

AN EVENING TOUR BELOW 100 METRES

Amateur Wireless

Every
Thursday 3^d

and
Radiovision

Vol. XXI. No. 535

Saturday, September 10, 1932

A GOOD IDEA FOR MAKING OLD SETS SELECTIVE



"GIVING THE FIRST CLASS SERVICE WHICH WAS EXPECTED OF THEM"

"... Radio enthusiasts can purchase them with every confidence. Their outputs are above the average and they give a clean, steady output..."

says the Technical Editor of "Popular Wireless"

You can end all your H.T. battery troubles—you can take all the uncertainty out of battery buying, for Ediswan H.T. Batteries are now GUARANTEED against failure to give absolutely satisfactory service. No battery manufacturer could afford to give such a guarantee unless he had complete confidence in his product. Every single cell in every Ediswan battery must successfully pass four separate tests before it leaves the factory, and special precautions are taken to ensure perfect insulation between cells.



<p>60 VOLTS</p>	<p>69</p>	<p>120 VOLTS</p>	<p>13'</p>
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Standard Capacity. Where the anode current required does not exceed 10 M/A these batteries will give highly satisfactory service. If super-power valves are used, the super-capacity type should be used.

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

Look for the Ediswan Authorised Dealer sign when you buy!

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

Guarantee

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

EDISWAN

the Guaranteed
RADIO H.T. BATTERIES

THE EDISON SWAN ELECTRIC CO. LTD.



PONDERS END, MIDDLESEX

B.173



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<p>COSSOR MELODY MAKER MODEL 335. Complete with valves, speaker and cabinet. Cash price, £7/7 6. Balance in 11 monthly payments of 14/10.</p> <p>COSSOR ALL-ELECTRIC MELODY MAKER MODEL 336. Complete with valves, cabinet, and speaker. Cash Price, £11/15/-.</p> <p>COSSOR MELODY MAKER MODEL 334 with Metallised Variable-Mu S.G. and Detector Valves, Power Valve and Cabinet. Cash Price, £6/7/6.</p> <p>RADIO FOR THE MILLION "STATION MASTER 3" (Model A). With valves and cabinet, for battery use. Cash price, £5/11/-.</p> <p>"STATION MASTER 3" (Model B) with valves, speaker, and cabinet for battery use. Cash price, £7/10/-.</p> <p>SLEKTUN SCOUT S.G.3. S.G., Detector and Power. Pilot Author Kit "A" (less valves and cabinet). Cash or C.O.D., £4/8/6.</p> <p>OSRAM "THIRTY THREE" MUSIC MAGNET. Complete kit, comprising all components, including valves, cabinet with self-contained speaker. Cash price, £9/9/-.</p> <p>READY RADIO 303. 3 valve Kit (Det. 2 L.F.) with valves, cabinet and permanent magnet moving coil speaker. Cash Price £6/17/6.</p> <p>READY RADIO METEOR S.G.3. 3 valve screened-grid receiver with valves, cabinet and permanent magnet moving-coil speaker. Covers short, medium and long waves. Cash Price £3/17/6.</p> <p>LISSEN SKYSCRAPER 3. Chassis model with (Lissen) S.G., Detector, and Pentode valves. Cash price, £4/9/6.</p> <p>FERRANTI BAND-PASS 3 (Battery Model) with Panel and baseboard, but less valves. Cash price, £7/19/6.</p> <p>FERRANTI BAND-PASS 3 (All-electric Model) With Panel and baseboard, but less valves. Cash price, £11/3/6.</p> <p>TELSEN "AJAX" 3. Complete kit less valves and cabinet. Cash price, £3/1/6.</p> <p>TELSEN "JUPITER" S.G.3. Complete kit less valves and cabinet. Cash price, £3/17/0.</p>	<p>Send 10/- only</p> <p>Send 21/7 only</p> <p>Send 10/- only</p> <p>Send 10/2 only</p> <p>Send 10/- only</p> <p>Send 8/1 only</p> <p>Send 15/- only</p> <p>Send 12/7 only</p> <p>Send 16/3 only</p> <p>Send 8/3 only</p> <p>Send 14/8 only</p> <p>Send 20/6 only</p> <p>Send 5/8 only</p> <p>Send 7/- only</p>	<p>EPOCH "200" PERMANENT MAGNET MOVING-COIL SPEAKER (New Edition). With 3-ratio input transformer. Cash price, £1/15/-.</p> <p>EPOCH MM. PERMANENT MAGNET MOVING-COIL SPEAKER with 5-ratio Input Transformer. Cash Price £1/7/8.</p> <p>ULTRA 1933 IMP PERMANENT MAGNET MOVING-COIL SPEAKER with input transformer. Cash price, £1/17/6.</p> <p>W.B. PERMANENT MAGNET MOVING-COIL SPEAKER (Type P.M.4). Complete with transformer. Cash price, £2/2/-.</p> <p>BLUE SPOT SPEAKER UNIT AND CHASSIS. Type 100U. Cash price, £1/19/6.</p> <p>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/-.</p> <p>R. & A. "BANTAM" PERMANENT MAGNET MOVING-COIL SPEAKER with 3-ratio input transformer. Cash price, £1/7/6.</p>	<p>Send 6/6 only</p> <p>Send 5/- only</p> <p>Send 6/10 only</p> <p>Send 5/9 only</p> <p>Send 5/5 only</p> <p>Send 6/5 only</p> <p>Send 5/- only</p>
ACCESSORIES			
<p>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.</p> <p>ATLAS ELIMINATOR. Type A.K.260. Tapped at 60/80 v., 90/100 v., and 120/150 v. at 12 m/A. Trickle charges at 2, 4, or 6 v. accumulators at 3 amps. Cash price, £4/10/-.</p> <p>B.T.H. PICK-UP (Senior Model) complete with support arm. Cash price, £2/2/-.</p> <p>GARRARD INDUCTION GRAMOPHONE MOTOR. For A.C. Mains model 202. Mounted on 12 in. nickel motor plate with fully automatic electric starting and stopping switch. Cash price, £2/10/0.</p> <p>EKGO ELIMINATOR. Type A.C.12. Three tappings: S.G. 80 v., 120/150 v. at 12 m/A. Cash price, £2/15/-.</p> <p>REGENTONE D.C.1. H.T. ELIMINATOR for D.C. Mains, tapped S.G. Detector and 120/150 v. at 25 m/A. Cash Price £1/19/6.</p> <p>REGENTONE W.1.F. H.T. ELIMINATOR for A.C. Mains, tapped S.G. Detector and 120/150 v. at 12 m/A. Cash Price £2/15/0.</p>	<p>Send 5/6 only</p> <p>Send 8/3 only</p> <p>Send 5/9 only</p> <p>Send 4/7 only</p> <p>Send 5/- only</p> <p>Send 6/2 only</p> <p>Send 5/1 only</p>		

ULTRA 1933 BLUE FOX. A.C. or D.C. Send mains. Detector and Pentode valves. Moving-coil speaker. Complete with valves, ready for use. Cash price, £10/10/-.

Balance in 17 monthly payments of 12/9. Send 12/9 only

ADVENTURER

BUILD THIS AMAZING 1933 5-VALVE SUPER-HET

Designed and described by "Maxamp" in PILOT RADIO ENVELOPE No. 3 containing Full-size Blueprint, photographs, assembly and wiring instructions with full operating notes. Obtainable by return of post.

Send 1/- only

ULTRA 1933 TIGER RECEIVER. A.C. or D.C. Mains, S.G., S.G. Detector and Pentode, Moving-coil speaker. Complete with Mazda Valves, ready for use. Cash Price, £15/15/0.

Balance in 17 monthly payments of 20/-.

Send 20/- only

ULTRA 1933 PANTHER. A.C. mains only. Two Variable-mu S.G. H.F., S.G. Detector and Power Pentode output valves. Moving-coil speaker. Complete with valves, ready for use. Cash price, £18/18/-.

Balance in 17 monthly payments of 23/1.

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All orders over 10/- C.O.D. charges and carriage paid

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West End Showrooms: 62 High Holborn, London, W.C.2.

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

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A.W. 10/9/32.

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

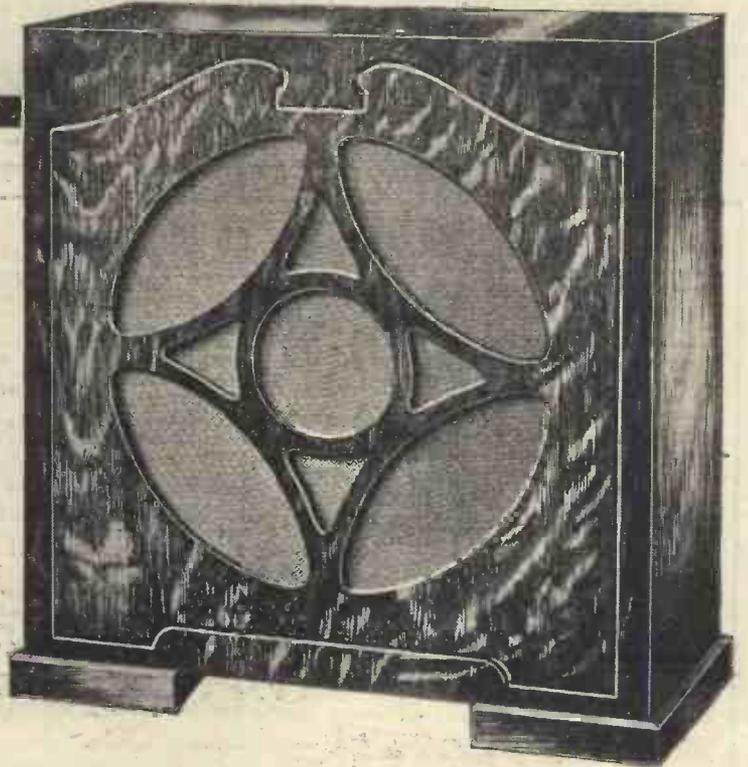
The best Speaker Value in the World

31K 31/6

EVERYBODY remembers the world famous Blue Spot 66K Unit and how much it did to improve radio reproduction.

An improved model of this remarkable unit is used in the Blue Spot 31K cabinet speaker. 31K will be one of the outstanding features of this season, both from the point of view of value for money and superb performance.

31K reproduces every sound with clarity and sweetness. It makes wireless a pleasure to listen to, so delightfully "real" is the standard of its performance. Singers, speakers,



and all kinds of music are reproduced with effortless ease and with never a sign of distortion to mar their beauty.

Aside from its performance 31K is a really well made, handsome piece of furniture. Its rich dark oak cabinet looks well in any surroundings. Ask your dealer to demonstrate 31K for your pleasure and judge it for yourself. Write for Catalogue No. A.W. 48. S.

66K

—UNIT ONLY—the improved model of the world famous 66K
15/-



66KC

—unit mounted to specially designed chassis ready for screwing to baffle board or cabinet, 19/9

THE BRITISH BLUE SPOT COMPANY LTD.
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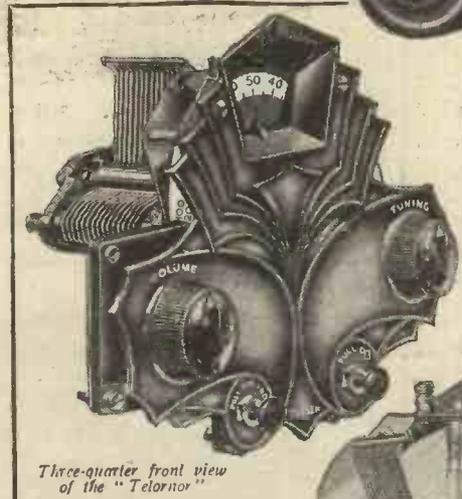
Distributors for Northern England, Scotland and Wales: H. C. RAWSON (Sheffield and London), Ltd., 100, London Road, Sheffield; 22, St. Mary's Parsonage, Manchester; 44-46, High Bridge, Newcastle; 37, 38, 39, Clyde Place, Glasgow.

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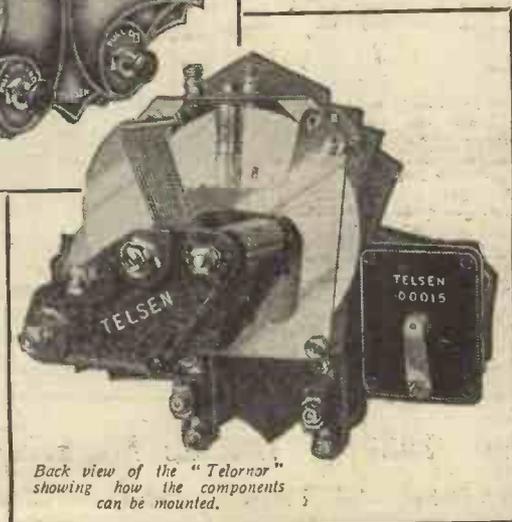
TELSEN

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.

GIVE your home-built set the dignity of an expensive commercial radio receiver with the new Telsen "TELORNOR." It makes better sets easy to build! The handsome silver oxidised 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

Get your copy of the new **TELSEN RADIOMAG, Issue N° 3**

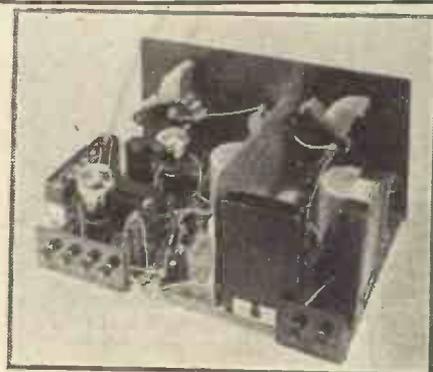
ANNOUNCEMENT OF THE **TELSEN ELECTRIC CO., LTD.**, ASTON, BIRMINGHAM

You Cannot Go Wrong If You Use An "A.W."

FULL-SIZE BLUEPRINT

EACH BLUEPRINT SHOWS THE POSITION OF EVERY COMPONENT AND EVERY WIRE, AND MAKES CONSTRUCTION A SIMPLE MATTER.

WHEN ORDERING, PLEASE SEND A POSTAL ORDER, NOT STAMPS, TO BLUEPRINT DEPT., "AMATEUR WIRELESS," 58/61 FETTER LANE, LONDON, E.C.4 GIVING NAME OF SET AND NUMBER OF BLUEPRINT REQUIRED.



A MODERN THREE

The Home-Lover's Battery Three uses shielded coils and has a screen-grid high-frequency stage. It is an ideal set for constructors who want an outstanding three-valver

CRYSTAL SET

6d., post free.

1931 Crystal Set AW308

ONE-VALVE SETS

1s. post free.

Easy to Build One AW304
 Short-wave One-valver AW327
 B.B.C. One-valver AW344
 Portable Short-wave One AW354

TWO-VALVE SETS

All these 1s. each, post free.

Two Star 2 (D, Pen) AW315
 The 25/- Two (D, Trans) AW330
 Ten-Station Two (D, Trans) AW336
 Inexpensive A.C. 2 (D, Trans) AW346
 Midget Two (D, RC.) AW348
 Mascot Two (D, Trans) AW353
 Ideal Regional 2 (D, Trans) AW357
 Music Lover's Two (D, Trans) WM260
 New Economy Two (D, Trans) WM265
 Family Two (D, Trans) WM278
 Screen-grid Two (SG, Trans) WM289
 Economy A.C. Two (D, Trans) WM286
 A Two for 7 Metres (D, Trans) WM295

THREE-VALVE SETS

All these 1s. each, post free.

1932 Ether Searcher (SG, D, Pen) AW325
 Wide World Short-wave Three (D, RC, Trans) AW332
 New Favourite Three (D, RC, Trans) AW334
 Home-Lover's All-electric 3 (SG, D, Trans) AW335
 The P.W.H. "Mascot" (D, RC, Trans) AW337

Home-Lover's Battery 3 (SG, D, Trans) .. AW341
 £8 Radiogram (SG, D, Trans) AW343
 New Regional Three (D, RC, Trans) AW349
 World-Ranger Short-wave 3 (D, RC, Trans) AW355
 Ether Marshal (SG, D, Trans) WM247
 Meridian Short-waver (D, RC, Trans) WM255
 Five-advantage Three (D, RC, Trans) WM257
 Everybody's A.C. Radiogram (SG, D, Trans) WM258
 Double Band-pass Three (SG, D, Trans) WM259
 Everybody's A.C. Radiogram (with automatic G.B.) WM262
 New Economy Three (SG, D, Trans) WM263
 New Plug-in Coil Three (D, 2 Trans) WM270
 Transportable Three (SG, D, Trans) WM271
 Multi-Mag Three (D, 2 Trans) WM288
 Percy Harris A.C. Radiogram (D, RC, Trans) WM294
 The Prosperity Three for Batteries (SG, D, Trans) WM296
 The Prosperity Three for A.C. Mains WM297
 The Prosperity Three for D.C. Mains WM298

FOUR-VALVE SETS

All these 1s. 6d. each, post free.

Four Star 4 (SG, D, RC, Trans) AW318
 50/- Four (SG, D, RC, Trans) AW331
 Advance Four (2SG, Trans) AW356
 Your Home Radiogram, (SG, D, RC, Trans) AW358
 Brookman's Three-plus-one (SG, D, RC, Trans) WM233
 Ether Rover (SG, D, RC, Trans) WM266
 Quadradyne (2 SG, D, Pen) WM273
 Double Band-pass Four (SG, D, RC, Trans) WM274
 Everybody's Radio Gram. (SG, D, RC, Trans) WM276
 A.C. Quadradyne (2 SG, D, Pen) WM279
 Ideal A.C. Home Super (Super-het) WM290
 Gold Coaster (A.C. Short-waver) WM292
 Triple-tune Four (2 SG, D, Trans) WM293

FIVE-VALVE SETS

1s. 6d. post free.

James Short-wave Super (Super-het) AW328
 Simple Super (Super-het) AW340
 Ideal Home Super (Super-het) WM280
 Easytune 60 (Super-het) WM284

SIX-VALVE SETS

All these 1s. 6d. each, post free.

Century Super (Super-het) AW287
 A.C. "Century Super" (Super-het) AW295
 " " Mains Unit (1/-) AW295A
 Super 60 (Super-het) WM229
 Super 60 (with Wearite base) WM249
 Super 60 (with Lewcos base) WM251
 1932 Super 60 (Super-het) WM269
 1932 A.C. Super 60 (A.C. Super-het) WM272

SEVEN-VALVE SETS

1s. 6d. post free.

Super Senior (Super-het) WM256
 Super Senior (Wearite base and Lewcos coils) WM261

PORTABLE SETS

1s. 6d. post free.

Hiker's Two (D, Trans) (1/-) AW345
 General-purpose Portable (SG, D, RC, Trans) AW351
 Town and Country Four (SG, D, RC, Trans) WM282
 Everybody's Portable (5-valve super-het) WM291

AMPLIFIERS

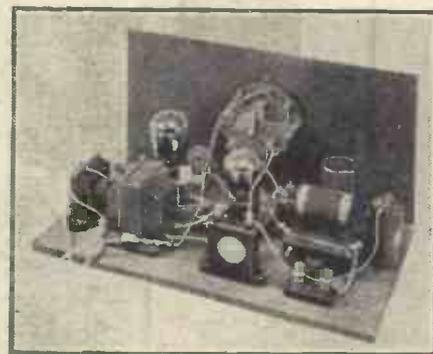
All these 1s. each, post free.

Universal Push-pull Amplifier AW300
 "A.W." Record Player (L.F. Push-pull) AW319
 Quality Amplifier (DC), 1/6 WM264
 A-P-A (Power Amplifier for A.C. Mains) WM275
 A-P-A Radio Unit (SG, D.) WM281
 Economy Gramophone Amplifier WM277

MISCELLANEOUS

1s. each post free.

Choke Output Unit AW240
 Simple Tester Unit (6d.) AW246
 "A.W." Improved Linen-diaphragm Speaker AW248
 Handy L.T. and G.B. Unit for A.C. Mains AW254
 Ohmic Coupled DX Unit AW255
 Simple Gramophone Amplifier AW257
 Novel Linen Diaphragm Speaker AW260
 H.T. Unit for A.C. Mains AW262
 Gramophone Tone Control AW264
 H.T. Unit and Trickle Charger for D.C. Mains AW272
 2-watt A.C. Amplifier AW283
 "A.W." Selectivity Unit (6d.) AW290
 B.B.C. Official Selectivity Unit (6d.) AW294
 A.C. Trickle Charger AW305
 Amateur's Linen Speaker AW307
 D.C. H.T. Unit AW312
 Output Unit for Pentode Sets AW316
 "A.W." Short-wave Adaptor AW317
 Short-wave Plug-in Adaptor (6d.) AW326
 Short-wave Super-het Adaptor (6d.) AW329
 Ether Searcher Radio-gramophone Motor Board AW333
 "A.W." Short-wave Adaptor AW339
 "Mascot" Mains Unit AW350
 "A.W." Trickle Charger AW352
 An Add-on Band-pass Unit AW359
 "W.M." Linen Diaphragm Loud-speaker WM235
 Two-Minute Adaptor for Short Waves WM240
 Super 60 A.C. Unit WM248
 A Simple Mains Unit WM283
 Short-wave Director (6d.) (wavemeter) WM285
 Voltage Regulator WM287

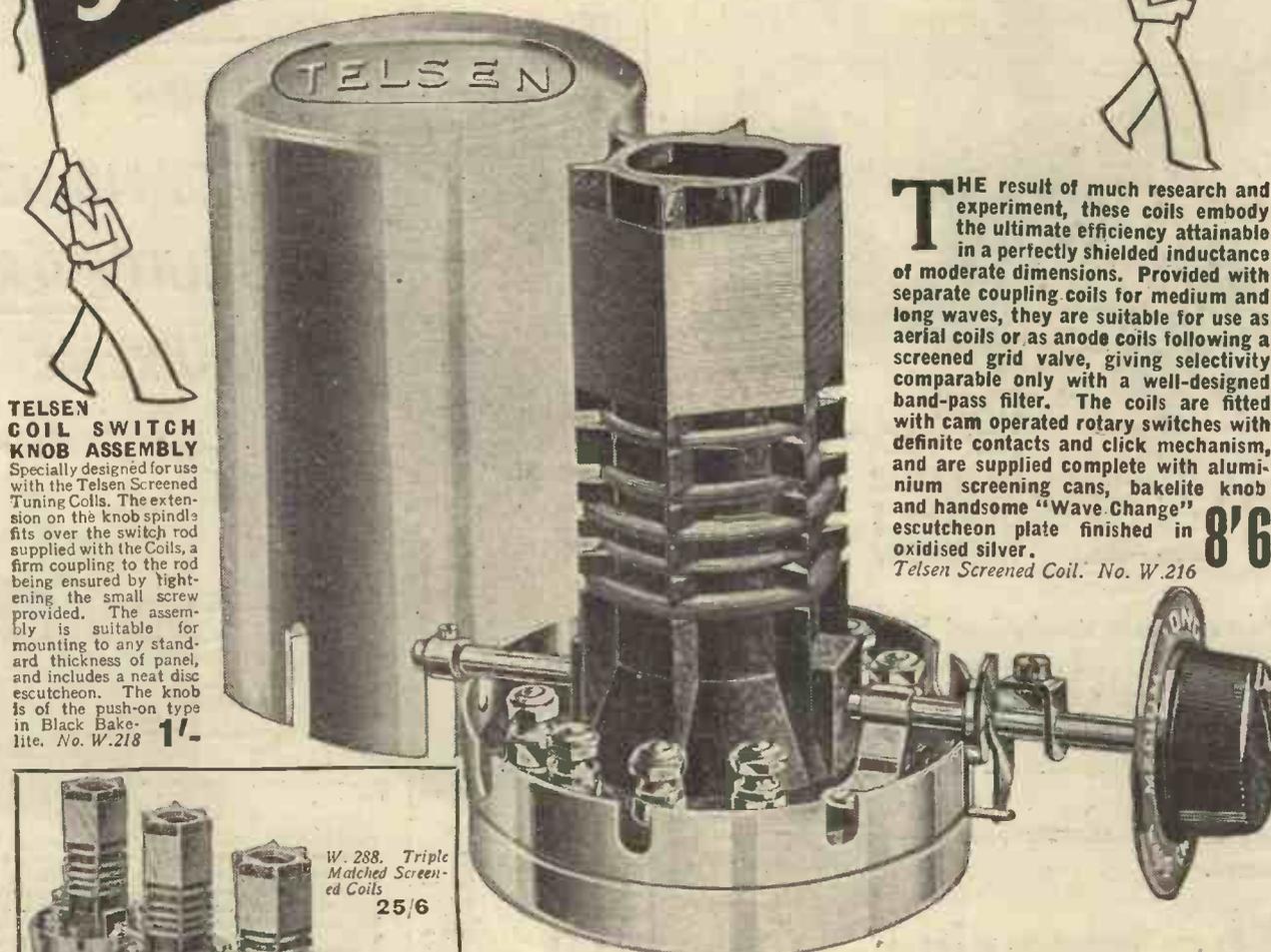


AN UP-TO-DATE TWO

This is the Ideal Regional Two, a set specially designed for those living near the Regional stations. It is very selective

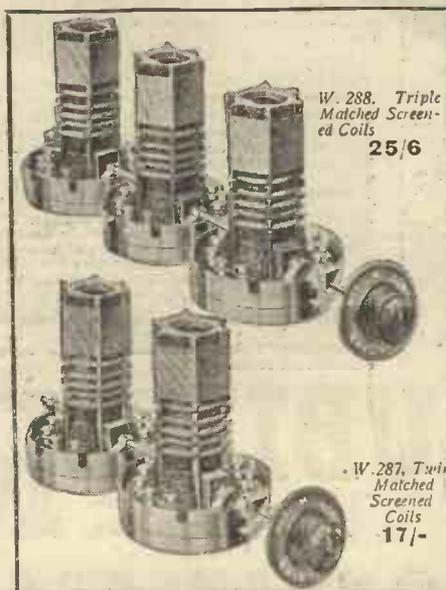
Copies of "Amateur Wireless" and of "Wireless Magazine" containing descriptions of most of these sets can be obtained at 4d. and 1s. 3d. respectively, post free. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine" sets.

TELSEN SCREENED TUNING COILS



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 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 Screened 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. **6d.**
No. W.217

TELSEN

RADIO COMPONENTS

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

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



BUY 100% BRITISH

LOOK FOR "EDDY" IN YOUR DEALER'S WINDOW

Mazda valves are standardised by most leading British receiving set manufacturers. They are designed by British engineers and manufactured throughout in our British factory devoted entirely to Mazda valve production. You can buy with confidence!

Always ask for Mazda valves—your dealer has them.

The amazing

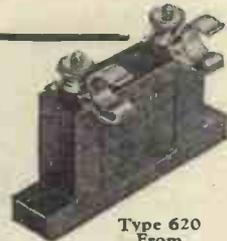
MAZDA THE BRITISH VALVES



The Edison Swan Electric Co. Ltd.
155 Charing Cross Rd. London, W.C.2.

Mazda Radio Valves are manufactured for The British Thomson-Houston Co. Ltd., London and Rugby.

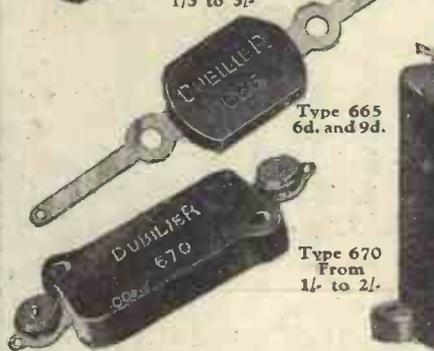
From 6^d
to 37/6



Type 620 From 1/3 to 3/-



Type 610 From 1/3 to 3/-



Type 665 6d. and 9d.

Type 670 From 1/- to 2/-

Type B.775 From 3/- to 37/6

THERE IS A TYPE AND SIZE TO SUIT EVERY REQUIREMENT



For those who want condensers occupying only a fraction of the space of the ordinary type, yet containing the finest materials and workmanship, there are the Dubilier Types 610, 620, 665 and 670 Mica Condensers for receivers, while for power amplifiers and transmitters there are the Types B770/1/2 and B775/6/7.

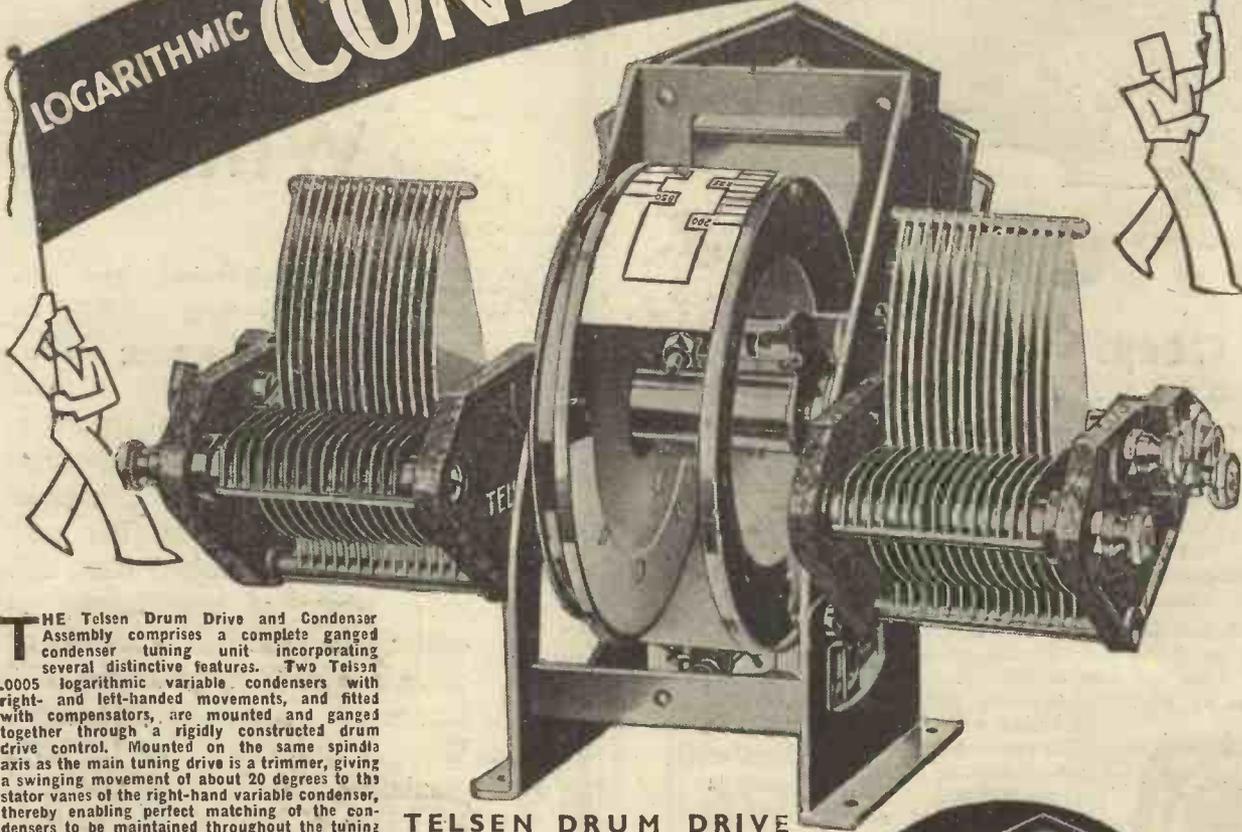
No matter whether a Dubilier Condenser is large or small, it is the most up-to-date in design and contains the finest materials it is possible to obtain. On every Dubilier Condenser rests the Dubilier reputation for Dependability. You may be sure that Dubilier will never let you down.

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

DUBILIER MICA CONDENSERS

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

TELSEN LOGARITHMIC CONDENSERS and DRUM-DRIVE



THE Telsen Drum Drive and Condenser Assembly comprises a complete ganged condenser tuning unit incorporating several distinctive features. Two Telsen .0005 logarithmic variable condensers with right- and left-handed movements, and fitted with compensators, are mounted and ganged together through a rigidly constructed drum drive control. Mounted on the same spindle axis as the main tuning drive is a trimmer, giving a swinging movement of about 20 degrees to the stator vanes of the right-hand variable condenser, thereby enabling perfect matching of the condensers to be maintained throughout the tuning range. Two scales are supplied with the unit, one marked in wavelengths and one in graduations from 0-100. The scale is illuminated and has the additional advantage of being easily removable when it is desired to fit one of special calibration. The escutcheon is handsomely finished in oxidized silver, and knobs of the push-on type are fitted. Provision is made for panel and baseboard mounting, and a double-ended spanner is supplied free with the unit for fitting the variable condensers. Full instructions for mounting are included with every unit. No. W.262.

17/6
Price

TELSEN DRUM DRIVE

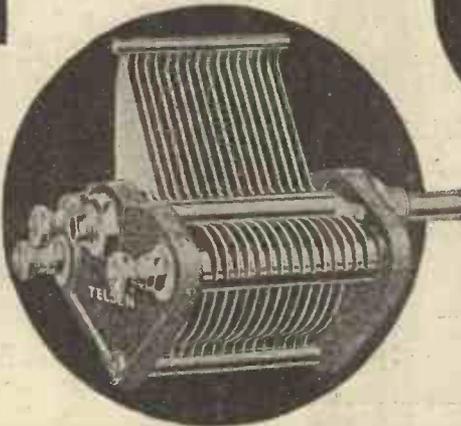
Follows standard practice generally, but embodies several detail refinements, among which may be instanced the cord drive, arranged to reduce wear to a minimum and to prevent over-run, and the rocking stator trimmer, which gives a variation of 20°, and visual indication of setting. For use with Telsen 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**



TELSEN LOGARITHMIC CONDENSERS

The frame is braced by three solid pillars, and the effective clamping of the vanes, each held at three points, makes distortion impossible. The rotor is also built into a rigid unit, the vanes being held at both ends. Generous bearings obviate backlash or end-plate. Models No. 260 and 261 (left-hand and right-hand movements respectively) incorporate a compensator (max. cap. 60 micro-micro henries).

