

DOWN TO 12 — UP TO 2,000!

100 STATIONS ALL WAVES *with the* MELODY RANGER

Amateur Wireless

and
Radiovision

*EVERYBODY'S
SHORT-WAVE
Supplement 8 pages*

Every
Wednesday

3^d

Vol. XXII. No. 556

Saturday, February 4, 1933

The **MELODY RANGER**

"A.W.'s"
OUTSTANDING
SUCCESS

AMATEUR WIRELESS MADE EASY
PRACTICAL SHORT-WAVE
SUPPLEMENT

8-Page
Free Supplement

The **MELODY RANGER** IS NEW, IS DIFFERENT
AND WE GUARANTEE IT!

... Before Building The

"MELODY RANGER"

read the leaflets
which give vital information
about the specified



RADIO COMPONENTS

To obtain brilliant results from the "Melody Ranger" be sure to ask for the recommended Lewcos Units—the Type MC H.F. Choke (Price 2/6), the Type II H.F. Choke (Price 6/-) and a 50,000 ohm Potentiometer (Price 3/6). 6 yards of Lewcoflex and Lewcos Connecting Wire and Sleeving are also required

Special leaflets describing these components have been prepared and are included in a new series which we shall be pleased to send on application to Radio Publicity Dept. A.

INSIST ON "LEWCOS"



LEWCOS RADIO PRODUCTS FOR BETTER RECEPTION

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

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

Recommended for the "MELODY RANGER" described in this number



THERE can only be one reason why "Atlas" is always specified by every noted designer—sheer excellence of value and performance. The author of the wonderful "Melody Ranger" now specifies "Atlas" Mains Units and Moving-Coil Speakers for the best results with his latest receiver.

The same unhesitating expert choice won "Atlas" the Olympia Ballots for two years in succession, so be sure to insist on "ATLAS" when you ask for a demonstration.

Model A.C.244. 3 H.T. Tappings: 60/80 v. (min. and max.), 50/90 v. (min., mid., and max.) and 120/150 v. Output 20 m/A. at 120 v. 59/6 or 10/- down.

Model A.K.260. With L.T. Trickle Charger for 2, 4 and 6 v. Accumulators. 90/- or 10/- down. Model D.C. 15/25. For D.C. Mains. 39/6 or 10/- down.

★ Tune in to the "Atlas" Programmes from Radio Paris (1725 metres) every Sunday from 3.0 to 3.30 p.m.

CLARKE'S "ATLAS" MAINS UNITS

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

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

PERMANENT MAGNET MOVING COIL SPEAKERS



Chassis Type. 35 per cent Cobalt Steel Magnet. One piece, impregnated diaphragm to prevent resonance. Complete with multi-ratio input transformer.

42/-
or 10/- down.

Cabinet Type. In handsome walnut cabinet specially designed to prevent box-resonance. Wonderful sensitivity and glorious tone.

70/-
or 10/- down

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

Please send full details of "Atlas" Mains Units and Loudspeakers.

Name

Address

29/4/2



WEARITE COMPONENTS

A Catalogue or Selection of Wearite Components made to order. Long life, high efficiency, and low maintenance. Write for details and price list to the Dept. of Sales, Wearite Components, Ltd., 740, High Road, Tottenham, N.17.

This WEARITE BOOK No. A.I. WILL HELP YOU SEND FOR IT TODAY

BEFORE you start "shopping" for your "Melody Ranger", or for any set, have this booklet, the A.I. beside you. Resistances, chokes, volume controls, mains transformers, switches, etc., they are all there—illustrated with full data—get your copy now.

HERE'S The WEARITE H.F.O.

-nothing else will do for your 'MELODY RANGER'

THE Wearite H.F. Choke is the result of much patient research. It is designed and built to cover from 10—2,000 metres without resonance peaks. Because of this, because of the name behind it, the designer of the "Melody Ranger" uses exclusively the H.F.O.

High frequency instability was the greatest difficulty to be overcome. The designer of the "Melody Ranger" tested and tested, and only the Wearite H.F.O. proved efficient. Don't jeopardise the quality and performance of your set, play for safety, use the designer's choice, **PRICE 6/6**



WEARITE

Reg. Trade Mark

WRIGHT & WEAIRE Limited,

740, HIGH ROAD, TOTTENHAM, N.17.

Telephone: TOTTENHAM 3847/8/9

2293

PREH POTENTIOMETERS MEET EVERY KNOWN NEED

The new range of variable resistances has been designed to meet the demand for a component with a particularly silent and smooth movement.

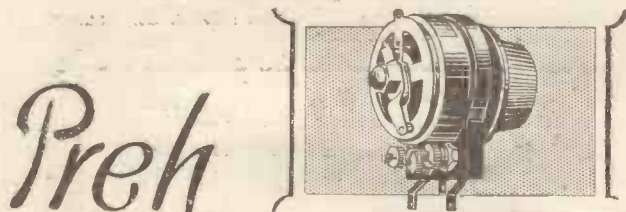
The curve of the potentiometer is arranged "straight line," which gives a straight-line ratio between angular movement and resistance variation.

The resistances can be supplied with "straight line" or logarithmic curves according to requirements.

In resistances of a value more than 50,000 ohms, the guaranteed tolerances are -15 per cent. and +30 per cent. of the rated values. In the case of low-value resistances the corresponding guaranteed tolerances are + or - 10 per cent.

These components are also supplied with a combined switch, making an extremely neat and robust unit. The switch has a quick make-and-break movement and will handle 1.2 amperes at 250 volts without arcing.

Prices for your special requirements on application



Preh POTENTIOMETERS AND RHEOSTATS

Preh Manufacturing Co., Ltd., Broadwater Road, Welwyn Garden City, Manufacturers and Wholesalers only supplied.

Sole Sales Organisation: Harwell, Ltd., The Sessions House, Clerkenwell Green, E.C.1. Phone: Clerkenwell 6905-6.

British Made



YOU WANT PERFECTION ? FOR SHORT WAVES

Then use the original BECOL EBONITE LOW-LOSS FORMER, tested before despatch and reliable.

Prices Low. Look for Trade Mark. Efficiency Tells.

INTERESTING.—Send 6d. (post free) for UP-TO-DATE HANDBOOK of Tuning Coils for Circuits, Dual Range, Band Pass and Super-het, fully illustrated with data.

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

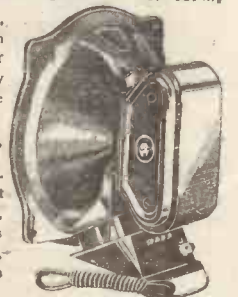
ONLY 2/6 DOWN FOR THIS SPLENDID NEW 1933 "BLUE SPOT" SPEAKER

NEW 1933 PERMANENT MAGNET SPEAKER No. 93PM.

The chassis is an outstanding example of first-class workmanship, and the unit, with its heavy Permanent Magnet containing a high percentage of Cobalt, is wonderfully sensitive. Send only 2/6 for 7 days' trial. If satisfied pay further 3/6 at once, then 8 monthly payments of 7/6. (Cash in 7 days, 59/6.) For further details see "Blue Spot" advertisement on page 184.



The British-made WATES UNIVERSAL METER is the only popular-priced instrument testing resistances as well as batteries, valves, circuit, and all components. Four readings on one dial. Send only 1/6 for 7 days' trial, if satisfied, balance by 5 monthly payments of 2/6. (Cash 12/6.)



E. J. HERAUD, LTD., DEPT. A.W.21, NUMBER ONE, EDMONTON, LONDON, N.15 and at Tottenham, Walthamstow, and Enfield Wash. Established 33 years.

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



Purveyors of Electric Lamps By Appointment



Manufacturers and Purveyors of Electric Lamps By Appointment

EDISWAN

The name that means 'EXCELLENCE'

MAZDA LEADS THE WAY IN 1933 WITH

"QUIESCENT PUSH-PULL"

—the new principle developed in the Mazda valve laboratories and used for the new "Wireless World Quiescent Push-Pull 2."



The problem of economically providing a battery operated set with sufficient power to operate a moving coil speaker efficiently has hitherto proved a serious difficulty. The new principle of Quiescent Push-Pull, developed in the Mazda Valve Laboratories, has solved this problem as, by the use of two Mazda Pen 220A's, a power output of as much as 1.3 watts can be obtained with a total H.T. consumption of only 6 mA at 120 volts.

The new principle is used to great advantage in this new "Wireless World" circuit, which has been designed to work with Mazda valves.

For full report on Quiescent Push-Pull see article by E. YEOMAN ROBINSON, CHIEF ENGINEER, THE MAZDA VALVE LABORATORIES, in "Wireless World" for January 6th, 1933.

The designer of the "WIRELESS WORLD" QUIESCENT PUSH-PULL 2 specifies 2 MAZDA PEN 220A's 17/6 ea. and 1 MAZDA H.L.2 . . . 7/- ea.

MAZDA THE BRITISH VALVES



THE EDISON SWAN ELECTRIC CO. LTD., 155 CHARING CROSS ROAD, W.C.2

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

GOOD RADIO DEALERS RECOMMEND EDISWAN

V.185

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

BRITISH MADE

99 P.M. 59 1/6

The most AMAZING Moving Coil ever produced

There are moving-coil speakers and many marvellous claims are made for them. Disregard all these and fix your attention on Blue Spot 99 P.M.

There has never been a moving-coil speaker of such stupendous achievement—never one that has genuinely earned the right to claim perfect reproduction. The main features of 99 P.M. are as follows:

Write for Catalogue No. A.W.64.S.

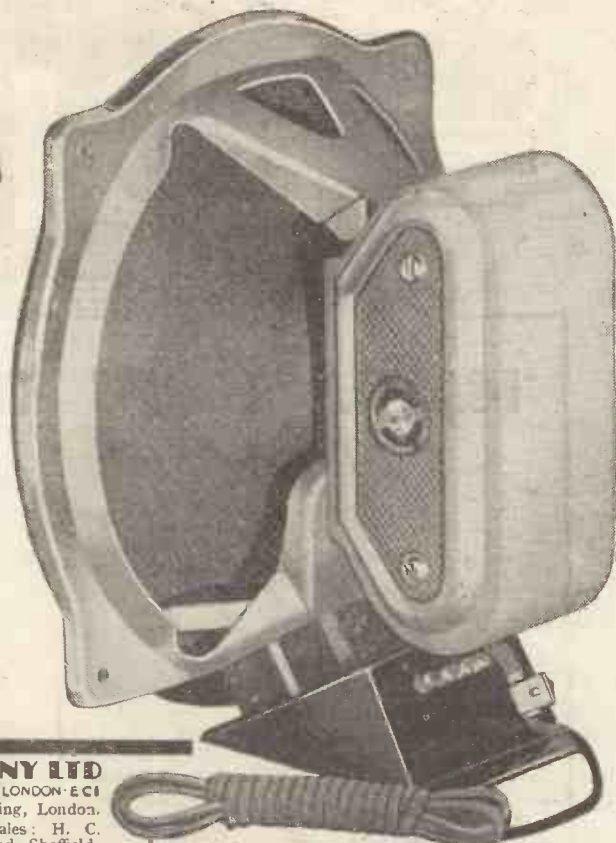


SPECIAL FEATURES.

- 1 Heavy magnet forged from highest grade magnet steel.
- 2 Powerful and permanent energy.
- 3 Magnetic energy in air gap is exceptionally high—1,320,000 ergs.
- 4 Pole pieces cadmium plated to prevent rusting.
- 5 Side plates are fitted to the magnet to exclude dust and magnetic particles from being attracted into the air gap.
- 6 Specially designed cone and speech coil. Astonishing faithful reproduction.
- 7 Valve-matching transformer incorporated. Undistorted output, 3 1/2 watts.

THE BRITISH BLUE SPOT COMPANY LTD

BLUE SPOT HOUSE · 94/96 ROSOMAN STREET · ROSEBERY AVENUE · LONDON · E.C.1
Telephone: Clerkenwell 3570. - Telegrams: Bluospot, Isling, London.
Distributors for Northern England, Scotland and Wales: H. C. RAWSON (Sheffield and London), Ltd., 100 London Road, Sheffield; 22 St. Mary's Parsonage, Manchester; 44-46 High Bridge, Newcastle; 37, 38, 39 Clyde Place, Glasgow.



See also Advt. of E. S. HERAUD on page 182

MULTITONE

TONE CONTROL L.F. TRANSFORMER IS ESSENTIAL TO EVERY SET AND RADIOGRAM.

It enables you:

1. To correct the lack of bass or top in loudspeaker or gramophone records.
2. To correct cut-off top notes due to selectivity, and to obtain the tone best suited to your individual taste.
3. To suppress heterodyne whistle.

VERY EASILY FITTED TO ANY SET

MODELS FOR QUIESCENT AND ORDINARY PUSH-PULL NOW AVAILABLE.

Our booklet (A) on True Tone Control will be sent post free.

MULTITONE

TONE CONTROL L.F. TRANSFORMER

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



17/6

(Specially graded Potentiometer Price 3/6)

"We're Fluxite and Solder—the reliable pair; Famous for soldering—known everywhere!"

When fixing up Wireless—there's no need to fret; Just call US to help you—then perfection you'll get!"

See that Fluxite and Solder are always by you—in the house—garage—workshop—anywhere where simple, speedy soldering is needed.

ALL MECHANICS WILL HAVE

FLUXITE

IT SIMPLIFIES ALL SOLDERING

All Ironmongers sell Fluxite in tins: 4d., 8d., 1s. 4d. & 2s. 8d. Ask to see the FLUXITE POCKET SOLDERING SET—complete with full instructions—7s. 6d.— Ask also for our leaflet on HARDENING STEEL with Fluxite. FLUXITE LTD. (Dept. 326), ROTHERHITHE, S.E.16

FOR ALL REPAIRS!

TELSEN H.F. CHOKES

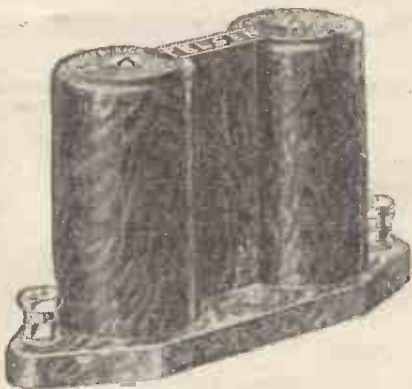
and DIFFERENTIAL, REACTION and TUNING

CONDENSERS



TELSEN STANDARD H.F. CHOKE

Covers the entire broadcast band, yet occupies only the minimum of baseboard space. With an inductance of 150,000 microhenrys, a resistance of 400 ohms, and an extremely low self-capacity, it is highly suitable for use in reaction circuits, and is constantly being specified in this respect by the leading set designers - - **2/-**



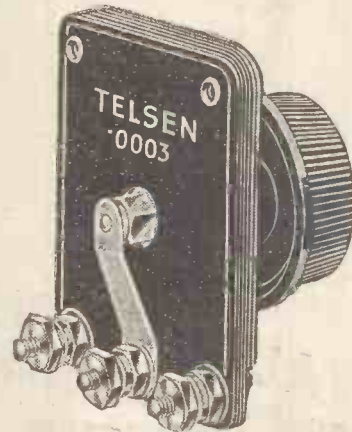
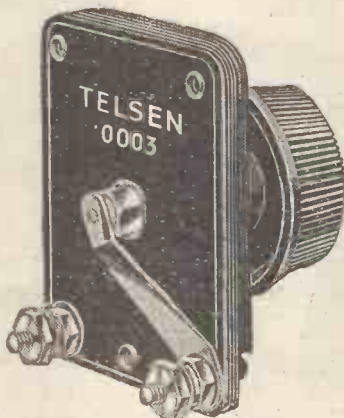
TELSEN BINOCULAR H.F. CHOKE

Where the highest efficiency is the primary requisite, the Telsen Binocular H.F. Choke is the inevitable choice. It has a high inductance of 250,000 microhenrys, with a very low self-capacity and a practically negligible external field (due to its binocular formation). It is definitely the essential choke where high class circuits are concerned - - - **5/-**



TELSEN DIFFERENTIAL CONDENSERS

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

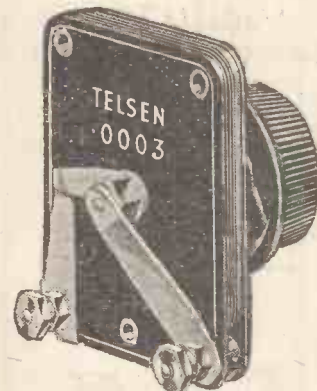
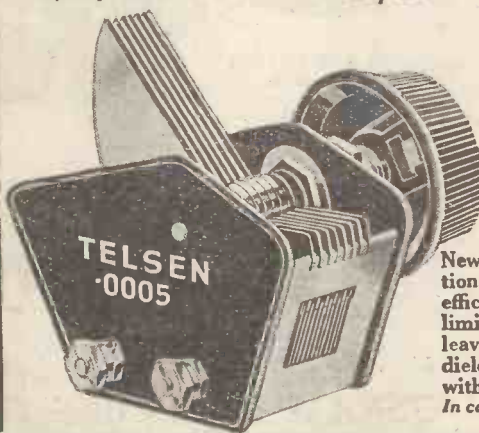


TELSEN REACTION CONDENSERS

Embodying every improvement and refinement indicated by the latest research. The vanes are interleaved with the finest solid dielectric, the construction throughout being of great rigidity and exceptional precision. Supplied complete with knob. In capacities .0003 .00015 and .0001 **2/-**
In capacities .00075 and .0005 **2/6**

TELSEN AERIAL SERIES CONDENSER

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



TELSEN DIELECTRIC TUNING CONDENSERS

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

RADIO COMPONENTS FOR LASTING EFFICIENCY

ANNOUNCEMENT OF THE TELSEN ELECTRIC COMPANY, LIMITED, ASTON, BIRMINGHAM

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

Amateur Wireless

and Radiovision

4-VALVE — 4-WAVE

MELODY RANGER

VS 2

Variable MU.
Screen Grid Valve.
Price 16/6 each.

L 210

Special Detector &
L.F. Amplifying
Valve.
Price 7/- each.

LP 2

Low Frequency &
Power Amplifying
Valve.
Price 8/9 each.

Osram Valves

MADE IN ENGLAND
SOLD BY ALL WIRELESS DEALERS

RECOMMENDED

For full technical information WRITE for the OSRAM WIRELESS Guide. Post free on request

OSRAM VALVES — A TONIC TO ANY SET

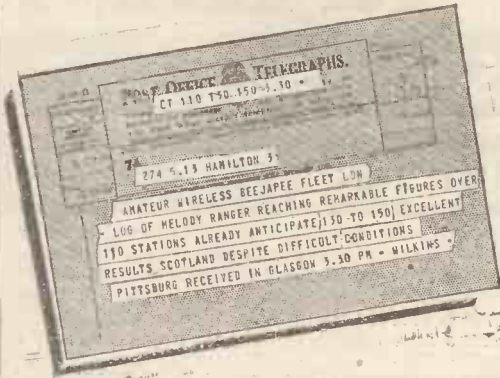
Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.

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

OVER 150 STATIONS

says Mr. S. Rutherford Wilkins with his

AUTHOR KIT



You can only duplicate Mr. S. Rutherford Wilkins' results with a PILOT AUTHOR KIT. ... There is no substitute



MELODY RANGER PILOT AUTHOR KIT

EXACT TO SPECIFICATION
With wiring-diagrams and operating instructions

DELIVERED
Carriage Paid
CASH or C.O.D.

KIT "A"

6 GNS.

with FREE Full size
Blueprint and Copy
Amateur Wireless

THESE ARE THE PARTS THE AUTHOR USED

	£ s. d.
1 Peto-Scott aluminium panel, 18 in. by 7 in., ready drilled	5 0
1 Peto-Scott baseboard, 18 in. by 10 in.	1 6
Peto-Scott screening foil, 18 in. by 10 in.	9
1 Peto-Scott aluminium screen, 9½ in. by 6 in., ready drilled	2 0
1 Bulgin 50,000-ohms potentiometer, type VC35 with insulating washers	4 0
1 type K.6 knob for volume control	4½
2 Lissen Universal 4-range coils, complete with two couplers and extension rod	1 10 0
2 Telsen 1-mfd. fixed condensers	4 6
1 Dubilier 1-mfd. fixed condenser, type 9200	2 9
1 J.B. .0005-mfd. variable condensers, type JLG	11 0
1 Ready Radio .0003-mfd. variable condenser, type Micadi	3 0
2 Ready Radio complete extension equipments and mounting brackets	2 0
1 Ready Radio .0003-mfd. variable condenser, type Micalog	3 6
2 Igranic Indigraph slow-motion dials, type VINIL	10 0
1 Ready Radio low-loss screen-grid valve holder, type S.G. short-wave	1 6
1 Ready Radio low-loss four-pin valve holder, type short-wave baseboard	1 3
2 Ready Radio Standard four-pin valve holders	1 0
1 Wearite H.F. choke, type H.F.O	6 6
1 Slektun Standard H.F. choke	4 0
1 Igranic short-wave H.F. choke	2 0
3 Lissen fixed condensers, .0001 mfd., .002 mfd., .006 mfd.	2 0
5 Graham Farish Ohmites (1,000 ohms, 30,000 ohms, 40,000 ohms, 1 megohm and 4 megohms)	7 6
1 Graham Farish vertical mounting resistance holder	6
1 Bulgin Junior 3-point switch, S.30	1 0
1 Lissen .00017-mfd. pre-set condenser	2 0
2 Peto-Scott panel brackets	2 0
1 Ready Radio L.F. transformer, 3-1	8 6
2 Belling Lee type R terminals, marked	5
11 Belling Lee Midget marked wander plugs	1 10
2 Belling Lee spade terminals, marked	4
1 Peto-Scott Red Triangle ebonite terminal strip, 2 in. by 2 in., ready drilled	3
2 Telsen terminal blocks	1 0
2 Peto-Scott coil tap plug mounts, with screws and ebonite distance pieces	1 3
6 Yards thin flex, connecting wire, screws, etc.	3 0
Copy "Amateur Wireless" (January 28th and February 4th issues)	Gratis

KIT "A" CASH OR C.O.D. £6 6 0

PETO-SCOTT

"MELODY RANGER" OAK TABLE CABINET

Figured Hand Polished Oak American Type Cabinet. Soundedly constructed of the very best materials. With lift-up lid. CASH or C.O.D. **15/-**

C.O.D.

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

EASIWAY

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

CASH

All orders over 10/- sent carriage paid

KIT "A" Author Kit comprising all FIRST SPECIFIED components including READY DRILLED engine turned Aluminium Panel as listed but less valves and cabinet. **11/6**

EASIWAY 12 MONTHLY PAYMENTS OF **11/6**

4 Mullard Valves as specified £1:19:3

KIT "B"

As KIT "A" but with valves less cabinet, CASH or C.O.D. Carriage Paid.

£8 5 3

or 12 monthly payments of 15 3

KIT "C" As KIT "A"

complete with valves and Peto-Scott American type oak cabinet with lift-up lid. CASH or C.O.D. Carriage Paid.

£9 0 0

or 12 monthly payments of 16 6

PILOT "MELODY RANGER" STRUCTAKIT

Comprises: 18-in. by 7-in. Aluminium Panel, ready drilled; 18-in. by 10-in. Baseboard; 18-in. by 10-in. Screening Foil; 9½-in. by 6-in. Aluminium Screen, ready drilled; 2 Panel Brackets; 2-in. by 2-in. Ebonite Strip, ready drilled; 2 Coil Tap Plug Mounts and Wire, Flex, Screws, etc., for panel and baseboard assembly of the "Melody Ranger" as specified by the Author. In sealed carton, CASH or C.O.D. POST CHARGES PAID **15/6**

PETO-SCOTT CO. LTD., 77 City Road, London, E.C.1. Telephone: Clerkenwell 9406/7
West End Showrooms: 62 High Holborn, London, W.C.2. Telephone Holborn 3248

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

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

NAME.....

ADDRESS..... A.W.4/2/33

ANY ITEM SUPPLIED SEPARATELY—ORDERS OVER 10/- SENT C.O.D. CARRIAGE AND POST CHARGES PAID

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

"SKYSCRAPER" RADIO

YOU BUILD IT YOURSELF FROM A TO Z

YOU SAVE POUNDS & YOU GET BETTER RADIO



This new Lissen "SKYSCRAPER" Kit Set is the only one on the market that you can build yourself employing a Metallised Screened Grid Valve, High Mu Detector, and Economy Power Pentode. Around these three valves Lissen have designed a home constructor's kit the equal of which there has never been before. Why be satisfied with whispering foreign stations when you can BUILD WITH YOUR OWN HANDS this Lissen "SKYSCRAPER" that will bring in loudly and clearly distant stations in a profusion that will add largely to your enjoyment of radio?

CONSTRUCTIONAL CHART FREE

Lissen have published a 1/- Constructional Chart, giving the most detailed instructions ever printed for the building of a wireless set. You can't go wrong—every part, every wire, every terminal is identified by photographs.

Everybody, without any technical knowledge or skill, can safely and with COMPLETE CERTAINTY OF SUCCESS undertake to build this most modern of radio receivers from the instructions given and the parts Lissen have supplied. You can get the Lissen "Skyscraper" Chart FREE from any radio dealer, or by posting the COUPON below direct to factory.



GREAT LISSEN CHART FREE TELLS EXACTLY WHAT TO DO WITH EVERY SINGLE NUT & SCREW

YOURS FOR ONLY 8/6 DOWN

POST COUPON BELOW

To-day you can buy the LISSEN "SKYSCRAPER" KIT on Gradual Payment Terms. "Skyscraper" Chassis Kit, complete with Valves. CASH PRICE 89/6. Or 8/6 down and twelve monthly payments of 7/6.

"Skyscraper" Kit complete with Walnut Cabinet and in-built Loudspeaker as illustrated, £6 5s. Cash, Or 11/6 down and twelve monthly payments of 10/6.

COUPON

To LISSEN, Ltd., Dept. A.W.35, Worples Road, Isleworth, Middlesex.

Please send me FREE copy of your 1/- "Skyscraper" Chart.

Name

Address

LISSEN

"SKYSCRAPER" KIT 3



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



BRITAIN'S LEADING RADIO WEEKLY
FOR CONSTRUCTOR, LISTENER & EXPERIMENTER

EDITOR:
BERNARD E. JONES.

TECHNICAL EDITOR:
J. H. REYNER. B.Sc. AM.I.EE.

RESEARCH CONSULTANT:
W. JAMES.

ASSISTANT EDITOR:
H. CORBISHLEY.

NEWS & GOSSIP FROM THE WEEK

FORTY-EIGHT STATIONS IN DAYLIGHT

SIR,—You will no doubt be pleased to hear of my success with the "Melody Ranger." During an hour's test on Saturday afternoon I was surprised to hear no less than 48 stations on the loud-speaker (a moving-coil). I heard for the first time an American station, W3XAL, this in broad daylight, and in the early hours of Sunday morning on the medium waveband.

F. MASON.
Letchworth,
Herts.

IT'S GUARANTEED!

THIS letter shows the sort of results that readers are getting with our sensational new set, further details of which are given in this week's issue. Enthusiastic and highly interesting letters have been received from readers with whom the "A.W." experts came in touch during the nation-wide tour of the "Melody Ranger" and many of them are reproduced this week. The set has not only the unique advantage of covering four wavebands and tuning from 13 to 2,000 metres, but its performance is guaranteed.

WORKING YOUR "MELODY RANGER"

Fine Results for All

SPECIAL features in this issue enable you to get the very best out of your "Melody Ranger." A special article, "The Melody Ranger on Your Aerial," describes the simple operation of this set, while in another feature special points of operation to suit local conditions—experience gained as the result of our tour—are given together with a tuning graph and a full list of stations and dial readings.

ALTERING THAT PRAGUE PLAN!

Fateful Meeting at Brussels Next Month

NOW that the tumult and the shouting of Madrid has finally subsided, the engineers of Europe's broadcasting organisations are putting their heads together to see how a new plan of wavelength distribution can be worked out. Next month the Union Internationale de Radiodiffusion will meet at Brussels, where data will be prepared for the full-dress assembly of European Posts and Telegraphs administrations timed to take place in Lucerne some time in the spring.

CHAOS WILL NOT BECOME WORSE!

ALTHOUGH it is the fashion to bemoan the chaos that is supposed to follow from the introduction of new high-power stations, many listeners are finding out for themselves that with a selective set they can actually get a better all-round selection of foreigners now than, say, last year or two years ago. The B.B.C. endorses this point in deprecating the implication of certain super-het manufacturers who have recently taken time on the air at Radio Paris and other stations to warn listeners that impending chaos can be met only with a so-and-so super-het.

EMPIRE LISTENERS WRITING HOME

IT used to be a complaint at B.B.C. headquarters that although we were sending out a special signal on short waves from G5SW, the listeners overseas were very uncommunicative as to the results obtained. How different, now,



Radio for speed cops! The Brighton police are now using their portable wireless sets to pick up instructions from the headquarters' transmitter. Here a motor-cycle policeman on his beat is seen tuning in

Also in this Issue—

FEATURES YOU SHOULD NOT MISS

The "Melody Ranger" on YOUR Aerial

The Radio Play "Bridge"

What is Quiescent Push-pull?

All Over the World with the "Melody Ranger"

EVERYBODY'S SHORT-WAVE SUPPLEMENT—AN 8-PAGE SPECIAL SECTION FOR EVERYBODY WHO WANTS TO GET RESULTS ON THE SHORT WAVES

with the multi-wavelength service from Daventry! Already, in spite of the fact that the service as inaugurated only on December 19, the B.B.C. has received more correspondence from distant parts of the Empire than it received over G5SW for the whole of the year 1932. Which rather looks as though the Chelmsford service was the "wash-out" many listeners thought it was!

MAN-MADE STATIC INCREASES

NO attempts at hushing up the serious nature of electrical interference to broadcast reception can avail against the rising tide of resentment on the part of the listening public. During 1932 nearly 40 per cent. of the B.B.C.'s technical correspondence was about this trouble. The B.B.C. points out that although the number of cases dealt with by the Post Office engineers is now four times what it was in 1929, individual cases take less time than ever—a tribute to the efficiency of the department concerned. Quite rightly, the B.B.C. suggests listeners should adamantly refuse to have anything to do with houses suffering from the too close proximity of electrical machines emitting radio frequency "mush." And equally we advise listeners to make sure that any electrical appliance they may buy is free from interference radiations.

"RENATE" FROM BERLIN

ANOTHER light musical programme comes from Berlin on February 11. It is called "Funk-Karussell" ("Radio Revels") and the cast will include Renate Muller, who "starred"

ANOTHER BUMPER NUMBER FULL OF FINE FEATURES NEXT WEEK—Usual Price 3d.

NEWS & GOSSIP OF THE WEEK —Continued

in *Sunshine Susie*. So many appreciations were received respecting the relay of "*Hier ist Berlin*" during Birthday Week, that listeners can anticipate with some confidence another good programme of a similar type on February 11.

ENGLISH AS SHE AIN'T!

TROUBLE over the word "Edwardian" is now ended! It appears that an absent member of the B.B.C.'s committee on spoken English was horrified when he later found that it had been decided to pronounce this word as "Edwardian" instead of what he insisted was the correct "Edwordian." So now the committee has altered its ruling and the announcers will say "Edwordian" same like we do! The word *joule*, the electrical unit named after the famous physicist, caused so much trouble that its pronunciation was held in abeyance. Now that is settled—"joule." Another one is *scena*, which we must now say as "shayna." The derived word scenario is to be pronounced "senaario"—not "skenario," as some American gum-chewing producers would have us say it!

WHAT THE EMPIRE SERVICE COSTS YOU

SOME bright statistician has worked it out that the cost of the Empire service from Daventry for each ten-shilling licence taken out is about 2¼d. Well, let's be magnanimous about it, shall we? Tell them to keep the change!

HIGHEST MASTS YET!

ONE of the outstanding features of the new Droitwich high-power stations, where you will recall the new Daventry National and

Midland Regional gear is to be installed by the Marconi people, will be the use of two of the highest masts in this country. They will jointly support the long-wave National aerial and the Midland Regional aerial, and will be no less than 700 ft. high. This is 200 ft. higher than the masts of other Regional stations and is made possible because Droitwich is right off any existing or projected arterial air route.

"NIGGER" DISAPPEARS FROM No. 10!

THE black cat known as Nigger has disappeared from No. 10 studio—the B.B.C.'s wharf studio near Waterloo Bridge. The watchman has been bemoaning the loss of his little friend and companion, so the kindly electrician has produced a female of the species—a tabby!

AND A TENT ARRIVES THERE!

LOOKING in at No. 10 to confirm the above cat episode the other day, we noted what looked for all the world like a tent planted in one corner. Actually this is what it was—for the narrator to "do his stuff" while the orchestra was playing in another part of the studio in a potted-opera effort. When the broadcast is over the narrator presumably folds up his tent like the Arabs and as silently steals away!

IN A STAR ROLE

JEAN MELVILLE, who has performed the responsible but often self-effacing task of providing pianoforte accompaniments for hundreds of vaudeville artistes before the microphone for some years past, is to be heard in the National vaudeville programme on February 6 in the role of soloist. Miss Melville is a prima donna of syncopation, but her name is seldom connected with the words "piano solos" in the programmes.

"SHOULD THEY BE SCRAPPED?"

TWO well-known journalists go to the microphone on February 11 to hold a discussion in the "Should They be Scrapped?" series. They are Mr. Hamilton Fyfe, former editor of a London paper and international correspondent, and Mr. Tom Clarke, former editor of an Australian paper, present editor of a London paper, and the living embodiment of modern journalistic methods as introduced by the late Lord Northcliffe. The subject of their discussion is "Should the Press be Abolished?"

RADIO MUSIC HALL!

FIRST shots in the guerilla warfare between the B.B.C. and the G.T.C. entertainment octopus having been fired without visibly impressing the public, it now remains for both sides to dig themselves in. The B.B.C. will make a concerted attack from the front line when it puts over the "Radio Music Hall" from No. 10 studio on February 4. This National programme will be particularly strong in well-known broadcasting stars, among whom will be Jack Payne and his band, Alexander and Mose, Stainless Stephen, Anona Wynne, Leonard Henry, Flotsam and Jetsam, Mabel Constanduros and the Western Brothers.

THE NEXT MOVE IN THE "WAR"

FOR the present the B.B.C. is avoiding engagements with G.T.C. artistes under the ban, although it feels that music-hall programmes will still be possible. Stars of the revue and legitimate stage, such as Binnie Hale, Paul Robeson and Nelson Keys, to mention but three, will probably augment

AUSTRALIA HEARD IN WALSALL

"I wish to add my congratulations to the many others I am sure you have already received upon your latest achievement in radio set design, the "Melody Ranger."

"In a very short while we tuned in more medium- and long-wave stations than I have ever heard before. I have always understood that short-wave reception is more a matter of luck than judgment and, if you do manage to tune in a station, it is only by means of very intricate and delicate manipulation of the dials."

"I am afraid your "Melody Ranger" has made me change my ideas very considerably. During the one evening that we devoted to the test of this set, we tuned in more than 20 short-wave stations. The greatest thrill of the evening, however, came when we succeeded in getting a concert from W8XK, Pittsburg. Later in the night we also managed to tune in Chicago, W9XF. About 8 o'clock on the following morning Sydney 2FC was heard at good head-phone strength, although the programme was almost drowned by mush and noise."

"The results that I have outlined above convince me that this is a truly remarkable receiver."

B.B.C. artistes in the production of essentially radio-variety programmes. Actually, there is no complete ban on artistes under G.T.C. contract, as is proved by the fact that Gracie Fields will be relayed by North Regional from a northern music-hall in the near future.

NO OFFICIAL B.B.C. ORGANIST

SINCE it became known that the B.B.C. was installing an organ at Broadcasting House hundreds of applications have been received from organists wishing to obtain a permanent job on the seat by the console in the Concert Studio. As the B.B.C. points out, it has no need of a permanent organist as in a church, as already on its staff it numbers several talented organists, chief of whom is Berkeley Mason, whose work with Sir Henry Wood at Queen's Hall is well known. The organ will be used by visiting organists, who will thus be saved the trouble of giving recitals in churches and halls outside Broadcasting House. The opening broadcast on the new organ is expected to be done in March and Sir William Alcock, who has been advising the B.B.C. on the design of the installation, will be one of the first to play on it for the microphone.

"FLU" AT THE B.B.C.

AN official of Broadcasting House, exasperated beyond endurance by the kindly matron's orders to "all his girl staff to go home because they were sickening for 'flu," which has taken a heavy toll at B.B.C. headquarters, was heard to remark that it would be a good thing if matron were to go home, and then perhaps some of his staff could come back!

CHOCOLATE ON THE AIR!



Broadcasting from a chocolate factory. Mr. David Cadbury at the microphone while describing an ingenious chocolate-wrapping machine in the course of a recent Midland Regional broadcast from the famous Bournville factory



The Radio Play "Bridge"

Listeners often blame the B.B.C. for making too much use of the dramatic control panel at which producers control radio plays without seeing the actors. And yet in the radio play studios there is a "bridge" at which the producer can see several studios at once. Our special Commissioner describes this side of radio play production

I EXPECT most listeners know how radio plays are produced with the now-famous "D.C.P."

The D.C.P. is the dramatic control panel at which the radio play producers sit and turn knobs controlling the volume of microphones in a number of separate studios.

The producers control the actors in each section by "flick" lights and key switches. The whole job of control is done in robot-like fashion, at a distance. The producer cannot see the actors he is handling.

"D.C.P." and Vaudeville

This scheme of play production—used also for some vaudeville broadcasts—is a scheme sponsored by the B.B.C. and which is excellent in its way. If carried too far there is a danger that the producer will lose personal touch with his artistes.

In fact some dramatic critics have

blamed the B.B.C. for doing too much of this "blind" control. They seem to think that it is the only way in which radio plays can be produced at London.

They, in common with many listeners, may not know that on the sixth floor of Broadcasting House there is a radio play "bridge" at which the "captain" can see his team of artistes in the 6B and 6C studios.

