover the whole of the side-bands, whilst at the same time excluding any interfering

(Continued on page 388)

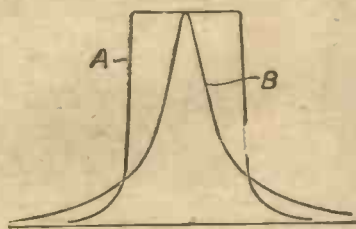


Fig. 1. Tuned circuit and band-pass coupling

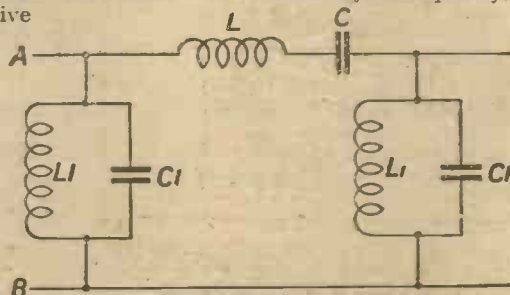


Fig. 2. Original Campbell filter unit

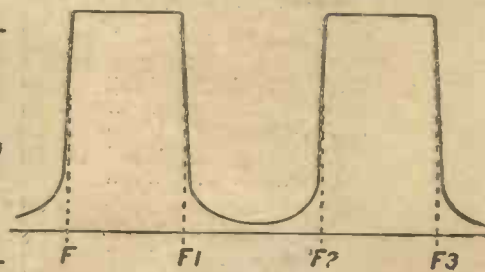


Fig. 3. Typical filter response

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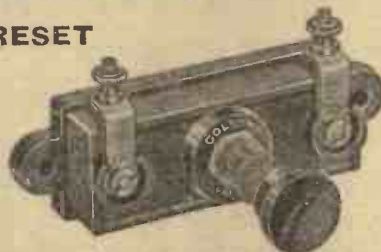
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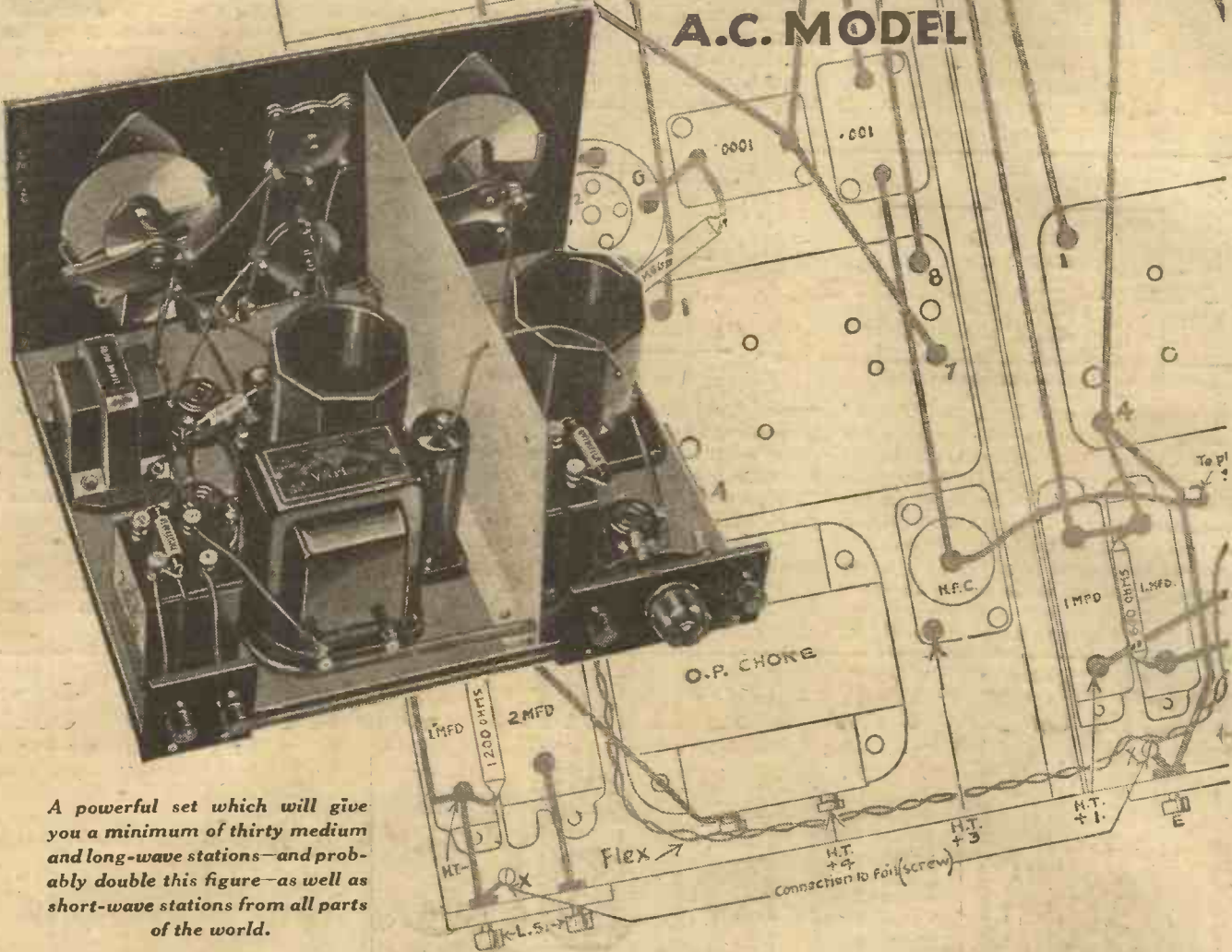
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# READY RADIO

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## "HOW THE PROBLEM OF SELECTIVITY IS BEING TACKLED"

(Continued from page 386)

signals. Progress in this direction therefore approaches one ideal of selectivity, namely, reception sufficiently sharp to separate stations operating within ten kilocycles of each other, without any sacrifice in quality.

The band-pass coupling is a development of the generalised filter circuit first produced by G. A. Campbell some twenty years ago. The principle involved is one of growing importance in wireless technique both on the high-frequency side and the low.

On the high-frequency side it is being

It consists of two leads A, B, having inductance  $L$  and capacity  $C$  in series, and inductances  $L_1$  and capacities  $C_1$  in shunt. The unit can be repeated, if necessary, to form an extended network. The larger the number of units used, the greater is the sharpness with which the network will separate one frequency from another.

The form of circuit shown in Fig. 2 will pass the two bands of frequencies, marked  $F_1$  and  $F_2$ , in Fig. 3, but will extinguish all frequencies outside these limits. By omitting the series inductance  $L$ , the two frequency-bands shown in Fig. 3 can be merged into a single band. This gives the

and get a high-pass filter, Fig. 6. This passes high-frequency currents through the condensers  $C$ , and drains away low-frequency currents through the inductances  $L_1$ .

Mention has been made of an alternative scheme for selective reception in which the high-frequency circuits are so sharply tuned that, without some form of correction or compensation, all pretence to quality would be lost. This razor-edge effect may be secured by the use of a piezo-electric gate, or by forcing reaction up to the threshold of self-oscillation.

A glance at Fig. 1 will show that the sharply-tuned response curve B, although it cuts away most of the side-band energy,

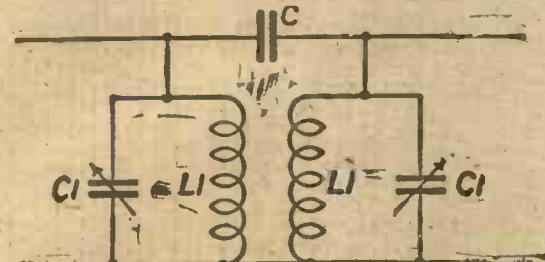


Fig. 4. Typical band-pass circuit

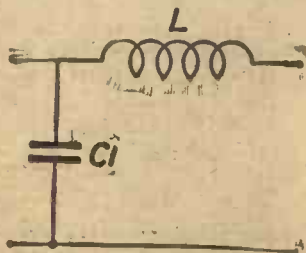


Fig. 5. Low-pass filter

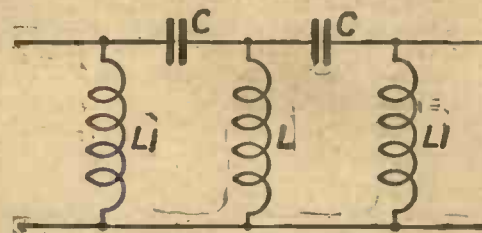


Fig. 6. High-pass filter

used, as already explained, to "shape" incoming signals into a flat-topped curve for subsequent rectification and reproduction; whilst on the low-frequency side the same principle is to be found in the tone-correcting or "shaping" circuits now being used in a certain type of receiver to restore notes that have been cut down below their normal value owing to over-sharp tuning.

The typical filter unit is shown by Fig. 2.

typical band-pass input, Fig. 4, as used in a broadcast receiver.

By omitting the series condenser  $C$  and the shunt inductance  $L_1$  in Fig. 4, the "band-pass" effect is reduced to zero, giving the well-known form of filter or smoothing circuit, Fig. 5, used to remove the ripple frequencies from a mains-supply unit.

By reversing the process and removing the series inductances  $L$  and the shunt capacities  $C$ , we go to the other extreme

by curtailing the amplitude of all frequencies outside the carrier-wave, does in fact gather in traces of all of them. The falling-off in amplitude becomes more pronounced the greater the distance from the centre.

Since the high musical notes are farthest removed from the carrier, they would in the ordinary way be excluded from the loud-speaker, so giving rise to pronounced gruffness.

