

The

6⁰

SHORT-WAVE MAGAZINE

Exclusively for the
Short-Wave Listener,
Experimenter and
Transmitting Amateur

MARCH
1939

—
VOLUME III
NUMBER 1

MULLARD DOUBLE TRIODE TV03-10



This new valve has been produced to satisfy the demand for a British valve to fulfil the same purposes as the RK.34, and we can confidently recommend it as a replacement in all cases.

TECHNICAL DATA

Heater, 6.3 V	0.85A	Anode Volts, 300 V max.
Amplification factor		12.5
Mutual Conductance	} Each	3.2mA/V
Anode Impedance		Section	3900 ohms
Anode Dissipation		5 watts max.
Base.....	Standard British 4-pin.	
The max. Anode Voltage may be used at 2 metres.		

For a free copy of the new list of Amateur Transmitting Valves apply to:

TRANSMITTING DIVISION,

MULLARD WIRELESS SERVICE CO. LTD.

225, Tottenham Court Road, London, W.1.

REPAIRS

Many thanks to the many readers who have sent their broadcast and communication receivers to Scott-Sessions Company for overhaul and adjustment during the last few months; and to many who have told their non-technical friends to send their B.C.L. sets for attention.

This has resulted in much fresh work for the engineers of Scott-Sessions Co. These men also are proud to have called themselves radio amateurs, in the past; and to have been of **GOOD SERVICE** to you now.

Thanks also to distant listeners from other countries, such as Iraq and from St. Helena, from whom we have received commercial or broadcast receiving equipment for overhaul and/or rebuilding etc., and needless to say, we see that **GOOD BRITISH WORKMANSHIP** goes into such jobs just as with the jobs that you will be sending to us shortly!

G. SCOTT-SESSIONS & CO.,
Radio Engineers

(Contractors to H.M. Government Departments, etc.)

EXCHANGE WORKS, MUSWELL HILL, LONDON, N.10.

Phone: TUDOR 4101/2 (Private Branch Exchange).

Cables: "Tropiset, London."

TROPHY BEST SELLERS

in the World's Best Selling Range of Short-Wave Receivers

<p>Performance and Price Unbeatable.</p>  <p>TROPHY 8 AC communication type receiver. Illustrated complete. Available out of cabinet for rack mounting.</p>  <p>TERMS: 15/6 with order and 18 monthly payments of 15/6.</p>	<p>COMMUNICATION MODELS</p> <p>Guaranteed 12 months including Valves.</p>	 <p>TROPHY 5 This new 5-valve AC junior communication model incorporates all the essential refinements for serious short-wave work. The price is extremely moderate, placing it within the reach of everyone. The improved method of bandspread tuning is only one of the many outstanding features normally only to be found in much higher priced instruments. The scale for the TROPHY 5 is available calibrated alternatively in metres or kilocycles. Complete with built-in speaker in cabinet illustrated above. For AC mains only 200/250 volts. Fully guaranteed.</p> <p>TERMS: 10/9 with order and 18 monthly payments of 10/9.</p>	<p>British and Better</p> <ul style="list-style-type: none"> ● 8 International Octal Valves. ● 5 Bands, 7-550 metres. Complete coverage. ● Continuous Band-Spread Dial. ● R.F. on all bands. A.V.C. and B.F.O. switches. ● Stand-by switch. ● B.F.O. with separate pitch control. ● High impedance output sockets for separate PM speaker. 'Phone jack. <p>Cash £9</p>
--	--	--	--

PETO-SCOTT CO, LTD. 77 (SM12), CITY ROAD, LONDON, E.C.1. Tel. Clissold 9875
 41 (SM12), HIGH HOLBORN, LONDON, W.C.1. Tel. Holborn 3248.
COMPLETE DETAILS COVERING ALL TROPHY RECEIVERS FREE ON REQUEST

THE BRITISH MANUAL OF AMATEUR RADIO

Though it was originally intended that this should appear at the end of February, it has been found necessary to defer publication until November next.

We appreciate that this announcement will doubtless cause disappointment to some of the many readers who have reserved copies; all reservations, however, will be regarded as standing orders and notification will reach applicants prior to publication.

THE SHORT-WAVE MAGAZINE, Ltd., 84-86 Tabernacle St., London, E.C.2

EASY WAY TO LEARN WIRELESS CODE

Use the **Instructograph Code Teacher**. Always ready. No weather interference. Beats having someone send to you. Speed range 5 to 40 w.p.m.

- Standard** (illustrated) with 10 tapes & Book of Instructions ... **£4 16 0**
- Junior** (a little smaller) with 5 tapes & Book of Instructions ... **£2 18 0**
- Standard** with complete oscillator **£6 8 0**
- Junior** with complete oscillator **£4 10 0**

Oscillator Equipment—Transformer & tube socket installed 8/-; 99 type radio valve 4/-; key & connecting cord 8/-; Trimm dependable 2000 ohm head phones 12/-; Total **£1 12 0**

Prompt shipments. Prices include postage charges.

INSTRUCTOGRAPH COMPANY 912 Lakeside Place, Chicago, Illinois, U.S.A.





GAMMATRON TUBES.

Hamrad will have available by about March 1st full stocks of the following **GAMMATRON** tubes, and will be in a position to Factor these to the Trade as a whole. This line will not be exclusive to Hamrad Agents, although they will naturally be able to give you service rather better than most Dealers.

- Gammatron H.K.54 Filament 5v5a.
Plate volts 2000. Output 50W.
- Gammatron H.K.154. Filament 5v7 $\frac{1}{2}$ a.
Plate volts 1500. Output 50W.
- Gammatron H.K.254. Filament 5v7 $\frac{1}{2}$ a.
Plate volts 3000. Output 100W.
- Gammatron H.K.354. Filament 5v10a.
Plate volts 4000. Output 150W.
- Gammatron 24. Filament 6.3v3a.
(Foreign) Plate volts 1000. Output 25W.



We offer the following Hytron tubes subject to being unsold.

- Hytron 866jr 7/6
- Hytron HY25 Equals the T20 ... 16/6
- Hytron HY40 Equals the T40 ... 23/0
- Hytron HY51 Equals the T55 ... 42/0
- Hytron HY61 Equals the RK39 ... 20/0
- Hytron HY60 Hotstuff Beam Tetrode 19/0
- Hytron HY57 Triode P.A. Oscillator 23/0
- Hytron 615 The U.H.F. Tube 17/0

The Hytron HY40Z will shortly be available to compete with the TZ40, at an attractive price. (Foreign)

TUNGSRAM

Hamrad are able to supply all the new Tungsr-Am American type tubes, including the new 6L6G. Prices are attractive and will be in the hands of every Agent by March 1st.



100 watt Auto transformers:
100/110 and 210/230/250..... 9/6

Filament transformers

210/230/250 Primaries.....	11/6
2.5v x 10a Secondary.....	11/6
5.0v x 8a Secondary.....	11/6
6.3v x 6a Secondary.....	11/6
7.5v x 6a Secondary.....	11/6

Mains transformers

210/230/250 Primaries.....	
2.5v 4a and 5.0v 4a and 6.3v 4a all C.T.	
350-0-350.....130 m/a.....	23/6
400-0-400.....130 m/a.....	26/6
450-0-450.....130 m/a.....	28/6
500-0-500.....130 m/a.....	31/-

H.T. transformers

Primaries 210/230/250.	
500 x 500.....150 m/a.....	27/6
500 x 500.....200 m/a.....	30/6
750 x 750.....250 m/a.....	38/6
1000 x 1000.....250 m/a.....	42/-
1250-750 x ditto ..250 m/a.....	44/-

RESISTORS & CHOKES

Hamrad will shortly have full stocks of Ohmite Manufacturing Company's lines and will be able to distribute these to Traders generally. Lines will include

- Ohmite vitreous enamelled rheostats.
 - Ohmite filament dropping resistors.
 - Ohmite power line chokes for preventing interference from H.F. currents.
 - Ohmite vitreous enamelled fixed resistors in all values from 5 ohms to 100000 in 25, 50, 100, 160 and 200 watt ratings.
 - Ohmite "Dividohm" vitreous enamelled resistors. The resistor is calibrated and and marked so that tapping clips may be placed at a definite value. Wattage ratings from 10 to 100 watts. 1000 to 50000 ohms.
 - Ohmite centre tapped resistors for eliminating hum.
 - Ohmite R.F. Plate chokes for 5, 10, 20 and 40 metre bands.
 - Ohmite transmitting band switches.
 - Ohmite non-inductive resistors, all types.
- Keep in touch for full dope when available. (Foreign)

EIDSONS T9 CRYSTALS.

500 sold in a month! There must be a reason. New delivery in Customs now.



7 MC band - 10/6 with certificate

EIDSONS ceramic holder, shown above. Hand lapped plates - 7/6 Hamrad are Sole European Agents for these lines. (Foreign)

After having been trading for only two months Hamrad have had to rapidly remove to premises three times the size. Please note new address below.

Sleeving. Coil formers in Calit and Trolitul. Amelit formers. Trolitul switches. Resistors from 1/4 to 100 watt at competitive prices. R.K. tubes. Competitive tubes at keen rates. A list of Hamrad Agents at the time of going to Press is given below. Support your nearest Dealer, Please!

Much time is saved if you will deal with the Agents, they are there to serve you and take an interest in you, always. If you do not get the treatment you desire from any of Hamrad's Agents please write and tell us so, we'll do the rest!

HOW MUCH DO YOU LOSE ?

A considerable amount of useful KF energy is absorbed by inefficient aerial feeders. By using one of the specially designed feeders described below you will find that you gain greatly increased efficiency. Use these cables for links too!

- All of these cables are suitable for frequencies from 1.7 to 22 $\frac{1}{2}$ Mcs.
- Type L.I.F.—Low impedance. Carries up to 100 watts 6d. yard.
- Type H.I.F.—High impedance, 350 ohms. Carries 200 watts 6d. yard.
- Type L.I.C.—Low impedance air-spaced co-axial. This is the latest and has very low attenuation, 70 ohms. Carries up to 250 watts 1s 6d. yard.

These cables were designed and made under the supervision of Dr. C. G. Lemon, G2GI, and Hamrad have the sole rights in Britain and U.S.A. Any lengths will be cut, with pleasure.

- LONDON**—A.C.S. Radio (G2NK), 16, Gray's Inn Road, W.C.1. Holborn 9894.
- H. B. Crowe** (G6CO), 22 Chipstead Gardens, N.W.2.
- Farradio** (G8KZ), 348 Portobello Road, W.10. Ladbroke 3143.
- BANSTEAD**—Raylec Ltd. (G6UB), High Street. Burgh Heath 1365.
- BELFAST**—H.F. Services (G13ML), 3 King's Crescent. Belfast 53206.
- BLACKPOOL**, S.—R. Maynard (G6MI), 129 Bloomfield Road.
- BOSTON**—S. J. Vamplew (G6LC), 41 Willoughby Road. Boston 2527.
- BOURNEMOUTH**—Radio Winton (G8BW), 415 Wimborne Road, Winton. Winton 2574.
- BROMLEY, KENT**—National Radio Hire Services (Ex-G5HX), 191 High Street. Ravensbourne 5601.

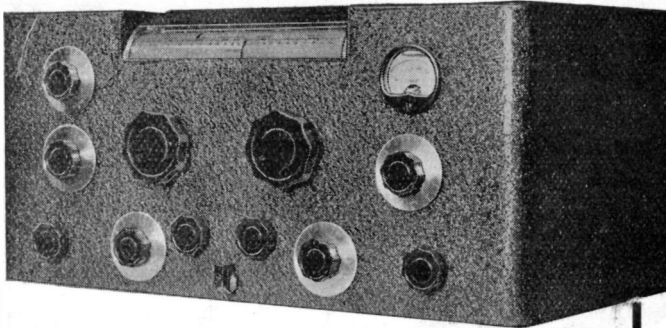
- CARDIFF**—E. H. Robins Trading Co. Ltd. (GW8WU), 32 City Road. Cardiff 3413.
- CHADWELL HEATH**—R. C. E. Beardow (G3FT), 3 Geneva Gardens.
- CONWAY**—J. W. Bevan Evans (GW3GL), The Aplary. Conway 156.
- EDGWARE**—F. George (G5FG), 35 Wolsey Grove.
- GRIMSBY**—Gt. Grimsby Coal & Tanning Co. Ltd. (G5GS), Electrical Dept., Fish Dock Road. Grimsby 5346.
- HENLEY-ON-THAMES**—R. G. W. Page (G5TP), Stoke Row.
- HIGH BLANTYRE, Lanarkshire**—D. R. L. Duthie (G6GW), The Park.
- HOVE**—Bondmag Ltd. (2ACU), 9a Mortimer Road, Hove, 3. Hove 6472.
- IPSWICH**—Wakelins Wireless Ltd. (G2AN), 66 Norwich Road, Ipswich. Ipswich 3856.

- KENFIG HILL**—Sid Waters (GW3GO), Radio Relay Station. Kenfig Hill 48.
- LANCASTER**—W. E. Ostle (2DYU), 49 King Street, Lancaster. Lancaster 641.
- LOWTON ST. MARYS**—J. Ince & Sons Ltd., 74 Newton Road.
- RUGBY**—Benn Radio (G3DI), 96 Lower Hillmorton Road. Rugby 2342.
- SALISBURY**—Southern Radio & Electrical (2ACC), 85 Fisherton Street. Salisbury 2108.
- SMETHWICK**—Midland Ham-Radio Services (G5FH & 6CG), 303 Oldbury Road, Broadwell 1338.
- SUTTON-IN-ASHFIELD**—Wilfred Hensstock, 29-39 Forest Street. Sutton-in-Ashfield 90.
- THORNE, YORKS.**—Benson & Farmer (G5GJ), 51 King Street.
- WEST HARTLEPOOL**—R. W. Stewart (G3LS), 8 East View Terrace, Seaton Carew.

Hamrad Wholesale, 32 St. Lawrence Terrace, Kensington, W.10.

LADBROKE 1166-7-8

NO SOONER HAD OUR ANNOUNCEMENT OF THIS NEW EDDYSTONE RECEIVER APPEARED LAST MONTH THAN WE WERE GRATIFIED BY A VERY PLEASING POST-BAG--SHOWING THAT WE HAD, AS WE INTENDED, PRODUCED SOMETHING A LITTLE BETTER—MORE OUTSTANDING. IN CASE YOU MISSED LAST MONTH'S ISSUE



WE REPEAT DETAILS OF THE LATEST

“EDDYSTONE” COMMUNICATION RECEIVER

Type E.C.R.

We particularly invite every reader of this announcement—including YOU—to write for the literature describing this new “Eddystone” Wonder.

The Chassis, Coil Unit and Crystal Unit are die-cast and the most complete screening is employed everywhere. The Superheterodyne circuit comprises 10 valves, including Rectifier. Switched coils cover a waverange of 9.5 metres to 190 metres, 33 megacycles to 1.6 megacycles, divided into 4 wavebands. Electrical bandspread tuning is employed. A crystal gate is fitted with phasing condenser and variable selectivity control. Volume controls for R.F. and L.F. adjustment. An “R” meter calibrated in decibels, B.F.O. control and switch and A.V.C. on and off. 3 Watts output.

PRICE £45

Post the Coupon for descriptive literature and performance specification of this wonder model to:

STRATTON & Co. Ltd. BROMSGROVE ST. BIRMINGHAM 5.
LONDON AGENTS: WEBB'S, 14 Soho St., W.1

CUT ALONG THIS LINE.

To Messrs. STRATTON & Co., Ltd., Bromsgrove St., Birmingham
Please send me details of Eddystone Receiver type ECR.

Name

Address

Clip off and post in ¼d. env. S.H.

THERE'S NO CATCH IN IT!



These Communication Receivers really do bring in DX. Don't take our word for it. Any **Hallcrafters, National, Hammarlund, R.M.E or Howard** Receiver may be tried out in your own home for three days against either full deposit or H.P. deposit and accepted agreement. If unapproved we return your deposit immediately less 5% of the Receiver price, to cover packing and carriage expenses. Detailed specifications and price list free on request. Why not write to-day for a trial of the model you think might best suit your needs and pocket? We guarantee the refund without delay or difficulty upon request. We only want satisfied customers.

Don't forget we carry a full range of the popular **HAMRAD** and **EDDYSTONE** components, and many other useful accessories, including most American type valves.

A.C.S. RADIO TECHNICAL MANAGER **G2NK**
16 GRAYS INN ROAD, LONDON, W.C.1
Telephone: HOLBORN 9894-5

LEARN CODE

You can become a fast capable Operator at Home with the

CANDLER SYSTEM!



T. R. McELROY, The Candler trained **WORLD'S CHAMPION** Telegraphist, on November 19th, 1938, held his title against all comers. He created a **NEW RECORD** of 75 w.p.m. McElroy says:—“I owe my success to Candler Training.”

CANDLER COURSES have made **Champions**.

SCIENTIFIC CODE COURSE for beginners. Teaches all the necessary code fundamentals scientifically.

HIGH SPEED TELEGRAPHING for operators with speed from 12 to 15 w.p.m. who want championship speed and technique.

IT'S easy to learn code the Candler way. Here is a scientific system of code instruction, developed over many years of practical teaching experience, that is world-famous. Candler students are correctly taught right from the start, with the proper fundamentals, so that their progress is truly amazing. With this system you learn to read code by sound, just as you read print by sight. In a few week's time, you will accomplish far more than with months of undirected practice. Literally thousands of radio and cable telegraphists owe their high proficiency to Candler Training.

Send for Free Book of Facts. It tells all about the famous Candler System!

Write to H. FREEMAN, 121, Kingsway, London, W.C.1. London Representative, (Room 55C).

CANDLER SYSTEM CO.
Asheville, North Carolina, U.S.A.

for Accurate Testing you need an

AVOMINOR

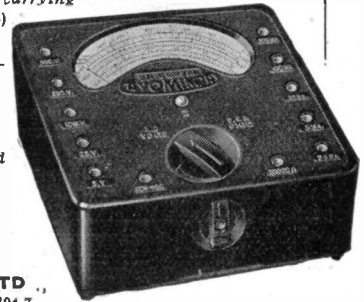
ELECTRICAL MEASURING INSTRUMENT

The UNIVERSAL AVOMINOR

Electrical Measuring Instrument

This compact precision moving-coil instrument covers all A.C. and D.C. testing. It has 22 ranges for measuring A.C. voltage, D.C. voltage, current and resistance. All readings are direct. No calculations. The high total resistance of the instrument—200,000 ohms—ensures accurate readings. Complete with interchangeable testing prods and crocodile clips; leads and instruction booklet ... **£5 10s**

(Leather carrying case, 10/-)



The word "AVO" is our Registered Trade Mark.



Highly efficient testing facilities are provided by either of these models of the Avomator. Whilst moderate in price, they are precision instruments, made by the makers of the famous Avometer—the world's foremost combination testing instrument.

BRITISH MADE

The D.C. AVOMINOR

Electrical Measuring Instrument

13 precision meters in one. This accurate moving-coil instrument has 13 ranges . . . voltage ranges sufficient for measuring H.T., L.T., Grid Bias, Mains and Eliminator voltages; milliamp ranges for testing all receiving valves and radio apparatus; resistance ranges for all resistance tests. In case complete with interchangeable testing prods and crocodile clips; leads and instruction booklet. **45/-**

All "Avo" Instruments are available on Deferred Terms if desired.

● Write for fully descriptive pamphlets.

Sole Proprietors and Manufacturers:—

THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
Winder House, Douglas Street, London, S.W.1. Telephone: Victoria 3404-7.

G5NI – Communication – Receivers



NATIONAL NC-44

This new NC-44 Communication Receiver combines capable performance with exceedingly low price. It employs seven tubes in a super-heterodyne circuit with a 8KB first detector and oscillator having exceptional stability and conversion gain, two 456 KC IF stages, 8K7 second detector, AVC with ON-OFF switch, CW oscillator and 25L6G beam tube output (2 watts UPO). A coil switch with silver plated contacts selects the four ranges from 30 MC to 550 KC. A full vision dial is calibrated directly in frequency, and a separate electrical band-spread dial makes accurate tuning easy. There are separate controls for RF and Audio Gain. Power supply operates on 110-230 volts A.C. or D.C.

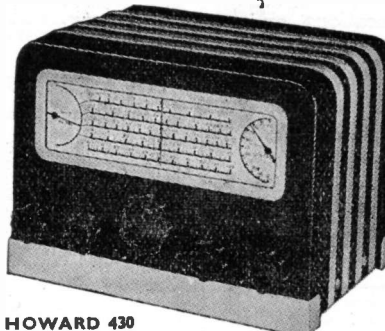
PRICE with tubes and speaker 16 GNS.

HOWARD 430. Six Tubes, four Bands from .54 to 40 Mc., Iron-cored IF's, Ceramic Coil forms, Beat Oscillator, Headphone Jack, Doublet Antenna Connections, Bandsread, Send-receive Switch, etc., AND IT COVERS 10 METRES.