No "Blind" Control

One of the accompanying photographs shows a producer listening on headphones in the little triangular cabinet adjoining these studios.

Through the two control room windows you can see the artistes in the 6C studio on the left and in the 6B studio on the right.

This disproves any suggestion that the B.B.C. always uses blind control for its radio plays.

Of course the producer in this listening cabinet is only one of the links in the chain. In all probability studio 6A at the back of him will be in use (he can look into this also if he wishes) and the 6D studio at the end of this group of studios on the sixth floor may also be switched into circuit.

At one of the D.C.P.'s the outputs from all these studios will be mixed. The personal element is introduced in the listening room by the fact that the assistant producer can signal to the artistes in the studios to which he has access.

Even the ordinary dramatic control panels are not so robot-like in their working as some radio play critics would suppose. Although the two main "D.C." rooms are on the eighth floor and the studios actually used for radio play are one and two storeys below, there is much more personal contact between the play producer at the "D.C.P." and the actors in the studio than you might imagine.

This is especially so during rehearsals.

There is a small "mike" near one of the "D.C." panels and through this the producer can speak to all artistes in the studios via the repeater speakers with incorporated two-stage amplifiers.

On 'Phones

The producer can also speak down to the studios during an actual broadcast, but in this case the officials in the studios use 'phones, so that the producer's remarks are not broadcast.

All the studios are not in use at one time, of course, and there is a very clever arrangement on the latest "D.C." panels whereby the artistes in idle studios can listen-in to the progress of the rest of the play.

This works both during rehearsals and broadcasts.

It is important, of course, that the speakers in any studio should not be working when the microphone is "alive." So the speakers are connected to relays which switch off the programme to the studios from which a broadcast is being made.

These relays are controlled by the contacts on the "D.C." panel potentiometers

(Continued on page 232)



Probing into the mysteries of the D. C. P. Every piece of B.B.C. apparatus has to be regularly tested and here an engineer is seen examining the wiring of a dramatic control panel

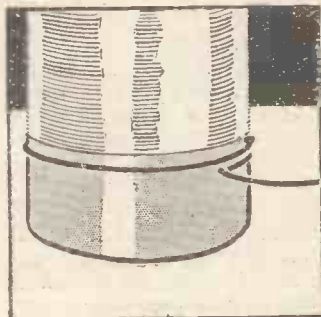
That Radio Dodge

WINDING A COIL ON A RIBBED FORMER

WINDING a coil on a ribbed former is sometimes difficult, especially at the start where the wire is very liable to slip off. However, if you file the ribs slightly flat, say an eighth of an inch from the top down to the level of the bottom of the coil, the coil will then butt against these shoulders and it will not slip off.

LEADS ON H.F. CHOKES

WHEN winding an H.F. choke or L.F. transformer, if the thin wire used is just left to hang out to act as a lead it will break



off. You should therefore solder the thin wire to a thicker piece, wind this round the bobbin once or twice, and use this as a lead out. Also the finish should be one or two turns of thicker wire.

ANCHORING THE FIRST TURN OF A COIL

WHEN winding a coil one sometimes has to start very close to the edge. This always means there is a danger of the coil sliding off the former. This dodge will obviate such a thing happening.

Drill the holes for anchoring the wire, as usual, where the end is required to be. Opposite these drill two more on the same level. Thread the wire in and out of the second set of holes and anchor it in the first set. You now have a fixed bearing to wind against, and it will prevent the coil sliding off.

FLEX FRAYED ENDS

SOME battery plugs do not grip the cotton covering on flex wire. This leaves an untidy mass of frayed ends. If you cut

off a piece of systoflex and slip this over the wire and covering, it can be pushed down on to the plug head and hides the frayed cotton ends.

NEAT FLEXES

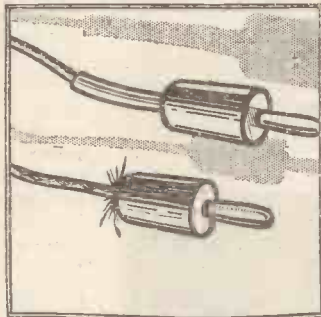
HOW often have you wondered how to hold twisted flex together at the ends without making an ugly knot. A neat and easy way is to pinch a thin strip of copper or other metal round the ends. Ordinary connecting wire will do if strip is not available.

STRAIGHTENING COPPER WIRE

ONE often wants to use a piece of copper wire that is kinked and twisted. A useful method of straightening is to hold the ends and run it once or twice round a wood or metal rod such as the "tommy" bar of a vice. The end of a table will do.

MAKING NEAT LEADS

HERE'S a tip for tidying up flex leads when terminated in wander plugs or spade tags. With some types of plug it is very difficult to make a neat ending as the flex covering cannot be tucked inside the plug. If you can get



a piece of rubber tubing or even systoflex tubing which fits tightly over the lead as shown in the sketch, you can push this hard down on to the plug and so cover up the ends of the flex.

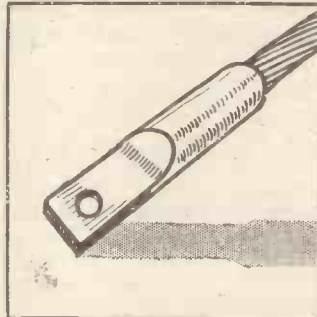
CABINET CORNERS

HERE is a simple way of making cabinet corners neat without using moulding. Cut the back square as usual, but on the sides cut out a strip from the ends equal to thickness of the back, leaving only one layer of ply to act as a veneer over the

ends. If a block is now fitted inside and the whole glued and screwed together, a strong corner will result. The top may be treated in the same way.

A GOOD LEAD-IN JOINT

THE connection to a lead-in insulator is often untidy. A good joint can be made as follows. Procure a piece of $\frac{1}{8}$ in. copper tubing about 3 in. long and flatten one end. Drill a hole in this end to fit the

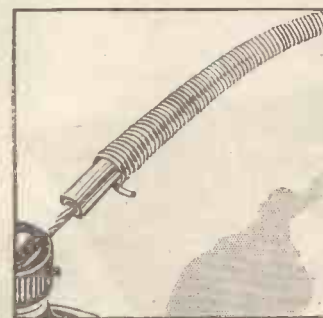


terminal on the lead-in tube and in the tube inside and out. (This is quite an easy job with a bunsen burner or spirit lamp.) Now tin each strand of the lead-in wire and fit in in the tube.

Heat the joint with a lamp and apply solder, which will run down the tube and make a solid job.

SCREENED LEADS

A CHEAP and easy method of making a screened lead is this: Cut off a piece of systoflex the length of the lead to be screened, slip it on to a rod or a knitting needle and wind tinned copper wire round its full length. Solder the end turns and add an earth wire.



WIRE UNDER TERMINALS

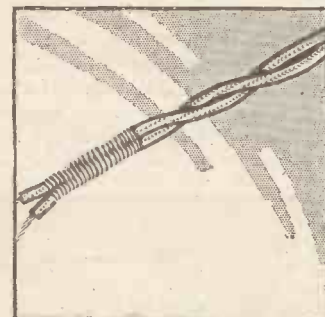
IT is very annoying when one has to get a wire into an awkward nook to find that it screws out as the terminal is screwed down. This can be avoided if the wire is wound round in the direction in which the terminal is tightened up. This will tend to screw the wire in towards the terminal spindle and prevent it from coming out as the terminal is tightened.

PLANING PLYWOOD

WHEN a baseboard has been cut to size the edges are generally planed smooth. If you plane right along the edge the end of the layers will chip off. There are two ways of avoiding this. First you can plane one-half of the edge then reverse the wood and plane the other half. The other way is to put another piece of wood so as to form a continuous piece of wood. Then you can plane straight through without chipping the ends.

TWIN FLEX

WHAT looks uglier than twin flex half unwound? You can tidy these ends up by wrapping insulation tape round them, or



get a piece of rubber tube and slip this over. Again, wind thread or thin string round it, it will look tidier.

IMPROMPTU INSULATORS

IF you want to erect a temporary aerial and have no insulators a good substitute is a cotton reel. Thread the tie-rope through the central hole and tie the aerial round the reel.

Also another substitute is a china egg. Some of these samples have holes through them, and these are convenient as insulators.

DO YOU KNOW—

THAT an accumulator stood in the battery compartment of a battery-driven set should be fixed in some way, so that it cannot be accidentally knocked over? The best plan is to cut stout plywood "masks" for all the batteries and to fix these to the baseboard so that a definite compartment is provided for the accumulator. THAT potentiometers in which the control

rod is threaded at the end can generally be ganged together by using a piece of threaded ebonite tubing to connect the centre spindles? A metal connecting piece should not be used unless the sliders of both potentiometers are connected to the same tapping point.

THAT it doesn't always pay to earth the screens on H.F. chokes and other high-frequency components? Efficient screen-

ing is sometimes obtained if the screen is left "in the air" and there is less damping than if a definite earth connection were made.

THAT the speaker connections should never be changed while a set is switched on and working? This is particularly the case with a set fitted with pentode output, as surge voltages may be caused which will damage the valve.

GENOA
BRĚSLAU
POSTE PARISIEN
MILAN
BARCELONA
LONDON REGIONAL
SCOTTISH REGIONAL
TOULOUSE
LEIPZIG
MIDLAND REGIONAL
SOTTENS

NORTH NATIONAL
HILVERSUM
KOSICE
SCOTTISH NATIONAL
COPENHAGEN
HEILSBURG
BARI
LONDON NATIONAL
FRANKFURT
TRIESTE
SWANSEA



ALL OVER THE WORLD WITH THE "MELODY RANGER"

This interesting article by a member of the "A.W." Technical Staff who went on the nation-wide tour with the "Melody Ranger" gives you some practical experience on bringing in stations with this sensational receiver

157 STATIONS on the "Melody Ranger"; a remarkable achievement, but what is even more wonderful is the average log at each sitting was between 90 and 100 stations. The local conditions over the entire country vary to a great extent and in view of this, it will certainly be of interest to readers to know of the unusual results that were obtained during the nation-wide tour conducted with the "Ranger." We could never determine beforehand, by simply examining a

map as to what results could be obtained in any given area.

It was noticed in areas only a few miles apart, that stations which were received at full loud-speaker strength in one area, faded or perhaps were unobtainable in another. A very good example of this was in Birmingham.

When logging stations in the centre of the medium wave dial, the London Regional was missed. Turning back to more or less the correct setting on the dials, it was discovered that while Mühlacker and Barcelona were both very strong signals indeed, London could only be received very weakly in between them, reaction having to be boosted considerably to obtain good speaker strength.

The same receiver was tested in Walsall, only 9 miles away, where London could be picked up with the reaction control in its normal position. In fact, it was sufficiently strong to cause interference with Mühlacker unless both aerial and grid circuits were very carefully balanced.

SWEDISH RELAYS

While the London National programme was slightly under average strength, the stations below 250 metres were, as a general rule, very powerful indeed and any number of Swedish relay stations, which use only a few hundred watts, sounded as if they were using between 10 and 12 kilowatts.

It is advisable for readers in the Birmingham and Walsall areas, that is, within 30 or 40 miles of the Midland Regional or Daventry National Stations, to adjust the .00017-mfd. blocking condenser in the grid circuit to the minimum capacity, that is, unscrew the knob as far as it will go. This will not decrease to any appreciable extent the signal strength.

Although, while in Clacton, it was only possible to give the receiver quite a short daylight test, it was obvious that the long-wave stations were exceptionally good, while those below 300 metres seemed to be rather below par with the exception of Turin, Bari, Trieste, and of course, the powerful German stations such as Frankfurt.

Going only a few miles north to King's Lynn, the long wave stations were much less powerful

than in Clacton with the exception of Radio Paris, Kalundborg, Oslo and perhaps the Russians around the 1,000-metre mark. The weaker stations were Motala, Warsaw, etc., which is really very hard to believe. By going still farther north to either Grimsby or Newcastle, where conditions are somewhat similar, the long wave stations were, one and all, very powerful.

ON THE EAST COAST

Along the whole of the East Coast as far as Berwick-on-Tweed, selectivity was not of primary importance, so that the .00017-mfd. preset condenser in the grid circuit should have the knob screwed right in so as to obtain the utmost amplification, relying on the aerial preset condenser for what little selectivity is necessary.

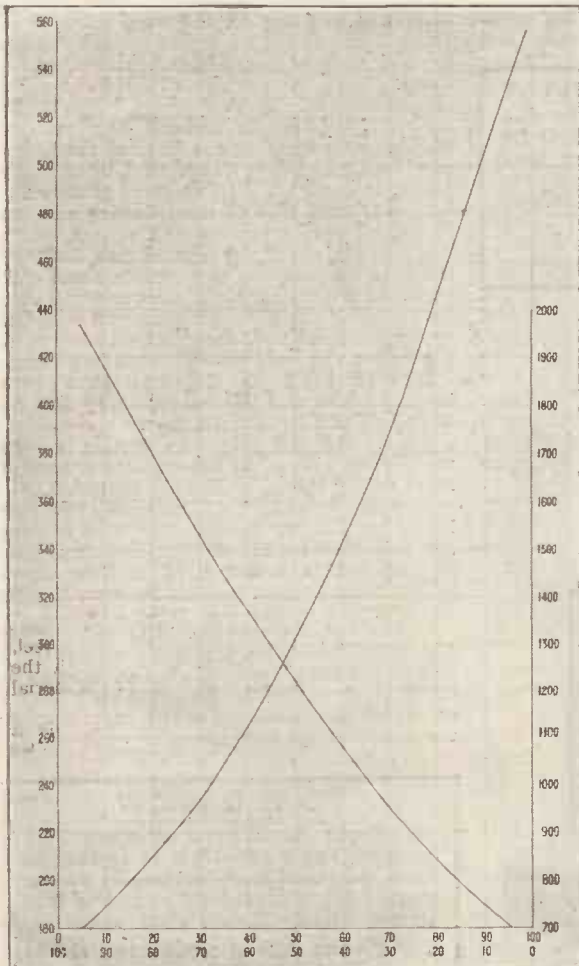
The farther north the less reliable become the French and Spanish stations, which is only to be expected when we consider that we have the whole of the country to cover, but to balance this, the Norwegian, Swedish, Dutch, Spanish, German and stations in Eastern Europe all come in with increased volume. This effect was particularly noticeable in the Manchester and Glasgow areas where the only two French stations to be received without pushing reaction were Radio Paris and Poste Parisien, whereas the Eastern European stations as well as the Italians, notably Milan and Turin, were obtainable at great strength.

These peculiar results may assist readers who feel that the receiver might fail in certain respects, even though it excels in others. A very remarkable feature in Manchester was that the Scottish National on 288.5 metres was infinitely stronger than the North National on 301.5 metres. This is very interesting when one considers that the North National is only some 20 odd miles away, whereas the Scottish National is at Falkirk which is north-west of Edinburgh and the country in between is anything but flat.

WEST REGIONAL RESULTS

Then down the west coast as far as Cardiff, Swansea and perhaps Bristol, the most level results were obtained, as there was no outstanding station, neither did we discover any distinct loss in volume.

It would be expected that the Irish stations, particularly Dublin or Athlone, would along the west coast be a reliable and powerful signal, but, contrary to this, it was not until south of Bristol that we could really say that Dublin was a good station. Travelling still farther south, very little variation is noticed until in the Exeter direction, where the long-wave reception is rather disappointing. The most powerful station was Warsaw, followed by



This is the actual tuning graph prepared by the writer for the "Melody Ranger." It covers both the medium and long waves. Short-wave calibrations will be given in a special article next week

"ALL OVER the WORLD with the 'MELODY RANGER'"

Radio Paris and Hilversum. The Spanish, French and Italian stations were all excellent, while the majority of the Germans came in at good strength, irrespective of power or wave-length.

Fading was very noticeable with the London National programme, although the Regional was very strong and steady.

A good earth is essential, and Filt earth connections were used during the tour.

With a receiver like the "Melody Ranger," with 110-120 stations on the medium and long wavebands alone, it is likely to be rather confusing as some of the languages and call signs are very similar. In view of this, it will help readers to a considerable extent if they construct a tuning graph, such as the one illustrated.

MAKING THE GRAPH

Obtain from the local stationer some squared paper, which should be divided into ten squares to the inch. Along the bottom edge should be ruled approximately 10 inches, and at each inch should be printed the corresponding dial readings. Commence with 0, and at ten squares along print the figure 10 and at twenty squares along, the figure 20 and so on until 100 is reached. If you happen to use a dial other than the one we have advised, it may be divided into 180 instead of 100, in which case it will be advisable to rule only nine inches and instead of having ten degrees for ten figures, you would have ten degrees for twenty figures.

At the left-hand edge a vertical line should be drawn, 19 inches long, and on this side should be printed the wavelengths which the receivers cover. Each division will represent 2 metres, so you must start with 180 and at the first inch, or at the end of ten divisions, print 200 and at the end of twenty divisions print 220, and so on until you reach 560. It is then quite a simple matter to plot the necessary points to obtain a curve.

LOCAL STATIONS

In the majority of cases a reader will be able to pick up the Regional and National programmes no matter where he is situated and there should be very little difficulty in receiving either Newcastle, Aberdeen or Fécamp at one end of the dial and Munich or Budapest at the other end. This will give more or less the beginning and end of the tuning scale. For example, by referring to the original readings, you will see that Budapest should be heard at about 98 degrees on your right-hand dial. We are taking the right-hand dial only because the

DIAL READINGS FOR THE STATIONS YOU CAN GET ON THE "MELODY RANGER" Table with columns for Long Waves, Medium Waves, and various international stations like Brussels, Florence, Prague, etc.

left-hand is so greatly influenced by the setting of the pre-set condenser, making the reading unreliable, while the grid circuit will remain sensibly constant.

By referring to the list of stations at the end of this issue, you will see that the wavelength of Budapest is 550 metres. Place a dot

STATIONS ON YOUR "MELODY RANGER"

The readings given in the table above for medium- and long-wave stations were obtained during a brief test with the "Melody Ranger" while the wavelength curve on the preceding page was being compiled. Next week dial readings for the two short-wave bands will be given

on the square which intersects the horizontal 550-metre line and the vertical 98-degree line. Then tune in North Regional or some other station at a similar wavelength which is very easily identified. The wavelength of the North Regional is 480 metres and the dial reading is about 85 degrees; here again make a mark where the 480-metre line crosses the 85-degree

line. Then carry on in this way with other stations, such as Rome, Midland Regional, Scottish Regional, London Regional, Milan or Breslau; the North and Scottish Nationals, Heilsberg, London National, Trieste, perhaps Dublin if you are on the west coast or in Ireland, and finally the lowest station you can receive, such as Newcastle, Aberdeen or Fécamp. With these stations logged the curve can be completed. You should without any difficulty be able to identify fifty stations without even knowing one word of the languages used. The dots should then be carefully joined up until you obtain a curve as shown.

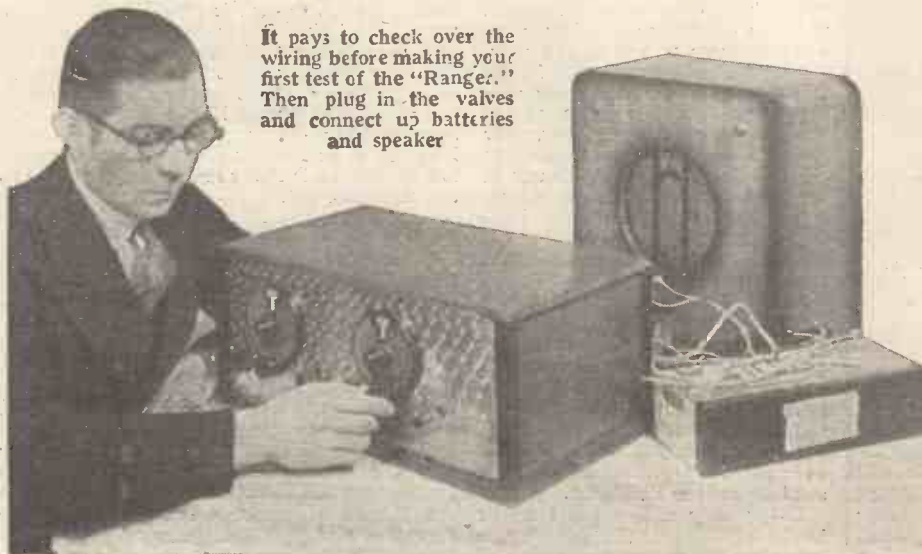
This is then used in the following manner. If, for example, you pick up a station with a dial reading about 65 degrees, you find this point on the base line of your graph and then go upwards until you strike the curve and then by following the horizontal line you intersect to the left-hand side, the exact wavelength of the station you have picked up will be given.

By referring to the list of stations given in this issue and the curve, every station heard should be identified.

Calibrating the long-wave section is very much more simple, as the stations are much more widely spread and easily identified.

Speaking generally, all the more important long-wave stations could be identified without any help from the curve. The difficult section of the dial is below 1,100 metres, where innumerable Russian stations are more hard to identify.

The first station that should be picked up is Huizen, followed by Radio Paris, Daventry and all the more powerful stations down to as low as Oslo. A good station at the very bottom end of the dial is Croydon or Heston, preferably the latter, on 830 metres.



It pays to check over the wiring before making your first test of the "Ranger." Then plug in the valves and connect up batteries and speaker

DO YOU KNOW

THAT you should never use a pencil for marking out a panel? It is so easy to leave the pencil lines accidentally on the surface and a conducting surface is thus formed, which will quite upset the results.

THAT when drilling a panel you should always lay a sheet of thick paper between the ebonite and the bench so that the polished surface does not get scratched by the drillings?

QUIESCENT PUSH-PULL

The correct valves for this purpose

are MULLARD **P.M.2A**

MULLARD **P.M.22A**
OR

MULLARD **P.M.22**

IT MEANS that two small power or pentode valves give twice the undistorted output for a high tension consumption which is substantially less than that of a single valve of the same type.

IT MEANS greater volume and better reproduction without extra running costs.

IT MEANS, essentially, Mullard Valves, because the Mullard Power Valve, type P.M.2A and the two Mullard Pentodes, types P.M.22A and P.M.22 are the ideal valves for this new circuit.

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

T.S.D., Ref. B.G.D., The Mullard Wireless Service Co., Ltd., Mullard House, Charing Cross Road, W.C.2.

The valves specified for the "Melody Ranger" are: P.M.12V, P.M.2DX, P.M.2DX, P.M.2A.

MADE IN ENGLAND

Mullard

THE MASTER VALVE

Advt. The Mullard Wireless Service Co., Ltd., Mullard House, Charing Cross Road, London, W.C.2.

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



NOW—for 39'6
most brilliant set

*The Ultra
 Selective*

TELSEN

*Full size Blueprint, with complete
 building and operating instructions
 supplied FREE with every kit!*

THE Ultra Selective TELSEN 'ASTRALA 3' smashes all existing standards of kit set value and design. It costs less to buy and less to run. It is easier to build and easier to operate. It is up-to-the-minute in design and ahead of all the rest in performance. Its selectivity is simply astounding, its range enormous, its reproduction superb. Yet every component you require for building it, together with full-size blueprint and detailed instructions, is contained "complete in the box" for 39/6. You may already have some of the components by you, in which case you can obtain the blueprint and full building and operating instructions post free for 1/-. Whichever you do, you can be sure that in building the TELSEN 'ASTRALA 3' you are building the finest set from every point of view. Go to your dealer now.

TELSEN
RADIO COMPONENTS

*Complete kit of parts,
 including panel, base
 board, terminals,
 battery cords, and all
 accessories*

39'6

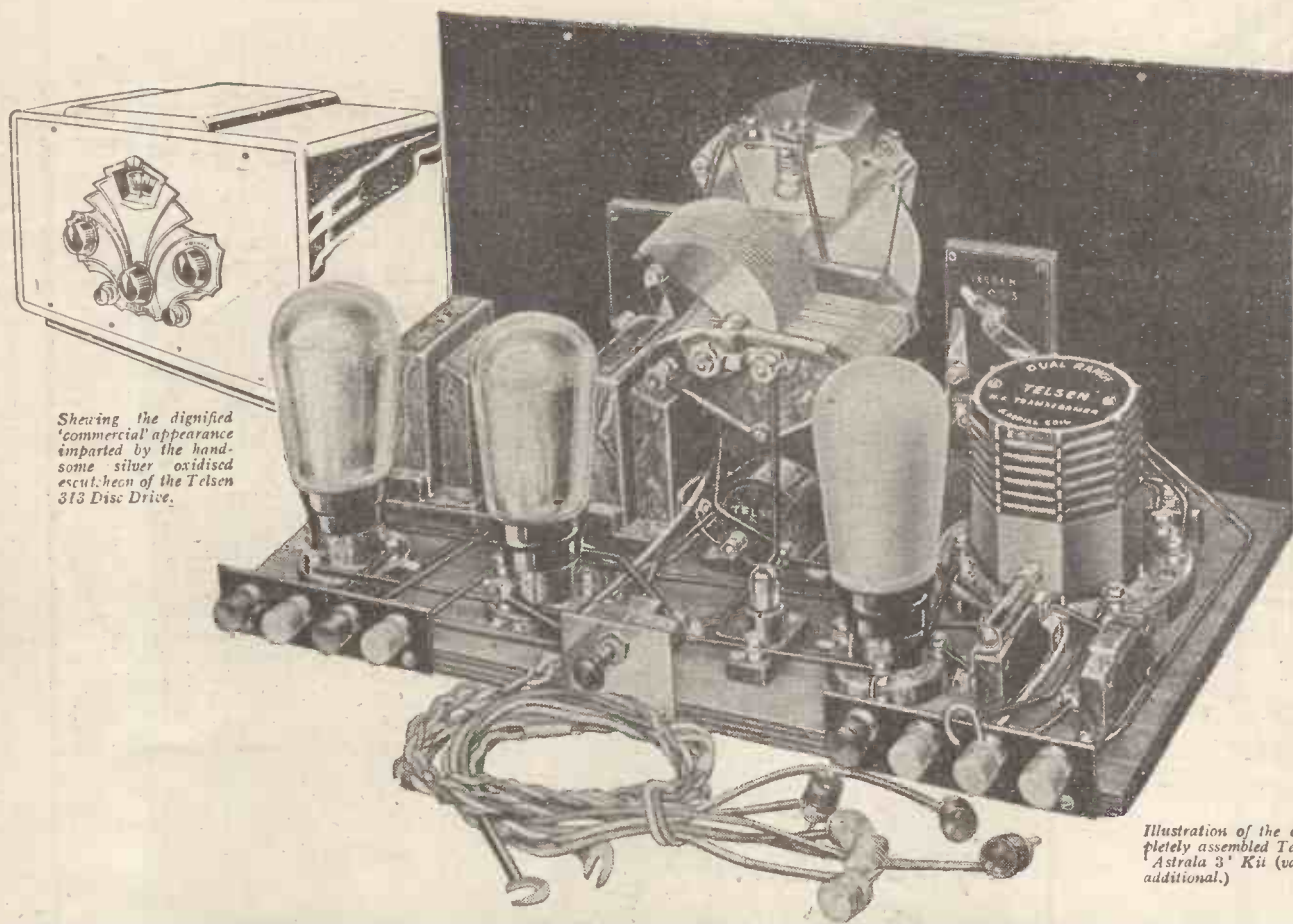
*Obtainable from all
 radio dealers.*

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

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

you can build the
ever designed....!

‘ASTRALA 3’



Showing the dignified 'commercial' appearance imparted by the handsome silver oxidised escutcheon of the Telsens 313 Disc Drive.

Illustration of the completely assembled Telsens Astrala 3' Kit (valves additional.)

The TELSEN 'ASTRALA 3' embodies every ultra-modern refinement, including slow-motion disc drive control, air-spaced logarithmic condensers, decoupling in circuit, separator control and handsome silver oxidised escutcheon plate.

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



again!

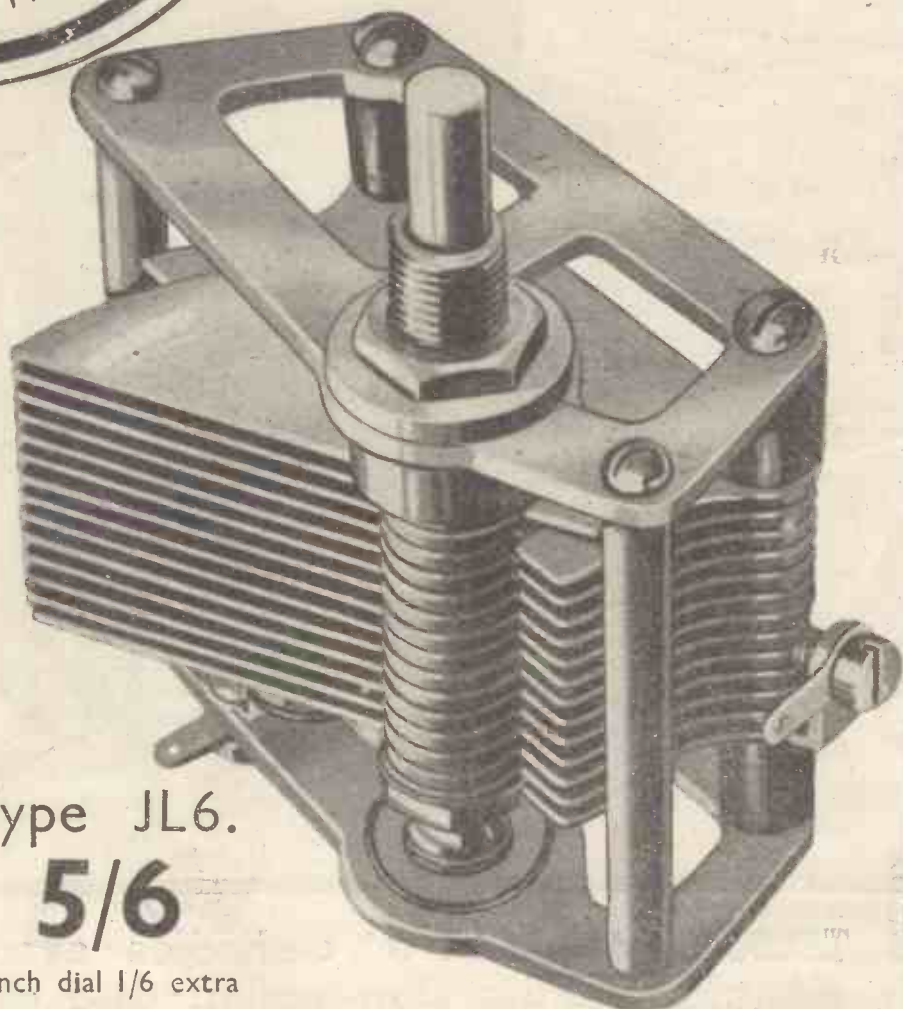
When you are buying the components for your "Melody Ranger," remember this: the tuning condensers used by "Amateur Wireless" themselves for the original model of this sensational receiver were J.B. type JL6.

Build your "Melody Ranger" exactly as the original. Then you are certain of world-wide reception as good as the original's in all parts of the country. Make certain of fullest success—follow the specification and use J.B.

Type JL6.

5/6

4-inch dial 1/6 extra



THE PRECISION CONDENSER *Specified in the "Melody Ranger"*

Advertisement of Jackson Bros. (London) Ltd., 72, St. Thomas' St., London, S.E.1.

'Phone: Hop 1837.

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

On Your Wavelength!

MAKING IT SNAPPY

I SOMETIMES wonder if we are not a bit inclined to overwork the habit of referring to things merely by their initials. Of course, abbreviations like H.T., L.F., G.B., S.W., S.G., and so on are now current coin, and everybody knows exactly what they mean. But as a correspondent points out, casual references to combinations like A.V.C., F.G.B., and Q.P.P., are really "going it a bit thick" so far as the ordinary layman is concerned—unless the mystic letters are clearly explained at the time. Not being a particularly hot "expert" himself, it took him quite a while to find that the first lot stood for "automatic volume control." "Free grid bias" was a bit easier, but he is still at a loss to know what the third batch of initials really stand for. Well, I'm inclined to agree with our friend's main argument, and to feel that it would be a pity if we sank, say, to the level of the chemists, who simply revel in things like H₂O, H₂SO₄, and C₂H₅OH. As a body chemists are no doubt quite as respectable as the rest of us, but I must confess I don't envy their liking for formulae.

HIGH-SPEED RECORDING

I T is amazing to think that it is possible to see the track of a 12-metre wave—which corresponds to a frequency of 25 million a second. Yet Mr. Watson Watt performed that feat at the recent Exhibition of the Physical Society by using a cathode-ray oscillograph. In fact he went further and showed the trace made by a 30-centimetre wave in the one thousand-millionth part of a second. In order to keep pace with the wave, it is necessary for the electron stream inside the oscillograph tube to travel with a velocity at least half that of light—than which nothing can move faster. The principle employed in making such measurements is very similar to that used for recording speech on "talky" films, or—coming a step nearer to everyday practice—to the way in which sounds are imprinted on an ordinary gramophone record.

H.T.B.s CATCH COLD

A S I write, the great cold spell continues unabated and the number of enthusiasts who sit up into the small hours in search of American stations is probably minute. That's just one of the effects of frost upon wireless reception! Another rather queer one is that some listeners who use battery sets may possibly find their apparatus not quite up to the mark just now. The reason is that the dry high-tension battery is not a little affected by temperature. It can, in fact, catch cold; though, unlike the human sufferer, it recovers immediately as soon as it gets warm again. I had not realised how greatly cold could affect a dry H.T.B. until

I carried out a big series of tests a year or two ago. One part of the tests was to run batteries continuously through fixed resistances, the initial current being 4 milliamperes. The voltage under load was taken night and morning.

UPS AND DOWNS

N OW, you would expect each voltage reading under these conditions to be somewhat lower than the previous one. What I found, when the batteries were housed in an unheated room, was that after a very cold night they would all show a surprisingly big drop. If a warm day followed I often obtained a higher reading in the evening than in the morning. This was rather puzzling at first, until the effects of the temperature were realised. It was eventually found necessary to maintain an approximately constant temperature night and day in the laboratory to enable the tests to be carried out properly. The moral is: Don't keep your H.T.B. in some chilly, draughty corner, or you may find that both the quality and the sensitiveness of your set are inclined to suffer in cold weather. At the same time, don't place it too near the fire, for excessive warmth is even worse for it than cold. A temperature of a little over 60 degrees is ideal for its health.

YOU'LL HEAR THIS ONE!

I F you haven't already heard Athlone, the new Irish Free State transmitter, you will have no difficulty about picking him up should he be at work when you make the attempt. The old 1-kilowatt Dublin station came in pretty well in this country, but Athlone rejoices in 60 kilowatts as well as a wavelength that is distinctly favourable for long ranges. At the time of writing the transmitter has been used chiefly for test transmissions, but it will not be long before it comes into regular operation. I hear that there is hardly a country in Europe from which reports of good reception have not already been received. Rather sur-

prisingly, the Irish station has been well heard at ranges running into thousands of miles, in India on the east and Newfoundland on the west. When he comes into regular working and puts out his full power, Athlone should be one of the most strongly heard of all non-B.B.C. stations.

NO TIME WASTED

S EVERAL of our go-ahead manufacturing firms were very quick off the mark with special components as soon as quiescent push-pull had made its bow in this country. Input transformers and output chokes for the type of Q.P.P. that requires either two pentodes or two triodes with high negative grid-bias are already available. I have tried out several different kinds, and they certainly deliver the goods. The great point about Q.P.P. is that it does not mean scrapping your existing set. So long as there is room for an extra valve-holder, all that you have to do is to put one in, to replace your present L.F. transformer with a Q.P.P. input, and to do the simple wiring required. The output choke can be outside the set if there is not room for it within. The expense is quite modest and Q.P.P. quickly pays for itself by the greatly reduced current drawn from the high-tension battery, despite the big increase in volume.

WHY THE CHOKE?

S OME people will probably wonder why firms specialising in Q.P.P. components are turning out output chokes and not output transformers. Their reason for doing so is to facilitate the change-over in existing sets. Nearly all modern moving-coil loud-speakers have a built-in input transformer intended to match the instrument to a single pentode or triode. By itself this transformer cannot be used for any kind of push-pull, but if you fit a suitable output choke it receives a new lease of life and works just as well in Q.P.P. as it did with a lone output valve. Some of these chokes are so

PERSONALITIES IN THE WEEK'S PROGRAMMES



On Your Wavelength! (continued)

arranged as to give a number of step-down ratios ranging from 1-to-1 to 3-to-1. With them you can match up various kinds of valves to your loud-speaker by means of its own transformer. Where there is no output transformer in the set or loud-speaker, another kind of choke can be used. This has two alternative step-down ratios, one quite small and one ranging up to 75-to-1. The high-ratio terminals are simply connected direct to the loud-speaker without an intervening transformer. A very high ratio is necessary in the output choke or transformer, because in push-pull the valves are effectively in series, with the result that their joint impedance is pretty high.

THE BATTERY RADIOGRAM

ONE big advantage conferred by Q.P.P. is that quite a modest battery-operated set will give first-rate reproduction of gramophone records. In the past the battery radiogram has not been so popular as it might because when the pick-up was followed by a first L.F. valve (or detector valve turned into a first L.F. by switching) and a small power output valve, the undistorted volume obtainable was usually less than that which a good mechanical gramophone can give. Q.P.P. enables you to obtain all the volume that you want from gramophone records and the current required is not more than 5 or 6 milliamperes.

SOME NEW VALVES

SO far, we have heard about only one kind of Q.P.P.—that in which pentodes or triodes are biased back almost to the cut-off point. There is another sort in which no bias at all is used on the grid of the output valve. This demands not only special transformers, but also special valves, and our valve manufacturers are busily engaged at present in evolving these. The no-bias valve has almost the whole of its characteristic curve on the positive side. This naturally means that, when it is in use, grid current must flow, and we have always been taught that on the L.F. side of the set the merest whiff of grid current was enough to upset the appercart. So it is in ordinary circuits, but in zero-bias Q.P.P. the input transformer positively enjoys grid current and is able to deal with it in such a way that no distortion is introduced. I have seen one of the new valves, which is a twin. It has one filament, but two separate grids and two separate plates.