- No. 130 Cap .00025, 4/6
- No. 131 Cap .00035, 4/6
- No. 132 Cap .0005, 4/6
- No. 260 (Left-hand movement with trimmer) Cap .0005, 5/-
- No. 261 (Right-hand movement with trimmer) Cap .0005, 5/-



TELSEN

RADIO COMPONENTS

Get your copy of the new TELSEN RADIOMAG, Issue N° 3

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

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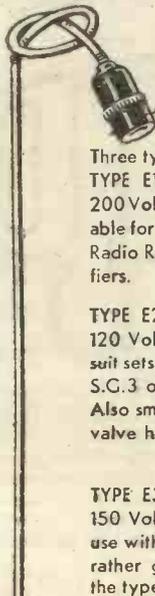
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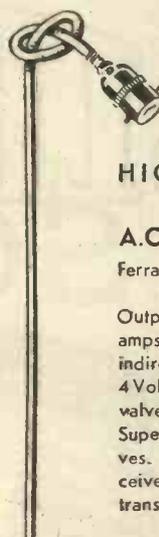
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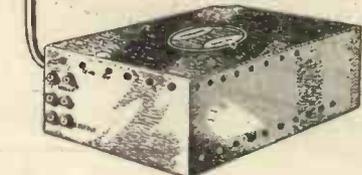
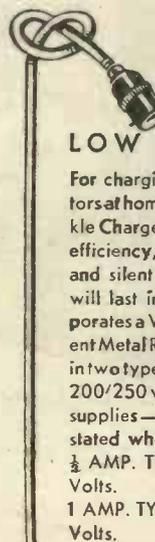
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**BRITAIN'S LEADING RADIO WEEKLY
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NEWS & GOSSIP OF THE WEEK

HIGH POWER FOR BELFAST ?

B.B.C. Considering 75 Kilowatts for Northern Ireland

Now that the regional stations are within sight of completion—only Washford Cross remains to be opened—the B.B.C. is turning its attention to minority demands. First on the list is Belfast, which was to have had a 15-kilowatt station built in place of the existing rather old-fashioned low-power station. Now we learn that engineers are seeking a site some 15 miles to the south-west of Belfast, to be used for the erection of a high-power station of the type used at regional centres. It is suggested that an aerial power of 75 kilowatts may be considered. In this way the whole of Northern Ireland would be covered with a strong signal. Irish listeners would have the additional advantage of the National programme from the super-power Droitwich station to be completed about the same time. From being the worst off it looks as though Northern Ireland listeners will one day be very nearly best served by the B.B.C.

BIG CHANCE FOR BRITISH SET MAKERS !

If the new proposals for the broadcasting system in Australia are agreed upon there will be a big chance for British manufacturers to beat foreign rivals. Among the proposals is the erection of a chain of eight long-wave stations to serve rural areas in outlying parts of Australia. This would create a demand for double-waveband sets that set makers in this country are peculiarly fitted to meet.

LIVELIER DANCE-BAND TONE

Have you noticed the improvement in the "pep" of Henry Hall's band? This is due to the recent change-over from studio BB, which is wanted for television experiments, to studio 3A, where the

Children's Hours have hitherto been broadcast. There is certainly a livelier tone about the acoustics. It is of interest to note that whereas the BB studio has a reverberation time period of .85 second, the 3A studio has only .6 second. This smaller period is said to be better for the broadcasting of rhythmic combinations such as the dance band. At all events, Henry Hall is quite satisfied with the change.

HENRY'S TOUR

During the first two weeks in September Henry Hall will be on a busman's holiday, touring the Continental studios looking for new ideas—if any!—in dance-band broadcast presentation. By the way, that new rhythm we were talking about last week has been found. It comprises alternate bars of 4/4 and 3/4, and it will be introduced to listeners with a tune called "The Pep Step."

NO "WAR" WITH FREE STATE

Our B.B.C. correspondent deprecates the idea that the suggested high-power Belfast station is an answer to the "menace" of the 60-kilowatt Athlone station in the Irish Free State. Despite political tension between the two countries, the B.B.C. maintains the friendliest relations with the broadcasting officials of the Free State. So far as programme interchange is concerned we appear to give more than we take. A military-band concert and two "Proms" have been taken recently from Belfast, whereas we have had nothing since the Eucharistic Congress.

HOW MANY LINES ?

According to an engineer of the B.B.C., the Germans are inclined to laugh at us for making use of only thirty lines to a television picture, whereas it is common practice in Germany to use between ninety and 120 lines, in order to obtain a well-defined image. Our engineers are not particularly rattled over this matter. They suggest that before the Germans say any more they should take a "look see" at our television images—and then see whether their ideas on lines should not be readjusted.

THE RADIO CURFEW

St. Pancras Council has made an extraordinary condition on its Brookfield Estate, and one that is likely to cause much annoyance. All



The New York Radio City is rapidly growing. In the centre is the tall seventy-storey R.C.A. building. On the left is the R.K.O. giant theatre, while on the right is the R.K.O. office building and International Music Hall. In the Radio City group is to be a British Empire building

NEXT WEEK: THE "A.W." WIZARD" — A FINE NEW SET

NEWS & GOSSIP OF THE WEEK —Continued

radio sets must be switched off by 11 o'clock! Such a condition punishes nuisances and innocents alike. It is questionable whether this edict could be enforced at law. While we have every sympathy with bye-laws encouraging the suppression of loud-speaker nuisances, we are against the idea of attempting a wholesale dictatorship of listeners' rights.

TEST MATCH ACCOUNTS FOR BREAKFAST

THERE is a strong possibility that the B.B.C. will break its usual rule of being silent at breakfast time when the test matches come along in Australia during the coming winter. By means of the England-to-Australia beam service it would be possible for the B.B.C. to relay eye-witness accounts of the matches immediately at the close of play. This evening period in Australia would, of course, correspond to early morning in this country. An idea we hope will not be merely pigeon-holed!

EXCITING SCOTTISH NEWS BULLETINS

NOW that we can so easily keep in touch with Scotland by the night-time reception of Scottish Regional we are learning some of the differences of policy that are allowed by the B.B.C. in its various outlets. The regional news from Scottish Regional, which we happened to hear the other night, was notable for its absence of censorship. There were two thrilling accounts of hold-ups in Glasgow and quite a lot of "meaty" stuff that would never be allowed from London Regional—a station that seems to devote most of its local news time to reports on the doings of the L.C.C. and accounts of service re-unions!

OUR IMPARTIAL RADIO CRITICS!

NOT content with having the B.B.C.'s programme lads out to lunch, the Critics' Circle has now asked out Charles Siepmann and the Talks Department. While such informal gatherings may do something to inspire better understanding between the critics and those criticised, we cannot help wondering whether such gatherings will prove inimical to really unbiased criticism. You cannot be entirely callous to a man who has just had lunch with you. Let our radio critics retain their position of "splendid isolation."

EMPIRE RECORDING

THIS business of recording programmes for Empire consumption proceeds apace. We hear that *Dr. Abernethy*, the very successful play produced by Howard Rose, has been added to the ever-growing list. John Watt is busy writing a *Cavalcade* type of entertainment for the same purpose. On the other side of Empire broadcasting, we hear that the two 20-kilowatt short-wave transmitters will be installed during this month, which means that Empire test transmissions may be expected before Christmas.

A REAL ORIENTAL TOUCH

GET ready for the return from his long Indian tour of Ernest Longstaffe, the popular producer especially known to listeners for his Christmas pantomimes. Ernest Longstaffe has been preparing what he calls "A Revusical Journey from India to England," for which he has been collecting camel bells from the Sind Desert as well as tonga and rickshaw bells. All these will add to the Oriental touch. This show will be broadcast sometime during the week beginning October 16.

WIRELESS MADE EASY!

Don't miss the important announcement on page 489 which deals with two special features in next week's issue. A special course for beginners will be started and the issue will also contain constructional details of a fine new set. Both the beginners' course, "Wireless Made Easy" (a special supplement in the issue), and the new "A.W.' Wizard" receiver will interest all listeners. Make sure of your copy of next week's issue.

THE "WIZARD" IS COMING!

EMPIRE NEWS PROBLEMS

AT his presidential address to the Institute of Journalists, Sir Emsley Carr made an interesting allusion to the effects of the Empire news bulletins broadcast from Chelmsford. He said that many of the smaller papers in India, mostly of a seditious nature, and published in the vernacular, were making a habit of "lifting" news from the B.B.C.'s broadcast bulletins. They were thus getting a free news service for which the larger papers had to pay considerable sums. This copyright infringement is certainly one of the problems of Empire news broadcasting. It is up to the agencies to solve it.

DECLINED WITH THANKS!

WOULD-BE visitors to the studios at Broadcasting House should take note of the following extract taken from a letter received by an applicant from the B.B.C. Chief Engineer: "Whilst we much appreciate the interest in our work your application denotes, we have found that it is impossible to conduct an unlimited number of tours round the building without serious interference with the work of either transmission or rehearsal taking place in our various studios. We have, therefore, no option but to express our inability to accede to your request."

THE RADIO PARIS PROGRAMMES

Broadcasting the Programmes!

SO many last-minute alterations have been made in the published programmes of Radio Paris that the station now broadcasts a summary of the day's programme three times every day, so that listeners can know what to expect in the following programme session. At 11 p.m. a summary is broadcast of the programme for the following day. If you are listening late on Saturday evening you should make a point of noting the items of the Sunday Radio Paris programmes.

THE "EARS" OF THE HAMPSHIRE "FRONT"

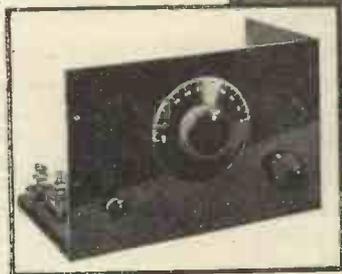


During the autumn manoeuvres of the Army at the Hampshire "front" portable wireless sets in cars are used to communicate between the sections. Here the operators are having a busy time with a portable receiver

Make your Set Selective with

AN ADD-ON BAND-PASS UNIT

It is quite easy to convert old and unselective sets to band-pass tuning, and constructional details are given here of a simple add-on unit, which, with the average plain-tuned circuit, forms an efficient band-pass arrangement



THANKS to modern band-pass circuits, selectivity is not necessarily expensive. Most of the "straight" sets nowadays (that is those which are not super-hets) have some form of band-pass tuning, while even super-hets sometimes have band-pass tuned intermediate frequency stages.

The reason for band-pass popularity is not hard to find. A well set up band-pass circuit is as selective as modern arrangements will allow, and is ever so much easier to operate and more effective than a wavetrap.

Acceptor and rejector wavetraps are, after all, only a remedy, whereas a good band-pass arrangement is not just a correction for poor tuning, but is a cure at the source for non-selectivity.

No Ganging

Some set users are deterred from building up a band-pass outfit because they are afraid that ganging and tuning will be too difficult. It is quite true that early band-pass circuits needed careful setting up and that, owing to ill-matching between coils and ganged condensers, results were often not so good as those obtained with a plain tuned circuit, and in addition the bugbear of double humping was introduced.

Most of these troubles, however, apply only to band-pass circuits which are ganged, that is in which the two coils are

tuned by the two sections of a ganged condenser. If the coupling between the ganged circuits of the band-pass arrangement is not fairly constant, results will be poor on the long waves, while good on the medium or vice versa. Also if the tuning points of the two circuits do not correspond over practically the whole range, signal strength will be lost and station strength will be weaker owing to one of the circuits being out of tune with the other. Not only does this cut down strength, but it destroys the inherent value of the band-pass arrangement, for the double humping destroys any selectivity that might otherwise be apparent.

How it Works

In its bare essentials a band-pass circuit consists only of an additional tuned circuit capacity coupled to the normal tuning of the grid circuit. Apart from the convenience of operation in a big set, there is no reason why the two circuits should be ganged. They can just as well be tuned independently and this immediately cuts out all the difficulties associated with ganging and trimming. Trimming is only necessary to correct for errors of condenser adjustment, and if ganging between the condenser sections is not necessary, then all the difficulties associated with ganging and trimming are removed. If the two condensers are separately operated, the correct tuning point of each circuit can be found at any place on the wavelength scale and there need never be any fear of double humping provided that the circuits are properly tuned.

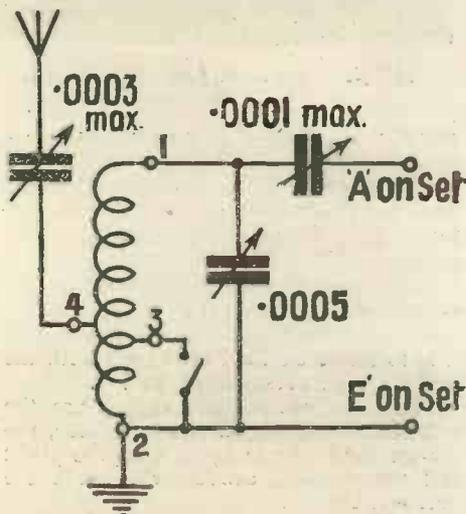
Matching Unnecessary

Where the circuits are independently adjusted, it is not even essential for

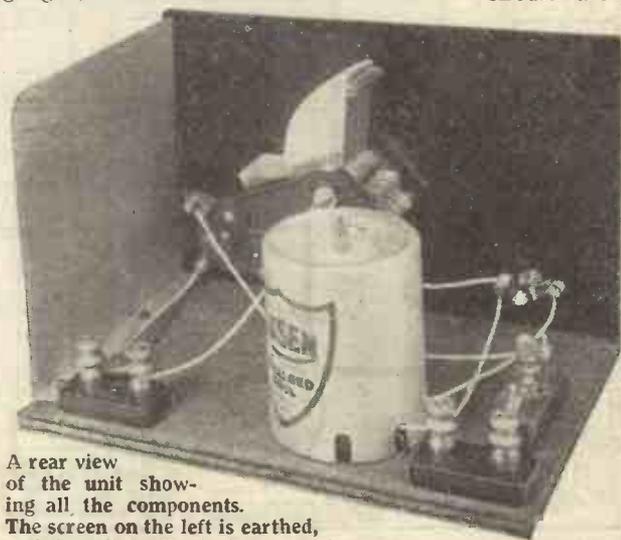
the coils of the two halves of the band-pass circuit to be identical, although in the ordinary ganged band-pass arrangement this is a vital point.

The possibility of having separately adjusted band-pass sections opens up all kinds of possibilities in the way of adapting old-fashioned band-pass sets to band-pass tuning. The average plain-tuned arrangement of a "straight" set is virtually one-half of a band-pass circuit. If another tuned circuit is put in parallel with this tuning of the set, and a suitable form of coupling provided between the two tuned arrangements, a band-pass circuit is formed. The independent condenser adjustment removed all difficulties and the resulting band-pass circuit is much more effective in operation than a wave-trap and is just as easy to tune.

A simple unit which can be added to



This theoretical circuit of the band-pass unit shows how simple is the arrangement



A rear view of the unit showing all the components. The screen on the left is earthed, and the coil is effectively screened

Components Required for THE ADD-ON BAND-PASS UNIT

- One .0005 mfd. tuning condenser (Lotus, Polar, Utility, Lissen, Telsen, J.B.)
- One .0001 mfd. reaction type condenser (Readi-Rad, Lissen, Utility, Peto-Scott, Formo, Lotus)
- One dual range aerial coil (Lissen, Slektun)
- One on-off switch (Readi-Rad, Lissen, W.B., Telsen, Bulgin, Junit, Wearite)
- One .0003 mfd. max. preset condenser (Sovereign type J., Formo, Lissen, Telsen)
- Ebonite panel, 9 in. by 6 in. (Lissen, Becol, Redfern)
- 5-ply baseboard, 9 in. by 6 in. (Peto-Scott, Carrington, Pickett)
- Screen to specification, 5½ in. by 5½ in. (Peto-Scott)
- Two terminal blocks (Lissen, Sovereign, Belling-Lee)
- Connecting wire and sleeving (Lewcos, Jiffilinx)

“AN ADD-ON BAND-PASS UNIT”

(Continued from preceding page)

practically any old-fashioned set with plain tuning to form a band-pass arrangement is illustrated by the accompanying photographs. Constructionally, nothing could be simpler. It consists, essentially, only of a coil and condenser, a coupling condenser and a series aerial condenser.

The unit is extremely simple to make up and as it is shielded it can be worked right at the side of the set without causing any ill-effects in the way of mutual coupling between the coils. It is, in fact, essential to keep the unit and the receiver

being secured to the baseboard to cut down stray coupling.

A reproduction is given here of the full-size wiring guide and blueprint. The small reproduction is handy in showing how the wiring goes, but it is much better to have the full-size blueprint in order to get the positions of the parts right. The full-size print can be obtained, price one shilling, post free, from the Blueprint Department, AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4.

The construction of the unit exactly as illustrated will be described and those who want to modify it in any way can do so, and the construction will be apparent from this description.

The special dual-range coil used in the bandpass unit is switched on to medium or long by a panel-mounting short-circuiting switch, connected across one section of the coil. The panel therefore carries the main tuning condenser, the wave-change switch and the small coupling condenser.

The blueprint shows you just where to mount the baseboard parts and is also a guide in drilling the panel.

The main variable condenser recommended in the components list is a one-hole

facing the rear edge of the baseboard. This is because terminals 1, 2, and 4 are wired to components nearer the panel.

The wiring itself can be either soldered or clamped direct under the terminal heads. The unit photographed is wired on the point-to-point system, and, as you will see, it looks quite neat.

Easy Wiring

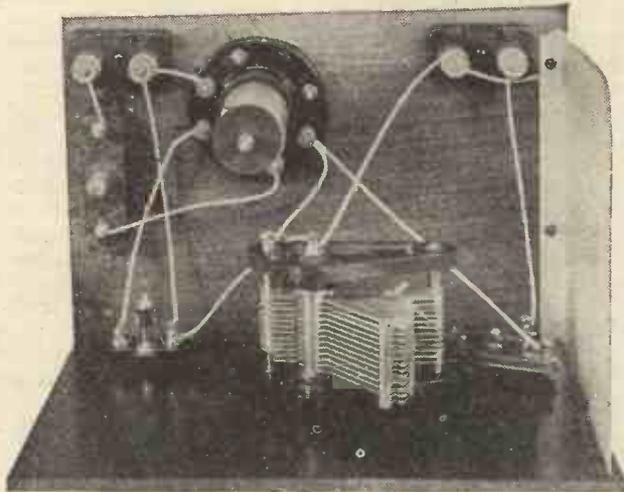
If you follow the blueprint you cannot possibly go wrong. You will see that the aerial is connected through the pre-set condenser to terminal 4 of the coil, and that the wave-change switch is connected across terminals 2 and 3. The earth terminal on the terminal block at the left of the set looking from the back is connected by a short piece of wire to the screen. This wire should be tucked under the flanged edge of the screen and the screen then firmly screwed down to the baseboard.

When all the wiring is done, the coil screen should be put over the coil and clamped down by the small terminal on the top.

Now for connecting up. Disconnect the aerial and earth wires from your set and connect them to the aerial and earth terminals on the right-hand terminal block of the unit, on looking at the unit from the back. The right-hand terminal is for the aerial and the left-hand for the earth.

The unit is wired to the set via the left-hand terminal block. Of the two terminals on this block, the right-hand is the earth and the left-hand the aerial connection.

(Continued on page 528)



This plan view of the unit emphasizes the simplicity of the construction

fairly close together, so that there is not a long coupling wire on the above-earth potential side. A simple vertical screen prevents coupling between the coils, for this would destroy the true bandpass tuning.

Cheapness, as well as simplicity, is the salient feature and, in fact, a glance at the list of components will show you how easy it is to convert an old set to one with the modern type of bandpass tuning.

The main components needed are the coil, and condenser on the aerial side, the pre-set condenser in series with the aerial and the coupling condenser between the unit and the set.

Terminal Connections

To facilitate connections there are two terminal blocks.

One set of these terminals is connected to the aerial and earth terminals on the receiver, the aerial and earth wires being taken to the other terminal bracket.

The layout of the little unit is straightforward, but it is advisable to follow the arrangement of parts suggested, as this makes for short and direct connections.

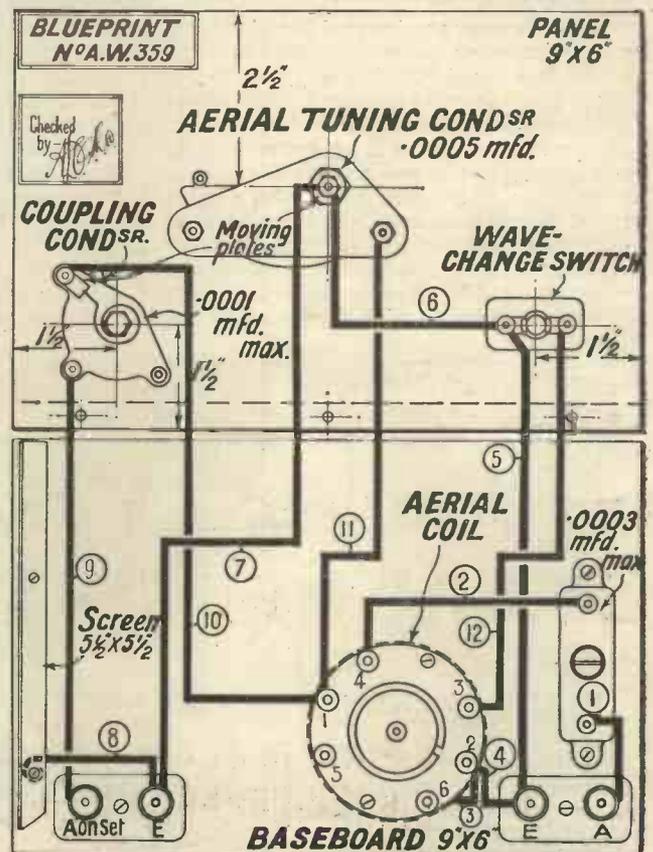
Of course, if you want to build the unit into the set, this can be done, but you should follow the suggested layout to minimise the possibility of stray coupling. Some old sets have plenty of panel space to spare and quite probably you will find that the tuning coil and condenser, the pre-set condenser and the coupling condenser can be mounted at one end of the baseboard, the vertical screen on the unit

mounting component, and the coupling condenser and wave-change switch also require only one-hole for fixing, and are secured by a clamping nut.

Drill the panel from the back, using the blueprint to show the exact centres and do not forget to drill three small holes along the lower edge for the woodscrews, as well as the three main holes for the component fixing.

Mount the switch and the two condensers and screw the baseboard firmly to the panel.

Now you will be able to see where to mount the coil and the three other small baseboard parts. The vertical screen is mounted at the left-hand side of the unit, looking from the back. Do not screw the screen down firmly at this stage, however, as one of the terminals has an earth return wire clamped under the screw. If this were not done the vertical screen would not be so effective as it would not itself be connected to earth. Make sure that you mount the coils the right way round with the terminals 2, 6, and 5



The wiring diagram of the unit: a full-size print is available, price 1s. post free

Next Week's Issue of "Amateur Wireless"—
September 17—will include a special

WIRELESS MADE EASY SUPPLEMENT



CONTAINING a variety of practical features, a very special Percy Harris contribution of great novelty and interest, and, in particular, a main idea which we have been cogitating for months. In meeting many thousands of the public at Olympia, Manchester, and elsewhere, we have become aware that there is a tremendous number of people to whom wireless would come as a most delightful and welcome hobby but who are deterred from taking it up by their avowed ignorance of even the simplest wireless facts. Now, we naturally want to bring into wireless as many people as possible, and our supplement next week is an earnest of a very serious attempt we have made to interest those who at the moment do not know the first thing about it. We have compiled an **Elementary Wireless Course for Beginners**. It is on entirely new lines. It has been discussed and criticised by many members of staff, and a number of brains have been brought to bear upon the problem of conveying essentially difficult ideas in essentially simple language. The brunt of the work has fallen upon our technical editor, Mr. J. H. Reyner, who with those assisting him has prepared a course of instruction to meet the needs of the veriest beginner. The instruction is sound scientifically, but brightly and even delightfully presented. Readers with some radio knowledge, and those without any at all, will be able to make progress from the very first sentence; will more readily enjoy the use of their set; will obtain a sound understanding of the laws of set operation; and will be enabled to reach out to bigger and more interesting things. The illustrations have been originally conceived and bring home wireless truths in a new way.

ON SALE THURSDAY, SEPT. 15,
USUAL PRICE—3d.

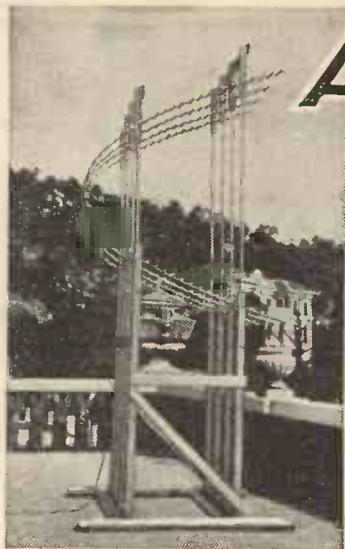
and details of a **VERY SIMPLE-TO-BUILD**
'STAR' RECEIVER—The "WIZARD"

A wizard is a sorcerer, an enchanter. Both ideas apply well to this set. It enchants by its simple basic idea and by its performance. As a sorcerer, the set brings you the

stations from the "vasty deep" of ether space—brings them in plenty, and does not mix them! On another page of this issue we talk at length about it. Anybody with our instruc-

tions can build the "Wizard" and make a great success of it. And almost without instructions, anybody can operate it! Next week's "A.W." will be a great issue.

AN EVENING WITH A SHORT-WAVER



Conditions are fine for short-wave reception now, and this interesting article describes a short tour with a popular short-wave set, the "World-ranger Short-wave 3"

strength (at maximum) of the German stations on the medium waveband, and even when there was bad fading at certain times during the evening, the station was still audible.

Short-wave Static

It did not take long to make it obvious that on the short waves one part of the condenser dial may cover a band almost obliterated with static, but the other part of the dial gives interference-free reception. I tuned round and found another American transmitter, W8XK, and, as a matter of fact, this was searched for and found on and off until the early hours of the morning.

The three-position switch was shifted and almost immediately Moscow was heard broadcasting on 50 metres.

Up on the broadcast bands, the Russian stations are mostly all in between 1,000 and 1,200 metres and Morse interference makes them extremely difficult to receive at times. The 50-metre Moscow transmissions were absolutely free from jamming.

The Spanish stations are often heterodyned on the broadcast band, but down the short waves I found Madrid (EAQ) free from jamming. The quality was not good, but it was, I think, as good as that which one generally gets from the Spanish stations.

THE other evening I sat down in the sole company of a short-wave set, with the fixed intention of seeing just what stations are to be heard nowadays below 100 metres.

One of the joys of short-wave working is that while there are always dozens of stations to be received (the interest never flags), the conditions vary; and on any night you cannot be quite sure what new giants have sprung up in the short-wave ether and what old favourites have relegated themselves to the background.

Loud-speaker Results

The set used for this brief ether tour was the "World Ranger," described in AMATEUR WIRELESS Nos. 532 and 533, and this was chosen not only because it was the latest short-wave set produced by the AMATEUR WIRELESS Technical Staff, but because it is typical of very many short-wave sets; it is a straightforward detector and low-frequency "hook-up" (capable of working a speaker) with no H.F. stage.

To start with, I had a 120-volt dry battery and an inductor speaker, the latter connected up through a tapped transformer to the loud-speaker terminals.

Later on, an attempt was made to use 'phones, but these were found quite unnecessary and the set was also worked from a 120-150-volt eliminator, giving 20 milliamperes. This was an A.C. mains unit, but, owing to the decoupling in the detector circuit of the "World Ranger," there was no instability; nor was there any appreciable hum heard in the speaker.

A quick turn of the dials settled any doubts as to whether nowadays the short waves are worth while. I started listening at 9.30 in the evening, and about the first station I picked up was W2XAF. This station was heard at good strength throughout the evening up to about 11.30, and it was "America" with a vengeance! American reception is impossible on the medium and long wave-bands with all but the biggest sets, but it is my experience that nowadays you will get America on the short waves on practically any good evening—using only 2 or 3 valves!

There is an undeniable thrill in hearing stations thousands of miles away. On the inductor, W2XAD romped in at about the



B.B.C. engineers working one of the special short-wave receivers which are used in some outside broadcasts

When the tuning of the "World Ranger" was mastered and when the best position for the potentiometer had been found, the stations simply romped in and the surprising thing was the selectivity.

Radio Colonial (Paris) was heard on 19.68 metres and higher up the dial (on the next coil tapping) on 25.16 metres. Right at the side of it on this latter wavelength, was our own Chelmsford G5SW. As I was working the "World Ranger" not far from Chelmsford, the station was not heard well owing to "skip" effects. This, of course, was quite the reverse from what one gets on the broadcast band.

Mind you, it is not only the American and Australian stations which have right of way on the short waves. Early in the evening I heard some well-known Continental stations, Zeesen, Rabat, Paris (FLJ), and Bucharest.

The famous 9-kilowatt Italian short-waver in Rome, 2RO, was a good signal, and was remarkably devoid of fading.

Searching for S.A.!

The American station log was increased by the addition of W9XF and W3XAL.

A short-wave list was consulted and for nearly an hour I sat at the dials trying to bring in the Johannesburg short-wave broadcaster on 49.2 metres—a station about which a friend of mine in South Africa sends such glowing reports. The fates were unkind, and JB remains on the log as one of the stations yet to be conquered.

My evening at the dial of the "World Ranger" extended itself to the early hours of the morning and a total of 23 stations was brought in between the tuning coil limits of about 14-80 metres. Prague was heard working at good loud-speaker strength, proving that the triple-range short-wave coil is efficient at the top end of the scale.

Twenty-three stations, each providing real programme value, open up an entirely new field of listening and is a welcome diversion when the broadcast band is full of heterodynes and giant station jamming. I am certain that another evening at the dials will double the length of the reception log and it shows above all, that a listener who cannot receive below 100 metres is missing something of vital interest in wireless nowadays.

K. U.

HERE IT IS

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The construction that conquered microphony;
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made in the history of valve development;
that made possible the P.M.1HL non-micro-
phonic detector.

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low anode consumption thus abolishing all
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The following Mullard Valves are specified for "Your Home Radio-gram" described in this issue:

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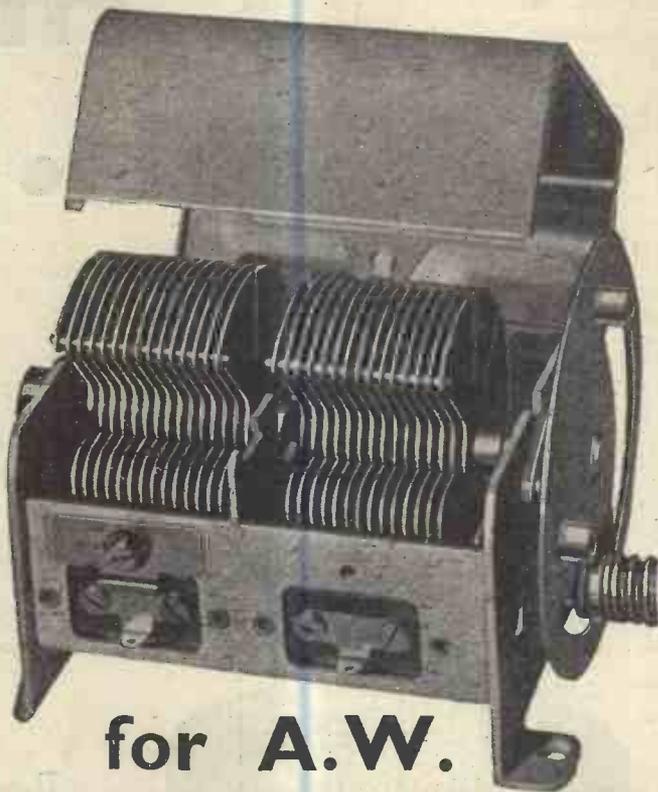
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SPECIFIED



**for A.W.
"YOUR HOME
RADIOGRAM"**

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The British Radiophone Uni-Control Two-Gang Condenser (Type 458) used in the "A.W." "Your Home Radiogram" is designed so that the variable air dielectric trimming condenser belonging to the section nearer the dial can be adjusted from the front of the receiver.

The rotating spindle of this trimmer is brought through the main spindle and its adjusting knob is mounted concentrically with the main operating knob. This permits very accurate trimming and enables maximum signal strength to be obtained with the minimum of trouble.

The other section has a mica dielectric trimmer which can be pre-set in the usual manner. A cover and disc drive are provided with this highly efficient two-gang condenser.

Price 2 1/2

**RADIOPHONE
GANGED CONDENSERS**

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

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On Low Wavelength!

A PROBLEM

TO me one of the greatest of all wireless mysteries is not the temporary waxing and waning of certain foreign stations, but the way in which some of them provide terrific signal strength during the first months of their existence and then become feebler and feebler. Motala, Radio Iberica, Barcelona, Warsaw, Hamburg, Frankfurt, Bero-muenster, Sottens, Lwow, Zeesen, and Bratislava are just a few examples that leap instantly to one's mind. I was discussing this matter the other day with an eminent wireless engineer and he confessed that it had worried him a good deal. The only thing he could think of was that possibly the actual soil in which the earth connections of big transmitting stations are buried undergoes in course of time a chemical or physical change, or possibly both. There seems to be something in this idea, and it would be interesting if investigations could be carried out. But even if it is found that these changes occur, I doubt if it will entirely solve the mystery, for I think I am right in saying that in more than one case where the range of a station has become enormously reduced with the passage of time its field strength has been found at a checking point fifty or sixty miles away from the transmitter to remain absolutely constant.