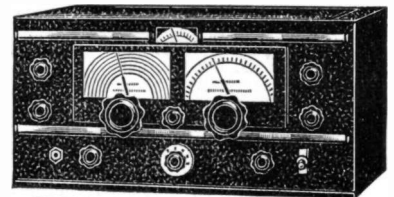
PRICE 9½ GNS.

HOWARD 450 A. 12 Tubes, 6 bands, 65 Mc. to 540 kc. Complete with Crystal Filter and Speaker

PRICE 30 GNS.



HOWARD 430



RME 70

All the advantages of the 69 plus a Built-in Noise silencer. Iron-cored IF's, illuminated DB-R Meter, new type Crystal Filter with phasing and selectivity Controls, Relay and Break-in Control, new Cabinet with Chromium trim.

Lower in **PRICE 35 GNS.**

"BLILEY" NEW VFI 40 METRE CRYSTAL. At last a variable frequency 40 metre crystal, allowing 12 kc. shift on fundamental and giving 24 and 48 kc. on 20 and 10 metres respectively. **PRICE 45/- EACH.**

"OHMITE" LATEST 100-WATT DUMMY ANTENNA. True 72-ohm impedance on all frequencies at any power up to 100 watts. Get to know the true efficiency of your Transmitter. **PRICE 20/- EACH.**

SPECIAL OFFER. Fully shrouded Transformers by America's largest manufacturer. While they last. T7260-400/400 v. 150 m/A. 6.3VCT. 4A. 5V3A, 12/6; T7236-375/375 v. 120 m/A., 6.3VCT. 4A. 5V3A 10/6; T7326-350/350 v. 100 m/A., 6.3VCT. 3A. 5V3A, 8/6; T7307-350/350 v. 80 m/A., 6.3VCT. 3A. 5V3A, 7/6; T7000-320/320 v. 80 m/A., 6.3V4A, 5V3A, 7/6; T464919-10V4A Primary Tapped 110-250V, 5/6. Chokes interleaved and Impregnated: 20 Hy. 500 ohms 100 m/A., 4/11; 15 Hy. 250 ohms 60 m/A., 1/11.

Catalogue 1½d. 70-p. Manual 7½d.

RADIOMART

44, HOLLOWAY HEAD, BIRMINGHAM, 1. Telephone: Midland 3254.

The
Short-Wave Magazine

No. 1, Vol. III.

MARCH, 1939

Contents

	PAGE
Editorial - - - - -	7
A Three-Stage Battery Transmitter. <i>The Editor</i> - - -	8
The 1.7 Mc DX Tests - - - - -	12
On the Amateur Bands. <i>Old Timer</i> - - - - -	14
The Cathode-Ray Tube. <i>A. F. Hollins</i> - - - - -	16
The HF Tuning Unit for the Class-B One Valve. <i>Tester</i> -	13
The Other Man's Station—G6YR - - - - -	19
“Have You Heard . . . ?” <i>F. A. Beane, 2CUB</i> - - - - -	22
Book Review - - - - -	24
Conditions—The Month's Survey - - - - -	25
Notes and News from the East. <i>Reported by VU2EU</i> - - -	25
Listeners' DX Corner. <i>The DX Scribe</i> - - - - -	26
Calls Heard Section - - - - -	29
56 Mc Notes. <i>A. J. Devon</i> - - - - -	30
Frosting Aluminium. <i>F. H. North, 2FPP</i> - - - - -	31
Letters to the Editor - - - - -	32
Here and There - - - - -	33
Civilian Wireless Reserve Notes - - - - -	34
The Month's Club News - - - - -	34
Readers' Bargain Page - - - - -	40
Station List—31 to 62 Metres - - - - -	iii of Cover

Editor - AUSTIN FORSYTH, G6FO
Assistant Editor - S. W. CLARK, 2AMW
Business Manager - C. T. MILDENHALL
Advertisement Manager - A. W. MARRIOTT

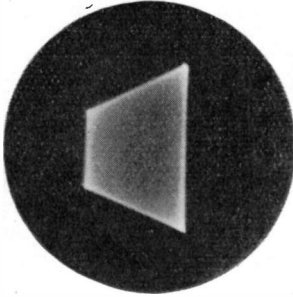
Published on the first Wednesday in each month at 84-88
Tabernacle Street, London, E.C.2. Telephone: Clerkenwell
6230. Annual subscription: Inland 8s.; Abroad 10s., post paid.

AUTHORS' MSS.

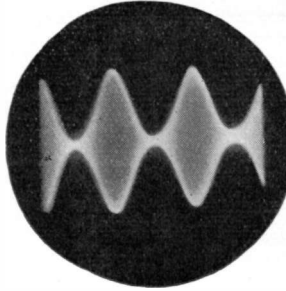
Articles submitted for Editorial consideration must be typed
double-spaced with wide margins, on one side only of quarto
sheets, with diagrams shown separately. Photographs should
be clearly identified on the back. Payment is made for all
material used, and a figure quoted in the letter of acceptance.
A large stamped addressed envelope should be enclosed
for the return of MSS. not found suitable for publication.

SEEING

Oscillogram showing carrier modulated to 30 per cent (recorded without time base unit).



IS



Oscillogram showing deeply modulated carrier (recorded with time base unit).

Half actual size of Mullard E.40-G3 screen.

BELIEVING !

The Mullard E.40-G3 Cathode Ray Tube

enables the experimenter to observe the effect of circuit alterations, the efficiency of various forms of valve control, frequency stability and many other important characteristics; the accurate knowledge of which is essential to every serious experimenter.

Write for the Mullard E.40-G3 Booklet in which are described in detail some of the many measurements which may be undertaken.

OPERATING DATA

Second Anode Voltage	Va2	...	500—800 volts
First Anode Voltage	Va1	...	140—200 volts
Grid Voltage	Vg	...	0—25 volts
Heater Voltage	Vf	...	4 volts

Full details of this tube, together with a number of circuits showing application details, will be found in the Mullard E40-G3 booklet. If you have not already received a copy, post coupon below.

PRICE £2 : 15 : 0

Every "Short-Wave Magazine" reader should be in possession of a copy of this up-to-date Cathode Ray Tube publication. Fill up Coupon for a free copy.



- To the Mullard Wireless Service Co., Ltd.,
- Cathode Ray Tube Dept., S.W.10.
- 225, Tottenham Court Road, London, W.1.
- Please send me your FREE BOOKLET
- on experimental uses of the Cathode Ray
- Tube.

■ Name

■ Address

■



Birthday

Editorial

WITH THIS ISSUE, the MAGAZINE enters on its third year of life. It is therefore fitting that we should look back a little on what has been achieved as well as forward in anticipation of what we hope to accomplish.

By the support of our readers and our advertisers, to whom we have offered our thanks before and do so again now no less gratefully—remarking in passing that we are told we give good value for money—we have attained a measure of success which ensures our continued efforts in the direction exemplified by the words which appear on the front cover.

But we are by no means satisfied yet; we are far from having reached the stage where we can sit back and say amongst ourselves in the office "We are producing the perfect, the ideal paper and everyone is happy." It is impossible to please all the people all the time—the best we can hope for is that most readers find something to interest them in each issue. And it is worth remarking here that our issues of the last three months were completely sold out, in spite of a print order increased progressively each month by several times the extra demand for the preceding issue.

During the past year, we may truly say that this MAGAZINE has brought Amateur Radio within the public ken and has thereby been the means of assisting hundreds of readers to a transmitting licence, in itself no mean feat. On the technical side, we have focused the attention of a large number of active transmitters and experimenters on what used to be the two most neglected amateur bands—1.7 and 56 Mc. The present high activity on both these frequencies is directly attributable to what has been appearing in our pages for the last nine months, backed by exclusive news of practical results in advance of anything previously published in this country.

The style, range of contents, features and even the layout of the MAGAZINE are being copied more and more by similar publications all over the world. To us, this is both a compliment which we acknowledge and an effective spur to further improvement.

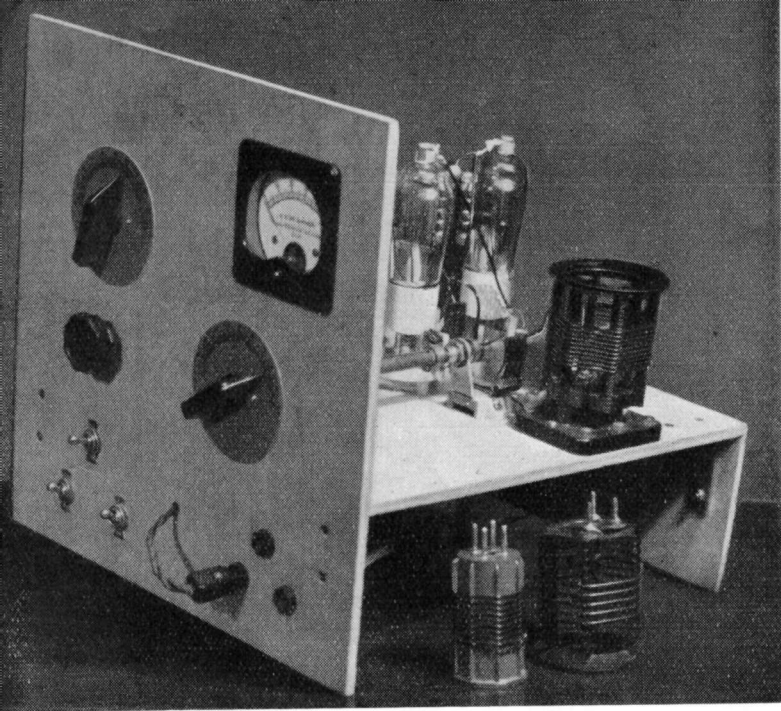
Readers, who will not have failed to notice that we never print self-praise or letters of the "I-think-your-paper-is-wonderful" type (though we get many such and greatly appreciate each one), will perhaps on this occasion overlook any tendency for self-gratification which may be apparent in the paragraphs above.

*Austin South
Ed.*

Three-Stage Battery Transmitter

By

Austin Forsyth, G6FO
(Editor)



NOT ONLY do we get a steady stream of requests for battery transmitter designs, but nearly all our recent mains circuits have had to be adapted for battery operation by the Query Department. It appears that quite a large number of readers interested in transmission are faced by the problem of "No Mains," and in many cases it is assumed that because power is not available, the full enjoyment of Amateur Radio is not possible.

We have therefore set about the business of producing a sound design, adaptable to existing equipment, which not only incorporates the most up-to-date ideas in transmitter construction, but also produces in the finished job shown here plenty of RF output with reasonable battery loading. There are many battery transmitters in daily operation, but owing to the fact that in most cases power economy is studied to an exaggerated extent, few of them give more than a watt or two of RF output, even though the input may be of the order of five or six watts. It is always the RF output which matters most, not the input—an obvious fact which is yet too often forgotten or lost sight of because transmitters are rated by the DC input to which they can be run, this by itself not being any indication of how much power goes into the aerial.

Hence, in battery working, one should aim first at getting high RF output, coming back from this point towards power economy; or, putting it another way, do not push current saving too far without keeping an eye on the RF output, because a reduction of 5 mA somewhere might mean a 50 per cent. drop in RF at the tank—and that is not economy.

● Power Supply

Since one of the most important considerations in battery transmitter working is connected with the installation and use of the supply, a few words on this point should find place here.

First, the voltage employed should be as high as possible consistent with that which the valves will

safely stand. This in effect means that more watts are available for less current—and it is of course the current load which ultimately kills the batteries.

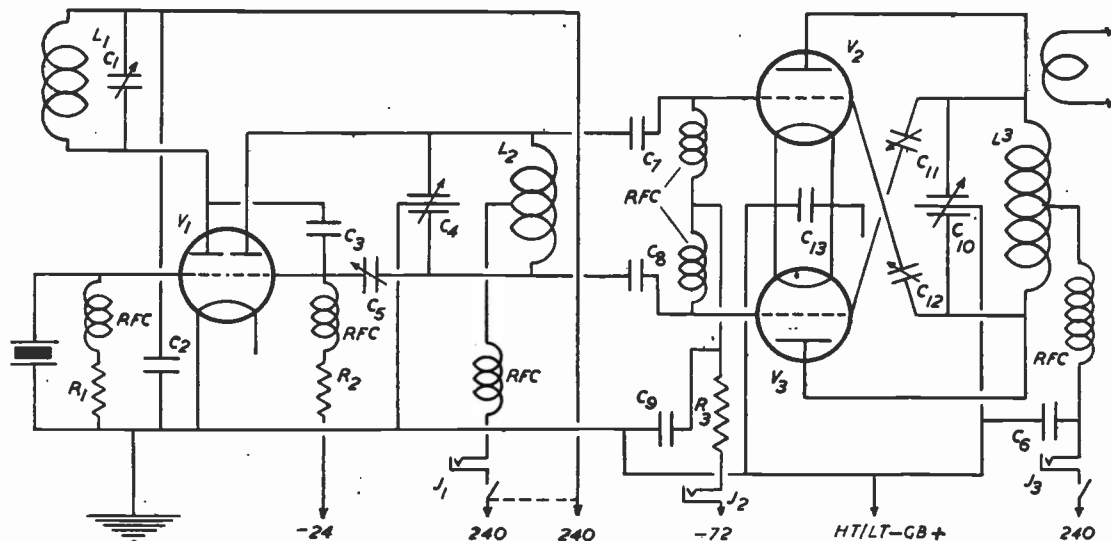
Secondly, the batteries should be connected to the transmitter in such a way that the loading can be kept even, i.e., if one section of the supply feeds a low-power load (such as a CO/FD stage) and another section the PA (taking more current), the batteries should be changed about at intervals so that the total load on them is equalised.

Thirdly, it is false economy of the most extravagant kind to buy cheap batteries, even if they are paralleled, since the standard-capacity types have very low recuperative ability when subjected to heavy loads. The right kind of batteries for economical transmitter operation are the triple-capacity 120-volt blocks, such as "Drydex" H.1015, which can be connected in series-parallel for long life and high loading. Four of these blocks can be arranged in two 240-volt sections, when loads of 30-40 mA per section will be well within their recuperative power and they can be forgotten for months.

The tables of operating data given herewith show the battery loading imposed by the particular transmitter we are discussing. We can hear someone say "What, 70 mils from batteries," to which we would reply that if they are connected as suggested above, the actual loading will be less than 35 mA per section average and since we are considering a CW transmitter, the effective current drain is still further reduced owing to the intermittent nature of the load. In point of fact, this transmitter could be operated on CW for a period of at least six—and probably nine—months on four 120-volt triple capacity blocks, costing in all just over £3 to instal, and assuming between two and three hours on the air daily.

We might add that these calculations are based not on fancy, but on practical experience, and can no doubt be borne out by many readers who use battery power.

Efficient—High RF Output—Low Battery Load — Easily Built



Circuit of the Battery Transmitter, fully discussed in the text. The CO/buffer-doubler plate supply can be taken from one pair of 120-volt batteries and the PA HT from another. The output coupling link should be connected to the centre of L3, in order to load the output stage symmetrically.

● Circuit Arrangement

The most suitable valves available for battery working are the Hivac ceramic-based short-wave type, which can quite safely be operated at up to 250 volts on the plate and will stand considerably more. They are therefore the obvious choice. Keeping in mind the importance of working for the highest possible RF output, it next becomes evident that the PA stage must not only get plenty of drive, but in order to allow normal inputs to be used (10-15 watts) the PA stage should have some power-handling capacity.

Thus we arrive at a three-stage circuit with a pair of PX.230SW's in push-pull for the output; the intermediate stage provides the necessary driving power and the push-pull PA will give some 7 watts of RF at 7 Mc with 10 watts input.

The most economical way of arranging the two preceding stages is to employ a twin-triode, one half as CO, the other as buffer-doubler; so the Hivac B.230, now made with a ceramic base, falls into place for V1.

Then, with a 7 Mc crystal and working into the aerial on that band, the circuit is CO-Buffer-PA, with the buffer and PA neutralised; for 14 Mc output the second stage doubles the crystal frequency and the PA is again a straight-driven neutralised amplifier. To get "push-pull drive" from a single-ended stage, it is desirable to arrange the circuit as shown at L2/C4, using a split-stator condenser, actually a Polar 160 mmF twin-gang. This ensures accurate balancing and stable operation. Direct coupling to the PA follows because the layout is such that the physical displacement between the stages is measured only by the length of the coupling condensers C7, C8, so that the extra tuned circuit which would be introduced by link-coupling becomes unnecessary.

The output tank L3/C10 is also tuned with a Polar type "E" split-stator condenser (a design we

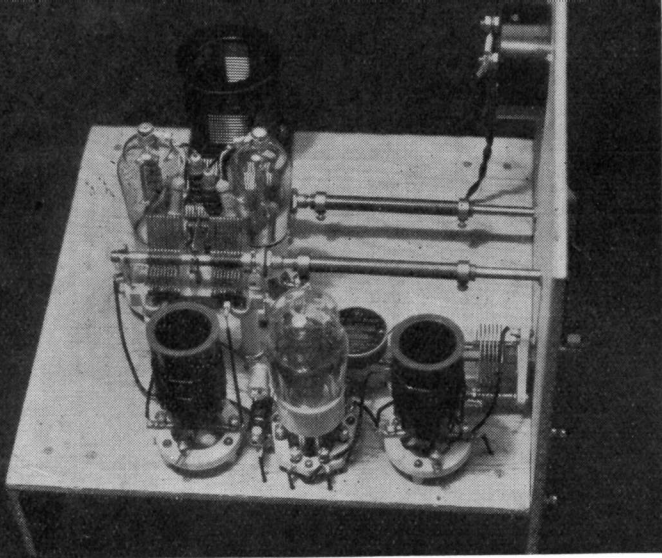
find extremely useful for all low-power circuits similar to those mentioned here) and the balance obtained is such that neutralisation holds for both bands, once it has been set for either. The PA is operated with a bias value of three times cut-off, plus that which is made across the leak R3, the buffer stage being similarly biased and neutralised. Notice that the PA is neutralised by passing out-of-phase voltage from the plate of one valve into the grid of the other, i.e., it is necessary to make sure that the neutralising condenser connections cross each other.

C13 is the filament by-pass condenser for the PA, and the same compromise value of .002 mF has been chosen for the other fixed capacities to make the transmitter suitable for operation on all bands 3.5 to 28 Mc. The 50 mmF feed condenser C3 may be considered a bit small, but this value was arrived at after experiment to find the coupling which gave the best drive to the buffer-doubler while keeping the CO load down. The characteristics of the Hivac B.230 in combination with a resistor of 50,000 ohms for R1 between them limit the CO plate current to 12 mA under operating conditions.

Note that while two separate HT inlets are shown, the voltage applied to all anodes is the same in order that the battery loading can be equalised by changing them round, as described in the paragraph headed "Power Supply."

● Construction

There are several points to be brought out on the constructional side, though the photographs give a very good impression of the layout. A wooden chassis of the kind advocated by "Tester" in the February issue is used, this one being the smaller of the two sizes mentioned by him. There is ample space for the symmetrical arrangement of all parts and the round hole for the Premier 0.50 mA meter can easily be cut out with a fret-saw.



Side view showing general layout. Right to left front: C1, L1, B.230, with QCC crystal holder just behind valve and midget neutralising condenser C5 at right of L2. Note space left for modulator between PA stage (from L2/C4 forwards) and front panel.

Since the PX.230SW has its *grid* connection at the top, it is necessary to mount C4 on Eddystone 2½-in. insulating pillars in order to shorten the PA grid connections. C4 control is the upper left-hand dial in the panel view, with C1 knob directly below, and C10 dial to the lower right. Both C4 and C10 are on Eddystone extension shafts, thus bringing the condensers where they are wanted in the circuit and ensuring the shortest possible connections.

The QCC type U crystal holder is mounted across a pair of valve-sockets carried on midget s/o insulators, this being more convenient than using a valve-holder for the crystal, since a baseboard type mounting is required and the QCC holder only fits the American centring. The B.230 is mounted in a Bulgin 7-pin baseboard valve-holder, and the two PX.230SW's in Eddystone standard 949 holders.

A QCC "Ten-Watt Type" output circuit assembly was chosen because the coil sizes are just right, an insulated plug-in base is required, and coil-changing is facilitated by the type of mounting. C10, the Polar .00016 mF twin-gang connected split-stator, can be fixed direct to the baseboard, since its construction is such that the two stators are carried on a steatite base, having connecting lugs on both sides, which greatly facilitate the wiring. One pair of stator lugs looks straight at the coil-base connecting screws, and the other two towards the plate pins of the valve-holders, which are fixed slightly on the skew to shorten the leads. The four leads involved need each not be more than ¼-in. long!

The two coils L1, L2, mount in Eddystone type 949 valve-holders and the CO tank tuning condenser C1 is fixed direct to the front panel, the rotor being made earthy in the RF sense. No dial is necessary on C1, because once adjusted it can be left set whether the transmitter is on 7 or 14 Mc.