SCREENED CHOKES

A COMPONENT that has been needed for a long time is the screened H.F. choke, and these have now been placed on the market by one or two manufacturing firms. When you come to think of it, the screened tuning coils and H.F. transformers that we use to-day are little bigger physically than chokes. If it is necessary to screen them to prevent

interaction—and we know from experience that it is—then it seems to stand to reason that in sensitive circuits, at any rate, chokes should be shielded. Another advance is the introduction of a special super-heterodyne choke for use in the second detector stage. The intermediate frequency of most super-hets is either 126 or 110 kilocycles. The wavelength corresponding to 126 kilocycles is 2,371 metres, but the average H.F. choke is not very effective at much over 2,000 metres. The super-heterodyne choke does good work up to 2,500 metres or more, and is thus just the thing for the job.

SUPER-HET OR STRAIGHT?

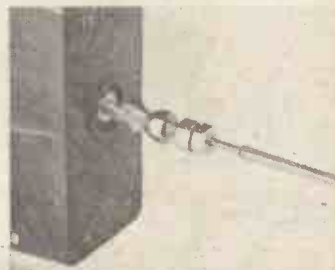
THE great super-het versus "straight" set controversy still ranges. Some there are who tell us that the super-het can never provide the quality that the straight set is capable of giving. Others insist that the super-het can be a genuine quality receiver and that no straight set will ever equal it, either for selectivity or for simplicity of tuning. Valve for valve, the straight is, of course, a good deal more efficient—you simply cannot imagine such a thing nowadays as an eight-valve straight set. Myself, I am a super-het enthusiast, and I really believe that hardly any other kind of set will be made in two or three years from now, unless, of course, some startling new development turns up. The super-het's worst fault is hiss, but that can be corrected in various ways. Its quality, if it is properly designed and contains an efficient tone-control arrangement, should be first-rate, and there is no set of anything like equal performance to compare with it in the matter of cheapness in production. I don't think that anyone who has used a really good super-het ever wants to go back again to straights, and that is the acid test.

THE DOUBLE-HARNESS LOUD-SPEAKER

TWIN loud-speakers are becoming very popular. Two kinds are now available. The first employs two instruments of the same dimensions, so adjusted that they straighten out each

FOR BUZZING SPEAKERS

Have you tried the old tip of slipping valve rubber over the drive rod of a speaker unit



used with a linen-diaphragm. A long driving rod may whip and resonate on the loud notes. This is cured by slipping on the cycle valve rubber

other's peaks and resonances. In the second, the loud-speakers are of quite different types. One is large, and has a good response of from about 30 to 1,500 cycles a second; the other is much smaller, and its response ranges from about 1,200 cycles upwards. The two form a kind of push-pull arrangement, the big speaker taking charge of the low notes and the little fellow dealing with the high-pitched sounds. Either combination gives very good results, a considerable improvement upon those obtainable with most single speakers. The idea of using loud-speakers in double-harness is not, of course, new. It is a good many years now since I described in these columns the use of the original Amplion horn speaker working in tandem with the old Kone. It must have been in 1924 or 1925 that I used this combination.

TOO MANY DUDS

MY sympathies are all with those writers of the letters on the subject of dud components that have appeared in AMATEUR WIRELESS. There is no question that far too many faulty bits and pieces escape detection on their way through the test-room. But some cases are perfectly astonishing. Recently I purchased a pick-up adaptor plug and brought it home before opening the box. On doing so I was electrified to find that this had been made up so as to break not the grid circuit, but the plate circuit of the valve. Imagine the plight of some unfortunate beginner who used it as it stood. And I don't quite know how the windings of his pick-up would have liked the dose of H.T. current. Then, during the past week I purchased a volume-control potentiometer of well-known make whose travelling contact turned out to be of the hit-and-miss type, with more misses than hits.

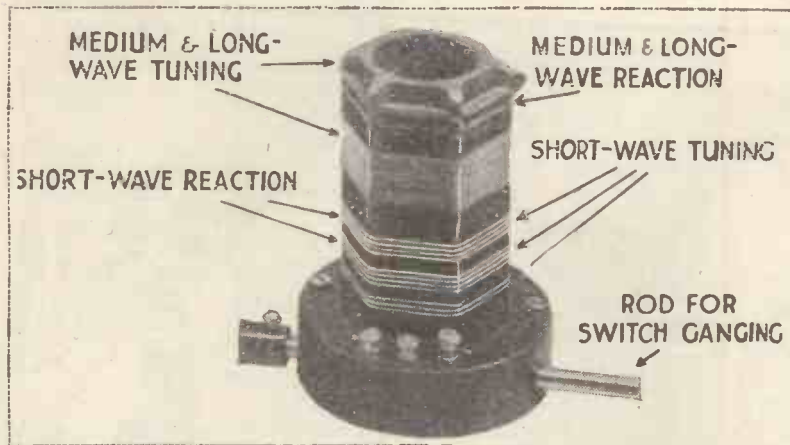
THE IMPOSSIBLE HAPPENS

AND yet if you pay a visit to the Mint you will, no doubt, come away with the impression that for a faulty coin to pass into circulation would be a matter of impossibility—unless your visit includes an inspection of the Mint's own museum. At the Mint every single coin is tested again and again by delicate machines which weigh and measure it and by skilled operatives with a fine sense of touch and eagle vision. So elaborate are the tests that no defective coin could possibly get into circulation. Couldn't it? In the museum you will see quite a variety that have been returned by banks after they have got into circulation. One that I particularly remember is a shilling with a piece bitten out of it by the stamping machine. That must have happened very early in the making of the coin—yet it came through every test and passed out from the Mint. This being so, one can understand why it is that an occasional dud component goes into stock, but it should be only an occasional one.

THERMION.

THE HEART OF THE "MELODY RANGER"

"In the 'Melody Ranger' . . . there is the outstanding feature of a four-range coil. This coil is indeed the heart of the 'Melody Ranger' circuit, and accounts for the wonderful range of stations that have been logged



during our tests all round the country. . . . The very wide wavelength range enables many stations normally outside the range of sets to be tuned in at full strength . . . the coil is a great engineering triumph."

A PART from the many circuit improvements that have been incorporated in the "Melody Ranger" four-valver, there is the outstanding feature of a four-range coil. This coil is indeed the heart of the "Melody Ranger's" circuit, and accounts for the wonderful range of stations that have been logged during our tests all round the country.

The design of a four-range coil, covering wavebands that include the ultra-short, short, medium and long waves, is not done in a day. It took many months of patient research before the coil you now find in the "Melody Ranger" was finally evolved.

Great credit is due to the Lissen laboratories for the evolution of this coil, which gives the home constructor his first chance to build an efficient set that is equally suitable for the short waves as for the normal broadcasting wavelengths.

coil represents from the design point of view, its practical production has been made extremely simple.

Talking of switching—in the Lissen coils used in the "Melody Ranger" the switch is a marvel of scientific elimination of losses.

The very small capacity of the switch in the coils we have used has the additional advantage that the tuning condenser goes down to a very low minimum wavelength. It is a great triumph in any coil to be able to go right down to 12 metres, but when we remember that the Lissen coil does this and covers all the other wavelengths as well, we get some idea of the unique advance that has been made.

The coil is remarkably efficient on the medium and long waves. The very wide wavelength range on the medium waves, for example, enables many stations that are normally outside the range of sets to be tuned in at full strength.

The heart of the "Melody Ranger" pulses with vitality—the coil is a great engineering triumph.

ONE HUNDRED PER CENT ENTERTAINMENT

Sir,—I was very interested to have a chance of testing your new wonder set, the "Melody Ranger," when your representative arrived here in Edinburgh. I have been an enthusiastic reader of your journal for some years and have made up a number of your circuits.

Never, however, have I had a set which impressed me like the "Melody Ranger."

Unfortunately my aerial and earth system was not at all good, for the aerial consisted of a wire hanging out of the window, and the earth connection was made to the water tap.

Despite these unsatisfactory conditions, however, 66 stations were identified during the evening. Of these, 8 were on the ultra-short waves. Sensitivity on the long waves was remarkable and selectivity was adequate. Altogether 15 long-wave programmes were tuned in, and both Berlin and Eiffel Tower were received free from interference.

On the medium waves, the same high standard was apparent. A remarkable feature on this waveband was the reception of a programme from Kosice with negligible interference from the Scottish National programme, which is very strong in Edinburgh.

The "Melody Ranger" must take its position at the top of the tree for wireless receivers as far as I am concerned. Altogether it is an extraordinary set which can be guaranteed to give excellent results on all wavebands, even under the worst possible conditions. 100 per cent. entertainment is attainable with the "Melody Ranger" for quite a modest sum.

B. PATTERSON

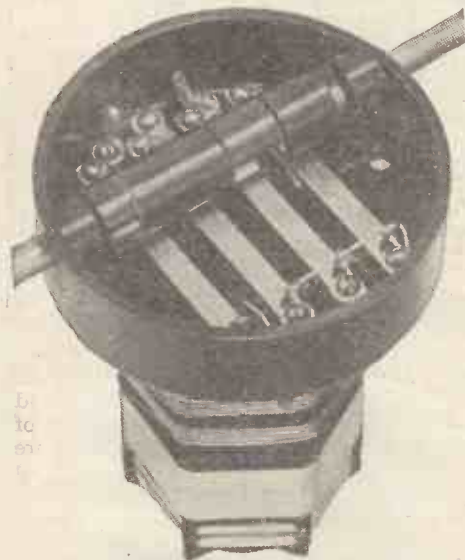
NEXT WEEK:— THE "MELODY RANGER" ON THE SHORT WAVES

A very important feature of the design is the splitting up of the short-wave bands into two ranges. This enables all the short waves of importance to be covered by the tuning condenser, without skimping either the very short or the moderately long limits of the short-wave band.

As seasoned amateurs appreciate, the whole success of short-wave reception depends on the reaction system. In the Lissen coil this point has received very special attention, with the result that the number of turns and their relation to the tuning windings is such that extremely smooth reaction is obtained.

The coupling of the aerial to this four-range coil naturally presented some difficulty, as the usual value of coupling for one waveband would not normally do for another waveband. Here again, the Lissen engineers have gone into practical difficulties with a will that eventually found a way out. The result is that you can use the same aerial connection to the coil for all the wavebands covered.

Still better results are obtained if the aerial is taken straight to the grid end of the winding when the set is tuned to short waves, and it is for this reason that we have in the "Melody Ranger" included the coil-tapping panels near the coils.

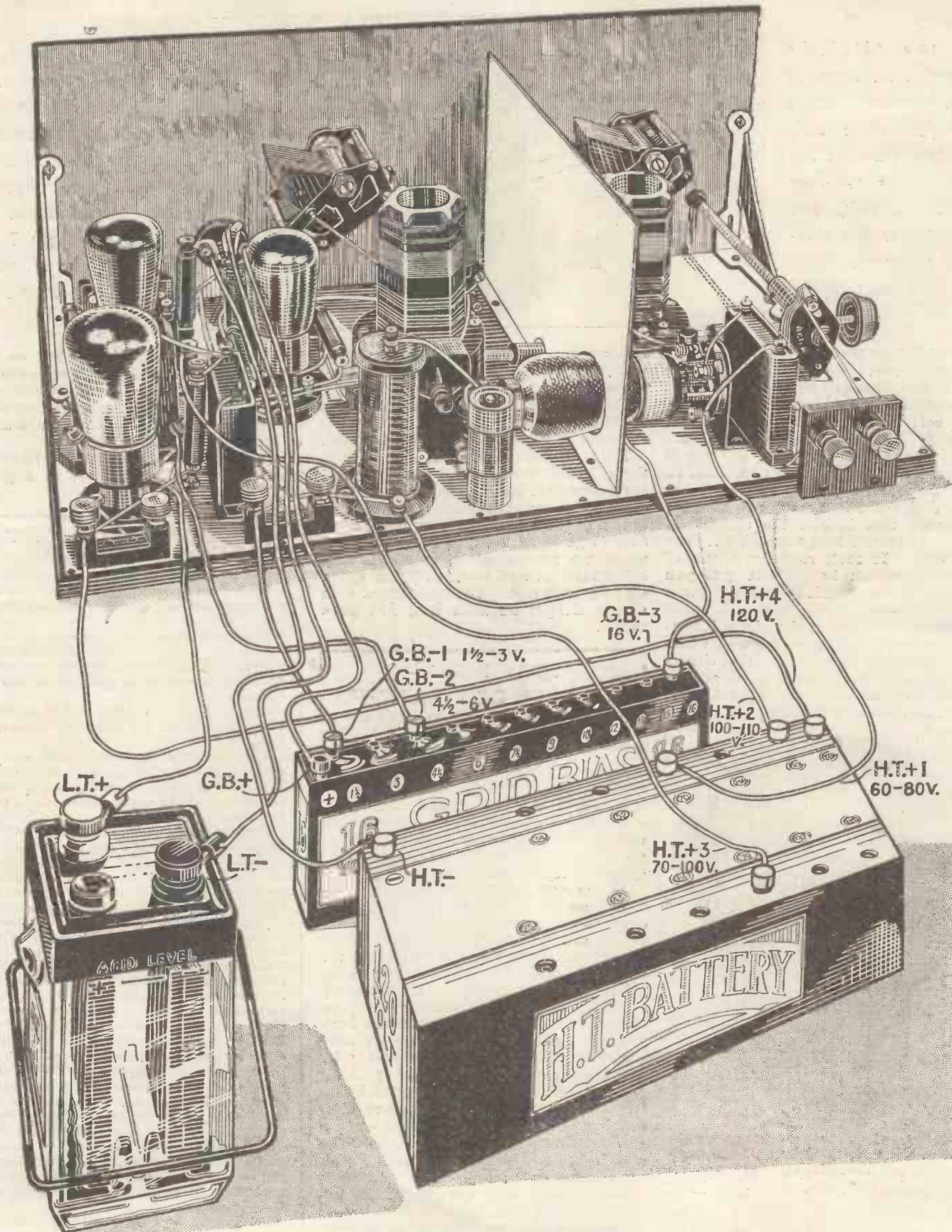


An underneath view of the four-range coil used in the "Melody Ranger," showing the switching

Few amateurs can realise how many little snags have to be overcome in the making of even two-range coils. How much more work, then, has to be put into the making of a four-range coil!

Apart from the outstanding advance this

HOW TO CONNECT UP YOUR "MELODY RANGER"



This pictorial diagram shows you how to connect the high-tension, low-tension and grid-bias batteries to your "Melody Ranger." Suitable tappings both on the grid-bias and high-tension batteries are shown. There are four positive high-tension tappings and three grid-bias negative tappings. The leads to the batteries should be as short and direct as possible and the aerial and earth leads (which connect up with the small terminal block on the right) should be kept well away from the batteries. Operating details for the "Melody Ranger" are given elsewhere in this issue

“We get all these foreign stations so clear and strong since we put Exide and Drydex Batteries in our portable; thought Katowice was Midland Regional the other night.”



SOME POPULAR SETS AND THEIR EXIDE AND DRYDEX BATTERIES

	For L.T.	For H.T.
Columbia 306 and 309	Exide JZ2 12/-	Drydex H.1051 11/-
Marconiphone, 255 ..	" JZ3 14/-	" H.1056 12/-
	" CZ3 11/-	
Murphy, Model B4 ..	" LFJ5 13/-	" H.1018 13/-
	" RMP6 12/6	
Portadyne, Challenger	" JWR5 12/6	" H.1018 13/-
	" PY4 10/6	
Pye Twin Triple ..	" RSZ4 13/-	" H.1024 15/-
	" JS3 12/-	

There is an Exide and Drydex Battery for every set
 These prices do not apply in the Irish Free State.

Exide AND

Drydex

BATTERIES FOR WIRELESS

- Exide Batteries for wireless low tension and high tension. Drydex Dry Batteries for wireless high tension and grid bias. Also for torches, cycle lamps and bel's.

EXIDE WIRELESS BATTERIES ARE USED IN NINE OUT OF EVERY TEN BRITISH SHIPS

Obtainable from Exide Service Stations and all reputable dealers.

EXIDE BATTERIES, EXIDE WORKS, CLIFTON JUNCTION, NEAR MANCHESTER. BRANCHES: LONDON, MANCHESTER, BIRMINGHAM, BRISTOL, GLASGOW, DUBLIN, BELFAST

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

"IT'S GUARANTEED" by "AMATEUR WIRELESS"

Build the "Melody Ranger" with the Direct Radio Kit and if you find cause for complaint your purchase will not be considered completed until your "Melody Ranger" operates to your absolute satisfaction.



The DIRECT RADIO

FOUR WAVE BAND

MELODY RANGER



"The tests I have completed with this receiver during a tour of the country confirm my opinion that the "Melody Ranger" sets an entirely new standard in home constructor receivers for 1933."

S. RUTHERFORD WILKINS, Designer of the "Melody Ranger."



"I whole heartedly recommend the Melody Ranger to all seriously interested in Foreign programmes, and particularly to my Colonial friends for reception of the B.B.C. Empire broadcasts. Its extraordinary efficiency on all wavebands is all the more remarkable considering the low cost and simplicity of construction." DONALD F. MARCUS, Managing Director, Direct Radio, Ltd.

NOTE THE OUTSTANDING FEATURES:

"The Greatest of All 'Melody Ranger' Kits" - (Technical Editor)

Study carefully the specification—only first-class

components included, made by first-class manufacturers—the result: first-class performance on all wavebands.

- 1. Short-wave accessories 100% British Made, made by the firm recognised in the Trade as the experts in short-wave component manufacture.
2. T.C.C. and Dubilier fixed condensers—chosen for reliability.

Table listing components and prices for Kit No. 1, including items like coils, panels, foils, screens, potentiometers, and various condensers.

Table listing components and prices for Kit No. 2, including items like T.C.C. fixed condenser, ready radio units, mounting holders, switches, and various transformers.

Table listing components and prices for Kit No. 3, including items like ready radio units, variable condensers, and various transformers.

Overseas Customers

Direct Radio are making special arrangements for the dispatch of "Melody Ranger" kits to any part of the world. In addition to the kits specified on this page we are featuring a special Overseas Kit consisting of all necessary components as listed, Valve, Table-model cabinet with Bluespot 6G8 Loudspeaker Unit in special Colonial Cabinet, Batteries, Aerial and Earth, in fact everything necessary for a complete B.B.C. Empire Broadcast Receiving station for £15. Cable code word to order complete outfit: "Melorange".

Table listing components and prices for various kits, including Siemens battery, Oldham type battery, Siemens G.B. battery, and various accumulators and transformers.

If you prefer a manufacturer's Cartoned Kit, buy a Ready Radio "Melody Ranger" Kit, officially approved by the designer, S. Rutherford-Wilkins, World Tested, fully guaranteed. Price £5 12s. 6d., or on Easy Terms, 12 monthly payments of 11 3. Now in stock, awaiting your order. Use Coupon below.

OFFICIAL DEMONSTRATION 159 Borough High Street, London Bridge, S.E.1 "Amateur Wireless," in co-operation with Direct Radio, invite you to a demonstration of the "Melody Ranger" constructed from Direct Radio guaranteed kit.

CASH, C.O.D., AND EASY PAYMENT ORDER FORM. To DIRECT RADIO, LTD., 159 BOROUGH HIGH STREET, LONDON, S.E.1. Please dispatch to me at once the following goods...

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

WHAT IS QUIESCENT PUSH-PULL?

FROM the very early days of broadcasting, the best brains in radio engineering have been concentrated on the problem of increasing the electrical efficiency of valve-operated receivers—the problem of how to obtain the maximum output for the minimum expenditure of high-tension current.

This question is particularly important from the point of view of users of battery-operated receivers, because high-tension supply derived from even the very best makes of dry battery costs over £1 per unit.

Power Valve Figures

The enormous strides which have been made in this direction are indicated by the existence of such valves as the P.M.2A pentode which is capable of an undistorted output of the order of 150 milliwatts for an anode current of approximately 7 milliamperes, and the more recent P.M.22A pentode which gives a similar output for a high-tension drain of only 4½ milliamperes.

The drawback to the use of these small output valves is that, while they provide adequate power for operating small speakers at moderate volume, they cannot be expected, and are in fact not intended, to drive the large moving-coil speakers which represent the high-water mark of present-day reproducing apparatus. Of course, bigger outputs can be obtained by using bigger valves, or by using two small valves in the conventional push-pull circuit, but in both cases the high-tension current consumption is increased in proportion to the extra power obtained.

For some time past, radio engineers have been experimenting with new forms of power amplification designed to give generous output and at the same time substantially to reduce the amount of current drawn from the high-tension battery. One of the most successful of these methods, and one which has now reached the point when it can be applied practically to sets of all types, is known as "Quiescent Push-pull."

"Rest" Current

The object of this system of amplification is to avoid the losses inevitable in all conventional forms of amplification and due to what is known as the "rest" current of the amplifying valves. When a low-frequency valve is given its normal negative bias and no signal is being received, a steady anode current of a definite value flows continuously in the circuit, and when a signal is being received, the instantaneous value of the anode current varies above and below this mean or "rest" value.

In Quiescent Push-pull, two valves, which may be of the small power or pentode type are employed, the connections of the circuit being substantially the same as for ordinary push-pull. The valves, however, instead of being given their normal bias, i.e. biased to the mid-point of their working grid base, are biased right down to the bottom bend of their characteristic curve; so that the rest current is extremely small, usually of the order of a milliamperes only.

Due to this excessive bias, each valve can only amplify half of each signal wave, the other half being, to all intents and purposes, suppressed; and the connections of the inter-valve push-pull transformer are such that while one valve amplifies what may be termed the positive half waves, the

second valve amplifies the negative half waves.

Valve Type	"Rest" Current for a pair of valves.	Grid-Bias for Quiescent Push-Pull.	Normal Anode Current.
Power Valve, P.M.2A	2 m/A.	-7.5 volts	6 m/A.
Low Consumption Pentode, P.M.22A	2 m/A.	-6.0 volts	6 m/A.
Pentode, P.M.22	4 m/A.	-16.5 volts	12 m/A.

Three important results follow. In the first place, during periods when no signals are being received, the drain on the high-tension battery is practically nil. Secondly, the output of a pair of valves operated in quiescent push-pull is rather more than twice the output of a single valve of the same type. The third point is that practically no current is drawn from the high-tension battery by the output stage except that actually converted into useful work in the speaker.

Saving in H.T.

As previously mentioned, the circuit for quiescent push-pull does not differ materially from that for the conventional push-pull circuit. It is necessary, however, that both the input and output transformers shall be specially designed to meet the new conditions. The input transformer, for example, should have a higher step-up ratio than usual, in order that it may provide the larger grid swing required by each valve—for the effective grid base of each valve is practically twice the normal grid base.

Valves of the ordinary three-electrode power type or of the pentode output type can be employed in quiescent push-pull, and the working conditions for typical Mullard valves operated at 120 volts H.T. in this circuit are given in the accompanying table.

It will be seen that the rest current, that is to say the high-tension current drawn during periods when no signal is being received, is only 2 milliamperes for a pair of valves of the small power or pentode class, and this in itself represents a considerable economy in battery power.

A NOTABLE ACHIEVEMENT

12 Barrs Street, Bristol.

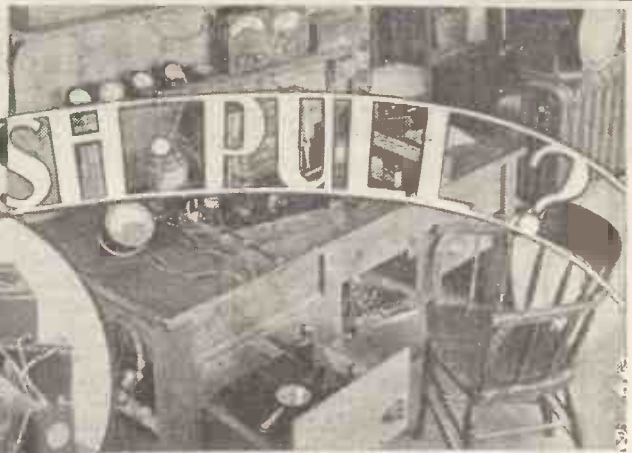
Sir,—I was very pleased to have the opportunity of testing your new set, the "Melody Ranger," here in Bristol, and must say that this definitely is a marvelous receiver. From a technical point of view its qualifications are unique in that it covers all the useful broadcast bands that are at present available with such a simple method of wave-band switching. The ease of handling appears to have been a great point in the design of the set.

I was very agreeably surprised when I found that I could get no less than 61 stations on the medium and long waves, of which 9 were on wavelengths over 1,000 metres. Selectivity seems to be adequate on both wavebands, and I was very surprised to be able to separate easily Zeesen from 5XX and Radio Paris. On the short waves, I managed to tune in six stations during the short time occupied by the test, and this would be considered a notable achievement for a set specially designed for short waves only under these conditions.

I was surprised at the way in which the short-wave programme from Zeesen was received as I was able to obtain this station at full loud-speaker strength without fades and with the reaction condenser not at the point of maximum reaction. I congratulate the designer and the "A.W." Technical Staff on a very excellent receiver.

W. G. SUTTON,

Secretary, Wireless Retailers' Assn.



PRIZE COMPETITION RESULTS

"Melody Ranger" Kits Given Away to 20 Winners

IT has taken two members of the staff nearly eight hours to read through and mark the entries in this extremely interesting competition! Our method was first of all to eliminate all entries containing six mistakes or more and then to work through the others with very great care to find the first twenty, for we have to say at once that nobody sent in a correct list; indeed, the nearest were those of the following seven competitors, each of whom made four mistakes:—

W. O. Bevan, 17 Balgavies Avenue, Craigiebank, Dundee.

G. L. Craike, 5 Mount Row, Grosvenor Square, London, W.1.

J. T. Dawson, 15 Reynolds Road, Old Trafford, Manchester 16.

A. C. Forster, Thicket, Chaddleworth, near Wantage, Berks.

J. W. Holmes, 44 Algernon Road, Lewisham, London, S.E.

T. J. Parham, 47 Algernon Road, Lewisham, London, S.E.

W. A. Twigg, 476 Whalley New Road, Blackburn, Lancs.

There then came two score of competitors each of whom made five mistakes and in addition was indefinite with regard to some of the numbers. From these we judged the following thirteen to be the nearest to the correct solutions:—

W. Allcroft, 3 Clumber Place, Worksop, Notts.

F. W. Ballantyne, 10 Healey Street, Kentish Town, N.W.1.

Mrs. S. G. Duncan, 16 Drumoyne Quadrant, Glasgow, S.W.1.

G. Dunn, 12 Doris Street, Cambridge.

J. Fenwick, "Bythorne," 20 Derby Crescent, Hebburn-on-Tyne.

C. W. Holland, 64 Prebendal Avenue, Aylesbury, Bucks.

A. C. Hoyle, 9 Tinker Road, Rawmarsh, near Rotherham, Yorkshire.

T. Jones, 3 Lodore Road, Fishponds, Bristol.

W. T. Millington, 17 Kingsway, Lincoln.

C. Norris, 12 Dog Hall, Woodfield Road, Lockwood, Huddersfield.

J. Switon, 6 Alston Lane, Glasgow, S.E.

S. Ward, 12 King's Meadow Road, Meadows, Nottingham.

D. Wilson, 1537 Dumbarton Road, Glasgow, W.4.

The total number of entries—excluding a number of letters which reached us after first post on the closing day and which we did not open—was just over twelve hundred.

We have made arrangements for every prize-winner to be sent a kit of parts of the "Melody Ranger." We congratulate all the prize-winners, and believe that they will have great pleasure and satisfaction in building and using the kit.

For the sake of our readers in general and especially of the competitors, we give here

the correct solutions to the clues:—

1. Built for £5.
2. Single switch, but four wavebands.
3. H.F., Det., two L.F.
4. Gramo-radio.
5. Four valves.
6. Metal panel.
7. Simple wave-changing.
8. Easy tuning.
9. Good appearance; a winner.
10. Volume up to standard.
11. Coil covers four wavebands.
12. Matched coils.
13. Ultra-short, short, medium and long wavebands.
14. Low H.T. consumption.
15. Easy to build.
16. Screened.
17. S.G. H.F. variable-mu.
18. Distant stations, locals, and radio-gram.
19. Smooth reaction.
20. Good-quality reproduction.

A talk about one of the results of the great potato famine which occurred in Ireland in the late forties of the last century will be given in the Belfast programme on February 18.

Belfast presents a vaudeville programme on February 14, in which will be heard Ernest Sefton and Betty le Brock, the Comedy Duo, and Mischa Motte.

A PROBLEM which has puzzled me for some few weeks, curiously enough, has only just been solved. You may have noticed the fact yourselves when tuned in to the Italian stations. I had observed on various occasions that when an operatic performance was picked up through the Milan, Turin, or another of the North Italian stations, the actual call came from Rome, and when on another night I was listening to a relay on the 441-metre wavelength, the call emanated from one of the Northern studios. On the same nights, although through, say, Trieste, I picked up the Rome announcer's voice, I did not receive the operatic transmission through the capital station, but a totally different programme, and it seemed curious that a performance apparently emanating from the Teatro Reale in the capital should not be put out by the Rome station.

Opera from Turin

The Italians have noticed that when an opera from Turin is broadcast through the Turin station, the theatre feels the draught in its booking office; and consequently, to avoid this, the Turin performance is only transmitted through other stations, and the same procedure applies to all the studios, namely, that the particular city in which the show takes place is not linked up in the network. You will see at once that by so doing the E.I.A.R. gives its Rome and Naples listeners the opportunity of hearing singers from Milan, Genoa and so on; and in the same way the provincial unseen audience hears those engaged in the Italian capital. The beauty of this arrangement is that the theatres do not suffer in the same way as if their local performance through the ether were available to the local population and everybody is pleased.

OUR LISTENING POST

By JAY COOTE

Do you hear Radio Maroc on the broadcast band? According to my log, I have only picked up this station this winter on rare occasions, and when Athlone is testing at high-power there seems little possibility of even hearing its carrier wave. On the other hand, on the short waves the transmission is well

MOUNTING THE FUSE

In a sub-baseboard-wired set you should never fit removable components underneath so that the set has to be taken out of



its cabinet to make any alteration. For instance, always mount a fuse above the baseboard, so that you can easily replace it if necessary

received. Try for Rabat on Sundays on 23.28 metres (12880 kilocycles) between 12.30—2 p.m., or on 32.26 metres between 8 and 10 p.m. G.M.T. You will find it a very strong signal.

Dual-Band Working

There is a great advantage in owning a receiver which will allow you to find broadcasts on both the broadcasting band and on the short waves. Although it is useful to possess a coil which can give you a transmission above 550 metres, thus allowing you to tune in Ljubljana, which has raised its energy to 7 kilowatts, I think it is even more useful to own a set which can work successfully down to 200 metres. In some receivers I have handled, Budapest was just beyond the range, but on those occasions I was successful in getting good reception from the relays on 207.5 and 209.7 metres. They are, at times, it is true, badly jammed by morse; but it is better than nothing, if you want this particular programme.

This year of grace, 1933, will see a good deal of reorganisation of the German broadcasting system, as the 283-metre channel loaned by Portugal must now be returned. The small Berlin relay will close down, and Magdeburg and Stettin on this channel will take the Hamburg programme jointly with Bremen, Flensburg, and Hanover. The new 60-kilowatt station at Berlin will need no relays. The second German net will comprise Frankfurt-am-Main, Freiburg-im-Breisgau (5 kilowatt), Cassel, and the new Treves station, all operating on 259 metres.

Riga (Latvia) is a station which does not, for the moment, figure very prominently in our logs, but may do so towards the end of this year.

OUR BROADCAST CRITIC

COMEDIANS



Jessie Matthews—heard recently from Radio Paris

THERE are comedians who are comedians, and comedians who are almost tragedians. Perhaps now that the B.B.C. is determined to set Broadcasting House in order by combing out mere amateurs (and those that are merely amateurish) we shall smile once again. If some of the vaudeville people know that basement studio no more, they will only have themselves to thank. The powers that be have suddenly discovered that weak lines and silly jokes are not worth paying fees for. Furthermore, only "microphone voices" are now to be heard. I shall believe it when I hear it for, in broadcasting, hearing is believing.

In two vaudevilles this week I heard four good comedians, taking Clapham and Dwyer as one. Nobody could ever accuse them of poor broadcasting, but I have heard them below their own standard—notably on the night the Prince of Wales was supposed to listen, but caught a train instead. This week, however, supposedly catching a train themselves, I never heard them to better advantage. Perhaps they like travelling?

The next on my list is Horace Kenney who, as a potential channel-swimmer, was admirable. He did not allow one weak line to go through. One of his many good lines deserves quotation. He was being cheered up by a newspaper reporter who told him to be of good courage. "Remember: *Nil desperandum*," he said. Kenney roused himself immediately. "Yes," he said, "if he can do it an *Englishman* can!"

My third is Hugh E. Wright, whose style of humour suits a microphone. I shall look forward to hearing him again.

Last, but by no means least, there was the charmingly Cockney Mrs. Pullpleasure, advertised to play violin solos, but who actually described a film scenario (she called it anything but that) which she had written. I was quite vexed when the announcer told her she would have to stop as she had overrun her time. I want her to finish that story at her next broadcast, and if she ever actually films it, I hope she will send me a ticket to go to see it.

These comedians are *real* comedians. I have listed them because I consider their work of a careful order. They have taken the trouble to polish their scripts until each comedy line is worth broadcasting. That is high technique in comedy-playing. Comedians have no more right to broadcast silly lines than a singer has to sing out of tune. It is all technique, after all.

I was rather intrigued with the Meduria Sisters in songs with guitar accompaniment. The guitar was so arrestingly flat and their voices so charmingly sharp that I extracted

a good deal of entertainment out of them. I thought the Cossack Singers a trifle rough; they buzzed dreadfully through my speaker. I was left wondering whether they meant to!

Anona Winn's ghost story about Broadcasting House hardly came off, but I think she has ability in writing those sort of things. She may yet find her feet. I say this because she admitted it was a new venture. I hope she will try again; she nearly succeeded as it was.

How did you like Graham Payn, the boy soprano? I have trained boys' voices for over thirty years, and I give it as my opinion that Master Graham's voice has seen its best days. He ought to stop singing soprano now. Then he may be a robust tenor, or something nice, later on.

Gretl Vernon sings better than she whistles. At least, I thought so the other night, when I noticed that her whistling was not true to pitch. Still, she is quite attractive in vaudeville.

Floy Penrhyn's American globe-trotter style runs a risk of becoming monotonous unless she is careful to make each broadcast very different from the last. I would have included her in my list of good comedians

PROGRAMME POINTERS

The question of how opera is best presented to listeners is one over which I have pondered. I have urged that operatic concerts should be given regularly, and have suggested that they are better than relays from Covent Garden or Berlin Opera House. I still hold to that opinion. However, I must in fairness say that I think the ideal was reached in a recent broadcast of Offenbach's "Tales of Hoffman" in an abridged form. It was sung in English to splendid words, every syllable of which came through clearly and distinctly. I do not ever remember following opera with as little strain before. I suggest we have a series of "cut operas." All in English, of course. It is almost impossible to get the words over unless the performance is in the studio. Even if opera were sung in English at Covent Garden (a rare occurrence) it is not satisfactory. I plead for "Cut Studio Opera in English."

—for she was very good at times—but for the fact that she let some poor lines through. If she takes the greatest care with her next script we may get some real fun out of her.

I listened to part of the Hallé Concert and heard Debussy's "L'Après Midi." I heard the B.B.C. Orchestra play it less than a week previously—at the last Prom, to be exact. I came to one conclusion. While I consider the B.B.C. strings the best I have ever heard, I am bound to state, "our" wind instruments cannot touch "theirs." Manchester wins easily. The intonation of the Hallé band was perfect. The wind agreed with the strings and the whole thing was clean and sweet. I never hear that with the B.B.C. unless the strings play alone. As soon as wind (in any quantity) enters the whole effect is blurred, simply because "our" wind never plays in tune for more than a bar or two at a time. Very sadly do I say it—but the B.B.C. Symphony Orchestra is inferior, in my opinion, to the Hallé Orchestra *because of this fault*.

Directly that concert was over, I ran round to the other programme and listened to "our" strings led by Marie Wilson and conducted by Arthur Catterall. My opinion was confirmed. The B.B.C. strings take some beating for wealth of tone.

By the way, you really *must* listen to this new series called "Strange Music" on Wednesday evenings. I thoroughly enjoyed Mr. Richard Hughes lecturing on the music of North Africa. Some of the records he played were, naturally, very primitive, but one song attracted me enormously. It was a sort of plainsong, sung well in tune in the key of E minor. Mr. Hughes warned his listeners that the voice of his lady native was a bit strident. It was, but I thought it exceedingly well produced. Also I thought she phrased admirably and seemed to know what she was about.

The Tuesday studio symphony concert pleased me. Sir Landon Ronald always gets the best out of Elgar and I am particularly fond of that serenade for strings. Thea Philips sang splendidly.

Ghosts at Solberga was a failure. They weren't ghostly. Faults in production: too much music and very ugly; dog broadcast far too much; too much shouting; *much* too much sleigh-bell and horse effect. In other words, a moderately good yarn spoilt.

WHITAKER-WILSON.

The MELODY RANGER

THE NATION-WIDE TOUR CONDUCTED BY "A.W." WITH THE "MELODY RANGER" HAS PROVED THAT THIS SENSATIONAL NEW SET IS A REAL WINNER. IT'S GUARANTEED!

BY this time, with the wealth of information given with last week's issue, you will very probably have assembled the "Melody Ranger" and will now be in a position to make use of as much information as possible on the efficient operation of this extraordinary new receiver.

From our nation-wide tests we are sure that the "Melody Ranger" will give good results on *your* aerial, because it has passed stringent tests on every possible type of aerial in different parts of the country.

To get the best out of this set we suggest quite a short aerial will be enough, and from our experience we think a wire of between 25 and 35 feet should prove ample.

With this it is most important to use an efficient earth. All the rules of good earthing that apply to special short-wave sets must obviously apply to the "Melody Ranger," which incorporates full facilities for tuning *all* short waves between about 12 and 90 metres.