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### Television Transmissions

**S**IR,—Recently I have experienced quite a peculiar kind of humming noise from my speaker when tuning in at odd times during the day and late at night. The noises sound very much like what I assume to be mains hum, but, as there is no sign of the noises being heard at any point on the tuning dials other than at one particular spot, I cannot bring myself to believe I am actually experiencing mains hum. Has anything happened recently to any transmissions which would account for these peculiar noises?—C. P. (Uxbridge).

The noises you are experiencing are the carrier and modulated waves of the vision-picture transmissions now being radiated by the B.B.C. The transmissions cannot be resolved into intelligent reception of pictures without a special television receiver. Your receiver is, no doubt, tuned to the London National station to pick up these sounds, and if you will tune to Midland Regional you will hear the normal transmissions which are coupled with the television broadcasts.—Ed.

### Wire-wound Resistances

**S**IR,—One of the H.T. positive points on my eliminator failed to work, and after testing by substitution I eventually found that this was due to the failure of the 40,000-ohm resistance. I sent it to the

makers, and they were good enough to send me another resistance free of charge.

In the second instance, a friend's set which I had made gradually deteriorated until it gave only a small volume of sound. I was put on the track of the defect by happening to touch two points in the set with two fingers, when the volume returned. At last I found that the 250,000 wire-wound resistance in the R.C. coupling stage was defective.

While I am writing, may I say how thoroughly I endorse the recent remarks by "Thermion," with regard to home constructors. Personally, I should decline a gift of the best ready-made set. I much prefer to construct my own.—R. W. R. (Rochester).

### Tone Controls for Two Speakers

**S**IR,—I have two speakers in use, one of which I occasionally take into the garden. When these two speakers are used together in the house they appear to give too much high-note response, but work quite well individually. Is there any way in which this effect can be reduced without impairing the general working of both?—G. W. (Hitchin).

The best course to follow is that of connecting a variable resistance of 15,000 ohms in series with a .01-microfarad fixed condenser and

arranging this in parallel with the terminals of one of the speakers. A similar arrangement may be employed across the terminals of each speaker, and by adjusting the variable resistance you will effectively control the pitch of reproduction from each speaker. The speakers must be connected together in series for this arrangement to be effective.—Ed.

### A Matter of Bass

**S**IR,—Commenting on the letter from "G.A. (Argyle)," complaining of insufficient bass, I suggest he concentrates on a first-class transformer as his chief expense. Ferranti AF3 or, better still, Ferranti AF5. There are many others less bulky if he desires. His loudspeaker need not be terribly expensive. A good four-pole cone mounted on an inch-thick box, 4 ft. square, 18 in. deep, open at the back, or alternatively mounted on a 9-ft. square baffle board, should, in conjunction with a real transformer, give him all he requires; top and speech particularly he may find superior to many cheap moving coils.—E. (Wimbledon).

### "Home-lover's All-electric Three" Motor-boating

**S**IR,—I have built the "Home-lover's All-electric Three" and am endeavouring to use a moving-coil speaker in place of the ordinary balanced-armature type you specify. It is in this respect that I believe I have gone wrong, for I get troublesome motor-boating and mains hum. When I put in a cone speaker from another set, my reception is all that one could wish. Will

(Continued on page 392)

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## “READERS’ IDEAS AND QUESTIONS”

(Continued from page 390)

you, therefore, explain why this trouble should occur and how it can be avoided?—F. W. (Kent).

Your moving-coil speaker, no doubt, has its own input transformer incorporated in its design. The D.C. resistance of the primary winding of this transformer is much less than that of the windings of an ordinary balanced-armature speaker, and consequently there is less voltage drop between the point of H.T. supply and the anode of the power valve. The latter tends to consume somewhat more anode current than is allowed for in the design of the receiver, and mains hum and other troubles result. We recommend you to introduce a power type voltage dropping resistance between the H.T. supply terminal and the H.T. terminal on the speaker transformer. One terminal of a 2-microfarad condenser should then be joined to this terminal of the speaker transformer and the other terminal of the condenser connected direct to the cathode or earth return circuit. A suitable value of power-type voltage dropping resistance will be 2,000 ohms.—Ed.

### YOU WILL BE THE JURY!

INCLUDED in the autumn talks are some very bright ideas. For example, on Saturday nights listeners will become a vast jury, deciding “cases” fought out by opposing Counsel before the microphone. After the Judge has done his summing up the verdict will be left to us. Although the cases will, of course, involve fictitious characters they will be based on real-life trials of the past.



ON September 7 a running commentary on the St. Leger, by Mr. R. C. Lyle, will be broadcast from the Town Moor racecourse, Doncaster, in the National programme.

A programme of Russian music, which includes items by prominent Russian composers such as Glazounov and Medtner, will be given by Edna Willoughby, on September 10.

Raymond Lilley will play violin solos in a concert by the Whitby Municipal Orchestra, which will be relayed to the Northern Region from the Spa at Whitby, on August 29.

### YOUR SHOW GUIDE

Last week's 116-page issue of “Amateur Wireless,” the first special Show Number, contained a complete review of the exhibits at Olympia, and if you are going to the Show you will find the issue an extremely helpful guide and a great time saver. If you cannot go to the Show then use your copy as an index to the new season's products. Visitors to Olympia should note that the “A.W.” Stand is No. 7, and that floor plans of the exhibition and a list of exhibitors are given in this week's issue on page 344.

In connection with the Three Choirs Festival, an orchestral concert will be relayed from the Public Hall, Worcester, on September 7 to the Midland Regional, when the London Symphony Orchestra will be conducted by Sir Ivor Atkins. An attractive programme includes William Walton's well-known piece, “Portsmouth Point.”

Listeners taking holidays in North Wales should tune in to a talk from Leeds, by Professor W. Sherard Vines, on August 29. Professor Vines will describe some books which would make topical reading for holiday-makers in North Wales.

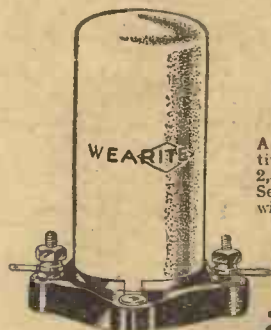
Non-stop variety will be outdistanced by a John Watt show which is to be broadcast Nationally on September 10. “Crescendo,” a vaudeville programme, will not even recognise the meaning of the word stop, for all the items, singers, dance bands, orchestra, organ, pianos, etc., will follow one another at breathless speed from beginning to end of the programme. There will be no announcements and everything will be done from one studio.

Vaudeville for London Regional listeners on September 3 will consist of the following turns: Len Fillis, Elizabeth Pollock, John C. Payne, Abie and Sandy, Esther Coleman, and Melville Gideon.

One of the most popular concert parties whose performances are relayed are “The Bouquets,” who appear each evening at the Spa Theatre in Scarborough. Listeners will be glad to know that they are to broadcast again on September 1.

# Additions to the comprehensive range of Wearite components

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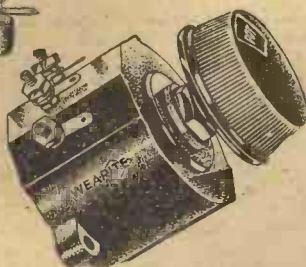


### THE H.F.P. H.F. CHOKE

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 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.



### PUSH-PULL SWITCHES

Operate on entirely new principle. “Snap” action, self cleaning.

The G.S.P. Type Price 1/-

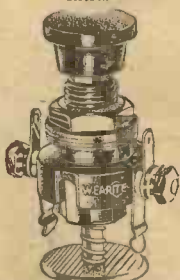
An “on-off” switch. Price 1/3

The G.W.C. Type

An efficient wave-change switch. Price 1/3

The G.C.O.

A “change-over” switch. Price 1/6



### 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.



Here are a few of the new products Wearite are showing at Olympia. The complete range exhibited covers every possible need of the constructor—and behind each individual product is the experience of years spent in the production of components sound in principle and construction. Examine these Wearite parts—and compare the workmanship.

● ASK ABOUT THE NEW WEARITE “STICK-ON” VARIABLE SELECTIVITY AERIAL LEAD-IN.

PRICE 1/-  
NO HOLES! NO TOOLS! FITS ANY WINDOW. SEE IT DEMONSTRATED.

### WEARITE COMPONENTS NEEDED FOR THE ADVANCE FOUR

	Price, each
Four 4-pin Valve Holders (S.1)	1/3
Two 50,000-ohm Variable Potentiometers (Q.V.C.)	4/6
One Rotary Switch, 4-pole (1.24)	4/6
Two 600-ohm Decoupling Resistances (D.R.)	1/-
Three 1,000-ohm Decoupling Resistances (D.R.)	1/-
Two H.F. Chokes (H.F.P.)	3/6