For the neutralising condensers, a pair of mica trimmers of the ordinary screw-adjusting type have been chosen for the PA stage and for the buffer side one of the new Eddystone air trimmers, an extremely ingenious design of very small physical dimensions which has the moving half on a spiral thread, the whole being small enough to be supported in the wiring. This type 1100 component is ideal for neutralising low-power circuits where the DC voltage does not exceed about 300 or thereabouts. In the side-view photograph, it can be seen above the RF choke between the B.230 and the left-hand coil, which is the buffer-doubler tank L2, with C4 above and immediately behind.

The RF chokes shown are not superfluous, but necessary; if they are not included, queer things

will happen. The same applies to the tank by-pass condensers C2, C6.

A DPST on-off switch applies LT to the transmitter and HT to the CO side; this appears as the middle top switch in the panel view. To the left below is the buffer-doubler HT switch and on the right that for the PA. The middle top jack is PA plate, PA grid at the bottom right, and in the photograph the meter is plugged to buffer-doubler plate. The switches are Bulgin and the jacks Webb's Igranite single close-circuit.

All HT/LT wiring is beneath the chassis, a row of terminals along the back sub-panel connects in the HT, LT and bias supplies and, except for the PA tank leads which are in No. 16 enamelled, all wiring is in 18's tinned copper with black sleeving. The components are fixed down by means of 4.BA and 6.BA brass nuts and bolts and if the transmitter is built as specified, at no point will any RF wiring come near the wooden chassis nor will there be any uninsulated DC paths, as the supply terminals alone are mounted, at 1-in. intervals, on wood—and we could not trace any leakage when testing with 1000 volts across HT positive and negative.

● Operation

Adjust the bias and supply voltages to those given in the accompanying table, switch on LT and HT to the CO and with the meter temporarily connected in the HT lead (to read CO plate, which is not

LIST OF PARTS FOR THE "THREE-STAGE BATTERY TRANSMITTER."

- V1—Hivac B.230 twin-triode.
- V2, V3—Hivac PX.230SW.
- C1—100 mmF, S.W.R., Leeds.
- C2, C6, C9, C13—0.002 mF, Dubilier 690W.
- C3—50 mmF, Dubilier 690W.
- C4, C10—Polar type "E" 160 mmF twin-gang.
- C5—Trimmer (neutralising) condenser, Eddystone 1100.
- C7, C8—200 mmF, Dubilier CTS620.
- C11, C12—Trimmer (neutralising) condensers, Eddystone 1023.
- R1—50000 ohms 1-watt, Dubilier.
- R2, R3—10000 ohms 1-watt, Dubilier.
- RFC—Eddystone, QCC, Denco, Raymart, Premier; all standard 10-180 metre type.
- Bulgin DPST (one), SPST (two) switches, 7-pin valveholder, jack plug. Clix type B terminals, 4 black, 3 red. Eddystone extension controls (1008), 4 valveholders (949), 2 midget s/o insulators (1019), 2 pointer knobs and dials (1027), one knob (1089), 2 2½-in. insulating pillars (1028). QCC type U holder and 7 Mc crystal, 7 and 14 Mc centre-tapped coils with base (10-watt type). 3 Igranite close-circuit jacks, Webb's Premier 0-50 mA m/c meter. Wooden chassis, Venesta 12-in. square ¼-in. plywood baseboard and panel, with 4-in. runner.

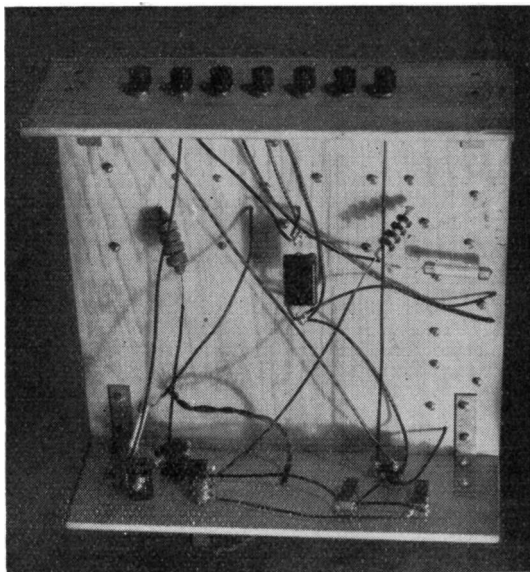
jaacked) adjust C1 till the crystal takes up; this will be with the condenser about one-third in mesh, and the plate current will rise from around 5 to approximately 10 mA when the crystal oscillates.

Now neutralise the buffer side, this being done by adjusting C5 till no flicking appears in the CO plate current reading and there is no RF in L2 as C4 is swung through resonance. Note that this particular type of condenser (C5) has no insulation on the rotor side, so that it must be moved a little at a time with one finger (the HT being switched on and off) till the correct setting is found; this will be just after the rotor has engaged the stator.

Then plug the meter to buffer plate, switch HT to that stage and tune for minimum plate current. The dip will not be very pronounced. There should now be a good RF indication at L2, grid current showing in the PA, with the crystal following as the transmitter is switched on and off (if not, ease C1 off a little) and a clear sharp note in the monitor with the key plugged to the buffer plate jack. It is at J1 that the transmitter is keyed.

Next, swing C10 through resonance and, with the meter in the PA grid, vary the trimming (neutralising) condensers C11, C12, together till the meter shows no change in grid current as C10 goes through resonance. It is possible with these screw-adjusting midget condensers to get the grid meter absolutely dead steady—the correct neutralising setting will be found near the maximum capacity end of the range.

The very complete tables of operating data give all other necessary information, the figures having been taken from the model illustrated and described here: Grid current, plate current, dial settings, coil values, plate and grid voltages and PA loadings are all just as we had them over a protracted test period and much changing from band to band.



Underneath the Battery Transmitter chassis.

In mentioning testing, it is of interest to add that we ran the transmitter on artificial load continuously for three hours under 14 Mc conditions (see table) with a 25 per cent. overload—50 mA PA plate current—without there being the slightest over-heating anywhere and with only about 1 mA change in total

(Continued at foot of next page.)

Voltage and Current Readings, HT 240 volts.

Band.	CO plate mA	D'blr bias V.	D'blr plate mA	PA bias V.	PA grid mA	PA plate resonance mA	Permissible PA loading for max. RF output, mA.	Total Tx plate current at max. efficient input
7 Mc	12	-24	15	-72	10	7*	50 mA (12 watts)	77 mA.
14 Mc	12	-24	18	-72	5½	11*	40 mA (9.6 watts)	70 mA.

(*These figures can be reduced to 5 and 7 by using larger coils, but RF output is lowered.)

Drive Frequency, 7185 kc.

Dial Settings.	7 Mc	14 Mc
C1, CO.	fixed for both bands	
C4, B/D	61° (BA)	50° (D'blr)
C10, PA.	87°	80°

Coil Values.

	7 Mc.	14 Mc.
L1	17 turns. No. 18 enamelled, wound to follow threads.	
L2	19 turns. No. 18 enamelled, centre-tapped, wound to follow threads	10 turns. do. wound double-spaced.
L3	QCC "10-watt Type" 7 Mc coil, centre-tapped.	Do., 14 Mc.

Total LT Consumption, 0.9 amps. at 2 volts.

L1, L2, are wound on Raymart threaded forms, type CT4.

N.B.— These figures only apply if the Transmitter is built exactly as specified.

The 1.7 Mc DX Tests

Preliminary Report

WE HAVE just time this month to outline the highlights of the February 1.7 Mc Transatlantic Tests, on which the full report will appear in our April issue. Most G operators have already written but there has not, at the moment of writing, been sufficient time for the individual American and European results to reach us.

Briefly, then . . . Upwards of 50 stations, including G, GI, GW, HB, F, FA, SM, HA, OZ, W1-4 and W8 came on for the Tests. Best days were February 14 and 16. G3JU worked W1-2, W4, with only four watts. WIBB was heard daily, sometimes at R7. Peak time was about 0600 GMT, but contacts were made as late as 0725. Certain G's spoil some DX by being out on their time, one distinguishing himself by calling during the precise ten minutes he should have been QRX. The W's were right there every day, keeping schedule perfectly. Conditions generally were not as good as in January, and it is agreed that February was a bit late this year. W 'phone was logged by several listeners. Noise-level was high most days, but QRM absent before about 0630. At least eight G stations got across, and about fifteen W's were heard on CW or 'phone. W1AW, WIBB and WIME were the most consistent DX stations, and FA8BG one of the loudest signals. G2PL logged W6 'phone.

● Individual Results

Now for the DX reports, in which the RST obtained by the G's mentioned is given first:

G2DQ worked WIBB, 238/459 on Feb. 4 at 0752; WIME, 359/459 at 0630 and WIBB just after on Feb. 10. Feb. 14 produced three QSOs—WIBB, W2CAY and WIME between 0550 and 0615, with

reports in of RST-569. On Feb. 16, WIME was worked 559/459 at 0553 and WIBB yet again, 339/559 at 0650.

G2PL worked WIBB, 569/589; W2CAY, 569/599; WICPL, 559/579 and WIME 459/579—not a bad bag between 0530 and 0640 on Feb. 14! On the 16th, WIME 559/569 and W1AW 329/569 were contacted about 0550, and at 0655 on Feb. 18, G2PL heard a W6 on 'phone, the actual letters of the call not being definitely identified.

G3GH with 9.4 watts worked WIME at 0515 on Feb. 16, 439/449. She was a most accurate schedule-keeper throughout the Tests.

G3JU with his four watts did brilliantly. W4FAZ 339/449 at 0655 and W2FGK 339/439 at 0713 on Feb. 10; on the 12th, W1ERQ 339/539 at 0588, finishing up on Feb. 14 with W4FLF 229/539 at 0655. A very fine performance. G3JU's reception of the W5BFM 'phone, reported last month, has been confirmed. This must be some sort of a record.

G5MP had an abortive QSO with W2CAY on Feb. 14, the W's reply signal and report unfortunately being wiped out by local noise.

G5RI, who only has batteries for power, worked W1AW and WIME on February 16.

G6GM has a good log. Feb. 8 brought WIBB 239/559 at 0455, WIME 459/459 at 0532 and W1AW 369/459 at 0535. On Feb. 10, WIME and W1AW were worked again about the same time, and a third QSO with WIME followed on Feb. 14. The final day, Feb. 16, saw three quick contacts with WIBB, W1AW and WIME all over again, at about 0500, with average reports of 459/459.

G6SQ on February 12 got contact with W2CAY 339/339 at 0735.

Well done, all—and the rest of it next month.

THREE-STAGE BATTERY TRANSMITTER

plate current from time to time. The PX.230SW's just had the chill off them and the B.230 was only slightly warmer.

To get 14 Mc output, plug the appropriate coil in at L2, tune the doubler for minimum plate current (which should produce grid mA in the PA) and then apply HT to the output stage, adjusting it as before for minimum plate current.

● General Notes

The CO is not keyed, because the note is much sharper when keying in the buffer plate; to break the CO circuit would mean reducing the crystal output in order to get a quicker pick-up—or else putting out a floppy note. If the buffer neutralisation is slightly out, and HT is applied to CO and PA, the result will be a low PA plate current reading due to RF pulling through from the CO and driving into the PA (this is when the transmitter is operated CO-Buffer-PA). Hence, it is important to check for this, otherwise there will not be complete RF cut-off and a spacer will be radiated.

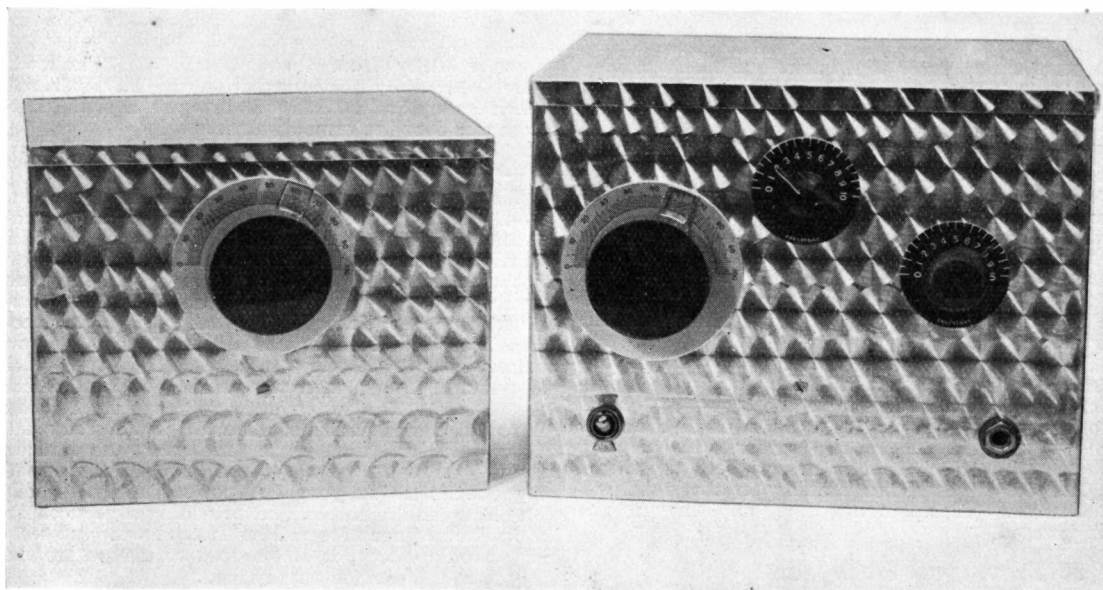
The aerial coupling can be linked in by means of a few turns round L3, or a permanent link can be wound on the QCC coils and taken to a couple of extra valve-pins fitted in the former (holes are provided) thence from the appropriate screw connections in the coil mount.

We shall be asked about 'phone working with this transmitter—we always are. The most economical method of modulation is by grid control of the PA at reduced input, though for full control one speech amplifier would be required. The current taken by the speech amplifier valve would be about equal to the saving in the PA by cutting down the carrier power, hence if it is accepted that 'phone efficiency cannot be as high as that obtained on CW, modulation is quite practicable. Actually, we intend to provide for modulation in this design and for that purpose the layout has been arranged so that there is enough space for the modulator between the front panel and the PA stage . . . more of this later.

A final point to which we might draw attention now is that the B.230 circuit as far as L2/C4 itself forms a single-valve two-stage transmitter, and the circuit and layout of the PA is equally applicable to any other direct-coupled push-pull RF amplifier using triodes.

The HF TUNING UNIT for the CLASS-B ONE VALVE

By "Tester"



The HF tuning unit is on the left—it can be used as a simple pre-selector for any battery receiver (see text). The Class-B receiver itself was fully described in March, 1937, and has been a most successful design.

THERE IS very little to be said about the HF unit, and it is shown side by side with the Class B receiver which it is intended to precede. It should be noted, however, that this tuned HF stage is actually an efficient little pre-selector—though of the simplest one-stage type and without regeneration—and it will be found to improve results with any battery receiver. The gain on 14 and 28 Mc is quite surprising, even if its performance on the other bands did not alone justify its existence.

The circuit was given in Fig. 1 on p. 28 of the September issue, together with all values. It is therefore only a matter of obtaining a metal box $7\frac{1}{2}$ -in. all three ways (that illustrated is made by E. Paroussi), fitted with a chassis and having a 2-in. sub-space. The coil, valve and tuning condenser are mounted above the chassis, and the other parts below. A midget s/o insulator at the back of the box connects the output to the aerial terminal of the Class-B receiver, the supply wiring being taken to that for the latter.

Notes on operation and adjustment were given previously, the only point to emphasise here being to make sure, when using this HF tuning unit as a pre-selector for another receiver, that there is a feed condenser somewhere in the lead from the plate of the valve, and that the supply wiring "answers" that on the other set.

● A Class-B Note

We are sometimes told that this receiver does not perform well on 1.7 Mc. The reason always is that the RF choke efficiency needs to be improved, as in the original design, neither the 1.7 nor 56 Mc bands were actually included. Accordingly, for

good 160-metre reception, it is only necessary to put an ordinary "all-wave" choke in series with the existing one, while a further point worth watching is so to proportion the grid and reaction windings that quite tight aerial coupling can be used on 1.7 Mc, i.e., the aerial series condenser should be nearly all in. The band-spread condenser is too small to cover the whole 1700-2000 kc range in one sweep, and it will be found that two "notches" on the band-setter will be required.

As regards 56 Mc, many readers have been able to get results on this frequency by experimenting with coils and disconnecting the band-setter in order to get the lowest possible minimum. A receiver of this type will not be entirely satisfactory on five metres even when it is made to oscillate down there, and rather than attempt to give precise data on this point, we prefer to leave the 56 Mc possibilities to readers' own ingenuity and experimentation.

“SEVENTY THREE”

How many amateurs know just how those mystic numerals 73 came to mean "best regards?" Well, here's the story.

During the American Civil War, the telegraph and railroad administration was in the hands of one Andrew Carnegie. After the close of the war, the telegraph operators all bonded themselves into the "Order of Military Telegraphists." Upon Andrew Carnegie reaching the age of 73, the Order of Military Telegraphists gave him a testimonial dinner, and from that date hence, "73" came into being as a symbol of good wishes.

On The Amateur Bands By Old Timer

WE FEEL that a little chat about our oldest band—1.7 Mc—will not come amiss. For some time now, we have been musing on the futility of the continued practice of exclusive 7 Mc operation on Sunday mornings, when the input used is from 5-10 watts, or even more power than this.

Just listen and count the large number of stations calling "test after test" without *hearing* a reply. Even if one is received, how often is the QSO killed before it really gets started? We refer both to 'phone and CW. A few weeks ago we heard a G8 thank a station for receiving him, as he had been calling "Test" for two hours without success.

Those of us who wish to carry out some experimental work with QRP on 7 Mc during the weekends find it impossible due to the crowded state of the band. Even if we do have several contacts, are we to trust the reports received, in view of the fact that these reports always bear the initial "QRM OM"? A little listening on the band will soon make it apparent that all this is not exaggerated.

● A Breath of Fresh Air

After experiencing the greatest difficulty in working a station 100 miles away on 7 Mc, we plugged in the 1.7 Mc coils and QSY'd to "160" . . . and immediately had the sensation of breathing fresh pure air. The activity was high with plenty of stations to work but very little QRM. One short test call was sufficient to raise someone, and a perfect contact resulted. "QRZ?" at the end immediately brought a reply for another 100 per cent. QSO.

● DX and 1.7 Mc

You have already read of the DX results recently obtained on this band, which proves conclusively that it may be considered as a seasonal DX channel. Any evening after dark, stations may be worked all over the British Isles with QRP, and the occupancy by Continentals is on the increase. There was a time, not many months ago, when the band would be dead* up to 2200 GMT as far as amateur signals were concerned. This does not obtain to-day, and contacts are being made regularly every evening of the week at all hours.

Is it not therefore obvious that time, energy and power are being wasted every day by futile key-jangling on 7 Mc? If the stations contacted were 500 or more miles away we could understand the desire to operate with patience plus low power, but we hear G working G over a few miles, when a commercial company would choose a much lower frequency for such communication. 7 Mc is *not meant* for purely local contacts; when we say "not meant," we mean that the ground-wave signal attenuates too rapidly, and the band is not suitable for these purely domestic QSOs. This point is proved by the fact that signals have suffered very

much recently from that "watery" or "hollow" effect caused by scattering from the F2 layer. A quick change to 1.7 Mc will bring in a signal free from this over the same distance.

● BCL QRM and Cures

We know what we shall hear from many of you. You will say that you get hundreds of BCL complaints if you operate in BC hours on 1.7 Mc. Providing you take the normal precautions, and do not use more than 10 watts, you should have no trouble at all. We refer to CW of course, as modulation will creep into the detector grids of unselective receivers like oil into dry bearings. If you cannot get satisfactory results with conventional key-thump filters, then try primary keying, where AC is used. The best method to adopt in this case is to put a small lamp of about 15 watts across the key; which will then be in series with the earthed input lead to the primary, and have small smoothing condensers in your PA power supply. 1 mF on either side is ample, and providing a good choke is in circuit your note will be T9x. In the interests of personal safety, it is essential to make sure the key is in the earthed supply lead.

● Use the Top Band

We therefore inaugurate a campaign for all low-power stations to get going on 1.7 Mc—you will have more enjoyment per hour, needless QRM on 7 Mc will be removed, and your operating ability will improve by leaps and bounds. Taken by and large, the operator on 160 metres may be considered very good, and though there are a few "lids," what band does not suffer from these? We know that once you have tried it, you will leave 7 Mc for quite a while. Those who have no permits should apply to the GPO as soon as possible, but remember, the input to the last valve *must not exceed ten watts*.