Now let us briefly examine the controls of the "Melody Ranger." We have two knobs or dials for tuning, a knob for controlling the volume, a knob for controlling the aerial input, a knob for the reaction, a knob for switching the set on and off and lastly a knob on the side of the cabinet for changing the wavebands.

Altogether, then, there are six distinct controls. This apparently large number of control knobs need not discourage the beginner. For it is a fact that the inclusion of all these controls actually simplifies the overall operation, enabling results to be obtained without critical setting of any one knob.

So-called "simplicity of control" is often a snare and a delusion, for the elimination of certain essential controls on a set of this type, such as the aerial coupler or the reaction, would make the control of the remaining knobs infinitely more critical, besides reducing the "ranging" possibilities of the set.

You can take it that all the knobs on the "Melody Ranger" are useful, and that none are put on the panel just for ornament!

Let us remind you first of the action of the knob at the side of the cabinet, that is the knob on the end of the wave-change-switch mechanism. Looking from the side of the cabinet and turning the knob in a clockwise direction, which is from left to right, you get ultra-short waves at the first setting, that is waves extending from 12 to 28 metres.

At the next position of the knob you get the short-wave band from 26 to 90 metres, so there is plenty of overlap between the two wavebands for short waves. Then at the third position of the knob, still turning it clockwise, you get on to the long waves, from 700 to 2,000 metres, and at the last position, that is as far as the knob will go to the right, you get the medium

ON YOUR

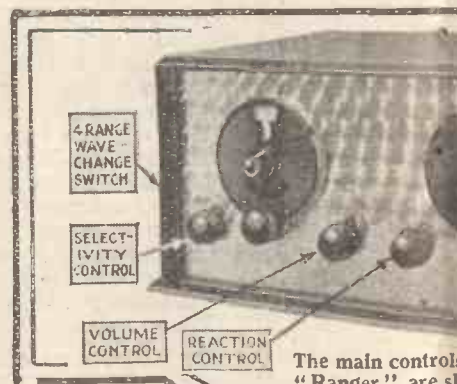
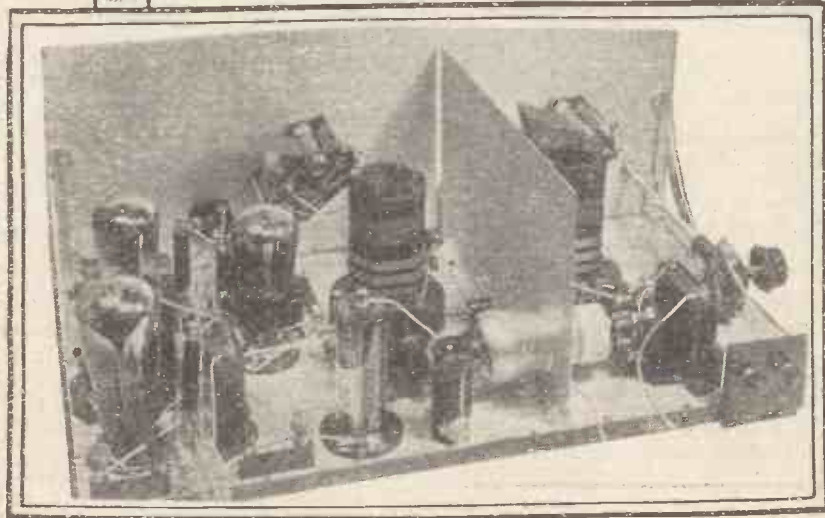
Being an enlightening article on the which, as our Technical Staff point out while being essentially a simple

waves from 175 to 560 metres.

Turning back to a study of the knobs on the front of the set we shall now be able to give you some valuable advice on their operation. Let us make a start with the tuning.

This is really very easy, in spite of the two knobs. The tuning curve given elsewhere in this issue refers to the setting of the right-hand dial, for this is the dial that is more or less independent of the aerial.

Your particular aerial will determine the setting of the aerial-coupler control next to the left-hand dial and that in turn will be affected by the coupler. That is to say, you will find some variation in the adjustment of the left-hand tuning dial according to where you set the aerial-coupling control, but this will not, of course,



The main controls "Ranger" are shown in this photograph.

THE "RANGER" IS NEW, IS DIFFERENT

RANGER

AERIAL

operation of our new wonder set, offers scope for finesse in control of the set to bring in the stations

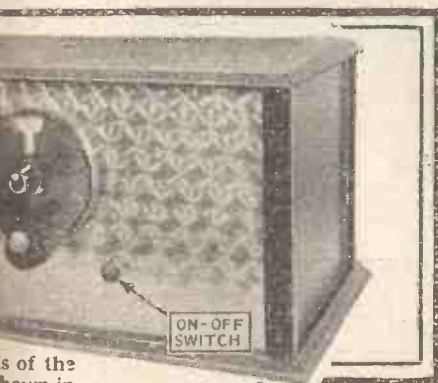
affect the setting of the right-hand or inter-valve tuning dial.

In spite of all this the setting of the left-hand or aerial tuning dial should not be very different from the setting of the right-hand dial when tuning in any given station, especially around the middle portion of the tuning range.

SHORT-WAVE TUNING

When you are tuning in the short waves the carriers of the stations will be tuned in best on the right-hand dial by keeping the set in a state of gentle oscillation. The left-hand dial on short waves can, while you are searching, be made as fairly flat for easy operation.

This is done by turning the aerial-coupler knob until the plates overlap by a third or more. Rather flat tuning on



s of the shown in graph

"From our nation-wide tests we are sure that the "Melody Ranger" will give good results on your aerial, because it has passed stringent tests on every possible type of aerial in different parts of the country."

ALL OVER THE COUNTRY THE "MELODY RANGER" HAS BEEN GIVEN ACTUAL AERIAL TESTS IN EVERY B.B.C. REGIONAL AREA. THESE INSTRUCTIONS ARE BASED ON EXPERIENCE GAINED IN THE NATION-WIDE TEST

the aerial dial will then be noted but while searching on short waves this is really a great advantage.

After locating a station on the right-hand dial you can then proceed to sharpen up the aerial-tuning setting by decreasing the capacity of the aerial-coupler condenser, that is by turning the knob nearly as far as it will go to the left.

You will then find that the station tuned in on the right-hand dial will be limited on the left-hand dial to two or three degrees, instead of coming on a large part of the dial as before.

You should notice an increase in signal strength when the signal is properly tuned in on both dials.

By the way, you remember those little coil taps inside the set? See that they are plugged in so that the direct grid connections are made on the short waves.

On switching over to medium or long waves, by operating the knob on the side of the cabinet as already explained, you should plug the coil taps into the tapings provided.

Tuning on the medium and long waves is a little different from the short-wave tuning. The first thing you will notice is that the tuning of the right-hand dial is now less critical than the left-hand dial.

This is because the aerial coupler, unless you have by chance adjusted it for maximum coupling, will reduce the damping of the aerial tuning circuit to a greater extent than is being done for the inter-valve tuning.

In general, it will be found that although the inter-valve tuning is slightly flatter than the aerial tuning this is not a disadvantage, and in fact it enables stations to be tuned in without too critical an adjustment.

Should the selectivity prove inadequate on the right-hand tuning dial you can

always remedy it by a slight adjustment of the inter-valve pre-set coupling condenser inside the set (just beside the high-frequency chokes).

CONTROL OF SELECTIVITY

A slight decrease in the capacity of this condenser will have the same effect on the detector grid tuning as has the aerial coupler on the grid circuit of the screen-grid valve. That is to say, the damping



will be lowered and the tuning will be greatly sharpened.

In general, though, this increase of selectivity will be obtained only at the expense of the volume, and under normal conditions the pre-set condenser should be adjusted for maximum coupling. Still, there is the delightful feeling that you can always effect a compromise should conditions or your locality prove exceptionally adverse.

We have dealt at length with the tuning of the "Melody Ranger" because upon the

DIFFERENT, AND WE GUARANTEE IT!



THE "MELODY RANGER" IS A MELODY SET WITH AN AMAZING RANGE—AND EASY TO TUNE!

THE "MELODY RANGER" (Continued)

correct operation of these two controls largely depends your success.

Now we must show how to make the most of the other controls. You have, in the aerial-input and reaction controls, two complementary controls that will make or mar the selectivity of the set. This is highly important to remember.

The two tuned circuits, on their own, may prove inadequate to separate high-power stations adjacent in wavelength. This, in spite of the fact that each circuit is designed to get the last ounce of efficiency.

If you will make use of the aerial-input and the reaction as we suggest you will have no trouble in separating all the worth-while stations. This we guarantee, as we are able confidently to do after our extensive tour of the country.

The great thing to remember is that the

reaction amplifies the signal to which the set is tuned to a greater extent than it amplifies all other signals. Thus you might have an incoming signal that is quite loud enough without any reaction.

Where is the aerial coupler, though? Probably half-way in. Then the thing to do if the wanted station is slightly interfered with by adjacent stations is to cut down the overall volume on the aerial coupler and to make up the strength of the wanted station on the reaction. By doing this you will eliminate a very great deal of interference that cannot be cut out by mere tuning.

VOLUME CONTROL

You may wonder perhaps where the volume control comes in. Actually this is a very good control, as it enables the volume of very strong signals, such as the locals, to be cut down without any loss of quality. This is because it is a variable-mu control, altering the amplification of this valve by altering the negative bias on the control grid, a process that does not in any way interfere with the amplifying property of the valve.

We want you to use the volume control purely and simply as a volume con-

trol. Use it to cut down the strength of stations that are too strong. Use it to get the most out of the very efficient high-frequency amplification stage when the signals are weak. Use it all the time just for volume and do your station-separating stunts on the aerial-coupler and reaction controls.

A word or two on the right batteries. Of course you will use a two-volt accumulator for the filament supply. You can please yourself what capacity accumulator you use but for the high-tension

SUITABLE VALVES FOR THE "MELODY RANGER"

	V.-mu S.G.	Detector	L.F.	Power
Mullard..	PM12V	PM2DX (rect)	PM2DX	PM2A
Marconi	VS2	Ht.2	L210	LP2
Osram	VS2	L210	L210	LP2
Cosor	220VSG	210L.F.	210L.F.	220P
Mazda	S215VM	HL210	L210	P220
Six Sixty	SS215VSG	SS210D	SS210D	SS220P
Micromesh				
Lissen	SG215V	HL210	L210	P220
Eta		BY1814	BY210	BW1304
Dario		Super D.at.	Universal	Super Power
Tungsram		PD220	L210	P215
Fotes		BC18	BC9	BDG
Triotron		SD2	TOZ	ZDZ

battery we strongly urge you to use a double-capacity battery.

A set is only as good as its batteries, you know! The "Melody Ranger" takes about 12 milliamperes of anode current when running "all out," which, although

(Continued on page 214)

THE COMPONENTS YOU WILL NEED TO BUILD THE "MELODY RANGER"

CHOKES, HIGH-FREQUENCY

- 1—H.F. choke (Wearite type H.F.O., Lewcos, or Ready Radio).
- 1—H.F. choke (Slektun standard, Lissen astatic, Lewcos, Ready Radio, Goltone, Varley, Climax, R.I., Wearite).
- 1—Short-wave H.F. choke (Igranic type CHORT, Wearite, Goltone, Slektun).

COILS

Two special coils complete with two couplers and extension rods (Lissen).

CONDENSERS, FIXED

- 1—0001-mfd. fixed condenser (Lissen, Dubilier, Telsen, T.C.C., Graham Farish, Goltone).
- 1—002-mfd. fixed condenser (Lissen, Dubilier, Telsen, T.C.C., Graham Farish, Goltone).
- 1—006-mfd. fixed condenser (Lissen, Dubilier, Telsen, T.C.C., Graham Farish, Goltone).
- 2—1-mfd. fixed condensers (Telsen, Dubilier, Lissen, T.C.C., Goltone, Igranic).
- 1—1-mfd. fixed condenser (Dubilier type 9200, Telsen, T.C.C., Igranic).

CONDENSERS, VARIABLE

- 2—0005-mfd. tuning condensers (J.B. type J1.6, Polar No. 3 with phosphor-bronze balls, Utility).
- 1—0003-mfd. series aerial condenser (Ready Radio, special low minimum type Micadi).
- 1—0003-mfd. reaction condenser (Ready Radio type Micalog).
- 1—00017-mfd. preset condenser (Lissen, Ready Radio, Sovereign, Goltone).

DIALS

- 2—Slow motion (Igranic Indigraph type VINIL, Utility type W181).

HOLDERS, RESISTANCE

- 1—Vertical mounting holder (Graham Farish).

HOLDERS, VALVE

- 1—Low-loss screen-grid valve holder (Ready Radio type SG short-wave).
- 1—Low-loss four-pin valve holder (Ready Radio type short-wave baseboard).
- 2—Four-pin valve holders (Ready Radio standard).

PANEL AND BASEBOARD

- Aluminium panel, drilled to specification, 18 ins. x 7 ins. (Peto Scott or Ready Radio).
- Baseboard covered with foil 18 ins. x 10 ins. (Peto Scott or Ready Radio).
- Aluminium screen, drilled to specification, 9½ ins. x 8 ins. (Peto Scott or Ready Radio).

RESISTANCES, FIXED

- 1—1,000; one 30,000, one 40,000, one 1-megohm, one 4-megohm, fixed resistances (Graham Farish type Ohmite, Erie, Dubilier, Goltone, Claude Lyons).

SUNDRIES

- Pair of panel brackets (Peto Scott, Bulgin, Burton).
- Complete extension equipment and mounting brackets (Ready Radio).
- 6 yards thin flex (Lewcoflex, Goltone).
- Connecting wire and sleeving (Lewcos).
- Piece of ebonite 2 ins. x 2 ins. (Beacol).
- 2—Coil tap mounts complete (Peto Scott, Bulgin), or four ¼ in. sockets (Belling & Lee); piece of ebonite 2 ins. x ½ in. (Beacol).
- Knob for volume control (Bulgin type K6).

SWITCH

- 1—Three-point switch (Bulgin Junior, W.B., Ready Radio, Telsen, Goltone).

TERMINALS AND PLUGS

- 2—Terminals, marked Aerial, Earth (Belling-Lee type R, Clix, Eelex, Bulgin).

- 11—Wander plugs, marked H.T.—, H.T.+1, H.T.+2, H.T.+3, H.T.+4, G.B.—, G.B.—1, G.B.—2, G.B.—3, two plain (Belling-Lee Midget, Clix, Eelex, Goltone, Gripso).
- 2—Spade terminals, marked L.T.—, L.T.— (Belling-Lee, Clix, Eelex, Goltone, Gripso).
- 2—Terminal blocks (Telsen, Lissen).

TRANSFORMER

- 1—Low-frequency (Ready Radio, Lissen, Telsen, Multitone, Varley, Bulgin, R.I. Di-feed, Slektun).

VOLUME CONTROL

- 50,000-ohm potentiometer, with insulating washers (Bulgin type VC36, Watmel type T1, Varley, Lewcos, Ready Radio, Sovereign).

ACCESSORIES FOR TABLE MODEL

- 2-volt accumulator (Lissen, Exida, Fuller "Block" C.A.V.).
- 16-volt grid-bias battery (Lissen, Ever Ready, Drydex, C.A.V., Pertrix).
- 120-volt H.T. battery (Lissen, Ever Ready, Drydex, C.A.V., Pertrix).
- Loud-speaker (W.B. type PM4 cabinet model, Rola type F5PM, Atlas, R. & A., Celestion, Epoch), Cabinet (Direct Radio, Peto Scott).
- Mains unit (Regentone type W.I.C., Atlas, Ekco), Earth (Graham-Farish "F.H.")
- Aerial (Electron)

ALTERNATIVE ACCESSORIES FOR CONSOLE MODEL

- Cabinet (Camco "Embassy," Myers-Hunt "White-hall de Luxe," Peto Scott).
- Loud-speaker (W.B. type PM4 chassis model, Rola type F5PM1, Atlas, R. & A., Celestion, Epoch).

THE SET THAT WILL DO MORE THAN OTHERS

The first successful ALL-WAVE RECEIVER -the "Melody Ranger"- congratulations to A.W.

LISSEN STAND BEHIND

For the first time a kit of parts for a technical journal circuit, produced in its entirety by a single radio firm—for the first time a kit set "test reported" by the technical designer—for the first time a kit of parts every one of which has been made in the same factory, matched and balanced, tested and re-tested to meet the demands of the circuit. Lissen have produced this kit of parts for the "Amateur Wireless" "Melody Ranger"—with every screw, every wire, every terminal packed in an attractive carton and branded with the name ZALMA—with Lissen standing behind it!

ZALMA

TEST REPORTED
KITS

**NOT ONLY
AVAILABLE
FOR CASH
-BUT ON
EASY
PAYMENTS**

**NOW
AVAILABLE
FROM
ALL
DEALERS**



This Zalma Kit has been distributed by Lissen to the radio dealers of the country. You do not have to pay cash—you can get it on the easiest of easy terms from your own dealer.

A Special Zalma Blueprint of the "A.W." "Melody Ranger" is yours for the asking—either from your dealer or by posting COUPON below.

**Amateur
Wireless**

19th January, 1933

Messrs. Lissen, Ltd.,
Lissenium Works,
Worples Road, Isleworth.

Dear Sirs,

I am glad to have had an opportunity of seeing your "Zalma" kit of components for building the AMATEUR WIRELESS "Melody Ranger."

We ourselves in the "Amateur Wireless" Laboratory have built a set from your kit, which we find complete in every detail, and on very thorough testing it, I am happy to say that the results were right up to standard, and I have, therefore, much pleasure in approving the "Zalma" Kit.
Yours faithfully,
(Signed) S. Rutherford Wilkins.
Technical Department.

**READ WHAT MR.
RUTHERFORD WILKINS
SAYS OF ZALMA**

KIT 'A'

KIT "A" includes every part required to build the set, except valves.

WITHOUT VALVES

£ 5.5 CASH

or 13/- deposit and 12 monthly payments of 0/-

KIT 'B'

INCLUDING VALVES—absolutely complete Kit, with Lissen Metallised S.G. Valve, S.G. 215, Two Lissen Valves Type L.2, and Lissen Power Valve P.220.

COMPLETE WITH VALVES

or 15/- deposit and 12 monthly payments of 11/6.

CASH PRICE

£ 6.5.0

**ASK YOUR DEALER FOR THE
KIT WITH GENUINE LISSEN COILS**

ZALMA

TEST REPORTED
KITS

MADE BY LISSEN LTD.

**1/- ZALMA
BLUEPRINT
FREE
POST THIS COUPON**

WORPLE RD ISLEWORTH, MIDDLESEX

COUPON

To Lissen Limited, "Zalma" Dept. 2, Worples Road, Isleworth, Middlesex.

Please send me FREE your Zalma Blueprint of the "A.W." "Melody Ranger."

Name

Address

You will Help Yourself and Help-U's by Mentioning "A.W." to Advertisers

Read what the Editor of "Amateur Universal All-Wave Coils as used

LISSEN
The ONE and ONLY
SPECIFIED COIL!

Amateur
Wireless

December 19th, 1932.

Messrs. Lissen Limited,
Lissenium Works, Worpole Road,
Isleworth, Middlesex.

Dear Sirs,

I have much pleasure in congratulating you on the success which has followed the months of research which you have put into the development of your new Universal all-wave coil, some samples of which I have now had in my laboratory for many weeks. Mr. Rutherford Wilkins, who is in charge of the "Amateur Wireless" laboratory, has tried out the new coil in exhaustive fashion, and now that our tests are complete we can say from our own knowledge that your coil efficiently covers all the four wavebands (12 to 2,000 metres). On each of these bands (12 to 30, 27 to 90, 180 to 560, and 750 to 2,000 metres) covering is complete with a .0005 condenser. We are glad to note the very marked advantage of smooth reaction on the short and ultra-short waves. The switching is excellent mechanically; its self-capacity is almost negligible and owing to the material and method of construction the losses are practically nil and consequently there is no tendency to restrict reception at the bottom of the ultra-short wave band.

So good in every way have we found this coil that we propose to incorporate it in a new "star" receiver, the "Melody Ranger," now in course of designing in our laboratory. We feel that the coil is an outstanding achievement and we believe that it will prove the heart of one of the most successful sets we have yet introduced to the public.

Yours faithfully,

General Editor
Editor.

The SINGLE FUNDAMENTAL MAKES THE MELODY RANGER

You must realise that this Lissen Coil is the ONLY thing that makes the all-wave "Melody Ranger" possible. It could not have been produced except by close collaboration between Lissen and "Amateur Wireless." It cannot be satisfactorily duplicated because its design is unique, the difficulties insuperable without months of intense effort. IT IS THE ONE AND ONLY COIL THAT WILL GIVE YOU FULL AMATEUR WIRELESS "MELODY RANGER" RESULTS.

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

Wireless" says about the Lissen in the "A.W." MELODY RANGER

SHORT WAVE WORK IS TRICKY WORK

The first successful all-wave receiver—the "Amateur Wireless" MELODY RANGER. The first time it has been found possible to combine all-wave ranges from 12 to 2,000 metres in a single coil—and Lissen have done it! Short-wave work is tricky work—minute stray capacities, relatively small masses of material such as knobs of solder, have an altogether disproportionate effect upon the tuning efficiency of the coil. Switching is extremely difficult to arrange—the medium and long-wave windings have unexpected effects upon the short-wave coil. You would be surprised if you knew how many times this Lissen "Melody Ranger" Coil has been backward and forward between the "Amateur Wireless" laboratory and the Lissen physicist. It definitely could not have been produced at all except for this close co-operation between the "Amateur Wireless" designers and the unrivalled facilities of the Lissen organisation.

THING THAT POSSIBLE IS

No matter how you intend to buy the parts for your "Melody Ranger"—as a complete kit or part by part, for cash or by easy payments—YOU MUST, FOR YOUR OWN SAKE AND IN FAIRNESS TO A FINE SET, INSIST UPON THE GENUINE LISSEN "MELODY RANGER" COILS. Look for the name Lissen on every coil if you want satisfaction from the set.



15! EACH

The
LISSEN
UNIVERSAL

4 WAVE-RANGE COIL

LISSEN LTD., WORPLE ROAD, ISLEWORTH, MIDDLESEX

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

THE "MELODY RANGER" (Continued)

very economical for such a sensitive set, is rather too much for a standard battery.

PITTSBURG HEARD IN KING'S LYNN
119 High Street,
King's Lynn.

Sir,—I am very glad to have been able to make a test of your new receiver. You most probably know that conditions here are notoriously bad, and I have a very inefficient aerial, which makes the results even more remarkable.

During the afternoon between 3 and 4 o'clock I had little difficulty in picking up about 28 stations on the four wavelengths. Selectivity is not a very big problem here except that Mühlacker often interferes with London Regional, as does Leipzig with the Midland Regional, but I was glad to see that in both cases they could be obtained quite clearly.

Later in the evening, after testing for approximately 1½ hours, the total number of stations which were definitely identified numbered 60—40 of these being on medium waves, 10 on long waves, and 10 on short waves. Finally, I was very surprised to hear W8XK, Pittsburg, which I had not heard before.

Bearing in mind the conditions, I feel that these results are extremely good and ultra-short wavelengths to be a real asset when they are obtainable with so little difficulty.

I should like to take the opportunity of congratulating you on such an excellent receiver.

W. H. PUGH.

The voltage applied to the detector valve may be found a little critical, especially on the short waves, where you ought to experiment to find which voltage gives the smoothest reaction. We suggest 72 to 108 volts as the limits for your adjustments. The screen-grid wants about 60 to 72 volts and the anode of this valve 108 volts. The maximum is applied to the anodes of the last two valves.

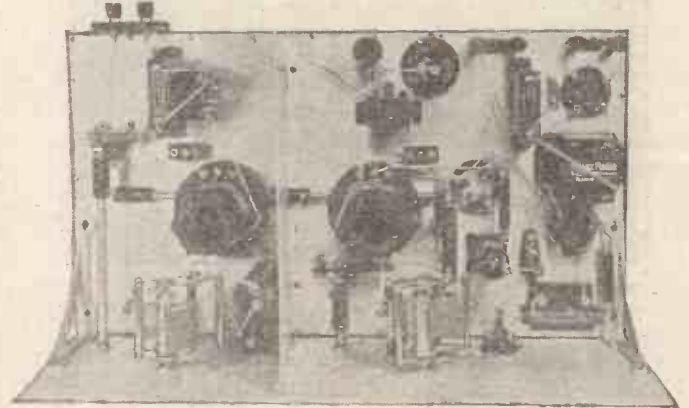
Grid-bias requires the use of a 16½-volt battery, with the maximum negative for the variable- μ valve, and between 1½ and 6 volts for the other grid-bias plugs, depending to some extent on the high-tension-voltage adjustments.

We specify a good speaker for the "Melody Ranger," which is well worth a moving-coil. As there is usually an output transformer in the modern moving-coil chassis we have a simple anode circuit for the power valve of the set, and all you have to do is to connect the loud-speaker terminals of the "Melody Ranger" direct

to the appropriate input connections on the transformer of the speaker.

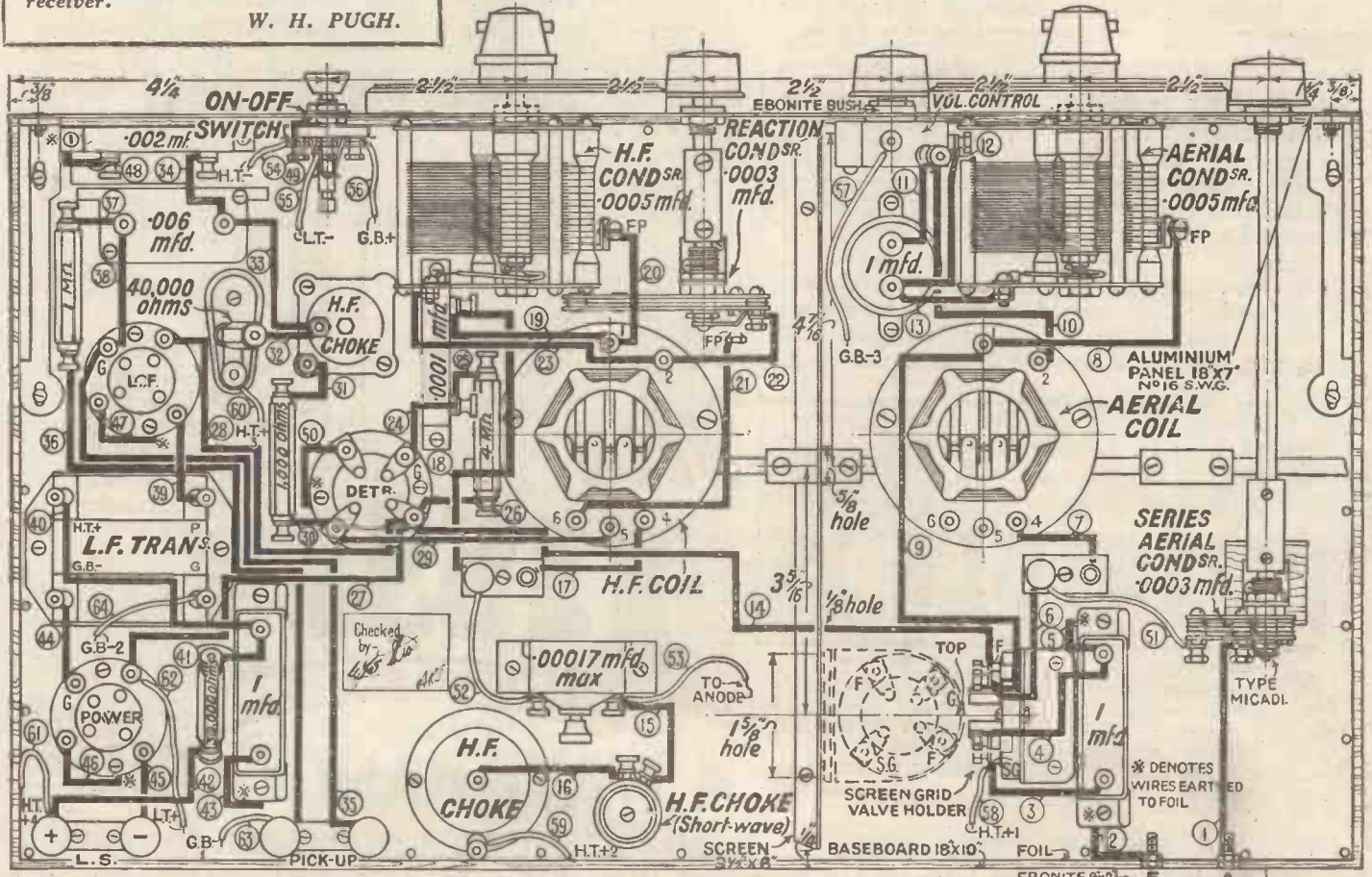
One final point—keep those loud-speaker leads well clear of the battery and aerial and earth leads. This is an *all-wave* set, remember, and short waves must be treated with respect.

Special displays are being made of the "Melody Ranger" in many parts of



The completed "Melody Ranger"

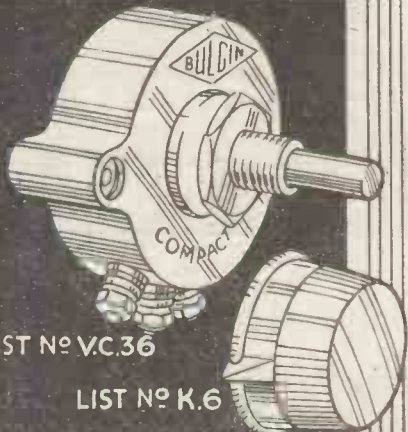
the country. In London the set can be seen in the Radio Department windows of Messrs. Selfridge & Co., Ltd., of Oxford Street, W.



A small scale reproduction of the wiring and layout diagram of the "Melody Ranger." A full size blueprint was stitched into every copy of last week's issue, together with a plan of the wires used, shown actual length

NEXT WEEK: MORE ABOUT THE "RANGER," IN ANOTHER BUMPER NUMBER OF "A.W."

SPECIFIED FOR THE Amateur Wireless "MELODY RANGER"



LIST No VC.36

LIST No K.6

LIST No S.39

In practically every popular circuit which has appeared you will find Bulgin Products incorporated, a sure indication that set designers have every confidence in recommending them. This splendid new receiver, "The Melody Ranger," incorporates a Bulgin Volume Control, specially chosen for lasting efficiency and compactness, and one of the famous Bulgin range of switches, which are renowned for their positive action and reliability.

FIRST MENTIONED AND DEFINITELY INCORPORATED

List No.		Price
VC. 36	VOLUME CONTROL 50,000 ohm	4/-
Complete with K.6 Bakelite Knob and Insulated Bush		
S.39	JUNIOR 3-POINT SWITCH	1/-

Insist on Bulgin—you get the Best

IMMEDIATE DELIVERY

FROM ALL DEALERS



Telephone: Grangewood 3266

Telephone: Grangewood 3267

A. F. BULGIN & CO. LTD., ABBEY RD., BARKING, ESSEX

SLEKTUN

COMPONENTS NECESSARY

Specified for the

FOR BEST POSSIBLE RESULTS

"MELODY RANGER"

SLEKTUN SUPER L.F. TRANSFORMER

The Transformer you need for best possible results. Specified by all leading set designers as the finest obtainable. Recommended for the "Melody Ranger."

Ratios:
2 : 1,
3 : 1,
4 : 1,
5 : 1.

8/6



GUARANTEED 3 YEARS

SLEKTUN H.F. CHOKE

Specially recommended for its exceptionally high inductance combined with low self capacity. A perfect H.F. Choke that is entirely free from dead spots and chokes efficiently from 30 to 2,500 metres. Its extremely low D.C. resistance effectively prevents voltage drop when used in the anode circuit of a valve.

4/-



You will always get better results with Slektun Components. They are recommended for their quality by all leading experts. Ask your dealer specifically for Slektun. In case of difficulty, write for complete list.

SLEKTUN PRODUCTS LTD., 21 Douglas St., Westminster, S.W.1.

Phone: Victoria 3406

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

GUARANTEED BY
G.P. KENDALL
 B.Sc.

READY RADIO KITS
FOR THE MELODY RANGER

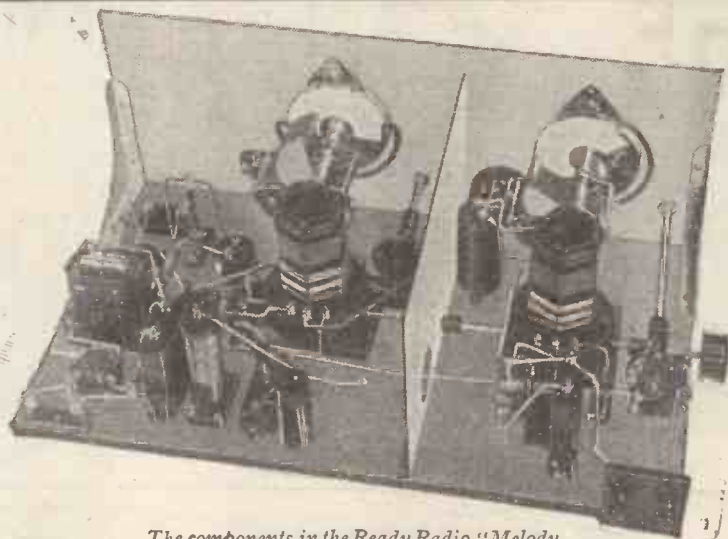
APPROVED BY
S. RUTHERFORD WILKINS.

Everything you need down to the last screw, and including panel ready cut and drilled, baseboard, all screws and nuts, etc., and Jiffilix for wiring—the most convenient method of wiring ever invented.

WITH FULL-SIZE OFFICIAL
 PRINT AND FULL
 INSTRUCTIONS

£5.12.6

Or 12 monthly payments of
 11/3



The components in the Ready Radio "Melody Ranger" kit are not all of the same make, and were chosen by Mr. G. P. Kendall from the best manufacturers in the country.

THE COILS IN THE READY RADIO
 "MELODY RANGER" KIT ARE NOT OF
 LISSEN MAKE

You are assured that the Ready Radio Kit you buy is exactly as approved by Mr. S. Rutherford Wilkins, whose testimonial to the Ready Radio Kit is printed below.

MODEL A

COMPLETE KIT WITH VALVES
 AND WALNUT CABINET WITH
 CELESTION M/C SPEAKER.

£10 14s. 9d.

Or 12 monthly payments of 21/6.

Thank you for the opportunity of testing out the Ready Radio Kit of my latest all-wave set, the "Melody Ranger." I am glad to be able to pronounce it perfectly satisfactory.

The results on all wavelengths were quite up to the standard, and I am sure that everybody who builds the set from your kit will have complete satisfaction.

S. RUTHERFORD WILKINS.

MODEL B

THE KIT WITH THE SPECIFIED
 MULLARD VALVES

£7 11s. 9d.

Or 12 monthly payments of 15/3.

Handsome walnut cabinet, £2 2s. 0d.
 Cabinet, with Celestion Moving-coil
 Speaker, £3 3s. 0d.

Ready Radio "Melody Ranger" Kits contain only components tested and passed in the Ready Radio laboratories under my personal supervision.

Every kit is thus guaranteed to give the astounding results obtained by the designer.

G. P. KENDALL, B.Sc., Chief Engineer, Ready Radio.

READY RADIO LTD., EASTNOR HOUSE, BLACKHEATH, S.E.3.

Phone: Lee Green 5678.

'Grams: "Readirad, Blackvil."

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

MANUFACTURED ONLY BY READY RADIO
SPECIFIED PARTS FOR THE MELODY RANGER
CHOSEN BY "AMATEUR WIRELESS"

The vital components chosen and specified for the "Melody Ranger" are all Ready Radio. Our vast experience in the manufacture of high-efficiency all-wave components is your guarantee that the set you build with Ready Radio Components will give you 100 per cent. efficiency.

DO NOT BE PUT OFF WITH SUBSTITUTES—INSIST ON READY RADIO



The components in the Ready Radio "Melody Ranger" Kit are not all of the same make, and were chosen by Mr. G. P. Kendall from the best manufacturers in the country. All genuine Ready Radio Kits are packed in special display cartons.

For price of complete set see opposite page.

Six reasons why you should build your "Melody Ranger" with a Ready Radio Kit :—

1. We are the largest distributors and manufacturers of kits in the world.
2. We are official distributors for "Amateur Wireless" and all press sets.
3. You get everything you need down to the last screw.
4. Every component and kit is tested and passed under the personal supervision of Mr. G. P. Kendall, B.Sc.
5. Every purchaser is entitled to the benefits of our Registered Service Scheme—your guarantee and safeguard.
6. Every Ready Radio Kit is guaranteed 100 per cent. efficient.

From radio shops everywhere. In case of delay or difficulty order direct from :—

READY RADIO LTD.

Eastnor House, Blackheath, S.E.3



Ready Radio L.F. Transformer Ratio 3:1 8/6



Ready Radio Micalog .0003 Condenser 3/6



Ready Radio Series Aerial Micadi Condenser (Special low minimum) .. 3/-



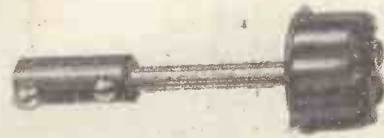
Ready Radio Short-wave Valveholder 1/3



Ready Radio S.G. Short-wave Valveholder .. 1/6



Ready Radio Standard Valveholder 6d.



Ready Radio Short-wave Extension Equipment (Set of two) .. 2/-

Announcement of READY RADIO, LTD., EASTNOR HOUSE, BLACKHEATH, S.E.3. Phone: Lee Green 5673. Grams: Readirad, Blackvil, London

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

WILL D.C. VALVES BE STANDARDISED?

An article by J. H. REYNER, B.Sc., A.M.I.E.E., of interest to all users of direct-current mains apparatus

THE voltage on the heater circuit of A.C. valves has been standardised in this country and on the Continent at 4 volts. Directly-heated valves intended for use with A.C. sets are also provided with a 4-volt filament, and even our rectifying valves are now operated at this standard voltage. This is undoubtedly of great assistance both to the designer and the user. It facilitates the obtaining of replacements, for if the original make is not available an alternative is usually on hand which will, at any rate, give comparable results.