GRID-GLOW RELAYS

PERHAPS the most interesting example of close-set electrodes is seen in the so-called grid-glow discharge tube or thyratron relay, where the spacing is of the same order as the "free" movement of the gas molecules inside the bulb. This gives an amazingly sensitive combination, a very small variation in grid voltage setting up a sustained output current sufficient to operate a heavy relay. The thyratron valve is, in fact, the most sensitive general-purpose relay at present known, but unfortunately it is of the "trigger" type. That is to say, the slightest impulse is sufficient to set it going at full strength, but there is no sustained proportion between input and output, such as is necessary, for instance, in amplifying broadcast signals. Some day we may perhaps discover the secret of combining this property with the sensitivity of the thyratron and so pass another milestone on the path of progress.

A PUSH-PULL POINT

PLAYING around with a push-pull amplifier the other day I was very puzzled by a curious distortion which was occurring. The notes did not appear to be clearly defined, and I was quite unable to see the reason why. Moreover, the amplifier seemed to me to be overloading rather more quickly than it should do, although it was sufficiently sensitive to give me all that I required. In fact, I was just vaguely dissatisfied with the performance because the result was not

what I should be getting either in quality or punch, but I could not see where the trouble was occurring. I finally came to the conclusion that, perhaps, I was using two valves which were far from matched. I therefore decided to check up the anode current of the two valves to see whether they were reasonably similar.

I found that one was about 18 milliamperes and the other nearly 30, so that I appeared to have spotted the cause of the trouble. On replacing the 30 milliamper valve with another, however, I found very much the same state of affairs. What is more, I found that if I changed over the two valves, the one which formerly took 18 milliamperes now took 30 and vice versa. This naturally caused me considerably perplexity, and it was not for quite a long time that I found the cause of the trouble, which was a break in one-half of the secondary winding of the push-pull input transformer. Consequently, one valve was not receiving any grid-bias at all while the other valve was receiving its normal value. The valve without any grid-bias was taking 30 milliamperes instead of the normal 18, and it so happened that that particular make of valve was uniform in that particular, so that any valve of that type inserted in the circuit without any grid bias would give a reading of approximately 30 milliamperes.

NEEDLES FOR PICK-UPS

IN a good many pick-ups, the socket is so deep that the ordinary needle, when inserted, protrudes but a very little way. This sometimes makes it rather difficult to start it properly on its journey along the grooves of a record. There is one way out of the difficulty which is well worth trying, though I cannot guarantee that it will be successful in every case. This is to use talkie needles, which are obtainable at most gramophone shops, instead of those of the ordinary variety. Talkie needles are much longer and they last well, since they are designed for playing giant records.

AN UNUSUAL FAULT

TALKING of counting revolutions of the turntable, there is a fault often unsuspected which is apt to spoil reproduction in radio-grams which contain clockwork motors of rather cheap type. Most of these will play one side of a 12-in. record well enough, but often when they are used for the second side without rewinding there is something noticeably unpleasant in the reproduction. What happens is that the record speed falls off

a little towards the end of the second side and this causes the pitch to drop gradually. It is just as well, therefore, to make sure by counting the revolutions how many records your motor can play at one winding without beginning to lose speed. Adjust it to seventy-eight in the way already suggested, then wind up fully and play the first side of a record. Without re-winding, turn over and re-start on the other side. About half-way through the second side, make a re-count. If the speed is still seventy-eight, make another one near the end. If yours is a double- or treble-spring motor, continue the process with the first and second sides of another record. Once you have found the point at which the speed begins to fall, you will know just how many record sides can be played at one winding without loss of quality.

ONE WORD OF WARNING

I FEEL I ought to raise a gentle word of caution and warn the reader against rushing into the purchase of sets of American manufacture pushed by glowing advertisements. This warning does not refer to sets of American design and manufactured in this country, though even here it is as well to consider carefully whether the completely British article is not better value. What I have chiefly in mind is the catch-penny set made in America last year and unsold over there on account of the appalling trade depression (we have known nothing like it in this country) which prevailed over there. The first-rate American set is first-rate. The cheap-jack American set is horrible. It appears to offer you more than you can obtain for the same amount of money in British sets. Do, please, remember that you cannot get more than you pay for. Bear in mind that the cheaper lines are out-of-date models and that they are offered over here simply and solely because they couldn't be sold in the country where they were made. Lastly, do not be taken in by the nasty habit of including the mains-rectifying valve in the number of valves that a set is announced to contain. It would be just about as honest to advertise a motor-car as a six-wheeler and to add in the smallest of type (if you added it at all) that one of these was the spare and the other the steering wheel.

VALVES AND "TOOBS"

I HAVE had a certain amount of experience of American sets, and I can say that the best of them are very good indeed and that the rest are—well, the rest. One of the worst features of American sets is that they use American valves. There are some good American valves and there are also some extraordinarily bad ones. Last year, to give an example, an American firm, which was endeavouring to capture the British market, sent me down a set to test. I adjusted it as directed for the local voltage, plugged in, and switched on. There was

DON'T MISS THE SPECIAL
ANNOUNCEMENT ON
PAGE 489

On Your Wavelength! (continued)

complete silence. Tests showed that one of the screen-grid valves was a "dud." I telephoned to the company concerned, which immediately sent down a demonstrator in a swift car. With him he bore all kinds of test instruments and a selection of "toobs." He also brought a spare set, which, after a brief examination of the first, he decided to install. He rigged the thing up and switched on. This time there was not silence, but there was horrible distortion. The testing instruments pointed to a defective valve and from a capacious bag he produced a number of spares. He had three screen-grids with him (the culprit was an S.G.), but every one of these turned out to be defective. But all of them, mark you, were supposed to have passed the most stringent tests and were therefore fit for sale to the ordinary purchaser. Can you beat it?

EVERYBODY'S DOING IT

It is pretty well certain that, before this note appears in print, the great army of listeners will have gone beyond the five-million mark. When you think that there are only just over eleven million homes in Great Britain—and this number includes the tiniest of cottages in the wildest parts of the country—you will realise what extraordinary progress this represents. Almost every other house in the country now has its wireless set. Not until November does broadcasting here celebrate its ninth birthday. Nine years ago there were probably not more than 50,000 listeners at the very outside. Our numbers have increased a hundred-fold in this short period, and that, I think, is something like history.

WRONG AGAIN

ON company, I think, with a very large proportion of writers on wireless subjects, I believed that, owing to its being held in August—the holiday month—the Wireless Exhibition

this year had slender chances of being a great success. I was utterly wrong. Despite the handicap imposed by the heat wave which came along during its early days, the 1932 Radio Olympia was definitely the most successful exhibition that has yet been held. It was visited by 170,000 people, and the Radio Manufacturers' Association estimates that at least £50,000,000 worth of trade will be done during the season in wireless sets and wireless components as against £29,000,000 for last season. Orders have already been placed for 2,000,000 sets (as against 1,250,000 last year), and very nearly double last year's number of valves and batteries.

A BUSY TIME AT MADRID

BY the time that this note appears in AMATEUR WIRELESS the International Telegraphy and Radio Telephony Conference will be sitting at Madrid. No less than seventy countries are sending delegates and there will be an enormous amount of work to do. The interests of broadcasting on this side of the Atlantic are being looked after by representatives of the U.I.R., who intend to take as their slogan "Broadcast wavebands for broadcasting." As matters are at present, there is still far too much commercial morse on both the medium band from 200 to 550 metres and the long waveband between 1,000 and 2,000 metres. It is believed that a way may be found of effecting a clearance.

LONG-WAVE PROBLEMS

ONE of the greatest of all problems confronting the Madrid Conference is that of the number of countries which demand a place on the long waves. It is not always realised that the long waves were, so to speak, the birth-place of broadcasting. The earliest regular transmissions were those of the Eiffel

Tower, made, if I remember aright, on 2,600 metres. Hilversum followed on about 1,100 metres; later came the services using wavelengths between 200 and 550 metres. Everyone realises the enormous advantage of the long waves for broadcasting. A 50-kilowatt station with a wavelength of over 1,000 metres has a very much larger service area than a station of the same power using a wavelength between one-fifth and one-half this amount. Perhaps the greatest of all advantages of the higher wavelengths is that transmissions upon them are comparatively little affected by conditions of daylight and darkness. Again, fading on the long waves is virtually non-existent. Unfortunately, though, the band between 1,000 and 2,000 metres is already overcrowded, and one does not see how newcomers are to be fitted in.

THE BIG PROBLEM

THE great difficulty is that if broadcasting stations are not to interfere with one another the separation between them must be based not upon wavelengths, but upon kilocycles. It has been found that at least a 10-kilocycle separation is required between powerful long-wave transmitters. Now, the higher the wavelength, the greater is the wavelength difference required to produce a 10-kilocycle interval. For instance, two of the little Swedish relays, Boras and Ornskoeldsvik, are separated by only one metre, but the frequency difference between them is 10 kilocycles. On the other hand, though the difference in wavelengths between Königswusterhausen and Radio-Paris is 90 metres, the frequency difference is only 10 1/2 kilocycles, and the 60-metre wavelength difference between Huizen and Kaunas is equivalent to a kilocycle difference of only five. This means that to fit in a considerable number of stations an enormous band of long waves will be required.

THERMION

PERSONALITIES IN THE WEEK'S PROGRAMMES



AT THE B · B · C ·

The New TELEVISION BROADCASTS



KENNETH ULLYETT gives an impression of the television broadcasts now being made by the B.B.C. on the Baird system, from Broadcasting House, London

THE usual stately solemnity of the B.B.C. studios is being invaded by Mr. Robb and his associates, who are doing the new television broadcasts from Broadcasting House.

Like a Film Studio

The studio (that which Henry Hall uses when the television experts are not busy) looks more like a film studio than a B.B.C. room, while the Baird broadcasts are on!

A visitor on the little gallery of the dance-band studio looks down on an interesting scene during a television broadcast.

Through the glass windows of the silence cabinet he can see the nose of the spot-light television transmitter. One of the glass windows is removed so that the

done, at the end of the studio right under the gallery.

The pianist is tucked away in a far corner of the studio and all over the floor there is a maze of microphone and photocell cables.

A trouble they are up against is in changing quickly from a close-up to a long shot. It means that the artiste being televised has to step back quickly away from the scanning apparatus, the lenses have to be changed, the photocell positions checked and, of course, the microphones moved, so that although the artiste's position in the studio is different, the volume is still the same.

Quick Changes

All this has to be done as quickly as possible, so that there is the minimum delay between the close-up and extended screen transmissions. Later on, they may have dual sets of photocells, microphones, and scanning apparatus, so that one ganged change-over switch will suffice.

first few days of the television transmissions!) and the only effective illumination is the reflected light of the scanning spot.

The transmissions start at 11 p.m., but Robb, Birkinsbaw and the other television enthusiasts are busy nearly all day in trying out new studio arrangements and rehearsing the artistes. This rehearsing is done down to the minutest detail and the artistes have to rehearse with their heavy make-up on, so that the final television transmissions will be just the same as the rehearsals. After each section of the rehearsal, the stands supporting the photocell groups and the microphones are shifted and a new test made.

The Check Set

The control-room engineers can tell at once, of course, whether the speech and music are O.K., and a mirror-drum monitor receiver in the control-room is a check on the quality of the television. As a matter of fact, there is no need to watch the monitor closely for the meter readings on the various amplifiers tell the whole story. The B.B.C. engineers have a receiver which gives a picture measuring 7 in. by 3 in., the proportions of this picture being the same as those of the background screen.

There has been a great deal of secrecy observed about the new television broadcasts, but I am sure that the photographs on this page will go a long way towards satisfying the curiosity of television enthusiasts.

Heavy Make-up

The photograph in the heading shows a coon singer undergoing a close-up in front of the scanning machine. There are photo-cell stands on both sides of him. His heavy make-up is obvious. The artistes are told that great contrasts, such as black and white, televise best. The nose of the scanning machine can just be seen behind the control-room window.

Enthusiasts can hear these broadcasts on four nights a week from 11 p.m. onwards. The television signals are given on London National and the accompanying sound on Midland Regional.



IN BROADCASTING HOUSE

(Above) Controlling the mirror-drum scanning machine in the anteroom of the television studio. (Right) At the controls of the television mixing panel in the control room, where the photocell inputs are blended into the main amplifier input

spot-light apparatus can come close up to the glass. He sees the 7-ft. by 3-ft. white screen which forms the background for the close-up and full-length broadcasts and

The change-over is rendered more difficult by the fact that the studio is in semi-darkness. The pianist has a small reading light (even a candle was used during the

PERCY W. HARRIS on

THE PROBLEM OF TUNING RANGE

Stray capacity and poor component design affect the tuning range of a set, and the problems to be faced in this connection are fully dealt with

ALTHOUGH one does not hear much about it, the problem of tuning range is a considerable worry both to the commercial set designer and to the experimenter at home. I am led to this conclusion on examining a number of the new commercial sets at the Exhibition, and in reading over letters from readers who have been building their sets not from published designs, but according to their own ideas and experiments. Let us see what really are the problems we have to face.

Medium and Long

At the present time, and excluding the ultra-short wave-bands, we have to deal with two ranges of wavelengths. On the lower band we go from about 200 metres to 550 metres and on the upper band from—well, from where? We used to say from 1,000 to 2,000 metres, knowing that within this band we could include all stations wanted, but look at the list to-day! You will find a string of stations below 1,000 metres. Between 600 metres and 1,000 there are two 10-kilowatt stations, three 20-kilowatt, and one 50-kilowatt, all Russian; while on 1,000 metres we have the 100-kilowatt Leningrad station. Actually, however, unless you are a Bolshevik (and I sincerely hope you are not) you will not find much interest in the interminable lectures and propaganda sent out by these stations. From the entertainment point

of view the range from 1,000 to 2,000 metres will generally give you all you want.

Going Down Low

Unless we make our sets quite elaborate with condenser switching we desire that the one variable condenser should serve for both wave bands, only the coils being changed. The .0005 variable condenser is fairly well standardised, and there is no difficulty whatever in making this condenser cover the upper band satisfactorily. Most trouble arises in the lower band, where if we choose a coil of sufficient inductance to tune to 550 metres with the .0005 condenser at a maximum, we may in certain circumstances have difficulty in getting as low as 200 metres at the other end of the scale. Experimenters did not notice this when there was nothing of any importance below about 300 metres, and the station which has drawn attention to the problem is undoubtedly Fécamp, which comes in very well indeed in many parts of England. Its wavelength is 223 metres, and Scotch readers naturally wish to get Aberdeen, which is on 214 metres, or 55 kilocycles higher.

Stray Capacity

What are the reasons why a set will not go down low enough? The answer is quite

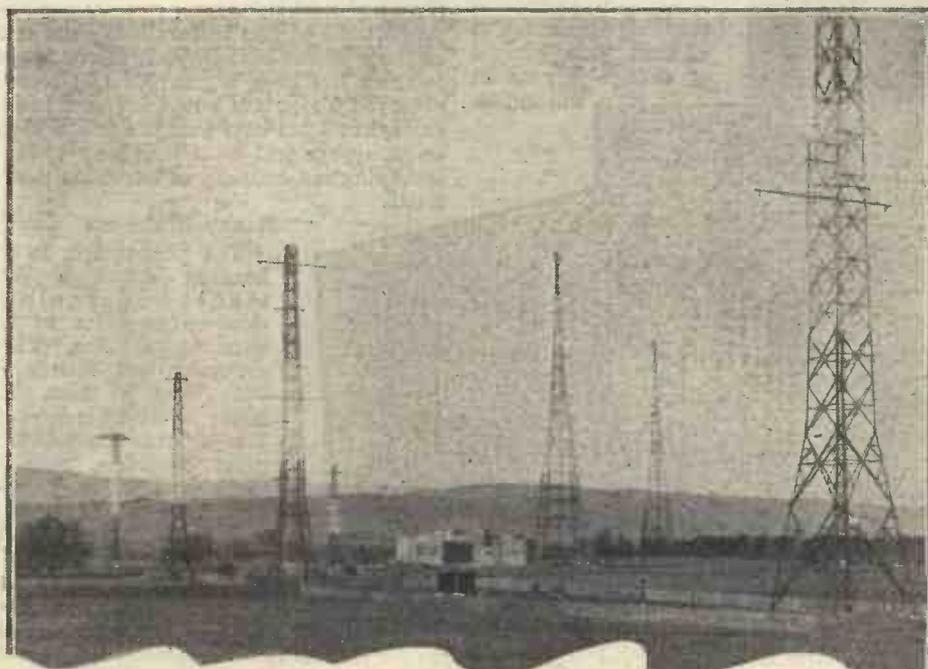
simple—either the inductance of the coil is too high or the capacity of the condenser together with associated capacities (this last is important) is too high on the minimum setting. So far as the inductance is concerned this is fairly well defined, for with .0005 across it, it must tune up to as far as we want to go, which is generally 550 metres. If you are used to making wireless calculations you will not find it difficult to work out how much capacity is required across this inductance to tune to 200 metres, and if you do so you will find the figure is quite appreciable, which might lead you to think there is no need to worry on this score. If, however, you are not provided with the apparatus and facilities for measuring the minimum capacities of condensers as well as the self capacities of coils and different windings, and the associated aerial coupling, you may be gravely misled. You would be surprised to know how greatly different makes of condensers vary in their minimum capacity. It is not unusual to find a cheap condenser in which the minimum capacity is not much less than a tenth of the maximum. With such a condenser, and a fairly tight aerial coupling, you will not be able to go down to 200 metres however hard you try.

Cutting Down Capacity

But let us assume that you have a condenser with a very low minimum, what other troubles have you to face? Capacity due to distributed capacity between the leads, capacity between valve pins and sockets, and inter-electrode capacity in the valve. You have also another very important place to look—distributed capacity between the windings of the coils. You may have two coils, each with the same inductance, and each tuning up to 550 metres approximately with a given low-minimum condenser. At the other end of the scale with the variable condenser set at minimum one may tune to 200 metres and the other as high as 250 metres because in the latter case the windings are so arranged to give quite a high capacity between themselves, and the overall distributed capacity may add sufficiently to the minimum of the condenser and that of the wiring generally that you cannot get down to the figure you want. Bunch-wound coils made with thin wire may have a lower distributed capacity than coils wound with the same wire in neat layers with the turns touching. The "scramble windings" often used for temporary coils have a surprising way of working out more efficiently than neat turn by turn winding which looks as if it is done on a machine!

This is a very interesting and important subject for all set users, and I propose to devote more space to it in a future article.

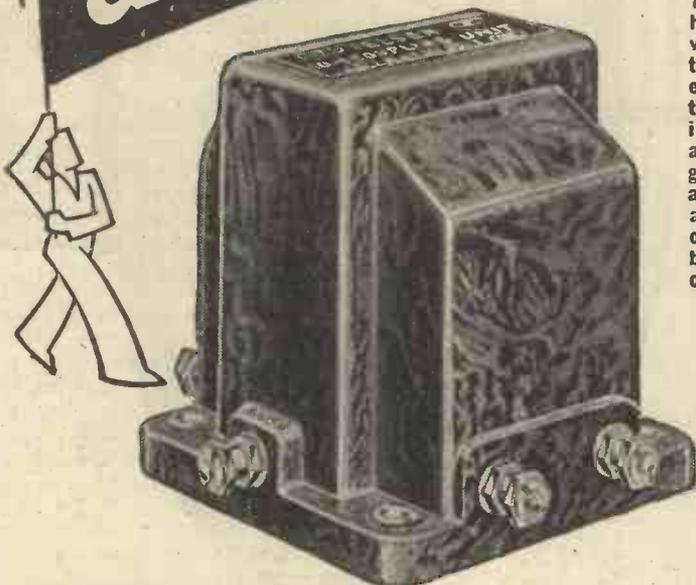
THE LEAGUE'S OWN STATION



The League of Nations station at Prangins, Lake Geneva. The medium-wave and beam aerials of this famous station can be seen in this view.

TELSEN

**10-1 COUPLING UNIT
& 1-1 COUPLING UNIT**



TELSEN 10-1 INTERVAL COUPLING UNIT

This is a filter-fed transformer using a high permeability nickel alloy core, which enables a 10—1 voltage step-up to be attained while preserving an exceptionally good frequency characteristic. The response is compensated in the higher frequencies for use with a pentode valve, this combination giving an amplification greater than anything previously achieved, equal to two ordinary L.F. stages, but with better quality of reproduction.

12⁶

No. W.215

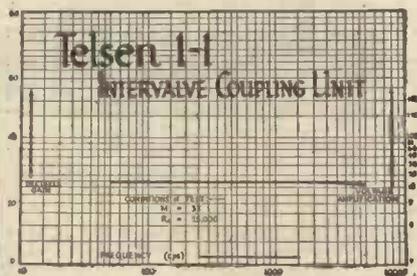
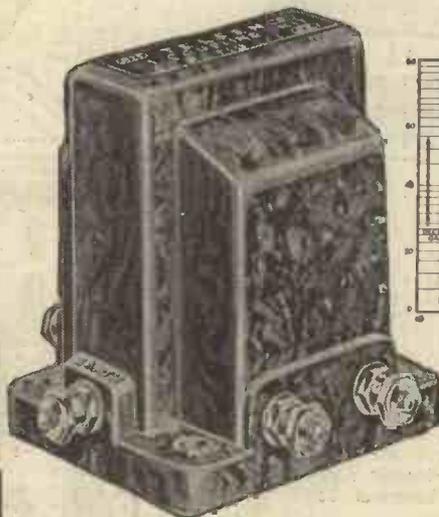
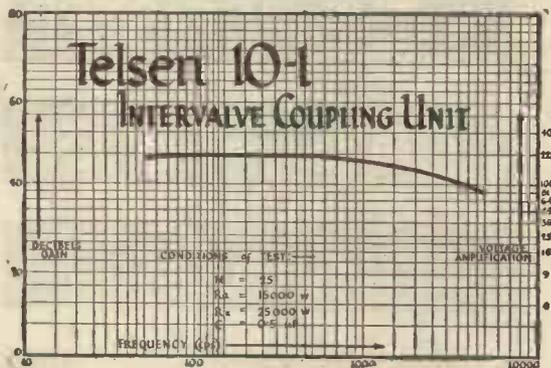


TELSEN 1-1 INTERVAL COUPLING UNIT

This is a modern development of the one-time deservedly popular R.C. unit. It incorporates a low pass filter feed in its anode circuit, thus effectively preventing "motor-boating," "threshold howl" and other forms of instability arising out of common couplings in eliminator and battery circuits. Used with an H.L. type valve it will give an amplification of about 20 and a perfect frequency response, at the same time consuming negligible H.T. current.

7⁶

No. W.214

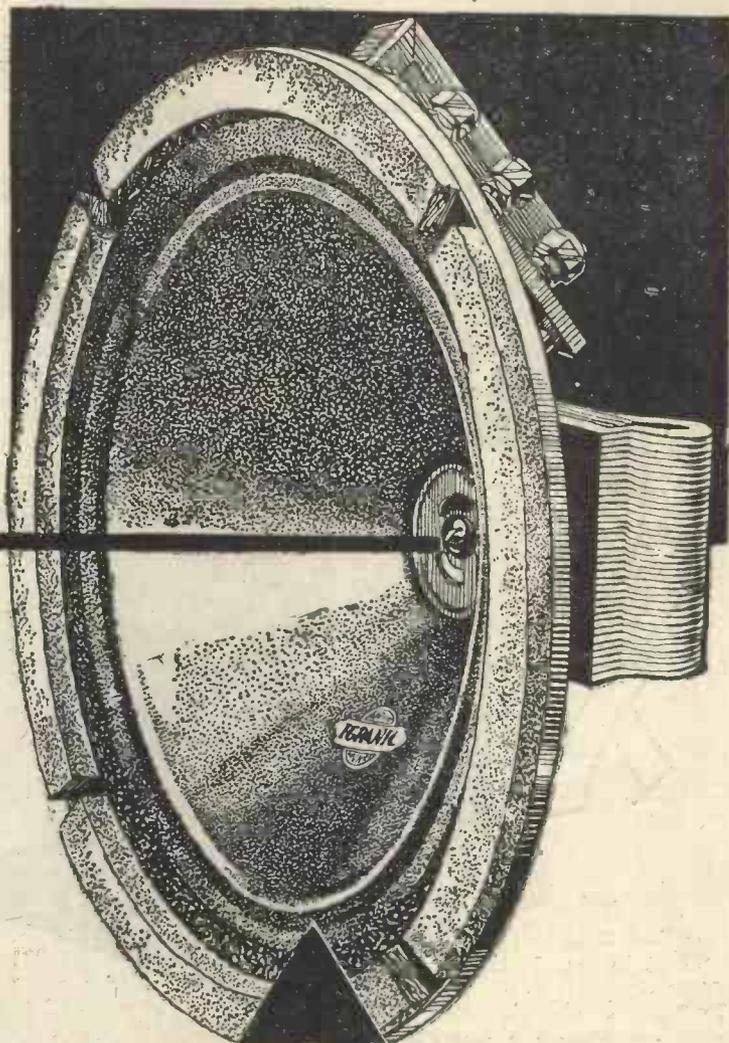


TELSEN
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DR. E. H. CHAPMAN O.T.—

A SEARCH FOR THE BEST CIRCUIT

Amateur set designers will be interested in this description of the development of a popular standard circuit into one giving vastly better results

THE development of the Regional Scheme, with its high-power transmitting stations, has brought along with it certain difficult problems to the wireless constructor. First and foremost, there has been the problem of selectivity. The powerful Regional transmitters have demanded an entirely new standard of

North National transmitters did not cause me a great deal of trouble. I found that, by reducing the length of wire in the two tightly-coupled coils A E and F R in Fig. 1, I could increase selectivity. There was a loss of volume on reducing the lengths of these coils, but a medium could be struck between gain in selectivity and loss in volume.

On the long-wave coil, however, it was entirely different. North Regional "broke through" to an extent of a quarter or a third of the tuning condenser dial at the lower end. I tried different methods of curing this "break-through" trouble. First I tried increasing the length of the windings A E and F R of the long-wave coil in order to increase the natural wavelength of the aerial circuit, and so take that natural wavelength as far away from the North Regional wavelength as possible. This certainly reduced the "break-through" effect, but at the expense of selectivity. I tried decreasing this length of coil but, although selectivity was increased there was a considerable loss in volume.

Apart from trying to cure this "break-through" effect of North Regional on my long-wave coil, I had another object in view. That was to obtain Königswusterhausen clear of Daventry National and

Amongst many attempts to solve this dual problem, I tried loading inductances of various kinds, and I tried an additional tuned aerial circuit. None of my attempts proved satisfactory, so finally I decided to give up the attempt and look round for a different circuit.

Where was the starting point in the search for the new circuit I desired? Additional selectivity was required and North Regional "break-through" on the

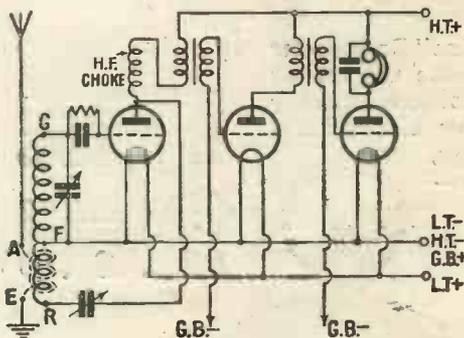


Fig. 1. The original circuit before the modifications described were attempted

selectivity in our wireless sets. In the area round the North Regional station, there has been, in addition to the selectivity problem, the problem of the "break-through" of the 479 metres transmission on to the long-wave coils in use in that area.

My own experience of these troubles, incident to the establishment of the North Regional station sixty miles away, must have been typical of the troubles of many others who live within the same distance of this station.

The Original Circuit

When the North Regional station commenced transmissions I had in general use a three-valve receiver built according to the circuit diagram in Fig. 1. It may be recalled that this particular circuit was first described in AMATEUR WIRELESS in October, 1928, and that the circuit then marked a considerable advance in selectivity.

As far as the medium broadcast band was concerned, the North Regional and

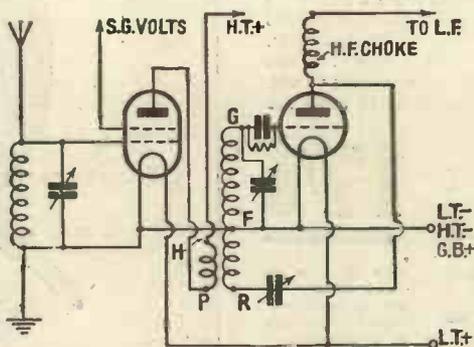


Fig. 2. An H.F. screen-grid stage added to Fig. 1

Radio-Paris. When I did achieve this object, the volume of Königswusterhausen was not sufficient for loud-speaker reception. I was between the devil of losing Königswusterhausen and the deep sea of North Regional "break-through."

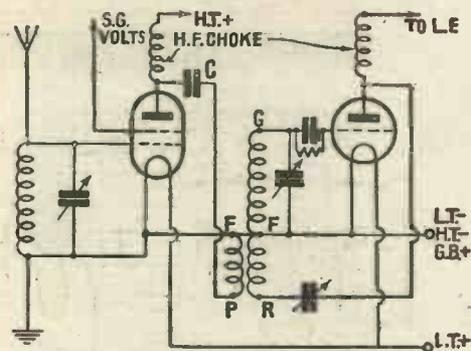


Fig. 3. Choke feed to the anode of the screen-grid valve

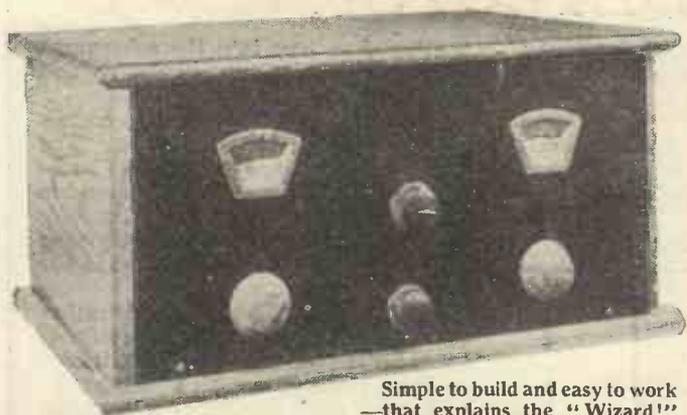
long-wave coil was to be prevented, yet volume was not to be sacrificed. Clearly, I thought, a stage of screen-grid high-frequency amplification must be added. How could this be done in such a way as to retain the useful selectivity of the original circuit shown in Fig. 1?

By the addition of a screen-grid stage to the circuit diagram of Fig. 1 we get the circuit diagram of Fig. 2. In this circuit the coils P H and R F form a high-frequency transformer coupling the screen-grid valve to the detector valve. I tried this arrangement with fair success but there was one decided objection to it. The H P sections of the long-wave and short-wave coils would have to be taken to a change-over switch, and the section H P in use would be carrying the high-tension current to the anode of the screen-grid valve. Such a course did not commend itself to me.

The more usual choke-feed anode-current supply to the screen-grid valve suggested itself. Accordingly, I re-drew my circuit diagram as shown in Fig. 3. In this circuit we have choke feed to the anode of the screen-grid valve, and the usual fixed

(Continued at foot of page 502)

INTRODUCING THE "A.W." WIZARD"



Simple to build and easy to work —that explains the "Wizard!"

IN the "A.W. Wizard"—a fine new set to be described constructionally in next week's issue—the "A.W." Technical Staff is combining all the good features of the new season to make a really outstanding, easy-to-build three-valver.

Modern reception conditions call for something special in the way of circuits and a difficulty that the Technical Staff has had to contend with so far has been the increase in set complication when the theoretical circuit is made good enough to cope with present ether conditions.

A set nowadays must be, above all, selective; it must give good tone at full volume without necessitating too much high tension, and it must be easy to build and work. It is extremely difficult to combine these features, for many ultra-selective circuits are difficult to make up. They need a large number of components in the H.F. and detector stages. The wiring is complicated. The operation is above the capabilities of non-technical listeners. Ganging and trimming have to be done.

Accurate Tuning

The "A.W. Wizard" strikes a new note in all these features. Its circuits are not ganged. There is individual control for both the highly selective tuning circuits. Two separately controlled condensers ensure that you get accurate tuning over the whole wave-range. That overcomes a snag of many ganged sets in which the tuning is good at one part of the scale and poor at the other end.

The "Wizard's" claim to selectivity is founded on fact, and it has undergone rigorous tests within a few miles of the London National and Regional transmitters. The sharp tuning is obtained by having a very small coupling to the tuning coils, both of the detector circuit and of an efficient screen-grid stage.

Most listeners now are aware that a good screen-grid high-frequency stage in front of a leaky grid detector sharpens up the tuning and cuts down inter-station jamming, due to the fact that a smaller aerial input will give the same volume output.

Wizard" both circuits have the condenser control brought out to the panel.

Simple Control

This does not complicate tuning because there is a condenser in series with the aerial to reduce aerial loading on the first tuning circuit and therefore the dials move practically in step. There is no ganging or trimming to be done and no matter what station is being received you can be sure that the "Wizard" is accurately tuned to it. That is the surest way to produce knife-edge selectivity.

The coupling between the screen-grid valve and the detector is of a low-loss nature. Both the tuning condensers have one set of vanes at earth potential and therefore both tuning controls are stable. There is no risk of the "Wizard" squealing as the hands are moved near the dial!

Good Tone

Good tone, it should be noted, in the "A.W. Wizard" is assured by a parallel-fed type of coupling between the detector and the power valve. The set gives an output sufficient to work a good inductor or moving-coil speaker and yet the H.T.

A fine new set, simple enough for everybody to build, extremely easy to operate and, above all, outstanding in performance, is on the way. A constructional description of it will be given in next week's issue and these preliminary notes are of vital importance to all listeners on the look-out for a better set

This applies only when the tuning circuits of each valve stage are accurately in tune and in the "A.W."

consumption can be kept down to within 10 milliamperes.