● ON4HS and 3.5 Mc 'Phone DX

We have had a most interesting letter from H. S. Simmons, 68, Ave Prince de Ligne, Brussels, giving full details of his experiences using telephony for DX working on 3.5 Mc. He says that very few amateurs appear to appreciate the potentialities of this frequency for DX 'phone contacts and as he has been at it since 1926, you will understand that he knows something about it. Starting in 1926, he has worked regularly ever since, rarely missing a night. And we mean night, between 2300 and 0700 GMT! All European countries. W1, 2, 3, 4, 8, 9, VE1, 2, 3, CO7CX, HI7G, and TI20FR have been worked, while his 'phone has been heard in W7 and K4. This winter, he has contacted to date 62 DX stations including VE1, 2, 3 (14 different VE3's), W1, 2, 3, 4, 8, 9 (5 W9's and 7 W4's) and VE1GR 33 times. The latter station has been worked regularly for the past three winters, even in a temporary QRA with a "broom stick" aerial just off the ground. During an international W/VE "round table" consisting

* [Except for "Fish Fone."—ED.]

of 42 stations held on January 7, 22 of them received ON4HS and he gave them reports in turn. Last winter 52 QSOs were made with VE1GR and literally dozens of European stations owe their first Transatlantic contact on 'phone to ON4HS, who put them through to Canada. It is interesting to know that up to last autumn the input was only 20 watts to a pair of 46's, but he now uses 45 watts to a T55 and a half-wave doublet. Congratulations, ON4HS and VE1GR; we think it a marvellous record, and hope you top the 52 contacts this year.

● G8RZ, Cumberland

H. Fox, Jubilee House, High Harrington, Cumberland, received the call 2ABF in May 1936; 14 months later, G8RZ was granted and 40 countries in 4 continents have since been worked with 10 watts to a TZ05-20 final fed into a G2BI aerial. The power supply is from a generator run by a car battery, which also lights the filaments, as his QRA is half a mile from the nearest house and no mains



bless his door. We believe the only ignition QRM he has ever experienced was from an aeroplane that had lost its way! Fancy having no vacuum cleaners on Sundays!!

Modulation is effected by an HL2, transformer coupled to a QPP2AD into the grid circuit of the final stage, while his "intake" relies on an 0-v-2 using an indoor aerial.

● QRPP

Some interesting details of one-watt experiments by G3XT of Saxmundham, Suffolk should encourage all low-powered stations. Contacts with SP (569), 3 LA's (559), LY (349), PA (569), GM (559) have been made, and about 15 G's have reported signals from 559 to 579. All this was done in the course of a few days using *slightly less than one watt input* on 7118 kc with a 132-ft. aerial, 22-ft. high and badly screened by trees; all QSOs were made between 0800 and 2000 GMT and many on Saturdays at lunch time with QRM nearly at its height. G8SD and G3JU are also believed to be doing similar work, and here we should say we are always very pleased to publish results obtained with really low power like that used by G3XT.

● QRP 'Phone DX

G18GK of Belfast now comes forward with another QRP record. His call was among those published in the MAGAZINE in January as being heard in New York on 7 Mc 'phone. His input at the time was 6 watts (300 v. at 20 mA) to a 66-ft. aerial, coupled to the tank by a separate tuned circuit and running North-and-South, 35-ft. high at the north end, sloping to 20-ft. at the other. On 14 Mc CW, with less than 10 watts, he has had contacts with VU, VK, XE, YV and PY.

● Our Unhappy Band Again

G8LY (YL Constance Hall) of Winchester, agrees with our remarks of February on the present-day condition of 7 Mc, but asks if it is fair to lay all the blame on 7 Mc, when 'phone operators probably talk their "drivel" on 14 and 28 Mc as well, but are not received in such large numbers owing to skip. This is no doubt true, but it is also true to say that more stations use telephony on 7 Mc than on any other band. Generally speaking, the operator on 14 Mc (and especially 28 Mc) is more experienced and advanced in the art and will run his station in a more sensible way, although we know certain 14 Mc stations we would willingly bomb had we the necessary facilities.

British Valves—A New Development

We are very glad to be able to announce that Messrs. Webbs, the well-known amateur supply house in Oxford Street, have taken up the Tungram transmitting valve agency so far as those types applicable to amateur use are concerned.

These new Tungram products are highly competitive in price and can be thoroughly recommended for the particular service for which they are designed. Several of them have already been used in MAGAZINE transmitters and readers will be familiar with, for instance, the APP4g and the OS-12/501.

Following are brief particulars and prices: APP4g, 15s., high-slope RF pentode, a particularly efficient frequency multiplier; OS-12/501, 22s. 6d., RF pentode, 12 watts anode dissipation, suitable as a doubler or un-neutralised PA and similar to the RK.25; OQ-15/600, 12s. 6d., the familiar 0-15/400 triode re-designed for harder work at higher frequencies; OP-38/600, 17s. 6d., RF triode capable of 85 watts RF output at ordinary communication frequencies and 35 watts anode dissipation.

All these valves are specially designed for amateur operation and have ceramic bases in every case.

In addition, Messrs. Webbs hold the sole agency for the new Tungram 6L6 which, with a ceramic base, is priced at 7s. 6d. only.

They also inform us that the Hallicrafters 5-10, new USW superhet, is now in stock at 14, Soho Street, Oxford Street, London, W.1, from which address and from 41, Carrs Lane, Birmingham, fuller information is available on all the items mentioned here.

"The Short-Wave Magazine" circulates throughout the World

The Cathode-Ray Tube—IV.

Explaining the Time Base

By *A. F. Hollins*

(Messrs. Mullard Wireless Service Co., Ltd.)

FOR A NUMBER of purposes it is necessary to apply to the horizontal or "X" deflection plates of a cathode-ray tube a "time-base" voltage, and reference is often made to the fact that such a voltage should be "linear." The purpose of this voltage is to enable the observation of a voltage applied to the "Y" plates, as a function of time, and it is perfectly obvious therefore that any time-base voltage should, when applied to the deflector plates, cause

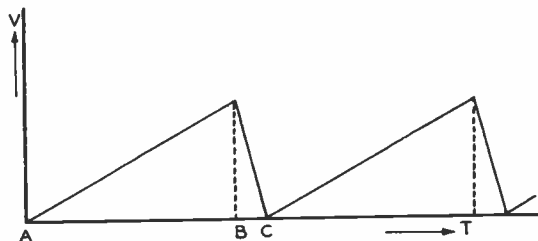


FIG. 13

the spot to traverse the cathode-ray tube screen uniformly with time.

Fig. 13 shows a typical voltage-time curve, and from the shape of it the significance of the term "saw-tooth," which is sometimes applied to a time-base voltage, is apparent.

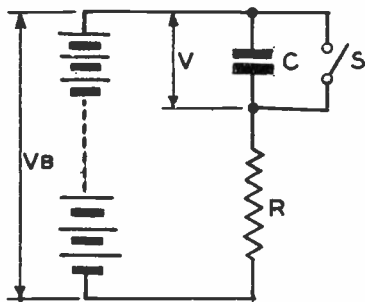


FIG. 14

It will be noticed that during the interval of time A-B the voltage increases proportionally with time; during the interval B-C it drops rapidly to zero.

The time interval A-B might be called the "traverse time," that is, the time taken for the spot to move completely across the screen, and the interval B-C is known as the return time or fly-back and should, of course, be as short as possible.

In discussing the characteristics of a time base, as for instance in connection with television, the fly-back time is usually expressed as a percentage of the total period, A-C.

In principle the simplest circuit for the production of a time-base voltage is a condenser which is charged via a resistance and periodically short-circuited, perhaps by means of a contact on the shaft of a motor, see Fig. 14.

Examining this circuit arrangement in detail, it is known that the voltage across a condenser which is being charged through a resistance, will vary with time as shown in Fig. 14a. The voltage does not

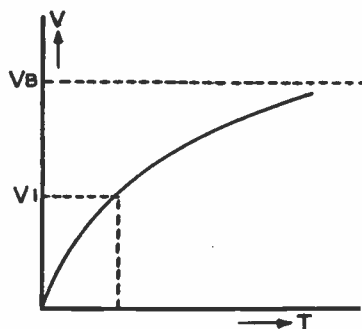


FIG. 14 A

increase linearly with time, excepting during the early part of the charging period, when it may, with some degree of approximation, be assumed to do so.

In order, therefore, to obtain from this circuit a voltage wave-form which is reasonably satisfactory for use as a time base, it would be necessary to discharge the condenser each time the voltage across it has risen to V_1 . An obvious drawback to this arrangement therefore is that it is only possible to use a comparatively small part V_1 , of the total charging voltage V_B , so that in order to obtain the necessary deflection voltage for even a moderate

size of tube it would be necessary to use some hundreds of volts as a charging source. A further drawback to the use of any mechanical system of discharging the condenser is of course the fact that it would be impossible to obtain a sufficiently high frequency, by this means.

If, instead of charging the condenser via a resistance, a constant current charging source is employed, a voltage-time curve is obtained as shown

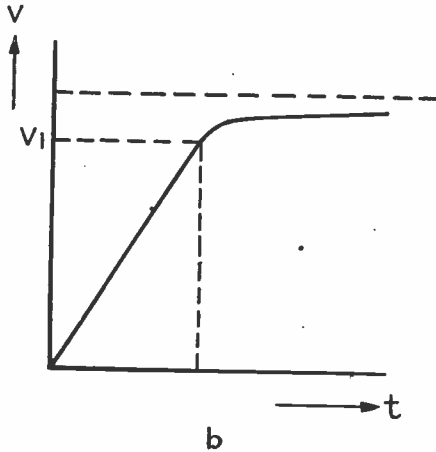


FIG. 15

in Fig. 15, from which it will be seen that the linearity of the voltage is extended almost to the end of the complete charging period. Such a constant current charging source might be either a saturated diode or a pentode. A pentode is usually employed because the normal type of diode available has not a sharp saturation point, a diode having a plain tungsten filament being desirable for this purpose.

An ordinary neon lamp could be used as a means of discharging the condenser, but it would have the disadvantage of limiting the available sweep voltage to about 30-50 volts, which represents the difference between the starting and extinguishing voltages of this type of tube, and moreover this range of operation is not constant and the lamp therefore is uncertain in action.

● Gas Triodes

A considerable improvement results from the use of a gas-filled triode, the action of which is as follows: When a negative bias is applied to the grid, no anode current will flow until the anode voltage has reached a value which is, say, "n" times greater than the grid bias. The factor "n" is constant for a given valve, so that by doubling the negative grid bias, the starting or ignition voltage

will also be doubled. By adjusting the negative grid bias, therefore, the starting voltage can be selected to any desired value within the permissible limits set by the construction of the valve.

The operation of the circuit shown in Fig. 16 then, is that at the moment of switching on, the voltage across C commences to rise proportionally with time, until it reaches the critical value holding for the particular gas triode in use. Immediately ionisation commences within the valve, the condenser begins to discharge until, having reached the lower critical value at which ionisation ceases, the grid of the gas triode again takes control and the whole sequence of events is repeated.

As a charging valve Fig. 16 shows a pentode. As is known, the I_a/V_a characteristic of a pentode is such that the anode current varies very little over a wide range of anode voltage so that the charging current will be more or less constant.

The value of the charging current can be controlled by a voltage applied to grid 2, but since this control will give only a limited range of charging current it will be necessary to arrange for the switching in of various capacities in order to cover a wide range of frequency.

In operating the circuit shown in Fig. 16 therefore, the grid bias of V2 forms the amplitude control of the time base, and within the limit of each capacity unit, the grid bias of V1 forms the frequency control.

It should be noted here that in altering the amplitude of the time-base the frequency will also change, since, in altering the value of voltage at which the gas triode will "trigger off," the condenser takes either more or less time to charge up to this value.

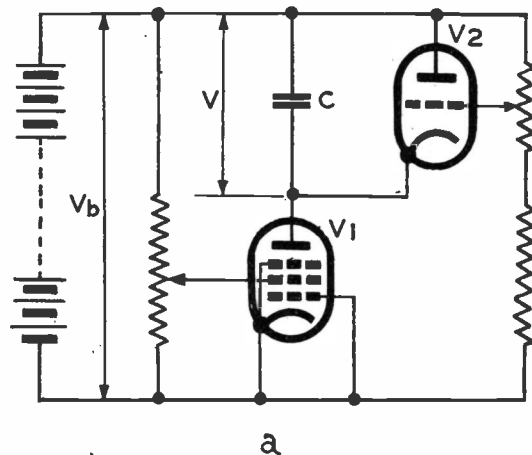


FIG. 16

THE CATHODE-RAY TUBE

An approximation to the time-base frequency using the circuit shown is given by the formula

$$F = \frac{I}{CV}$$

where I is the charging current in microamperes, C is the capacity in microfarads and V is the voltage swing.

● Linearity of Time Base

Some further attention might with advantage be paid to the actual effect of a non-linear time base on the appearance of an image due to, say, a sine wave voltage, across the vertical plates.

Fig. 17 shows an enlarged image of a non-linear time-base voltage with the time and voltage scales marked off in degrees. It will be seen that during

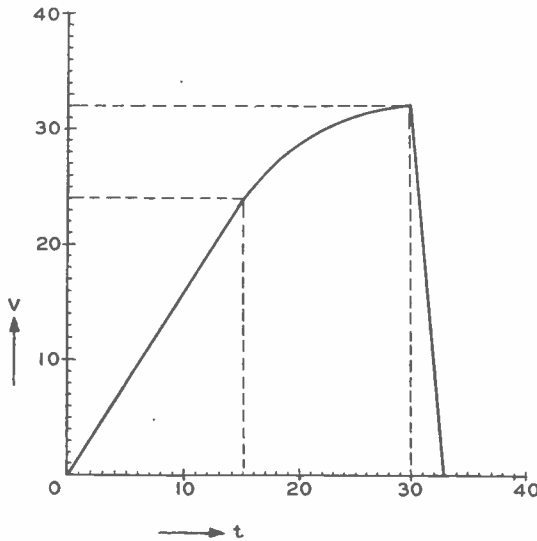


FIG. 17

the first 15 units of time the potential across the horizontal plates of the cathode-ray tube will have risen to 24 units, but during the second half of the charging period the potential only rises by a further 8 units.

Now for the purpose of translating this voltage-time curve into scanning speed it will be assumed that the time scale is calibrated in seconds and the

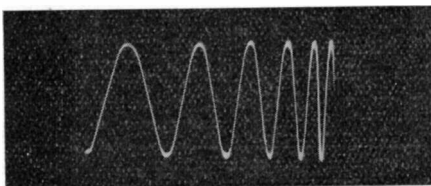


Fig. 19.

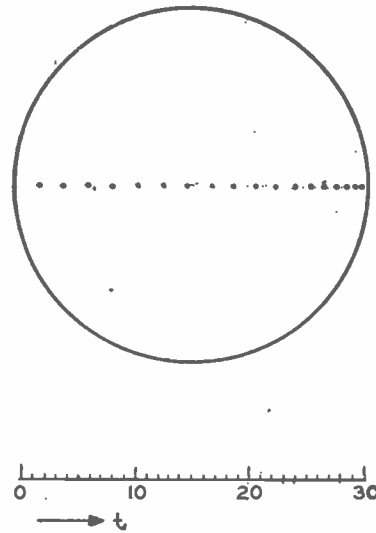


FIG. 18

potential scale in volts, and for a deflection sensitivity a value of 5 millimetres per volt will be assumed. Now during the first 15 seconds the spot will have travelled a distance of 120 millimetres, so that the speed of the spot during this period is 8 millimetres per second. During the second half of the charging period the spot travels a distance of 40 millimetres but at a gradually decreasing speed, the *average* of which is just under 3 millimetres per second.

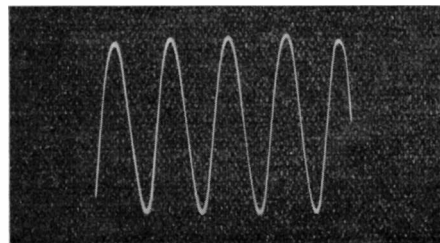


FIG. 20.

Therefore if a series of spot positions could be taken over equal intervals of time for a complete scan of the tube, they would appear somewhat as shown in Fig. 18.

It follows from this that using such a time base, any voltage which varies as a function of time, would, when applied to the vertical deflection plates, produce an image which was cramped towards one side. Fig. 19 is of a sine wave voltage showing 6 complete cycles, and in this photograph the effect of the non-linear time base is very clearly seen.

As a comparison Fig. 20 shows a similar sine wave against a linear time-base.

(To be continued.)

The Other Man's Station

G6YR

THE STATION we illustrate this month—that of R. W. Rogers, G6YR, 21, Chester Avenue, Southport, Lancs.—is another which, while holding a highly creditable DX and activity record, is home-built throughout on "straight" lines.

Licensed in August, 1935, G6YR has graduated from a 59 tritet to the extremely effective multi-band rig shown in the wooden rack, which is 20-ins. wide by 6-ft. high. The main transmitter is 6L6-6L6-T55, link-coupled at each stage, and operated on the HF bands 7 to 28 Mc; the CO/ECO driver buffer-doubler is on the third shelf from the top and the T55 final next above. The highest shelf carries some 56 Mc gear, on which frequency they are very active in Southport. The 1.7 Mc transmitter complete, 6L6-210, is on the fourth shelf, with the modulator below again; this consists of a 2-stage speech amplifier feeding a pair of PX4's which in turn drive two 210's in Class-B. The modulator alone is shielded, using copper foil on the inside of the chassis, all the rest of the apparatus being built up on open wooden shells.

Not visible in the photograph are the power units—three 350-volt packs (one for bias), a 500-volt supply, the filament transformers, and a keying valve using an 83; the rectifiers are also 83's throughout.

On the receiving side, G6YR uses a trusty 1-v-1 on all bands 28 to 1.7 Mc, which has brought him



much in the way of DX. Also shown to the left of the receiver is a heterodyne frequency meter, essential for keeping check when using ECO drive.

The aerial chiefly employed is a full-wave 14 Mc wire, end-fed, running NW-SE, and sloping down from a maximum height of 30-ft. Length, direction and plane all just right for DX, in fact.

Using this equipment, G6YR has an enviable record. 100 countries worked on CW, winner of the 1938 British 1.7 Mc Contest, 2nd place in the 1937 Dutch and German Contests, 2nd in the 1934 BERU Receiving Contests, and second again in the RSNI's 1935 event. Certificates held are the coveted BERTA, WBE, 28 Mc WBE, WAC with 28 Mc endorsement, and HBE.

The 'phone log shows five continents worked, while G6YR considers his most interesting CW effort a tri-band QSO with ZS1AN on 7, 14 and 28 Mc in the space of 70 minutes, early in 1938.

In case anyone wonders about the T55, he won it in a draw! Some people have all the luck, but G6YR and his station deserve it, because he is one of those who tackle Amateur Radio in the real amateur way—designing, building and operating his own equipment.

To Intending Contributors

We are always glad to see work, whether a briefly-expressed idea or a long article, which may be suitable for publication. A note on how to submit material appears on the Contents page and we cannot in future consider any which does not conform to this. As we are now receiving a large quantity of MSS, we add the following points for further guidance.

It is seldom, if ever, possible to print anything exactly as drafted by the author and we invariably have to make alterations and corrections, either on the purely literary side or for technical accuracy, since the MAGAZINE maintains a high standard in both respects.

But we do not wish to destroy the individuality of any author's work, hence intending contributors can best help themselves and us by arranging their

material in the form in which they would expect to see it in print. This involves a close study of the general contents of the MAGAZINE, from which can be learnt such points as accepted abbreviations, the use of sub-headings, and sequence in laying out an article. Diagrams and sketches, which are always finally drawn for publication by our draughtsman, need not be copper-plate, but they must be clear and accurate for copying.

The time taken in giving a decision on outside contributions varies from three days to three weeks, depending upon the amount of work we have on hand when the article is received; in the nature of things, uninvited contributors will understand that all other correspondence has priority.

It is also only fair to add that the percentage of acceptances is quite small.

PREMIER RADIO

Makers of High Grade HAM GEAR AT REASONABLE PRICES

PREMIER 1939 HIGH FIDELITY AMPLIFIERS

A NEW COMPLETE RANGE OF 7 HIGH FIDELITY PA AMPLIFIERS FOR AC or AC/DC MAINS OPERATION.

With the exception of the 3-watt models, all Premier Amplifiers incorporate the new Premier Matchmaker Output Transformer, enabling any single or combination of speakers to be used. 6 8/10, and 15-watt systems are provided with two separate input channels which can be mixed to any level. The 30- and 60-watt systems have 3 input channels. The built-in Pre-Amplifiers ensure that the gain is sufficient for any low level crystal or velocity microphone. The actual gain of the 6-, 15-, 30- and 60-watt amplifiers is over 100 decibels. Tone controls are also incorporated.

	Kit of Parts with Valves.	Completely Wired & Tested.		Kit of Parts with Valves.	Completely Wired & Tested.
3-watt AC Amplifier	40/-	£2 : 15 : 0	8-10-watt AC/DC Amplifier	£4 : 10 : 0	£5 : 5 : 0
3-watt AC/DC	40/-	£2 : 15 : 0	15-watt AC	£5 : 15 : 0	£7 : 0 : 0
6-watt AC	£5 : 5 : 0	£6 : 0 : 0			

Black Crackle Steel Cabinet 15/- extra.

30-60-watt AC Amplifiers or Modulators, completely wired and tested, in Black Crackle steel case. Power Pack in separate case to match. 30-watt £12 : 12 : 0 complete; 60-watt £15 : 15 : 0 complete.