Is the D.C. Market Waning?

With D.C. valves we do not find the same situation. Most people regard the D.C. market as a waning one and not worthy of serious consideration. If there were reasonable prospects of complete replacement of D.C. supply by A.C. within the next year or so, then this attitude might be justifiable, but this is not the case. We have been told for some years now that D.C. supply would be obsolete in a very short space of time, but the number of change-overs which have taken place is comparatively small, and there is no prospect of complete elimination of D.C. for several years to come.

There is also the question of the Continental market to be considered. D.C. on the Continent is still quite prevalent and will remain for many years, because electric supply over there is farther advanced, and any changes will, in consequence, be slower in coming.

In the circumstances it seems that some standardisation on the question of D.C. valves is highly desirable. We have three types available in the indirectly-heated class alone. There were the original Mazda $\frac{1}{2}$ -amp. valves taking 0.5 amp. at 6 or 8 volts. These were followed by the Osram series taking $\frac{1}{4}$ amp. only at 16 volts. Both these types utilise practically the same heater wattage as the A.C. counterparts,

and the characteristics of the D.C. valve are, therefore, very similar to their A.C. brothers and sisters.

This season has seen the introduction of a still more economical type of valve placed on the market by Mazda's in which the consumption is only 0.1 amp. at between 20 and 40 volts. With certain types of valve it is possible to obtain the emission from the cathode with less heater wattage, and in these cases the heater is so arranged that it only requires 20 volts to operate it, while in other cases where a full emission is required 40 volts is necessary. These valves are excellent in use, their principal disadvantage being that the volts begin to pile up, and if one has more than about five such valves in series it becomes questionable whether the mains supply will be able to provide the voltage required. Five 40-volt valves would use up 200 volts, leaving nothing for drop in smoothing chokes, grid bias, etc., so that we soon reach a limit.

Still a Difficulty

True, it is probable that the valves would not all require 40 volts. Some would only use 20 or 30, and in fact the Mazda people have recently reduced the voltage on the valves slightly to allow for this very point, but it remains a difficulty to be contended with.

On the other hand, the question of cabinet heating is almost non-existent with the 0.1-amp. type. With this class of valve the total wattage dissipation in the set is of the order of 50 to 60 watts, of which only 20 are accounted for by the valve heater. This is irrespective of the number of valves in the set, and compares very favourably with the wattage dissipation

on the heaters of an A.C. four- or five-valve set. The remaining watts, of course, are made up by the anode current consumption and by the energy required for the field of the loud-speaker, which is usually connected straight across the D.C. supply. These losses are present in any type of set unless a permanent magnet is used, and it will be seen that the 0.1-amp. type of valve gives us losses certainly no greater than and sometimes a little less than the corresponding A.C. set.

The Heating Problem

Consequently there is no difficulty in dissipating the necessary heat. When we come to consider larger filament currents, however, the problem becomes more



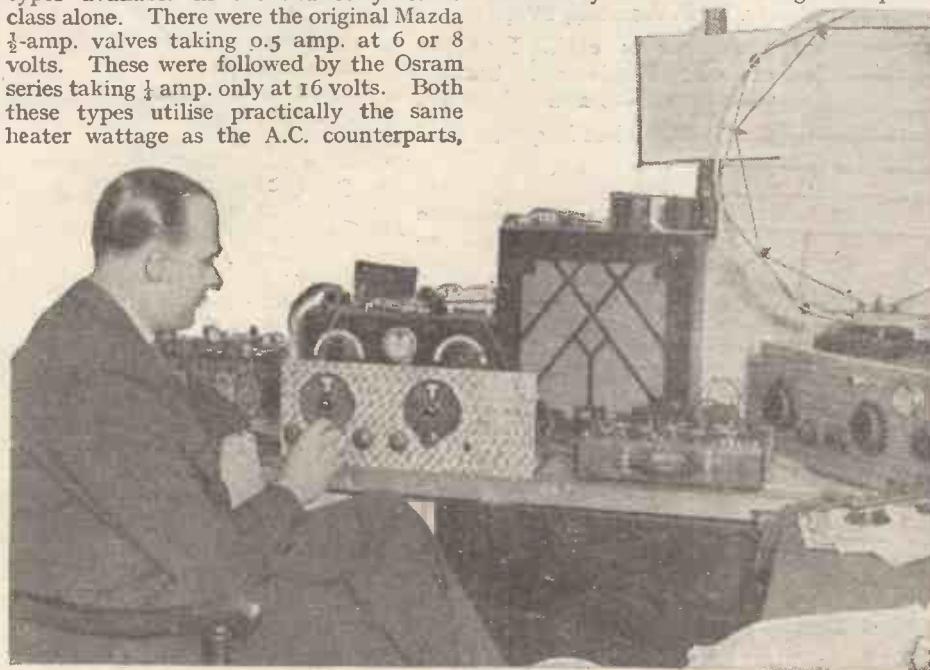
CARE OF YOUR RECORDS

Don't handle the face of gramophone records more than can be helped. Keep the surface of each record dusted and free from grease. Handle the records by the edges, keeping the fingers off the sound track

difficult. At a quarter of an amp., for example, the current is two and a half times as great and the dissipation on the heaters alone becomes 50 watts instead of 20. We have an extra 30 watts to dissipate, which means that the problem of ventilation becomes more serious.

Generally speaking the $\frac{1}{4}$ -amp. size is quite satisfactory from the point of view of the voltage on the heaters, because one can use seven valves in series before any question of limit is reached even with a 200-volt supply, and this is all that would be required for most purposes. Therefore we have to make up our minds as to whether we are prepared to put up with a little extra heat loss and not have to worry our heads about voltage limitations or vice versa.

Messrs. Philips and Telefunken have agreed to standardise on a current consumption of 0.18 amp. at a voltage of between 20 and 25. This will be seen to be practically midway between the two types just discussed, and would provide a very satisfactory compromise for British manufacturers. The extra heating introduced by the 0.18-amp. heater is only some 16 watts more than that with the 0.1-amp. type, which is not a serious increase, and although the figure of 0.18 seems a rather peculiar one there would seem to be good reasons for its adoption.



The "Melody Ranger" in the laboratory. Short-wave tests being carried out on an experimental model of our sensational new set. It is because the "Ranger" has been so thoroughly tested all over the country that we can guarantee its performance

TELSEN SELF-SEALING CONDENSERS

MICA CONDENSERS AND GRID LEAKS



TELSEN MICA CONDENSERS

Adaptable to flat and vertical mounting. H.F. losses, even in the larger sizes, have been virtually eliminated. Grid-leak clips supplied free with the smaller capacities.

In capacities of from .0001 to .002 mfd. - **1/-**
Also .006 mfd. - **1/3**



TELSEN PRE-SET CONDENSERS

Give widest variation between maximum and minimum capacities, and exceptional range of selectivity adjustment when used in the aerial circuit. High insulation with low loss. In mfd. capacities of from .002 (max.) and .00025 (min.) to .0001 (max.) and .000005 (min.) - **1/6**



TELSEN GRID LEAKS

Absolutely silent and practically unbreakable, the resistance being unaffected by the application of different voltages. Guaranteed completely non-inductive. Produce no capacity effects. In capacities of from 5 to 1 meg. - **1/-**

TELSEN TAG CONDENSERS

Of compact and sturdy construction. May be mounted on either insulated or metal panels. Tags enable the condensers to be connected to any other components, either directly or by soldering. H.F. losses are negligible. In capacities of .0001 mfd. to .002 mfd. - **6^D**



TELSEN SELF-SEALING CONDENSERS

represent a very definite advance on current condenser practice. Only the highest quality foil paper and the finest linen tissue are employed, each individual plate being self-sealing and the case itself finally triple-sealed with a newly-discovered bitumastic compound, for permanent efficiency. Every condenser is subjected to rigorous tests up to Post Office and Admiralty standards, the exclusive method of construction making them genuinely non-inductive. They give the highest insulation with complete freedom from breakdown—built for lasting efficiency under all conditions.



TELSEN SELF-SEALING BAKELITE CONDENSERS

Specially designed for 2-way fixing.

Cap. Mfd.	500 Volt Test	1000 Volt Test
.01	1/6	2/6
.04	1/9	2/9
.1	1/9	2/9
.25	2/-	3/-
.5	2/3	3/3
1.00	2/3	3/6
2.00	3/-	5/-



TELSEN SELF-SEALING BLOCK CONDENSERS

In metal cases with soldering tags . . .

Cap. Mfd.	500 Volt Test	1000 Volt Test
4.00	5/6	9/6
6.00	8/-	14/6
8.00	10/6	

RADIO COMPONENTS FOR LASTING EFFICIENCY

ANNOUNCEMENT OF THE TELSEN ELECTRIC COMPANY, LIMITED, ASTON, BIRMINGHAM

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



SETS of the SEASON

GECOPHONE OVERSEAS SUPER-HET

Note flap at side for coil changing

opening for access to the coil units, of which there are three, interchangeable so that wavebands from 12 to 30

tuning, though this is not critical in any way.

The tuning control is a sheer delight.

IT is not often that, among commercial sets, I have to try one that tunes down among the short waves. Having more than a nodding acquaintance of wave-lengths below 100 metres, and more than ordinary respect for Gecophone products, I settled down to an enjoyable evening testing the new Overseas super-het you see illustrated this week.

My tests, partly for pleasure, I admit, extended far into the night, as I twiddled and listened enthralled to voices from thousands of miles away. I got America as clearly as most listeners probably get a European station, and so loudly that I had to make generous use of the volume control to avoid disturbing members of the family who had retired to bed!

The set is doubly interesting because it works entirely from A.C. mains. There is a sort of unwritten law among short-wave fans that to get really good reception on short waves you must use batteries. Yet this set is as quiet on the shortest of the short waves as any battery-operated short-waver I have heard, and infinitely more convenient and reliable in action.

Good Super-het Circuit

Added to the advantage of all-mains working is the super-het circuit, with its unrivalled ability to separate stations.

From an examination of the circuit it is clear that the makers have spent a lot of time perfecting the super-het sequence, which, in brief, consists of a band-pass input tuning a screen-grid valve, which does the first detection in its anode circuit, at which point the oscillations from a separate valve are injected.

Follows a screen-grid intermediate-frequency amplifier, the second detector and a pentode output valve. Three screen-grids are used altogether, all being of the metallised type.

The U₁₂ rectifier valve supplies ample power to the PT₄ pentode output valve, and to the preceding valves in the super-het sequence.

A feature of the set is the teak cabinet, which is built up on very robust lines to withstand the difficult conditions of the various climates of the Empire—for which, incidentally, the set is primarily designed.

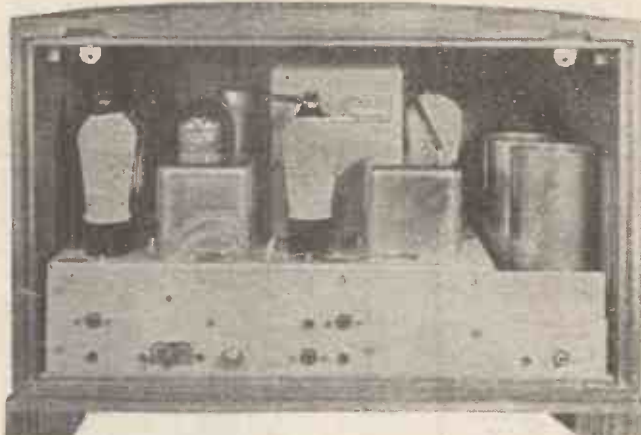
Modern metal-chassis construction, with special treatment of vulnerable parts to withstand tropical heat and moisture, is a great point about this admirable set.

One end of the teak cabinet has a flap

metres, 30 to 80 metres and 200 to 550 metres are adequately covered.

I found these coil units very easy to slip into position. The method of making contact between the coil units and the metal chassis is commendably sound from a mechanical point of view. Incidentally, the use of these interchangeable units has enabled the makers to provide band-pass tuning for the medium waves, where it proves very valuable in avoiding "mushy" background, but as this form of tuning is not used on the short wave ranges, somewhat simpler coil assemblies are made possible.

It is, I think, important to realise that



This back view of the Gecophone Overseas Super-het shows that the chassis construction externally is very neat in spite of the complicated and capable circuit. All the H.F. components are effectively screened, as can be seen.

the super-het action of this set functions on all wavebands covered. There is no question of compromising the performance on any one wave-band to meet the unusual wavelength scope. I was frankly delighted with the short-wave performance, and thought at first that the medium waves might have to suffer. I was quite wrong, for on tuning in the medium-waves I found the set equally delightful, providing a wide variety of foreign programmes with a completely silent background.

The operation of this unique set is really amazingly simple. On the front of the cabinet there are only three knobs, and for medium waves only two of these are used, one for tuning and the other for volume. On the short waves the third knob provides a trimming for the main

tuning, though this is not critical in any way.

The tuning control is a sheer delight.

BRIEF SPECIFICATION

Makers The General Electric Co. Ltd.

Price £25.

Valve Combination Super-het circuit with PT₄ output and U₁₂ rectifier valve.

Power Supply A.C. mains. 100 to 250 volts.

Power Consumption 70 watts.

Type Table-cabinet set needing external loud-speaker. Covers short waves from 12 to 80 metres and medium waves from 200 to 550 metres.

Remarks Best mains all-waver I have yet tested.

On the short waves a critical variation of tuning capacity is of course essential to the successful logging of the many stations to be heard. The Gecophone set has one of the nicest slow motion controls I have ever handled. There is a direct drive for quick searching, mostly used on the medium waveband, and a 30-to-1 reduction for the short waves.

The volume control is very smooth in action, as it not only varies the negative bias on the intermediate-frequency amplifier but also varies the aerial input at the

same time.

In these days of console type sets it is refreshing to try a set such as this with its externally-connected loud speaker. For the test I used the new H.M.V. permanent-magnet moving-coil, and the resulting quality was really pleasing.

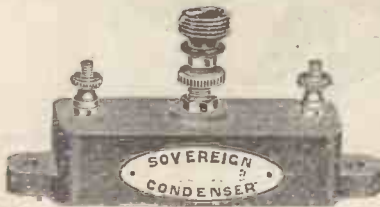
The set is so well engineered that a good speaker, such as the one I had for this test, is really essential to bring out the inherently good quality of the amplification.

Plenty of volume can be obtained, as the undistorted output of the PT₄ is nearly 2 watts, which corresponds with a sensitive speaker to very fine volume, more than ample for even a large room.

I imagine this set will command a ready sale overseas.

SET TESTER

IT HAD TO BE GOOD



SO SOVEREIGN IS OFFICIALLY RECOMMENDED FOR "A.W.'s" GREATEST SET

FOR YOUR "MELODY RANGER" 18 gauge Aluminium Panel 18 in. by 7 in. drilled exactly to required specifications for the "Melody Ranger" in Brown 4/- or Black Crystalline finish Also Aluminium Screen 9 1/2" x 6" ready drilled as specified 1/3

EVERY SIGNAL RECEIVED BY THE "MELODY RANGER" HAS TO PASS THROUGH THIS COMPONENT

It is essential that the pre-set condenser in this set be accurate and stable, or the whole performance of the "Melody Ranger" is jeopardised. By using a Sovereign Pre-set Condenser (.00017 mfd.) you completely eliminate all risk of this, carry out the designer's own recommendation, and save yourself money, without sacrifice to efficiency. The Sovereign Pre-set Condenser as recommended for the "Melody Ranger" is obtainable from all Radio Dealers, and costs only ... **1/3**

Sovereign manufacture a full range of components suitable for the "Melody Ranger" obtainable from all good Radio Dealers.

In cases of difficulty send direct; also for Catalogue to Dept. A.W.2.



SOVEREIGN PRODUCTS LTD., Sovereign House, Rosbery Avenue, LONDON, E.C.1.



SPECIFIED BY



AMATEUR WIRELESS

The designer of the "Melody Ranger" stakes his reputation on its success and chooses a Regentone Mains Unit. "I have officially specified your Mains Unit type W.I.C.," he writes. Type W.I.C. costs £3 10s. Other Regentone Mains Units (there's one for every battery set, to fit inside any portable) from 39s. 6d. or 7/6 down.



A Wonderful Offer! A FINE SPEAKER and A DISTANCE SWITCH



We offer our latest Super Double Magnet Speaker together with a Wates Distance Switch which enables it to be switched on or off from wherever it may be used. The double balanced Armature Adjustable Speaker Unit are of specially prepared Tungsten Steel, and the reproduction is comparable with that of a moving-coil unit. The handsome Walnut-fronted Cabinet is 18 1/2 in. high, 12 1/2 in. wide, 7 in. deep. Send only 2s. 6d. for 7 Days' Trial, if satisfied complete purchase by 7 monthly payments of 5s. (Cash 35/-).

ONLY 26 DOWN

SWITCH OFF FROM ANY ROOM

The Wates Distance Switch given with this Speaker switches the set on or off from ANY room. No need to go to the set to switch off—just press the button and you need not have the main speaker working whilst using a speaker in another room. Equally efficient with battery or mains sets.



(Note:—If for use with H.T. Eliminator Set, special Switch is required, at 3/- extra, making final payment 6/-.)

THE WATES DISTANCE SWITCH SUPPLIED ALONE

If for Battery or Mains set, send only 1/- for 7 days' trial, balance (if satisfied) by 4 monthly payments of 2/6. (Cash, 9/6). If for H.T. Eliminator set, send 1/6, balance (if satisfied) by 5 monthly payments of 2/6. (Cash, 12/6). Simple fitting instructions supplied. Easily installed and a real boon.

Send only 1/-



E. J. HERAUD, Ltd., Dept. A.W.19, NUMBER ONE, EDMONTON, LONDON, N.18.

Branches: 78/82 Fore St., Edmonton; 77 West Green Rd., Tottenham; 34 St. James St., Walthamstow; and 130 Hertford Rd., Enfield Wash.

FILL IN THIS COUPON NOW

Please send me, FREE and POST FREE, full details of Regentone Mains Units.

Name.....

Address.....

A.W.6...

REGENTONE LTD., Regentone House, 21 Bartlett's Buildings, Holborn Circus, London, E.C.4. Telephone: Central 8745 (5 lines). Northern Distributors: W. E. Beardsall & Co., Victoria Bridge, Manchester.

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



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

ORMOND STATION-LOGGING DIAL

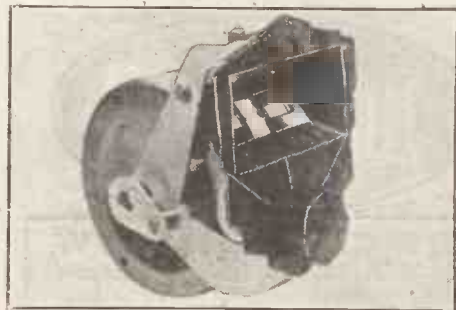
IT would seem that dials are being worn fatter this season! At any rate, we have recently received from the Ormond Engineering Co. a special form of dial known as the Station-logging Drum Dial. This contains a very large escutcheon of which the window is 3 in. by 1 7/8 in. This is recessed by approximately 1 in., and in the rear portion there are three apertures. The centre one is engraved in degrees from 0 to 180, while the two side windows show a blank white ivory scale on which the name of any particular station may be written. These portions of the scale are matt finished and can quite easily be marked with a blacklead pencil. If it is desired to remove or alter any marking, india-rubber will erase the writing completely leaving the surface fresh for further marks.

A further small window in the top of the aperture allows the indications to be illuminated by a small pilot lamp.

The whole device is well constructed and as far as the mechanics of the dial are concerned it is excellent. The size is admittedly somewhat larger than one is accustomed to, but in these days of single-control sets there is no lack of panel space and this is certainly no disadvantage, apart from the slight extra labour involved in cutting out the panel for the escutcheon.

BULGIN UNIVERSAL POWER CHOKES

IN line with their recently announced range of H.F. chokes, Messrs. A. F. Bulgin & Co. have now marketed a complete series of L.F. chokes. We are testing,



A station-logging drum dial by Ormond

this week, the Universal Power Choke, which is rated at 20 henries when carrying 50 milliamperes D.C. The manufacturers make a special point of the fact that the choke gives its rated inductance when

carrying the full stipulated current. In point of fact, we found that the inductance varied but little over the whole range of current, being only 29 henries with no D.C. at all, this value falling to 21.5 at 62 milliamperes.

The choke is housed in a pressed-steel case finished in aluminium grey and makes an attractive unit. It actually occupies 2 3/8 in. square by 3 1/2 in. high, and the terminals are conveniently located on the top so that the component can be housed in a confined space without difficulty of access.

The D.C. resistance of the choke was 400 ohms, which is not excessive in view of the constant inductance characteristic. At a price of 10s. 6d. this choke can be considered good value for money.

GOLTONE DUAL-RANGE COIL

THE "Goltone" Dual-range Coil is an attempt to provide matched inductances from stock. The windings are matched at the works to plus or minus one per cent. on modulated H.F. oscillator

long-wave winding is accommodated in two slots in an ebonite former mounted at the foot of the coil. In between the two is a reaction winding or aerial coupling winding as the case may be.

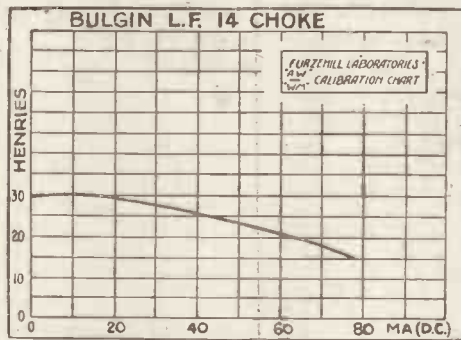
The coil is mounted on a small bakelite base, 2 3/8-in. diameter, having six terminals around the periphery, while an aluminium screening cover, 2 3/8-in. diameter by 3 3/8-in. high, fits over the whole assembly. The



A Goltone screened dual-range coil with the cover off to show the windings

connections from the terminals are brought out through slots cut in the base of the can so that the screening is as complete as possible. It is essential, of course, to mount the coil on a baseplate of metal in order to obtain a completely enclosed coil, but this is quite conveniently done. If a metal baseplate is not being used, a special cover for the underside of the coil can be obtained.

The coil is made in several types, each of which has its own particular application, but the general construction is similar throughout. Altogether, the coil is a good one and will find a variety of applications in the hands of the enthusiastic constructor.



This curve illustrates the test carried out on the Bulgin Universal Power choke

panels so that it is no longer necessary to send out the coils in matched sets, every individual coil being within fairly close limits.

The construction of the coil is simple. The short-wave section is wound on a 1 1/4-in. diameter paxolin former, while the

A CURIOUS legend from the Isle of Rugen in the Baltic is the basis for the play, *The Hill People*, by Janet Muir, which will be given in the Midland Children's Hour on February 21.

An "anonymous" orchestral work, *Syllogism*, is to have its first performance at a concert by the City of Birmingham Orchestra, conducted by Leslie Heward, on February 25.

Sir Richard Arkwright is the title of a play by Edwin Lewis which is to be broadcast to North Regional listeners on February 6. It tells the story of the life of this great inventor.

**ANOTHER BUMPER
ISSUE OF
"AMATEUR WIRELESS"
NEXT WEEK.
USUAL PRICE 3d.**

Recommended for the "MELODY RANGER"



DI-FEED

L.F. Intervalve TRANSFORMER
 With the high permeability
K-METAL CORE

Following the famous series of nickel-alloy core transformers, the "Hypermu," "Hypermite," and "Parafeed," R.I. have evolved this fine and accurately assembled transformer which, although remarkably low in price, maintains the high standard introduced by R.I. in their first transformer in 1922.

The design of the "Di-feed" is based upon further metallurgical research in nickel alloys, resulting in "K" metal, which is used for the core, and enables the primary winding to carry D.C. up to four milliamps, with a no load inductance of approximately 30 henrys.

The excellent overall curve is due to the special method of winding as employed in the famous 'Hypermu,' which reduces leakage to an absolute minimum.

Ask your dealer or write to R.I. for a free copy of the "Di-feed" leaflet, giving diagrams and fullest information for constructors.

R.I. DI-FEED L.F. TRANSFORMER

List No. D.Y. 33. Primary D.C. Resistance 780 ohms. Secondary D.C. Resistance 3,700 ohms. Primary inductance 30 henrys. Ratio 1/3 1/2 or 1/4 1/2 (auto connected). Size 2 1/2 by 1 1/2 by 2 1/8 in. high.

7/-



Advt. of Radio Instruments Ltd., Croydon, Surrey. Phone: Thornton Heath 3211.

Take a leaf

out of the HEYBERD HANDBOOK!

Do you want to know how to build a Mains Unit, a Battery Charger or a Unit for energising the field of a moving-coil speaker? Full details are given in the Heyberd Handbook for kits for many purposes. Seventeen different circuit diagrams. Hints and tips on servicing. And . . . complete details of the many Mains Units, Chargers, Transformers, Chokes, etc., available. Whatever your need in mains working—Heyberd the mains specialists can help you.

Remember—Heyberd components have been consistently specified by "A.W." and contemporary set designers.

POST COUPON

I enclose 3d. stamps for fully illustrated and informative Handbook—"Mains Power for Your Radio," packed with useful hints, tips and diagrams for running the radio from the electric supply.

Mr.
 Address

A. W. 5.



10 FINSBURY STREET, LONDON, E.C.2.
 One minute from Moorgate Station.

PARTEX

RADIO

We Give You More

Part Exchange Experts

Part Exchange Experts

SEND US your requirements for SETS, KITS, COMPONENTS and ACCESSORIES, together with list of goods for which you wish us to give our fullest allowance in PART EXCHANGE. Balance payable by CASH or H.P.

NAME

ADDRESS

A. W. 42/33

PARTEX RADIO, VULCAN HOUSE, 56 Ludgate Hill, LONDON, E.C.4

CONVERT YOUR SET with this CABINET!



The Cameo 'Waverley,' a handsome oak cabinet for converting your set into a modern Radio-Gram. Wonderful acoustical properties. Complete with Motor Board, Baffle and Shelf. Oak: £5 10 0. Mahogany: £6 15 0. For Ostron Four or with polished Woodon Panel: 4/- extra.

See this cabinet at our showroom and send for FREE Cameo Cabinet Catalogue giving particulars of the complete range.

If any difficulty in obtaining Cameo cabinets send direct



Carrington Manufacturing Co., Ltd., Showroom: 24 Hutton Gdn., London, E.C.1. Phone: Holborn 8262. Works: S. Croydon.

Put in 1d. envelope.

NAME

ADDRESS

15 A.W.

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



Short-wave Reception

SIR,—I have read with considerable interest some remarks regarding short-wave reception. The remarks to which I refer are on page 1427 (December 31, 1932, issue) in the paragraph entitled "Once again," and also on page 1434 in the article which is entitled "What is the ideal set for to-day?"

In the first mentioned article the writer foretells of a short-wave super-heterodyne boom for 1933 which, in our opinion at Eelex House, is correct. In the second article the writer concludes by saying "units and adaptors are all very well as a makeshift, but they are a makeshift, and there is no point in denying it."

The Editor invites letters from readers on all interesting radio subjects. For the most interesting letter published each week a general-purpose valve or other component to the same value will be given.

Surely these two statements in one issue of your magazine are a little contradictory? Our long experience has proved to us that an efficient screen-grid broadcast receiver used in conjunction with the Eelex short-wave convertor, is definitely more efficient than a straight 3- or 4-valve short-wave receiver.

As you know, the convertor enables the broadcast receiver and unit to be used as a complete and powerful super-heterodyne short-wave receiver, and the usual tuning difficulties which are so often experienced in a "straight" short-wave set are eliminated with the super-heterodyne principle.

L. H. Fitz-Gibbon.
(J. J. Eastick & Sons).

Cut-price Components

SIR,—With reference to "W. M.'s" letter, I would venture the opinion that, in his particular case, he has been most unfortunate with regard to his valves.

I have just completed the construction of a radio-gramophone (four-valver) working from the mains, and in every instance I have used cut-price components, even down to the smallest fixed condenser or terminal, and I am very pleased to be able to say that I have not experienced the slightest trouble from any component either from age or faulty workmanship.

My valves were purchased at a cut-price shop and, even after a year's service, their emission is still as good as when I first

What Our Readers Think

The Editor does not necessarily agree with the views expressed by readers and does not accept responsibility for the letters published. Letters cannot be published which do not bear the sender's full name and address



bought them. I will admit that I only use the receiver for about two hours in the evening, but whatever wear and tear has been saved by minimum usage has been more than balanced by the heavy work that the valves have had to do when working.

E. W. J. (Woodford Green).

"Hot" Dance Tunes

SIR,—I read with dismay that the S.B.C. Dance Band is going to play "hot" numbers direct from America. About a year ago the dance music was a wonderful cure for bad tempers, but lately it is about the worst possible medium for such. The main object of modern composers seems to be to imitate animals and the noises heard in everyday life—surely this is not what music was supposed to do, but perhaps I am wrong in calling it music. Rhythm it may be, but it certainly is not my idea of music.

I have no doubt that a good many of your readers would disagree with me. May it never irritate them as it does me.

B. O. M. N. (Birmingham.)

Balanced Armature v. Moving Coil

SIR,—I read with interest Thernion's note in the recent test of musical frequencies and in which he states: "I knew that the balanced-armature could not deal with anything very low-pitched."

I might say that I have tried almost every speaker of note that has come on the market during the last twelve months, mostly moving-coils from 39s. 6d. to 70s., but I have not yet been able to find one to

equal or even approach two German (balanced-armature) speakers I purchased twelve months ago. I am fed up with having to reach these speakers down from their shelves to prove to people they are not large moving-coil units and chassis.

These Germans were put under the test referred to along with moving coils (five in all) and they completely outclassed them all.

Wonderful results were obtained from 50 to 5,000 cycles; in fact, from 50 to 150 they stood alone and they will also take a much heavier volume than the rest without any distortion.

G. E. F. (Sheffield).

Improving Selectivity

SIR,—May I express my appreciation of your "Add-on Band-pass Unit," described in AMATEUR WIRELESS dated September 10. I live in a notably bad district as regards reception and had the greatest difficulty in separating North Regional and North National. Foreign reception was therefore impossible. I tried practically everything connected with selectivity and in my search for fresh ideas I came across your band-pass unit. After a hurried "hook-up" I switched on. The results—a detector 2L.F. circuit forty to fifty stations loud, clear and each without a trace of background. Operated according to instructions, Langenberg was clear of Manchester (North Regional) and there was definitely no reduction in signal strength in spite of knife-edge selectivity.

R. S. (Sale).



Christopher Stone at the microphone with Ray Noble, the popular dance music personality, during the making of a record in the H.M.V. studios. Note the special "mike" used for recording

B.B.C. Response Tests

SIR,—I was very interested to see "Thermion's" references in a recent issue, to the response tests broadcast by the B.B.C. Unfortunately I was away from home at the time, but listened to the broadcast, in the N.E. of Scotland, on a popular make of loud-speaker connected to Harris' "Mascot." I consider I have a good ear, but I was astounded at the results I listened to and regretted I was not at home here to test my own speakers!

I do hope, as "Thermion" suggests, the B.B.C. will give us more of these frequency tests at intervals, and they should give us occasionally some broadcast talks on receiving sets and their components, which I am sure would be appreciated by many listeners.

J. E. (Duffield).

Strange Happenings

SIR,—I was interested in "Puzzled's" letter in a recent issue. I have had a similar experience only two days ago, though in this case I was running a loud Tenor-record through the radiogram. When the singer was at the height of the song, a glass globe crashed down. Can anyone explain the cause?

Turning down the light for effect, I found it started to flutter in unison with the sound-frequency of the speaker. Bass notes dimmed the light, whilst the top notes brought the light to double the strength!

E. W. (Middlesbrough).

Watch that Switch!

SIR,—I recently experienced a rather peculiar defect with my four-valve radio-gram, the details of which might be of interest to other readers:

My set had been working perfectly, when suddenly during the reception of a programme it emitted a continuous "Pop-Pop" not unlike the low frequency oscillation known as motor-boating. But as this set is fully de-coupled and has a choke output filter, I ruled out that possibility at once. I observed, however, that this "oscillation" only occurred during loud passages, so with the aid of a spare set and a tester, valves, batteries and loud-speaker were all examined and found to be O.K.

I next turned my attention to the circuit and whilst testing the L.T. supply to the valveholders, I accidentally knocked the panel. This caused the tester to fluctuate for a second or two and then return to normal. An examination of the L.T. switch brought to light a faulty contact spring.

The sound-waves from the built-in loud-speaker apparently caused the switch contacts to vibrate during the loud passages, resulting in a fluctuating L.T. supply—hence the motor-boat effect. A new switch effected a complete cure.

L. N. R. (Liverpool).

Maurice Udloff's Artistris combine light classical music with modern dance numbers. They appear in a Midland Regional ballad concert on February 22, and also illustrate a talk on dance history given by Robert Baker.

New Times Sales Co

MELODY RANGER

Easibilt

CONSTRUCTOR KIT

WITH **LISSEN COILS**

Complete Kit as listed less Valves and Cabinet. Cash or C.O.D. Carriage Paid.

£5-5-0

Or yours for **9/6** DOWN and 11 monthly payments of 9/6

EASIBILT "MELODY RANGER" KIT

Contains these fully Guaranteed Parts

	£	s.	d.
2 LISSEN "Universal Four Range" coils complete with two couplers and extension rods...	1	10	0
2 BELLING-LEE marked spade terminals	0	4	0
2 G.E.C. 1-mfd. fixed condensers	4	0	0
1 DUBILIER 1-mfd. fixed condenser, type 9200	2	9	0
1 GOLTONE .0001-mfd. fixed condenser	5	0	0
1 GOLTONE .002-mfd. fixed condenser	5	0	0
5 ERIC resistances as specified	5	0	0
2 IGRANIC Indigraph S.M. dials, type VINIL	10	0	0
1 KEYSTONE .0003-mfd. variable condenser	3	0	0
1 KEYSTONE standard H.F. choke	3	6	0
1 KEYSTONE short-wave H.F. choke	2	0	0
1 KEYSTONE 3-point switch	1	0	0
1 LEWCO'S 50,000-ohm potentiometer	3	0	0
1 LEWCO'S H.F. choke, type M.C.	2	6	0
1 LISSEN .004-mfd. fixed condenser	1	0	0
1 N.T.S. ready-drilled aluminium panel, 18 in. by 7 in.	4	6	0
1 N.T.S. baseboard 18 in. by 10 in., and foil for same	2	0	0
1 N.T.S. aluminium screen, 9 1/2 in. by 6 in., to specification	2	0	0
1 READY RADIO .0003-mfd. (Micad) condenser	3	0	0
1 READY RADIO low-loss 4-pin valveholder	1	3	0
1 SLEKTUN Coil type L.F. 3-1 transformer	4	9	0
2 SOVEREIGN terminal blocks	1	0	0
2 WAVEMASTER .0005-mfd. var. condenser	9	0	0
1 W.B. screen-grid valve holder	1	0	0
2 4-pin valve holders	1	0	0
1 Pair panel brackets	2	0	0
2 Complete extension equipments and brackets	2	0	0
2 Marked terminals	2	4	0
11 Marked wander-plugs	1	4	0
1 Ebonite terminal strip, 2 in. by 2 in.	3	0	0
1 Pair coil tap plug mounts with screws and ebonite distance pieces	1	3	0
6 Yards flex, connecting wire, screws, etc.	2	0	0

EASIBILT KIT Cash or C.O.D. £5 5 0

KIT AS ABOVE but with Valves less Cabinet. Cash or C.O.D., £7/4/3. Or 12 monthly payments of 13/3.

KIT AS ABOVE but with Valves and Cabinet. Cash or C.O.D., £7/19/3. Or 12 monthly payments of 14/6.

Separate items in this Kit sent Cash or C.O.D. Part Kits value over 40/- on Easy Terms. Orders over 10/- sent Carriage and C.O.D. Charges Paid. Send for latest lists.

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

Please send me..... for which I enclose £ s. d. Cash/Deposit

Name

Address

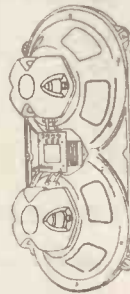
11/4/33

EVERYTHING CARRIAGE PAID

NEW 1933 RADIO ON EASIEST OF EASY TERMS

QUICKEST DELIVERY

CELESTION "REETONE" Model 99 DUAL MATCHED SPEAKER



Consists of 2 matched moving-coil units mounted on one baffle. One unit handles treble input the other the bass, thus rendering amazingly life-like reproduction. Complete with special input transformer. Balance in 11 monthly payments of 7/9. Cash Price £4/15/-. Carriage Paid. Available as 2 Permanent Magnet Units, 2 Energised, or 1 Permanent Magnet and 1 Energised. Specify type required when ordering.

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

ROLA PERMANENT-MAGNET MOVING-COIL SPEAKER F.6. With Universal tapped input transformer. Cash Price £2/9/6. Carriage Paid. Balance in 11 monthly payments of 4/6.

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

LISSEN "SKYSCRAPER" S.G.3 COMPLETE WITH VALVES

CHASSIS KIT

Chassis Model with (Lissen) S.G., Detector and Pentode Valves. Cash Price, Carriage Paid, £4/9/6. Delivered Carriage Paid on first payment of 8/3. Balance in 11 monthly payments of 8/3.

CABINET KIT

With Lissen Valves, Walnut Cabinet and special balanced-armature loud-speaker. Cash Price, Carriage Paid, £6/5/0. Delivered Carriage Paid on first payment of 11/6. Balance in 11 monthly payments of 11/6.

"ZALMA" For Building the MELODY RANGER

KIT "A." — Includes every part required to build the set, complete except valves, batteries and accumulator. With Cash Price, Carriage Paid, £5/5/-. Balance in 11 monthly payments of 9/6.

KIT "B." — As Kit "A" but with Lissen Metalised S.G. Det., L.F. and Power Valves. Cash Price, £6/15/9. Carriage Paid, 12/6. Balance in 11 monthly payments of 12/6.