As a result, the "Wizard" can be worked from a 15- or 20-milliamper type of mains unit or from a medium-capacity high-tension battery.

A feature of outstanding importance to novices in the construction has not been overlooked. The "Wizard" can be built by any handy man in a couple of hours, and there are no soldered joints in it.

No Soldering

This will remove all constructional difficulties and as there is no soldering to be done in the "Wizard" all the work of construction can be done with a brace and a bit, a screwdriver and a pair of pliers! What could be simpler?

Circuit refinements which make the "Wizard" absolutely up-to-date, include a simple change-over switch arrangement for radio or gramophone and a combined wavechange and on-off switch. There are only four knobs on the panel, and only two knobs to be operated in the actual tuning.

Constructional details of this fine new outfit will be given in next week's issue, and a special method of presentation of the constructional features will ensure that the "A.W. Wizard" can be made up within a couple of hours and that it will work right first time.



A snap taken last week in the "A.W." laboratory of the new "Wizard" being put through its paces. The complete set is of striking appearance, and is housed in a special type of cabinet to be shown next week. The set is a real winner!

WHAT IT IS FOR

THE VALVE DETECTOR

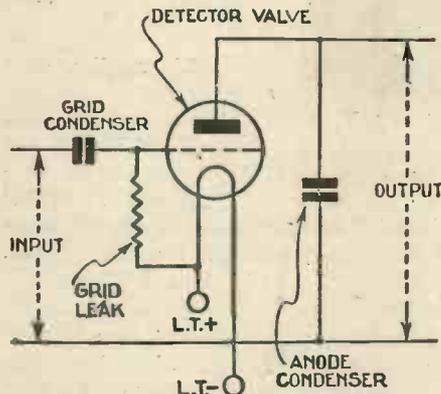
TO the average beginner studying these articles, it must seem rather obvious that the function of a detector is more than merely "detecting" wireless waves. In fact, to say that the valve used in what is commonly referred to as the detector position detects signals is misleading. If any detecting can be said to be done, it is surely a process that takes place in the tuned aerial circuit. At that early point the aerial may perhaps be said to detect waves in the ether that would pass unheard but for the phenomenon of resonance—which is another story.

At the detector stage, wireless signals undergo a decisive change, whereas any valves preceding the detector merely amplify whatever signals are being picked up. At the detector a separating or de-modulating process occurs, which can be grasped only by those who have a knowledge of what a wireless telephone signal really is.

For the present we must consider the telephony received as being composed of a very high-frequency alternating current, upon which is super-imposed, by the process of modulation, the much lower frequencies of speech and music. As the medium of transmission is ether and not air, the original audible frequencies have to be carried on the very much higher frequencies of wireless waves.

The job of the detector is to regain the original audible frequencies, by separat-

ing them from the carrier high-frequency. The circuit shown by the diagram is the usual arrangement for a detector. The grid leak and the grid condenser together play an important part in making the audible frequencies wrapped up in the incoming signal affect the anode current of the valve.



This diagram shows the main outline of a modern detector-valve circuit. The grid condenser isolates the grid from the low-tension negative side of the filament supply, while the grid leak applies a small positive potential to the grid. The anode condenser serves to by-pass the unwanted high frequency, appearing in the anode circuit after separation by the detection process, from the audible frequencies

The anode condenser serves to drain away the high-frequency current, which, once the effect of the low frequencies has been obtained, is of course no longer required. Indeed, if the high-frequency

is allowed to pass into the subsequent amplifier, there will be distortion and instability.

Values for the grid leak and condenser must be carefully chosen. The modern tendency is to use a .0001-microfarad condenser and a 1-megohm grid leak. Such values will effectively prevent what is known as frequency distortion—cutting of high notes in the audible scale.

Another form of frequency distortion can be caused by the incorrect choice of value for the capacity of the anode condenser. Usually, with a moderate-impedance valve, a capacity of not more than .0003-microfarad is recommended. If a lower capacity is used the high frequency by-passing will not be sufficient, while if a much larger capacity is chosen the higher notes of the audible scale will be by-passed with the high frequency it is primarily desired to eliminate.

Although the detector's function is mainly to obtain the effect of the audible frequencies impressed on the carrier wave, it also acts as a low-frequency amplifier. This sometimes unsuspected function of the detector can again upset the quality unless suitable precautions are taken. The detector in its function of amplifier must be arranged so that it does not overload. This is best achieved by using a medium impedance valve with as much high tension on the anode as possible.

HOTSPOT;

"A SEARCH FOR THE BEST CIRCUIT"

(Continued from page 499)

condenser c in the anode lead from this valve to the detector valve. The coil P H in Fig. 2 has become coil P F, the end F being connected to the common negative and earth.

What next? Clearly there is no need for the tightly-coupled coils P F and R F. We shall get the same result by using the one coil R F. Hence we may take the lead

Our next step is to consider the aerial circuit. There are two ways of making this circuit selective. We can introduce a coil of the same kind as the coil R F G in the aerial circuit as shown in Fig. 4, or we can introduce an aerial-series condenser of the variable type. Experimental tests proved the latter to be the better alternative. We now have a complete circuit as drawn in Fig. 5.

What is there novel in the circuit diagram given in Fig. 5? Merely the one change, that is all. A simple change

one simple change, there is a great deal of systematic experimental work with its inevitable disappointments.

A four-valve receiver built according to the circuit diagram of Fig. 5 has been used by the writer for several weeks. The selectivity of the receiver is unusually good. On the long-wave coil it is possible to obtain clear reception of Königswusterhausen when both Daventry National and Radio Paris are working. This is the most severe test of a long-wave coil in this district, and there are few receivers which can be made to pass this test successfully.

On the medium wavelengths, using coils covering a wavelength band of 230 to 580 metres, over fifty stations have been received at good loud-speaker strength. A further list of ten stations has been compiled for coils covering wavelengths from 120 to 230 metres. On lower wavelengths the usual stations have been received, Amsterdam Experimental on 80 metres, French amateurs, the Vatican station, Moscow on 50 metres, Schenectady, Zeesen, Madrid, Rome, and several other stations not yet identified. No attempt has been made to build a special short-wave receiver using this circuit. Only ordinary apparatus and assembly have been used. The lowest wavelength so far recorded has been Paris Poste Colonial on 25.20 metres.

Further work on the circuit is in progress, and there is promise of interesting results.

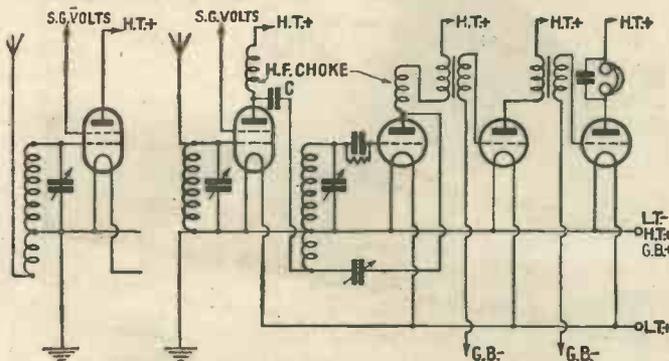


Fig. 4 (left). The next circuit modification, and Fig. 5 (right) the final circuit arrangement

from condenser c to point R of the coil R F G. We then have a detector valve coil which corresponds exactly to the coil R F G in Fig. 1. We know that we can make this coil almost as selective as we please by shortening the length of the section R F.

which takes the lead from the condenser c to the reaction end of the detector-valve coil instead of to the grid end of that same coil. It has not taken long to describe how this change was evolved, but those who are used to experimental work of this kind in wireless will know that, behind this

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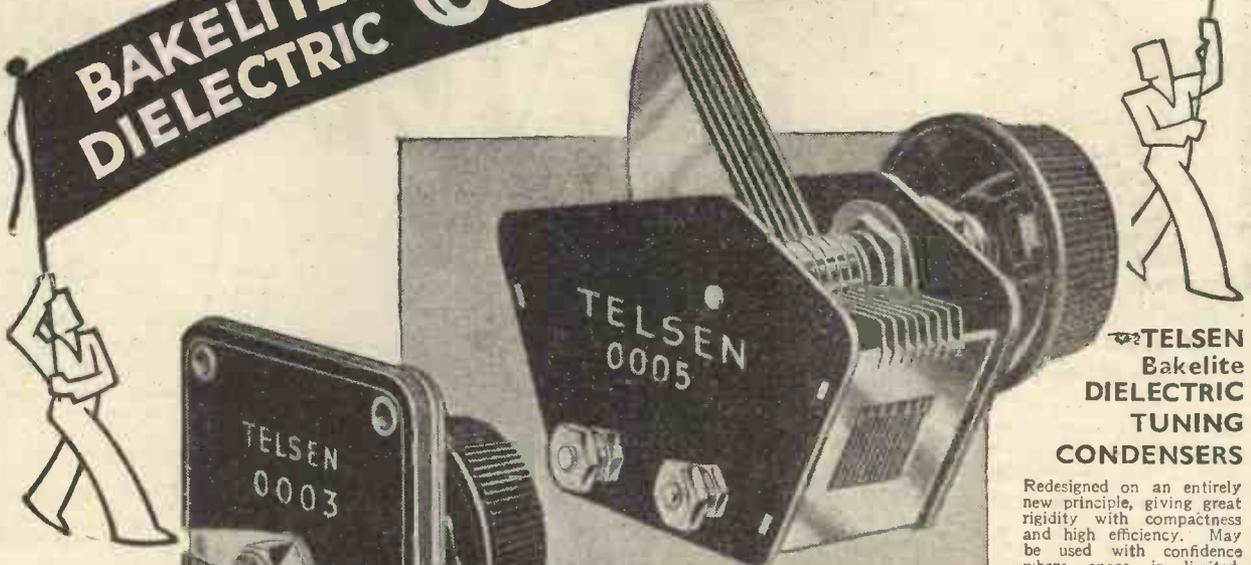


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ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON BIRMINGHAM

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

Our Broadcast Critic

TALKS ABOUT

FINE PIANO-PLAYING



ARTHUR DE GREEF
The Famous Pianist

THERE has been some bad alternating again. The other night I came into the house a few minutes after eight and switched into the National without looking at the programme. The orchestra did not sound quite like the full B.B.C. orchestra, so I switched round to the Regional. That sounded very much the same. I found, however, that I was wrong over the National. It was Queen's Hall, and the other was Section C. It occurred to me then that it is really rather feeble to find Sir Henry Wood conducting the Prom orchestra on one side and Adrian Boult conducting Section C on the other, both playing classical music. Musicians would hesitate, not knowing which to choose; non-musical people would dislike both. There were sopranos in both programmes. For forty minutes things were like that, regardless of public taste. Surely something can be done to see that the Regional Scheme is properly carried out?

I am not alone in admiring Harold Samuel's playing of Bach in the Queen's Hall this week. Press opinions have been unanimous. Apart from the performance as an interpretation of Bach, Mr. Samuel's pianism might well be cited as a model for other pianists—something for them to imitate in the wireless sense.

Naturally, when any player steps on to the platform in the Queen's, or any other hall, his first consideration is the audience before him. Anything else is unthinkable. The fact that a few microphones are slung across the building probably means nothing to him. In a studio at Broadcasting House it is a different matter; he feels he is there for one reason only—broadcasting. If he has any taste he guards his tone, remembering that misjudgments in the dynamic sense may have bad results. All this misses a player at one of the Proms, and he may commit indiscretions. Most of them do.

Harold Samuel's playing completely satisfied both his visible and invisible audience because his tone was so round and soft. He gave the Promsters all the intensity a *fortissimo* suggests, but with such restraint that *not once* did the piano

sound hard. I wish every pianist would do the same. No wonder, at the conclusion, the hall rang with the cheers of an excited audience!

That was a good concert. Dorothy Silk sang with taste and feeling—and with a certain depth of interpretation. She, also, was well received. Arthur Cranmer was another success.

The Bach Proms are generally homely affairs, the instrumental soloists being culled from the orchestra itself. Charles Woodhouse (violin), Robert Murchie, and Frank Almgill (flutes), played beautifully in a Brandenburg Concerto. They have done it all before, of course—many times—but it sounded very fresh and crisp.

One of the outstanding features of the Proms thus far was the amazing performance by Lionel Tertis of an arrangement of his own for viola of Elgar's 'Cello Concerto. I remember the concerto coming out in 1919 when Felix Salmond played it with the London Symphony, and I was interested in the adaptation, which I thought skilful.

Most people would have enjoyed Keith Faulkener's singing of three of the "Songs of Travel" by Vaughan Williams. They are light enough for anybody. I always think Vaughan Williams has slightly overscored them. I found the orchestra rather heavy in places. In any case it

would be a good idea to reduce the number of players to an absolute minimum in these orchestrated songs. It is irritating to miss the singers' words.

Only three out of Holst's seven "Planets" were given. I must own to wanting the other four. They are very beautiful. And now, Mr. Holst; what about writing your eighth "Planet" to celebrate the discovery of Pluto? A tone poem centred round the god of Hades ought to excite your imagination!

The Saturday-night Prom was light in weight all through. I suggest to those of you who do not profess to follow the Proms (but who are open to conversion to good music) that the Saturday-night Proms make a very good beginning. Surely nobody could fail to have enjoyed the *Peer Gynt Suite*? Or the Saint-Saens piano concerto? My only grumble about the latter is that Mr. de Greef played too loudly—in one place so loudly that the piano sounded out of tune to me. He is so masterful a player that he would be wise to guard his tone a little more—just for the sake of the audience he cannot see.

I have heard no vaudeville this week. I missed the only one. I am not sure that I minded; they have become a bit tedious recently. I listened to Ashley Sterne's little affair called "Grand Slam." Until recently I did not know he was a musician. Composers are not often humorous writers and humorous writers are very rarely composers. However, he seems to be both. In this instance I liked his music immensely, but his humour did not appeal to me. I suppose it is always the way when one expects too much. "Book by Ashley Sterne," I read in the programme. "That should be amusing," I thought. But it wasn't a bit. All the same it made a pleasant show, very suitable for summer broadcasting.

The Sunday afternoon recital by May Mukle ('cello) was one of those personal, intimate broadcasts for which I have asked so frequently. I hope we shall have them throughout the winter. Miss Mukle is quite one of our best 'cellists.

Later in the evening I listened to the Canadian Trio. They had changed their pianist, but I am sure they could not have minded, because the deputy possessed a distinct and pleasant sense of rhythm. What a difference rhythm makes to music!

WHITAKER-WILSON.

PROGRAMME POINTERS

Drama by wireless is unquestionably a power. That much, at least, has been abundantly proved. There have been successful "thrillers" of various kinds. One or two have been morbid; many listeners thought "Rope" rather on that side. My pointer this week is not exactly to morbidity in "Obsession," but to its being too human. That play, on the stage when one is in a theatre for the purpose, might pass without comment, but there is a limit—there must be a limit—to what is broadcast in the form of these human dramas. In the home it is a different matter altogether. Also the fact that the whole thing is unseen tends to make these human plays almost unbearable. This one—all honour to Dulcima Glasby—was impelling; one had to endure everything in it in order to hear how it ended. As a matter of fact, it ended happily, but there were some very harrowing moments in it. The whole question of these intensely human plays requires thought. Plays with big moments in them are naturally welcome, but agony piled on—especially piled on via the ether—needs careful censoring. This particular play was a little bit—well—too human.

FIRST constructional details of this battery-operated radio-gramophone were given last week on pages 440-442.

The radio-gramophone consists of an up-to-date four-valve receiver unit, a permanent-magnet moving-coil speaker, a clockwork-driven turntable, pick-up, volume control, and batteries.

The set itself is made up on a flat baseboard in the conventional way, and as there is actually no panel it is, in fact, a great deal simpler to build than many complete receivers.

The Layout

On this page is a complete list of the parts you need for building "The Home Radio-Gram," together with a list of accessories, gramophone motor, pick-up, batteries, and so on. In last week's issue a small scale reproduction was given of the full-size blueprint of the set unit. This is a guide to the wiring, but it will pay you to get the full-size print, which can be obtained, price 1s. 6d., post free, from the Blueprint Department, AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4. There is a particular reason why the print is handy when you start building the "Home Radio-Gramophone" and it is that not only does it give a full-size plan view of the set, but it gives a half-scale reproduction of the drilling needed on the cabinet front. A little diagram illustrating this is given on this page, but if you have the half-scale sketch of this drilling layout before you, it is quite easy to make the holes in just the right places in the cabinet front.

Starting Construction

The set itself is quite straightforward to make up from a kit of parts, but it is as well to detail the various constructional steps.

First, you will see that all the parts are mounted on the wooden baseboard supplied with the Camco "Popular" cabinet. Not all of this baseboard is needed for mounting the parts and only the front part of the board is used. This should first be covered with a piece of aluminium foil measuring

HOME

This fine set for battery operation was introduced in last week's "A.W." No. 534, on page 440. These further constructional notes and operating details will assist home constructors

17 in. by 10 in. Make sure that the metal used is fairly stout and free from bumps, for if there are any raised places on the metal, they may short-circuit the under-wiring of some of the components, although if all the parts are firmly screwed down, this is very improbable.

The Metal Base

You will see from the blueprint, that the foil sheet is cut away at two places along the front edge, so that, at a later stage in construction, two L-brackets can be screwed to the baseboard to support condensers without making electrical contact with the foil.

When these two cuts have been made in the sheet it can be tacked down to the baseboard. Some metal foil is covered with an insulating lacquer to preserve the polish, and it is essential to remove this coating before the various electrical connections are made to the foil which covers the baseboard.

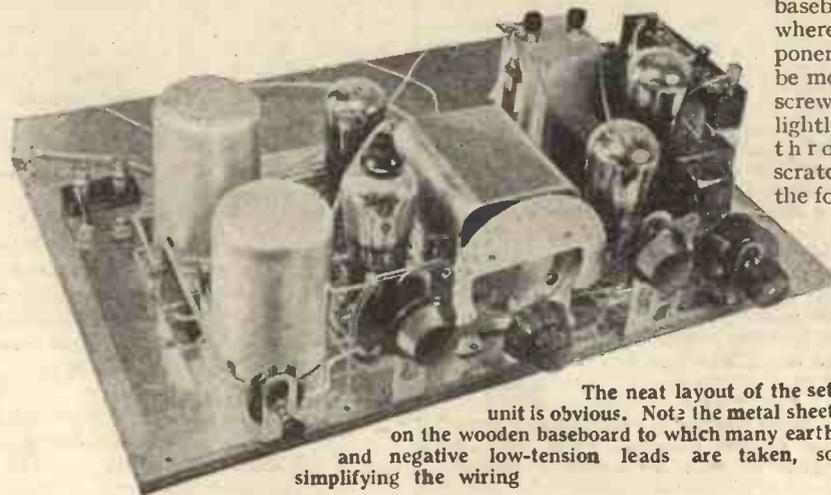
When you have finished this job, you should put the full-size blueprint over the top of the foil and baseboard to see where the components are to be mounted. The screwholes can be lightly pricked through and scratched on to the foil. Get the exact positions for the variable condenser,

coils, valve-holders, smoothing choke, terminal block, and the rest of the parts.

The two coils are screwed down on to the bases of the screens. The battery clips for the grid-bias battery are screwed down to the foil. The on-off switch and the wavechange switch are mounted on L-brackets which are screwed through the foil to the baseboard and which make contact with it.

Panel Layout

The four brackets needed for supporting the differential and reaction condensers and the wavechange and on-off switches, are supplied with some complete kits of parts or can be made out of brass or aluminium strip. The exact height of the parts on these brackets is not critical, but you should



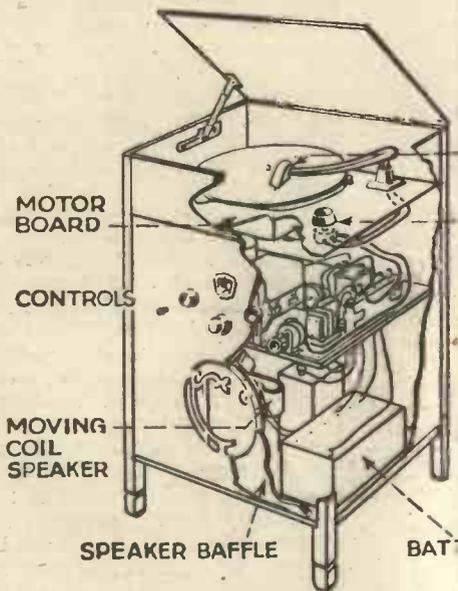
The neat layout of the set unit is obvious. Note the metal sheet on the wooden baseboard to which many earth and negative low-tension leads are taken, so simplifying the wiring

WORKING



HOME

RAD



This sketch shows how the turntable equipment, speaker and batteries are placed in the "Popular" cabinet



YOUR

Battery users and those who want a simple radio-gram to work with battery valves and a mains eliminator will be interested in this easy-to-build outfit

RADIO-GRAM

keep the panel layout symmetrical and the wiring short.

Earth Return Leads

You will see when wiring up that some of the wires end in spade tags, which are screwed to the foil and which make connection with it. Sometimes these spade tags are clamped beneath a component (as in the case of the H.F. choke and one of the fixed condensers). In other cases, the wires are taken to spade tags which, without being clamped under a component, are screwed down to the foil and baseboard. Take care that they make good connection, for otherwise the earth return circuits will not be complete. One of these earthing wires is clamped under the front of the two-gang condenser.

Flexible resistances are used in the construction and shielded wire is also used for some of the leads. One wire is taken underneath the set baseboard from the aerial terminal to one terminal of the differen-

tial condenser. It is taken underneath the baseboard to keep the wiring on top neat. As it is an aerial wire, see that it does not short-circuit to the foil on the baseboard. The battery flexes are taken straight from the various components, while there are three short and direct leads to the grid-bias battery.

Test the set and check over the wiring before putting it in the gramophone cabinet. The blueprint should be used for checking over the leads. Each lead can be ticked off on the blueprint as its actual counterpart in the set is passed as O.K. When testing the set, you will notice that there are two wires going to the volume control on the gramophone motorboard. These do not come into play when the set is working on radio reproduction, however.

For economical working, it is recommended that a double or triple capacity H.T. battery be used. If the "Home Radio-gram" is worked from a mains unit, battery valves being used in the set, an ordinary 120-150-volt unit, giving about 15 milliamperes, is suitable. An accompanying table shows suitable 2-volt battery

valves for all four positions in the set.

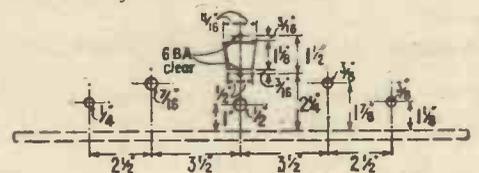
The top of the radio-gram cabinet should be drilled to take the spring-driven motor, the pick-up, and volume control. It is of vital importance to position the pick-up correctly, so that there is good tracking.

Most pick-ups are supplied with a mounting template, so that taking the motor spindle as a basis for mounting, you cannot go wrong in positioning the pick-up. The mounting centres for each make of pick-up differ, so that it is impossible to give a drilling diagram for all makes.

A Dual-purpose Switch

The two-pole double-throw rotary switch on the front of the set is a handy control. When in the centre position, the whole set is switched off. When turned to one side, the low-tension circuit is made and the set is switched to "radio."

When turned to the other position, the set is switched to "gramophone," the pick-up volume control being automatically brought into circuit. You should note that if the "Home Radio-gram" is used mainly for gramophone reproduction, then the screen-grid and detector valves should be taken out of their sockets and inserted only when the set is needed for radio. In the average working, though, this is quite unnecessary.



A sketch showing the drilling centres on the front of the radiogram cabinet

If the "Home Radio-gram" is battery driven, there is no need to shield any of the wiring except where indicated on the set itself. If the radio-gram is used with a mains eliminator though, you may find it essential to shield the pick-up and volume-control wires.

As there is an output choke in the set, a remote speaker can be used as well as the one in the radio-gram cabinet. There is

(Continued on page 525)

PICK-UP

GRAMO
VOLUME
CONTROL

TERIES

ment, set
ne special

COMPONENTS REQUIRED FOR YOUR "HOME RADIO-GRAM"

.00015-mfd. bakelite dielectric differential reaction type condenser (Formo, Telsen, Lotus, Igranic, Polar, Utility, J.B.).

Baseboard, 18 in. by 14 1/2 in. (as supplied with cabinet) (Camco).

Piece of aluminium foil 17 in. by 10 in. (Peto-Scott).

Four brackets to specification (Peto-Scott).

Uni-control dual condenser (British Radiophone, J.B., Utility, Polar).

Dual-range aerial coil and H.F. coil with reaction (Slektun, Lissen).

.0005-mfd. reaction condenser (Lissen, Readi-Rad).

Low-frequency transformer (Lissen Hypernik, Slektun, Telsen, Varley, Atlas, R.L., Igranic).

20-henry output choke (Bulgin, Lissen, Heayberd, R.L., Tunewell, Varley, Atlas, Regentone, Ferranti, Slektun).

High-frequency choke (Lissen Disc, Igranic, Wearite, Readi-Rad, Telsen, Lewcos).

Screened high-frequency choke (Wearite, Bulgin).

Four 4-pin valve holders (W.B., Telsen, Lissen, Lotus, Benjamin).

Combined radio-gram-off-switch (Bulgin).

Two 2-mfd. fixed condensers (Telsen, Lissen, T.C.C., Dubilier, Ferranti, Wego).

One .0001-mfd., two .0002-mfd., one .006-mfd. fixed condensers (Lissen, T.C.C., Dubilier, Telsen, Igranic, Wego, Formo, Graham-Farish).

20,000-ohm, 30,000-ohm spaghetti resistances (Graham Farish, Lewcos, Telsen, Lissen, Varley, Bulgin).

One 1/2-megohm grid leak with wire ends (Lissen, Dubilier).

One 1/2-megohm grid leak (Lissen, Dubilier, Telsen, Sovereign).

Push-pull 3-point shorting switch (Bulgin, Readi-Rad, W.B., Telsen).

One grid-leak holder (Readi-Rad, Bulgin, Lissen, Wearite, Dubilier, Telsen).

One terminal block (Lissen).

Pair G.B. battery clips (Bulgin).

50,000-ohm variable potentiometer (Varley, Lissen, Colvern, Igranic, Wearite, Bulgin).

Connecting wire and sleeving (Lewcos, Jiffilix, Quickwre).

Four yards thin flex (Lewcoflex).

Two spade terminals marked H.T.—, H.T.+ (Belling Lee, Clix, Eelex).

Six wander plugs marked H.T.—, H.T.+ 1, H.T.+ 2, G.B.+ , G.B.—1, G.B.—2. (Belling Lee, Clix, Eelex).

Three feet single screened tubing (Goltone).

ACCESSORIES

Cabinet (Camco type "Popular").

Gramophone motor (Cabaret).

Pick-up (Clarion Radio, Lissen, Bowyer-Lowe, B.T.H., Marconiphone).

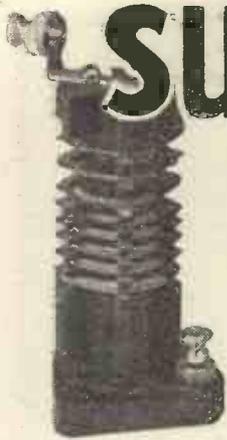
Loud-speaker (Igranic, R. & A., Rola, Motor, W.B., Lanchester, Epoch).

120-volt H.T. battery (Lissen, Ever Ready, Pertrix, Siemens).

9-volt G.B. battery (Lissen, Ever Ready, Pertrix, Siemens).

Accumulator (Lissen, Ever Ready, Exide, Fuller, C.A.V.).

SUITABLE CIRCUITS FOR SEVEN METRES



ALAN HUNTER offers suggestions to amateurs wanting to experiment on the ultra-short waveband around seven metres



BEFORE any real progress can be made on the ultra-short waveband around seven metres experiments will have to be made at both transmitting and receiving ends. This fact is appreciated by the B.B.C. engineers, who in addition to the erection of the seven-metre transmitter on top of Broadcasting House are now building a series of special short-wave receivers in order to pick up the experimental transmissions.

Most amateurs can, at very small

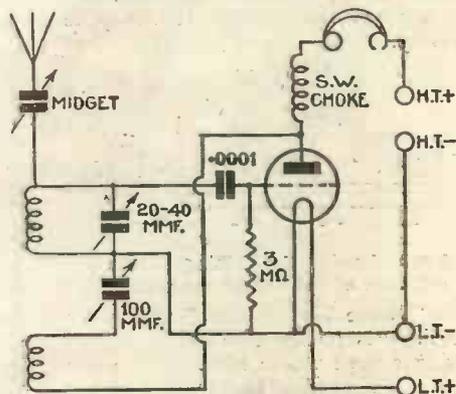


Fig. 1. Simple detector circuit for seven-metre reception. Instead of connecting the grid leak to low-tension negative it could be connected to the slider of a potentiometer across the low-tension supply

expense, participate in the reception side of the tests. No field of amateur work is likely to offer more scope for individual experiment than seven-metre reception. It might be thought that as the range of the signals from the B.B.C.'s headquarters is limited to 15 miles or so the only amateurs able to take part in the tests are those living in the London district. As a matter of fact many amateur transmitters in various parts of the country are now turning attention to ultra-short waves, and we hear reports of signals being sent out on the authorised amateur waveband of 5 metres.

At this early stage in the development of ultra-short waves it is not possible to lay down any hard and fast rules about circuits for reception. Only extensive practical experience can fully determine which of the several alternatives is the best for all-round reception.

At present there appear to be four types

of circuit for ultra-short wave reception. For a start the simple detector valve circuit shown by Fig. 1 is to be recommended. The arrangement is very similar to that used for ordinary short-wave reception, but values for the coils and condensers are, of course, much smaller. The coils can be home-made at practically no expense.

A member of our technical staff has obtained satisfactory tuning and oscillation with an 8-turn tuning winding and a 16-turn reaction winding. About 25 in. of No. 16 gauge D.C.C. wire should be wound on a 1-in. former and about 50 in. of similar wire will do for the reaction. When removed from the former the windings will spring out to about 1 1/4 in. diameter.

Ultra-short Range

Such coils, with a neutralising type of tuning condenser, having a minimum capacity of 1 1/2 micro-microfarads and a maximum of 20 micro-microfarads, will tune from just below 6 metres to just over 8 metres. The valve capacity has an important effect on the tuning at such high frequencies, and the amateur must therefore experiment with the exact number of turns needed.

An HL type of valve with an impedance around 10,000 ohms will be satisfactory

one with a very small minimum being essential.

The capacity of the grid condenser should be .0001 microfarad, and the grid leak can be either 2 or 3 megohms.

More Powerful Circuit

For more powerful results on the seven-metre band there is much to be said for the super-het converter type of unit. This is illustrated by Fig. 2. Here we have the circuit diagram of the Eddystone

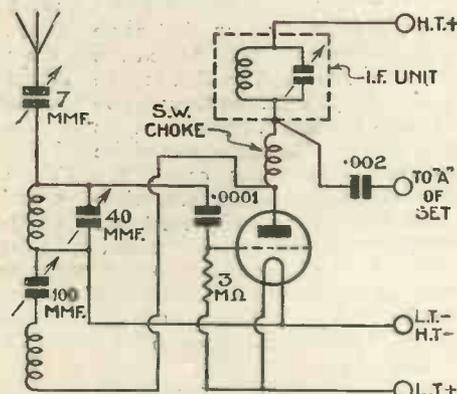
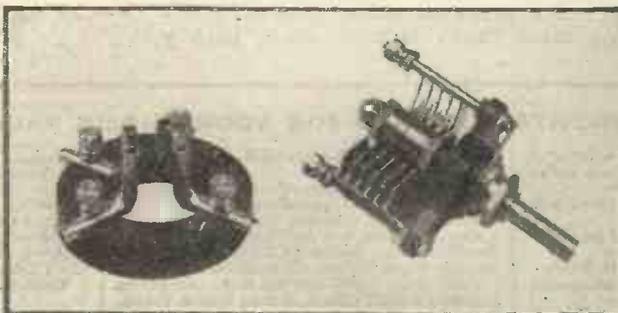


Fig. 2. The Eddystone super-het converter circuit for seven-metre reception. This converts a broadcast set tuned to medium waves into an ultra-short-wave super-het of great sensitivity. Note the special I.F. coupling unit



Typical short-wave components for seven-metre working—an Eddystone variable condenser and a low-loss valve holder

with this Fig. 1 circuit—preferably a metallised type of valve. As with all ultra-short wave circuits, use an aerial of not more than 20 ft. total length, otherwise reaction will be difficult or impossible to obtain.

For the coupling of the aerial to the tuning coil a midget or neutralising type of condenser should prove satisfactory—

converter recently introduced by Messrs. Stratton & Co., Ltd., who specialise in every branch of short-wave reception.

It will be seen that this converter circuit follows the usual plan of arranging two high-frequency chokes in series in the anode circuit of the autodyne detector, and taking a fixed condenser from the junction of the two chokes to the aerial terminal of the set.

The aerial tuning circuit consists of an Eddystone seven-metre coil in parallel with a 40 micro-microfarad Eddystone Microdenser. A 100 micro-microfarad Microdenser is used for the reaction.

The special component of this circuit is the Eddystone intermediate-frequency coupling unit, which consists of a tuned circuit in series with the ultra-short wave choke. This is instead of the more usual long-wave choke used in the position shown by the dotted line of the Fig. 2 circuit.

(Continued on page 528.)

Honour at Stake!