### for THE SHORT-WAVE THREE

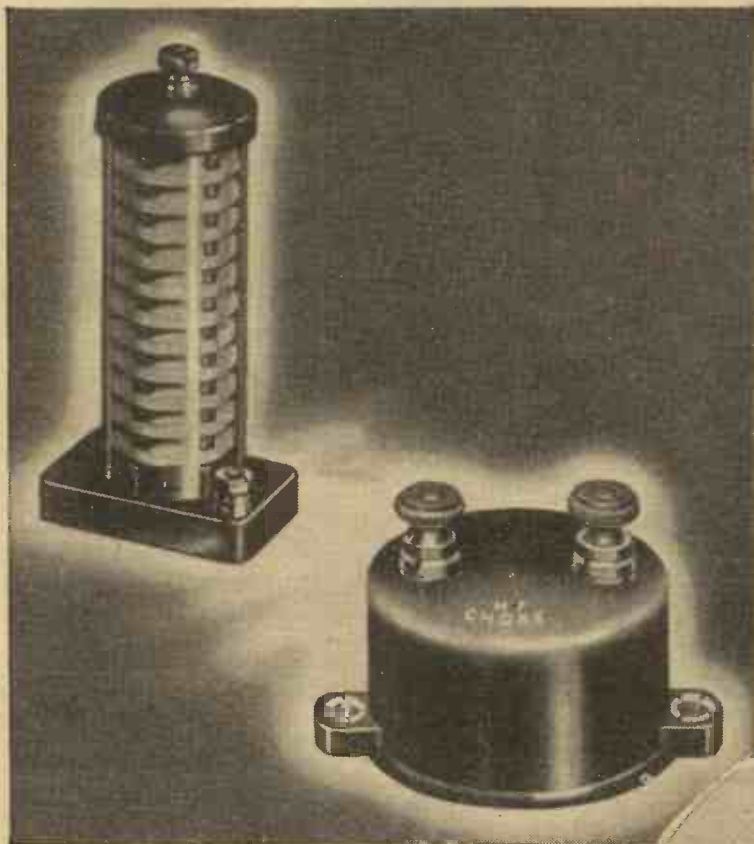
	Price, each
One “On-Off” Switch* (9 G.S.P.)	1/-
Three 4-pin Valve Holders (S.1)	1/3
One Short-wave Choke (H.F.3)	4/6

# WEARITE

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



# New S.G. & H.F. Chokes



## S.G. CHOKE

A new H.F. Choke specially designed for screened grid sets, and for use wherever a high efficiency choke is required. Highly efficient sectionalised windings almost entirely air-spaced and completely enclosed in a protective cover. Self capacity, D.C. resistance and losses are exceptionally low for a choke of such high inductance.

Price 5/6

## STANDARD H.F. CHOKE

A highly efficient general-purpose choke for use wherever a standard choke is recommended. Specially suitable for reaction purposes.

Price 1/6

The importance of using the correct chokes in modern circuits is fully explained in our new 36-page Book of ten Kendall-Price Circuits, published at 1/-

POST COUPON NOW AND WE WILL SEND YOU YOUR COPY FREE.



To: Ready Radio, Ltd., Eastnor House, Blackheath, S.E.3.

Please send me the Kendall-Price Book of ten circuits—free.

Name .....

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If you wish to have with your free book ten full-sized blueprints, enclose 1/- in stamps with this coupon.

A. W. 1c.

# READY RADIO

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



### "THE WORLD-RANGER SHORT-WAVE 3"

(Continued from page 343)

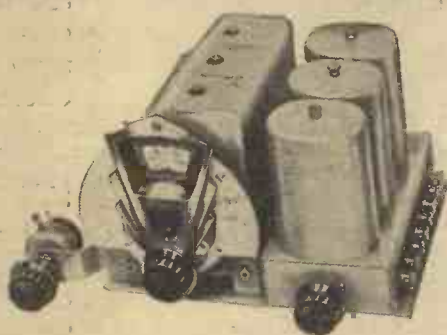
using the blueprint as a guide, forms one of the ends of the box-like formation. Do not, at this stage, mount the box to the panel for otherwise you will find it difficult to mount the reaction condenser and to wire up the triple-range coil. The first step should be to mount the two condensers, coil switch, and on-off switch on the panel. The coil and its associate three-position switch are mounted against the panel and secured by two bolts which pass through panel, switch, and coil. The other components are of the one-hole mounting variety. When you have mounted all these up firmly on the panel you can butt the baseboard box temporarily against it and see where a small part of the ply-wood top must be cut away to clear the fixed vanes of the reaction condenser. When this job has been done the box and panel can be screwed together. The box baseboard is an adequate support for the panel and no other means of strengthening, such as panel brackets, is necessary.

#### Completing the Wiring

Well now, with the panel components mounted, the main parts can be screwed to the baseboard and the wiring completed. The three valve holders, H.F. choke, potentiometer, series aerial condenser, low-frequency transformer, and decoupling condensers, should all be screwed down. As there is plenty of space to spare on the baseboard, there is no point in delaying the mounting of the parts until some of the

wiring is carried out. There are no special points to note about the spacing and the blueprint gives the layout in a very clear manner, so that you cannot possibly go wrong in the spacing of parts.

The wiring is just as easy. Rigid insulated wire is used for the major connections on the baseboard and the battery flex leads connect direct with their respective components. Wires pass through the baseboard to the coil and to one or two of the smaller parts. Drill these holes from underneath and push the wires up through the baseboard, the ends being later soldered to tags or clamped underneath the terminal heads. Further constructional details and operating notes for the finished set will be given in next week's issue.



One of the new Radiophone Radiopak units described on page 294 last week. The band-pass model is shown. It includes ganged coils, condensers, and all the H.F. components

### THE CLARION RANGE

FOUR receivers will comprise the Clarion programme for the coming season, although it is probable that other models will be added later. These range from the popular table consolette to the radio gramophone, which, by the way, is one of the first commercial receivers to incorporate the Garrard automatic record changer. All models are for use on A.C. mains only.

A thoroughly up-to-date four-valve circuit employing two variable-mu screen-grid stages, screen-grid detector, and power pentode output is used, and the moving-coil reproducer, which is built into the four models, is of the energised type. A valve rectifier is used for supplying high-tension current.

Provision is made for the use of a gramophone pick-up and external loud-speaker on the consolette model, which costs eighteen guineas. Several unique features are incorporated in the range, notably the method of tone control which enables the user to accentuate the top notes.

The cabinet work of the four models is very tasteful and conforms to the modern idea of simplicity. There are only three controls on the panel, the main-tuning control is in the centre with a clearly marked scale calibrated in wavelengths, the volume control on the left, and the combined wavechange and on-off switch on the right. No reaction is employed in the design of the set.

A representative of AMATEUR WIRELESS recently attended a demonstration of the British Clarion Company's sets and was impressed with their overall performance.

## QUALITY

is the

## MOTOR POLICY

Superior performance, and a high quality that will make you and your friends gasp with admiration—that is what MoTor has aimed at—and achieved, in the richness of tone, naturalness of speech, and unusual sensitivity of the MoTor Minor moving-coil speaker.

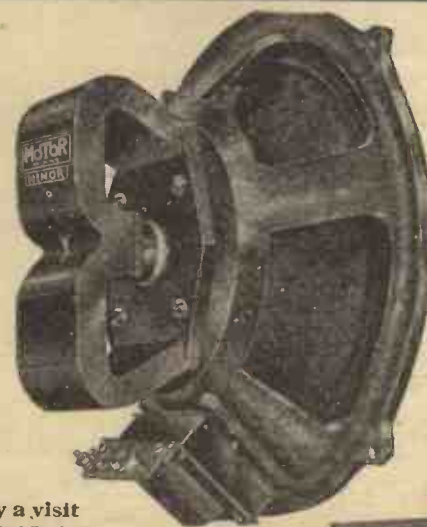
Make quality your policy too—pay a visit to our demonstration showrooms opposite Olympia and hear this and the full range of MoTor speakers under real working conditions. Then you will realise you don't need a new set—you just need a MoTor Minor.

**Demonstration Showrooms:**  
**67 HAMMERSMITH RD., W.14.**  
**OPPOSITE EMPIRE HALL**

(Open only during Radiolympia)

**TEKADE RADIO & ELECTRIC LTD.**  
**147, Farringdon Road, London, E.C.1**

Telephone: Clerkenwell 2426.



BRITISH  
MADE

### MoTor MINOR

Permanent Magnet  
MOVING COIL

Including transformer and  
baffle board

**39/6**

CHESTER. Handsome walnut  
cabinet incorporating MoTor  
Minor P.M. Moving Coil  
Speaker

**65/-**

MoTor Minor Unit in attrac-  
tive leatherette Baffle Case  
as shown below

**45/-**

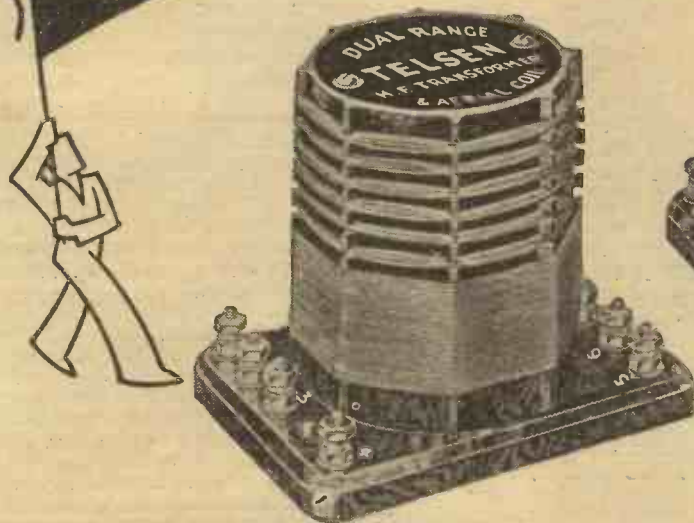


In moving coil and balanced  
armature type speakers  
MoTor is supreme. Write  
for fully descriptive pamph-  
lets to:



# TELSEN

## DUAL-RANGE AERIAL COILS



### THE TELSEN H.F. COIL

May be used for H.F. amplification with Screened Grid Valve, either as an H.F. Transformer or, alternatively, as a tuned grid or tuned anode coil. It also makes a highly efficient Aerial Coil where the adjustable selectivity feature is not required.

**5/6**

No. W.154



### TELSEN DUAL-RANGE AERIAL COIL

Incorporates a variable selectivity device, making the coil suitable for widely varying reception conditions. This adjustment also acts as an excellent volume control, and is equally effective on long and short waves. The wave-band change is effected by means of a three-point switch and a reaction winding is included.