GARRARD RECORD CHANGER



Plays eight 10 in. or 12 in. records automatically without attention.

Complete with powerful induction motor and sensitive pick-up, this Automatic Record Changer is as easy to install as any ordinary spring gramophone motor and is perfectly reliable in use. Only 4 1/2 in. high above motor board. No electrical knowledge needed—supplied ready for use. Cash Price £10. Carriage Paid. Balance in 11 monthly payments of 18/6.

With **18/6** order

LISTEN TO MY VARIETY PROGRAMME

FROM RADIO - PARIS SUNDAY NEXT 6.30 p.m.



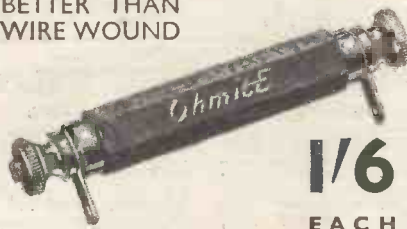
Graham Farish

says :-

"OHMITES never let you down—"

Because they are built to stand their full current-carrying capacity with an ample margin of safety. Never heating up, they cannot break down or create unwanted noises. For your permanent satisfaction fit Ohmites once and for all time."

BETTER THAN WIRE WOUND



1/6 EACH

The popular and efficient resistances for all general purposes. All values 300 ohms to 5 megohms. 1/6 each. For those who prefer interchangeability and convenience in mounting, holders are available, vertical and horizontal, 6d each.

SAFE MAXIMUM CURRENT CARRYING CAPACITY OF "OHMITES"

Table with 4 columns: Ohms, Milliamperes, Ohms, Milliamperes. Includes a note: HEAVY DUTY TYPE APPROXIMATELY DOUBLE THE ABOVE RATINGS, PRICE 2/3.

GRAHAM FARISH COMPONENTS

Graham Farish Ltd., Masons Hill, Bromley, Kent. Export Office: 11/12 Fenchurch St., London, E.C.3

BROADCASTING STATIONS

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

Large table listing broadcasting stations with columns for Kilo-metres, Station and Call Sign, Power (Kw.), and Station and Call Sign (Kw.).

In memory of Richard Wagner, who died on February 13, 1883, the B.B.C.'s Sunday Orchestral Concert on February 12 (Regional) will consist of excerpts from the opera "The Mastersingers of Nuremberg" and the B.B.C. Orchestra (Section B) will be conducted by Adrian Boult. Frank Titterton will make one of his compara-

tively rare appearances among the soloists who also include Miriam Licette and Jan van der Gucht.

The Welsh Interlude for Daventry National listeners on February 11, will be given by Professor W. J. Gruffydd, Professor of Welsh at the University College, Cardiff.

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 answered; 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.

TUNABLE HUM

HUM of any kind is usually absent from modern mains receivers whether they are commercially built or home-constructed from good designs. But with A.C. sets, even when the conventional and well-known methods of preventing tunable hum are incorporated, it is quite possible that this most objectionable form of interference may be induced by some set of circumstances which cannot be arranged for in any method of design. Here are a few examples which have recently come to light. In every case the remedy is obvious.

FROM THE POWER CIRCUIT

An expensive radio-gramophone was placed against the inside wall of a semi-detached house. Tunable hum, which had not been evident when the set was tested in the retailer's showroom, was very bad, breaking up both speech and music. The service engineer from the makers, called in when the retailer confessed himself beaten, moved the set into the centre of the room for testing purposes and found no hum at all. Immediately it was placed back in its original position hum developed. Investigation showed that the power circuit of the next house was enclosed in the party wall and ran immediately behind the set.

A three-valve local-station receiver working on a mains aerial gave excellent results in every room but one. In each room a separate earth had been made, and in the room in which tunable hum developed, the earth connection was found to be broken beneath the surface of the soil. In this case ordinary hum also developed to some extent and gave a clue to the trouble. In two other cases tunable hum was caused by long and wandering aerial leads; in one inside and the other outside the house. In both these cases high-frequency was apparently induced into the mains by direct inductive coupling between the aerial and some portion of the lighting circuit.

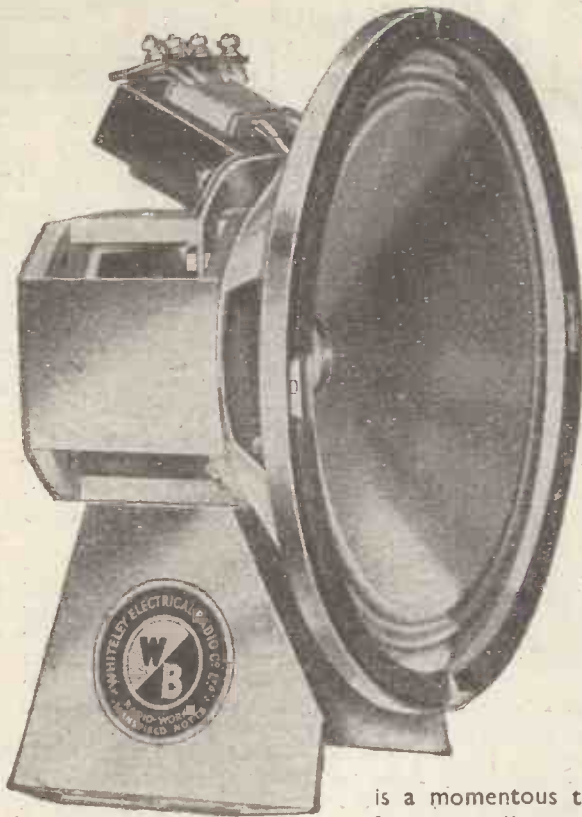
STRAY H.F.

The most remarkable case is left to the last because it is only interesting as an example of the curious things which can happen. A very well-known commercial set, one particular example of the hundreds, possibly thousands, that were made, gave bad modulation hum when it was put on test at the works. Nothing would induce it to behave properly, and it was at last sent to the research laboratory of the firm for investigation. The set was eventually pulled to pieces and a loop of thin rubber-covered flex was discovered stretching right across the base of the chassis. How it got there it is difficult to imagine, but its effect was to give a coupling between the mains transformer and the H.F. side of the set which developed a really ferocious tunable hum on all stations.

E. H. R.

Owing to an error and an oversight, the Telsen kit advertised in last week's issue of this paper was called the Telsen "Astral" Three instead of the Telsen "Astrala" Three.

Why it is SPECIFIED for the 'MELODY RANGER'



"Mansfield Senior" PM4 Chassis 42/-, complete with tapped transformer. Handsome Cabinet in Oak to suit, 25/-.

The new MANSFIELD MAGNETIC SYSTEM

is a momentous thing—it gives greater power from a smaller magnet. It makes possible in a moderate priced moving-coil speaker a performance at least equal to very high priced instruments. It allows the use of a heavy steel framework without magnetic loss; the "Mansfield" magnet cannot lose its magnetism. The magnetic flux is concentrated where the work is done instead of being diffused over the whole system. The magnet is 30 per cent. more efficient than good cobalt steel of same weight and 10 per cent. more efficient than chrome steel of three times the weight. Write for leaflets and HEAR it at your dealer's; you will be AMAZED

"MANSFIELD" Permanent Magnet Moving-Coil SPEAKERS



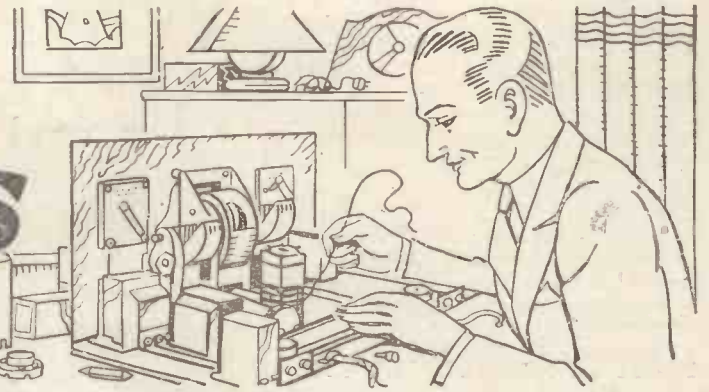
PM4 Cabinet.

A revolutionary development

Whiteley Electrical Radio Co., Ltd., Dept. A, Radio Works, Mansfield, Notts. Irish Free State Distributors: Kelly and Shiel, Ltd., 47 Fleet Street, Dublin.

In my Wireless Den

Weekly Notes by W. James : : Theoretical and Practical



ON 25 CYCLES

THOSE who have a 25-cycle supply of alternating current will probably know that the usual 50-cycle apparatus is not satisfactory on their supply.

A power transformer designed for a 50-cycle supply has a primary winding of, say, 1,200 turns for a 200-volt circuit and an iron core of a given size. When this is connected to the supply, the other windings not being joined to the circuit, the primary is acting as a choke coil and is passing quite a small current.

Connect this 50-cycle transformer to a 25-cycle supply and the current may easily be excessive. The turns could be increased to 2,400, but then finer wire would have to be used to get the turns in the space available.

In practice the number of turns would be increased and also the amount of the iron. The no-load current might be allowed to exceed that in the 50-cycle case, but an increase in the number of turns or in the size of the iron core, or both, is necessary.

A 25-cycle transformer will work on a 50-cycle supply, but there is no sense in buying a special 25-cycle transformer, excepting for a 25-cycle supply.

WHAT ABOUT GRAMO-RADIO

I WONDER how many people have been puzzled to find that although their sets reproduce radio very well the quality is not good when a pick-up is used.

This is usually due to two things. In the first place, most sets have a certain amount of correction in the low-frequency side which compensates for distortion produced in the high-frequency circuits. The correction may not be perfect, but the low-frequency side is usually adjusted to provide good quality by making good the loss in treble notes produced by the tuning circuits and the detector.

When a pentode output valve is used the correction is fairly easy.

The second point is that the average pick-up has a characteristic which, taken with the well-known deficiencies of records, is far from uniform over the whole musical range. The output from the pick-up itself usually needs correcting.

If the pick-up is connected direct to the low-frequency side of a set, therefore, the results are not likely to be satisfactory, as the correction in the set will usually not be that required. Additional correction is

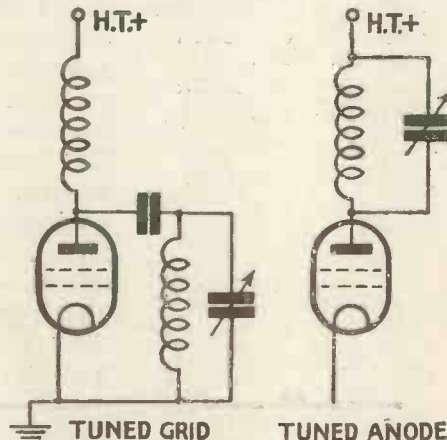
needed and this should be connected between the pick-up and the set.

T.A. AND T.G.!

THE tuned-anode and tuned-grid circuits are really quite alike in some respects and quite different in others.

Considering the high-frequency side first we see, upon looking at the accompanying diagram, that there is in each case a tuning coil and condenser which usually have equal values. But while the tuned-anode coil is directly connected to the anode of the valve, the top of the tuned grid is joined through a fixed condenser.

Normally, this fixed condenser has small H.F. losses and so there is nothing much lost here. In the tuned-grid circuit, however,



This diagram illustrates the point raised by W. James in the accompanying paragraph regarding tuned-anode and tuned-grid circuits

is a high-frequency choke coil and this may add to the losses of the circuit. But a good one has but little effect and may often be neglected.

The result is that the circuits behave practically alike at high-frequency.

Now when we come to look at the circuit from the point of view of its steady voltages we see great differences. Thus in the tuned-grid circuit one side of the tuning condenser is earthed while in the tuned anode one side is joined to high-tension positive.

Thus there is a difference in the cost of the two circuits, they must be used in the correct way and the performance of the two circuits is very much the same.

The tuned-grid circuit, because of the

H.F. choke in the anode fixed to the valve, is sometimes the more stable of the two and then again when a gang condenser is being used this circuit has an advantage.

FLEXIBLE RESISTANCES

FOR some time now it has been the custom to fit in sets for voltage dropping, de-coupling, and similar purposes, wire-wound resistances of the flexible or spaghetti type.

These resistances consist of a core of insulating material over which is wound the fine wire resistance. At each end a connecting tag is fitted and the outside covering is a piece of systoflex or similar material.

An advantage of this type of resistance unit over the old-fashioned clip resistance is that the part can be connected directly to the points in the circuit without fitting or the use of additional connecting wires. The flexible resistances are cheap as well.

But now it seems that the carbon or metallised rod type, having wire ends, is likely to be more useful for many purposes than the flexible wire-wound pattern. These new units are cheap and are not liable to break down.

The wire-wound type was sometimes rather fragile, but the new units are strong and seem well suited to the needs of modern sets. To meet the convenience of set makers the resistances are often colour coded, three markings being used.

A SILENT BACKGROUND

IT is sometimes rather difficult to make a mains set with a perfectly silent background. Hum seems to be picked up in so many ways, that one cannot be too careful in arranging the parts and the wiring.

Bad joints in the wiring often result in hum and a bad contact between a grid pin of a valve and the socket of the holder may be troublesome.

If, therefore, you should be troubled with a little hum, go carefully over the wiring to make sure all connections are good and then see that all valves make sound contact.

Another point, too, is that earthing the metal chassis or the circuit in a different place may improve matters. The position of the mains lead might be such that it is putting hum into the set. It is little things such as these which must be gone over when one is trying to remove the last trace of hum.

CONVERTING—AND TROUBLE

I WONDER how many times an amateur with a good battery set has decided to convert it, with disastrous results.

The fact is that you must expect trouble, unless the set is a simple one. It is the high-frequency stages that are so difficult to deal with.

Mains valves have characteristics very different from the equivalent battery types, and good results will rarely be obtained unless the parts used happen to be just right and the layout decided on is good.

In many cases it is better to fit a mains unit for the high-tension circuits and to trickle-charge the filament accumulator. Most battery sets can be connected to a mains unit without altering the circuit in any way. Running costs are small and it is just a matter of the purchase price, which should be reckoned as being the expenditure on a number of dry high-tension batteries.

Always choose a mains unit capable of providing the set with, say 150 volts. The usual set will take this voltage very well and the increase in the output, as compared with when a 120-volt battery is used is well worth having. There are normally no hum troubles or instability.

UNIVERSAL VALVES

IT seems possible that one day we shall have valves so arranged that they may be used as pentode, screen-grid, or ordinary triode valves according to the way they are connected.

A pentode has, of course, three grids and an anode, as well as the filament in the case of battery types, and the heater plus cathode in most mains types. A mains valve, therefore, normally has six electrodes, but in the pentode one of the grids is joined inside the valve to the cathode, leaving five electrodes to which connection can be made through the contacts provided.

A screen-grid valve is really much like a pentode in construction, excepting that it has only two grids, or one grid and a screen grid. The valves have totally different characteristics, but the pentode type can be made to be suitable for high-frequency amplification.

There is no doubt about the advances being made in valve construction. In due course we shall find new types available. The result will be that it will be possible to obtain a much better performance.

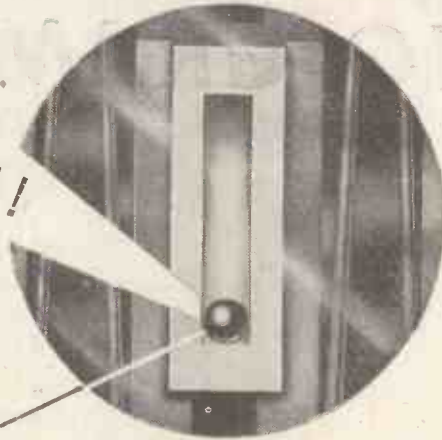
When you come to consider the matter it must be admitted that wireless reception is very far from perfect. Improvements are needed in many directions and it is interesting to observe that the valve makers are doing their part.

The Manchester Tuesday Mid-day Society's Concert on February 7, to be relayed from the Houldsworth Hall will consist of songs by Schubert and Hugo Wolf sung by Marjorie Ffrangcon Davies.

The Liverpool Philharmonic Society's concert to be relayed from Liverpool to the Northern Region on February 7, includes a performance of a suite, *Triumph of Sensibility*, by the young composer, Ernst Krenek.

WARNING !

DOWN!



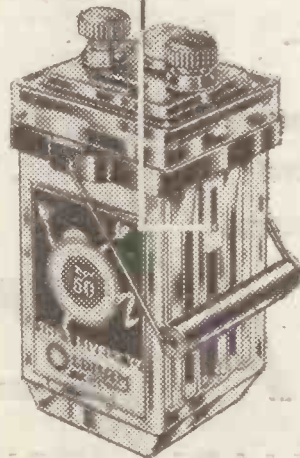
...time
to recharge!

It's annoying when your accumulator runs down without warning and such a good programme, too!

The Lively 'O' Automatic Discharge Indicator has ended all guesswork and disappointments. Go to your dealer and see the Lively 'O'—see the Automatic Discharge Indicator—the little window with the bead that warns you when it's time to recharge.

That is only one of the many novel features which have made the Lively 'O' a worth-while proposition.

NOTHING EXTRA TO PAY FOR THE AUTOMATIC DISCHARGE INDICATOR



The **Lively 'O'**
ACCUMULATOR

MADE BY

OLDHAM
REGD.

0.25 (Green Label) 25 amp. hrs. (actual) for 2-valve Sets - - - 5/6	0.50 (Red Label) 50 amp. hrs. (actual) for 3-valve Sets - - - - 9/6	0.75 (Blue Label) 75 amp. hrs. (actual) for 4-valve and Larger Sets - 12/6
---	---	--

British made by Oldham & Son, Ltd., Denton, Manchester, and at London, Glasgow, Belfast and Dublin. Makers of Dry Batteries and Accumulators. Established 1865.

The New Home-Built de luxe RADIO-GRAMOPHONE using

TWO VARIABLE-MU VALVES

ONE of the best battery-operated Radio Gramophones yet designed by the "W.M." Technical Staff, this astonishingly selective set includes two variable mu valves for great range and good quality of reproduction. There are two Tuning Controls so that no ganging troubles will be experienced, thus greatly simplifying the preliminary adjustments.

With the "Words and Music" Radiogram you bring to your fireside all the best European and some of the American stations

OTHER CONTENTS INCLUDE

FOR THE CONSTRUCTOR

USING THE HARRIS ETHERGRAM: Percy W. Harris gives further details about his latest set. THE HOME SHORT-WAVER, a screen-grid four, by the "W.M." Technical Staff. THE A.C. CALIBRATOR ON TEST.

TECHNICAL FEATURES

RADIO ON THE ULTRA-SHORT WAVES: Marchese Marconi explains his latest achievements (with circuit diagrams). ARE MODERN VALVE HOLDERS GOOD ENOUGH? WHERE DO THE WATTS GO? By J. H. Reyner, B.Sc., A.M.I.E.E. SMOOTHING GEAR IN YOUR MAINS SET: W. James. THE USE OF REACTION: Capt. H. J. Round. PUSH-PULL POWER FOR BATTERY SETS: W. James. HOW I RECEIVED 541 STATIONS: W. Oliver.

GENERAL ARTICLES

A REAL RADIO SERVICE FOR THE EMPIRE: With a special zone map of the world. NEED FOR EMPIRE SHORT-WAVE SETS. GETTING AMERICA ON THE SUPER 60. RAILWAY RADIO. MUSIC OF THE MONTH. WORLD'S BROADCAST WAVELENGTHS: Over 380 stations arranged in order of wavelength, including short-waves.

GRAMO-RADIO SECTION

OUTSTANDING RECORDS. Special items that deserve attention. A CUTTER FOR FIBRE NEEDLES. By Charles H. Fisher, A.M.I.A.E. CHOOSING YOUR NEW RECORDS.

A SPECIAL 16 PAGE
SUPPLEMENT
DESCRIBES IN FULL DE-
TAILED CONSTRUCTION
of the "WORDS AND
MUSIC" RADIOGRAM and
includes a half-scale
BLUEPRINT

WIRELESS MAGAZINE

FEBRUARY ISSUE

OF ALL BOOKSTALLS AND NEWSAGENTS



Photograph shows Noel Coward, author and composer of "Words and Music" and the curtain at the Adelphi Theatre, London.

We want everybody to feel that this set is something more than a mere machine with four valves, some coils and some condensers. That is why we have named it after Noel Coward's latest show at the Adelphi Theatre, London. Noel Coward is the most versatile man connected with the stage to-day and he has done much to raise the artistic standard of popular entertainment. In the "Words and Music" Radiogram, the "Wireless Magazine" Technical Staff offers you the best radio entertainment that can be obtained.



ON SALE TO-DAY PRICE 1/4

EASY TERMS

Everything Wireless supplied on lowest terms;
Prompt Delivery Guaranteed,
Price List Free on request.

NEW LISSÉN "SKYSCRAPER" KIT
including valves. Cash Price £4/9/6
With order 5/-
And 11 monthly payments of 8/6

LOUD SPEAKERS UNITS
NEW BLUE SPOT 90 P.M. MOVING-COIL With order
UNIT. Cash Price £2/19/6 5/-
And 11 monthly payments of 5/6
NEW EPOCH 20- PERMANENT MAGNET With order
MOVING-COIL UNIT. Cash or C.O.D., £1/15/- 5/6
And 6 monthly payments of 5/8

ACCESSORIES
12 EKIDE W.H. HIGH-TENSION ACCUMU-
LATORS. (120 volts, 5,000 M/A). The
cheapest and best high-tension supply
where mains are not available. Cash Price £3/15/-
And 11 monthly payments of 7/-

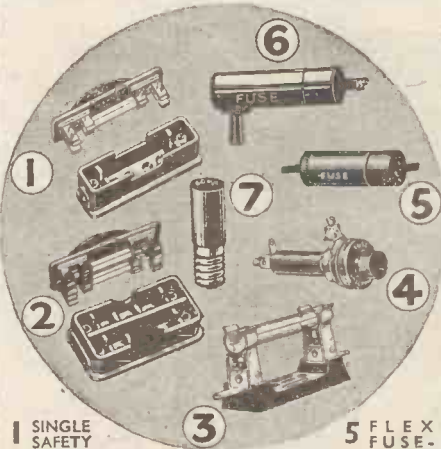
ATLAS ELIMINATOR. A.C. 244. Three H.T. With order
tappings. 20 M/A output. Cash Price £2/19/6 5/-
And 11 monthly payments of 5/6

SET OF THREE NEW VALVES, Mazda, Cosmor With order
or Mullard. 1 S.G., 1 Det. and 1 Power. Cash Price £1/12/3 5/2
And 6 monthly payments of 5/2

Rola Speakers supplied on similar terms.
All above carriage paid.
To avoid delay, will customers kindly send first
payment with order.

The
LONDON SUPPLY COMPANY ESTD 1925
11, Oat Lane, Noble St., LONDON, E.C.2
Phone NATIONAL 1977

FUSES and FUSE-HOLDERS



- 1 SINGLE SAFETY BASEBOARD FUSE-HOLDER ... 1/6
 - 2 TWIN SAFETY BASEBOARD FUSE-HOLDER ... 2/6
 - 3 SINGLE OPEN FUSE-HOLDER ... 9d.
 - 4 PANEL FUSE-HOLDER ... 1/6
 - 5 FLEX FUSE-HOLDER ... 1/-
 - 6 WANDERFUSE ... 1/-
 - 7 "SCRUFUSE" ... 6d.
- Ratings: 60 m/a. 150 m/a.
250 m/a. 500 m/a.
750 m/a.

SPARE FUSES. All ratings and sizes, 6d. each.
Each rating a different colour (avoiding possibility of error).

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

BELLING-LEE
FOR EVERY RADIO CONNECTION

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

"THE RADIO PLAY BRIDGE"

(Continued from page 191)

which break the relay circuit when the potentiometer is in any but the faded-out position. Although the play producer is several floors above the actors, he is almost as much in touch with them as though he were in the studio.

When the producer wants to give instructions he throws a key on the "D.C." unit which connects his mike with the loudspeakers and housephones in the studios.—this disconnects the output of the amplifier feeding his own speaker.

The other keys on the "D.C." panel are each under a separate input control "pot." The keys are connected to relays associated with particular studios. When one key is thrown a relay operates which lights the green cue-lamp in the studio connected to that particular input.

In two of the studios where vaudeville is normally done, the listening-room gear includes microphones. A producer of vaudeville programmes can therefore give instructions to artistes from the desk at which he is listening to the rehearsal.

When the play producers want visual control they can go to the sixth floor and use the 6A, 6B and 6C studios.

But normally the ordinary "D.C.P." control is satisfactory and the speaking-back arrangements between studio and producer are almost as good as personal production in the studio itself.

A CABINET FOR THE "MELODY RANGER"

THE photograph shows the Myers Hunt Whitehall *de luxe* cabinet recommended for the "Melody Ranger" console model. Builders of the "Melody Ranger"



The special Whitehall *de luxe* cabinet fitted with a "Melody Ranger."

who wish to house this in a console type cabinet will be interested in this handsome cabinet produced specially for the set. The Whitehall *de luxe* cabinet is supplied with the panel ready drilled to accommodate the "Melody Ranger" controls, and the baseboard and shelf are included. The price of the complete cabinet is only 33s. carriage paid or C.O.D.

Readers may be interested to note that a lecturer is required to help with a class in "Wireless Science" one afternoon a week (Wednesday preferred) at the Working Men's College, Crowndale Road, N.W.1. Further details may be obtained on mention of "A.W.", from the superintendent.

Safety First

insist on

ERIE

HAND-TESTED

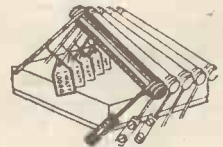
RESISTORS

for the

"MELODY RANGER"

and incidentally

SAVE MONEY



COMPLETE KIT
of 5 as recommended
with special connecting links

5/3

Erie Resistors are GUARANTEED against breakdown. They are safe, silent and constant under load. Use them with confidence. Obtainable from all radio dealers or from the RADIO RESISTOR CO., 1 Golden Square, Piccadilly Circus, London, W.1.



Now you can have extra loud speakers in bedroom, kitchen, and lounge—and switch your set ON or OFF from any room. Equally efficient with All Mains or Battery Set. Operating power merely a flash lamp battery.

More than doubles your radio pleasure. Absolutely safe and easy to install.

WATES Costs only 9/6

DISTANCE SWITCH

Of all radio dealers with full instructions.
Send p.c. for folder, 'Radio and Comfort.'

WATES RADIO LTD.

184-188 SHAFTESBURY AV., LONDON, W.C.2

Tune in on this New Wireless Instruction



The I.C.S. Wireless Courses cover every phase of wireless work, from the requirements of the youth who wishes to make wireless engineering his career to the man who wants to construct a broadcasting set for his home and, at the same time, to know how and why it operates and how to locate any faults that may develop.

No branch of industry has ever progressed as rapidly as wireless and the rate of progress is increasing. Only by knowing thoroughly the basic principles can pace be kept with it. Our instruction includes American broadcasting as well as British wireless practice. It is a modern education, covering every department of the industry.

OUR COURSES

Included in the I.C.S. range are Courses dealing with the installing of radio sets and, in particular, with their Serviceing, which to-day ultimately concerns every wireless dealer and his employees. The Operating Course is vital to mastery of operating and transmitting.

There is also a Course for the Wireless Salesman. This, in addition to inculcating the art of salesmanship, provides that knowledge which enables the salesman to hold his own with the most technical of his clients.

We will be pleased to send you details of any or all of these subjects. Just fill in and post the coupon, or write in any other way, stating which branch of Wireless interests you—the information you require will be forwarded at once.

YOU MAY USE THIS COUPON

International Correspondence Schools, Ltd.,
Dept. 36, International Buildings,
Kingsway, London, W.C.2.

Without cost or obligation, please send me full information about the Courses I have marked X:

- THE I.C.S. WIRELESS COURSES
- THE I.C.S. RADIO COURSES

Name..... Age.....

Address.....

POST CARD

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 trade 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.

Goodman Speakers

IF you are on the lookout for a new permanent-magnet speaker, then get details of the Goodman Dreadnought. This has a cobalt steel magnet and a specially treated Veratone cone, giving maximum sensitivity. A multi-ratio transformer is included, of course. If you want a cheaper model moving-coil, there is the Renown constructed on somewhat similar lines. **936**

Coils for Your "Ranger"

The real "heart" of the "Melody Ranger" is the special four-waveband coil used, which enables the set to tune from 12 to 2,000 metres. I am sure that all enthusiasts will want to know about this special Lissen coil, and I have just received latest details from Lissen on this latest triumph, and I advise you to write through my free catalogue service for a copy of this information. You'll be interested, I'm sure. **937**

Choking the H.F.

A Wearite H.F. choke is specified for the "Melody Ranger," and I see that Wearites have now produced a truly helpful folder describing a whole range of H.F. chokes of all sorts, including that used in the "Ranger." Circuits and technical details are given, and you will find this folder handy in your radio "den." **938**

Ediswan's Book

The latest revised edition of the Ediswan H.T. battery book contains a considerable amount of useful matter of interest to every battery set user. As well as advice on the correct choice and use of H.T. batteries, with a list of appropriate "Don'ts," it includes a useful "Stations received" chart, with long and short wavelength lists, and space to fill in listeners' own dial readings. Copies can be obtained free through my Catalogue Service. **939**

A Handy Pre-set

Another thing specified for the "Melody Ranger" is the Sovereign pre-set condenser. Pre-sets are always useful, but they must be accurate and soundly constructed. The Sovereign pre-set is really good. Full details are available in the latest Sovereign catalogue. **OBSERVER 940**

RECOMMENDED FOR THE MELODY RANGER

WATMEL TYPE 1 POTENTIOMETER

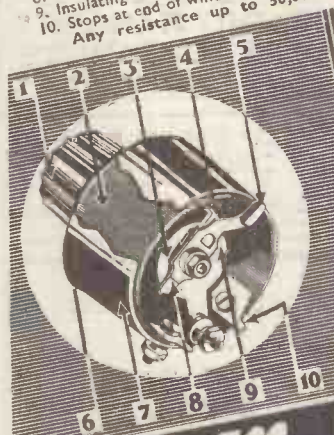
50,000 Ohms
5/6^D

Our policy this year is to specialise in Potentiometers and Volume Controls of all types. You can, therefore, be certain when purchasing a Watmel Potentiometer, that you are obtaining the very best from a firm that is concentrating on this type of component.

THE WATMEL POTENTIOMETER (Type 1)

This resistance is wound on a special non-shrinkable former which gives perfect contact. Note the points:

1. Polished pointer former.
 2. Wire-wound former.
 3. Large contact plate.
 4. Positive stop.
 5. Contact finger. Phosphor bronze.
 6. One-hole fixing—brass bearing bush resulting perfect bearing.
 7. Bakelite case, protects winding.
 8. Back self-cleaning contact.
 9. Insulating bush to insulate spindle from panel.
 10. Stops at end of winding.
- Any resistance up to 50,000 ohms, 5/6



Watmel COMPONENTS GET THE BEST OUT OF ANY SET

If you cannot get this component from your local dealer, write to us and we will send what you require within 24 hours. Write for Catalogue.

Watmel Wireless Co., Ltd., Imperial Works,
High Street, Edgware.
Telephone: Edgware 0323.
(M.C.80)

2/9 VALVES 3/6

Each **BRITISH MADE—POST FREE** Each
 210 H.F. Simply tell us your Set and we **230 Super Power.**
 210 L.F. will supply the correct B.H. **And also the**
 210 Det. Valve. All our valves are **famous 220 S.G.**
 220 P. fully tested. **at 4/- each!**

MONEY RETURNED IF NOT SATISFIED Send to-day to—
The B.H. Valve Co., 8 Station Road, Finsbury Park,
London, N.4. Phone - Avenue 3118. Trade Enquiries Invited



GRIPSO
MIDGET
WANDER PLUG
 THE PATENT SIDE SPRING
 STRONGLY GRIPS ANY SIZE
 BATTERY — 12 TITLES
THE GRIPSO COY.
 28 VICTORIA ST. LONDON, S.W.1

EACH **1½**



10,000 Gramo-motors from Stock.
Big Cash Discount Allowed!
 Make a Gramophone of Radiogram. Order
 loose kits and assemble them at home.
 Get for 3d. our new 64-page catalogue
 with scale drawings and instructions
 how to make cabinets, gramophones or
 radiograms, and what parts to choose. We
 sell motors from 7/6, tone-arms, soundboxes,
 1/8, pick-ups, big volume horns, loud-
 speakers, radio kits, complete receiving
 sets, gramophones, radiograms and parts.
 Established 1903.—The Regent Fittings
 Co., A.W., 120 Old Street, London E.C.1.

★ **REPAIRS**

★ to Loudspeakers 4/-. Blue Spots 5/-.
 Transformers 4/-. Moving Coils, etc.
 quoted for. Prompt Service. 12 months
 guarantee. Trade Invited. Streatham 6618.

★ Loud-speaker Repair Co.,
 2 SHIPKA ROAD, Balham, London

Famous maker's Offer!



5 Radio-Gram 65/-
CABINET for
7 DAYS' FREE TRIAL
(OR 10/- MONTHLY.)

Follied Oak and Piano built! The
 acoustic Tone brings a fine thrill. Makers
 to Radio-Press, B.B.C., 2,000 clients.
 Other Models 35/- to £15.
 Photographs and List FREE.

PICKETTS Piano-Tone
 Cabinets,
 (A.M.) Albion Road, Bexleyheath.

**For "MELODY RANGER"
 PICKETTS CABINETS**
 Recommended for Best Results

RADIO SUPPLIES

Send your list of Radio needs for our quotation. Kits, Parts,
 Sets, etc. Everything in Radio stocked. Prompt delivery;
 seven days' approval. Catalogue free. Taylor and Standard
 Wet H.T. replacements stocked.

A. TAYLOR, 57 STUDLEY ROAD, STOCKWELL, LONDON.

An "Amateur Wireless"
 Handbook

The **HOW**
 and **WHY**
 of **RADIO**

By **ALAN HUNTER**
 2/6 NETT.

Of all Newsagents and Booksellers, or
 2/9, post free, from "Amateur Wire-
 less," 58, 61 Fetter Lane, London, E.C.4.

SHORT-WAVE NOTES

ANYONE seeing a particularly good singer in a talking picture would, if possible, like to hear the same singer via the radio. During the past few years with my short-wave set I have heard from America quite a number of the more prominent film stars and some of the more popular radio artistes. Such stars as Bing Crosby, the Mills Brothers, Charles Rogers and His Band, Kate Smith, etc., broadcast very frequently, and one gets to know the stars not only by name, but also the sound of their voices. Consequently, one is infinitely more interested in a film in which these stars appear, as you actually see what they look like and in their next broadcast can visualise them actually singing in the studio.

Through W2XAL

On Saturday afternoon, Bing Crosby was broadcasting over the N.B.C. network, and I picked him up through W3XAL. Signal strength was excellent and there was absolutely no fading or static. How a man can sing sentimental songs before breakfast is rather beyond me. The concert carried on until four o'clock and concluded with a recital by Hilda Burke, contralto. Here again programme matter seemed rather heavy for the time of day, which would be eleven o'clock in the morning, U.S.A. time.

The Change

This period of the year usually brings about a change in schedules for the more prominent and enterprising of the short-wave stations, and if you are not very careful you will be listening in at the wrong time of the day and be wondering why you cannot obtain some of those favourite stations which are usually so reliable. A good example of this is those old friends W2XAD and W2XAF. Until quite recently they have been radiating every day of the week between 6 and 8 p.m. for W2XAD, and 10 to 4 a.m. for W2XAF. For the next two months or so these schedules have been rearranged, and in future W2XAD will be "on the air" on Mondays,

Wednesdays and Fridays, between 7.30 and 8 p.m. and on Sundays between 7 and 9. W2XAF will be broadcasting on Sunday, Monday, Tuesday, Thursday and Saturday nights between midnight and 4 a.m.

VK2ME Sydney for the month of January will be broadcasting between 4 and 6 in the evening, Australian time, equivalent to 6 to 8 a.m. G.M.T., and a short transmission will follow at 10 p.m. until between two and three o'clock.

W2XAD Again

Viewing the present conditions it seems as if we shall have to wait only six or seven weeks before W2XAD comes in again at its old strength between nine o'clock and midnight.

This week-end was one of the best this year for short-wave reception. On Sunday afternoon the number of stations that could be heard was really astonishing. LSY, W3XAL, Radio Coloniale, W2XAD and Prangins all came in at good strength before four o'clock. Between four and five I heard W1XAL on 31 metres, which is distinctly good at this time. Another remarkable feature was the reception of 20-metre American amateurs. No less than twelve of these could be received quite comfortably on headphones.

A station I had not heard before was Buenos Aires on 16.2 metres. I cannot trace this station on my log, neither is it in any of the schedules. Moscow was operating for practically the whole of Sunday on 50 metres, and was being relayed by Moscow REN on 45.38 metres.

FILM TELEVISION

ONE outstanding problem in television arises from the fact that the intensity of reflected light is only a small fraction of the direct beam used for scanning. For instance, it is comparatively easy to get clear-cut effects in shadow or silhouette pictures, because here the full strength of the scanning beam either passes directly to the photo-sensitive cell, or else is entirely cut off; whereas to show the features, in full face, one must depend upon reflected light.

One solution of the difficulty is to "shoot" the scene with a cinema camera and then to scan the film so produced with a very strong ray of light, the film being placed between the scanning lamp and the photo-sensitive cell, so that the latter is acted on by transmitted as distinct from reflected light. This may appear rather a complicated process, but a combined film-television projector is now available in which the completed film can be televised thirty seconds after being taken.

M. B.



I.F. ARRANGEMENT

Give a little thought to the layout of the I.F. stages of your super-het. Keep the intermediate-frequency transformers close to their associate valves. The leads from the I.F. cans should be taken direct to the anodes, as shown here.

A programme of the music of Vaughan Williams, conducted by the composer in person, will be given by the Belfast Philharmonic Society at its third subscription concert in the Ulster Hall on February 17.