HOW STUDIO SOUNDS
ARE PRODUCED



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

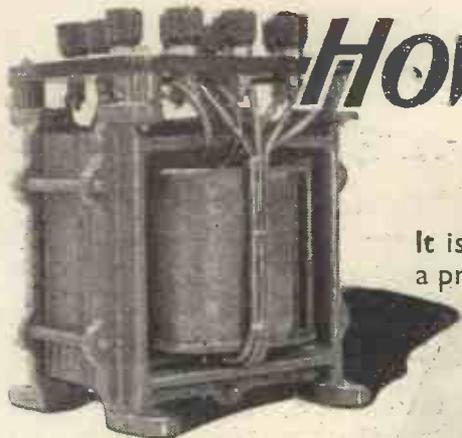
No power better for *volume*—no power better for *tone*—no power at all so pure and long lasting as the current of a Lissen H.T. Battery. All radio dealers sell it. Ask firmly by name of Lissen.

LISSEN HT. BATTERY

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

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

HOW TO MAKE YOUR OWN MAINS TRANSFORMER



This is the mains transformer described. It can easily be made at home

It is quite a simple matter to wind transformers for mains units, and a practical description of a good home-made transformer is given here by G. H. WRAY, F.C.S.

THE transformer described was designed to work on 50-cycle mains, and to give an output of 210 volts, for the input to a Westinghouse H.T.8-type metal rectifier, and 14 volts for the input to an A.3-type rectifier, the output from the latter being used to energise the field windings of a low-resistance moving-coil speaker. A 4-volt filament winding, designed to carry 3 amperes, was also included. This article will be confined to the practical constructional details, the somewhat complex theoretical side of transformer design having been dealt with in several excellent articles published recently in the wireless press.

A Low-loss Design

The efficiency of a transformer depends upon certain losses, known as copper loss, and iron loss, and in the transformer described in this article the writer considers that these losses have been kept as low as

and has a cross sectional area of 1.5 sq. in. The end clamps shown on the transformer illustrated were made in cast iron, at a local foundry, from a pattern made in ply-wood, but clamps which are equally suitable and in some ways better, can be obtained, together with the necessary clamping bolts, from Messrs. Savage, or from Sound Sales, Ltd. The terminal plate is mounted on top of the transformer and held in position by four 1/8-in. screws through four corner fixing holes in the plate and screwed into the tops of the end clamps. The terminals are the small pattern Belling Lee. The windings are layer-wound on the Type 4F. bobbin, which is made of Paxolin, and is also obtainable from Messrs. Savage. These bobbins are the correct size for use with No. 4 pattern stampings, and have a winding space of 2 1/4 in. long by 3/4 in. deep.

Choosing the Wire

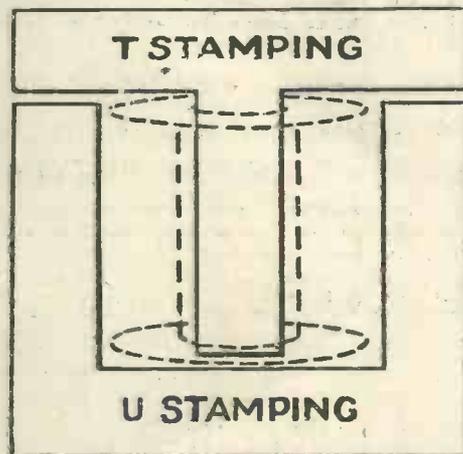
Enamelled wire is used for the primary and secondary windings, and d.c.c. wire for the 14-volt and 4-volt windings. The design of the transformer gives a winding ratio of six turns per volt, and the primary is wound with a total of 1,500 turns for 250 volts input, and is tapped at the 1,320th, the 1,380th, and the 1,440th turn, to enable the transformer to be used on supplies of 220, 230, or 240 volts. 28 S.W.G. wire is used for the primary, and the leads and windings may either be brought through holes drilled in the cheeks of the bobbin, or as some difficulty may be experienced in deciding upon the position of these holes, saw cuts about 3/8-in. deep may be made in the bobbin cheeks with a hacksaw, and the windings brought through these slots. The turns should be wound on firmly and evenly, finishing each layer closely up to the cheek of the bobbin, and in order to support the cheeks and prevent them from being pushed outwards during the process of winding, a piece of wood should be cut to fit inside the bobbin, also two wooden end cheeks. A piece of screwed rod is passed through the centre and the whole is tightened up with nuts at either side. When the primary winding is completed, two layers of "Empire" cloth are wound over it as insulation.

A thin earthed screen, sheet copper is the most suitable, may now be placed between the primary and the other windings; its object being to reduce background noises when the transformer is on circuit.

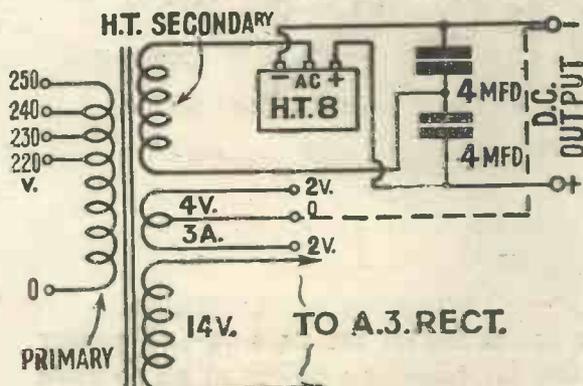
The same effect can be obtained by wind-

ing the 4-volt filament coil immediately over the primary winding, the centre point being earthed, the coil, therefore, provides a screen and this procedure was followed in winding the transformer illustrated in this article.

If, however, a thin copper screen is used instead, it must not completely encircle the primary winding or it would have the effect of a short-circuited turn of very heavy



The arrangement of the transformer core stampings



The recommended rectifier circuit for use with the mains transformer described here

possible, consistent with a transformer of this type. Other losses may be introduced by insufficient care in workmanship either in coil winding or assembly, and too much attention cannot be attached to this point.

Building the Core

In constructing the transformer, the first part to be considered is the iron core, and this is built up of Stalloy iron which is a special alloy, giving high efficiency. The stampings are a standard size, listed as No. 4 pattern, and are stocked by Messrs. Brian Savage, and by Messrs. J. Sankey and Sons. Nine dozen pairs are required, the core is built up to a thickness of 1 1/2 in.

gauge wire, and current would flow with the possibility of damage.

The 4-volt winding is next wound on, this consists of 26 turns of No. 19 d.c.c. wire and a centre tapping is brought out at the thirteenth turn. Two layers of "Empire" cloth are wound over the filament coil, and the H.T. secondary winding can now be commenced. This consists of 1,330 turns of No. 30 S.W.G. enamelled wire. This is slightly more than the calculated number of turns, in order to allow for drop in voltage due to D.C. resistance of the wire. Two layers of insulating cloth are wound over the H.T. winding, and the 14-volt which is the final winding, is then commenced. Eighty-four turns of No. 22 d.c.c. are required, and when completed, the winding is protected and an improved finish given to the transformer by covering the coil with one layer of thin Leatheroid. During the winding of the bobbin and final assembly of the transformer, careful attention should be given to insulation, as unless this is reasonably good throughout, the reliability of the transformer will be impaired.

The transformer is now ready to be assembled. The bobbin is placed on its side on the table, and the core is built up by inserting a T-piece stamping in the core opening at one side, and a U-piece from the opposite side, reversing the order of

(Continued on page 538)

LISSEN SHIELDED COILS

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 long waveband 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.

TWO-GANG AND THREE-GANG INCORPORATE WAVE-CHANGE AND FILAMENT SWITCHES

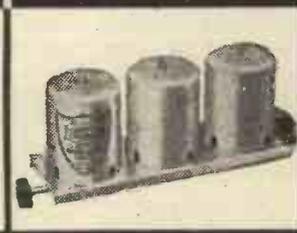
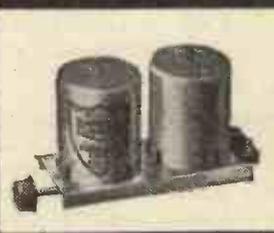
No need to keep on buying new coils for every circuit you build—just get a set of these Lissen Coils and you can adapt them to any circuit.

Single Lissen Dual-range Shielded Coil 6/6 Two-gang Lissen Shielded Coil 17/6 Three-gang Lissen Shielded Coil 26/-



2 GANG 17/6

3 GANG 26/-



The ONLY FULL-SIZE Condenser selling at 6d.
The ONLY Condenser selling at 6d. that has standard terminals and requires no soldering into circuit.

LISSEN

FIXED CONDENSERS AND GRID LEAKS

EXACTLY THE SAME LISSEN CONDENSERS AND GRID LEAKS FOR WHICH YOU WERE PREVIOUSLY PAYING 1/-

REDUCED TO 6^D

LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX

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

REGIONAL RECEPTION

Regional reception demands a special type of set if maximum pleasure is to be derived. Constructional details were

FOR modern local-station reception in this country a well-designed set, such as the "Ideal Regional Two-valve," is absolutely essential. Yet, in spite of the need for such attributes as a high degree of selectivity and an ability to give good-quality reproduction, the local-station set must be easy to build and simple enough to be operated by non-technical members of the family.

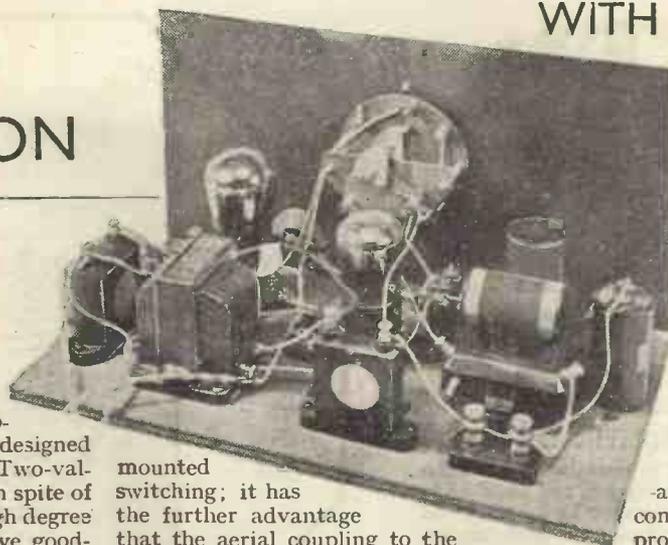
These guiding rules of set design were before the Technical Staff when the "Ideal Regional Two" was designed. The result, as can be seen from an examination of the circuit diagram and the illustrations, is an outstanding product possessing many points of interest.

Selectivity Needed

Probably the main need in a local-station set of to-day is a high degree of selectivity. Not only is this essential for the separation of two approximately equal-strength signals, but for the reception of the locals clear of interference from powerful adjacent foreigners.

Band-passing, as incorporated in this two-valve set, is undoubtedly one of the best ways of making a simple set really selective. This method, which consists essentially of two tuned circuits coupled together in a scientific manner so that equal performance is obtained over all wavelengths, and without loss of quality, has been adopted in the "Ideal Regional Two" by making use of the new British General coil unit.

This covers both wave-bands with panel



WITH THE "IDEAL REGIONAL 2"

given last week of a fine two-valver for this purpose, and these operating notes are of great assistance.

to 10 miles of 50-kilowatt stations, such as Brookmans Park, Moorside Edge and Westerglen, the shorter aerial may be necessary to obtain complete separation of the alternative programmes.

The operation of the "Ideal Regional Two" could hardly be made simpler. In spite of the fact that a very selective band-pass aerial tuning system is incorporated the tuning is virtually a one-knob procedure.

Easy Control

The Lissen two-gang condenser, with its two concentric control knobs, will be found ideal in action, providing as it does the advantage of simultaneous variation in the two tuning circuits with the invaluable advantage that either of the circuits can

mounted switching; it has the further advantage that the aerial coupling to the coil is maintained by an ingenious method of aperiodic coil switching. In effect this means that the selectivity, as governed by aerial coupling, is just as good on medium and long waves, so that the ultimate performance of which a two-valve combination is capable is obtained.

Pentode Output

As might be expected, the two valves in this set are arranged in the order of detector with reaction and power output. The two valves are of course transformer coupled, and the output valve, as a further aid to maximum amplification, is a low-consumption pentode.

The Mullard PM22A pentode has enough undistorted output to meet average domestic needs when a sensitive loud-speaker is used. It has the very great advantage that the anode-current consumption is only 4 or 5 milliamperes. With the HL type of detector valve recommended the total anode current is well within the capabilities of a standard type of high-tension battery.

Before discussing the operating aspects of this set a word or two on the aerial and earth may be of assistance. We suggest

that with this set, having a large degree of inherent selectivity, an aerial of not less than 70 feet should be used in order to get the maximum sensitivity. If a shorter aerial is used the results will still be satisfactory, but the range, particularly on the long waves, will not be as great as possible.

The only condition under which a really short aerial may be advisable with this set is when it is worked within the "blanketing" area of the regionals. Within say 6

be separately adjusted to get the last ounce out of a weak station.

Reaction should be used sparingly on nearby stations, though for the more distant ones it will of course have to be pushed to the limit in order to get sufficient signal build-up to work the loud-speaker.

Apart from the tuning and reaction, the controls on the "Ideal Regional Two" consist of the battery on-off switch, which is integral with the tuning dial, and the wave-change switch connected to the band pass tuning coil. The set is switched off when the lever under the tuning dial is moved to the left—the position being clearly marked "off"—and the set is switched on in either of the other two positions of this lever, which could also be used for medium and long wave-changing.

For good loud-speaker reception within fifty miles of a regional centre of broadcasting this set, as its name is intended to indicate, is absolutely ideal. Its well-designed circuit also lends itself to more distant reception when conditions are favourable.

COMPONENTS REQUIRED FOR "THE IDEAL REGIONAL 2"

Ebonite panel, 14 by 7 in. (Lissen, Peto-Scott, Becol).

Baseboard, 14 by 8 in. (Peto-Scott, Camco, Pickett).

Dual condenser control unit (Lissen).

.0005-mfd. reaction condenser (Lissen, Lotus, Telsen, Dubilier, Burton).

Band-pass aerial coil, with reaction (British General).

.01-mfd. fixed condenser (Dubilier, type 3200).

.0002-mfd. fixed condenser (T.C.C., type S.B.; Lissen, Goltons, Dubilier, Telsen, Ormond).

One .005-mfd., one .0002-mfd. fixed condensers (T.C.C., type "S"; Lissen, Dubilier, Telsen, Goltons, Igranic, Ormond, Formo).

One 4-pin, one 5-pin valve holders (W.B., Lissen, Benjamin, Telsen, Igranic, Goltons).

One 1-mfd., one 2-mfd. fixed condensers (Lissen, Dubilier, Telsen, T.C.C., Ferranti, Wego).

High-frequency choke (Lissen disc, Telsen, Dubilier, Igranic, Lewcos, Goltons, British General, Ready Radio).

Low-frequency transformer (Telsen Radiogrand, Lissen, Lewcos, Igranic, Bulgin, British General, Ferranti).

One 5,000-ohm, one 10,000-ohm spag-ketti resistances (Lissen, Lewcos, Telsen, Bulgin, Varley, Goltons, Graham-Farish).

One 3-megohm grid leak (Lissen, Dubilier, Telsen, Goltons, Sovereign).

Four yards thin flex (Lewcoflex).

Two space terminals, marked L.T.—, L.T.+ (Belling-Lee, Clix, Ealex).

Four wander plugs, marked H.T.—, H.T.+ , G.B.—, G.B.+ (Belling-Lee, Clix, Ealex).

Connecting wire and sleeving (Lewcos).

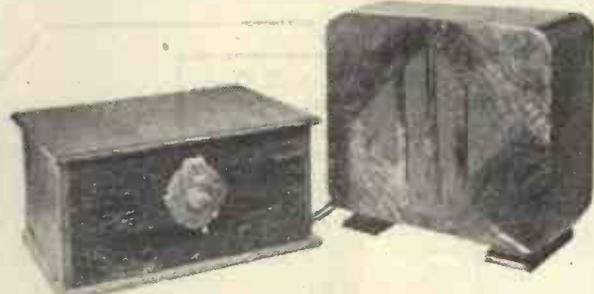
ACCESSORIES

Accumulator (Lissen, Drydex, C.A.V., Pertrix).

H.T. 120-volt battery (Lissen, Drydex, C.A.V., Pertrix).

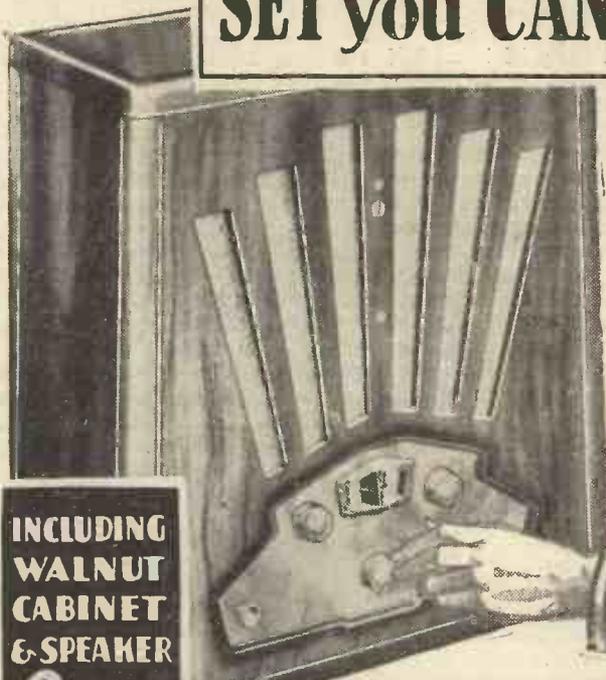
9-volt grid-bias battery (Lissen, Drydex, C.A.V., Pertrix).

Loud-speaker (Motor "York," R. and A., Lancheater W.B., Igranic).



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FROM GREAT LISSEN

FREE CHART



Lissen have published a 1/- Constructional Chart, giving the most detailed instructions ever printed for the building of a wireless set. Every part, every wire, every terminal is identified by photographs. This new LISSEN SKYSCRAPER KIT SET is the only one on the market that you can build yourself employing a Metallised Screen-grid High-mu Detector and Economy Power Pentode Valve. Around these three valves Lissen have designed and produced a home constructor's kit the equal of which there has never been before. It is the only battery set delivering such power—yet the H.T. current consumption is far less than that of the average commercially designed 3-valve set.

You buy the Lissen Skyscraper Kit complete with valves—a Lissen Metallised S.G., a High-mu Detector, and a Lissen Economy Power Pentode Valve—and the price is only 89/6. Or you can buy the Lissen Walnut Console Skyscraper Cabinet and Loud-speaker combined as illustrated. It holds all batteries, and accumulator and loud-speaker as well. It makes everything self-contained. A special Lissen Pentode Matched Balanced-armature Loud-speaker of great power is supplied with the cabinet and the price of the Skyscraper Kit complete with valves and this cabinet and loud-speaker is only £3 5s.



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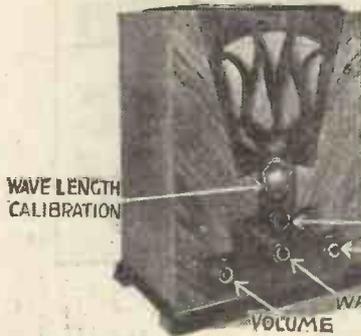
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SETS OF DISTINCTION

LOTUS BAND-PASS THREE

for A.C. MAINS



Makers: Lotus Radio, Ltd. Price: 16 gns.

IN the Lotus three-valver illustrated on this page we have an excellent example of a powerful and selective combination of three valves working from the A.C. mains. It is this type of set that provides us with the real reason for the man in the street's preference for the straight three as against all other types.

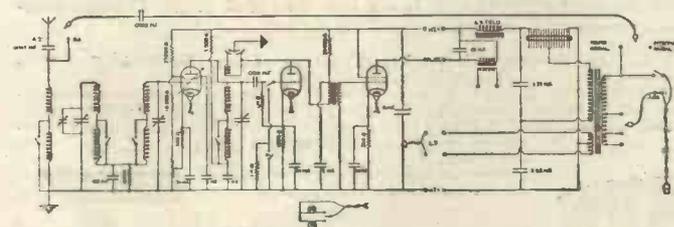
Flexible Control

There is, in this Lotus model, a flexibility of control that will delight the expert knob twiddler, yet withall a simplicity of operation that enables many home and foreign stations to be tuned in without any control *finesse*. The simplicity and the flexibility are at one and the same time achieved by the inclusion of just the right number of controls. There is nothing superfluous or muddling in the control, yet there is everything needed to get the ultimate ounce of performance from the three valves.

As might be expected, the inevitable sequence of the three valves is screen-grid, detector, and pentode. With this simple sequence of valves the designer has fashioned a circuit that, in practice, provides as much in the way of "hot" performance as I have yet encountered.

Let us look into the circuit. The screen-grid is a variable- μ type, which means that its sensitivity is well under control, which, in turn, means that no matter what the volume level may be the quality is

maintained at par—there is no high-note skimping when the volume is cut down. Further, this variable- μ valve avoids cross modulation and other interference troubles.



The circuit of the Lotus Band-pass Three

preceding the variable- μ , which is a Mazda A.C.SC/VM, is a capacity-coupled bandpass input-tuning circuit. There is no need to emphasise the value of this circuit, which provides good-quality selectivity in a way that cannot be obtained any other simple way. The aerial is loosely coupled to the bandpass through a condenser in series with an aperiodic winding.

While on the screen-grid stage I must

Circuit Details

Another very good point is the method of connecting the variable condenser in the tuned-anode circuit for the screen-grid stage coupling to the detector. The moving plates of the inter-valve condenser, which is part of the three-gang condenser, are at earth potential. This is made possible by the series connection of a 1-microfarad fixed condenser, which has no effect on the tuning, but effectively prevents the high potential on the anode from being shorted to earth. Reaction is applied to the anode coil by the differential system.

The detector is coupled to the pentode by the usual transformer method. Bias for all three valves is by means of cathode resistances, which provide grid-bias at the expense of anode volts. The anode supply comes through a Westinghouse metal rectifier, ample smoothing being provided by using the loud-speaker field as the smoothing choke and by using an electrolytic condenser at the output.

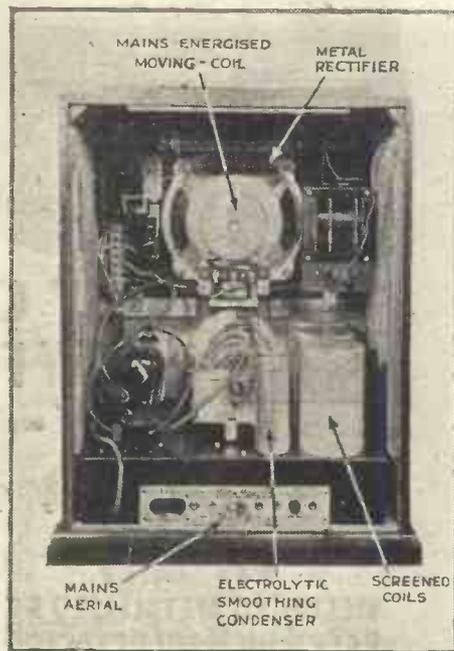
This circuit, which I have space only briefly to describe, has been interpreted in the modern way. There is a metal chassis with canned coils, a three-gang condenser, metalised screen-grid and detector valves, a mains-energised Magnavox moving-coil loud-speaker—all housed within a pleasing-looking cabinet. The external connections are made to a strip at the back of the chassis. In addition to the usual aerial and earth sockets there are alternative connections for internal and mains aeriels. Each has its uses. There are sockets for a pick-up and at the back of the loud-speaker you can connect an external loud-speaker, provided it is of the high-resistance moving-iron type.

Controls are brought out to suitable positions on the front of the cabinet. There are four knobs, one at the centre for tuning, below it a wave-change and mains-switch knob combined, on the left the

volume control, and on the right reaction.

When bringing the set into action for test, I was careful to adjust the little trimmer knob at the back of the set, as per instructions, so that the aerial loading was made just right.

This initial adjustment is highly important, and is made at about the 300-metre mark. Once made, this trimmer adjustment can be entirely forgotten, though its benefits will be realised whenever the set is operated. I found the set distinctly lively after I had set the trimmer and on



The salient features of the Lotus Band-pass Three are clearly shown by this lettered photograph

the single tuning control I immediately brought in Brussels No. 1 at full loud-speaker strength, with hardly any reaction.

A very good point about the tuning scale, which is calibrated in medium and long wavelengths, is that only the appropriate calibrations are illuminated. When tuning in medium waves the scale is illuminated by a bulb mounted behind the medium-wave calibrations, and when the long waves are being tuned the medium-wave bulb is dead, while another bulb behind the long-wave calibrations comes into action.

In addition to Brussels No. 1 in daylight I was able to bring in Huizen, Poste Parisien, Fécamp, Langenberg, and North Regional. These came in at such strength during daylight that I was tempted to

(Continued on page 516)

An Inter-Valve Tone Control

Here is a component which opens up new possibilities of quality reproduction—the Lissen Inter-valve Tone Control. Hitherto the best you could do in the control of tone was to attempt to correct in the output stage those faults of quality inherent in the receiver itself. Now the Lissen Inter-valve Tone Control gives you **SCIENTIFIC CONTROL OF TONE IN THE HEART OF THE RECEIVER.** By rotation of the special potentiometer (which is fitted to the front panel of the receiver) you get real variable control, so that for any particular item you can bring out deep bass or obtain brilliant high-note-response just as your ear demands.

A wonderful tone control for radio gramophone work, entirely eliminates needle scratch without sacrifice of quality. Specially designed to fit under the base of the Lissen Hypernik Transformer—can also be fitted in a few moments into any transformer-coupled receiver

LISSEN

INTER-VALVE TONE CONTROL

PRICE COMPLETE WITH
SPECIAL POTENTIOMETER **10/6**

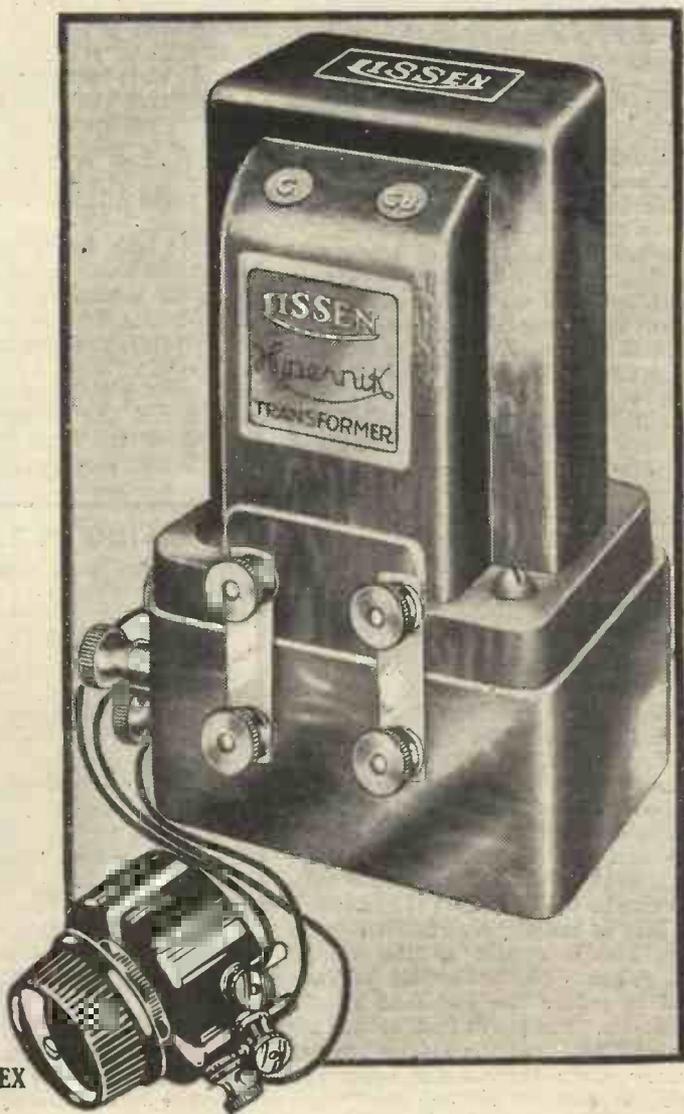
LISSEN

HYPERNIK L.F. TRANSFORMER

If you want absolute truth of tone, use the Lissen Hypernik Transformer, as all the foremost set designers are doing. You cannot get such a good response curve—such fine quality reproduction—from any other transformer at anything like this price.

With a primary inductance of fully 100 henries, the Lissen Hypernik Transformer yet operates perfectly when passing currents up to 5 m/A or more. Its step ratio is 4 to 1 and a stage amplification of more than 100 is obtained. PRICE **12/6**

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IN MY WIRELESS DEN

WEEKLY HINTS —

CONSTRUCTIONAL



& THEORETICAL

BY W. JAMES

NEW VALVES AND OLD

THERE is nothing quite so disappointing as to fit a valve just purchased and to find that the results are no better than when the old valve is used.

This happens usually because of a fault in the set or else the new valve is of the wrong type. You might think that a new detector valve will improve the volume of the weaker stations, for example, and find that no noticeable improvement is obtained.

If the new valve has exactly the same characteristics as the old one the results are bound to be equivalent. Usually, however, the amplification factor of the new valve is different from that of the old, and the impedances are not the same.

Thus there is a chance that the sensitivity, quality, and anode current will be different. The new valve may well not handle the signals from the local station so comfortably as the old, and so on. It is, therefore, rather dangerous to purchase a new valve having characteristics very different from the old. This applies as well to all stages.

There are several types of screen-grid valves, and while the set may work very well with one type the results when using a different type may be poor.

With power valves there is the question of anode current, and the type of loud-speaker. If is, of course, possible to overload the high-tension supply, whether this is a battery or mains unit, and the result is always loss in output.

The various factors concerned must, therefore, be considered before a change is made, or the results may be worse than before the new valves were obtained.

A GRID CONDENSER DETAIL

THE fixed condenser in the grid circuit of a detector valve may have a value of from .0003 to .0001 microfarad.

The value of .0003 microfarad was nearly always used a few years ago and is still used in some sets. A value of .0002 is found in a proportion of sets, and some use a .0001. Now if you tried your set with these different values the chief point noted would be the change in quality. The high notes would increase in strength as the value of the condenser is decreased.

This fact is usually remembered when there is high-note loss in the tuning circuits. The detector circuit is then designed to reduce the high-note loss so far as possible. You might find, in the case of your own set, that the results are not satisfactory when the smaller condenser is fitted, but this will be true only when the set now gives plenty of top.

There may be an effect upon the reaction when the grid condensers are changed, but usually the effect is negligible. Hum may be altered when the set is of the mains type. Usually the hum is reduced by fitting the larger condenser.

The changes produced are not large unless the set is of the good-quality type. With some loudspeakers the quality will be poor in any case, but when the quality is good, changes in the value of the grid condenser will produce considerable differences in the results.

"SHORT" AERIAL TO EARTH

IF you short-circuit the aerial and earth terminals of a set and listen, the noises should be the minimum. A quiet background is essential for good results from distant stations or the noise will prevent clear reception.

Low noise can arise from many causes. Some valves are noisier than others. The detector is frequently the most difficult to make quiet. Then, again, there are some parts which if not sound will introduce noise.

A grid leak, for example, may be noisy because its value is not constant. A leaky condenser is also likely to produce noise. Bad contacts, such as poor joints and badly fitting valves are also troublesome. Much can be discovered by testing by stages. First try the power stage alone.

Then add the detector, and so on. If tests show that a stage is noisy it should be examined very carefully. There may be

no well defined fault, but rather a series of little faults.

Dust may be the cause of the trouble. Therefore keep the parts clean. Dampness is also responsible for many difficulties. Leakage paths may alter the characteristic of a set completely, quite apart from the noise introduced.

Some sets will bring in a much greater background of noise than others. Those fitted with a pentode, and not having a filter to reduce the strength of the higher notes are troublesome in this way. The remedy is to add the filter and to weaken the top notes. This will cut down the rush and noise and make reception more pleasant if less accurate.

"THE LOTUS BAND-PASS THREE"

(Continued from page 514)

try out the mains aerial. Even with this admittedly poor pick-up I got Brussels at good strength by advancing the reaction.

The sensitivity is just as good on the long-wave band. This was proved by the truly exceptional strength of Hilversum, while Radio Paris needed a toning down on the volume control. The sensitivity is, I think, above the average.

Fortunately, this good feature of the performance is not, as might be expected, obtained at the expense of the selectivity. I found the tuning had true bandpass characteristics, the locals and other powerful stations spreading for an appreciable amount and then falling away sharply on each side of the spread limits. Midland Regional was clear of London Regional, with a silent space in between. On long waves Zeesen was almost clear of Daventry.

An example of the usefulness of the internal aerial—a short length of insulated wire on the inside of the cabinet—was afforded later, when crackles were rather unbearable on the outdoor aerial owing to approaching thunder. The internal connection gave full loud-speaker reproduction of the locals without the slightest trace of background. This connection would also be useful in the wipe-out area of a regional.

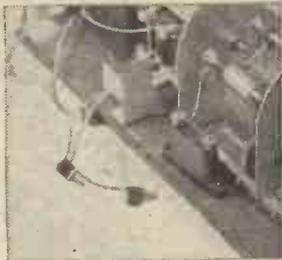
The quality of the reproduction is well up to the generally high standard set by this year's models. Remember, it is a Magnavox moving-coil, and it is driven by an Osram MPT4 pentode power valve. This quality is unaffected by the setting of the volume control, which has a wide range of audibility, specially valuable in cutting down the local stations.

Very little mains hum could be detected during my tests of this set, and when actually listening to a programme, even a distant one, the hum is quite negligible.

SET TESTER.