New Premier Self-Powercut RF Tuning Unit, incorporating a Var. Mu pentode amplifier followed by a power grid detector. Designed for high-fidelity reception. Wave range 200-560 and 800-2,000 metres. £4 : 9 : 6 complete with valves.

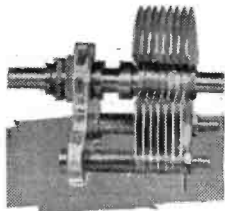
PREMIER MATCHMAKER UNIVERSAL MODULATION TRANSFORMERS

Will match any modulator to any R.F. Secondary Load. Triodes, Tetrodes, and Pentodes Class A. Single or Push-Pull Class "ABI" and "B" in Push-Pull or 500 ohms line input, can easily be matched to any of the following Radio Frequency final stages requiring modulation. Triodes, Tetrodes or Pentodes operating under Class "A," "B," "BC" and "C" conditions either Single or Push-Pull. Totally enclosed in cast cases with engraved Panel, and full Instructions. Ratings are based on R.F. inputs.

50 Watt, 17/6. 150 Watt, 29/6.
300 Watt, 49/6.

A new range of "Matchmaker" Universal Output Transformers which are designed to match any output valves to any speaker impedance, are now ready.

5-7 Watt, 13/6. 10-15 Watt, 17/6.
20-30 Watt, 29/6



SHORT WAVE CONDENSERS

TROLITUL Insulation. Certified superior to ceramic. All-brass construction. Easily ganged.

15 m.mfd.	1/6	100 m.mfd.	2/-
25 m.mfd.	1/9	160 m.mfd.	2/3
40 m.mfd.	1/9	250 m.mfd.	2/6

All-brass slow-motion Condensers, 150 m.mfd., Tuning, 4/3; Reaction, 3/9.

Double-Spaced Transmitting Types.

15 m.mfd.	2/9	40 m.mfd.	3/6
	160 m.mfd.		4/6

VALVES

AMERICAN VALVES.

We hold the largest stocks of U.S.A. tubes in this country and are sole British Distributors for TRIAD High-Grade American Valves. All types in stock. Standard types, 5/6 each. All the new Metal-Class Octal Base tubes at 6/6 each, 210 and 250, 8/6 each.

EUROPA MAINS VALVES 4v.

A.C. Types, A.C./H.I., A.C./L., A.C./S.G., A.C./V.M.S.G., A.C./H.P., A.C./V.H.P., A.C./P., and 1 watt D.H. Pentodes, all 4/6 each. A.C./Pens., I.H., 5/6; A.C./P.X.4, 6/6; Oct. Freq. changers, 8/6; Double Diode Triodes, 7/6; Triode Hex. Freq. Ch., 8/6; Tri. Grid. Pen., 10/6; 3½ watt I.H. Triode, 7/6.

UNIVERSAL TYPES, 20 v. .18 amps., S.G., Var-Mu., S.G., Power, H.F. Pen., Var.-Mu. H.F. Pen., 4/6 each.

13 v. .2 amps. gen. Purpose Triodes, 5/6; H. F. Pens. and Var.-Mu. H.F. Pens., Double Diode Triodes, Oct. Freq. Changers, 7/6 each. Full-Wave and Half-Wave Rectifiers, 5/9 each.

BATTERY VALVES, 2 volts, H.F., L.F., 2/3. Power, Super-Power, 2/9. Var.-Mu.-S.G., 4-or-5-Pin Pentodes, H.F. Pens., V.-Mu.-H.F. Pens., 5/- Class B, 5/- Freq. Changers, 7/6.

NEW TAYLOR TUBES

T.40. TZ.40. NOW IN STOCK. Price 24/- each. Prices now reduced on 866 Rectifier, now 10/-; 866 Junior, 7/6; T55, 45/-; 203Z, 52/6; 745, 65/-; T.20 and TZ.20, 17/6 each.

PREMIER MOVING COIL

METERS

Guaranteed Accuracy within ± 2 per cent. Model No. 2—Bakelite Case, 3 in., by 3 in. square, with Zero Adjuster.

0-500 Microamps	...	...	31/-
0-1 m.a.	...	...	25/-
0-10 m.a.	...	...	22/6
0-50 m.a.	...	...	22/6
0-100 m.a.	...	...	22/6
0-250 m.a.	...	...	22/6

0-1 m.a. movements with calibrated scale volts—ohms—m.a. ... 27/6

MODEL No. 21 MODEL No. 311.
3-in. square case, 3½-in diameter round case.

0-1 m/A	... 18/6	0-1 m/A	... 22/6
0-10 m/A	... 17/6	0-10 m/A	... 20/-
0-50 m/A	... 17/6	0-50 m/A	... 20/-
0-100 m/A	... 17/6	0-100 m/A	... 20/-
0-250 m/A	... 17/6	0-250 m/A	... 20/-

MODEL 311. 0-1 m/A. movement, with calibrated scale, volts-ohms-m/A., 25/-.

VOLTAGE MULTIPLIER RESISTANCES, guaranteed accuracy ± 2 per cent. All standard ranges, 1/3 each. TAPPED SHUNT to provide readings of 5 m/A., 25 m/A., 250 m/A., and 1,000 m/A., 5/6.

PREMIER SHORT-WAVE KITS

Are all sold complete to the last detail. All valves and coils are included as well as theoretical and wiring diagrams, and lucid instructions for building and working. Thousands are giving excellent results all over the world.

Each Kit uses plug-in Coils and the Coils supplied tune from 13 to 170 metres. All Kits are supplied with a steel chassis and Panel.

1 Valve Short-Wave Receiver or Adaptor Kit	17/6
1 Valve Short-Wave Superhet Converter Kit	20/-
1 Valve Short-Wave A.C. Superhet Converter Kit	22/6
2 Valve Short-Wave Receiver Kit	25/-
3 Valve Short-Wave Screen Grid and Pentode Kit	58/6

NOW READY. Premier 1938/9

New enlarged Illustrated Catalogue, Handbook and Valve Manual! Send 6d. in stamps for 90 pages of Valve Data, Technical Articles, Circuits and Premier 1938/9 Radio.

Callers can now get their requirements from JUBILEE WORKS as well as 50 HIGH STREET, CLAPHAM, S.W.4 (Macaulay 2381) & 165 & 165a, FLEET STREET, E.C.4 (Central 2833).

All Post Orders to JUBILEE WORKS, 167 Lower Clapton Road, London, E.5
(Amhurst 4723)

ELECTRIC GRAMO. MOTORS

Collaro A.C. 37 Motor, 100-250 v. A.C., 12in. table and unit plate, auto stop and start, 30/-.

Collaro Gramo. Unit, comprising A.C. 37 motor, pick-up and vol.-control, 45/-.

Collaro U36 Motor, for A.C. or D.C., 100-250 v., 12in. table, auto stop and start, 45/-.

Moving Coil Speakers. Magnavox 8in. PM's with Output Transformer, 10/6. Magnavox 8in. Energised, 2,500 ohm field with Transformer, 9/11.

Utility Micro Cursor Dials, Direct and 100-1 Ratios, 3/9.

Premier Transverse Current Microphone, 20/-. Microphone Transformer, 6/-. Table Mike Stand, 7/6.

Braided Metal Screened Wire for mikes, pick-ups, etc. Single 4d. yd.; Twin 6d. yd.

Premier U.S.A. Quartz Transmitting Crystals, 7 mc. and 3.5 mc., 10/- each. Enclosed holder and base, 3/.

Cardboard Electrolytic Condensers, 4 mf. or 8 mf. 500 v., 1/6 each, 8+4 mf. 500 v., 2/3, 8+8 mf. 500 v., 2/6, 4+4+4 mf. 500 v., 2/6, 16+8 mf. 500 v. 3/6.

Tubular Metal Can Electrolytics by famous makers. 4 or 8 mf. dry, 500 v., 2/6 each. 8 mf. wet, 450 v., 2/3. 8 mf. 650 v., Peak dry, 4/-. Bias Condensers, 6 mf. 50 v., 6d.; 50 mf. 12 v., 1/-; 25 mf. 25 v., 1/-; 50 mf. 50 v., 1/9.

Tubular Condensers, all values from .0001 to .5 mf., 6d. each. U.S.A. Valve Holders, 4, 5, 6 and 7 pin., 6d. each. Octals 9d.

Ceramic U.S.A. Valve Holders, all fittings 1/- each. Premier S.W. H.F. Chokea, 10-100 metres, 9d. each. Pie-wound, 1/6 each. Screened, 1/6 each.

Short-Wave Coils, 4- and 6-pin types, 13-26, 22-47, 41-94, 78-170 metres, 1/9 each, with circuit. Special set of S.W. Coils, 14-150 metres, 4/- set. with circuit. Premier 3-band S.W. coil, 11-25, 19-43, 38-86 metres. Suitable any type circuit, 2/6.

Premier Mains Transformers.—

Screened primaries 200-250 volts. Fully Guaranteed. Wire end types.

S.P. 250. 250-250 v. 60 m/A. 4 v. 1-2 a., 4 v. 2-3 a., 4 v. 3-4 a., all C.T., 10/-.

S.P. 300. 300-300 v. 60 m/A. 4 v. 1-2 a., 4 v. 2-3 a., 4 v. 3-4 a., all C.T., 10/-.

S.P. 351. 350-350 v. 150 m/A. 4 v. 1-2 a., 4 v. 2-3 a., 4 v. 3-4 a., all C.T., 13/-.

S.P. 352. 350-350 v. 150 m/A. 5 v. 2 a., 6-3 v. 2 a., 6-3 v. 2 a., all C.T., 13/6.

The above can be supplied Fitted with Panel and Terminals, at 1/6 extra.

S.P. 500. 500-500 v. 150 m/A. 15/-.

S.P. 501. 500-500 v. 150 m/A. 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 3-5 a., all C.T., 21/-.

S.P. 502. 500-500 v. 150 m/A. 5 v. 3 a., 4 v. 2-3 a., 4 v. 2-3 a., 4 v. 3-5 a., all C.T., 25/-.

S.P. 503. 500-500 v. 200 m/A. 5 v. 3 a., 6-3 v. 3 a., 7-5 v. 3 a., or 2.5 v. 5 a., all C.T., 25/-.

S.P. 1,000. 1,000-1,000 v. 250 m/A., 21/-.

The above can be supplied Fitted with Panels and Terminals, at 2/- extra. Details of complete range available.

Special Transformers wound to order.

PREMIER

SMOOTHING CHOKES

60 m/A. 40 hy. 6/6 150 m/A. 40 hy. 11/6
80 m/A. 30 hy. 7/6 250 m/A. 40 hy. 15/-

PREMIER

SWINGING CHOKES

150 m/A. 160 ohms, 3,000 v. insul., 10/6.
250 m/A. 80 ohms, 2,000 v. insul., 15/-
500 m/A. 100 ohms, 4,000 v. insul., 18/-

PREMIER

L.T.

TRANSFORMERS

All Primaries tapped 200-250 volts. Between winding insulation 1,000 volts.

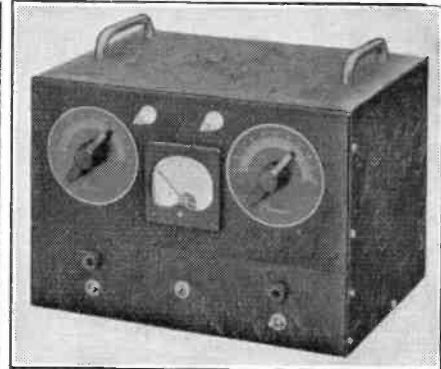
2.5 v., 8 amps	CT. ...	8/6
4 v., 5 "	CT. ...	9/6
5 v., 3 "	CT. ...	8/6
6 v., 2 "	CT. ...	8/6
6.3 v., 3 "	CT. ...	8/6
7.5 v., 3 "	CT. ...	8/6
10 v., 3-4 "	CT. ...	11/6
12 v., 4-5 "	CT. ...	11/6
14 v., 4 "	CT. ...	11/6
22 v., 1 "	CT. ...	7/6
5 v., 3a+6.3 v., 3a	...	10/-
5 v., 3a2.+5 v., 8a	...	14/6

3,000 volt Test Type

2.5 v., 5a	CT. ...	11/6
2.5 v., 10a	CT. ...	12/6
10 v., 4a	CT. ...	14/6

Premier Battery Charger: Westinghouse Rectification. Complete. Ready for use. To charge 2 volts at 1/2 amp., 10/-; 6 volts at 1/2 amp., 16/6; 6 volts at 1 amp., 19/6; 12 volts at 1 amp., 21/-; 6 volts at 2 amps., 32/6.

Auto Transformers. Step up or down A.C. mains between 100-250 volts. 60 watts, 9/-; 100 watts, 11/6.



The NEW PREMIER 10-15 WATT ALL-BAND TRANSMITTER

Designed to meet the demand for a really compact self-contained T.X., which can be used for 'Phone or C.W. on all bands.

A 6L6 is used as a modulated oscillator in a Tritet circuit, allowing a fundamental and second harmonic operation, without coil changing, from any one Xtal. A 6C5 speech amplifier is R.C. coupled to a 6L6 modulator, giving approx. 9-10 watts audio. A 400-volt power supply with generous smoothing gives completely hum-free output. Housed in steel cabinet, in black crackle finish, 12 in x 9 in. x 8 in.

Complete with Xtal and coils for 7 £10-10-0 and 14 mc. operation ...

Write for details of all Premier Transmitters.

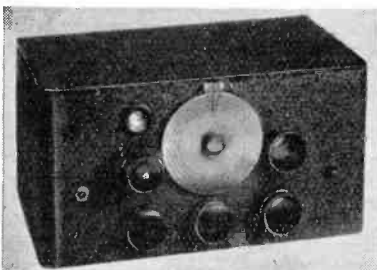
NEW PREMIER 1939 "5. v. 5" COMMUNICATION RECEIVER

5-valve Superhet-covering 12-2,000 metres in 5 wave bands.

- Beat Frequency Oscillator
- Iron-cored IF's
- 2-Speed Band-Spread Control
- Phone Jack
- A.V.C. Switch
- Over 4-watts Output
- Send-Receive Switch
- Illuminated Band-Spread Dial

Provision for single wire or Di-pole Aerial. International Octal Valves for 200-250 v. mains (A.C.). Built into Black Crackle Steel case providing complete screening. 10 1/2 in. Moving Coil Speaker in separate steel cabinet to match Receiver. Complete with all tubes and Speaker ...

£8-8-0



HAVE YOU HEARD . . . ?

A Monthly Commentary for the Broadcast Listener, presented by F. A. Beane, 2CUB

ONLY MODERATE conditions seem to have prevailed during the few weeks prior to writing this article, but since then there has been considerable improvement resulting in excellent reception of a fair number of DX stations, innumerable "locals" and a few newcomers.

The most amazing feature was the sudden and most marked falling off of the Cuban broadcasters that are generally heard with such remarkable consistency and power, even when their North American contemporaries are almost imperceptible. Possibly the various changes in frequency and ownership of one or two of these stations was the reason for their variable performance.

● The Americas

While dealing with Cuba, "Land of lovely ladies and the best tobacco in the world," to quote one of them, I will commence by giving the latest information concerning the activities of these stations.

Cuba.—A year or so ago a COCE was reported in this country but was obviously the call COCD or COBZ mis-read; now, however, the real COCE is about to come on the air and will relay the new CMC transmitter, 1530 kc, from 1300 until 0430 daily. COCE's frequency has yet to be announced, the address is Prado 18, Havana and the slogan of CMC (likely to appear in the short-wave announcements) "Valdes y del Valle."

COCM, 30.51 m, 9833 kc, has changed hands, being in the "Radio Cadena Suaritos" ("Suaritos Radio Network") and relaying CMBL, 750 kc, "del Refresco Materva." The title of the "onda corta" is now "del la Gaseosa Salutaris," and the studio address 25 No. 1113, Vedado. No schedule is yet available and it would appear that COCM has been temporarily discontinued to facilitate the change over. It is quite conceivable that a new QSL may be issued.

COCQ, relay of CMQ, 1010 kc, has changed to approximately 34 m, 8730 kc. Schedule is 1200-0600 weekdays, 1155-0530 (Monday mornings) Sundays, and programmes begun and concluded by the playing of the rumba "Siboney," well known to most listeners. From 1730-1830 and 2300-2400 CMQ and COCQ join the "Cadena Crusellas," linking up with COCO, CMCK, CMJK, CMJA, CMKD and CMKS, thus explaining why the COCO call is to be heard on COCQ's frequency.

COCW, 6330 kc, relay of CMW, is causing confusion by using the slogan "La Voz de las Antillas" on its QSL and "La Voz del Radio Philco" over the air, but from observations it appears that the latter is the official title during commercial broadcasts and the former used only during a certain programme, consequently being referred to less frequently. The schedule is 1155-0530 weekdays, 1455-0300 (Monday mornings) Sundays, commencing with the Mexican tune "Estrellita" ("Little

Star"). A pronounced hum is the outstanding characteristic of COCW's transmission and four chimes comprise the identification signal.

COCX, 11740 kc, relay of CMX, 1260 kc, now announces as "de la Casa Lavin y la Pasta Dental Gravi." COCO appears to have moved to 5980 kc with the title "Radio Philips," while COCH, of the "Compania Nacional de Radiodifusion, S.A.," has added the song of a nightingale to its already varied repertoire of identification signals.

Chile.—CB970 appears to be nearer 9720 kc than its official 9700 kc. A bugle is used, the slogan "La Voz de Chile" frequently employed and "La Cooperativa Vitalica" when programmes are derived from CB76. Reports should be sent to Casilla 1627, Valparaiso.

Colombia.—HJ6ABB, "Radio Manizales," Manizales, is now heard on 6108 kc where it interferes with GSL. HJ6ABA, "La Voz de Pereira," Pereira, now on 6050 kc after 2300. A gong is struck at intervals and news items interspersed with a Morse dash. New calls not yet known.

Dominican Republic.—The powerful 6243 kc station now announces as "Broadcasting Nacional, HIN y HIIN en ciudad Trujillo," and it appears that the short-wave call is now HIIN and HIN that of the medium-wave parent transmitter. After an absence HIZ is again prominent but on the slightly lower frequency of 6310 kc, or just *higher* in wavelength than COCW. A 4-chime signal is employed and the announcement given as "Broadcasting Nacional, HIZ y HIIZ en Ciudad Trujillo." Like HIN, the short-wave call has evidently had a numeral incorporated to conform with the more general method of allocating calls in the Republic. Good reception may be secured from HIIL, 6480 kc, after midnight, the announcement being "HIIL, Emisora Nacional el Diario, en Santiago de los Caballeros," preceded by three "NBC"-type chimes, with a single chime interspersing announcements.

Some surprise was caused recently by reception of a transmitter on 45.25 m, 6630 kc, mentioning "La Voz de Espana," the Spanish Republic, and giving a talk relating to the Civil War, ending with the Republican Anthem at 0040. Shortly after the station announcement showed it to be HIIT (possibly HIIT now) and it had, presumably, been relaying Madrid.

Nicaragua.—Excellent reception of this more difficult country is now possible through YNRS, 6740 kc. Programmes are radiated simultaneously by this station and YNPR, "Pilot Radio," 8590 kc, reception of the former being very good after midnight. The announcement is given in both Spanish and English, generally as "YNRS, Radio Nicaraguente, and YNPR, Pilot Radio" with a request for reports to be addressed to P.O. Box 164,

Managua. YNPR is generally audible at the same time but much weaker. Incidentally it is difficult to secure verification.

Venezuela.—Careful tuning in the vicinity of 6520 kc has failed to reveal the well-known YV4RB, "La Voz de Carabobo," Valencia; has it changed to the 60 m band? Reports would be appreciated. YV5RR, "Estudios Universe," Caracas, 51.46 m, 5835 kc, relay of 5RS is well heard after midnight with call each quarter-hour but no identification signal. YV4RH, "Radio Valencia," Valencia, is still on 5910 kc despite reports to the contrary. Three chimes are used.

● Africa, Asia and Australasia

Mozambique.—Readers should experience little difficulty in hearing CR7AA, Lourenco Marques, on 6137 kc, where it is audible daily from about 1800 (or earlier) until 1840 when it is invariably obliterated by the carrier of SP48. Reception is often R5, announcers of both sexes may be heard, a three-chime signal used and English occasionally employed in addition to Portuguese. Care should be taken not to confuse it with any South African station if any mention of Johannesburg is heard, the explanation of frequent reference to this being that firms in that city sponsor many of CR7AA's English programmes, generally during Sunday evenings.

Singapore.—Very fine reception of ZHP, 9690 kc, is possible in the afternoon from about 1300 to close down at 1440. On Sundays programmes consist of popular dance recordings, with the titles and numbers given at intervals, and a news bulletin at 1320. The concluding announcement is generally "And that ends our programme of dance music for to-day and also our broadcast until five tomorrow evening," followed by the time, call-signs and frequencies and finally "God Save the King."

China.—XGOY, the Central Broadcasting Administration, Chungking, on an announced wavelength of 31.51 m, although actually near 31.58 m, now operates from 2000-2200 daily with war news, Chinese and English music. XGFA, Weichow, 43 m, is occasionally heard around 1430 with a female announcer, but reception is very weak.