★ CONVERT YOUR PRESENT SET— BATTERY or A.C. to "QUIESCENT"

THE "Quiescent" Push Pull system is revolutionising battery receivers— AND it can be adapted to your existing set! Be it a 2, 3 or 4 valver, the addition of one or two components will give you treble the undistorted output you are now obtaining— sufficient with M.C. speaker to fill a dance hall. A remarkable feature of this new system is that about half the usual battery consumption is used.

★ Send us the theoretical diagram or a blueprint of your set, enclosing 6d. in stamps and a stamped addressed envelope, and we will indicate the alterations necessary for conversion to "QUIESCENT." If, however, your circuit is not applicable, we will return your 6d. in stamps.

YORK RADIO, "Arvon," YORK RD., NEW BARNET

EVERY PART FOR EVERY CIRCUIT

LEONARD HEYS

BLACKPOOL

TO TRADERS ..

You will obtain courteous service, painstaking and PROMPT attention to all your enquiries for

MELODY RANGER NEW

GENTURY SUPER S.T. 300, S.T. 400

Telsen, Ready Radio, etc.

Kits and Components and all other trade requirements. Cash with order or C.O.D. at full recognised discounts (to bona-fide traders only, retail enquiries ignored.)

Write for details of our splendid trade service.

LEONARD HEYS, FARADAY HOUSE HENRY STREET - - BLACKPOOL

EASY TERMS PROMPT DELIVERY

Any Amplion, Blue Spot, Baker, Celestion, Epoch, Goodmans, Igranic, Lanchester, Ormond, R. & A., Rola, Sonochorde, or W.B. Moving Coil Speaker supplied promptly. **Send 5/- only** and pay the balance by monthly instalments. No references. Entirely private and confidential. Write for Catalogue and details to:

TURNADGE & PARTNERS, LTD.
110, Fleet Street, London, E.C.4
Telephone: Central 1903

300 FT. COPPER SPACED AND WIRE INSULATED IN 30 FT. INDOOR AERIAL

(Reps.) **SENSATIONAL CONDUCTIVITY SUPER-SELECTIVITY** (Prov. Pat.)

Plastape

SELF MOULDING AERIAL

10 STRANDED - "GRID-SPACED"

The arrangement of the wires. Ask about Extension or Earthing.

Lies flat against walls—moulds itself to any shape over which it is laid—only 1" wide—almost as thin as a visiting card (Non-sticky).

COLOURS TO TONE WITH YOUR ROOM (Buff, Grey, or Red).

Clear-sharp stereoscopic reception without background. Wonderfully efficient.

Send P.O. now (or from your dealer)

200 ft. wire (20 ft. length) ..	2/6
300 ft. wire (30 ft. length) ..	3/6
150 ft. wire (15 ft. length) ..	2/0

KENDEN MANUFACTURING Co., 16 Toaks Court, Cursitor St, E.C.4


B.B.C. STAFF CHANGES
DULCIMA GLASBY, the well-known play adaptor, is leaving the B.B.C. Mr. Bowker Andrews, who has been on balance and control work, is going to form a permanent library of records and Blattnerphone tapes at Broadcasting House.

DANCE BANDS IN FEBRUARY
THOSE who like dance music will have their fill in February, when a wonderful galaxy of talented bands is down for broadcasting. Included are Harry Roy, Ambrose's Blue Lyres, Roy Fox, Ambrose, Lew Stone and Geraldo.

KIT CAT CHANGES
SOME day, perhaps, when the possibility of broadcast relays from most public buildings is fully realised by architects and builders, the question of acoustics will become as important a factor as the design of the building itself. After more than ten years of broadcasting, however, experts can only point to the lounge of a seaside hotel and to a disused wharf beside the River Thames as providing satisfactory conditions for musical broadcasts. Bona fide places of entertainment, built or reconstructed since broadcasting came to make acoustics a pretty problem, are in the main notorious for an utter absence of any

STABILISING THE L.F.

A grid leak connected in the L.F. circuit between the grid and the grid terminal of



the L.F. transformer often cuts out instability. The arrow shows a leak connected in this way

claim to acoustical perfection. Sometimes, owing to unsuitability on this ground, a place of entertainment has ceased to figure in the B.B.C.'s list of relays, as for instance, the Kit Cat. But now, happily, conditions there are changed. The proprietors of the restaurant in the Haymarket, London, are Gaumont British and they have recently engaged Roy Fox to conduct the dance music in the restaurant as well as to advise, on dance music in the British studios. Their first step has been to improve the acoustics of the Kit Cat so as to make possible the relay to listeners of Roy Fox and his band; and on Wednesdays a relay will take place until further notice.

The Cats' Fugue is one of eight of Domenico Scarlatti's pieces which Michael Mullinar has chosen for a recital representing the genius of this early eighteenth century Italian master. Midland listeners will hear this recital on February 24.

A programme of Irish music will be broadcast from Belfast on February 16, which will include a number of Irish airs played on four trombones—a very unusual arrangement!

TAYLEX WET H.T. BATTERIES

Give long service, improved volume and tone. Very economical. Replacements for Taylex or Standard batteries at low prices; details post free. Also Bargain List; Radio Kits and parts at lowest prices.

A. TAYLOR, 57 STUDLEY ROAD, STOCKWELL, LONDON.

NO ONE can build the "MELODY RANGER"

without this essential cabinet which includes the battery shelf and combined baseboard panel ready drilled to specification



RECOMMENDED BY "AMATEUR WIRELESS"

The "Whitehall" Console Cabinet is made of Solid Figured Oak.

11/3 Brings one to your door: balance in 3 monthly payments of 8/9 Cash Price 33/- carr. paid or C.O.D.

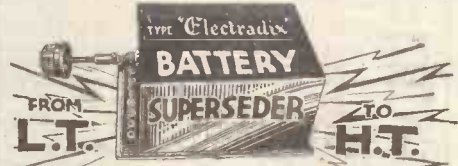
MYERS-HUNT

CABINET CO.,

7 AUSTIN STREET, LONDON, E.2.

Telephone: Bishopsgate 3037

Get a GENEROMETER



BATTERY SUPERSEDER—No H.T. Batteries needed for your set even if you are not on the mains. An H.T. Battery run down to 30 volts is useless and has to be thrown away. Yet you pay for the wasted volts.

The GENEROMETER makes H.T. from your L.T. 2-volt battery, rectified and smoothed. Gives three tappings, and lasts indefinitely. A boon and blessing to all using H.T. Reduced from £3 15s. New and Guaranteed.

37/6 from us only.

PARCELS.—For the Experimental Amateur who wants a useful junk-box of oddments, our famous Bargain Parcels of Electrical and Radio Sundries from dismantled W.D. sets, surplus stocks, etc., with Switches, Wire, Chokes, Condensers, and coils, and a host of useful parts, post free, 10lb. 7/-, 7lb. 5/-.

ELECTRADIX RADIOS, 218, Upper Thames St., E.C.4

IGRANIC COMPONENTS

WILL TELL YOU HOW GOOD THEY ARE



"REPAIRS? SEND THEM TO ME"

When the repair has been O.K.'d by me, you can be sure your component is as good as new. All repairs are laboratory tested and guaranteed for 12 months. Any make of speaker unit, Transformer or Pickup 4/-; Blue Spots 5/-; Moving Coils from 5/-.

Address your repairs to: **REPAIR DEPT. A. WEEDON POWER LINK RADIO CO.**
185, EARLHAM GROVE, LONDON, E.7.
(Phone, Maryland 4344)

GRIPSO

PATENT NAMED PLUGS & SPADES

LISTS FROM MAKERS

THE **GRIPSO COY.**

28 VICTORIA ST., LONDON, S.W.1

L.T. PLAIN OR NAMED

GRID

1/2 EACH

To Ensure Speedy Delivery mention "A.W." with Order

PREPAID ADVERTISEMENTS

Advertisements under this head are charged **THREEPENCE PER WORD**, minimum charge **THREE SHILLINGS DEPOSIT SYSTEM**.
 As the publishers cannot accept responsibility for the bona fide of advertisers in this publication, they have introduced a system of deposit which it is recommended should be adopted by readers when dealing with persons with whom they are unacquainted. It is here explained.
 Intending purchasers should forward to the Publishers the amount of the purchase money of the article advertised. This will be acknowledged to both the Depositor and the Vendor, whose names and addresses must necessarily be given. The deposit is retained until advice is received of the completion of the purchase, or of the article having been returned to and accepted by the Vendor. In addition to the amount of the Deposit, a Fee of 6d. for sums of £1 and under, and 1s. for amounts in excess of £1, to cover postage, etc., must be remitted at the same time. In cases of persons not resident within the United Kingdom, double fees are charged.
 The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to
"AMATEUR WIRELESS" ADVERTISEMENT DEPARTMENT,
 58/61 FETTER LANE, LONDON, E.C.4.

NEW EDITION RELIABILITY WIRELESS GUIDE.—Describes on page 23 Stupendous free gift.
NEW EDITION RELIABILITY WIRELESS GUIDE.—Complete Constructor's Encyclopedia detailing principal advertised components. Traders supplied.
NEW EDITION RELIABILITY WIRELESS GUIDE.—Incorporating Station Log sent post free.—J. H. Taylor and Co., 3 Radio House, Macaulay St., Huddersfield.

B.T.H. R.K. MOVING-COIL SPEAKERS. Guaranteed new, unused. Manufacturers' surplus. Original price, 6 guineas. Lightly sensitive and wonderful tone response. Will handle up to 10 watts output. Available for 6 v., 100 v., 200 v., 30/- Also A.C. models, £2/10/-. Carriage paid, C.O.D. or cash with order. Send for list of other unused bargains.—Seekamp, 46 Farringdon Street, London, E.C.4.

ELIMINATORS AND MAINS TRANSFORMERS REPAIRED.—Prompt service. Moderate charges.—The Sturdy Electric Co., Derwent View, Dipton, Newcastle-on-Tyne.

THE DEMAND for Qualified Radio Service Engineers and Technical Assistants is increasing rapidly. We are fitted with many receivers and testing instruments of the latest type for tuition purposes. Day and Evening Classes. Inclusive terms quoted for boarders. We have also a Home Study Course followed, if desired, by a short practical course. Prospectus free.—Northern Counties Wireless School, Preston.

EXCHANGES.—A Personal Visit in London Area Arranged if required to offer you a very high allowance on your present set or good class components in part exchange for practically any manufacture of set or components; second-hand goods on approval for 7 days against cash; send lists.—Bostock and Stonnill, 1 Westbourne Terrace, S.E.23, Sydenham 2236.

THE IMPROVED "TONIC" self-generating trickle-charger kit keeps 2-volt accumulators fully charged. Electric mains and charging stations unnecessary. Ideal for remote places, 7/- each, postage 9d. Particulars, testimonials, with pleasure.—Williams, Netherend, Cradley, Birmingham.

REPAIRS.—All types and classes of receivers, loud-speakers and components given expert attention. Instruments reconditioned, overhauled and modernised. Conversions and reconstructions carried out at lowest prices consistent with best workmanship and material. Estimates and technical advice free. If in any difficulty write at once to: The Express Radio Service Co., 5 Great Chapel Street, Oxford Street, W.1. Phone Gerrard 3335-6-7. Sole Service Agents for "Undy" Loud-speakers. (Special terms to traders.)

WORN-OUT CLOCKS WANTED.—Liberal allowance on clocks in any condition as part payment for the latest Electric Timepieces. Mains or battery-operated. Write for Price List.—A. Keith, 12a Lullington Road, S.E.20.

AMERICA NIGHTLY.—All-wave Tuners with Reaction, 20-2,000 metres, 6/-.—Evans, 77 Jermyn Street, London, S.W.1.

RADIO REPAIRS of Every Description. Speakers, transformers, mains apparatus, receivers overhauled, etc.; list free; terms to trade; moderate charges.—W. Thorpe, Tappits, Hebden Bridge, Yorks. Phone: 246.

EXPERIMENTAL SURPLUS, as new. Osram 4, £8; Amplion Speaker, 15/-; two-valver, 18/6. Components, Valves, etc. Stamp reply.—Simmons, 9 Ilfracombe Avenue, Southend-on-Sea.

AMBITIOUS YOUNG MEN wanted as Agents in all districts to sell Wireless Goods, Sets and Parts. All makes supplied, cash or Terms.—Apply A.T. Co., 241 Park Road, Aston, Birmingham.

VOLUNTARY HELP WANTED.—A lecturer is required to help with a class in "Wireless Science" one afternoon a week (Wednesday preferred) at the Working Men's College, Crowndale Road, N.W. For further details apply to the Superintendent.

A.C. ELIMINATORS.—200-250-volts. Output, 150 volts and 60 volts, 25 ma., 21/-; D.C., 12/6.—Platt, 10a Canonbury Park North, N.5.

BUY GUARANTEED COMPONENTS, ETC.—Write for keen quotation. "Melody Ranger," all parts immediate delivery.—Child, 29 Moray Road, London, N.4.

"UNIVERSAL" RADIO BARGAINS.—Resistance-coupled 3-valve Kits of well-known make, including Oak Dome-shaped Cabinet, Speaker Unit and Cone, 32/6. Permanent-magnet Moving-coil Speakers with Transformer, 18/6. B.T.H. Bakelite Cone Speakers, 19/11. S.G.3 Kits with Valves, 74/-; S.T.300, 41/6; S.T.400, 56/6. New Century Super alternative Kit, £5/12/-. Geared Dials, 1/-; Illuminated Disc Drives, 2/-; Disc Chokes, 1/-; Binocs, 1/6; Valve Holders, 4d. Leaks, 5d. Variable Condensers, 1/11; Fixed, 5d. Diffs, 1/7. Pre-sets, 11d. Mainsbridge, 1-mfd., 1/4; 2-mfd., 1/11. Pick-ups, 5/11; with Arm, 7/11. Bakelite cased Transformers, 2/9. 6-pin B.B.C. Coils, 1/6; Dual, 2/9. Baseboard Dual with Switch, 2/11. S.T.400 Coils, 6/9; Screened Coils, 5/6. Speaker Units, 2/11. Switches, 6d.; 3-point, 10d. Trickle Chargers, 13/9. Volume Controls, 2/5. Voltmeters, 2/11. Valves, Accumulators, Batteries, Eliminators, everything Radio, from a Crystal to a Super-het in stock. All Components for the "Melody Ranger" Kit. Build it, it's It! Thousands of Radio Bargains, Lists with Blueprints Free!—"Universal," 20 Victoria Road, Peckham, S.E.15.

TRICKLE CHARGERS.—1 Amp., Westinghouse Rectifiers, enclosed transformers. Particulars free.—Arden Agency, Wollaston, Northants.

QUIESCENT PUSH-PULL.—Revolutionise your present Battery Receiver by replacing existing output valve with quiescent push-pull. Full moving-coil output (1½ watts). Current only 6 milliamperes. Complete conversion kit, including 2 pentodes, specially matched transformers (push-pull), milliammeter and all necessary resistances, condensers, etc., £3 9s. Send for lists and diagrams.—Woods Radio, Holcombe Brook, near Bury.

USED AND NEW RADIO COMPONENTS AND SETS ON EASY TERMS.—Send your requirements.—Arlin, 14 Gloucester Street, London, E.C.1.

TRICKLE CHARGERS 12/6 CARRIAGE PAID.—Or sent C.O.D. Fuller, £1 17s. 6d., model, brand new, unpacked. Genuine clearance bargain; 200 v. 240 v. A.C.; charges 2 to 6 volts at over half an amp. Money-back guarantee. Send now. Limited number only. Satisfied customers have sent for more.—Feldman, 58 Meanwood Road, Leeds.

BANKRUPT BARGAINS.—List free with 3-valve diagram. Melody Ranger (alternative kit), 77/6; 3-valve kit, 22/6; S.T.400, 60/-; S.T.300 42/-. Any kit supplied. Dual coils with base and switch, 3/6; .0005 a.m., 3/6; Transformers, 2/9; Valve-holders, 4d.; P.M. M.C. Speakers from 18/-; D.G. Eliminators 20/-; A.C. (Westinghouse), 30/-; Triton Valves from 4/-; S.T.400 or S.T.300 Coils, 5/6; Switches, 4d. Mains Sets, 2 S.G. Pentode, M.C. Speaker, £7/10/-. Part exchange. Let me have your requirements and what you have to clear. Anything radio supplied.—Butlin, 143b Preston Road, Brighton. Phone: Preston 4030.

SOUTHERN RADIO'S WIRELESS BARGAINS.—Condensers, 4-mfd., 2/7 each; 2-mfd., 1/9 each; 1-mfd., 1/1 each; all 750-volt test. Brand new and boxed Screened H.F. Chokes (H.M.V.), 1/- each, 9/- per dozen. S. G. Brown's Solo Loud-Speaker Units, new and boxed, 3/9 each (listed 12/6). Manufacturers' Guaranteed Surplus: Mullard Radio For Million A.C. Kits, brand new, boxed, complete with Three Mullard A.C. Valves, £3/12/6 (listed £6/10/-). Ready Radio 303 Three-Valve Battery Kits, brand new and boxed, without Valves 25/-, with Valves 45/- each (listed £3/10/-). Hundreds of bargains in Mains Transformers, M.C. Speakers, etc.—Southern Radio, 323 Euston Road, London, N.W.1. Phone: Museum 6324.

RADIO-GRAM CABINETS.—Solid Oak, 28/- each delivered.—Musham, Killinghill Road, Bradford.

A concert given by the Newcastle-upon-Tyne Bach Choir, conducted by S.T.M. Newman, is to be relayed from the King's Hall, Armstrong College, to North Regional listeners on February 4.

North Regional listeners have already heard a programme of Cheshire Folk Songs, and this attempt to recapture something of the ancient spirit of the North will be repeated on February 11.

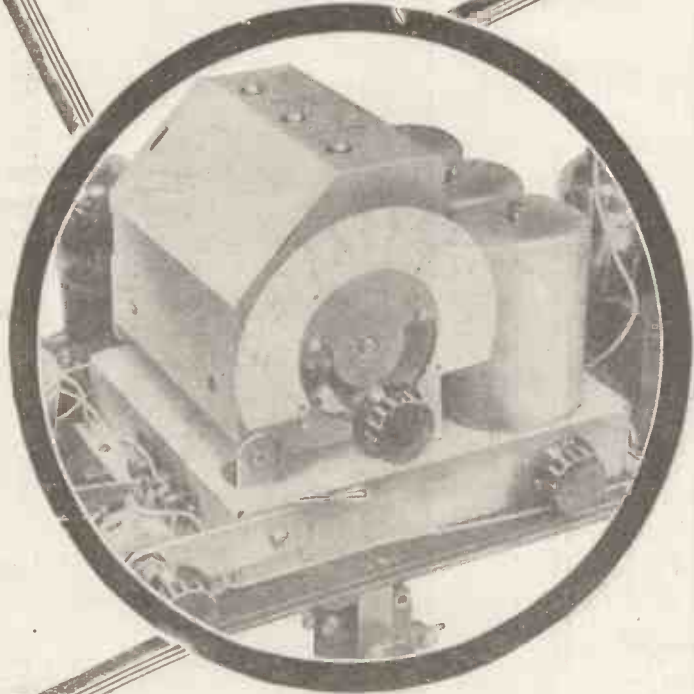
"Amateur Wireless and Radiovision." Price Threepence. Published on Wednesdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd." General Correspondence is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets. Contributions are always welcome, will be promptly considered, and if used will be paid for. Communications should be addressed, according to their nature, to The Editor, The Advertisement Manager, or The Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4.

FULL-SIZE BLUEPRINTS

- When ordering, please send Postal Order, NOT STAMPS.
- CRYSTAL SET (6d.)**
 131 Crystal Set AW308
- ONE-VALVE SETS (1s. each)**
 Easy to Build One AW304
 B.B.C. One-valver AW344
 Portable Short-wave One AW354
- TWO-VALVE SETS (1s. each)**
 Ten-Station Two (D, Trans) AW336
 Inexpensive A.C.2 (D, Trans) AW346
 Mascot Two (D, Trans) AW353
 Ideal Regional 2 (D, Trans) AW357
 Quality 30s. Two (D, Trans) AW361
 Ether Music Two (D, Trans) AW364
 Clarion Voice 2 (SG, D, Pen) AW371
 Home Station A.C. 2 (D, Pen) AW374
 Music Lover's Two (D, Trans) WM260
 New Economy Two (D, Trans) WM265
 Family Two (D, Trans) WM278
 Economy A.C. Two (D, Trans) WM286
 Screen-grid Two (SG, Trans) WM289
 A Two for 7 Metres (D, Trans) WM295
 New-style Radiogram (D, Trans) WM299
- THREE-VALVE SETS (1s. each)**
 New Favourite Three (D, RC, Trans) AW334
 Home-Lover's All-electric 3 (SG, D, Trans) AW335
 Home-Lover's Battery 3 (SG, D, Trans) AW341
 3 Radiogram (SG, D, Trans) AW343
 New Regional Three (D, RC, Trans) AW349
 World-Ranger Short-wave Three (D, RC, Trans) AW355
 Wizard (SG, D, Trans) AW360
 £2 2s. Family Three (D, 2 Trans) AW368
 Build As You Learn Three AW366
 Build As You Learn SG 3 (SG, D, Trans) AW372
 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
 Prosperity Three for Batteries (SG, D, Trans) WM296
 1932 Economy S.G. Three (SG, D, Trans) WM306
 Harris Ethergram (SG, D, Trans) WM308
 A.C. Calibrator (SG, D, Trans) WM309
- FOUR-VALVE SETS (1s. 6d. each)**
 Up-to-the-Minute Four (2 SG, D, Trans) AW356
 Your Home Radiogram, (SG, D, RC, Trans) AW358
 65/- Four (SG, D, RC, Trans) AW370
 Melody Ranger (SG, D, RC, Trans) with copy of "A.W.", 4d. postage AW375
 Ether Rover (SG, D, RC, Trans) WM266
 Quadradyne (2 SG, D, Pen) WM273
 Economy Radiogram (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
 Calibrator (SG, D, RC, Trans) WM300
 Table Quad (SG, D, RC, Trans) WM303
 "Words and Music" Radiogram (2SG, D, Trans) WM307
 Home Short-waver (SG, D, RC, Trans) WM311
- FIVE-VALVE SETS (1s. 6d. each)**
 James Short-wave Super (Super-het) AW328
 Simple Super (Super-het) AW340
- SIX-VALVE SETS (1s. 6d. each)**
 New Century Super (Super-het) with copy of "A.W.", 4d., post free AW363
 New A.C. Century Super (A.C. Super-het) AW365
 1932 Super 60 (Super-het) WM269
 1932 A.C. Super 60 (A.C. Super-het) WM272
 Ideal Home Super (Super-het) WM280
 Easytune 60 (Super-het) WM284
- SEVEN-VALVE SETS (1s. 6d. each)**
 Super Senior (Super-het) WM256
 Seventy-Seven Super (A.C. Super-het) WM305
- PORTABLES (1s. 6d. each)**
 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 (1s. each)**
 Universal Push-pull Amplifier AW300
 "A.W." Record Player (LF, Push-pull) AW319
 The Battery-operated Amplifier AW362
 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)**
 "A.W." Short-wave Adaptor AW339
 "Mascot" Mains Unit AW350
 "A.W." Trickle Charger AW352
 Add-on Band-pass Unit AW359
 Short-wave Adaptor for New Century Super AW367
 D.C. H.T. Unit (1/-) AW369
 Band-pass H.F. Unit (1/-) AW373
 "W.M." Linen Diaphragm Loud-speaker WM243
 Short-wave Director (6d.) (wavemeter) WM285
 Voltage Regulator WM287
 A.C. Mains Unit WM310
- Copies of the "Wireless Magazine" and of "Amateur Wireless" containing descriptions of most of these sets can be obtained at 1s. 3d. a 1/4 each, respectively, post free. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine".
 Address letters: 58-61 Fetter Lane, London, E.C.4

Amateur Wireless
 FEE 1/-
INFORMATION BUREAU
CUPON
 Available until Saturday
FEBRUARY 11, 1933

NOTHING
can take the
place of
RADIOPAK



THE band-pass "Radiopak" simplifies set construction as well as it simplifies selectivity. No development in modern component design is so important as this to the amateur constructor. Revolutionary in conception and design, neat, compact, and robust, above all the "Radiopak" is efficient. There is no alternative to the "Radiopak."

Consisting of screened coils, with provision for reaction, ganged condenser with drive, combined volume control, and on-off power switch, mounted neatly on a metal chassis, the "Radiopak" needs only the addition of valves, low-frequency circuit, loud-speaker, and batteries or mains unit to form a complete receiver.

Because the coils and condenser are matched with the highest possible degree of accuracy before leaving our factory, all ganging difficulty is eliminated, and each unit is supplied with a tuning scale calibrated in wavelengths.

- Width along front of baseboard, 9 3/8 in.
- Depth " " " " 6 in.
- Height " " " " 6 1/2 in.
- Supplied with full-size fixing template.
- STANDARD TYPE 535A
- fitted with 10,000-ohms potentiometer £3 0 0
- Extra Knob 6d. each

RADIOPAK
TRADE MARK
THE ONLY COMPLETE BAND-PASS TUNER

THE BRITISH RADIOPHONE LTD.
ALDWYCH HOUSE, ALDWYCH, W.C.2
Telephone: HOLBORN 6744

THE BEST CHOKE
AT ANY PRICE
FOR YOUR
"MELODY-RANGER"



List No. R3/46
4/6
EACH

Two "GOLTONE" Super H.F. Chokes are required for the "Melody Ranger," one for S.G. Anode and one for Detector.

Other "GOLTONE" RECOMMENDED COMPONENTS
Compression Type Condenser, type J, 1/- each
Short-wave H.F. Choke, R3/26. 2/6 each

FREE
1933 48 PAGE
FULLY
ILLUSTRATED
RADIO
CATALOGUE
NOW
ISSUED

"GOLTONE" SUPER H.F. CHOKE

As recommended for the "MELODY RANGER." For S.G. and super-het. circuits. Covering wavelengths from 10 to 2,750 metres, inductance, 350,000 microhenries. D.C. resistance, 225 ohms. Self capacity, 4 to 5 micro-microfarad. Height, 3 in. Length of base, 2 1/2 in. Width, 1 1/2 in. Obtainable from all first-class Radio Stores. Refuse substitutes. If any difficulty write direct.

Ward & Goldstone
PENDLETON. MANCHESTER LTD.

Pure Constant H.T.

An EKCO Power Unit will run the "Melody Ranger" for one shilling annually! * Batteries would cost you at least fifty shillings a year! See how much you save as the years go by! And you get pure constant H.T.—no gradual voltage-drop as with batteries. Provided you have electric light or power all you have to do is to connect the EKCO Unit suitable for your set in place of your battery and switch on—that's all. No alterations to set, valves or wiring. Prices as low as 39/6. Or you can purchase by Easy Payments if you wish. Consult your dealer or post coupon below.

*Based on 3 hours daily use of an average 3v. set.

Prices from

39/6

or by Easy Payments

All models are similar in external appearance. Size: 9 in. by 5 in. by 3 1/2 in.



RADIO POWER UNITS

Run your Melody Ranger for

1 a year



To E. K. C. L., Ltd.
(Dept. K.2.)
EKCO Works
Southend-on-Sea.

NAME

ADDRESS

Please send me illustrated FREE literature of EKCO All-Electric Radio.



SPECIAL SHORT-WAVE SUPPLEMENT



Short-wave Hints for Beginners

HAND-CAPACITY EFFECTS

OF the various troubles on short-waves probably hand-capacity effects are the most irritating. They can be cured by systematic elimination of inherent faults in the design of the short-wave gear.

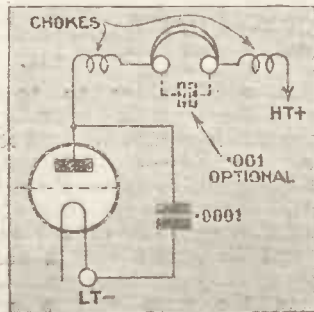
Apart from faults in the condensers used for tuning and reaction, such as incorrect connection of the moving plates, the trouble of hand-capacity or body-capacity effecting the setting of these condensers is often due to high-frequency current finding its way into the phones or loud-speaker output circuit.

Chokes and Condensers

If you are using a one-valver for headphone reception, or any set with phones, you must get rid of the high-frequency current at the detector stage. The first step is to connect a .001 microfarad fixed condenser across the anode and earth.

To ensure that the high-frequency has sufficient inducement to go through this condenser you must arrange high-frequency chokes in suitable positions.

Try short-wave chokes in each of the phones leads. Connect across the phones a .001-microfarad fixed condenser



To avoid hand-capacity effects when you are listening with headphones on a short-wave set you should try small chokes in each of the phones' leads. Also try connecting a condenser across the phones and a smaller one across the anode and earth of the valve

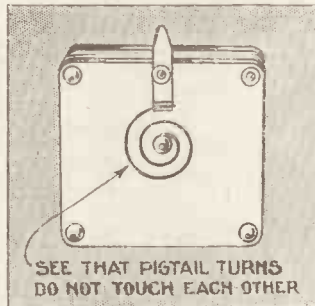
to eliminate or rather by-pass any residual high frequency.

These little stunts ought certainly to cure hand-capacity effects due to high-frequency, but remember there are other causes of the trouble!

STOPPING THOSE CRACKLES!

ON the short waves all sorts of noises seem to develop that are entirely inaudible on the normal wavelengths. For example, variable condensers that appear to be perfectly satisfactory on medium waves often create scratching noises when tuning short waves.

It is always advisable to use a pigtail type of connection for the moving vanes on a short-wave tuning condenser, and to avoid rubbing-contact connec-



When tuning on the short waves it is very important to keep the turns of a pig tail connection clear of one another, or cracking noises will develop

tions. Sometimes in spite of—or rather because of—the pigtail connections the noisiness continues.

This can often be traced to the rubbing together of two of the turns of the pigtail.

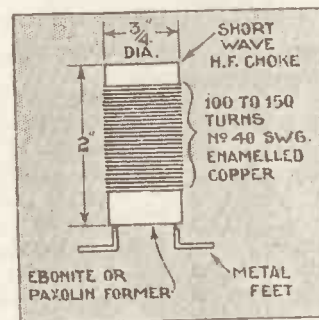
See, therefore, that the spirally arranged turns of wire on the pigtail are well separated before you hunt elsewhere for a mysterious noise.

MAKING A SHORT-WAVE CHOKE

FOR short-wave reception you need efficient short-wave chokes, often two or three being needed even in a simple

set. You can make these up yourself quite simply and cheaply too.

Use a 3/4-in. diameter paxolin or ebonite former, and fit two small metal feet to one end, to



Here are the simple directions for making an efficient short-wave choke. The ends of the fine wire should be soldered to thicker wires for the connections

stand up the choke on the baseboard or to mount it on the panel.

One hundred to one hundred and fifty turns of No. 40-gauge enamelled copper wire will be ample for a short-wave choke. The thin gauge of wire will keep down the self-capacity, which is an important point on short waves.

If you like to make a really good job of it you can slightly space the turns of the wire, but it will be quite satisfactory

choke wire ends, otherwise you may easily fracture the connections.

CONVERTING TO SHORT WAVES

IF you have a set with a high-frequency stage of amplification you should use a super-het type of short-wave converter. This will enable the existing set to be fully exploited on short waves, all the valves being used with the additional valve of the unit to form a powerful super-het arrangement.

If, on the other hand, you have a set in which the first valve is the detector you will have to use a plug-in adaptor type of unit. This is a unit that replaces the detector of the existing set, and makes use then of the low-frequency side only.

In such a combination the sensitivity depends on the efficiency of the short-wave detector and although the arrangement is worth while it is not usually so sensitive as the super-het arrangement.

Point About Super-hets

Remember this: a super-het set as used for medium and long-wave broadcast reception cannot be adapted for super-het short-wave reception by means of a super-het unit.

The only way out is to use a plug-in type adaptor and thus to make use only of the low-

THIS WEEK'S SHORT-WAVE ARTICLES

HOW THE SHORT WAVES SPAN THE WORLD. By J. H. Reyner and the A.W. Staff Pages Two and Three

PRACTICAL SHORT-WAVE WORKING. By Percy W. Harris ... Pages Four and Five

WORLD-WIDE SHORT-WAVE STATIONS ... Page Six

WHAT MAKES A SET A "RANGER"? Page Eight

if you wind on the wire as a single layer with the adjacent turns touching.

For making connections to such a choke it is advisable to solder thicker gauge wire to the

high-frequency side of the existing super-het set.

A super-het unit for short waves is intended for a straight set—not for a super-het, as some readers imagine.

ELEMENTARY WIRELESS COURSE

HOW SHORT WAVES SPAN THE WORLD



What are these short waves people talk about?

Short waves are ordinary wireless waves of a rather shorter wavelength than those which we normally use for broadcasting. As you have gathered, the customary broadcast transmissions take place on wavelengths between 200 and 2,000 metres, whereas short waves use wavelengths of anything from 10 to 100 metres.

What is the advantage of short waves?

They are more suitable for carrying signals over very long distances. To understand why this should be so we must consider just how the signals arrive at the receiver from the transmitter.

They travel through the air, don't they?

Yes. You remember I drew a picture of a wireless wave in terms of a rope of which one end was jerked rapidly up and down, causing a ripple to travel along the rope. I want you to think about this idea a little farther and to consider what happens at a considerable distance from the transmitter.

You know that the surface of the world is round, and therefore even on the clearest day your own vision is limited to a point some twenty or thirty miles away—what we call the horizon, in fact. Why can't we see any further than this?

I don't know. I suppose because you can't see round corners?

Exactly! Your sight travels in a straight line, and therefore when the earth's curvature has become appreciable you cannot see any farther. It is just the same with a wireless wave. This travels out from the transmitter in a straight line, and consequently it cannot travel more than a certain limited distance before it leaves the earth altogether and travels out into space.

But we can hear wireless stations hundreds of miles away?

There are two reasons for that. First of all, wireless waves do tend to cling to the earth to a small extent. They are even transmitted through the earth but with much greater difficulty, owing to the fact that the earth absorbs energy from wireless waves to a much greater extent than ordinary air.

What do you mean by "absorbs energy"?

You know that a wireless wave passing an aerial sets the electrons in the wire rushing up and down the aerial. These are the currents which we tune and amplify in our wireless receiver. Any metal or even any object of any sort is similarly affected.

Wireless waves passing through

This week J. H. REYNER and the "A.W." STAFF have compiled a fascinating article on the wonders of short-wave transmission, showing by means of homely analogies how short-wave signals can be sent right round the world with minute power

houses set up currents in the walls and the water pipes and so forth, but as the various bodies through which the waves pass are not usually tuned to resonance, the currents are quite small.

Do these currents affect the wave?

Certainly! They absorb energy from the wave so that it goes on its way a little weaker than before. Thus you see that a wave travelling through the earth,

Is our reception limited to a few hundred miles?

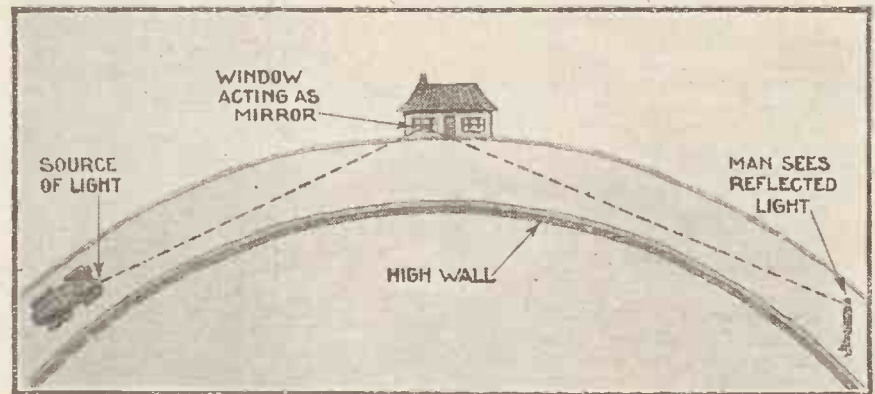
No, because there is another method by which the waves can arrive at a different point. The waves which leave the earth and travel out into space are not lost entirely because at a distance of 50 to 100 miles above the earth's surface there is a belt of electrified particles known as the Heaviside layer, after the late Oliver Heaviside, who first suggested its existence.

This reflects the wireless wave back to earth again so that we can hear signals, even though we may be thousands of miles away.

What do you mean by reflecting the wave?

Wireless waves are just the same as light waves, the only difference being that light vibrations are very much more rapid. Suppose you imagine a man walking along a country lane in the dark. Some distance ahead of him is a corner, and standing on this corner is a house.

Now, around the corner and out of sight of the man is a motor-car with



This pictorial diagram shows how a man might easily see the light from a car's headlamps even though the car were not in sight. Just as the light waves would be bent round, so to speak, by the reflection of the windows of the house, so short waves can span the globe by the bending action of the Heaviside layer above the surface of the earth.

which is absolutely solid material, is very rapidly reduced to a state of exhaustion.

In the air the absorption is relatively small and the wave has a more or less unhindered path, but near the surface of the ground the bottom part of the wave is continually being impeded by the various houses, trees, etc., through which it has to pass, and this drags it backwards a little.

This very fact tends to keep the "feet" of the wave on the surface of the earth so that it will follow the curved surface to a small extent, and distances of several hundred miles can be travelled by what we call the ground wave.

headlights, which shine on to the windows of the house and are reflected round the corner so that the rays reach the man.

He is quite unable to see the car or its lights, but sees the reflection of the lights in the windows of the house ahead, and he knows that a car is coming.

Just in the same way a point thousands of miles away from a transmitter and quite beyond reach of the ordinary ground wave is still able to receive wireless signals which have travelled up into the Heaviside layer and have been reflected back to earth.

I know that a mirror reflects light, but I do not see how you can reflect a wireless wave which you cannot see.

Reflection is due to a change in the direction of the wave. The speed at which it travels depends on the medium through which it is moving. It would be different, for example, in air and water, and in the same way the wave moves faster in an electrified atmosphere.

Thus when the top part of the wave reaches the Heaviside layer, it travels a little faster than the bottom part, and the whole direction of the wave is changed until it finally comes out of the layer and starts travelling back to the earth again.