SAVING IN TERMINALS

There are many little instances where you can save the use of a terminal strip by making connections direct to parts on the baseboard. The photograph shows a terminal which can quite well be used for the aerial connection. The condenser is in

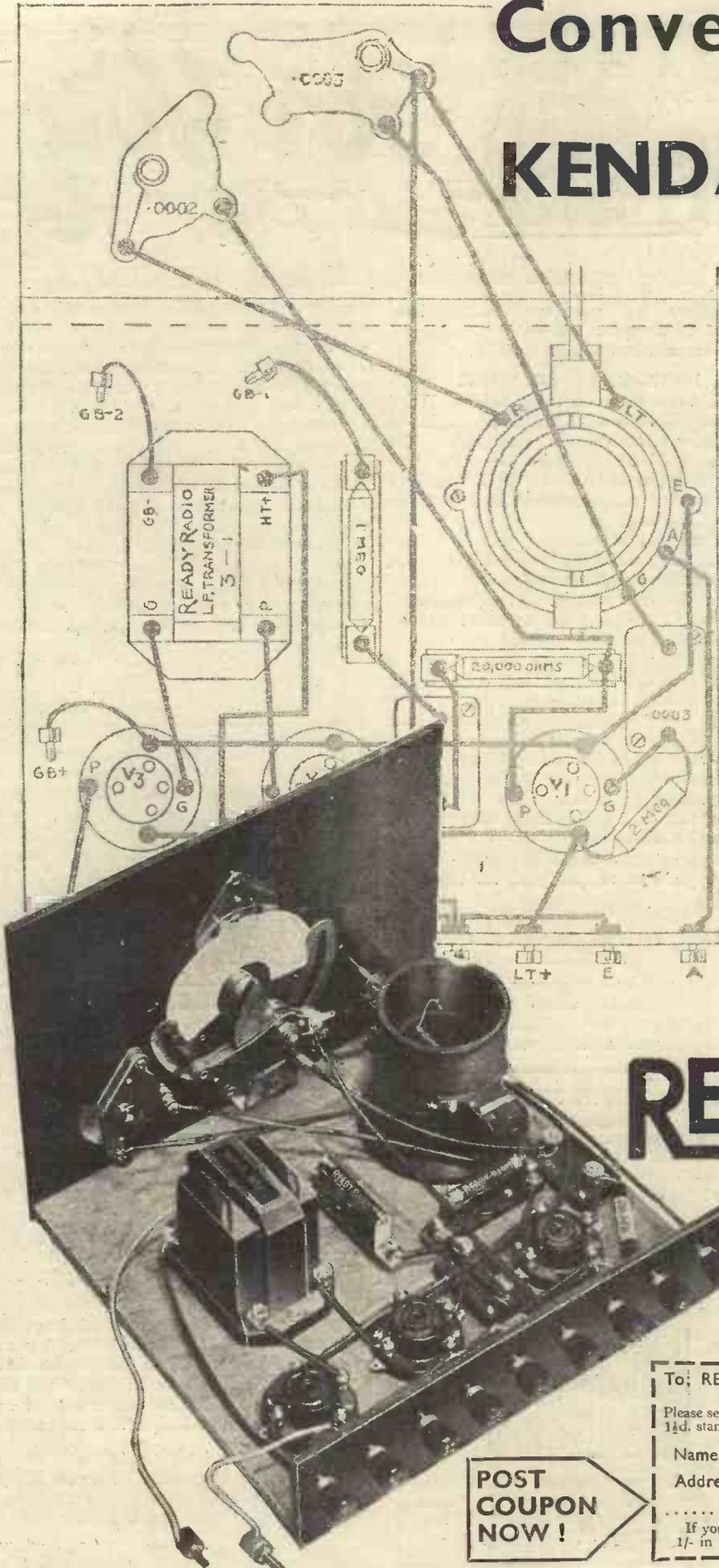


series with the aerial and the variable condenser, part of which can just be seen, so the free terminal of the fixed condenser dispenses with the usual aerial-earth terminal block. The earth connection is made to the low-tension wiring.

Convert your set to the KENDALL-PRICE 3

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

Free Post coupon now and we will send you **FREE** a 36-page 1/- Book (the size of a normal issue of "Amateur Wireless"). It shows you how, at the cost of only a few shillings, you can bring your present set right up-to-date. It contains complete instructions, photographs and diagrams of ten modern circuits both battery and mains-operated. Post coupon now.



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The sets described can be built from the diagrams in the Book but if you require full-sized dimensioned blue-prints of the ten circuits, enclose 1/- with your coupon.

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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.3a

Announcement of READY RADIO, LTD., Eastnor House, Blackheath, S.E.3

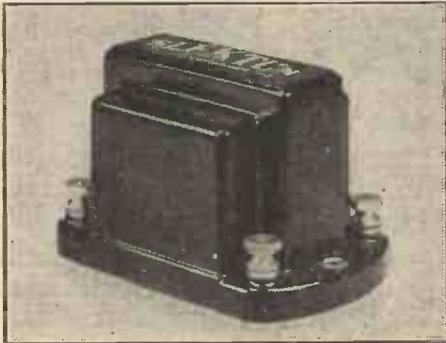
You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers



A weekly review of new components and tests of apparatus conducted by J. H. Reyner, B.Sc., A.M.I.E.E.

THE OSRAM V.D.S.

THE well-known Osram range of D.C. valves taking 0.25 amps. at 16 volts on the heaters has recently been supplemented by a variable-mu screen-grid type known as the V.D.S. The heater characteristics are those just stated, while the anode and screen volts for optimum working are 200 and 80 respectively with .5 volt negative on the grid. The mutual conductance is 2.4 mA/v., this value tailing off to the standard value of .005 mA/v. at 40



Slektun low-frequency transformer

volts grid bias. Whether the full use is made of the maximum mutual conductance depends on the permanent grid bias resistance in series with the variable portion, but it will be clear that the valve is capable of giving all the amplification required in a normal H.F. stage, together with the ease of control which is usually associated with the variable-mu working.

SLEKTUN L.F. TRANSFORMER

THE Slektun L.F. transformer which we have tested this week is a neatly made component which can be obtained in four types having ratios varying from 2—1 to 5—1, the actual model tested being rated at 4—1. These transformers are housed in black moulded bakelite cases which are shaped to the winding and core. The necessary terminals are accommodated on the base which is formed as part of the casing.

The transformer was tested under actual working conditions, that is besides being preceded by the normal type of detector valve a complete output valve circuit was wired across the secondary.

The preceding valve was an HL210 type, the steady anode current being approximately 2 milliamps.

The primary inductance of the transformer with no direct current in the winding was 32 H., this figure falling to 20 H. with 6 mA. D.C. These figures are quite good and the transformer should be

satisfactory for use even with low-impedance detector valves.

The transformer retails at 8s. 6d.

IRON-BRAIDED WIRE

WE have received from Messrs. Ward and Goldstone, Ltd., two samples of their new iron-braided sleeveings. As readers will know, hum troubles are likely to occur in A.C. or D.C. receivers if the heater supply circuit is not made entirely fieldless.

One method of ensuring this is to use ordinary electric light twisted flex, but an alternative method is to use an earthed shield round the wiring. The "Goltone" iron-braided sleeving has been introduced to enable this to be carried out simply and easily. The tubing consists of a centre of insulated sleeving, this being covered with a tinned iron braiding, the tinning being employed to ensure that rust troubles do not occur.

This sleeving is worth considering when a mains-driven receiver is being built, being definitely better than the usual twisted flex and much more easy to use than lead-covered cable.

The retail price is 9d. per yard for the single type, and 1s. per yard for the twin type.

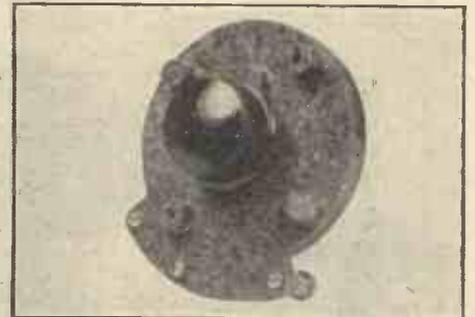
LISSEN TRIPLE-WAVE-CHANGE SWITCH

AN interesting component recently put on the market is the Lissen Triple-Wave-change Switch. This is designed primarily for use with the two coils which

this firm has recently introduced, but it has a variety of possible uses in other directions. There are three terminals, one in contact with the moving sector and the other two connected to contact springs. There are two contact springs to each terminal, and a flat metal sector slides in between the two. Since the springs are tipped with gold-silver, and as a continual rubbing action is obtained whenever the switch is operated, a good contact is certain.

The moving sector is located with a spring-loaded ball to occupy one of three definite positions depending on whether the sector is in contact with one or two of the contact springs or out of contact altogether.

As the switch is designed for fitting to the coils already mentioned, its size is rather larger than is necessitated by the



Lissen triple-wave-change switch

mechanism itself. It is actually $2\frac{1}{2}$ by $3\frac{1}{8}$ inches deep, and is designed for panel mounting so that in most circumstances it will fit snugly behind the panel and can be wired to the appropriate points in the circuit. It sells at 3s. 6d.

MAKING SPEAKER CONES

One of the secrets of getting good results with a home-made speaker cone is to make a good join which does not weaken the cone formation, for if there is a flabby



part on the cone surface, it will cause resonance. The cut should be made exactly to the centre of the cone and a firm join made with adhesive.

A London Regional vaudeville programme on September 13 will be given by Florence Desmond, Mario Lorenzi, Morton and Ridley, Carson Robison and His Pioneers, Gaby Vallé, Mr. and Mrs. Sargent ("developers of comedy"), and the B.B.C. Theatre Orchestra.

Organ music will be relayed from St. Nicholas Church, Bristol, on September 22, when the organist will be Rowland Shiles. An organ recital will be relayed from the Bristol Radio Exhibition on September 23. The organist will be Ralph T. Morgan.

Harold Gray, who gives talks on music in the Midland Regional Children's Hour, will be the pianist at a concert by the Midland Studio Orchestra on September 11. On this occasion the orchestra will be directed by Albert Moore.

The **TELSEN**

AJAX 3

BUILD THIS BRILLIANT CIRCUIT WITH THE AID OF THE FULL-SIZE 1/- BLUE-PRINT GIVEN FREE WITH THE NEW AND ENLARGED EDITION OF THE

TELSEN RADIOMAG



The Telsen "Ajax 3" represents one of the greatest circuit triumphs ever achieved by Telsen technicians. For here, at last, is a circuit which is as inexpensive to build and operate as only a "straight three" can be, yet which, owing to its brilliance of design, gives an all-round performance of hitherto unattainable excellence, with

a degree of range, power, and selectivity which definitely sets a new standard for receivers of its type. Full constructional details of this and several other brilliant circuits together with free full-size 1/- blueprints, are contained in the new, bigger, and better issue of the Telsen Radiomag—price 6d. You'll agree that it's the finest radio sixpenny-worth ever offered, for not only does it tell you how to build the latest types of receiver—not only is it crammed with valuable information from cover to cover—but it also contains full details of the improved and now all-embracing range of Telsen radio components at the revised prices now made possible by Telsen's enormous sale—the largest in the world! Get your copy of the Telsen Radiomag NOW—from your radio dealer or newsagent.

TOTAL COST OF
TELSEN MATCHED COMPONENTS

61'6

For building the Ajax 3, including panel, base-board, terminals, battery cords and all accessories.



"TELORNOR"

CONSTRUCTORS' OUTFIT

Contains all the sundry requirements for the construction of any type of receiver circuits using the Telornor. Of these the Telsen "Triple 3," the "Ajax 3," and the "Nimrod 2" are excellent as examples. All are supplied neatly packed in a carton with instructions.

Cat. No. 220

3/6

Included in the Outfit are the following components:

Specially cut and drilled crystalline finish panel. 14 in. by 10 in. Baseboard. Eight-way Battery Cord. Complete set of Wander Plugs suitably engraved, and Spade Terminals. Terminals for Aerial,

Earth and Loud-speaker. Engraved Terminal Strips. An ample supply of 22S.W.G. Tinned Copper Wire and necessary Sleeving for wiring up the set. A double-ended Spanner for mounting the single-

hole fixing components. A four-way Spanner for tightening up all terminal nuts. All the Wood Screws and sundry other small accessories contributing to the complete assembly of the finished Receiver.

TELSEN

RADIO COMPONENTS

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

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

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A COMPARISON OF PROGRAMMES— OURS AND THEIRS

By WHITAKER-WILSON

CASUALLY glancing through the foreign programmes the other day I came to the conclusion that we in England are better off than most other countries. After a careful examination of a week's radio activity all over the world I came to the conclusion that we are better off than the rest of Europe.

Of course it all depends upon your point of view. If you judge a broadcasting concern by its vaudeville your opinions are likely to clash with those of your next-door neighbour who judges entirely by serious music, or with the fellow on the other side of you who pays his licence mainly to hear talks and news bulletins.

Linguistic Difficulties

So far as vaudeville and humour is concerned, most of us have to discount foreigners altogether. I myself, for instance, have long given up listening to vaudeville in Polish. The same may be said of talks. I have had to miss two from Vienna this week—one of "Aboriginals at Home" and the other on "Poisonous Fungi"—on account of linguistic difficulties.

Except when the B.B.C. makes an occasional blunder by bad alternating, such as opposing Sir Henry Wood and the Prom. orchestra with Adrian Boult and Section C—which, fortunately, it does

not often do—as far as I can see the English programmes are much more distinctive in type, and certainly calculated to please a greater number of listeners.

The B.B.C. programmes have always been censured. Thousands of grumbles are received each year, but there is no getting away from the fact that a regional scheme such as ours does *in the main* provide entertainment for most shades of opinion.

Foreign Dance Music

The preponderance of light music and of dance programmes abroad is most noticeable. No doubt such broadcasting represents the outlook on life of foreign nations, who do not take their pleasures sadly as the Englishman is supposed to do. Even the bigger orchestral concerts, if you look into what they actually play and sing at such concerts, are less serious in intent than ours.

That is just the difference between giving a public what it is *supposed* to want and giving it what it *ought* to want. By saying that I do not mean to suggest that the B.B.C. has been perfect in all it has done.

Nevertheless, I must say one thing for the British Broadcasting Corporation on the question of giving people what they ought to want rather than what they are credited

with wanting: there is a definite attempt here to educate the public.

There are a good many people, we know, who do not want to be educated up to anything. Unfortunately they exist in quite large numbers. They object to anything they can describe as highbrow. The B.B.C. has never taken the view that such people are hopeless. On the contrary it has been the policy of Broadcasting House to turn away the wrath of these people with a soft answer. Yet the B.B.C. has always gone on, determined that serious music shall be broadcast if only as a distinction from light music.

Cafe-type Music

My impression of the general run of foreign programmes is that a great deal of it is really café-music. I mean music which, by its nature, mingles with your conversation at meal-times. I never go to a restaurant which possesses a band, personally, but I can quite understand the attitude of those who do. On the other hand, I am bound to state with considerable conviction that it is definitely bad for anyone (in the psychological sense) to make a habit of listening to music by wireless in the same manner as one listens to it in a café. There are people who

(Continued on page 522)

THEY COMPLETELY CAPTURED
"Radiolympia"

The new



"MANSFIELD"

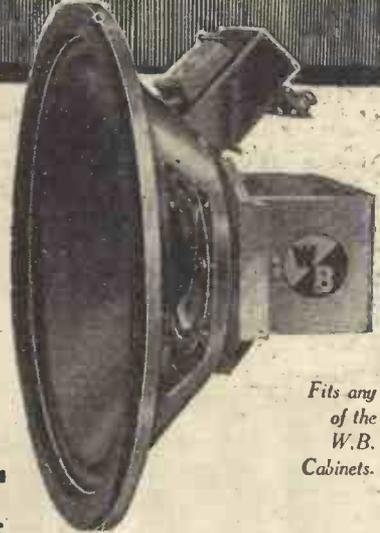
PERMANENT MAGNET
Moving-Coil Speakers

Write NOW for the art booklet, "Speaking of Speakers," giving full information on all the new W.B. moving-coil speakers. They caused intense interest at Olympia. W.B. are and always have been Pioneers and Leaders in this field. Makers also of the famous valve holders, switches, and the new Mansfield Kit—the only kit with a moving-coil speaker—ask for all the latest lists.



"Mansfield Senior"
(The Improved P.M.4.)

42/- COMPLETE with 3-ratio transformer



Fits any of the W.B. Cabinets.

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(P.M.5.)

27/6 COMPLETE with 3-ratio transformer

Whiteley Electrical Radio Co., Ltd., Nottingham Road, Mansfield, Notts.

Irish Free State Distributors: Kelly, & Shiel, Ltd., 47, Fleet Street, Dublin.



*distortionless
amplification
for 11/6*

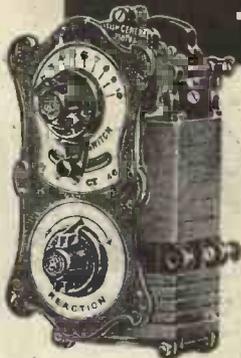
The Benjamin Transfeeda in one neat and attractive component gives you all the advantages of purity and volume of reproduction which previously could only be had at a prohibitive cost. Chief designers and Radio engineers have recognised the advantages of this new principle and are specifying the Benjamin Transfeeda in all their kits and sets. Follow their wise choice and specify the **BENJAMIN TRANSFEEDA** for your set.

TRANSFEEDA

THE BENJAMIN ELECTRIC LTD., Tariff Road, Tottenham, N.17

The famous

BRITISH GENERAL TUNING UNIT



*now reduced
to 10/6*

Write for Full List of B.G. GUARANTEED COMPONENTS POST FREE.

By reason of increased demand and enlarged production we are able this season to offer our well-known Tuning Unit at 10/6 instead of 14/6 as before. This Unit effectively replaces plug-in coils and covers the entire wave-band, from 200-2,000 metres. Easy fixing; simple tuning. Full instructions supplied with every model.

From all dealers or direct from the manufacturers—

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

MODERN RECEIVER DESIGN DEMANDS WEGO SMOOTHING CONDENSERS

Wego condensers are essential to the efficient functioning of modern radio receivers because of their low power factor, their high dielectric strength, their ability to withstand their rated voltages for an unlimited period of continuous running and their small dimensions.

These are the reasons why more and more important manufacturers are turning to Wego . . . why constructors insist upon them. And they only have to buy 'Wego' ONCE!

WRITE FOR FULLY DESCRIPTIVE LEAFLET

WEGO
CONDENSER Co., Ltd.
Spencer House, South Place,
E.C.2. Phone: National 4500



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

**'A COMPARISON of PROGRAMMES
—OURS AND THEIRS'**

(Continued from page 520)

play bridge with a loud-speaker turned fully on. I know of one family which regularly plays on Sunday evenings through a broadcast service, a symphony concert, and the Epilogue. These are the sort of people who are no good to the B.B.C. and whose opinions on music are not worth consideration.

The point of this is that the foreign stations mostly cater for these sort of people by broadcasting music that really does not require listening to at all. I have no remarks to make about the *quality of performance* abroad compared with that in England; I am going entirely by the programmes.

Foreign Opera

The best part of foreign transmissions undoubtedly comes under the heading of opera. We in this country do not regard opera in the same way as, for example, they do in Vienna. There it is part of municipal life. Here it is not. Neither is wireless likely to make it so, here or abroad. On the other hand, they are so used to performing opera in foreign countries, and have such a distinctive manner of rendering it, that those who are really attracted to what is a great form of art cannot do better than listen to foreign opera. The relays we have had here from abroad have all been good.

Our own programmes certainly suit the English temperament far more than anything to be found on the continent. Our

programmes are far from perfect; probably they will be so for some time yet, but no intelligent listener can deny that there is obviously a serious and determined attempt to entertain and to educate at the same time.

We are still filling odd spaces with too much routine-work, such as quintets and sextets and gramophone records; there is still too much that "sounds like the wireless," if I may thus beg the question; but there is much that is really worth listening to. There is one thing, however, that the B.B.C. has denied us. *Accordion solos at midnight*. If you want accordion solos at midnight you must switch in Radio Normandie (Fécamp). They have them there.

WIRELESS MADE EASY !
See the Special Announcement on page 489 of an outstanding new feature next week.

Popular songs will be given by Clifford Atkinson and the Revue Chorus in a vaudeville programme for London Regional listeners on September 23. The programme, which will be relayed from the Northern Region, will be supported by the Wagstaff-Greenwood Dance Band.

The short religious services, conducted by the Rev. W. H. Elliott, and relayed from St. Michael's, Chester Square, which were broadcast on Thursday evenings until recently, will be resumed in the National programmes starting on October 6.

A CHANGE OVER

READERS will be interested to note that Ready Radio, Ltd., have sold their mail-order business to Direct Radio Ltd. The Ready Radio policy is now to distribute their goods direct through the usual trade channels. "A.W." readers can therefore still obtain any Readi-Rad parts from local dealers. It is the aim of Direct Radio, Ltd., to carry on all the traditions of Ready Radio, Ltd., and the mail order business is being dealt with at 159 Borough High Street, London, S.E.

Direct Radio, Ltd., will offer after-sales service in connection with all parts and a feature will be made of prompt delivery so that set-builders will not be delayed. Hire-purchase facilities are available, and the after-sales service will apply to parts purchased on the deferred-payment system as well as to those for cash. Kits of parts will be sold for all sets described in this journal, as well as the components of all leading manufacturers. Details of the Direct Radio, Ltd., service can be obtained free on mention of "A.W."

Lance Sieveking has written a new musical comedy called *Money for Nothing*, which will be heard by London Regional listeners on September 19.

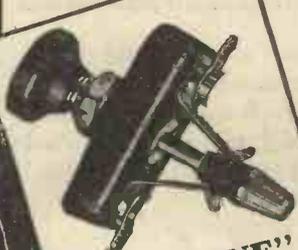
The talks on "New Problems in Northern Industry," which have been given each month recently by prominent northern speakers, have proved of great interest to listeners. On September 13 Mr. Leslie Runciman, son of the President of the Board of Trade, will broadcast from Newcastle a talk on "New Ships for Old."

GOLTONE COMPONENTS

AGAIN RECOMMENDED

**"IDEAL REGIONAL 2" &
YOUR "HOME RADIOGRAM"**

FOR THE

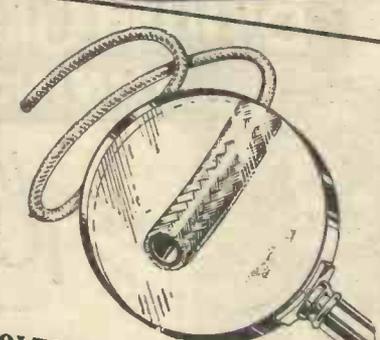


**"GOLTONE"
PUSH-PULL
SWITCH**
R26/744 7d. each



**"GOLTONE"
BINOCULAR H.F.
CHOKE**

R3/36 2/6 each



**"GOLTONE"—BRAIDED SINGLE
TINNED COPPER TUBING**
Exclusively Specified for YOUR
"HOME RADIOGRAM"

Air Spaced and low loss. No. R43/91.
Per yard lengths, 2m/m Bore .. 9d.
See Radio Catalogue FREE on request
for Full range of Screened Conductors.

**OTHER "GOLTONE" COMPONENTS
USED IN THE SETS DESCRIBED IN
THIS ISSUE—**

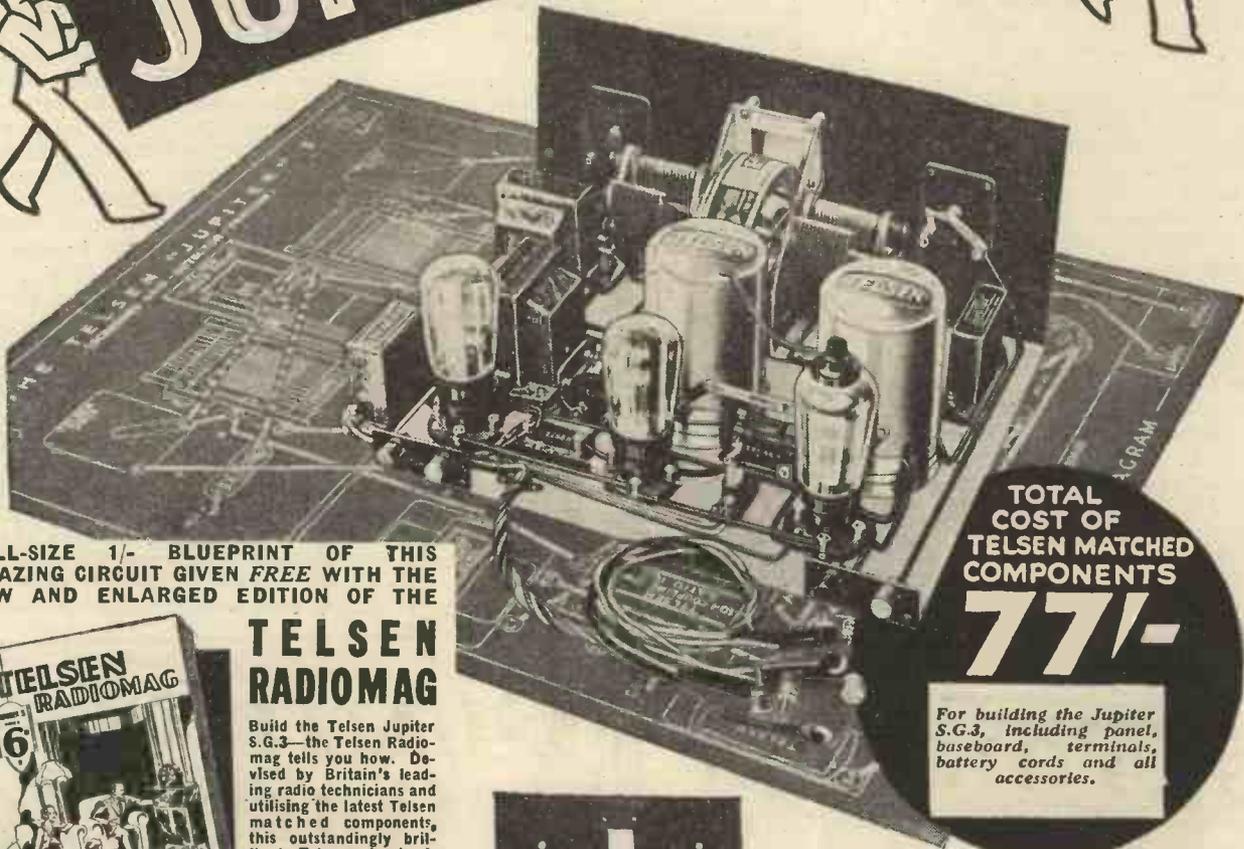
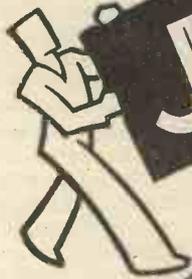
- | | |
|--------------------------------|-------------------------------------|
| 4 and 5 Socket Valve Holders. | Terminal Blocks. |
| 1 and 2 mfd. fixed Condensers. | Connecting Wire and Slewing. |
| High-frequency Choke. | .001, .0002, .008 fixed Condensers. |
| Low-frequency Transformers. | 3 Point Push-pull Switches. |
| Spaghetti Resistances. | Indicating Wander Plugs. |

"GOLTONE" Components are obtainable from all first-class Radio Stores.
Refuse Substitutes. If any difficulty write direct.

New edition of large Radio catalogue sent FREE on request



The TELSEN JUPITER S.G.3



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

TELSEN RADIOMAG

Build the Telsen Jupiter S.G.3—the Telsen Radiomag tells you how. Devised by Britain's leading radio technicians and utilising the latest Telsen matched components, this outstandingly brilliant Telsen circuit is one which every keen home constructor will want to build. For it gives a performance immeasurably ahead of anything previously

achieved—not only in its extreme selectivity, its exceptionally wide range, and its tremendous amplification, but also in its really superb quality of reproduction. Complete constructional details, together with a full-size 1/- blueprint, are contained in the new Telsen Radiomag, issue No. 3. Packed with valuable information, this biggest and best issue also tells you all about the improved and now all-embracing range of Telsen radio components, at the revised prices only made possible by Telsen's enormous sale—the largest in the world. Get your copy now, price 6d., from your radio dealer or news-agent.

TELSEN

RADIO COMPONENTS

TOTAL COST OF TELSSEN MATCHED COMPONENTS

77/-

For building the Jupiter S.G.3, including panel, baseboard, terminals, battery cords and all accessories.



DRUM DRIVE CONSTRUCTORS' OUTFIT
This Outfit contains all the necessary requirements for the construction of the TELSSEN "JUPITER S.G.3," but the constructor will find the Outfit of great value in the building up of any receiver circuit employing the drum-drive condenser assembly.

No. 219
3/6

THE OUTFIT CONTAINS THE FOLLOWING:

- | | | |
|--|---|--|
| 1 Metal panel with attractive crystal-line finish, specially cut and drilled for mounting the Telsen Drum Drive and other panel-mounted components normally required in a ganged condenser receiver. | 7 Wander plugs mounted in holder. | 1 Volume ditto. |
| 1 Baseboard, 14 in. by 10 in. | 2 Spade tags. | 1 "On-off" escutcheon. |
| 1 Aerial and earth terminal strip. | 1 8-way Battery cord. | 2 Height plinths for the matched screened coils. |
| 1 Loudspeaker terminal strip. | 1 Cord clip. | ½ in. of 3 m.m. sleeving (black). |
| 2 Red terminals complete and mounted in holder. | 2 Large insulating washers. | 1½ in. ditto (red). |
| 2 Black ditto. | 1 Small thick insulating bush. | 20 ft. of 1½ m.m. sleeving (green). |
| | 1 Small thin ditto. | 21 ft. of 22 S.W.G. tinned copper wire. |
| | 2 Spacing nuts for the reaction and aerial series condensers. | 1 Double-ended spanner for locknuts. |
| | 2 Spacing nuts for the "on-off" switch. | 1 Four-way spanner. |
| | 1 Wave-change Escutcheon with two screws and nuts. | Assortment of ½ in., ¾ in., 1 in., and 1½ in. wood screws. |
| | 1 Separator ditto. | |

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

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO. LTD ASTON BIRMINGHAM

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

Some Notes on Present-

day Short-wave Conditions

Around the Short-wave Dial

By M. BARNETT

THE transatlantic stations in the 49-metre group are now beginning to make themselves heard again before midnight. They will no doubt increase in strength as the winter approaches and the light evenings shorten. When they are to be heard at all, these stations are generally more reliable than the lower-wave stations, fading not being so erratic as a rule, although admittedly there is generally considerably more trouble from atmospheric in this band than there is at, say, 25 metres. Nevertheless, these stations are quite useful and will very often give good signals when the lower-wave stations are not to be heard at all.

I have noticed that quite a number of amateurs appear to consider that there is nothing useful to be heard over the 32-metre mark, and indeed make no provision for tuning their short-wave receiver or adaptor up to these longer-wave stations. If you have never tried for these stations before, and have not got a wave-meter handy, and assuming that your receiver uses plug-in coils, select a

coil which will tune in the 30-metre group of stations (W2XAF, Zeesen, etc.), at the bottom of the dial.

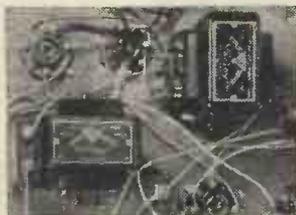
If your tuning condenser is of the usual .00025 mfd. short-wave type, 50 metres

should now come in at about 120 degrees on the dial. Search around here any evening after nine o'clock and you are certain to hit on what is generally the most powerful of all the short-wave stations—RW59, at Moscow, U.S.S.R. This station operates on exactly 50 metres, so that this will provide you with a very good point for calibration. Immediately above him you will find HVJ, the Vatican City station on 50.26 metres. This station does not broadcast very frequently, however, and is only on the air for a short period every day. Now, providing you choose a night when conditions are reasonably good, you should find a number of American stations, and possibly one or two Canadians, just below the Moscow station. The later the hour, the better, as far as most of these stations are concerned and at the present time of the year, there is precious little to be heard of them before eleven o'clock (except, of course, the Moscow and Vatican City stations already mentioned).

The short-wave stations have, on the whole, been coming through very well

CUTTING DOWN HUM

Hum and interaction can be avoided by the strict observance of an old but useful tip; do not mount transformers with the



magnetic fields in line. Here are two transformers mounted with the cores (and therefore the magnetic fields) at right-angles.



Build your eliminator with a metal rectifier and ensure years of service without the annoyance of breakdown or falling-off in output. Prices from 12/6.

Full particulars, circuits and prices are given in the new and enlarged 1933 edition of "THE ALL-METAL WAY." Post the coupon now, with 3d. in stamps, and get a copy.



METAL RECTIFIERS

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

COUPON

Westinghouse Publicity, 82 York Road, King's Cross, London, N.1
Please send me a copy of your 44-page booklet "THE ALL-METAL WAY 1933" for which I enclose 3d. in stamps.

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ADDRESS.....

A.W., 10/9/32.

QUALITY and QUANTITY

—the wonderful blend that makes

Player's Please



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

£20,000

Ask your tobacconist for particulars

5 FOR 3^d
10 FOR 6^d
20 FOR 11^½^d

during the last week or so. W2XAF, despite the fact that it is reported to use a beam aerial system directed towards South America, is quite a good signal now, although not so good as W1XAZ. CT/AA is also excellent on Friday nights. This station is very easily identified as the call is frequently announced, sometimes also in English. However, the call is quite easily distinguishable when given in the local tongue, the phonetic rendering of which is "say tay un ah ah." Good quality and very frequent announcing of the call sign mark this as a go-ahead station.

I see from the published lists of transmitters that there are now quite a number of ultra-short-wave transmitters in operation, or at least, licensed for operation, in the United States. The lowest of these is apparently W2XAB on 5.83 metres at New Brunswick. I wonder what is the lowest wave which has ever spanned the Atlantic, apart from amateur operators? The lowest commercial telephone is possibly WLO on 14.01 metres.

"WORKING YOUR HOME RADIO-GRAM"

(Continued from page 507)

no fear of the anode current tending to demagnetise the speaker movement.