No. W.76

**7/6**

### TELSEN COMBINED DUAL-RANGE SHORT-WAVE COIL UNIT

This unit for the first time brings the construction of short-wave receivers into line with the simplicity of modern practice. When tuned by a Telsen .00025 Condenser, a wave range of 20 to 80 metres can be covered by the operation of a switch, as in ordinary broadcast practice. The unit incorporates windings for aerial, tuning and reaction circuits, all coils being wound with stranded wire. The coil is also suitable for use with sets covering all wave bands with a .0005 Tuning Condenser. In this case the dual-range feature is not employed.

No. W.174

**4/6**



# TELSEN

**RADIO COMPONENTS**

**GOOD RADIO IS A JOY FOREVER**

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

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



## THE LOTUS S.G.4 PORTABLE



Ready for use  
the Lotus S.G.4  
portable set

ONE of the new Lotus sets is the type S.G. 4 Portable, a remarkably low-priced suit-case type of set, which is equally suitable for indoor and outdoor use.

The circuit is of the straightforward screened-grid detector, L.F., and power type, and the tuning control is extremely simple. The lid of the set carrying the speaker and frame aerial opens, disclosing the control panel. This carries a combined wave-change and on-off switch, and a

reaction volume control. A simple thumb operated tuning control drives the two tuning condensers and the scales are graduated direct in wavelengths, which greatly simplifies station searching.

Owing to the efficient screen-grid coupling the selectivity is of a very high order and National and Regional can easily be separated within one mile of the transmitters.

The components on the set chassis are adequately supported so that the receiver can withstand repeated vibration, and a twelve months' guarantee is an additional protection for the set-user.

The circuit is economical in its H.T. demands and the battery compartment, which is enclosed by a lid held on with four thumbscrews, contains a Drydex power-type battery and an Exide unspillable accumulator. The speaker is a Celestion balanced-armature instrument and the tone is natural without being boomy.

The whole set is enclosed in a grained rexine case, with a flat sprung handle, and is quite light in weight.

The price of the set ready for immediate use is twelve guineas, but it can be obtained on deferred payment terms of 23s. 8d. and eleven monthly payments for the same amount.

Full details can be obtained free on mention of AMATEUR WIRELESS from Lotus Radio, Ltd., Lotus Works, Mill Lane, Liverpool.

The first act of Robert Sherwood's play, *The Road to Rome*, in the Midland Regional programme will be broadcast from the Birmingham Repertory Theatre on September 6.

The weekly Welsh Interlude, on September 7, will be given by Mr. D. G. Evans, who will tell listeners of the Swansea Valley dialect.

Mrs. Dora Herbert Jones will give the Welsh Interlude in the Daventry National and West Regional programme on September 10.

On August 28, North Regional listeners will hear a concert by the Northern Studio Orchestra, directed by John Bridge, with Irene Crowther, pianoforte, as soloist.

"Amateur Wireless and Radiovision." Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd."

General Correspondence is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets. Contributions are always welcome, will be promptly considered, and if used will be paid for. Communications should be addressed, according to their nature, to The Editor, The Advertisement Manager, or The Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4.

**YOU ONLY NEED TO HEAR KENWELL POWER-PACK**

**MODEL A.C.U. £8.15.0 H.T. L.T. G.B. AND MOVING COIL SPEAKER**

**EVERY BATTERY MAN CUTS COSTS AND CUSSING WITH THIS COMPLETE MAINS UNIT AND MOVING COIL SPEAKER**

"It's a braw Set—  
ye Ken."—  
McQuality

### Turn your Battery Set into an ALL-MAINS MOVING COIL SET!

Hundreds of Battery Set users who visited our Stand at Radiolympia discovered that the Kenwell Power Pack was just the unit they required to bring their Set up-to-date.

And then—it is so economical in current consumption that its complete cost can be written off out of savings in the first 18 months!

### DON'T SCRAP YOUR BATTERY SET

—it has always been a good friend to you. Ask your Dealer to show you how simple it is with the Kenwell Power Pack to plug into the nearest mains socket and put all dry battery troubles behind you for good!

Listen to the magnificent tone of the Moving-Coil Speaker and you will agree it makes your old Set as good as anything at Radiolympia.

Your Dealer can supply—or write now for illustrated folder describing this money-saving and efficient Power Pack.

#### SPECIFICATION OF AC/U MODEL

H.T. 80 v. and 150 v. (fixed) 0-100 v. (variable) 25 m/a.  
L.T. Trickle Charger at .25 amp.  
G.B. 5 Tappings: 1½, 3, 4½, 9, and 15 v.  
Mains energised moving-coil speaker.  
Price £8 15s. 0d. Other models on request.

**KENWELL RADIO, LTD.**  
200 CITY ROAD, LONDON, E.C.1

**See it—Hear it—and KNOW!**



# TELSEN

## MANSBRIDGE AND MICA

# CONDENSERS

### TELSEN MANSBRIDGE TYPE CONDENSERS

These are made by the most advanced processes from the finest materials it is possible to obtain, and subjected during manufacture to a series of stringent tests under laboratory conditions. They are of the true Mansbridge type, self-sealing, non-inductive, and hermetically sealed. They are offered in two types, the capacities from .01 to 2 microfarad in Bakelite cases, and in blocks of 4, 6 and 8 microfarad in metal cases with soldering tags.

Cap.	500 Volt Test	1,000 Volt Test
Mfd.	No. Price.	No. Price.
.01	W.232 1/6	W.239 2/6
.04	W.230 1/9	W.237 2/9
.1	W.231 1/9	W.238 2/9
.25	W.229 2/-	W.236 3/-
.5	W.228 2/3	W.235 3/3
1	W.227 2/3	W.234 3/6
2	W.226 3/-	W.233 5/-

### TELSEN MANSBRIDGE BLOCK CONDENSERS

These are contained in metal cases finished in brown and with fixing holes. As with the other types of Telsen Mansbridge Condensers they are self-sealing, non-inductive and hermetically sealed. Three types, each made having total capacities of 4, 6 and 8 microfarads, each type being divided into 2 microfarad sections, so that several arrangements of capacity may be obtained. Neat and substantial soldering tags are provided for each section.

Cap.	500 Volt Test
Mfd.	Cat. No. Price.
4	W.175 5/6
6	W.176 8/-
8	W.177 10/6

1,000 Volt Test
Cat. No. Price.
W.178 9/6
W.179 14/6

### TELSEN TAG CONDENSERS

This type is of extremely compact and sturdy construction. It may be mounted on either insulated or metal panels by utilising the two baseboard screw holes in the neatly designed moulded casing. The tags enable the condenser to be connected to any other component either directly or by soldering. H.F. losses are negligible. The capacity is stamped on the soldering tag.

Capacity.	No.
.0001	W.207
.0002	W.208
.0003	W.209
.0004	W.210
.0005	W.211
.001	W.212
.002	W.213

### TELSEN "MICA" CONDENSERS

The new Telsen "Mica" Condensers represent an important advance in technique: H.F. losses have been practically eliminated even in the larger capacities. In order to distinguish them from the earlier type, now to be discontinued, the new condensers are enclosed in a re-designed case which, while possessing all the adaptability of the previous one as to flat and vertical mounting, is of more attractive appearance. Grid leak clips may, as heretofore, be mounted in series or in shunt, and are supplied at no extra charge with capacities .0001, .0002, and .0003 microfarad.

Cap. Mfd.	No.
.0001	W.240
.0002	W.241
.0003	W.242
.0004	W.243
.0005	W.244
.001	W.245
.002	W.246

.006 W.247 ... 1/3

### TELSEN PRE-SET CONDENSERS

Very low minimum capacity, giving a wide range of selectivity adjustment when used in aerial circuit. Substantially made, easily adjusted and provided with locking ring. High insulation and low loss.

Max. Cap.	Min. Cap.	No.
Mfd.	Mfd.	
.002	.00025	W.149
.001	.000052	W.150
.0003	.000016	W.151
.0001	.000005	W.152

1/6

# TELSEN

RADIO COMPONENTS

## GOOD RADIO IS A JOY FOREVER

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

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# P.P.M. SOUNDEX



## 27/6

INCLUDING TRANSFORMER

### The Talk of Olympia

Wherever a group of men meet at Olympia you will hear them discussing Celestion's latest achievement—the wonderful P.P.M. SOUNDEX—it's the talk of Olympia—everyone agrees that the extraordinary power and tonal quality is really amazing and considering the small size it is beyond belief. If you come to Olympia hear it in the Celestion demonstration room No. 9, or ask your dealer to demonstrate. Insist on the Celestion P.P.M.—it will amaze you.

**OLYMPIA**

Stand No. 127

Demonstration Room  
No. 9

# CELESTION

*The Very Soul of Music*

Celestion Ltd., London Road, KINGSTON-ON-THAMES. London Showrooms: 108 Victoria Street, S.W.1

## BROADCASTING STATIONS

Broadcasting Stations classified by country and in order of wavelengths. For the purpose of better comparison, the power indicated is that of the carrier wave.