Iraq.—A station taking the same programme as YI5KG, 41.67 m, is to be heard from 1500 to 2000 near 9830 kc. Programmes are chiefly Arabic music with an English announcement at 1630, then Arabic news, another English call at 1645, and more Arabic music. Strength is usually about R6-7 and the transmitter evidently the new 1,500 watt set mentioned in my last article. Address reports to I. Hassan, Esq., Qasr el Zahoor Broadcasting Station, Baghdad, Iraq.

New Zealand.—A ZL4ZB, or 2ZB, Dunedin, is said to operate around 1700 in the region of 4 Mc and to close at 0900, the programme consisting of recordings.*

● Europe

Much activity is in evidence and many new countries have inaugurated short-wave transmissions during the past few months.

* [See p. 14, February issue.—Ed.].

Italy.—Another channel allotted to the Imperial Short-Wave Centre, Prato-Smeraldo, is I2RO12, 19.87 m. On February 12, 2RO6, 15300 kc, broadcast a special programme to the United States in connection with the death of His Holiness Pope Pius XI. The schedules of the new transmitters have yet to be published. A station frequently announcing as "Radio Napoli" is to be heard on 6163 kc around 2200, and was first heard about a year ago.

Lithuania.—LYR, Kaunas, "Radio Kaunas," 32.21 m, is still active in the evenings but is likely to be replaced by one or more of the following:—LYZ4, 19.61 m, LYZ3, 25.21 m, LYZ2, 31.5 m.

Norway.—LKV, 15167 kc, heard one Sunday at 1347 with relay of the European Skiing Championships and LKQ, 11737 kc, from 0806 on the same day.

Denmark.—An OZH² was heard on 15320 kc once at 1400.

Spain.—A Republican station with announcers of both sexes, the title "La Voz de Espana" and gong note signals, is to be heard near 8900 kc at 1200 or closing with the Republican Anthem at 2300.

Portugal.—A transmitter, thought to be "Emisora Nacional," was logged on 8800 kc at 2300. CSW4, 15135 kc, operates on this frequency around 1345.

France.—A Paris-Mondial station is to be heard at 1830 in the vicinity of 9626 kc and has, apparently, replaced TPB11, 31.41 m, 1615-2300, with its programme directed to Africa and the Eastern Mediterranean.

Switzerland.—R. H. Collier (Cheltenham) reports a letter verification from the Swiss Federal Telephone Communications for his reception of the Schwarzenberg transmitter. The schedule was given as daily, except Sundays:—1800-1900 on 9535 kc; 2345-0045 15305 kc and 0100-0200 11865 kc. Power 100 watts. A new transmitter with 25 kW aerial power, is to make its debut soon. Reports should be addressed to Director-General, The Swiss Federal Communications Co., Radio Section, Berne. For those studying German, a programme entitled "The ABC of German" is broadcast every Friday 0730-0800 and a suitable text-book, as used in the broadcast, will be sent free on request.

● Last Minute News

Bob Everard, brilliant exponent of the amateur bands, reports the ultra-high-frequency broadcasters W2XDG, XHG, 3XEY, 4XCA, 6XKG, 8XNU, XWJ, XDY, 9XUY, XJL and XAZ, and the Police WQIE, WQMC, WQKL, WQAI, WQOP, WQKW, WQLV, WQDM, WQVB, WQNK, WQVN, WQKC, WQVV and WQNI. Believe it or not, but there was a time when Mr. Everard was an ardent BC band listener and his friendly rivalry spurred me on many a time to greater heights!

HIG, 9300 kc, heard around 2223; YV1RL, "Radio Popular," with 4-chime signal, now on 4850 kc; an unidentified Spanish-speaking station near 9400 kc at 2240 with news, each item being interspersed by a gong note; what appears to be

Mention the Magazine when writing to Advertisers. It helps you, helps them and helps us

"Radio Romania, Bucharest," on 9200 kc approximately, with news at 2000, male and female announcers and 9-note interval signal.

● Programme Highlights

I understand that the installation of a short-wave transmitter and equipment on the Pan American Airway's "Yankee Clipper" No. 17 for use during its initial flight to Europe has just been completed.

The apparatus was constructed specially for the flight to CBS specifications and will be employed to keep the air-liner in contact with the CBS network during its test flight across America as well as during its maiden trip across the Atlantic. The call allocated is WCBN, the power 100 watts with a frequency range of 1600 kc to 23 Mc, and it will be permitted to use any of eight channels within this band.

No date, times or other details are yet available but listeners are advised to keep an eye on their newspaper and the CBS programmes for news of the "Clipper's" departure as the broadcasts promise to be of outstanding interest.

Programmes of the Philharmonic Symphony Society of New York, with John Barbirolli conducting, may now be heard on Sundays from 2000-2100 from either W2XE, 11830 kc, or W3XAU, 15270 kc, the announcements for the latter being in Spanish. Other CBS outstanding programmes include "Salute to New York's World Fair" Sundays at 1830; "Dancing Moods" at 1845 daily, and "Your Melody Corner" at 2215 Tuesdays-Fridays inclusive.

Philatelist-SWLs should make a point of listening for either JLG, 7285, or JZJ, 11800 kc, at 1945 on Saturday, March 25, when a programme entitled "Stamp Collecting in Japan" will be broadcast, while the gardener may find interest in the Japanese Mr. Middleton's "Japanese Lily Bulb Species" to be radiated over the same stations at 2015 on Thursday March 2.

Woden Transformers

Messrs. Woden Transformer Co., Ltd., St. John's Square, Wolverhampton, manufacture not only power transformers ranging from the 250-0-250 volts type to those giving 2000 volts each side of centre, but also smoothing chokes, swinging chokes, universal modulation matching transformers in three sizes, and LT/HT charging equipment. They also have available two standard models in speech amplifier-modulators for PA work or amateur transmitters operating at inputs from 10-12 or 50-75 watts. All this is described and illustrated in their new catalogue, which readers will find well worth having for reference.

Wire

One of the primary and most used commodities in wireless is, strangely enough, wire. We have recently been obtaining many of our supplies from Messrs. P. Ormiston and Sons, Ltd., 79 Clerkenwell Road, London, E.C.1, who are manufacturers and stock an enormous range in silk, cotton and enamel-covered wire in all gauges. Fuse and resistance wires are also obtainable, and many of the rarer alloy types which have certain specialised applications. *Trade Sales only* are handled from this address.

BOOK REVIEW

The famous "Admiralty Handbook of Wireless Telegraphy," the new edition of which has been out some months, is now published in two volumes.

The first part contains something like 500 sub-heads dealing with the mathematics of the subject, including magnetism, electricity and the fundamentals generally. There are also chapters on machines, instruments, oscillatory circuits, and a very full treatment of AC theory and practice. Much of this section of the Handbook demands fairly advanced mathematical knowledge, but not so much that the technically-minded reader without it will fail to find a great deal to interest and instruct him.

Volume II. is simply described as being devoted to "W/T Theory." In eleven chapters the fundamentals of radio transmission and reception are adequately covered, and several aspects are treated in a new way. By recourse to mathematics, the greatest pains are taken to explain everything fully, and it is here that the amateur will find himself getting out of his depth. As before, however, there is much to be learnt without having to pursue the theoretical treatment too far.

The Admiralty produce their "Handbook of Wireless Telegraphy" about every five or six years primarily for officers and ratings of the signal branch of the Royal Navy. It is therefore somewhat restricted in scope from the amateur point of view, and some sections of it suggest that radio technique in the Service is not yet up to current amateur practice—which, indeed, is well known.

In style, layout and general appearance the two volumes are still rather old-fashioned, but it is pleasing to find that the Navy has at last discarded the "jar" as the unit of capacity. To offset this, they have adopted their own standard of nomenclature for the audio and RF frequency ranges involved in radio work, though the lettering used—as "V.H/F" for what we call UHF—is quite straightforward.

For all that, this publication remains a very sound text-book and extremely good value for money. Vol. I. costs 4/- and Vol. II. 6/-, postage extra, and they are obtainable from H.M. Stationery Office, York House, Kingsway, London, W.C.2, with branches at Edinburgh, Manchester, Cardiff and Belfast, or through any bookseller.

We shall be glad to publish the name and address of any reader granted a new two-letter call, as we think a monthly QRA list would be helpful. In order to start up-to-date, please do not send yours if it precedes the series "G4B", unless it has not yet been published elsewhere. Overseas QRAs are also invited.

A Distinguished Visitor

H.H. Prince Abdel Moneim, SU1AM, the well-known Egyptian amateur, represented his country at the Conference on Palestine held in London during February.

Conditions—The Month's Survey Improving—Then Disturbed

IT NOW appears that the sunspot which made its central meridian passage on January 4—as reported in last month's survey—did cause a radio fade out. A small magnetic storm was reported from U.S.A. starting late on January 5, while an ionosphere storm commenced at 0230 GMT on January 6. It was, however, relatively short lived, which is more than can be said of one which followed the meridian passage of what was apparently the same sunspot on its second transit of the sun's disc. But more of that later.

Sunspot activity decreased somewhat about January 15 and short-wave reception was only moderately good. A small sunspot crossed the meridian about January 16 and a slight magnetic disturbance was reported on January 18, radio conditions deteriorating rapidly at 1930 GMT on that day. There followed several days when conditions were only fair after dark, though quite good during the day. 14 Mc signals deteriorated gradually from 1930 GMT and 11 Mc broadcasters about an hour later.

● Magnetic and Ionosphere Disturbances

Very early on February 1—about 27 days after January 4—a large sunspot made its c.m.p. It was on the sun's disc from January 25 to February 7, and its area on January 31 was 650 millionths of the visible hemisphere. At 1800 GMT on Feb. 1 a magnetic disturbance started, lasting till 0300 GMT, while an ionosphere storm caused very poor short-wave conditions during the evening. At daylight on February 2 reception was slightly below normal, but after dark it became very poor and another magnetic disturbance took place.

February 3, 4 and 5 were fair, but February 6 was the worst day of the whole period, a magnetic storm taking place between 1200 and 2400 GMT, while the Aurora Borealis was seen at Cromer for about 15 minutes at 1900 GMT. Conditions were abnormally good in the afternoon, after which they became extremely poor, no American stations being intelligible in the evening and flutter fading spoiling all short-wave reception. On February 7, 8 and 9 conditions were much below normal in the evenings and further magnetic disturbances occurred on February 7 and 9. February 10 marked the return to normal, the disturbances having thus lasted over a week.

● Conclusions

It is thought that all these occurrences were related to the central meridian passage of the sunspot on February 1, though it is peculiar that there were a few fair days in the middle of the disturbed period. It is to be noted that the worst effects occurred on northern transmission paths, South Americans often being very good signals when North American reception was extremely poor.

After this solar activity became low for a time and about February 12 began to increase again. At the time of writing another large sunspot is approaching the meridian and if it remained active there is a possibility of further variation having taken place about February 18 or 19.

Forecasting for the coming Equinox, we should hardly expect such high frequency conditions as were apparent at the vernal equinox last year, for it has now been well established that the present sunspot cycle reached its peak early in 1938.

Notes and News from the East

By Wm. H. G. Metcalfe, VU2EU

DURING THE last six weeks your correspondent has been doing a lot of travelling; the January notes were written at Meerut, February's near the Afghan border in the North-West Frontier, and now these lines for the March issue are being composed in Baluchistan, where he will be until the end of March. Altogether he has travelled about 2,200 miles and seen some very interesting sights, including going through the famous Bolan Pass, which carries the steepest broad-gauge railway in the world. All mail must still be sent c/o Peshawar District Signals, Peshawar, N.W.F.P.

VU2FO has been very active using a single 6L6 ECO with 9 watts input and a W8JK beam; he says that he is getting better reports with this rig than he did with his PP RFP30's and used it in the BERU tests in conjunction with a Hammarlund Super Pro and a Hallicrafters Skyrider S.16. VU2FO mentions that the only G stations which come through with any degree of regularity are G8IT, G6TD and G6MK. Conditions with VK between 2130 and midnight GMT remain good but it is noted that South African stations are fewer in number over the same period. Zedders are at good strength between 0230 and 0400 GMT, the loudest and most consistent being ZL2VM. Conditions for North America are not nearly so good as those which prevailed for November and December, but most W districts can be heard and worked between midnight and 0200 GMT on 14 Mc.

● Queer Calls

Information is requested on ZC6RL,* who was heard CQ'ing on 14220 kc at 0530 GMT on Feb. 3. This station was logged in Baluchistan and no other stations were being received at the same time. It is understood that the QRA of VU7BR* is Bahrein; he was heard working G8PO, but due to heavy QSB and QRN the full QRA could not be obtained. ZC6EC is very active and can be heard most evenings in QSO with strings of W's. Cards for this station should be sent c/o SU1SG.

The cup for the station calling the most CQs before signing should be presented to a certain VK7 who sent CQ fifty-seven times and then signed five times. An ON4 is also in the running, as he called CQ 48 times and then signed twice!!

● QSLs

LU8EN has at last come through with the card which enabled VU2EU to send in his claim for WAC. Most South American stations appear to be very slow to QSL and sometimes years elapse before the coveted card arrives.

7 Mc has opened up on one or two days and a number of G's have been heard on this band, generally working locals. 28 Mc is still very erratic and is only alive for an odd half-hour daily. If any stations listed by VU2EU in "Calls Heard" require further, and fuller reports they will be sent on request.

A Russian station who QSLs! After many months of waiting VU2EU has at last received a card from U4AM, who gives his QRA as Kazan on Volga but requests cards to be sent via. SKW Moscow and not direct.

* [See February "DX Corner" for information on these calls.—ED.]

Listeners' DX Corner

By The DX Scribe

IN VIEW OF our frequent references to CW and the enormous help that a good knowledge of the code can be to all real DX listeners, we are very glad to learn from several contributors that they are getting down to it seriously. They all say they have boosted their country total, as several countries do not permit telephony operation on any band; notably Germany and Danzig. Furthermore, most amateurs in the more distant parts of the Empire rely on CW and simple low-power transmitters for their contacts. It is obvious that a station situated hundreds of miles from civilisation would need very extensive equipment to operate with say, 50 watts 'phone, whereas a one-valve oscillator circuit will produce a good signal all over the world with 500 volts on the plate. It is true that the quality of such a signal may not be ideal, but the fact that there is a signal at all is of interest to DX-minded amateurs, and it can only be received if the listener knows the Morse code.

Most of you will admit that a signal can still be read on CW long after the modulation has faded below the mush level, and for this very reason alone, we feel that we must lift our hat to Bob Everard for his truly amazing reception of 1.7 Mc telephony stations from U.S.A. You will see the number in his log in "Calls Heard," and we shall be very interested to read some of the extracts from the verifications which he will no doubt receive in due course; VE1NA should be added to his list.

● QSLs Received

Conrad Tilly of Bristol from ZS1BL, W6CQI, 6AHP, VP9L, PK4KS, VE4ACP, CE3AY, PY3EN, VK2OQ, WIBNO and W8PUN (Port, 3.9 Mc), LX1AY (7 Mc); Leslie Morgan of Bournemouth from CN8AJ, W7ACD, VE4BF, 4ALO for 28 Mc, CN1AF and VE4ZK for 14 Mc; Bob Everard from VK2IQ,

PK1VM, 1VY for 28 Mc, ZS5CL, W9DB (S. D.), W9UEW (Neb.), ZS4L and VE3HY; Eddie Strowbridge of London, N.W.10, from VK5BW, HI3N, VE3AFD, CN8MI and ZS4H (who says he is not interested in SWL reports); T. Derek Aldwell, Armagh, N.I. from W5GTC, 6FT, 7FL (Mont.), W9JLI (S. D.) for 28 Mc and K5AM, PY2CK for 14 Mc; E. Trowell, Sheerness, Kent, from PY3EN, SUIWM, VE1JP, LY1BF; Derek Steeden, St. Annes-on-Sea, Lancs., from K4FKC, K6OQE, PY1GU and XZ2DY.

● 1.7 Mc

Although it is not in our province to publish the full results of the MAGAZINE 1.7 Mc tests, it is interesting to record that these were much more successful than last year. We ourselves heard W1, 3, 8, and FA, although we think that conditions were not as good as the week prior to the commencement. A really comprehensive log appears from C. Martin, Pound Road, Bursledon, Southampton, and he writes as follows: "Having been a 1.7 fan for fifteen years, I have not heard such use being made of the band for a long time—the credit for which, in my opinion, is largely due to the publicity given in the MAGAZINE." Thank you, Mr. Martin.

● Queries Answered

F. A. Richardson, 37, Bourne Road, Coventry, received FNIC in Chandernagore, French India, on February 5 and wonders if the resultant contact with G6TZ was the first between these two countries. FNIC used to be very active in 1937 and worked his first G in May of that year and is the only station in French India. QSLs should be sent to D. W. Patterson, Gondalapara, Chandernagore. He has the call VU2GN in case he wishes to operate on British territory. Frank Jones, 6, Sutherland Street, Fenton, Stoke-on-Trent, asks if each of the six ZS districts constitute a separate country. The only recognised countries within the Union of South Africa are: The Union (ZS1, 2, 4, 5, 6), South-West Africa ZS3, Bechuanaland and Swaziland. There used to be a low-powered portable station in Bechuanaland using a ZN1 call, but there are no known stations operating on the amateur bands at



Patrick Boylan, 19 Quay Street, Co. Dublin, is a member of BSWL (436) and has verified all continents.

present in these two last-named territories. Frank next asks if U9 is separate. U9 and U0 (zero) constitute the S.F.S. Republic in Asia and count as one country; others in Asia are: Uzbeek (U8), Turkomen (U8) and Tadjik (U8), whereas UX denotes a portable or expedition station, UK a communal club station and UE a laboratory experimental station. Other separate countries in the U.S.S.R. are U2 White Russia, U5 Ukraine, U6 Transcaucasia, while U1, 3, 4, 7 form the Soviet Federal Socialist Republic in Europe. Don't forget the surrounding lands belonging to U.S.S.R., such as Franz Joseph Land, Nova Zembla and New Siberian Is. They count too—if you can hear them!

Many have written and asked for news of CS2V. He claims to be an experimental station in Lisbon, and presumably has a special licence. D. C. Gordon (2FBT) of Charterhouse, Godalming, asks if TA1AA, heard on 7 Mc, is genuine. We have previously stated our belief in the authenticity of this station, and have heard it rumoured that he is an officer in the Turkish Army operating with Army equipment. No QSLs have ever been received however, and he will continue to be one of the mysteries on the air. He does give a QRA in Ankara, but cards have always been returned marked *inconnu*. T. D. Aldwell of Armagh, N.I. (like Syd Walker) wants to know in what continent PK2 may be counted. The official ruling of the IARU* gives the boundary between Oceania and Asia as running through Malacca Strait, thereby separating Java, Sumatra and all D.E. Indies from Asia. He also asks if NY and K5 are different. No, they are for the same country and are in N. America, as the IARU boundary line separates Panama from Columbia.

● QRAs

E. Trowell of Sheerness asks for the QRAs of VQ2HV (suggest this should be VQ2HC), OX2OI and OH2RI, but we feel that both these are the same, i.e., OH2OI in Helsinki. M. Marks, of Ewell, Surrey, asks for addresses of G3YL and G3ZD. The former is Miss Ruth Jebb, The Lyth, Ellesmere, Shropshire, but we have no details of the second. And while on the subject of QRAs, it appears we slipped up last month when suggesting that Bud Hawkins' reception of VQ4ETJ in Nairobi was in reality VQ5EJT, as G. W. Osborne of Oxford heard a W actually in QSO with VQ4ETJ and is quite sure of the call; E. W. Field (BSWL1025) confirms and gives QRA as Nairobi. However, A. Hamilton of London, N.W.6 tells us the call is VQ4ECJ (or is this another?), but apologies are in order if the call really came from Kenya and not Uganda. Leslie Morgan distinctly heard YM4R on 14 Mc 'phone at 1805 on Feb. 9; we confess ourselves beaten, as telephony stations are believed to be forbidden in Danzig, and anyway, YMs carry two letters after the prefix.

● The Round Table

In February we gave details of the six-continent round table that took place on January 4 between W4DLH, G5ML, HK5AR, VK4JU, VU2CQ and SU1AM (it was SU1AM and not IWM) and we reported that R. Gammons of Headington, Oxon, overheard all sides. We rather gained the impression

* [The IARU, the International Amateur Radio Union, is a federation of most of the recognised amateur transmitter societies of the world, only one per country being accepted.—ED.]

from his letter that he had been successful in picking up the six of them, but G. W. Barron of Whetstone, North London, is not so sure that this was possible with a simple 0-v-1 receiver. Mr. Barron was listening and reports as follows: W4DLH RS45, G5ML RS58, VU2CQ RS4/55, SU1AM RS59plus, whereas HK5AR and VK4JU were inaudible. G5ML was only receiving these two RS22 using a beam receiving aerial and an HRO. Some further details of your reception please, Mr. Gammons.