Mains-users may care to use an electric turntable drive in place of the clockwork motor shown. In this event, it will be necessary to keep the two wires going to the motor well away from the rest of the set wiring.

Of the two high-tension leads of the set, the H.T. plus 2 is taken to the point of

Valves Required for your "Home Radio-gram"

Make	Screen-grid	Detector	L.F.	Power
Mullard	PM12	PM1HL	PM2DX	PM2A or 202
Marconi	S21	HL2	L210	LP2
Osram	S21	HL2	L210	LP2
Mazda	SG215	HL210	L210	P220
Cossor	215SG	210HL	210LF	720P
Six-Sixty	SS215SG	SS210HL	SS210LF	S 3220P
Lissen	SG215	HL2.0	L210	P220
Fotos	BC150	BC18	BC9	BD9
Dar'o	S9	Super HF	Universal	Super Power BW303
Eta	BY6	BY2020	BY1814	

maximum voltage on the battery and the H.T. plus 1 is taken to 70-90 volts. If a mains unit is used, the H.T. plus 1 wander plug should be put on the variable tapping, or that marked S.G.

The "Home Radio-Gram" when mounted in the "Popular" cabinet is not only an efficient receiver, but is a good-looking piece of furniture. London readers can see the "Home Radio-Gram" in the Radio Department windows of Messrs. Selfridge and Co., Ltd., W.1.

With the coming of autumn a new series of broadcast talks will begin. Two innovations are promised, which should attract wide interest. One is to be a series of relays from various European capitals by that popular broadcaster, Vernon Bartlett. Mr. Bartlett is shortly starting on a tour of Europe and his reports of current events are likely to enhance his reputation at the microphone. A second innovation will take the form of eye-witness accounts of special events of the day, to be broadcast during the news bulletins.



Why pay 5/- for 3/6 worth of H.T.?

you can save money with a Lively 'O' H.T. Accumulator BECAUSE:

IT ELIMINATES WASTE

When you discard a run down H.T. Dry Battery you are throwing away power. Due to self-discharge the voltage of a Dry Battery continuously falls. Nothing can stop it. Finally it is too weak to work your Set but there is still power left in it—power you cannot use—waste! The Lively 'O' H.T. Accumulator is waste-proof. Its famous "air-spaced" construction prevents self-discharge. It is full of life right up to the time when it needs recharging.

IT COSTS LITTLE TO RECHARGE

For only a few shillings—much less than the cost of a new H.T. Dry Battery—the Lively 'O' Accumulator can be recharged—made like new again—full of life and energy, ready to run your Set for another three or four months.

IT LASTS FOR YEARS

Provided it is charged every three or four months the Lively 'O' Accumulator will last for years. It is definitely the most economical H.T. supply you can use. Every Wireless Dealer sells it in convenient 10 volt units.

TWO TYPES:

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

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

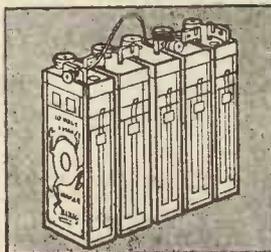
BRITISH MADE by Oldham & Son Ltd., Denton, Manchester. Est. 1865, and at London, Glasgow, Belfast and Dublin.

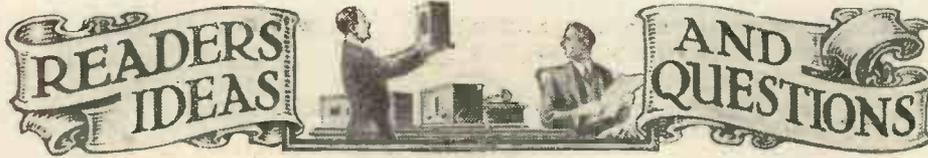
The

Lively 'O'

H.T. ACCUMULATOR

PUT THE LIVELY 'O' INTO YOUR RADIO





The "A.C. Century Super"

SIR,—I feel I must write you an appreciation of my set as built to Mr. James' specification, in the "A.C. Century Super." I am within three miles of North National and Regional, and can receive Prague and Langenberg free of any interference. I was astounded at the results of this set. I have had it since January and had never seen the inside of a wireless set until I bought the blueprints and necessary parts for this set, and found the assembling of it quite easy. I have just converted it into a radiogram. From Radio Normandy at 40 on dial round to Vienna at 170, I can get every station of 1 kilowatt and over clear and distinct, and the same on the long band. It is a pleasure to work and with a Blue Spot 100D the set is delightful, both in tone, volume and purity. This set is quite reasonable in price to build and, honestly speaking, I would not change it for any other set. I know the tendency of every amateur wireless fan is to brag a little about his set, but this set of mine is absolutely it! I am more than delighted at it, as it was to be my first and last venture in set making. Please thank Mr. James from me for a real good set—the only one that is any good for this district.

W.D. (Huddersfield).

Adding Variable H.T. Tapping

SIR,—I have a mains unit which does not allow my getting a sufficiently low voltage for applying to the anode of a bi-grid valve in my receiver. I have no knowledge of how to go about reducing the voltage to give me a current consumption of .1 milliampere for the valve in question, and would therefore welcome your assistance in the matter.

K. R. (Surrey).

The easiest way to overcome your difficulty is to add an arrangement to your mains unit whereby you can get a variable voltage supply for the point in question. This is best accomplished by connecting one end of a 20,000 ohms fixed resistance to the maximum positive output terminal of your mains unit and joining the other end of this resistance to one end terminal of a 50,000 ohms wire-wound potentiometer. The other end of this latter should then be taken to the negative output terminal of the mains unit. The centre terminal of the potentiometer is then connection for the variable output voltage tapping, and a 2-microfarad capacity fixed condenser should be wired between this point and the negative output terminal of the supply unit.—ED.

Gramophone Pick-up Wiring

SIR,—I am having trouble with my receiver, which I have recently adapted for gramophone work. The set is a pro-

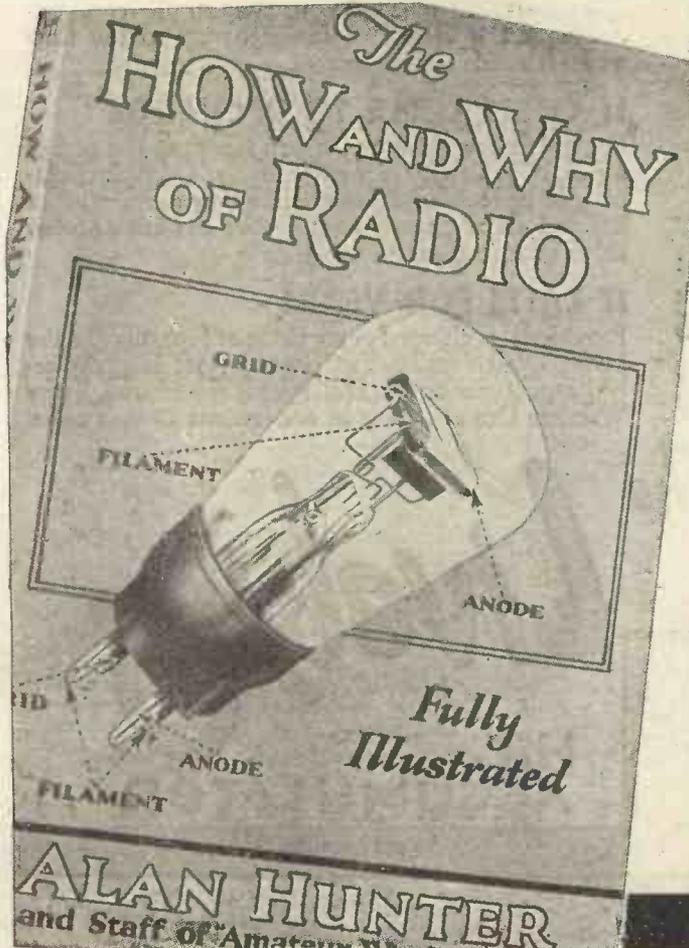
prietary one with a console-type cabinet. To avoid having to take out the back of the cabinet each time I wish to use the set for gramophone work I have fitted a change-over switch to switch in the pick-up. My trouble is that when I use the pick-up there is a terrific noise set up which drowns the music from the record. Perhaps I have gone wrong in wiring up the switch so will explain my connections in an endeavour to assist you. The centre terminal of the switch is wired to the grid terminal of the detector-valve holder and one of the side terminals of the switch is connected to one of the pick-up terminals. The other pick-up terminal is joined to a point giving 1½ volts negative bias in the grid-bias battery. The other terminal of the switch is left dead. The switch itself is arranged on the back-board of the cabinet. Can you, from these details, advise me where I may have gone wrong?

F. M. (Eastbourne).

The wiring between your detector-valve holder and the gramophone switch is far too long for satisfactory working. Grid-circuit wires should never exceed about two inches or three inches at the most. If you will arrange the gramophone switch by the side of the detector valve-holder to keep the wiring short and then break the grid-condenser and leak circuit when wiring up the switch, you will overcome your trouble.—ED.

Curing Modulation Hum

SIR,—I experience a rather curious form of mains hum now that I have adapted my receiver to work from the lighting mains. The hum is very noticeable when I
(Continued on page 528).



EXPRESSLY WRITTEN FOR THE BEGINNER

"The How and Why of Radio," written by ALAN HUNTER, has been expressly compiled for beginners.

It provides a clear conception of the general theory and practices of wireless reception in simple, non-technical terms, and contains over ninety clearly-defined illustrations. It has been mainly compiled from that popular series of articles in AMATEUR WIRELESS:—"The How and Why of Radio."

Get this indispensable book NOW. Of all Newsagents and Booksellers, or 2/9 post free

from

"AMATEUR WIRELESS,"
58/61 Fetter Lane, London, E.C. 4



"ECLIPSE" ACTIVITIES

QUITE a host of American listeners have been busy taking records of the effect on wireless reception of the recent total eclipse of the sun. As the eclipse was not visible in this country, Professor Appleton, of King's College, hopes to utilise the American observations to verify his theory of the "double" Heaviside layer. He is of opinion that the upper layer is produced by the action of ultra-violet light, whilst the lower is caused by electronic emission from the sun. If this is so, the effect of the eclipse on the upper layer will be practically simultaneous with the cutting-off of the light, whereas, owing to the much lower speed of the electron stream (about 1,000 miles a second), there should be a "lag" in the effect on the lower layer. The higher layer reflects short waves of 80 metres or less, whilst the lower reflects the medium waves used for ordinary broadcasting. By a comparison of the relative behaviour of the two types of wave during the eclipse period, it is hoped to remove some of the mystery which still surrounds the constitution of the Heaviside layer. R.

The attempts to relay from Detroit running commentaries on the competition for the British International Trophy will be made on September 3, 5 and 6, and not on September 2, as previously announced. Kaye Don, in Miss England III, and Gar Wood, in Miss America X, are the competitors.

Episode 4 of "An Omnibus Romance" will be given by Mamie Soutter and Blake Adams in a National vaudeville programme on September 16. Others in the "bill" are the Three Ginx, Our Bill, Mario de Pietro, Rose Perfect, Haver and Lee, and the B.B.C. Theatre Orchestra.

The opening speeches on the occasion of the Worcester General Infirmary Gala Week are to be relayed in the Midland Regional programme from the Guildhall, Worcester, on September 22. Among the speakers will be the Mayor of Worcester—Councillor Diana Ogilvy—and Viscount Cobham, who is Lord Lieutenant of the County of Worcester.

An appeal on behalf of the Harborne Home and Dispensary for Animals is to be given by Miss Janet Joye, the well-known revue artiste, on September 18 in the Midland Regional programme.

In his gramophone recital for Midland Regional listeners on September 19, Robert Tredinnick has arranged a programme of miscellaneous pieces. Many of the new mid-month issues will be heard on this occasion, including one record of special interest to Midland listeners.

In a programme of "requests" to be given by the Midland Studio Orchestra on September 24, Geoffrey Dams is to be the soloist and David Branson will be heard in numbers at the piano.

The Sheffield soprano, Ida Bloor, will sing from Manchester on September 11.

Joseph Farrington and the King Cross Subscription Prize Band from Halifax will broadcast for North Regional listeners on September 11.

New Times Sales Co NEW 1933 RADIO

MANUFACTURERS' KITS

- RADIO FOR THE MILLION "STATION MASTER 3"** (Model B). With valves, cabinet and speaker as advertised. Cash price, £7/10/-. Balance in 11 monthly payments of 14/-. **10/-** order
- COSSOR MELODY MAKER MODEL 335.** Complete with valves, speaker and cabinet. Employs Cossor variable-mu S.G., H.F. stage, detector and power valves. Cash price, £7/17/6. Balance in 11 monthly payments of 14/10. **10/-** order
- 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. Balance in 11 monthly payments of 17/6. **15/-** order

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 £2/10/0. **4/7** order
- Balance in 11 monthly payments of 4/7. **3/10** order
- B.T.H. SENIOR PICK-UP** with arm and base. Cash price £2/2/-.
- Balance in 11 monthly payments of 3/10. **3/10** order

- ULTRA 1932 TIGER RECEIVER.** A.C. or D.C. Mains, S.G., S.G. Detector and Pentode, Moving-coil speaker. Complete with Mazda Valves, ready for use. Cash price, £15/15/0. Balance in 17 monthly pymts. of 20/-. **20/-** only

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 Give long service, improved volume and tone. Very economical. Replacements for Taylex or Standard batteries at low prices; details post free. Also Bargain List; Radio Kits and parts at lowest prices.
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"READERS' IDEAS & QUESTIONS"*(Continued from page 526)*

switch over for long-wave reception, but not quite so apparent when working on the medium waves. If I use my set for gramophone amplifying there is no hum at all. I have experimented with extra smoothing chokes and large capacity condensers, but this has not effected a cure. I am therefore seeking your advice with a view to eliminating the hum from my apparatus.

C. D. (Kent.)

It seems from what you tell us that you are experiencing modulation hum. This form of hum is usually only noticeable when radio is being used, and does not occur when a pick-up is being employed. We assume you have alternating current supply mains from which you are working your receiver. If you have a valve rectifier in the mains unit, you should connect a .01 microfarad capacity condenser between each anode of the rectifying valve and the centre point of its filament heater winding. Should you have a mains unit with a metal rectifier in its construction, you should arrange to fit a couple of power-type H.F. chokes between the rectifier and the ordinary L.F. smoothing circuits, one in each lead. You should then connect two 2- or 4-microfarad capacity condensers in series and across the L.F. smoothing circuit end of the two H.F. chokes and connect the centre point between the two condensers to earth.—Ed.

Simple Anode-current Tests

SIR,—During the course of my endeavours to experiment, I often have occasion to test the anode-current consumption of valves. I find it somewhat tedious to disconnect wires in order to arrange the milliammeter in series with the anode

circuits of different valves and would welcome any advice you may be able to offer in connection with simplifying this form of testing.

W. R. (Leigh-on-sea).

One of the most useful things we have discovered in connection with the simplification of valve anode-current tests is a special valve-plug adaptor with a split circuit arrangement whereby a valve may be withdrawn from its holder, the adaptor inserted in its place, and the valve reinserted in the adaptor. By connecting the meter to the two terminals provided on the adaptor the anode current consumption of the valve may be determined.—Ed.

Filtering Out Heterodyne Whistles

SIR,—The greatest difficulty I have experienced during the last twelve months in connection with my wireless reception has been the cutting out of heterodyne whistles. I use a moving-coil speaker, which seems to accentuate the troubles. If I use a cheap balanced-armature speaker the whistles are greatly reduced. Quality, however, from this cheap speaker is not to my liking. Is there any way in which I can overcome the nuisance without spoiling the quality of reproduction when using my moving-coil speaker?

E. H. (Wiltshire).

It is now possible to obtain special heterodyne filters for filtering out the whistles usually heard in high-quality loud-speakers. These filters take the form of low-pass high-frequency rejectors and are designed to be connected in the anode circuit of the detector valve in the receiver. Their frequency cut off is in the

region of 3,500 cycles, which frequency is sufficiently high for those of normal taste in quality of reproduction.—Ed.

Gramophone Volume Controls

SIR,—I wish to fit a volume control on the turntable of my gramophone motor, and it is to be used solely for controlling the volume of gramophone reproduction. I have a circuit diagram of the wiring required but am uncertain what value potentiometer to use.

A.P. (Bath).

A high resistance potentiometer, one having a resistance of at least 150,000 ohms, should be used unless a lower value is specifically stated to be desirable by the manufacturers of the pick-up. Even then the lowest value of potentiometer should not be less than 25,000 ohms.—Ed.

Reducing Needle Scratch and Surface Noises

SIR,—I am using loud-tone gramophone needles and find these cause more needle scratch and surface noises than the soft tone. Unfortunately I do not get enough brilliance from my speaker when using soft-tone needles, and am therefore forced to use needles which give rise to unwanted noises. Is there any way in which I can overcome the trouble without going to great expense in the matter?

T. D. (Bucks).

It is quite likely that the extraneous noises you are experiencing are mainly due to your working your gramophone with its lid open. You should arrange to close down the lid over the gramophone turntable and pick-up so as to avoid direct sound interaction between the pick-up and record and the loud-speaker.—Ed.

"AN ADD-ON BANDPASS UNIT"*(Continued from page 488)*

The wires from this block to the aerial and earth terminals on the set should be quite short and should be well spaced, for otherwise they will upset the bandpass action.

If there is a pre-set condenser in the main set, it should be short-circuited, or it can be removed entirely (the wires being joined across) and used in the bandpass unit. In any case, it should be cut entirely out of circuit, for it will upset the value of the capacity coupling between the circuits.

Operation is easy. The coupling condenser (right-hand control on the panel-front) should be set at maximum with the vanes in, and the wave-change switch, for a first test, should be pulled out so that the unit is operating on the medium waves. The set must also be switched on to the medium waves, of course.

How to Tune

Leave the tuning condenser of the main set at the normal setting for a local station and tune in the unit until the station is heard. The addition of the unit may alter the original readings somewhat, but you will soon find out the best position.

The dials on the unit and mains set should move approximately in step and when you have found two or three main stations in this way, you can start to improve the selectivity and get a true bandpass effect. Screw down the pre-set condenser on the unit, so that there is the maximum aerial coupling, but gradually turn the knob of the coupling condenser

in an anti-clockwise direction, so that the coupling between the unit and the set is reduced and the bandpass effect sharpened. You will find a certain value of this coupling condenser which gives the best selectivity. On local stations it will probably be found possible to slacken off the coupling condenser more than on distant stations. Variation of coupling will also make a slight difference to the dial readings.

When you are accustomed to the operation of the unit in conjunction with the set you can then slacken off the pre-set condenser to sharpen up the tuning on the aerial side—that is, on the tuning of the added unit. You will probably find that as you rotate the pre-set condenser knob, the selectivity is increased up to a point, but the dial readings on the unit are altered slightly.

You will soon accustom yourself to operating the two dials and you will find that, correctly adjusted, this bandpass unit is just as effective in increasing selectivity, as the addition of an ordinary H.F. valve. At the point of correct adjustment, there should not be any drop in signal strength, owing to the greater selectivity.

NEXT WEEK :**TWO SPECIAL FEATURES**

See the Important Announcement on page 489

"SUITABLE CIRCUITS FOR SEVEN METRES"*(Continued from page 508)*

The pre-set type of condenser at the top of the unit enables a suitable intermediate-frequency to be determined during actual reception. When connected to a set it is necessary to tune the set to the same wavelength as that of the intermediate-frequency unit. The unit covers a range from about 240 to 500 metres, and a suitable wavelength in this range is selected on which to amplify the initial ultra-short wave signals brought in on the autodyne detector.

The two circuits already discussed are, at the moment, favourites among amateurs who have already done extensive experiments on the ultra-short waveband. There are two others that may come into use later. One is the Armstrong super-regenerative circuit, whereby a separate quenching valve is used to enable much greater reaction effects to be obtained from the detector.

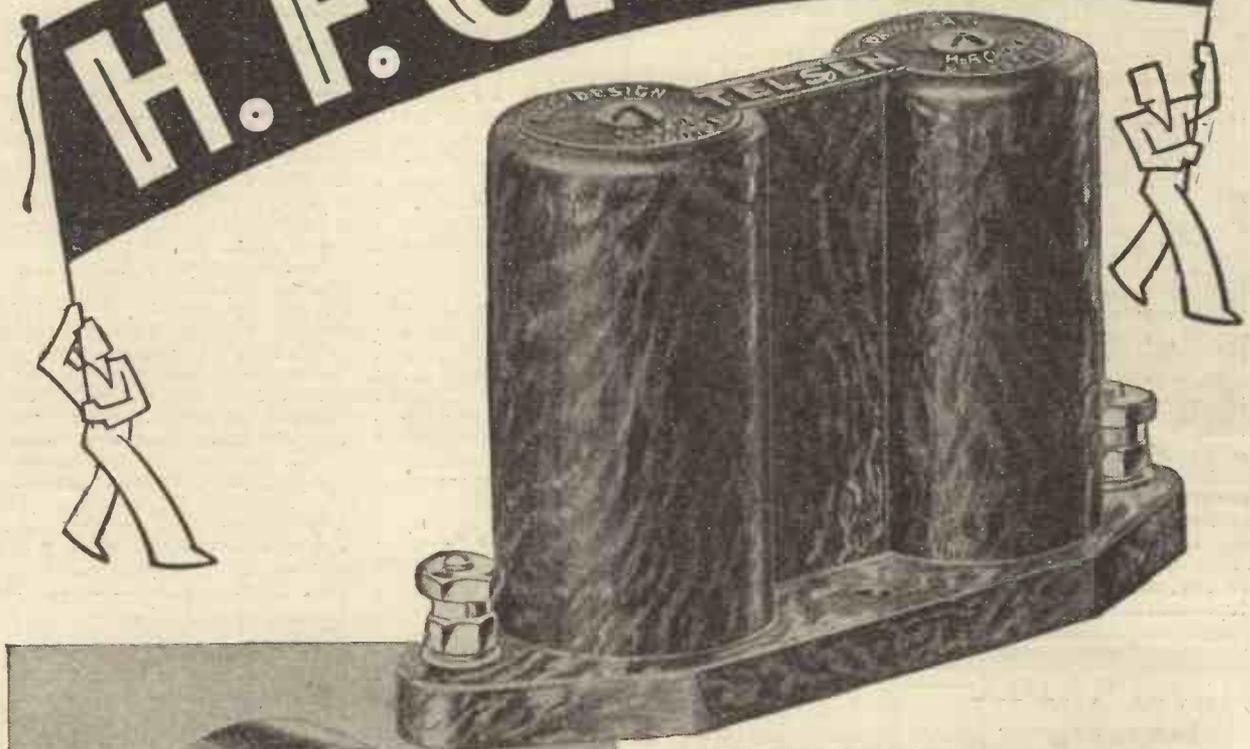
The remaining circuit consists of a screen-grid valve in front of the normal detector. No amplification can be expected from the screen-grid at such high frequencies, but it may prove useful as a means of stabilising the set's reaction.

For a start there is nothing to beat the two circuits shown at Figs. 1 and 2.

They provide ample scope for the keen amateur, who in the near future will find plenty of telephony and possibly television signals to justify the ultra-short-wave set's existence.

TELSEN

H.F. CHOKES



TELSEN BINOCULAR H.F. CHOKE

In H.F. amplification the performance of a choke is of supreme importance. The Telsen binocular H.F. Choke is called for wherever the highest efficiency is required. It has a high inductance of 180,000 microhenries, low self-capacity, and a negligible external field, due to the binocular formation, making it the ideal choke for a high class circuit. No. W.74

5/-

TELSEN STANDARD H.F. CHOKE

The Telsen Standard H.F. Choke utilises the minimum baseboard space. It is designed to cover the whole broadcast band, has very low self-capacity, and is highly suitable for reaction circuits. The inductance is 150,000 micro-henries and the resistance 400 ohms. It has proved very popular and has been incorporated by set designers in many of the leading circuits. No. W.75

2/-

TELSEN

RADIO COMPONENTS

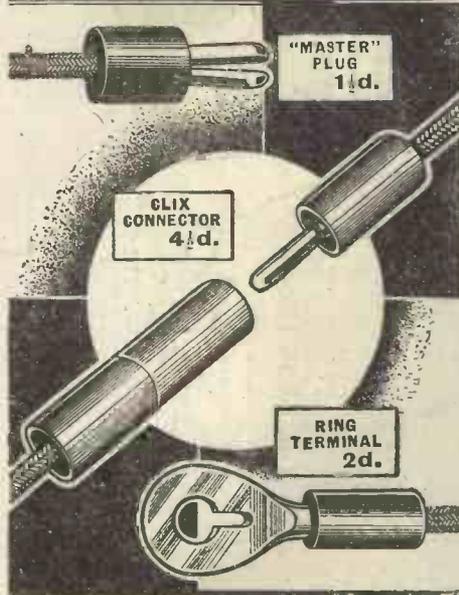
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OUR LISTENING POST

By JAY COOTE

HAVE you already picked up tests by Radio Luxembourg? They have not yet been made at high power, but the transmitter is being experimentally tried out on about 1,275 metres between 12.30 and 1.30 p.m., and again between 5.30 and 6 p.m. B.S.T. daily. All announcements are given out by a woman in German and French and sometimes in the Luxembourg dialect, which almost coincides with *platt-Deutsch* (low German), and thus rather akin to Dutch or Flemish. In French you may hear: "Allo! Allo! Ici Radio Luxembourg expérimental," the name of the city being pronounced as if it were written: *Looks-am-boor*. At present, during the preliminary canter, the wavelength of the station is far from stable; according to reports from listeners, it varies between 1,190 and 1,275 metres.

A Newcomer

Another newcomer on the ether is Radio Nimes (France), which, having closed down about a year ago, similar to the mythological Phoenix, seems to have resurrected from its ashes. It has been entirely reconstructed and is now heard testing on 238 metres. Regular daily transmissions having been advertised to take place from September 3, under favourable conditions, by the time these notes are in print they may have been faintly audible to you on this wavelength. At present the power is hardly likely to be more than 500 watts (aerial), if as much, but a slight increase is promised in the near future. Violent deviations from the channel it has adopted for its broadcasts should not take place, as the owner of the station, impelled by an earnest endeavour to stick to his wavelength, has adopted quartz-crystal control.

With the reorganisation of the German broadcasting system and the completion of two more high-power transmitters, the Reichsfunk has effected some drastic cuts and alterations in the programmes and time schedules of the studios. No longer when London has closed down shall we be able to switch over to Berlin for a further half-hour of dance music, as the stations, with the exception of two nights per week, will close down daily at midnight. This will spell 11 p.m. when we revert to winter time.

However, as a slight compensation on the two nights in question, special late concerts will be broadcast, which will also be taken by the Zeesen short-wave station for the benefit of Germans living abroad. In order to effect economies, it is possible that these transmissions may be simultaneously broadcast by all German stations.

New German Stations

You may have already heard the new Breslau, Leipzig, and Frankfurt-am-Main stations, as every step was taken to try and get them ready in time for the Berlin Radio Exhibition, which coincided in dates with our own. Unfortunately, however, this was found impossible, but the filip given to the builders and engineers has advanced the opening date by some weeks. News reaches me that the new Munich high-power transmitter will also soon be on the air.

It is good to learn that a practical working agreement has been concluded between the E.I.A.R. (Italian broadcasting authorities) and the Scala Opera House at Milan by which it has been decided that the studios are to assist the theatre financially. From time to time we have been given relays of performances from the Scala, and with the new arrangement we may expect more visits to that famous opera-house. I am told that there is every likelihood of these broadcasts being taken by Rome as well as by the North Italian group of stations, thus bringing the transmissions within the reach of a greater number of European listeners.

Finding a Wavelength

There would appear to be some doubt regarding the wavelength to be used eventually by the 175-kilowatt station which is to be built at Lakihegy (Hungary) to take the Budapest programmes. So far, it would seem that the 550-metre channel may be abandoned in favour of 210 metres, but I cannot yet secure a definite confirmation of this drastic move. Anyhow, it is hoped to get this new transmitter working before the end of the year. Budapest programmes will be an agreeable addition to our daily log; as it is with the present station, it is seldom they can be heard at a useful strength except during the winter months.

Listening on the short waves a night or so ago, I picked up Lisbon (CT1AA) and noticed that this very up-to-date amateur station had adopted a cuckoo call as interval signal. Announcements on that night were made in at least five different European languages, and in each instance the studio referred to itself as Radio Colonial, Lisbon. By the way, the wavelength is now regularly 31.25 metres, and if you can find Zeesen or Schenectady it is quite easy to tune in the Portuguese transmission, as it is a very powerful signal.

A new series of talks to begin in October is called "The Doctor and the Public." Sir Thomas Horder will be the first speaker and the series will be given by two physicians and a surgeon, who will discuss the difficulties which doctors encounter, fallacies concerning medical matters, and various other aspects of the profession. As in the case of the talks on law, the speakers will remain anonymous.

Harold Spicer, who has been Director of Music at Manchester College, Oxford, since 1919, is to give an organ recital from the Church of the Messiah on September 21. Midland Regional listeners will hear this recital.

MOUNT BATTERIES FIRMLY

Do not let the batteries in the battery compartment of a transportable move about, for they may pull the wiring loose and wander plugs may come out of their



sockets. A wooden batten is shown jamming a high-tension battery in position.

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.

No. W.154

5/6



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
RADIO COMPONENTS

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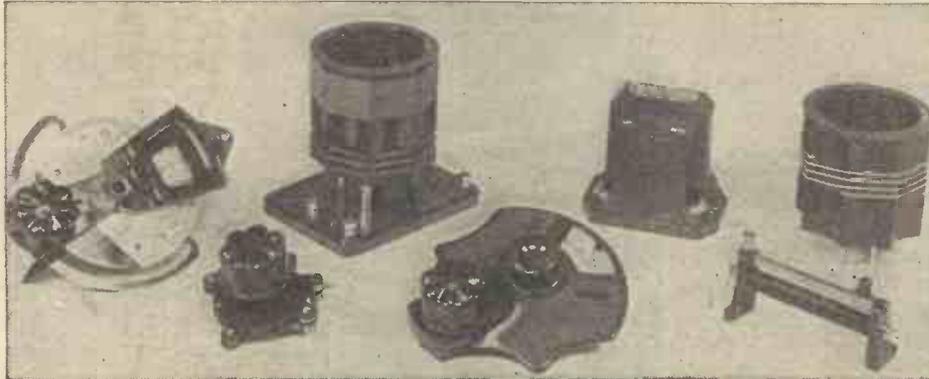
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THE NEW READI-RAD PARTS

SET builders will be interested in the new range of home-constructor parts produced by Ready Radio, Ltd. A selection of these is shown in a group in the accompanying photograph. All the components are built up on moulded bakelite having a very attractive brown mottled

moulded case, the terminal indications being stamped on the top. There are some handy slow-motion condenser controls in the new range, and also some handy base-board mounting potentiometers in 200, 400, 500, and 1,000-ohm cycles. These are of the straight slider type as can be



A selection of the new Readi-Rad components described, including slow-motion dials, Micalog condenser, dual-wave coil, low-frequency transformer, baseboard-mounting potentiometer and short-wave coil

finish and the insulation of this material is perfect. The knobs of the variable components are also made of this moulded bakelite and in the case of the condenser controls there are panel escutcheons to match, also of the same material.

Among the newcomers is a useful and compact low-frequency transformer, having a ratio of 3 to 1. This is covered in a

clearly seen from the above photograph.

Short-wave and dual-wave plug-in coils, wound on ribbed bakelite formers of a low-loss type, are handy for all circuits, while the new Micalog variable condensers facilitate construction. These are available in .0003 and .0005-microfarad sizes and combine all the advantages of solid di-electric condensers with the efficiency

usually considered to be the prerogative of air-spaced types. There are some .0001 and .0005-microfarad reaction condensers and also a range of log-law condensers in all standard capacities from .0001 microfarad.

Full details of all these parts can be obtained free on mention of AMATEUR WIRELESS from Messrs. Ready Radio, Ltd., Eastnor House, Blackheath, London, S.E.3.

A SOUTH LONDON EXHIBITION

MR. CHRISTOPHER STONE opened a wireless exhibition at the Bon Marche, Brixton Road, London, S.W.9, last Saturday, September 3, and readers who can possibly find time to visit the exhibition will find it very worth while. The entrance is in Ferndale Road. More than a score of well-known radio firms are represented, including Climax, Columbia, Cossor, Ekco, Ealex, Ferranti, Gecophone, Kolster Brandes, Lissen, Lotus, Marconi, McMichael, Philips, Portadyne, Pye, Tannoy, Triotron, Ultra, Varley, Westinghouse and others. AMATEUR WIRELESS has a stall. Following the very keen interest re-awakened by the Olympia Exhibition, many thousands of readers in South London who may have missed the great show will be glad to have an opportunity of seeing and hearing some of the most notable sets of the day. Admission is free and the exhibition is open until Saturday, September 10. (Saturdays, 10.30 a.m. to 10 p.m.; other days, 10.30 a.m. to 9 p.m.)

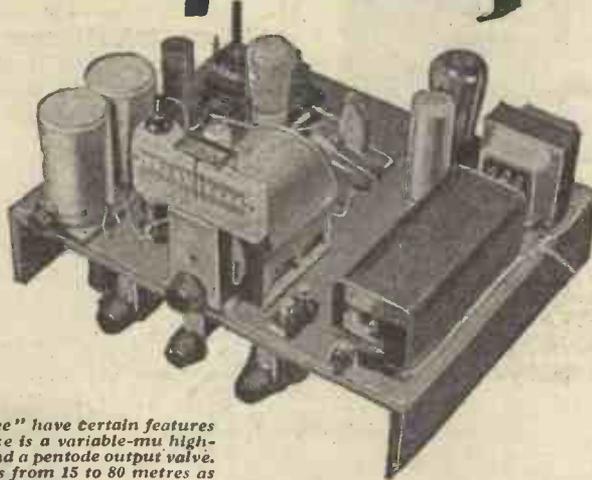
The Prosperity Three



DESIGNED FOR
BATTERIES,
A.C. and D.C. MAINS

All three versions of the "Prosperity Three" have certain features in common. In each case the valve sequence is a variable- μ high-frequency amplifier followed by a detector and a pentode output valve. Each set, moreover, covers the short waves from 15 to 80 metres as well as the medium and long broadcast wavelengths.