Kilo- Metres	cycles	Station and Call Sign	Power (Kw.)	Kilo- Metres	cycles	Station and Call Sign	Power (Kw.)	Kilo- Metres	cycles	Station and Call Sign	Power (Kw.)
<b>GREAT BRITAIN</b>				<b>GERMANY</b>				<b>NORWAY</b>			
25.53	11,751	Chelmsford	16.0	268.4	812	Radio L.L. (Paris)	1.0	235.5	1,274	Kristiansand	0.5
		(G&SW)				also on 33 m. (9090 Kcs.)		240	1,249.7	Stavanger	0.5
211.3	1,420	Newcastle	1.0	384.4	779	Radio Toulouse	60.0	364	824	Bergen	0.7
214.3	1,400	Aberdeen	1.0	447.1	671	Paris (PTT)	6.0	387.6	816	Fredrikstad	1.0
243.1	1,233.9	Belfast	1.0	455	659	Radio Agen	0.5	493.4	608	Trondheim	1.2
261.6	1,147	London National	50.0	465.8	644	Lyons (PTT)	1.5	1,083	277	Oslo	60.0
283.5	1,040	Swansea	0.12	568.5	527.7	Grenoble (PTT)	2.0	<b>POLAND</b>			
288.5	1,040	Plymouth	0.12	1,445.7	207.5	Eiffel Tower	13.5	214.3	1,400	Warsaw (2)	1.9
288.5	1,040	Bournemouth	1.0	1,725	174	Radio Paris	75.0	235	1,283	Lodz	2.2
288.5	1,040	Scottish National	50.0	<b>GRAND DUCHY OF LUXEMBURG</b>				312.8	959	Cracow	1.5
301.5	995	North National	50.0	1,250	240	Luxembourg	(tests) 200.0	335	896	Poznan	1.9
309.9	968	Cardiff	1.0	<b>GERMANY</b>				380.7	788	Lvov	16.0
355.9	843	London Regional	50.0	19 737	15,200	Zeesen (DJB)	8.0	408	734	Katowice	12.0
376.4	797	Scottish Regional	50.0	31 38	9,560	Zeesen (DJA)	8.0	563	531	Wilno	16.0
398.9	752	Midland Regional	25.0	217	1,382	Königsberg	0.9	1,411.8	212.5	Warsaw	120.0
480	625	North Regional	50.0	227.4	1,319	Flensburg	0.5	<b>PORTUGAL</b>			
1,554.4	193	Daventry (Nat.)	30.0	232.2	1,292	Kiel	0.25	241.6	1,241.8	Oporto	0.25
<b>AUSTRIA</b>				238.9	1,256	Nürnberg	2.0	282.2	1,063	Lisbon (CTIAA)	2.0
218	1,373	Salzburg	0.5	245.9	1,220	Cassel	0.25	<b>ROMANIA</b>			
245.9	1,220	Linzi	0.5	253.1	1,185	Gleiwitz	5.0	304	761	Bucharest	12.0
283	1,058	Innsbruck	0.5	259.3	1,157	Leipzig	2.0	<b>RUSSIA</b>			
352.1	852	Graz	7.0	289.8	1,112	Bremen	0.2	351	855.5	Leningrad (RV70)	20.0
453.2	662	Klagenfurt	0.5	270.5	1,085	Heilsberg	60.0	358	838	Moscow (Exp.)	15.0
518	579.1	Vienna	15.0	283.0	1,058	Magdeburg	0.5	385	779	Stalino (RV20)	15.0
<b>BELGIUM</b>				283.9	1,058	Stettin	0.5	389.6	770	Archangel	10.0
207.3	1,447	Franchimont	0.2	318.8	941	Dresden	0.25	476	630.2	Sebastopol	10.0
208.3	1,440	Antwerp	0.4	325	923	Breslau	60.0	502.4	579	Nijni Novgorod	10.0
210.1	1,428	Liege (Seraing)	0.15	360.6	832	Muhlacker	60.0	644	465.8	Kazan (RV17)	10.0
215.3	1,393	Chatelineau	0.2	372.2	806	Hamburg	1.5	720	416.6	Moscow (PTT)	20.0
215.4	1,392.5	Bruxelles		389.6	770	Frankfurt	1.5	825	363.6	Sverdlovsk (RV5)	50.0
		Conference	0.2	419.9	716	Leipzig (testing)	120.0	848.7	353.5	Rostov (Don)	20.0
215.5	1,392	Liege	0.1	453.2	662	Danzig	1.5	882	340	Saratov	20.0
230.3	1,304	Radio Wallonia	0.3	472.4	635	Langenberg	60.0	937.5	320	Kharkov (RV4)	25.0
239.5	1,258	Binche	0.3	532.9	563	Munich	1.5	1,007.7	310	Alma Ata	10.0
240.2	1,249	Liege (Exp.)	0.1	559.7	536	Kaiserslautern	1.5	1,000	300	Leningrad	100.0
245.9	1,220	Radio Schaarbeek	0.3	559.7	536	Augsburg	0.3	1,034	290	Kiev	100.0
268.5	1,117	Liege (Cointe)	0.4	560	530	Hanover	0.3	1,071.2	280	Tiflis (RV7)	100.0
337.8	888	Brussels (No. 2)	15.0	569.3	527	Freiburg	0.25	1,106	271.2	Minsk (RV10)	35.0
609	590	Brussels (No. 1)	15.0	1,020	185	Norddeich KVA	10.0	1,116	268.5	Moscow Popoff	75.0
<b>BULGARIA</b>				1,634.9	182.5	Zeesen	60.0	1,171.5	256	Tashkent	25.0
318.8	941	Sofia	1.0	2,525	119.3	Königswuster-		1,260	278	Bakou	35.0
		(Rodno Radio)		2,900	108.5	Hausen (press)	15.0	1,304	230	Moscow (Trades Unions)	165.0
<b>CZECHO-SLOVAKIA</b>				4,000	75	ditto		<b>SPAIN</b>			
58	5,172	Prague	0.5	<b>HOLLAND</b>				252.3	1,193	Barcelona (EAJ15)	6.0
249.6	1,201.8	Prague (2)	5.0	296.1	1,013	Huizen	8.5	276.6	1,121	Valencia	8.0
263.8	1,137	Moravska		1,071.4	280	Scheveningen-		348.9	860	Barcelona (EAJ1)	8.0
		Ostrava	11.0			Haven	10.0	368.1	815	Seville (EAJ5)	1.5
279.3	1,073.6	Bratislava	14.0	1,875	160	Hilversum	8.5	411.2	729	Madrid (EAJ7)	2.0
293	1,022	Kosice	2.5	<b>HUNGARY</b>				424.3	707	Madrid (Espana)	2.0
341.7	878	Brunn (Bruno)	35.0	208.5	1,438.4	Budapest (2)	3.0	456.6	557	San Sebastian	0.6
488.6	614	Prague	120.0	210	1,430	Magyazovar	1.5	<b>SWEDEN</b>			
<b>DENMARK</b>				550	545	Budapest (1)	18.5	231	1,301	Malmö	1.2
281	1,067	Copenhagen	0.75	<b>ICELAND</b>				257	1,166	Hörby	10.0
1,153	260	Kalundborg	7.5	1,200	250	Reykjavik	21.0	308.5	972.4	Falun	0.5
<b>ESTONIA</b>				<b>IRISH FREE STATE</b>				321.9	932	Göteborg	10.0
208.8	1,004	Tallinn	11.0	222.9	1,344.6	Cork (6CK)	1.2	435.4	689	Stockholm	55.0
465.8	644	Tartu	0.5	416.2	1,200.7	Dublin	1.2	541.5	554	Sundsvall	10.0
<b>FINLAND</b>				413	725	Athlone (tests)	60.0	770	389	Ostersund	0.6
291	1,031	Tampere	1.0	<b>ITALY</b>				1,229.5	244	Boden	0.6
291	1,031	Vihuri	13.0	25.4	11,870	Rome (2RO)	15.0	1,348	222.5	Moitais	30.0
368.1	815	Helsinki	13.2	247.7	1,211	Trieste	10.0	<b>SWITZERLAND</b>			
1,796	167	Lahti	54.0	269.2	1,115	Bari (testing)	20.0	244.1	1,229	Basle	0.65
<b>FRANCE</b>				273.7	1,096	Turin (Torino)	7.0	245.9	1,220	Berne	0.5
220	1,363.2	Béziers	0.5	312.8	959	Genoa (Genova)	10.0	403	743	Söfens	25.0
226.8	1,324	Fécamp	10.0	318.8	941	Naples (Napoli)	1.5	459.4	653	Beromünster	00.0
237.2	1,265	Bordeaux		332.1	903	Milan	7.0	700	395	Geneva	1.25
		Sud-Ouest	2.0	368.1	815	Bolzano	1.0	<b>TURKEY</b>			
249.5	1,202.4	Juan-les-Pins	0.5	441	680	Rome (Roma)	50.0	1,230	250	Istanbul	5.0
255	1,175	Toulouse (PTT)	1.0	509.8	599	Florence (Firenze)	20.0	1,538	295	Ankara	7.0
265.4	1,130	Lille (PTT)	1.3	625.3	571	Palermo	3.0	<b>YUGOSLAVIA</b>			
271.4	1,105	Renues	1.3	<b>LATVIA</b>				307	977	Zagreb (Agram)	0.75
286	1,049.1	Montpellier	0.8	198.5	1,570.1	Riga (test)	16.0	430.4	697	Belgrade	2.5
291.7	1,028	Radio Lyons	10.0	525	575	Riga	15.0	574.7	522	Ljubljana	5.2
293.7	1,021.5	Limoges (PTT)	0.5	<b>LITHUANIA</b>							
304.9	984	Bordeaux (PTT)	13.0	1,935	155	Kaunas	7.0				
309.9	968	Radio Vitus	1.0	<b>NORTH AFRICA</b>							
		(also on 43.75 m. (6,865 Kcs.))		303.3	825.3	Algiers (PTT)	16.0				
315	950	Marseilles	1.6	419	715.9	Radio Maroc					
328.2	914	Poste Parisien	60.0			(Rabat)	6.0				
345.2	869	Strasbourg (PTT)	11.5			and 32.26 m. (9,309 Kcs.)					