● An Aerial Problem

G. Hepburn, c/o D. Collins, 2, Livingstone Street, Clydebank, Scotland, is placed in such a position that the lead-in from an outside receiving aerial would be longer than the aerial itself. As many will probably find themselves in such a quandary, we are suggesting that a normal half-wave doublet be put up outside and the feeder cable fed into the centre (which is split by an insulator). This feeder cable should preferably be two parallel wires held together and can be of the type available from Messrs. Hamrad, or any of the well-known radio stores. It doesn't matter how long the feeder is, or if it is wound round the house or even buried under the earth; the losses will be negligible up to 100 feet or so. This will answer the problem, and a doublet is vastly superior to an inside wire for one-band reception, although it is as well to have an aerial in the shack or loft as a doublet will usually only receive signals at best strength which are well at right angles to itself. Make it 33-ft. long (16½-ft. each half) for 14 Mc, and double this length for 7 Mc or half for 28 Mc. Do not forget that the feeder must be coupled to the grid coil of the first stage, by a 2- or 3-turn winding, and not just attached to the aerial terminal.

Harold Owen is nearly up to Martin Bourke's record of 13 countries in 3 continents on 1.7 Mc, having logged 10 countries in as many continents. During the MAGAZINE 1.7 Mc tests he was rewarded by WIBB, FA8BG and HA8H. Look out for LY1J

DX FORECAST FOR MARCH, 1939

North America, (All times GMT)				
Eastern States of U.S.A.,	7 Mc	14 Mc	28 Mc	
VE1, 2, 3, VO, K4 and				
West Indies	2200-0830	All day	1200-2000	
Western States of U.S.A.,				
K7, VE4, 5 and XE ...	0400-0800	1700-2000	1500-1730	
		0500-1000		
Central America	2200-0800	1500-0900	1100-1500	
South America.				
All	2100-0800	2000-0900	0800-1600	
(Note:— S. America is frequently heard when U.S.A. signals are absent)				
Africa.				
ZS, CR7	1900-2100	1600-1900	0800-1600	
VQ2, 3, 4, OQ, ZE, ZD, FB,				
etc.	1900-2100	1600-1900	0800-1600	
FA, FT, CN, SU, ST, I7, etc.	1800-0800	All day	0800-1800	
			(or later)	
Asia.				
J, XU, MX, VS1, 2, 3, 6, 7,				
FI, etc.	1800-2000	0630-0900	0700-1100	
		1200-1800		
YI, ZC6, VU (north), U8, 9	1800-2200	0900-2000	0800-1400	
Oceania.				
VK2, 3, 4, 5, 7	1900-2000	1500-1800	1000-1200	
		0600-1000		
YK6, VK4 (Papua), VK9	1900-2100	1300-1900	0900-1100	
ZL, VR	1900-2000	1500-1800	1000-1100	
PK, KA7, KB6	1900-2100	1400-1700	1000-1100	

Note.—It is anticipated that under normal conditions signals should be audible all night on 14 Mc during March.

DX CORNER

too. Harold is more interested in sending useful reports to 1.7 Mc stations than to 14 Mc DX that everyone hears, and offers his assistance to any G who would like to write to him at 2, Campion Avenue, Basford Park, Newcastle, Staffs.

● Name-Plates and Dials

Gordon Birrell of Dundee writes a long and interesting letter again, and gives a good suggestion for making name plates, suitable for receiver panels. He takes a piece of plain white postcard and indents the characters with hard pencil. The indentations are then filled in with white enamel, by means of a pen nib; when thoroughly dry, four successive coats of clear varnish are applied, and the result certainly approximates to the commercial article, as the white stands out against a black background. The samples sent are proof of this.

● Correspondents Wanted

Arthur Walton, BSWL1061, 212, Intane Road, Fagley, Bradford, Yorks, wishes to correspond with BSWL members outside England. He uses two receivers, SG-v-2 and 0-v-1 with a picture-rail aerial, but hears such stations as YV4AE, 5AV, PY's on 14 and ZC6EC on 7 Mc. Derek Steeden, 71, St. David's Road North, St. Annes-on-Sea, Lancs., wants correspondents in any part of the British Empire and mentions that XZ2PB can be QSL'd at P.O. Box 380, Rangoon. During the month, Derek heard PK1RI, 4JD, 4KS, K7FST, KA1ME, which is strange, because Gordon Birrell was unable to hear the Far East at all.

● News from U.S.A.

M. W. Soplop, 54, Chestnut Street, Allegany, N.Y., has been concentrating on the reception of DX telephony on 7 Mc, and you will see what results he has obtained with G signals in the "Calls Heard" page. He offers to listen for any British or British Empire operator who would like to try 'phone tests with him on 7 or 3.5 Mc. The optimum times for reception in New York are 0730 to 0930 GMT for 7 Mc, and 0600 to 0800 GMT for 3.5 Mc. Communications for any tests should be addressed to Roger Legge, Junr., 20, Beethoven Street, Binghampton, N.Y., or to Earl Roberts, 2308, Roosevelt Avenue, Indianapolis, Ind. There is no doubt at all that such lists as Mr. Soplop has sent us are extremely interesting to G operators, and all logs of British calls heard from overseas will be welcomed, particularly on 3.5 and 7 Mc.

● Italian Amateurs

Douglas Chatt, 23, North View, Sherburn Hill, Co. Durham, asks us to clear up the question about Italian amateurs. There are no officially licensed amateurs in Italy, but "I" stations have been active since the earliest days. Several years ago, a government official put a transmitter on the air, pretended he was a "ham," and after having obtained the addresses of the stations he worked, he closed them down with fines! This little trouble blew over in due course, and there are now more Italians on than ever, many using good quality telephony, so we presume that the government is turning a blind eye in their direction; but they are not licensed.

P. Sawyer, 100a, North End, Croydon, Surrey, pulled some good ones out of the 14 Mc SLP including VU7BR (Bahrein), W6EGH, 6MK on CW and W7ESK on 'phone. K. Bunston, Gable Cottage, Broad Hinton, near Swindon, Wilts, has added VQ3, VQ5, and U8 to his country total, with HAC in six minutes on November 9, hearing J2JJ, PK1BO, W1ADM, ZD4AB, ZB1R and PY5AG commencing at 2150 GMT. He advises all interested in 7 Mc reception to listen around 2100 and 0800 for DX, as he heard KA1AX, TF3C, K4FAI, W5's, TI6RR, ZL2, 4, and W6 at these times, all on CW. A. Jotcham (2FWB) of Compton, Berks, sent a log for an 0-v-0 but did not mention to which band it referred. Eddie Strowbridge, 11, Leigh Gardens, Kensal Rise, London, N.W.10, has logged 75 countries on 'phone in 12 months, and tells us his opinion of those amateurs who use a fancy call to fool the world. "It can only be compared," he says, "with leading a blind man into a blank wall." Unanimous agreement.

● Set Listening Periods

March 5	2200-2300 ...	1.7 Mc.
March 12	2000-2200 ...	7 Mc.
March 19	0600-0800 ...	14 Mc.*
March 26	1600-1800 ...	28 Mc.*

* (American 'Phone Contest).

Please write your logs on separate sheets per band, and take care to differentiate between the figure 1 and the letter I. Full names and addresses should appear on each sheet, and as there will be literally hundreds of American stations operating in the last two periods, we suggest you only include W5, 6, 7, and W9 in S.Dak., N. Dak., Col., and Kansas, simply giving the total number of W1, 2, 3, 4, 8, 9, stations heard, thus: W1 (48), etc.

Kenneth Haswell, 132, Lancelot Road, Wembley, Mddx., reports for the first time and uses the "A.W.2." receiver, with which he has heard 66 countries; as he suffers from an electric railway at the end of his garden he hasn't done too badly. E. W. J. Field (BSWL1025-ISWC), 36, Watford Heath, Watford, Herts, sends us an extract from a verification from W8RNC, in which the American sent back the two USA stamps enclosed. W8RNC complained that 35 English stations have not sent cards for QSOs, even though a card was sent direct to all of them. Some very well known British stations appear on the list, too; apparently a fine signal does not necessarily indicate a fine sense of sportsmanship, although it is possible that some of these G's are a bit dilatory in sending cards. We have often pointed out the futility of impatience as applied to waiting for cards. Many stations only QSL once a year in an enormous batch.

When Writing Us

Please give your call sign or listener number for record purposes, if you have one. If you have had any previous correspondence with us, do not fail to quote the date and reference you will find on our letter; we have about two thousand carbon copies on the query files alone, and it takes time to find "my previous letter" if no other indication is given.

CALLS HEARD SECTION

SLP2 (Jan. 15, 0600-0730) 3.5 Mc

H. OWEN, 2 Campion Avenue, Basford Park, Newcastle, Staffs. "All-World Two." 33-ft. ENE—WSW.
 'Phone—LA3V, 5G. ON4AA, FK, HF, UM. OZ5CN. W2HS.
 CW—D3DYU, 4KPY. HA5I. HB9CB. OZ2IW, 7PD. SM7YC. WIJHN, LPS.

F. JONES, 6 Sutherland Street, Fenton, Stoke-on-Trent. 0-v(SG)—1(Pen). 18-ft, 40", 18-ft. high, approx. WSW.
 'Phone—HB9AA. ON4HS, SA. PA0MO. WIADM, 2HS.
 CW—D3DYU. HB9W, CU. OZ7PD. VE1FT. WIIGA.

SLP3 (Jan. 22, 1500-1700) 14 Mc

R. H. GARLAND, Hainault Road, Chigwell, Essex. 6v. Commercial, LS, half-wave doublet 65° E of N.
 WICGM, DHS, HQN, ITP, TW, 2GIZ, 3ZX, 8GLC, POQ. VO2Z. ZC6EC. FB8AH. FAF3C. SUIDM, MW, RH. F3QG, WT, 8RL, SB, SW. ES5C. SVICA, KE. HA1P, 2C. IIEI, LO, MB, MN, MT, 3PA (Sicily). YT7TJ. YU7AY. LY1AT, LX1TW, LA3B. SP3AC. CT1PM, QG. SM5KP, OF.

F. JONES, Stoke-on-Trent.
 'Phone—CT1QG. F3DC, WT, 8WK. HA2C. HB9CV. LY1AT. SM5OF. SUI1MW. ZC6EC.
 CW—D3IQN, 4TDB. FA8DA. C2AS, VF, 5BD, RV, SR, 6PY, 8II, IT. G15QX. HA2N, 5X. HB9BB. I1ND. LA7X, 8S. LY1KK. OH1NL. ON4VU. OZ4TO, 7NJ. SM5NV, 7NF, PY. 5PIQT, 3AC. SUIDB. U1AD, 8C. WITW, IYJ, 2AJA, ICV, 3HTW, 8CJJ, PYO. YL2AB, BZ. YM4AD, AV. ZB1U.

C. G. TILLY, BSWL319, Bristol, 6. "Everyman 4," LS. Indoor "Vee" beam, NSE—WES, both 28-ft. long, 40-ft. high.
 CN8MB. CT1NO, PM, QG. ES5C. F3BC, 8RL, YZ. FA3JY, 8CF. FB8AH. HA2C. HB9AB, DE, IIEI, FL, LO, MB, MN, MT. LA1G. OZ4UL. SM5KP, OF. SPIQE. SUIDM, MW, TM. SVICA, KE. VE1BK. WIBQS, BUZ, TW, 2GIZ, 3FJU, 6IKQ, 7ESK. YR5PB. YU7VB, XU. ZC6EC.

H. OWEN, Newcastle.
 CW—CT1CO. D3IQN, 4HWG. F8FQ. HA3A, 8D. IIMQ. LA1H, 7N, R, X, 8G. OH1NL, NV, 6NN. SM3MT, 5NV, WT, 6NB, UA, 7KJ. SPIAR. U1CO. W1AWU, BXC, QF, 2FD, FWB, ICV, IFA, JT, KZJ, ZA, 3ANZ, 6GRX, LYM, 8KHT, RWN. YL2AB. YM4AD, AV. YR5CZ, EF, VX. YU7PX.

'Phone—F3BC, WT, 8GM. FA3CF. HA2C. HB9DE, K. IILQ. LX1TW. SUI1MW. SV1KE. W1AA, FMP, 6OCA. YR5PB. YU7XU. ZC6EC.

GORDON BIRRELL, 1 Kenny Place, West Ferry, Dundee, Scotland. Battery 0-v-2.

CT1PM, QG. F3DC, GW, WR, 8TU, YM, XT. G2FC, MF, 8GO. HA2C. HB9AB, S. IIFU, LQ, MB. SUI1MW. SVICA, KE. VE1BH, BK, NU, 2AA, BG, 3HC. W1BIC, IPC, ITQ, TW, 2CSS, GIZ, KUD, 3FZE, GKZ, HPO, ZX, 6IKQ, 8ACY, IEB. ZC6EC.

SLP4 (Jan. 28, 1500-1700) 28 Mc

F. JONES, Stoke-on-Trent.
 'Phone—HR1AY. W1ETA, 2AHX, HWX, KCY, KPX, LHF, LVS, 3BBO, EOZ, GGF, 4EBW, EKI, 5BEN (Port. 9),

7ACD (Idaho), 8RK, AEM, AFO, ETJ, NKA, QBR, QDO, 9CVN (Kans.), GVP, JII, KVB (Neb.), ROQ, WUC.
 CW—W2LMN, 4FIJ, 8AZQ, 9BBS (Neb.), RZM, TJ.

R. H. GARLAND, Chigwell. 3v. battery, 'phones, 100-ft. end-fed.
 K4FAY. VE1CO, 2KX, OG. W1AUR, DHT, IGD, JSS, LEP, 2AHX, BMK, DVM, FDN, HQA, JMC, JOQ, KPX, LTA, LVS, 3AFH, AZG, BOP, GUF, 4CYV, EKI, MS, MV, 5BEN (Port., Chicago), GZK, 6PDB, 7EAI, 8AFQ, DST, GSC, LAC, MZM, NML, RKR, RLT, RRL, RXY, SIM, SRB, 9BOF, BYB, CGO, ES, CVP, ODW, PBV, ROQ, ULJ, WIP, WOS, WUC, YKH.

GENERAL 1.7 Mc

C. MARTIN, Lynton, Pound Road, Bursledon, Southampton. 1(regen)-v-1. End-on NE—SW. 1.1.39-8.2.39. (Excluding RSGB Contest).
 'Phone and CW—W1BB, AW, ME, DFS. SM7UC, QY. D4SZK. I6F. F3HD, MD, 8ZF, WF. C18LF. GM2OX, 3ND, 5ZX, 6JJ, 8SV, CN. C8W2WO, BG, 3KY, 5FI, OD, 6KY, AA, 8WU. C2AX, AO, YY, DF, MP, UJ, XP, XC, MI, CF, FO, RI, KO, FP, XS, GG, RA, SC, HU, DO, FS, VZ, PO, 3JU, ZL, UJ, DH, AH, GH, FM, CY, UB, BU, FN, PZ, XR, SI, TL, WC, PL, YB, ZJ, 4AU, AK, BY, CF, 5ZQ, HS, BK, KT, JO, MY, OH, NF, TN, ZT, OW, PR, PX, RI, FY, QY, UO, IH, YA, SN, RX, CM, JU, CU, OQ, AL, MP, QN, RD, 6YR, GO, LF, CI, MC, GM, HB, LL, SS, MK, YU, GR, NM, ML, BQ, WH, UT, II, SQ, YP, WY, VD, FO, 8AF, BD, JR, NV, IV, NL, GN, JM, PY, TR, TL, LO, GG, SG, CN, GI, MW, QZ, IJ, PM, FU, ML, PI, JC.

R. D. EVERARD, Belle Vue, Nelson Park, St. Margarets-at-Cliffe, Dover. "Sky Champion." 8.1.39-8.2.39.
 WIBES, KSM, KUW, KKR, BB, LTW, BNO, 2EJW, 3DQ, 4DAH, BJZ, 8OLR (Port. 3). CW2BG. C2PO, GD, KT, LZ, AX, 8SI, GW, OA, OJ, WC, 5VT, ZQ, MP, HO, 6PA, ST, NN.

B. W. WARREN, G6CI, 19 Melville Road, Coventry. 0-v-1. * denotes QSO.

C2FS*, AO, KQ, LZ, QM, 3HA, YB, AG*, JK*, UB*, UD*, FN, LP*, YA*, JO, 4CF, AU, CW*, 5TN, DN, 6HB*, UT*, 8IJ, PM, AB. CM2OX*, 8CN, TT. CW5OD. SM7UC. GYRW. GZFS. F8QM*. LYUJ* HA4C. UNOL.

3.5 Mc

R. D. EVERARD, Dover. Marconi SH6 or "Sky Champion." 8.1.39-8.2.39.
 W1IFD, IAW, DRI, ADM, AAH, IWG, BNO, CNY, DQA, FOF, JXV, 2AST, HS, BDT, EOA, HNA, CET, JZX, HQB, HNT, GOQ, DKS, MW, AOG, FLX, OR, 3FAM, DO, EWW, AHS, GPM, FTU, JC, GKJ, DOG, EOZ, BIN, AXR, GGW, CEI, AWU, 4CQG, DCQ, BAZ, BPG, CYV, CCM, DLK, 8GFS, CNA, KDX, JOE, LIQ, RH, CDT, JIN, AQ, BOZ, REI, NNJ, CHU, 9MM, HCD, WXL. VE1GR, LR, CR, CO, 2KX, GH, KG.

7 Mc

H. OWEN, Newcastle.
 CW—CM7AC. FA3RY. K5AM. U1BP, 2AW, NE, 3CU, QD, 5AJ, BL, 6ST. VE1KN, 2OM, 3TA. W1DFY, DKS, DTO, EIT, FYG, JUS, KFR, KOY, LET, LEV, LHB, LJE, LOB, ZK, 2BOM, CE, CGI, JHC, JHE, KDW, KJC, KNH, KNR, ILL, OB, 3CYC, EP, FAX, FQZ,

GDI, GME, GNU, GOX, GWU, HDP, HHG, 4DMA, FMF, 8BTB, OVZ, QXB, REU, RJK, RUK, SEB, 9ESN. YV4AX.

14 Mc

F. JONES, Stoke-on-Trent. 1.1.39-31.1.39.
 'Phone—C08BC. FB8AF, AH. K6OOE. PKAKS. TF3G. TC9BA. VE3LL, LR, MB, NF. XZ2DY. YU7XU. ZB1AY. ZC6EC. ZE1JA. ZS2AM, AZ, X, 6DY.
 CW—CM2OP. CR7AF. CT2BC. HH2MC. K4ESH, FAB, FAY, RJ. PK3AA. PY1AJ, DI, DS, 2CD, CW, 6AI. TF5C, M. U9ML, WR. UK3AA, CU. VE3AKG, FC, HB, NI, QI, 4AU, DW, OX. W5PJ, GUN, HGI, 6SI, 7AYO, 9LEI (Kans.), MNU (Kans.). VP2ZA. VU2BG. VK2EO, HP, 4PX. ZC6AA. ZE1JY. ZS1AC, BA, BG, BH, BM, CG, CR, 2AL, AM, AV, BV, X, 5BU, CXU, 6A, DL, DW, DV, EJ, EZ. ZL2FA, GN, 3JA, 4AO, DQ.

28 Mc

R. D. EVERARD, Dover. "Sky Champion" and RME 510X. 8.1.39-8.2.39.

V56AF. CR7AK. PK1VY, VM, 2WL. VK2GU. VP3AA, 6YB, 9L. CO7VP. XE2IV. T12RC. FG. LU1DJ, ET. K4FAY, EZR, 5AN. ZS2AF, 5T, 6S, W. TF3C. H17G. OH5OD. FA3JY, FB. CN8AV, AJ, MI, BA. SU1CH, NW, RD, GP, KM, PY2CK, FO, MI. VE1L, CR, ET, CO, DT, KK, 2KX, MX, IN, OG, FK, MW, 3DS, AIW, AFJ, ANE, AVB, KE, ASR, I.B, OO, JW, 4SH, ALM, BF. W5CYX, FUA, HDH, ZA (New Mex.), 60JK, PBD, PDB, NNR, NLS, MBD, NYD, LNI, AK, OR, POZ, NIO, PKK, 7EAI, ACD, BJS, ABK, 9NWQ, WTN, HDU, DRQ, ZIX, QXJ, GBQ, PO (Col.), VSK, UEB, RGT, RPJ, EOZ (N.D.), WZH, USI (S.D.), WOA, UEW, ROS, ZNA, KVB, AGS, DHO, TUI, YDC, HGV, JHN (Neb.).

OVERSEAS

M. W. SOPLOP, 54 Chestnut Street, Alleghany, N.Y., U.S.A. 29.11.38-13.1.39. QRK reports are given.
 7 Mc 'Phone—G2PU-8, IS-9, VG-6, KO-8, HN-6, IL-9, XV-7, FX-8, 3WJ-8, SI-8, NL-7, AC-6, TN-6. G13JP-8. C3GS-6, IV-8, PR-5, CD-5, RK-5, BG-8, AS-8, YJ-6, QS-7, YK-7, PH-4. CW3CR-7, KY-7. E13P-5. G5VV-6, LK-7, GN-7, WG-8, FA-8, CP-7, JA-8, OK-7. C15OY-6. G6TW-9, VQ-8, KB-7, UX-9, HF-6, HV-9, BW-9, GL-6, JO-6. CM6SR-9. G8NA-7, GM-8, AW-6, PT-8, FP-6, OC-7, IT-6, LV-8. E18N-5. CM8KQ-6, KR-6.