If you have a motor-car and you drive the near-side wheels faster than the off-side ones the car will turn round to the right and *vice versa*. In the same way the fact that the top of the wave travels faster than the bottom causes the wave to bend round.

Does not the electrified layer absorb energy?

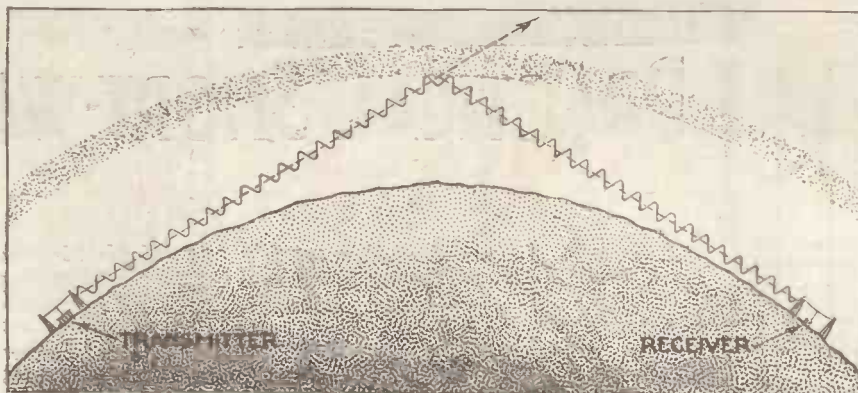
Yes. The ordinary atmosphere contains relatively few free or spare electrons, and therefore the wave is not appreciably "tired" in its travel through the air. The upper atmosphere, however, is in a state of intense electrification.

Many of the atoms of gas are broken up, leaving large numbers of free electrons. As soon as a wireless wave reaches them, they are thrown into intense agitation, and considerable energy is absorbed.

Then there is not very much left?

The absorption depends on the wavelength. It becomes less as we increase the wavelength, and for some time the trend of development was towards longer and longer wavelengths. Waves of 23,000 metres were used at one time. Such wavelengths are quite impracticable for telephony, and have serious disadvantages even for telegraphy, but there seemed to be no alternative.

Then it was found that if the wavelength was reduced, the absorption got more and more until a certain critical value was reached at about 214 metres. Below this the absorption began to get less. The wireless waves were vibrating so fast that the electrons could not keep up, and if really short wavelengths of



Here you see how a wireless wave sent out from a transmitter on a short wavelength is reflected back to a distant point on the earth by means of the layer of ionised atmosphere above the surface of the earth

the order of 10 to 20 metres were used the absorption was almost negligible.

This has led to considerable development in the use of short wavelengths of this sort, and by this means signals can be transmitted right round the earth.

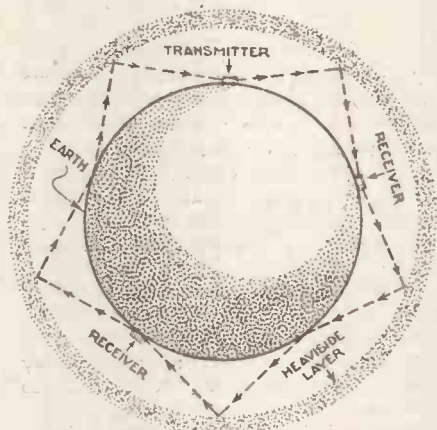


Diagram showing how a short wireless wave can be bent right round the earth, enabling communication to be established, if desired, between the antipodes

You mean they come back to the starting point?

Yes. They are reflected from the Heaviside layer and come down to earth again. Here they are reflected back into the upper atmosphere. They continue in this way to travel round the whole surface of the earth, and in fact evidence has been received of signals which have been three times round the world!

Thus it is quite an easy matter to pass the signals over many thousands of miles without difficulty.

Why don't we use short waves always?

Because perfect reception with short waves depends upon very consistent and steady reflection from the upper atmosphere. Unfortunately the Heaviside layer is not steady.

The height changes slightly from minute to minute. Moreover, in certain parts of the world the sun is shining and in others darkness reigns, and the conditions of the electrification are quite different by day and by night. Thus if the wave has to travel any distance it is sure to encounter very varying conditions.

Consequently the system is unsuitable for a regular programme service if the longer wavelengths can be used in preference. We can, however, successfully transmit by short waves from one side of the world to the other, and this is what is done on the relays which you have just been hearing from Australia and other places from whence the more steady wavelengths would never reach us.

How are these short waves produced?

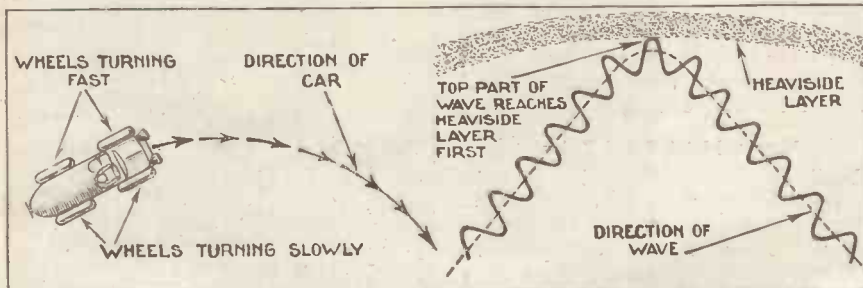
In exactly the same way as an ordinary wireless wave. The only difference is that the frequency of the current—that is, the rapidity of the oscillation—is very much greater. If we have current rushing up and down the aerial a million times a second, we produce a wireless wave having a wavelength of 300 metres.

If we want to produce a wave of 30 metres' length, we must make our oscillation in the aerial occur at the rate of ten million every second. Wavelengths of 15 and even 10 metres are used sometimes requiring a current oscillating at the incredible speed of 30 million vibrations a second.

How can you do this?

By using small coils consisting of a very few turns of wire and generally by taking certain precautions to make everything easy for such very high-frequency currents.

If this is done the operation of the receiver is exactly the same as on an ordinary broadcast wavelength.



Another of our ingenious analogies! If the near-side wheels of the car on the left were to turn more quickly than the wheels on the other side, the direction of the car would be curved, as shown. So in a similar way the top part of the wireless wave reaching the Heaviside layer causes the waves to bend round

BUILD AS YOU LEARN

PRACTICAL SHORT-WAVE WORKING FOR BEGINNERS



For this week's special short-wave supplement PERCY W. HARRIS leaves his usual subject of broadcast-set design and gives you some valuable practical information on short-wave working

speaker of what was spoken before the microphone.

In short-wave working we have to do exactly the same thing and just as we found that to pass from the long to the medium band we had to reduce the number of turns of wire, so in passing from the medium band to one of the several short-wave bands we have still further to reduce the number of turns. In fact, on some of the wavelengths with which we have to deal in modern communication even one turn of wire may constitute our tuning coil.

Up Goes the Frequency!

As we go down in wavelengths so we go up in frequency and one of the first problems we come against is the tremendous effect on our tuning of very slight changes of capacity. On anything approaching a well-designed receiver for the medium and long wave-band-movements of the hand and body near the receiver make no effect whatever on the tuning, but with the very short waves an inch movement of the hand a foot away from the coil may sometimes bring about enough capacity change to tune from one station to another!

True, this is an extreme case and will not happen in a proper design, but we must nevertheless appreciate the reason for it. Your body is a conductor, and while the lower end of the coil is joined to earth the upper end is not, and there is a very slight capacity between your hand and the upper end of the coil. The closer you bring your hand to this the greater the capacity will become and the greater the change it will make on the tuning.

In practically all short-wave sets the hand-capacity effects are removed by making the panel of metal and joining it to earth. At first thought it may appear to you that this would add still further to our troubles because a large sheet of metal directly earthed must have a great deal more capacity effect on the coil than one's hand.

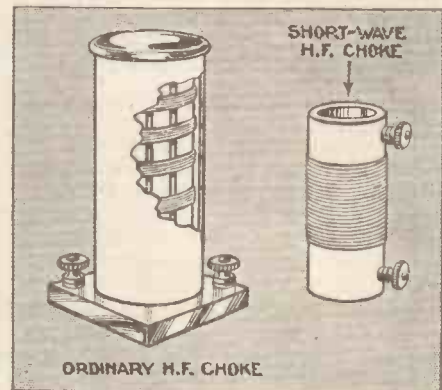
How a Metal Panel Helps

While this is true, remember that the position of the panel is fixed. Any effect it has remains constant and therefore it will not interfere with our practical working.

It may well be that a tuning position for a given station is made three degrees different by fitting such a screen, but

that station will always be found on the new position of the scale, and the panel will act as an effective shield between our hand and body and the coil itself.

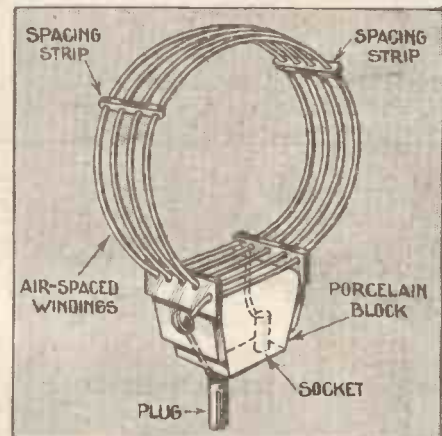
So important are tiny capacity effects in short-wave working that we may have a lot of trouble with some kinds of



On the left you see a high-frequency choke as used for normal broadcast reception. Contrast this with the special construction needed for a short-wave choke, as on the right

variable condenser where a long pigtail is used to make an electrical connection between the moving plates and the end plate of the condenser.

As we turn the spindle this pigtail may wind about it and by altering its position relative to the fixed plates may make erratic changes of capacity. This minute change may be completely unnoticeable on the medium band, but may render the condenser quite unsuitable for special short-wave working.

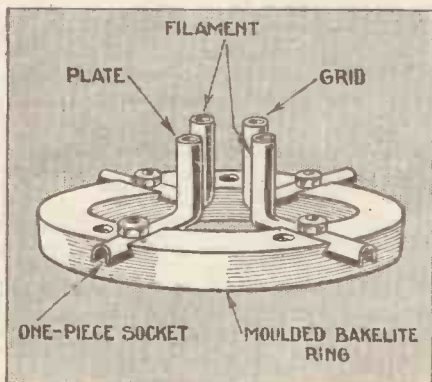


Here is a short-wave coil of the plug-in type. Note how the turns are air-spaced and held apart by means of small insulating spacers

WHILE short-wave working is based on the same principles as that of medium- and long-wave reception, there are many special problems which arise directly we get down into the short-wave bands. These problems are essentially practical. Unless you understand them you may wonder why certain steps are taken in designing a short-wave set, although the same precautions are not considered essential in the ordinary type of receiver.

Real Bas'is of the Set

You will remember how, in the earlier lessons, we saw that the coil of wire



For short-wave working low-loss components are essential. Here is a typical valve holder as used in short-wave sets for the detector valve. Note how the insulating material is cut down to a minimum

shunted by a variable condenser was the real basis of our receiver. This was adjusted to resonate with the incoming signals, the highest voltage being built up when the circuit is exactly tuned to the signal we want.

These voltages, as you know, are applied to the grid and filament of a valve, the voltage changes so given bringing about current changes in the plate circuit of the valve, so that in the end we get a faithful copy in the loud-

Another capacity effect which sometimes gives trouble may occur where a pressure contact is made, and a condenser which is quite good for medium-wave working may be very noisy in the short waves. I could give you many other examples if I had the space, but I have indicated just a few important ones just to let you see how carefully short-wave components must be chosen.

Where High-frequency Losses Occur

Now there is the matter of high-frequency losses. If you have two equal coils both wound of the same wire and with the same number of turns and the same spacing between turns, one being wound on a skeleton former of high-grade ebonite and the other on a tube of inferior composition, there may be all the difference in the world between the results obtained even with the medium waveband.

A poor former absorbs a lot of energy and may push up the high-frequency resistance of the medium waveband coil enormously. A few years ago the market was flooded with coils wound on inferior moulded composition formers, but nowadays the position is much better.

On short waves any troubles arising with inferior material are greatly enhanced, so point number two is that we must watch very carefully for coil-former losses.

It is not sufficient to keep inferior material out of the centre of the coil—we should also keep it away from everywhere else where the high-frequency currents and fields may reach.

High-frequency losses in valve-holders are by no means negligible on the medium waveband, so here again we should take particular care in our short-wave receiver. Best of all for short-wave work is a kind of skeleton valve-holder in which the solid di-electric material is removed as far as possible from the structure.

Solid Di-electric Condensers Unsuitable

Speaking of high-frequency losses in solid di-electric materials and how they mount rapidly as we go down in wavelength, this is a good place to point out that the solid di-electric variable condenser, which, by being compact and cheap, is sometimes used for tuning on the ordinary medium and long wavebands, is emphatically *not* suitable for short-wave working, for reasons which now will appeal to you.

Smooth reaction is always important in any receiver if we are to get the best out of our set, but on short-wave working *we cannot be too careful.*

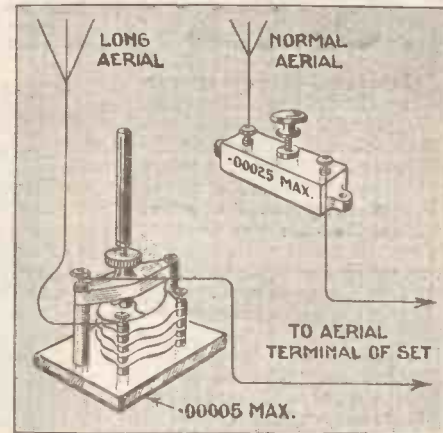
A whole article could be written on special modifications of reaction circuits to make them give the best on short-wave working and as hand-capacity

effects are of so great importance it will occur to you that one of the best types of circuit is where the moving plates of the reaction condenser are at earth potential and therefore connected directly to the panel. We are likely to have a lot of trouble in using reaction on short waves with any kind of circuit if our high-frequency choke is unsuitable.

As you probably know, the purpose of the high-frequency choke is to allow an easy passage of a direct current which must reach the plate of a valve, while acting as an effective barrier to the high-frequency currents it is desired to deflect round another path—usually through the reaction coil and condenser.

How the Choking Effect Varies

You can plot a curve showing the amount of the choking effect for the different wavelengths, and even the best chokes show bumps and depressions; and as every choke is bound to have its own natural frequency (which is designed to fall outside of the waveband we desire



Two alternative forms of aerial coupling for short waves. Left: a neutralising condenser for long aeriels. Right: a pre-set type condenser for normal or very short aeriels

although, occasionally, one can find a choke that with a particular circuit will not give trouble on any of the commonly used bands.

Generally speaking, particularly in simple short-wave circuits, it is best to obtain a special short-wave choke which is designed to be satisfactory on those important bands below 200 metres, on which so much interesting work is now being done.

The short-wave problems are, then, special to those parts of the circuit up to and including the detector. At the low-frequency end the technique is just the same as with an ordinary receiver.

So far we have dealt with the set itself, but there is still another important aspect of the case which might not occur to you. The

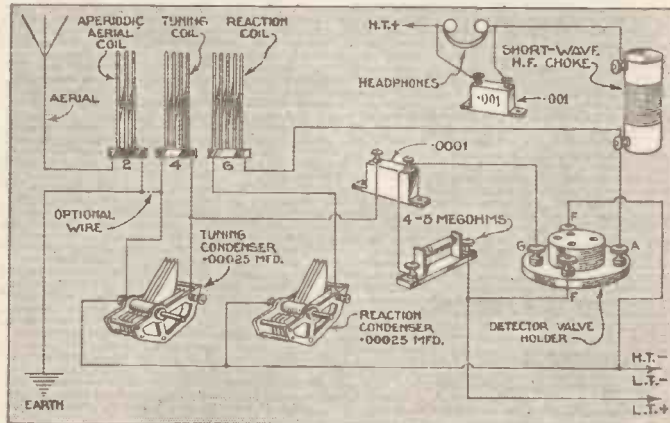
ordinary aerial and earth which we are accustomed to use for medium- and long-wave reception may give all kinds of trouble with short-wave work.

Results Depend on Your Aerial

You may find, for example, that a short-wave set which works perfectly in your friend's house on all parts of the scale refuses definitely to have any reaction effect whatever on your aerial on certain definite wavelengths.

The chief reason is that the natural wavelength of the ordinary small aerial, together with its earth lead, is generally considerably different from that of the medium and long-wave band wavelengths you want to receive (there are exceptions, of course), but on short-wave working not only may the small aerial you are using tune exactly to the wavelength you want, but one of the harmonics of the aerial may do the same.

Remember that with the ordinary receiver working on a medium waveband the aerial is acting merely as a collector of energy. On short waves it may act as a tuning circuit.

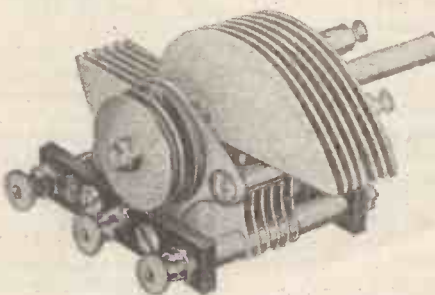


Complete short-wave one-valve in pictorial diagram. Note specially the values of the components for detection, tuning and reaction

to use it for) on some wavelengths it will actually absorb energy instead of deflecting it round the wanted path.

It may be that at the present time in your medium waveband receiver you have a high-frequency choke which is working very satisfactorily, but if you were to alter your coil to tune well down below 200 metres or above 2,000 you might find reaction uncontrollable.

There are, in fact, few "general-purpose" chokes which prove satisfactory on all wavebands in all circuits,



A typical short-wave tuning condenser. Note the ample spacing of the vanes

WORLD-WIDE SHORT-WAVE STATIONS YOU CAN HEAR

TO the absolute newcomer to the short-wave bands, that is to wavelengths below 100 metres, all this talk of world-wide reception sometimes seems a little exaggerated. The reason is that, although the short waves do indeed enable you to span the entire globe with quite a small set, you simply must choose your time and wavelength.

Unlike the broadcasting wavebands, the short wavebands have periods of "deadness"—there are certain times of the day and night when one short-wave band may be devoid of all signals of interest and yet at the same time another short-wave band may be literally teeming with stations.

Only by long experience can you exactly gauge the possibilities of any given waveband at a moment's notice, but it is not difficult to make a rapid exploration of, say, the 20-metre band to find whether conditions are favourable for long-distance reception.

If they prove poor you can then go up a little, and you are almost sure to find something around the 30- or 40-metre bands.

In this article for beginners at short waves we cannot do better than to sketch out the possibilities of all the short wavelengths of interest to listeners, and to hint as to what times are most likely to provide you with entertainment or logging interest.

Get a Good "S.W." Set!

Let us suppose that you have equipped yourself with a really good short-wave set, such as the Melody Ranger, and that, like this particular set, it tunes from about 12 metres up to 90 metres or more.

Possibly the very lowest wavelength signal you can get just now is Buenos Aires, call sign LSY, on 14.47 metres.

We suggest you look for this station whenever you are on the air, because it is easily identified by its interval signal, consisting of three musical notes.

This station is really "commercial," but it puts out a fair number of gramophone records in the course of the day's work.

The 20-metre Band

We are now in what might be termed the 20-metre band. There is plenty to hear around this band, if your aerial is "low loss" and you listen at the right time.

Try for W3XAL on 16.87 metres. This is an American at Boundbrook, New Jersey, operating between 1 and 9 p.m.

We find reception of this station very reliable between 1 and 4 p.m. On Sunday afternoons the station carries

out experimental stuff—so can you!

Another American you ought to log in the course of time, though not perhaps at the first time or two you try, is W2XAD, on 19.56 metres. At the moment the schedule seems a little erratic, but try your luck!

Finding Your Way

During daylight, *not at night, bear in mind*, there are at least twenty stations doing telephony on the 20-metre band. Many of these give their call signs and wavelengths, and are thus very useful if you want to calibrate a new short-wave set, so that you know where you are.

Tune in a Ball Game!

For the real short-wave tyro wanting a rapid conversion to the short-wave craze we heartily commend W3XAL on Saturday afternoon. During this period the power is increased to 30 kilowatts for the relay of a ball game between two American universities, or perhaps between two of the services.

If you have never tuned in on a ball game in America, this experience will be a real thrill. More like a massacre than a game at times, but very exciting! It is not much use trying for this station after 5 p.m.

Getting Australia!

On a wavelength of 31.28 metres, the Sydney station VK2ME in Australia can be picked up, but, so far as our experience goes, the only time it can be heard is from 6 a.m. to 8 a.m. on Sunday mornings. Although operating at other times during the day, reception is very difficult, if not impossible.

When we come to examine the 30-metre band in detail we find many interesting stations you can quite easily log on a short-waver of even average efficiency.

Take Prangins, for example. This Swiss station, called Radio Nations, and having the call sign HBL, transmits on a wavelength of 31.27 metres a number of political talks, sometimes given by eminent English statesmen.

Spanish Stations are Strong!

Going up in the scale we come to the 50-metre band. One of the new phases of this higher band is the inception of a number of high-power Spanish stations, several of which can be heard testing between 40 and 50 metres just now. Try San Sebastian on 43 metres, call sign EAR 262.

One of the most outstanding stations in the 50-metre batch is Moscow, on exactly 50 metres. Tune in to this Russian giant of the short waves between 6 and 9 p.m. on Sunday evening, when you will hear some amusing and albeit illuminating propaganda on the working of the Five-Year Plan in Russia.

Moscow Bids You Good-night!

At 9 p.m. English time you will hear the chimes of the Kremlin in Red Square, the time there being midnight, at which hour the Moscow station bids us good-night.

Vatican City is another very powerful short-waver near this setting that is worth your attention. It broadcasts on a wavelength of 50.26 metres. Several languages are used, and often you can hear programmes or announcements in English.

Going still higher up the short-wave band you will find many French amateurs around 80 metres. By a happy coincidence this wavelength is just 80 degrees on the right-hand dial of the short-wave range of the Melody Ranger.

Having briefly gone over the other landmarks for the beginners, we might now touch lightly on the conditions as we have found them lately, remembering that conditions on short waves change from week to week in a somewhat surprising way.

Americans—and Canadians Later!

We find that after eleven o'clock at night upwards of half a dozen Americans can easily be heard on the 50-metre band. After 1 a.m., one or two of the Canadians can usually be picked up on these wavelengths.

The Bandoeng station on 15.59 metres can be heard after lunch during the afternoons just now, calling up Kootwyk in Holland. Considering this means a spanning of 9,000 miles we think the strength is quite good, though the beginner might not agree!

At the time of writing, though this must not be taken as final (the short waves never are the same for long!), we cannot recommend you to try the 30-metre band for American or Canadian short-wavers. They just aren't there, and that's all there is about it!

To make up for this deficiency the 30-metre waveband is good for European short-wavers and for Australia at the times previously mentioned.

When Lisbon is Really On

By the way, an easy station to hear on this waveband just now is Lisbon, CT1A A on 31.25 metres. Although scheduled for Tuesday and Friday, we hear it only on the Friday, and there does not appear to be a transmission on the Tuesday at all. The time to listen is 9 to 11 p.m.

In a search for all the B.B.C.'s Empire station wavelengths you may try to get on to GSH, which is allotted to the very short wavelength of 13.97 metres. It is just as well to know that up to the present this wavelength has not been utilised, so don't blame your set if you cannot log GSH.

The American next to GSH, namely W8XK, on 13.93 metres, is not working either, so it is not much use wasting time trying for it, especially as there are so many others on higher wavelengths.

A station that you can get quite easily just now is Buenos Aires on 28.98 metres. It is a reliable signal after 10 p.m. at night.

With the Melody Ranger

A word or two on the operation of the Melody Ranger on short waves may be welcome. Remember that when tuning below 20 metres, and indeed when on the ultra-short-wave position of the four-waveband switch, the aerial coupling condenser should be adjusted so that the plates are right out of mesh.

Actually on the short waves of very high frequency the possible gain of energy through a big coupling is more than counteracted by the excessive damping of the aerial on the grid tuning.

Only Just Oscillating, Please!

Keep reaction in the position where it enables the detector to be just oscillating, and on no account push the reaction right over or the set will become very "dead."

On the shorter of the short waves all reaction condensers tend to affect the tuning to some extent, so whenever you make an alteration to the tuning on the first waveband of the Melody Ranger remember to readjust the tuning.

Another point that has emerged during our short-wave tests of this set is that the maximum amplification of the variable- μ valve is obtained with about 1 volt negative bias, so take care on the 20-metre band to turn the volume control slightly back from the maximum position, as this will apply a slight bias that will be found to make a considerable difference to the strength of the weak signals on, say, 15 metres. K.J.

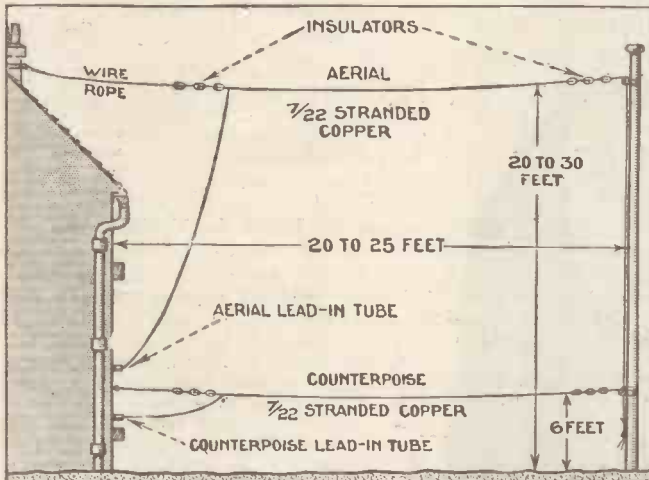
Practical Tips on Short-wave Working

A SHORT-WAVE AERIAL
MANY listeners fail to get really good results on the short waves because they imagine the haphazardly-erected aerial that probably serves quite well on the medium waves will be equally effective on the short waves.

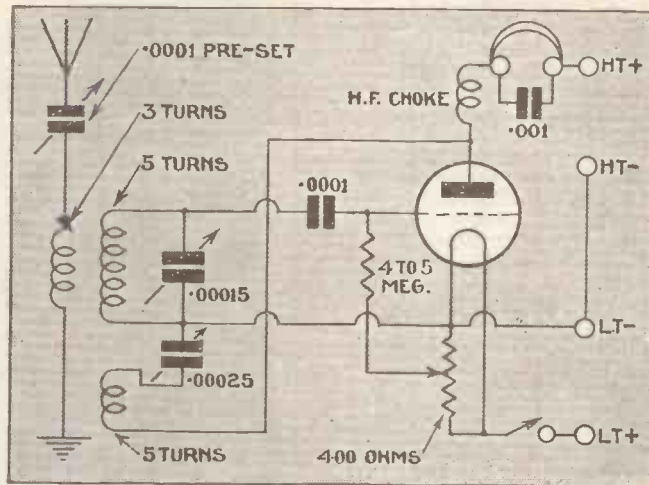
it in the house end through a lead-in tube similar to that used for the aerial. *The same type of wire should be used for the counterpoise as for the aerial.* This combined aerial and counterpoise should produce amazingly good results on short waves—that is if you have the

aperiodic winding for the aerial and earth connections. We suggest a three-turn coil in series with the aerial and the earth, loosely coupled, or, better still, variably coupled to the grid tuning winding, which as before will be five turns. If the aerial is fairly efficient

"S.W." ONE-VALVER
ONE of the most attractive things about the short waves is that you can get results, and world-wide results at that, on the very simplest of apparatus. For example, with a one-valver properly laid out for



Note these outstanding points about the erection of an efficient aerial and a counterpoise earth for really good short-wave reception. Such an arrangement will enable you to go right down to 12 metres or even lower in wavelength



A well-tried and thoroughly recommended one-valve circuit for short-wave reception on headphones. Note the values of the detector grid leak and condenser, and the use of a "pot" for varying the positive bias on the grid for smooth reaction

The truth is that for efficient short-wave working you must use a low-loss aerial and earth system. Otherwise signals will be lost before they get to the set, and reaction will be rather difficult or even impossible to obtain on the shorter of the short waves.

Fortunately, the best aerial for short waves is the least expensive type. It consists of a short single span of wire, erected as high and as clear of earthed objects as possible.

Keeping the Wire Clear

The diagram shows an ideal arrangement. Note that the house end of the aerial is suspended from the top of the chimney, and not, as is often done, under the eaves of the house. *This little point may make all the difference to the efficiency of the whole system.*

Two or three insulators should be fitted to each end, for insulation is of far greater importance on the short waves than on the medium and long waves. A total length of 30 ft. should be ample on short waves. In fact a much longer wire is definitely not recommended.

To make sure of a low-resistance earth you might go to the trouble of a counterpoise. This is nothing more than a miniature aerial, with all the rules of aerial insulation from earth fully observed.

Counterpoise Layout

Erect it about 6 feet from the ground and arrange to lead

space and inclination to erect it!

CORRECT AERIAL COUPLING

THE type of coupling you use for the aerial-tuning circuit of a short-waver depends to some extent on the nature of your aerial. With a very short aerial you can use a pre-set condenser connected to the top of the grid tuning coil.

Use one with a maximum

you will be able to connect the earth end of the aperiodic coil to the filament end of the grid-tuning coil. This is an advantage as it "anchors" the tuning and reaction condensers to earth, instead of leaving them "in the air" with resulting trickiness of operation.

Removing the Earth Wire

Sometimes, though, you may find that on the shortest wave-

lengths you can easily obtain headphone reception of American short-wave stations. The circuit diagram shows a suitable one-valver for short-wave working on wavelengths between 16 and 48 metres.

Although the circuit looks very similar, perhaps, to the type of layout adopted for ordinary broadcast wavelengths it is important to note the altered values of the components.

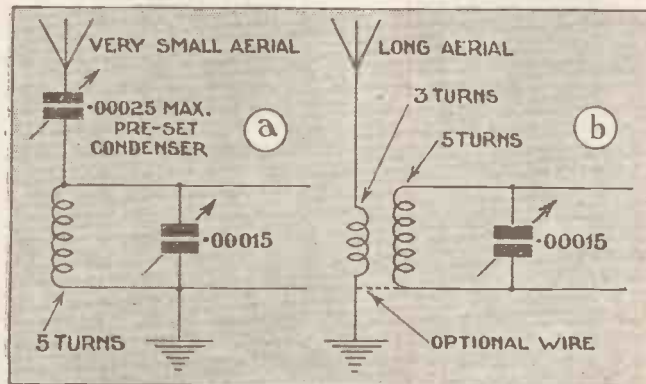
The aerial circuit is very much less damped than on medium waves. Note the use of a .0001-microfarad pre-set type condenser in series with a three-turn plug-in coil.

The grid-tuning circuit consists of a five-turn coil with a parallel .00015-microfarad variable condenser, which must be low-loss in design, and preferably have a pigtail connection for the moving plates.

The values for the detector are very important. The grid condenser is .0001 microfarad, though this could be higher if desired. The grid leak, for maximum signal strength must have a high value, preferably 4 or 5 megohms.

The lower end of the grid leak, which normally would go to the low-tension positive, is connected to the slider of a potentiometer, which has its winding across the low-tension battery.

The anode circuit of the one-valver is quite simple, there being a short-wave choke in series with the 'phones.



Two alternative ideas for coupling the aerial to the short-wave tuning circuit. If you have a very short aerial you might try the use of a pre-set condenser as at A, but with a very long aerial you may need a separate aerial coil as at B

capacity of .00025 microfarad, and as low a minimum as possible. This should work well with a very short aerial—15 to 20 feet—with a five-turn grid winding.

With longer aerials it may be necessary to cut down the resulting damping by using an

lengths reaction will be difficult with a rather inefficient aerial or earth. The only thing to do, short of improving the aerial or earth, is to disconnect the earth wire from the filament side of the tuning coil. This is only a compromise and it is better to improve the aerial.

What Makes A Set A "Ranger"?

Short-wave tuning will make any set a better "ranger" than it would be with the normal medium-wave and long-wave tuning circuits. This article explains why this is so, and how the "Melody Ranger," our new four-valve set, is an exceptionally fine ether-ranger

EVEN if you are a beginner at wireless you must be interested in the announcements elsewhere in this issue and the preceding issue about a set we call the "Melody Ranger."

Possibly you wonder what we mean by the word "ranger." Obviously it has something to do with range. But what is range, and how does this particular set obtain it?

We can conveniently take the "Melody Ranger" as an example in a simple explanation of the meaning of radio range, and touch lightly upon some of the factors that make range in a set possible.

What Range Really Means

Range is, briefly, the distance that can be spanned in the world between any two points on its surface by means of wireless waves.

Given suitable conditions of transmission and reception it is possible to extend the range in radio communication from pole to pole, or from England to Australia.

Between these extremes of range there is every degree of range, from the reception of the local station at, say, 10 miles to the reception of American broadcasting stations.

Wavelength Range is Important!

One of the most important things that determines the range of a set is the wavelength band over which the set will tune.

This may strike some beginners as strange. Surely, it may be asked, the amplification of the set will be more important than the wavelength range of the tuning?

Actually, this is not true, as short-wave pioneers within recent years have conclusively shown.

The short waves—that is, waves below 100 metres—can carry signals with amazingly small transmitting power, and can be picked up on relatively simple apparatus without much real high-frequency amplification.

On the medium and long waves—that is, from 200 to 550 metres and from 1,000 to 2,000 metres—great range is certainly influenced very much, not only by the power of the transmitter, but by the ranging properties of the set.

That is to say, on these normal broadcasting wavebands a high-power station has, in general, more chance of spanning thousands of miles than a low-power station.

Similarly a very sensitive set, by which we mean one with considerable high-frequency amplification, has more chance of picking up a very distant station on these wavebands than a simple set with little or no real high-frequency amplification.

its work properly. It is not always necessary to use a valve to get this pre-detector amplification. The process known as reaction is often sufficient.

Reaction is Amplification!

Reaction is a process whereby

For the ordinary broadcasting wavelengths reaction is not so indispensable, because we can obtain a large measure of stable and effective amplification before detection by means of what we call high-frequency-amplifying valves.

To-day the choice of efficient high-frequency-amplifying valves is wide. For single stages we make use of a very high-amplification valve, known as the screen-grid.

When the Variable- μ is Used

If we propose to use two stages of high frequency, or if we want above all a very good control of the ranging powers of the set, we use a modified form of screen-grid valve, called the variable- μ .

In this valve the amplification is readily controllable by altering the grid bias.

This alteration of the amplification does not affect the amplifying efficiency of the valve, and so we are able to reduce the range or volume very considerably without upsetting the quality of reproduction.

It might be thought a little strange that in this question of range we have left until the last the question of the aerial and earth system. The fact is that now we can obtain such ample high-frequency amplification from valves the use of a highly efficient aerial is no longer essential.

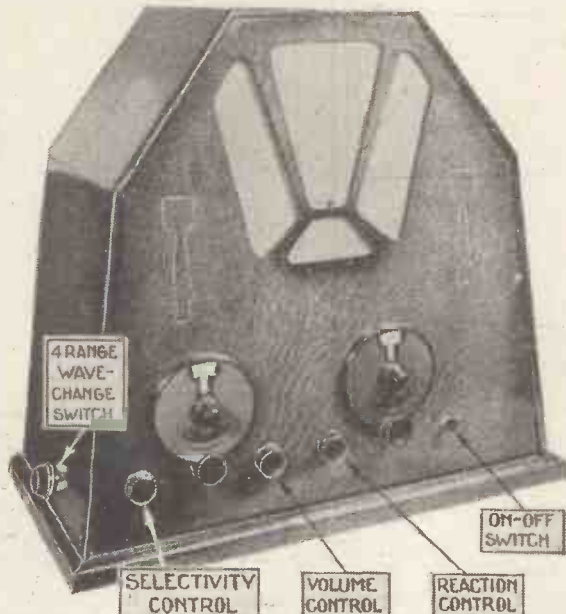
It is still true that a high aerial of, say, 100 ft. total length will have, of its own, greater ranging powers than a small, low aerial of, say, 30 ft.

Against the superior ranging powers of the large aerial we must offset the disadvantage that the long aerial is less selective and likely, therefore, to bring in more interference with the distant stations.

What a "Ranger" Needs

From what we have said it should now be clear that the set with the greatest potential ranging powers is the set fitted with a tuning range that extends from the short waves below 100 metres to the two normal bands, has good reaction control and at least one stage of high-frequency amplification.

The "Melody Ranger" we have mentioned is an out-of-the-ordinary "ranger" because it has all these attributes, as you will appreciate if you care to read the descriptions in last week's issue and elsewhere in this issue.



All the most important attributes of range in a set are included in the "Melody Ranger." This view of the new set in its console cabinet clearly shows the wave-change switch on the side, controlling four distinct wavebands, including the ultra-short and short waves from 12 to 99 metres

What High-frequency Amplification Means

High-frequency amplification has been mentioned. Do you know what that means? It means amplification before the detector of the set.

In other words, the weak impulses picked up by the aerial are made stronger before any fundamental change is made in the nature of the signal, before, that is, the low-frequency current corresponding to speech and music is separated by the detection process from the high-frequency or carrier-wave current.

This high-frequency amplification is necessary because if signals are below a certain strength the detector cannot do

the high-frequency current appearing in the anode circuit of the detector valve is fed back into the grid or input of this valve so that it "boosts up" the incoming energy.

To get the most out of this cheap and simple form of high-frequency amplification demands careful attention to such points as the grid bias, the value of the voltage on the anode and the size of the reaction coil and condenser.

For the short waves we make a great deal of use of reaction. In fact without reaction most of the short-wave sets in use to-day would be so insensitive that they could not pick up any of the world-wide range of signals now at their disposal.

IN OUR SUPPLEMENT NEXT WEEK

**AERIAL AND EARTH EXPERIMENTS YOU CAN TRY!
HOW THE "L.F." TRANSFORMER IS MADE.**

READERS' PROBLEMS SOLVED by PERCY W. HARRIS

Readers are asked to note that owing to the publication this week of our "Wireless Made Easy" Supplement in a special short-wave form, we have had to hold over the above articles promised for this week in our preceding supplement