### WHEN SUBMITTING QUERIES . . . .

Please write concisely, giving essential particulars. A Fee of One Shilling (postal order), stamped addressed envelope, and the coupon on the last page must accompany all letters. The following points should be noted.

Not more than two questions should be sent with any one letter.

The designing of apparatus or receivers cannot be undertaken.

Modifications of a straightforward nature can be made to blueprints, but we reserve to ourselves the right to determine the extent of an alteration to come within the scope of a query. Modifications

to proprietary receivers and designs published by contemporary journals cannot be undertaken.

Readers' sets and components cannot be tested at this office. Readers desiring specific information upon any problem should not ask for it to be published in a forthcoming issue, as only queries of general interest are published and these only at our discretion. Queries cannot be answered by telephone or personally.

Readers ordering blueprints and requiring technical information in addition, should address a separate letter to the Query Department and conform with the rules.

The seventh of the series of Facet programmes will be given on September 6, under the title of "The Worm Turns." To illustrate revolt in three different spheres, excerpts have been chosen from modern plays: In Business, by Scene 4 from "The Adding Machine," by Elmer Rice; In Youth, by Act 1 of "The Ship," by St. John Ervine; and In Family Life, by Act 2 of "The Breadwinner," by Somerset Maugham.

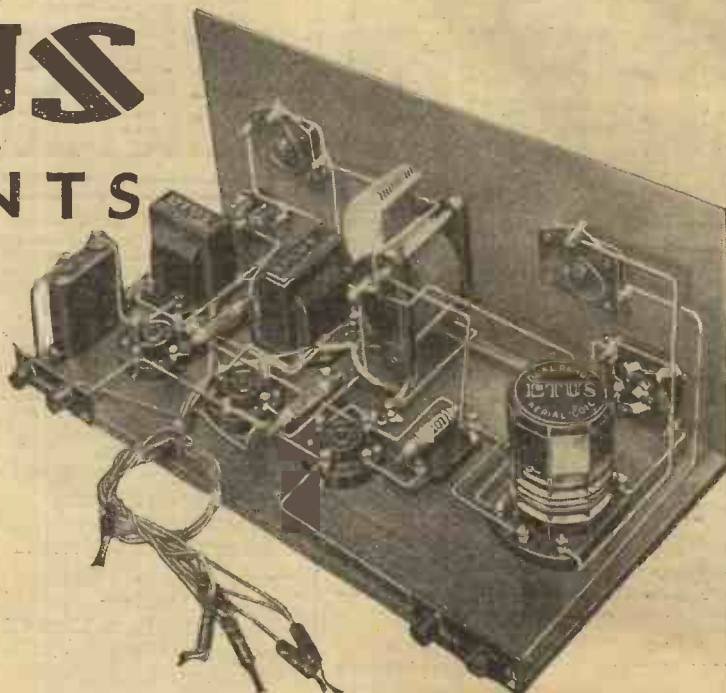


# NO GUESSWORK WITH LOTUS COMPONENTS

With the aid of the simple point-to-point wiring chart and full-size print, anyone can construct the LOTUS LANDMARK THREE in an hour or so, and, in addition to being easy to construct, the LOTUS LANDMARK THREE has been designed for easy tuning. It is very compact and includes the world-famous LOTUS Components, which, for many years, have been acknowledged as unequalled for efficiency and reliability, every one being GUARANTEED. By following the simple instructions supplied you will be able to enjoy the pick of the British and Continental broadcasts on a set you have built yourself.

## LANDMARK 3 KIT SET 39'6

Send the coupon below, to-day, for full particulars and FREE blueprint of the amazing LOTUS LANDMARK THREE.



## LOTUS GUARANTEED COMPONENTS

All the components in the "Landmark 3" Kit Set are obtainable separately, in addition to a big range of other components available. All are of the famous Lotus "Guaranteed" standard of quality and efficiency.

Here are a few of them:—

D.R.60 H.F. Coil	5/6	Slow-Motion	
D.R.50 Aerial		Condenser	6/6
Coil	5/6	Direct Drive	
2-gang Condenser	19/9	Condenser	3/6
3-gang Condenser	29/6	Differential	
Output Choke	5/6	Condenser	4/6
R.F. Choke	2/6	Reaction	
L.F. Transformer		Condenser	4/-
No. 1	5/6	Disc Drive	5/-
L.F. Transformer		Universal Switch	1/6
No. 2	7/6	Valve Holders,	
A.F. Power		from	6d.
Choke	15/-	Jack Switch JS8	
		from	1/6



Please send FREE wiring diagram of "Landmark 3," and full list of Lotus guaranteed components. (N.B.—If you also require your copy of "Choosing a Wireless Set," enclose 3d. in stamp.)

Name.....

Address.....

**LOTUS RADIO LTD.**

**MILL LANE - LIVERPOOL**



# FREE! RESISTANCE CALCULATION CHART STAND 273

When visiting our Stand ask for a free copy of the *Watmel* Resistance Calculation Chart.

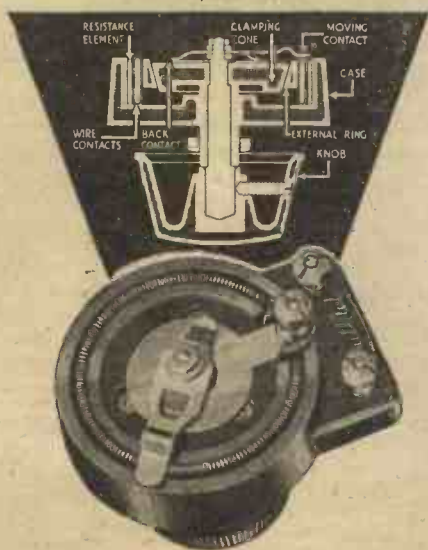
## WATMEL POTENTIOMETERS AND RESISTANCES

The 1932-33 Series of Watmel Potentiometers and Resistances will also be on view and we should like you to see the novel and advanced ideas used in the construction of our Type 3 Non-Inductive Resistance.

This new All-British Resistance is guaranteed to give a far steadier performance than resistances constructed on old and obsolete principles.

Price 4/6

Trade Enquiries invited.



Don't forget **STAND 273**

**Watmel**  
COMPONENTS  
GET THE BEST OUT OF ANY SET

WATMEL WIRELESS CO., LTD.,  
Imperial Works, HIGH STREET, EDGWARE,  
Telephone: Edgware 0323

M.C.70

# Postcard Radio Literature

## GET THESE CATALOGUES FREE

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them **FREE OF CHARGE**, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," "AMATEUR WIRELESS," 58/61, Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire. Please write your name and address in block letters.

### Ekco Consolettes

THERE are four consolettes in the new Ekco range—combined sets and speakers working direct from the mains. One of these is a super-hot, and interesting details of all models are given in the new Ekco folder.

818

### For Set Builders

Handy terminal blocks have just been produced by Ward & Goldstone. They have many advantages over existing types and I advise set builders to get details of these and the other new parts for set construction.

819

### Telsen Sets

Apart from a wide range of new components, Telsen have some fine new kit sets. Full details are available free through my Catalogue Service.

820

### Parafeed and Antinodal

The Parafeed coupling units and Antinodal short-wave adaptors produced by R.I. will interest set builders. Why not put your name down now on the Free Mailing List for details of these and other new R.I. products?

821

### Igranic Details

Pentode and output chokes, variable condensers and screened dual-wave coils are among the new Igranic parts, while the Igranic permanent-magnet moving-coil speaker just introduced will interest all set users. Full technical details are given in new Igranic literature.

822

### A Westinghouse Photo Cell

An inexpensive photo cell has just been produced by Westinghouse. This new cell, the type PA1, costs only £2, and I am sure it will appeal to television and home-talkie enthusiasts. A new folder describes it and its applications.

823

### New Belling-Lee Parts

You will find some interesting new components in the Belling-Lee range, new anode connectors, twin socket strip wander fuses, panel-mounting fuse holders, and so on. Get your name put down through my Catalogue Service for the latest literature so soon as it is available.

824

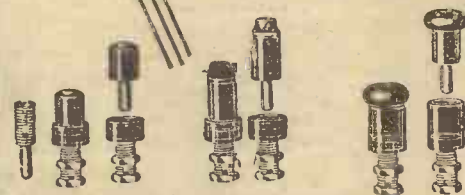
### Bryce Mains Transformers

If you are contemplating making up any mains-drive apparatus, you should get the new Bryce catalogue which describes a wide range of mains transformers and smoothing chokes.

OBSERVER. 825



The successes that Ealex products have gained in the wireless industry prove without a doubt that for absolute reliability you cannot do better than insist upon components and accessories bearing the name Ealex.



### ALL-MAINS PLUGS AND SOCKETS

2 DM Type S. 2 DW Type S. MPS Type.

Types 2 DWS and 2 DMS in six colours.

Plugs, 2d. Sockets, 2d.

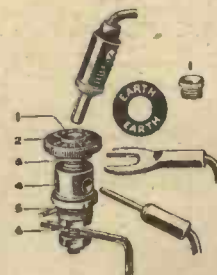
Series MPS in red and black only.

Plugs, 4d. Sockets, 2d.

### EALEX TESTING PRODS

For looking for faults in your set without the danger of shorting or burning out valves, a pair of Ealex Testing Prods are invaluable—the connecting points are enclosed in red and black insulated handles and only come into operation when required.

Price per pair, 3/6.