The turn of a switch enables you to reproduce gramophone records with a purity and volume unobtainable from an acoustic instrument. Constructors who build up any one of these three versions can rest assured that they will possess a first-class radio outfit that will give them many months of enjoyable musical reproduction!



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- THE ABC OF STATION IDENTIFICATION. By J. Godchaux Abrahams.
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- SOMETHING ABOUT NOISE! By W. H. O. Sweeney.
- THE LOW-FREQUENCY TRANSFORMER. By Percy W. Harris, M.Inst.Rad.E.
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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.



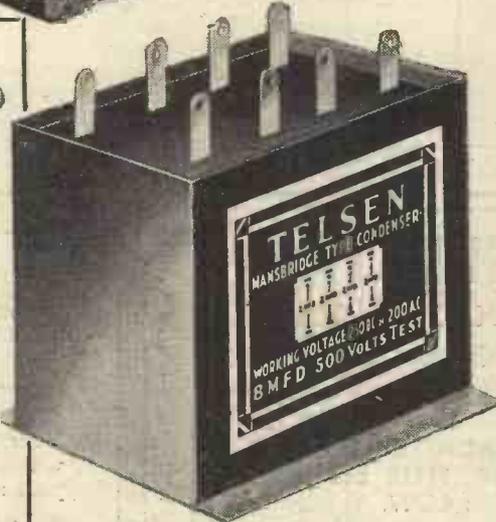
Cap. Mfd.	500 Volt Test No.	Price.	1,000 Volt Test No.	Price.
.01	W.232	1/6	W.239	2/6
.04	W.230	1/9	W.237	2/9
.1	W.231	1/9	W.238	2/9
.25	W.229	2/-	W.236	3/-
.5	W.228	2/3	W.235	3/3
1	W.227	2/3	W.234	3/6
2	W.226	3/-	W.233	5/-



TELSEN 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 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. Mfd.	500 Volt Test 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 "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 types, 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. Mfd.	Min. Cap. Mfd.	No.
.002	.00025	W.149
.001	.00052	W.150
.0003	.00016	W.151
.0001	.00005	W.152



TELSEN RADIO COMPONENTS

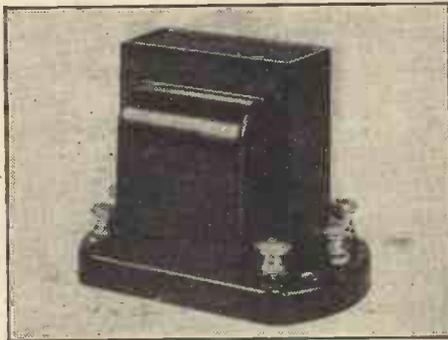
Get your copy of the new **TELSEN RADIOMAG, Issue N°3**
ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM.

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

SIMPLE TONE CONTROL

TONE control and the ability to regulate the natural tone of reproduction to suit individual station reception, is one of the most popular features of modern circuits. There are many ways of varying the tone, and as some of these are merely drastic corrections (such as the deliberate cutting off of bass or top) not all of them are satisfactory.

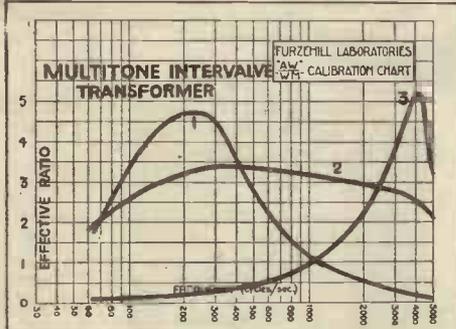
A practical form of tone control and one which commends itself on the score of simplicity is that used in the Multitone tone transformer. This system, which is fully covered by a patent, gives true tone control and is a great improvement on the normal two-way tone control at present effected by units consisting of an L.F.



The Multitone tone-control transformer

choke, condenser and potentiometer placed between the set and speaker.

The Multitone tone transformer, in addition to the usual four terminals for primary and secondary, has two additional



Performance curves of a Multitone transformer tested by "A.W."

terminals to which the ends of the winding of a special potentiometer are connected, while the centre terminal of the potentiometer is connected to the grid terminal of the transformer. There are several ways of connecting the transformer, either for direct or resistance feed. The potentiometer used should have a winding resistance of at least .5 megohms, and a special Multitone graded potentiometer has been produced for this special job.

The mean ratio of the Multitone transformer is 4 to 1 as the primary inductance is rated at 54 henries with no D.C. flowing, and 31 henries with 4 milliamperes steady D.C. flowing.

The metal baseplate of the transformer is in contact with the core, which is thus automatically earthed if used on a metal chassis. In other types of set the core can be earthed if necessary by clamping a wire under one of the fixing screws. A good idea of the tone variation possible with the Multitone transformer can be gauged from the accompanying curve, which was taken recently during an "A.W." test on a standard Multitone.

It is interesting to note that each transformer is tested by the Multitone Electric Co., Ltd., by putting it in the plate circuit of a valve oscillator covering a wide range and feeding the secondary output into a valve stage measuring at the same time the voltage across the secondary. The tone control is then brought into operation and the transformer checked up with the voltage amplification curve for a standard job.

Full details of these transformers can be obtained from the Multitone Electrical Co., Ltd., 95-8 White Lion Street, London, N.1.

A running commentary on the fifth official speedway test match between England and Australia is to be relayed from the Empire Stadium, Wembley, in the National programme on September 15.



British Made

HERE IT IS EXACTLY WHAT YOU REQUIRE FOR SHORT WAVES

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

YOUR OLD COMPONENTS

are worth money. Sort out the spare radio parts you no longer require and advertise them in the "Miscellaneous Columns" of **AMATEUR WIRELESS**. You will be surprised how quickly they will be snapped up.

Your announcement will cost you 3d. a word. Send your list of parts, together with your name, address and remittance, to:

"Small Advertisement" Dept.,

AMATEUR WIRELESS

58-61 Fetter Lane, London, E.C.

"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 free quotation will follow. Balance payable in cash or hire-purchase.

FREE Wireless Set, to introduce the Radialaddin Club.

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

RADIALADDIN, Limited

THE LARGEST RADIO EXCHANGE DEALERS IN THE UNITED KINGDOM

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

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.

Radiopak Units

TO my mind one of the most interesting components for the new season is the Radiopak. I have just received a folder dealing with the band-pass model of this. The Radiopak includes the H.F. and detector components needed for an efficient band-pass tuning arrangement, and the wire-wound volume control, completely screened coils and ganged condenser with escutcheon plate and pilot lamp attachment comprise a most useful unit which greatly simplifies set construction. The folder gives full practical and technical details.

831

A Fine Bulgin Book

I was very pleased to receive a copy of the new Bulgin comprehensive catalogue. It describes a wide range of parts, of outstanding interest to set builders, and if you cannot find something to interest you in the 80 pages of this catalogue, well...! I understand that free copies of this useful book will be sent through my Catalogue Service to readers who enclose 2d. in stamps to cover postage. Take my tip, it's worth it.

832

Another Price Reduction

Price reduction seems popular just now! The British Blue Spot Co., Ltd. tell me that they have made a ten-shilling reduction in the price of the popular 66K unit, which now costs only 15s. They have also sent me the latest literature describing this speaker and the other well-known models.

833

The New R.I. Catalogue

I advise every listener to write for a free copy (through my Catalogue Service) of the new R.I. Catalogue, which deals with everything from superhet complete receivers to small parts such as volume controls and H.F. chokes. This 40-page book will interest all set owners.

834

OBSERVER

In the Morley announcement in last week's issue, dealing with the Morley short-wave coil unit, the wavelength range was incorrectly given. This coil unit when tuned with a .00025-microfarad condenser tunes from 12 to 70 metres. Aperiodic aerial coupling ensures that there is an adequate coupling over the whole wave range.

GRIP

The "BOWSPRING" gives strong pressure over a far wider range of diameters than any plug we have so far tested.

Here are some tests with various well-known types of wander plugs. Starting from a small socket, each plug was pushed into progressively larger sockets until no contact was made, the force needed to remove the plug from each size of socket being measured in ounces.

In each case the "Bowspring" showed itself the better plug. Here is an example.

Socket diameter.	Grip of Bowspring.	Grip of typical split-pin Plug.
.127"	65 oz.	20 oz.
.133"	36 oz.	2 oz.
.134"	28 oz.	No contact.

The "Bowspring" continued to make contact until a socket just over .144" was reached.



Strong spring and wide self-adjustment. Side entry with Belling-Lee patent grip for flex. 12 indications and 6 plain colours.

BELLING-LEE
FOR EVERY RADIO CONNECTION

Advr. of Belling & Lee, Ltd., Cambridge Arterial Road, Enfield, Mdx.



pop a COP on your aerial



This little fellow is a well-made super lead-in which dispenses with all fiddling selectivity gadgets, lightning protectors, safety switches, wave traps, extra condensers—all these cost money, while a single COP at half a crown will do the work of all and do it properly. Controls volume, cuts out static nuisance, enables you to pick and choose your stations with vastly improved selectivity. Fixed in a few moments! Controlled by a touch of the finger! Adds so much to your pleasure, that you will find the COP the best friend you ever made in the radio world! Get one from your local radio dealer to-day, or send P.O. (postage free) direct to the makers: Clifford Pressland (Sales) Ltd., 84 Eden Street, Kingston-on-Thames

PRICE
2/6

6-in. size, 2/6
9-in. size, 3/-
12-in. size, 3/6



PRESSLAND
AERIAL CONTROL
COP

Scientific

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	Station and Call Sign	Power (Kw.)	Kilo-Metres	Station and Call Sign	Power (Kw.)	Kilo-Metres	Station and Call Sign	Power (Kw.)
GREAT BRITAIN			Radio LL (Paris) 1.0			NORWAY		
25.53	11,751 Chelmsford (G5SW)	10.0	also on 33 m. (9090 Kcs.)			235.5	1,274 Kristiansand	0.5
211.3	1,420 Newcastle	1.0	384.4	779 Radio Toulouse	60.0	240	1,249.7 Stavanger	0.5
214.3	1,400 Aberdeen	1.0	447.1	671 Paris (PTT)	0.0	304	824 Bergen	1.0
242	1,238 Belfast	1.0	465	659 Radio Agen	0.5	367.6	816 Fredrikstad	0.7
261.6	1,147 London National	50.0	466.8	644 Lyons (PTT)	1.5	493.4	608 Trondheim	1.2
288.5	1,040 Swansea	0.12	509.1	527.1 Grenoble (PTT)	2.0	1,083	277 Oslo	60.0
288.5	1,040 Plymouth	0.12	1,445.7	207.5 Eiffel Tower	13.5	POLAND		
288.5	1,040 Bournemouth	1.0	1,725	174 Radio Paris	75.0	214.3	1,400 Warsaw (2)	1.9
288.5	1,040 Scottish National	50.0	GRAND DUCHY OF LUXEMBURG			235	1,283 Lodz	2.2
301.5	995 North National	50.0	1,275	235.3 Luxembourg	(tests) 200.0	312.8	959 Cracow	1.5
309.9	968 Cardiff	1.0	GERMANY			335	866 Poznan	1.0
355.9	843 London Regional	50.0	10,737	15,200 Zeesen (DJB)	8.0	380.7	788 Lvov	10.0
376.4	797 Scottish Regional	50.0	31.38	9,560 Zeesen (DJA)	8.0	408	734 Katowice	12.0
398.9	752 Midland Regional	25.0	217.1	1,382 Königsberg	0.9	563	533 Wilno	16.0
480	625 North Regional	50.0	227.4	1,319 Flensburg	0.5	1,411.8	212.5 Warsaw	120.0
1,554.4	193 Davenport (Nat.)	30.0	232.2	1,292 Kiel	0.25	PORTUGAL		
AUSTRIA			238.9	1,256 Nürnberg	2.0	282.2	1,063 Lisbon (CT1AA)	2.0
218	1,373 Salzburg	0.5	245.9	1,220 Cassel	0.25	also on 31.25 m.		
245.9	1,220 Linz	0.5	253.1	1,185 Gleiwitz	5.0	ROMANIA		
283	1,058 Innsbruck	0.5	259.3	1,157 Frankfurt-a-M	17.0	394	761 Bucharest	12.0
352.1	852 Graz	7.0	267.1	1,123 Bremen	0.2	RUSSIA		
453.2	662 Klagenfurt	0.5	276.5	1,085 Heilsberg	60.0	351	855.5 Leningrad (RV70)	20.0
518	579.1 Vienna	15.0	283.0	1,058 Magdeburg	0.5	358	838 Moscow (Exp.)	15.0
also testing on 1,254 m. from 7.0p.m. (Mon., Wed., Sat.)			283.0	1,058 Berlin (L)	0.5	385	779 Stalino (RV20)	15.0
BELGIUM			283.6	1,058 Stettin	0.5	389.6	770 Archangel	10.0
207.3	1,447 Brachmont	0.2	318.8	941 Dresden	0.25	476	630.2 Sebastopol	10.0
208.3	1,440 Liege (Seraing)	0.13	325	923 Breslau	60.0	502.4	579 Nijni Novgorod	10.0
211.7	1,416.8 Antwerp	0.5	300.6	832 Mühlacker	60.0	644	465.8 Kazan (RV17)	10.0
215.3	1,393 Chatelneau	0.2	372.2	806 Hamburg	1.5	720	416.6 Moscow (PTT)	20.0
215.4	1,392.5 Bruxelles	0.2	389.6	770 Leipzig	150.0	825	363.6 Sverdlovsk (RV5)	50.0
Conference			419.9	716 Berlin	1.5	848.7	353.5 Rostov (Don)	20.0
230.3	1,304 Radio Wallonia	0.3	453.2	662 Danzig	0.5	882	340 Saratov	20.0
239.5	1,258 Binche	0.3	472.4	635 Langenberg	60.0	937.5	320 Khar'kov (RV4)	25.0
240.2	1,249 Liege (Exp.)	0.1	532.9	563 Munich	1.5	967.7	310 Alma Ata	10.0
245.9	1,220 Radio Schaarbeek	0.3	559.7	536 Kaiserslautern	1.5	1,000	300 Leningrad	100.0
272	1,103 Liege (Coinite)	0.4	559.7	536 Augsburg	0.3	1,034	290 Kiev	100.0
337.8	888 Brussels (No. 2)	15.0	569.3	527 Hanover	0.3	1,071.2	280 Tiflis (RV7)	100.0
509	590 Brussels (No. 1)	15.0	569.3	527 Freiburg	0.25	1,106	272.2 Minsk (RV10)	35.0
BULGARIA			1,020	185 Norddeich KVA	10.0	1,116	268.5 Moscow Popoff	75.0
318.8	941 Sofia (Rodno Radio)	1.0	1,034.9	183.5 Zeesen	60.0	1,171.5	256 Taschkent	25.0
CZECHO-SLOVAKIA			2,525	119.3 Königswuster-		1,200	293 Novosibirsk	4.0
58	5,172 Prague	0.5	2,900	103.5 Hausen (press)	15.0	1,304	230 Moscow (Trades Unions)	105.0
249	1,205 Prague (Strasnice)	5.0	4,000	75 ditto		also on 50 m. (6,000 Kcs.)		
263.8	1,137 Moravska-Ostrava	11.0	HOLLAND			1,380	217.4 Bakou	100.0
278.8	1,076 Bratislava	14.0	296.1	1,013 Huizen	8.5	1,481.5	202.5 Moscow RV1	100.0
293	1,022 Kosice	2.5	1,071.4	280 Scheveningen-Haven	10.0	also on 46.6 m. (6,438 Kcs.)		
341.7	878 Brunn (Brno)	35.0	1,875	160 Hilversum	8.5	1,600	187.5 Irkutsk (RV14)	10.0
488.6	614 Prague	120.0	HUNGARY			SPAIN		
DENMARK			208.7	1,437.8 Budapest (2)	3.0	252.6	1,187.3 Barcelona (EAJ15)	3.0
281	1,067 Copenhagen	0.75	210	1,430 Magyarovar	1.8	266.8	1,124.5 Valencia	8.0
1,153	260 Kalundborg	7.5	550	545 Budapest (1)	18.5	348.8	860 Barcelona (EAJ1)	8.0
also on 31.51 m. (9,520 Kcs.)			also relayed on 75 m.			368.1	815 Seville (EAJ5)	1.5
ESTONIA			ICELAND			411.4	729.1 Madrid (EAJ7)	2.0
298.8	1,004 Tallinn	11.0	1,200	250 Reykjavik	21.0	424.3	707 Madrid (Espana)	2.0
465.8	644 Tartu	0.5	IRISH FREE STATE			456.6	557 San Sebastian (EAJ8)	0.6
FINLAND			222.9	1,344.6 Cork (6CK)	1.2	SWEDEN		
291	1,031 Tampere	1.0	413	725 Dublin	1.2	231	1,301 Malmö	1.2
291	1,037 Viipuri	13.0	413	725 Athlone (tests)	60.0	257	1,166 Hôrby	10.0
368.1	815 Helsinki	13.2	ITALY			308.5	972.4 Falun	0.5
1,790	167 Lahti	54.0	25.4	11,810 Rome (2RO)	15.0	321.9	932 Göteborg	10.0
FRANCE			247.7	1,211 Trieste	10.0	435.4	689 Stockholm	55.0
220	1,363 Beziers	0.5	269.4	1,112 Bari	20.0	5415	554 Suedsvall	10.0
226.1	1,327.5 Fécamp	10.0	273.7	1,096 Turin (Torino)	7.0	748	401 Ostersund	0.8
237.2	1,265 Bordeaux-Sud-Ouest	2.0	312.8	959 Genoa (Genova)	10.0	1,229.5	244 Boden	0.6
238	1,260 Nimes	0.5	318.8	941 Naples (Napoli)	1.5	1,348	222.5 Motala	30.0
249.8	1,201.2 Juan-les-Pins	0.5	441	680 Rome (Roma)	50.0	SWITZERLAND		
255	1,175 Toulouse (PTT)	1.0	500.8	599 Florence (Firenze)	20.0	244.1	1,229 Basle	0.65
265.4	1,130 Lille (PTT)	1.3	525.9	570.3 Palermo	3.0	245.9	1,220 Bern	0.5
271.4	1,105 Rennes	1.3	LATVIA			403	743 Söthen	25.0
286	1,049.1 Montpellier	0.8	198.5	1,570 Riga (test)	10.0	459.4	653 Beromunster	00.0
286.7	1,046.3 Radio Lyons	10.0	525	572 Riga	15.0	700	395 Geneva	1.25
293.7	1,021.5 Limoges (PTT)	0.5	LITHUANIA			TURKEY		
304.9	984 Bordeaux (PTT)	13.0	1,935	155 Kaunas	7.0	1,200	250 Istanbul	5.0
309.5	969 Radio Vitus	1.0	NORTH AFRICA			1,538	195 Ankara	7.0
(also on 43.75 m. (6,865 Kcs.)			303.3	825.3 Algiers (PTT)	16.0	YUGOSLAVIA		
315	950 Marseilles	1.6	419	715.9 Radio Maroc (Rabat)	0.0	307	977 Zagreb (Agram)	0.75
328.2	914 Poste Parisien	00.0	and 32.26 m. (9,300 Kcs.)			430.4	697 Belgrade	2.5
345.2	869 Strasbourg (PTT)	11.5				574.7	522 Ljubljana	5.2

FREE! RESISTANCE CALCULATION CHART

You may not have had a chance to visit the Exhibition, in which case if you would like a copy of this chart just drop us a line, and we will forward one along to you.

If you are thinking of constructing a set at the present time, consider using WATMEL Components—"They get the best out of any set," and we have three specialities at the present moment—Potentiometers—Resistances and Coils.

NEW WATMEL SQUARE-LAW TAPERED RESISTANCE

This resistance is specially wound on a tapered former which gives a perfect square-law reading. This is the first resistance of its kind.



NOTE THE POINTS:

- Polished pointer knobs.
- Engaged bakelite front plate.
- Wire wound former.
- Insulating brush to insulate spindle from panel.
- Contact finger. Phosphor Bronze.
- One-hole fixing—Brass bearing bush resulting in perfect bearing.
- Bakelite case—protects winding.
- Back self-cleaning contacts.
- Large contact plate.
- Stops at end of wiring.

Any resistance up to 50,000 ohms.
Standard wiring Square Law type
5/6 6/6

Ask your dealer for full particulars or write direct to us. Trade inquiries invited.



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

WHEN SUBMITTING QUERIES

Please write concisely, giving essential particulars. A Fee of One Shilling (postal order), a 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.

A treat is in store for gramophone listeners on September 18, when a recital of gramophone records made by Melba and Caruso will be given in the National programme.

The Regional Revellers, a combination of artists well known to wireless listeners, are to appear again in a new show of "Song and Story" in the Midland Regional programme on September 22.

The Celestion P. P. M. Soundex is truly amazing! For such a compact speaker the volume is extraordinary—the tonal quality is perfect, being free from mush or distortion, giving a rich, deep note without boom or vibration. Truly a speaker of which Celestion can be justly proud, a speaker that will amaze you because of its realism.

Whatever your set, the Soundex will improve its quality.

Insist on your local dealer demonstrating the P.P.M. Soundex or write to Celestion for illustrated list.

Only 27/6 including universal transformer.

CELESTION
The Very Soul of Music

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

THE CONVERT!

By E. Noel Roberts

I REMOVED Angela's cat from my easy chair, seated myself and gazed expectantly at the loud-speaker. Lured by the mystic potency of my eye, the first few bars of music burbled merrily from out of the depths. Simultaneously, Angela entered the room.

"Do shut that thing off, Jack!" she said briskly. "You know mother doesn't like the wireless."

"But the variety programme's just starting," I pointed out stiffly. "I suppose you wouldn't like to take your mother to the pictures to-night—?"

Angela favoured me with one of her extra-special reinforced glances and I rapidly took cover behind a screen of pipe smoke.

"And I wish," pursued my spouse, "that you wouldn't put your feet on the fender. Your slippers are scorching! Or is it the smell of that awful tobacco of yours—?"

Sighing, I switched off the wireless. Angela and the loud-speaker in competition sounded like a brewing riot.

"I can't understand why your mother won't listen to a good wireless programme," I remarked bitterly. "It isn't as if she wanted to read—"

"Mother likes to talk in the evenings," sniffed Angela.

"That had not escaped my notice," I retorted crushingly, and before Angela could reply, her mother appeared.

Stifling a moan of resignation, I tried to read the evening paper, but the light chatter of Angela and her mother battered down the walls of concentration.

Then came inspiration. I crept away upstairs and returned with an old pair of earphones. Very soon I was placidly listening in, while the flood-tide of talk swept unheeded over my head.

The variety was good and I laughed long and heartily. Angela and her cat eyed me without any show of pleasure, but once or twice my mother-in-law gazed at me with thinly veiled curiosity.

The following day I returned home early to find the loud-speaker in full cry. Angela and her mother looked round guiltily as I entered.

"We were just—" began Angela defensively.

"You seemed to be enjoying yourself last night," broke in the parent, as if she was accusing me of something.

"And so you decided to sample it for yourself?" I finished blandly.

We had quite a restful evening listening-in. Our guest admitted that the entertainment provided was not without merit. When she left us a week later she had run our battery flat and was a confirmed wireless "fan." I hoped it would be a lesson.

"Oh, Jack," said my partner not long afterwards, "It's mother's birthday tomorrow and, as she's so keen on wireless now, I've ordered a portable to be sent to her. It will be so nice for her and it was such a ducky little set and not a bit dear—at least, not really dear. I thought you'd better know, because they'll be sending the bill, and—"

I surveyed the girl bleakly.

QUICK EASY PAYMENT SERVICE

We supply all good quality Radio Receivers, 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 10/- order**

NEW OSRAM "33" MUSIC MAGNET A first-class Kit, including Valves, Loud-speaker and Cabinet. Cash Price, £9/9/-. And 12 monthly payments of 15/-. **With 20/- order**

NEW TELSEN JUPITER S.G.3. KIT. Complete set of Components less Valves. Cash Price, £3/17/-. And 11 monthly payments of 7/-. **With 7/- order**

NEW LISSEN "SKY SCRAPER" 3 KIT. Cash price £4/9/6. And 11 monthly payments of 8/3. **With 8/3 order**

NEW TELSEN AJAX 3. Complete Set of parts for Det.; 2 L.F. Receiver, less Valves. Cash Price, £3/1/6. And 11 monthly payments of 5/8. **With 5/8 order**

MURPHY NEW ALL-MAINS 3-VALVE SET, Model A.3.A. Cash Price, £19/19/-. And 12 monthly payments of 33/-. We are appointed Murphy Dealers. **With 39/- order**

NEW MARCONIPHONE 2-VALVE BATTERY RECEIVER, Model 248. Including Valves, Batteries, and Loud-speaker. Ready for use. Cash Price, £4/19/6. And 12 monthly payments of 8/3. **With 9/- order**

NEW ORMOND PERM. MAGNET MOVING-COIL L.S. UNIT. (just released) Cash Price £1/18/6. And 7 monthly payments of 5/4. **With 5/4 order**

ATLAS ELIMINATOR, A.C.244. 3 H.T. Tappings. 20 M/A output. Cash Price, £2/19/3. And 11 monthly payments of 5/6. **With 5/- order**

NEW R. & A. "CHALLENGER" PERM. MAGNET MOVING-COIL UNIT. Cash Price, £1/15/-. And 6 monthly payments of 5/8. **With 5/- order**

NEW EPOCH 20c PERMANENT MAGNET MOVING-COIL UNIT. Cash Price, £1/15/-. And 6 monthly payments of 5/7. **With 5/7 order**

NEW BLUE SPOT 99 P.M. MOVING-COIL UNIT. One of the finest Units available. Cash Price, £2/19/6. And 11 monthly payments of 5/6. **With 5/- order**

NEW R. & A. "VICTOR" PERM. MAG. MOVING-COIL REPRODUCER DE-LUXE. With 6 Ratio Transformer and Cadmium plated Grill. Cash Price, £3/10/-. And 11 monthly payments of 6/5. **With 6/5 order**

BLUE SPOT 100U. INDUCTOR UNIT. Cash Price, £1/19/6. And 7 monthly payments of 5/5. **With 5/5 order**

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"HOW TO MAKE YOUR OWN MAINS TRANSFORMER"

(Continued from page 510)

assembly of T and U pieces in each layer, from left to right. The insulated side of the stampings must be kept the same way, upright through the core, in order to maintain a layer of insulation between each. The core opening is packed tightly with as many stampings as possible, so that when the stampings are clamped the bobbin may not be loose on the core. Before fixing the end clamps, two pieces of Leatheroid should be cut to fit over the sides of the bobbin, and lie on the faces of the stampings. These are placed on either side of the transformer, between the stampings and the end clamps, to prevent the clamps from being in metallic contact with the faces of the iron core.

Clamping the Assembly

The clamps are now fixed in position, and the whole assembly tightened up. Any looseness in the core will be apparent when the transformer is in use, in the form of a buzzing or humming sound. The terminal board is next mounted in position, and the leads and tappings from the windings are connected to the terminals in the manner shown in the illustration. Systoflex tubing being used to insulate the wires. The positioning of the terminals on the terminal board has no influence on the performance of the transformer, and may be left to individual constructors. On the transformer illustrated in the heading, spacing pieces were placed between the clamps and the terminal board to give added room under the terminals, but the clamps, which can be obtained from suppliers previously mentioned, are sufficiently high to make the addition of spacers unnecessary.

A Test

The transformer was silent on test, and the test results were as follows:—
Insulation resistance, Infinity.

Efficiency with all windings at full load, 86.6 per cent.

Ratios, 220 volts 230 volts	} 211 volts, 13.87 volts, 4.0 volts.
240 volts 250 volts	

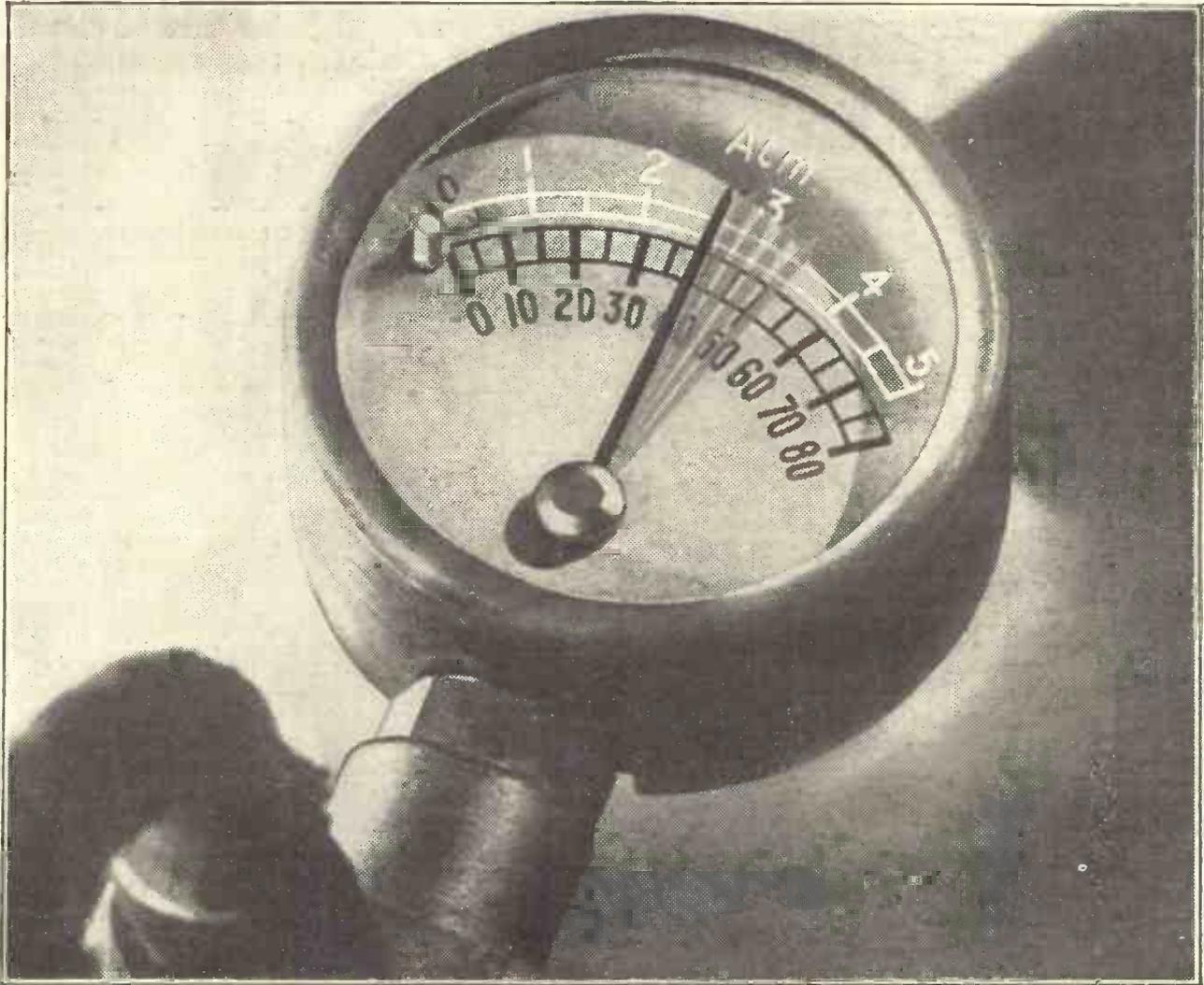
This transformer being designed to work on 50-cycle mains, will operate satisfactorily on any frequencies higher than 50 cycles, at the voltages which the primary tappings provide for, but if it is connected to mains on which the frequency is appreciably lower, unsatisfactory working, together with overheating and excessive primary current will result.

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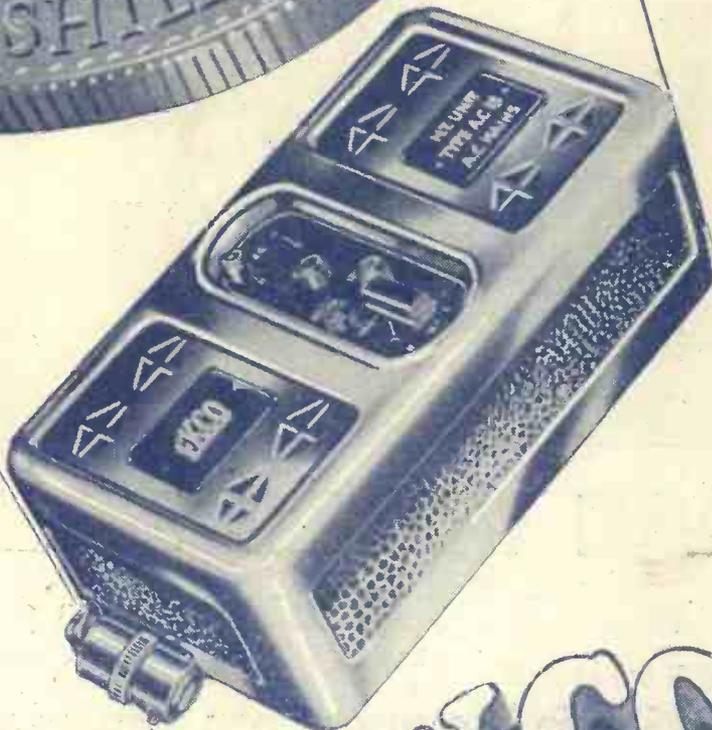
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