### EALEX TREBLE-DUTY TERMINAL

The new and improved Ealex Treble-Duty Terminal will be found to be very useful in any home-constructed set. 40 different indicating tops all interchangeable and supplied—the head cannot come off. This terminal can take three different connections. Price 4½d. each

Write for List B23

J. J. EASTICK & SONS,

Ealex House,

118 Bunhill Row,

LONDON : : E.C.1

Phone: Metropolitan 0314/5/6-





WHERE  
COMPACTNESS,  
EFFICIENCY and  
PRICE COUNT . . .  
USE

# DUBILIER

**TYPES 665 and 670  
CONDENSERS**

In every respect—save size and price—Dubilier type 665 and 670 are big condensers. The same high-grade materials, the same irreproachable finish and workmanship, the same exhaustive testing are all features of the 665's and 670's just as they are the characteristics of the more bulky Dubilier Condenser. The Type 665 and 670 are designed to fill the bill where chassis space is at a premium, where smallness of size must go with efficiency and utter dependability.

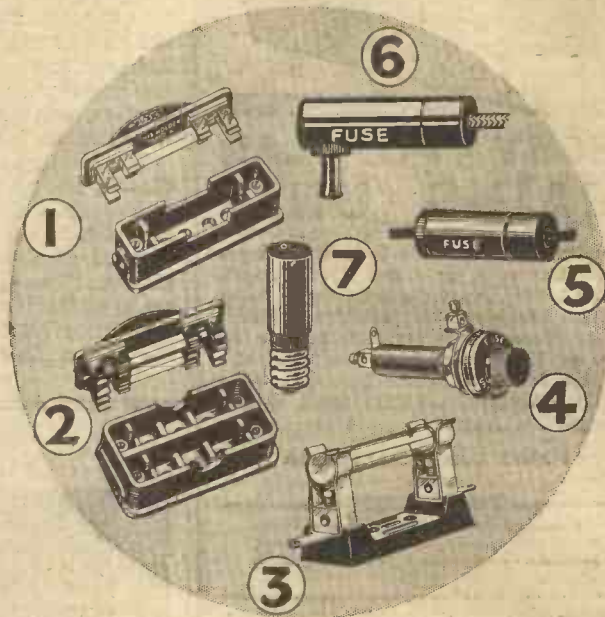


Dubilier type 665 and 670 condensers are available in all popular capacities at prices ranging from 6d. to 1/6.



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

## FUSE HOLDERS Programme 1932-33



- 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 WANDER FUSE. With 150 m/a. fuse . . . 1/-
- 7 "SCRUFUSE," Not bulb, not cartridge, yet both! . . . 6d.

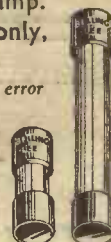
5 different colour-coded ratings 60 to 750 m/a.

### SPARE FUSES (shown actual size)

LONG FUSE. All ratings, 60, 150, 250, 500, 750 m/a., 1 amp., 2 amp., 3 amp.  
SHORT FUSE. For WANDER-FUSE only, 60 and 150 m/a.

Each rating a different colour avoiding possibility of error

Dealers will fit other ratings in any of these holders at the time of purchase.



Advert. of Belling & Lee Ltd., Cambridge Arterial Road, Enfield, Middlesex.

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



## STAND 13



## OLYMPIA'S MOST POPULAR MAINS UNIT

Heyberd's latest Mains Unit is proving a great attraction at Stand 13, Olympia, where a selection of the last thing in Radio Mains Equipment is exhibited. Model D.120 Mains Unit is especially suitable for two or three valve Receivers. Output: 20 m.a. at 120 v. Three tappings: S.G., 60/120 v. Var., 100 and 120 v. fixed. Trickle Charger 2 v. .3 amp.

Price 85/- Complete

—POST NOW—

I enclose 3d. stamps for latest Catalogue of Radio Mains Equipment, packed with technical tips and diagrams.

M.....

Address.....

..... A.W.27

# HEYBERD

MONARCH OF THE MAINS.

10 Finsbury St., London, E.C.2

(One minute from Moorgate Station)

We undertake to solve all Radio Problems, including S/W Transmission and Reception. Whatever your difficulty, write us.

Charges: 3/- per query, four or more 2/6 each, including diagrams.

**RADIO TECHNICAL AGENCY,**  
(Dept. A.W.) 2 Westgate Chambers, Newport, Mon.

### NEW EPOCH SPEAKERS

THREE interesting new permanent-magnet speakers and a mains-driven set in a console type of cabinet are produced by the Epoch Radio Manufacturing Co., Ltd., for the new season. The permanent-magnet speakers have integral tapped input transformers, matching up the speaker with the output stage. The popular A2 model has been increased in sensitivity by about 100 per cent., and the sturdy chassis and large-magnet dimensions of the A2 and of the other models ensure long life.

The new Epoch set is built up on a metal chassis, has completely screened coils and condensers and has the tuning control calibrated in wavelengths. A speaker is fitted integral with the set and above the set chassis. The appearance of the complete set is strikingly modern and sets quite a new line in cabinet design.

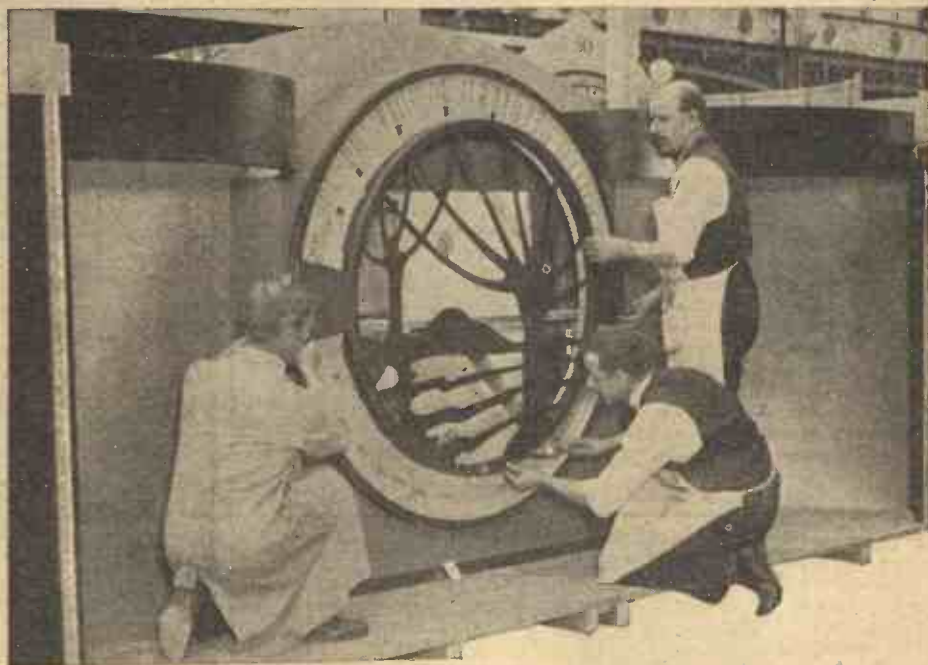
Full details of these new Epoch pro-

ductions can be obtained from the Epoch Radio Manufacturing Co., Ltd., of Exmouth House, Exmouth Street, London, E.C.1.

AN interesting exhibit at Olympia is the model studio in the Exhibition Buildings put up by Messrs. E. K. Cole, Ltd., for demonstrating new Ekco sets. Prominent B.B.C. artistes will give performances several times daily and immediately afterwards records of these items will be played through the new Ekco all-electric sets, so that the public can judge the good quality of reproduction.

It is understood that this is the first time that direct comparison between reproduction and the performance of a living artiste has been invited and it is certainly a good test of the quality achieved by Ekco in the new receivers.

### HOW IT WAS BUILT



Putting the finishing touches to the giant station-indicating dial which you will see on the Ekco Stand at Olympia

## "NEW SETS FOR OLD"

# YOU MUST

have that new set this year and get it at practically half price by purchasing through us, disposing of your old set (if any) at a most generous allowance.

**HUNDREDS OF SATISFIED  
CLIENTS WILL ENDORSE THIS**

Just write for particulars, enclosing 1½d. stamp, naming your old set, which we will buy and the new set you fancy and a quotation will follow. Balance payable in cash or hire-purchase.

**FREE** Wireless Set, to introduce the Radialaddin Club.

## RADIALADDIN, Limited

THE LARGEST RADIO EXCHANGE DEALERS IN THE UNITED KINGDOM

(Dept. A.W.), 47-48 Berners Street, London, W.1. Museum 1821.

Please forward this **INQUIRY 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 .....



## A NEW RECORD CHANGER

A NEW automatic record changer has been produced by the Garrard Engineering & Manufacturing Company, Ltd. This is mounted up on an all-metal chassis and handles eight 10- or eight 12-in. records. The chassis incorporates electric turntable drive, pick-up, the automatic record-changing mechanism and the controls, such as the speed regulator and record rejector switch.

The records are supported on three prongs and arms, rotated by a large cam, which allow the records to drop one by one on to the centre turntable. The cam also moves the pick-up clear of records and raises



The Garrard electric gramophone motor with automatic record changer

it step-by step as each record drops. The arms are easily adjustable for handling 10 or 12-in. records and there is a control to reject any record.

Extreme simplicity is a feature of the new Garrard record changers and as it is self-contained on its metal baseplate, it can be fitted into most radiograms without alteration to the existing cabinet arrangement.

Details can be obtained free on mention of "A.W." from The Garrard Engineering & Manufacturing Company, Ltd., New-castle Street, Swindon, Wilts.

## CHRISTOPHER STONE AT OLYMPIA

A NUMBER of people prominent in broadcasting, are assisting in recitals in the Columbia Theatre in the Olympia Annexe during the show. Mr. Christopher Stone is presiding at recitals every day, together with Mr. John Macdonell, who was connected with the B.B.C. Surprise Items. Other "favourites" by radio and record will be Clapham and Dwyer, Flotsam and Jetsam and Debroy Somers.

In the Polar announcement on page 193 of "A.W." for August 13, the Polar Star three-gang condenser was incorrectly stated to have a capacity of 5,000 per section. This should, of course, be .0005-microfarads per section. Full details are given of these new Star gang condensers in the Polar catalogue, copies of which can be obtained from Messrs. Wingrove & Rogers, Ltd., 188-9, Strand, W.C.2.

The Belfast Wireless Exhibition this year will be opened on September 14, and the B.B.C. has arranged to lend the new model of Broadcasting House, which will first be seen at Olympia. On September 10, Captain R. L. Henderson is coming to the microphone to tell listeners something of the plans and preparations of the organisers of the exhibition

## New Times Sales Co

## NEW 1933 RADIO ON EASIEST OF EASY TERMS

QUICKEST DELIVERY

## MANUFACTURERS' KITS

RADIO FOR THE MILLION "STATION MASTER 3" (Model B). With valves, cabinet and speaker as advertised. Cash price, £7/10/-.	With
Balance in 11 monthly payments of 14/-.	10/-
COSCOR MELODY MAKER MODEL 335. Complete with valves, speaker and cabinet. Employs Coscor variable-mu S.G., H.F. stage, detector and power valves. Cash price, £7/17/6.	order
Balance in 11 monthly payments of 14/10.	10/-
OSRAM "THIRTY THREE" MUSIC MAGNET. Complete kit, comprising all components including valves, cabinet with self-contained speaker. Screen-grid H.F., screen-grid detector and power output. Single-dial tuning, wavelength calibrated. Cash price £9/9/0.	order
Balance in 11 monthly payments of 17/6.	15/-
RADIO FOR THE MILLION "STATION MASTER 3." Battery Model A. Complete with valves and cabinet. Cash price £5/11/0.	With
Balance in 11 monthly payments of 10/2.	10/2

## ACCESSORIES

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 £2/18/6.	With
Balance in 11 monthly payments of 5/4.	5/4
B.T.H. SENIOR PICK-UP with arm and base. Cash price £2/2/-.	order
Balance in 11 monthly payments of 3/10.	3/10

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 transformer and protecting grille. Cash or C.O.D., £3/10/-.	With
Balance in 11 monthly payments of 6/5.	6/5
R. & A. "BANTAM" PERMANENT-MAGNET MOVING-COIL SPEAKER with 3-ratio input transformer. Cash price £1/7/6.	order
Balance in 5 monthly payments of 5/-.	5/-
W.B. PERMANENT MAGNET MOVING-COIL SPEAKER. Type P.M.4. Complete with transformer. Cash price £2/2/-.	With
Balance in 7 monthly payments of 5/9.	5/9
BLUE SPOT SPEAKER UNIT AND CHASSIS, TYPE 100U. Cash price £1/19/6.	order
Balance in 7 monthly payments of 5/5.	5/5
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.	With
Balance in 11 monthly payments of 5/6.	5/6
ULTRA IMP PERMANENT MAGNET MOVING-COIL SPEAKER, with input transformer. Cash price £1/17/6.	order
Balance in 5 monthly payments of 6/10.	6/10
EPOCH "20 C" PERMANENT MAGNET MOVING-COIL SPEAKER. With 3-ratio input transformer. This speaker will handle up to 5 watts. Cash price, £1/15/-.	With
Balance in 5 monthly payments of 6/6.	6/6
EKCO H.T. UNIT, Type A.C.25. For multi-valve sets requiring up to 25 m/a. 3 tappings, S.G., detector and 120/150 volts. For A.C. mains. Cash price, £3/17/6.	order
Balance in 11 monthly payments of 7/1.	7/1

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) 1932 Lists,  
(b).....for which I enclose  
first payment of £.....s.....d.....  
Name.....  
Address.....  
.....A.W. 27/8/32.....



10,000 Gramo-motors from Stock.  
Big Summer 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 cabinets, gramophones or radiograms, and what parts to choose. We sell motors from 7/6, tone-arms, soundboxes, 3/6, pick-ups, big volume horns, loud-speakers, radio kits, complete receiving sets, gramophones, radiograms and parts. Established 1903.—The Regent Fittings Co., A.W., 120 Old Street, London E.C.1.

## SPECIAL NOTICE. STAND No. 239

One of Radiolympia's New Features,  
"FLUXITE-KORD" SOLDER  
(REGD. TRADE MARK. SOLE PROPRIETORS FLUXITE LTD.)

Don't miss this opportunity of seeing it.  
Of equal value to the Expert or Amateur.  
Obtainable from all dealers. - 3d. per Reel

## PROTECT YOUR VALVES FROM ACCIDENTAL SHORT-CIRCUITING

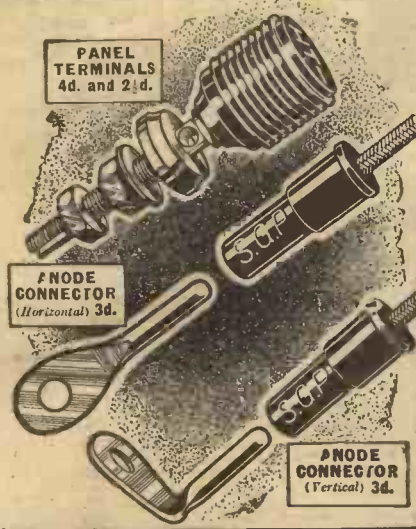


BY FITTING THE "BUSCO" FUSE SWITCH

All "BUSCO" Switches have Self-cleaning Contacts and "Set Cracking" is Safeguarded through the Vice-like Grip at Contact Points.

BUSBY & Co. Ltd, Price St., BIRMINGHAM





**LECTRO LINX LTD., 254, Vauxhall Bridge Road, S.W.1**

Large show and demonstration rooms at 67 Hammersmith Road, London, W., have been taken by Tekade Radio & Electric, Ltd., for the duration of the Show. These demonstration rooms are exactly opposite the Empire Hall and all types of motor speakers and sets incorporating these speakers are on show.

\*Phone: City 0191.  
\*Grams: Electradix, Cent, London.



## QUICK EASY PAYMENT SERVICE

We supply all good quality Radio Receivers, Components, and Accessories on deferred terms. Large stocks are carried and orders are executed promptly. Send list of requirements and a quotation will be sent by return of post. Price List free on request.

### MANUFACTURERS KITS

**NEW COSSOR MELODY MAKER,** Model 335 (just released). Complete Kit of Parts, Valves, and Loud-speaker and Cabinet. Cash Price, £7/17/6. And 11 monthly payments of 14/10. With order **10/-**

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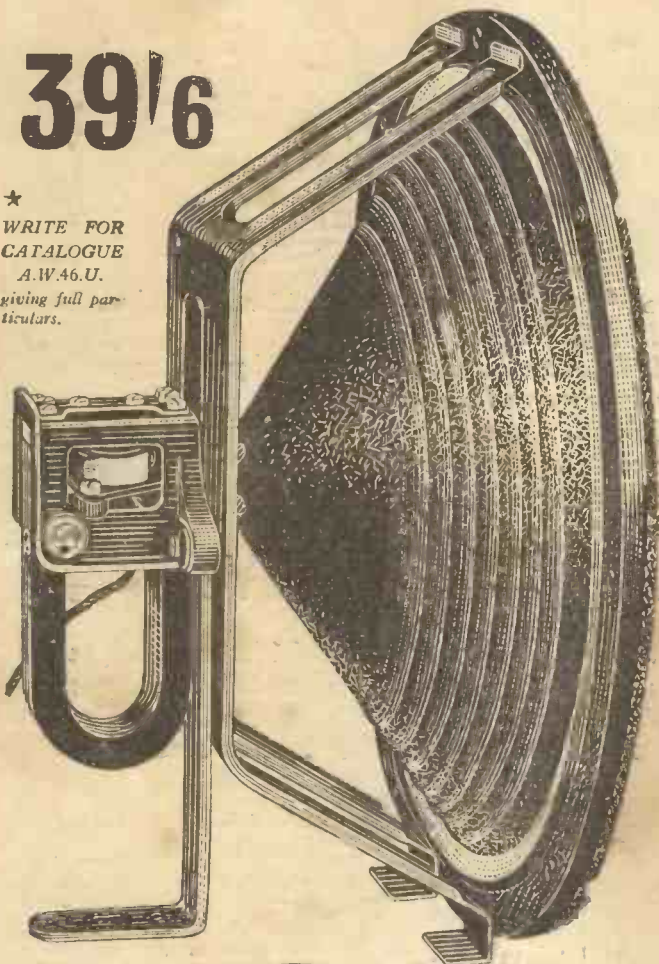
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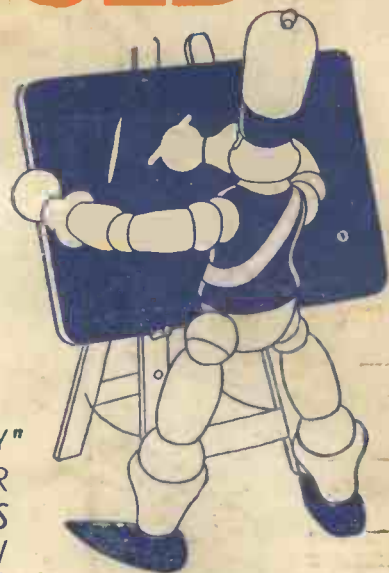


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