3.5 Mc 'Phone—G2DQ-7. ON4HS-5, 4UM-7. HB9AA-6.

VU2EU, WM. H. C. METCALFE, c/o Peshawar District Signals, Peshawar, North West Frontier Province, India. (Stn. near Afghan border). 2.1.39-23.1.39. Figures in brackets indicate RST. 1-v-1, Indoor aerial.
 7 Mc CW—G3FJ (358), FP (358), 6WL (559), YZ (559).

14 Mc CW—G2FT (339), 3AV (349), BS (569), 5IV (339), ML (579), 6HI (457), JF (579), SY (559), VQ (559), 8IW (579), PO (589). C15TK (348), 6YW (559). CM6XI (359).

28 Mc CW—G2MA (339), QT (579), ZP (459), ZV (559), 6AG (449), DH (569), 8GI (459), JV (359). CM6NX (559). CW8WU (559).

28 Mc 'Phone—G2DS (55), 5SA (33), 6BW (57), WT (57).

Acknowledgement.

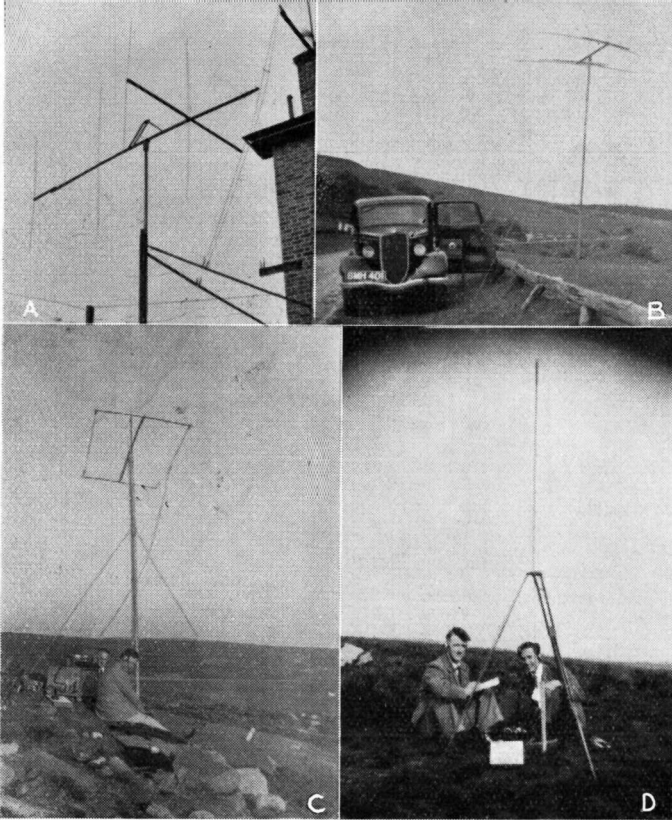
J. Wigginton, Halifax; G. Chalwin, Camberley; P. E. Taylor, Barnet; K. Haswell, Wembley; R. A. Hine, Moreton-in-Marsh; C. Gibbins, Herne Bay; J. L. Hall, Thornton Heath; BSWL24, Kilburn; P. Sawyer, Croydon; R. H. Greenland, Barnsley.

56 Mc Notes

Data on Concentric Line Control — Test Prospects — News Items

By A. J. Devon

Ideas in 5-metre aeri-als. A—G5BY's rotatable Yagi, showing the reflector, side members and directors which concentrate the radiation in a sharp beam. B—2AAH of Chichester used this rig in the September Tests; the aerial can be dismantled in five minutes and comes down into sections 4-ft. long to go in the car. C—G16YW and G18TS go portable with a $\frac{1}{2}$ -wave horizontal doublet and reflector. D—H. Willets, with 2ABF and 2CKC, used this neat vertical receiving aerial in our September Tests.



THIS ARTICLE is being prepared shortly before the 56 Mc Test Period scheduled in our last issue is due to commence. The results that may have been obtained during the Tests cannot therefore be discussed until next month—and if anyone reading these lines took any part at all in the Tests and has not yet reported, let the omission be rectified as soon as may be! Even if you called "Test" many times without result, or listened for hours without hearing a thing, *let us know*, because a negative report from your part of the country may provide useful and interesting information for the survey we hope to be able to make from the collated material.

We are anticipating that much valuable data will become available, since the actual response to our suggested schedule shows that something like 100-150 stations all over the country will have been in operation and we are looking forward with keen interest to their individual reports.

If the enthusiasm can be maintained and the support warrants it, we are quite prepared to run a regular short Test Period each month—preferably a little earlier, so that the report can be published in the issue immediately following.

● Transmission-Line Control

Briefly, a method of transmitter or receiver frequency stabilisation which depends upon the physical size and placing of open resonant circuits employing the minimum of capacity, and usually consisting of a pair of parallel rods on either grid or plate side of the oscillator valve, or both.

The advantage of such an arrangement is that by proper proportioning of the rods, bars or tubes used to form the oscillatory circuit, a high degree of stability can be obtained at the desired output frequency, i.e., it becomes unnecessary to double up from an LF crystal or ECO in order to get a drive sufficiently steady to control, say, a modulated

amplifier. Thus, transmission-line control has decided advantages. Up till recently, it has not been particularly popular, nor very widely tried, because in most cases it was not found possible to get a signal with a real crystal characteristic; this latter feature is generally agreed to be a *sine qua non* on 56 Mc if any serious work is being done.

All this leads up to the latest information made available through E. H. Conklin of RADIO. He has gone into the matter of transmission-line and concentric-line control very closely, both theoretically and practically, and has worked out a group of tables and curves which we hope shortly to reproduce, as space is not available here to do his thesis justice—it will be printed in full in the April issue of RADIO.

The main principles of parallel-line oscillator design—to use yet another descriptive term—are well known and covered from the practical point of view both in the *Radio Amateur's Handbook* and the *Radio Handbook*, as recently reviewed in these pages.

It has been difficult enough to wean the average casually-interested amateur from the use of self-excited transmitters of the cruder type for 56 Mc working, but the figures available and practical results obtained do suggest that high efficiency and good stability can be obtained with parallel-line UHF oscillators, though crystal-control still remains the most convenient and best understood way of putting out a good, clean signal on 56 Mc.

From the welter of ideas, facts and fancies in which is bound up the whole business of 56 Mc, what seems to emerge more or less plainly is that the modern well-equipped station should have a three- or four-stage CC transmitter, a specially built superhet with a high IF frequency, and either a big long-wire type aerial, a rotatable uni-directional beam arrangement, or a combination of two such aerial systems.

● News Items

G8KD/G8KF, Sheffield, who has a very fine station and is devoting much time to 56 Mc, asks for co-operation on a schedule of his own, of which the following is a digest:

Tuesdays—2000-2005 GMT, transmission using long-wire aerial, 50 watts 'phone, 58068 kc.

2005-2010 GMT, listen for replies.

2010-2015 GMT, using vertical dipole, 35 watts 'phone, 57232 kc.

2015-2020 GMT, listen for replies.

(The sequence will be repeated till 2040 GMT, followed by tests till 2230 GMT with any stations available.)

Sundays—The same group of transmissions and similar procedure will be observed starting at 1130 and 2000 GMT.

During these tests, which come into operation immediately and are to be continued till further notice, information will be given as to the plane of polarisation for each transmission. The long-wire aerials, arranged to cover N-S and E-W, are 80-ft. high and 16 $\frac{1}{2}$ -waves long, while the dipole has a reflector and can be rotated. The 56 Mc receivers at G8KD/G8KF are superhets, the Alexandra Palace television signal being used as a check on the condition of the band, since A.P. is received in Sheffield by reflection—or so G8KD considers it safe to assume. It is interesting to mention here that we also hear the television sound at well over 100 miles but have never found it any reliable guide to what may be expected on 56 Mc, though observations have been made practically daily for some nine months. The signal is quite steady with only slight fading at times and scarcely any variation from daylight to dark. The distance in G8KD's case is, however, much greater, and probably involves reflection or bending, with as a result considerable variations in signal characteristics which give him a fairly reliable indication of the state of the southerly transmission paths for 56 Mc.

The transmitters at G8KD/G8KF are of course CC on five metres, and either 'phone, ICW or CW can be used; 'phone is normally employed, and his transmissions have recently been reported from the south of England—hence the proposed schedule and details herewith.

Reports on other recent 56 Mc activity indicates that there has been little regular working in the south during the last month or so. A number of stations have come on from time to time, found only the locals available, and have then reverted to another spell on the communication frequencies.

The only DX—if we may still call it that—to record is yet another contact G5BY-G6FO at 1240 GMT on February 19, as a result of a schedule made in advance to test the new equipment at G6FO. It was not a little gratifying to find that the 126-mile link was still intact, in spite of nearly six weeks' total absence from 56 Mc by the Newport station. G5BY's signals were audible most of the afternoon of the same day, though never better than R5.

Some interesting local tests G5WU-G6FO revealed that G5WU gets out very much better with an indoor aerial and a short feeder than with a similar doublet erected high and clear outside, but having

Frosting Aluminium

By F. H. NORTH, 2FPP

ALUMINIUM is specially favoured by amateur constructors owing to the ease with which it can be worked and its screening efficiency. The main disadvantage is that, though it can be bent, drilled and adapted to any design, by reason of its softness various undesired marks and scratches are often left on the surface to spoil the appearance of the finished apparatus.

The writer has found the following method—which is not actually new—very useful in getting a frosted effect, as it not only removes the disfiguring marks, but also improves the look of the equipment.

● The Treatment

All that is required is one pound of caustic soda, obtainable at a chemist's for about ninepence, and a gallon of water. Note that the caustic soda is not in this instance the ordinary weakened domestic variety.

The water should be heated to about 120 deg. Fah., and not to boiling point, as the temperature of the solution is raised by the action of the soda. An earthenware container is best for mixing the dip, as the solution is very corrosive. Add the soda to the water and stir with a stick till it is dissolved.

The metal-work to be treated should first be thoroughly cleaned and then dipped in the solution, immersed for a few seconds only, then removed and washed immediately in warm water. Rinsing with cold water after this will remove all traces of the dip. Dry off in warm air—over a gas-ring or before a fire—and the desired effect will result. If heavy frosting is needed, add a pound of common salt to the solution before dipping the aluminium.

Various effects can be obtained with different strengths of mixture, but the proportions suggested are satisfactory for all usual requirements.

● Corrosive Poison

It must be remembered that such a dip is both poisonous and highly corrosive, and care should be exercised in handling it. Rubber gloves are an asset in the process, or a pair of long-nosed pliers can be used to hold the work while dipping. The solution must not be allowed to touch the skin.

Finally, when disposing of the dip, dilute it thoroughly with water, and if the drainage system of the house is used to pour it away, flush through with more water to remove all traces of the fluid.

a feeder 60-ft. long! We have an idea that feeder loss (as covered briefly on p. 26 of the January issue) may have quite a lot to do with this, because the system as a whole loads up better in the latter case. These tests give point to our own contention regarding low-impedance feeders on 56 Mc and bear out the results of the experiments outlined in January.

The promised Egyptian activity is beginning to materialise—SUIRD is to be on 56800 kc with 250 watts, CC.

Mention the Magazine when writing to Advertisers. It helps you, helps them and helps us.

CORRESPONDENCE

Criticism

I have one small criticism—it is your emphasised advocacy of British valves. In my opinion American valves are as good, except occasionally as regards their life. I should like to point out that our licences are given us for experimental purposes and thus our object should not be the construction of a transmitter in 1939 to last till 1949, in order to work all available DX in the interim. Hence, American valves are more suited to amateur purposes, especially in the case of the 10-watt man who uses the receiving type for his transmitter, these being much cheaper than their British equivalents.—NIGEL ANSLOW, 2BAN, 35 Gilpin Avenue, East Sheen, London, S.W.14.

[We take the opportunity to remind readers that not only are British transmitting valves, such as the recent Mullard and Tungram releases, becoming available at highly competitive prices, but also that it is in the British amateur's own interest that we encourage British manufacturers' products; furthermore, practically all our designs can be suitably modified to use American types.—ED.]

Potential Piracy!

I want to thank you for publishing my letter to you in November, and it is interesting to note that all the replies were from hams to be, viz., AA licence holders, and I find them all ready to help in any way.

In the December issue I have noticed the "Two-Band Two" transmitter and it seems a real v.v. FB little rig, but here once again it uses British transmitting valves. You should bring in account your overseas readers in India, Australia, New Zealand, F.M.S., Palestine, etc., where American tubes are the only available in the market and myself is very much willing to see a version of this "Two-Band Two" using American valves, a circuit which I am sure all your overseas readers will warmly welcome.

I myself is very much willing to go on the air, even as a PIARAT! But am unable to do so for the reason of not finding a Tx for my requirements, and when I at least find a low-power CW Tx that suits, it uses British valves.—REUVEN SOKOLOVSKY, 4 Nachlat-Benjamin Str., Tel-Aviv, Palestine.

[If you insist on American valves, Reuven, the "Two-Band Two" will work very well with a 6L6 CO and a T20 or 210 P.A.—ED.]

QSL, Please

I am very interested in receiving SWL reports on my ten-metre signals; I welcome them, and will verify each and every one I get. My transmitter runs 75 watts to a pair of RK49's, modulated with two 6L6's in class A-B. The aerial is a three-element close-spaced rotary beam, and my frequencies 29296 kc and 29286 kc.—K. SMEBY, W6QFB, 6207, West 5th Street, Los Angeles, Calif., U.S.A.

Weather Reports on 1.7 Mc

Could you please make it known through the MAGAZINE that G5KT and G3SB are putting out weather reports in the International Weather Code. These transmissions take place every Tuesday and Thursday and we hope to extend them if sufficient stations become interested. Transmissions commence at 2130 GMT with a general call "Wx Wx Wx de G3SB," followed by the message on 1745 kc, then "QX G5KT 1775 kc." At the close of the last transmission we look for replies and we particularly appreciate reports from SWLs, which should be sent to this address: T. C. BRYANT, G3SB, Beaconwood, Minehead, Somerset.

Bureau for American QSLs

At various intervals I had intentions of sending you G "Calls Heard" lists, but hesitated as I did not know if they were wanted. I now understand that this is the case, and would further say that if any transmitters or SWLs in England wish QSL cards forwarded, I should be glad to act as a QSL bureau. All cards received will be sent to their respective American destinations.—M. F. WILLIAMS, 119 South Eighth Street, Newark, New Jersey, U.S.A.

[Our readers will appreciate this offer and we hope that you will not find yourself at a disadvantage as a result of it.—ED.]

Search HF of 58.5 Mc

How about the MAGAZINE drawing more attention to the fact that new 56 Mc permits are from 58.5 Mc upwards? I always use 59.52 Mc and people seem surprised when they get me up there. I believe that 25 per cent. of the receivers will not reach 59 Mc and another 25 per cent. of operators never look that far. The only advantage is that I have half the band to myself!—D. T. BENNETT, G3OP, Film Industries, Ltd, 60 Paddington Street, London, W.1.

[We mentioned this very point on p. 24 of the January issue.—ED.]

Which Is It?

I must confess to being one of those you hit out at in February "Poisonalities," as I use "73s." I took the trouble to check over my cards and found that some 60 per cent. of them had the "s," including many from well-known transmitters. It seems to me that it would be interesting to hear what others have to say about this, as I feel sure that my result is not an isolated one.—R. T. PARSONS, 14 Carlyle Avenue, Brighton, 7.

[In spite of our correspondent's challenge and even if his figure had been much higher, the fact remains that "73" is correct, whether sent verbally or otherwise. The explanation will be found elsewhere in this issue, which shows that the term was adopted by line-telegraph operators long before it came into use for radio.—ED.]

... HERE AND THERE ...

More Countries to Work!

Here are the new prefixes issued by the American authorities for Pacific Island possessions:—

- K4 Puerto Rico.
- KB4 Virgin Islands.
- K5 Canal Zone.
- K6 Territory of Hawaii.
- KA Philippine Islands.
- KB6 Gaum.
- KC6 Wake Group.
- KD6 Midway Islands.
- KE6 Johnston Island.
- KF6 Baker Island, Howland Island, Am. Phoenix Islands.
- KG6 Jarvis Island, Palmyra group.
- KH6 American Samoa.
- K7 Alaska (including Pribilof Islands).

It is understood that each prefix counts as a separate country for the DX Century Club.

Mullard American Equivalents

In addition to the "Amerty" range of receiving valve types which are similar to those of American design, Messrs. Mullard's Receiving Valve Department has now introduced a number of further equivalents in the UX series, types and prices being as follow:—

6C6, 6D6, 24A, 36, 39, 42, 43, 47, 77 and 78 are all 10s. 6d. each, types 25Z5 and 80 are 9s., and the 75 is 9s. 6d.

All these valves are directly interchangeable with their American counterparts and can be used for replacement purposes in any American receiver, or in low-power transmitters.

Readers' Smalls

We already have no less than 40 small advertisements on hand for the April issue, which means that something like 100 came in for this month. Readers will therefore understand that there may now be two months' delay with their insertions, as we cannot afford any more space for what is of course in effect a free service.

Electradix Bargains

We are glad to draw readers' attention to the latest Electradix list—a new and enlarged one—which catalogues an enormous quantity of high-grade apparatus of every description, both radio and electrical; in addition, they can always quote for anything not in the list, and specialised electrical equipment can be built to specification.

It would be impossible for us to attempt to describe even a small part of the selection available under the 23 sections into which the list is divided, covering in detail under sub-heads like Resistances, Meters, Condensers and Transformers, about everything one can think of in the way of bargain-priced gear.

Write Messrs. Electradix Radios, Electradix House, 218, Upper Thames Street, London, E.C.4 for your copy.

Learning Morse

We are informed by Messrs. Candler that owing to the large number of requests for their "Book of Facts" as recently advertised in the MAGAZINE, supplies of this publication are temporarily exhausted. A new issue is in the press, and copies will be sent to all inquirers as soon as possible.

The New B.T.S. "Trophy 8"

In talking about this receiver, we must preface our remarks by saying that when mentioning the set on p. 31 of the February issue, we inadvertently stated that it had no RF stage. Actually, the "Trophy 8" receiver has a separately tuned RF stage, effective on all bands.

The wave-range of 7-600 metres is selected by a five-point switch assembly, band spreading being mechanical and using the dial reviewed in a recent issue. The "hour" hand gives the frequency indication, the "minute" hand travelling over a 180-degree scale. Calibration is quite good, though of course not sufficiently accurate for frequency setting. What might be called the "minute hand spread" on each of the five amateur bands covered is approximately as follows: 1.7 Mc, 420 degrees; 3.5 Mc, 190 degrees; 7 Mc, 80 degrees; 14 Mc, 30 degrees and 28 Mc about the same.



The performance on 1.7 and 3.5 Mc is particularly good and on 28 Mc rather better than at least one much higher-priced American receiver we have tried. 14 Mc suffers through image interference, which is also present to a lesser degree on 7 Mc. The effect on 28 Mc is that amateur stations are brought out twice, there being no commercial interference to speak of as there are so few of the latter working in the region of ten metres. S/W broadcast is very well received and commercial telegraph stations can be heard at tremendous strength all round the dial.

● Controls

The various controls work smoothly and easily, there being plenty of latitude on both RF and LF gains; by using these two knobs judiciously, and having available a small aerial, it is possible to overcome background noise difficulties and signal interference which would be intolerable on an ordinary superhet. The BFO injection is very even from band to band and is just right for the average

signal; the pitch control on the BFO is most useful in that it can be adjusted to improve the apparent selectivity by altering the beat on an incoming signal, thus helping to pick it out of QRM. This is, in fact, the way the pitch control should be used.

A "send-receive" switch is fitted which cuts HT on the "send" position, the heaters being kept on, and so no time is lost on changing over. One of our tests on any receiver supplied with such a switch is to check for "stand-by creep" from band to band, i.e., on changing from "send" to "receive" it should not be necessary to search for the signal again or even to re-tune it. The "Trophy 8" came through this test in an entirely satisfactory manner, there being no creeping at the highest frequencies.

● Construction

B.T.S. receivers have always been well built—which means sensible layout and clean finish on a good solid chassis. The particular set under notice also meets these standards, and is housed in a neat, good-looking crackle-finish steel cabinet. The speaker is an extra, being built into a smaller cabinet similar in appearance, which can sit on top of the set. A 'phone jack is fitted and headphone reception is quite good, though an effective earth should be provided to minimise hum.

The receiver is entirely self-contained, all that is required to get it into operation being an AC power point, aerial and earth.

The B.T.S. "Trophy 8" is an excellent example of a good all-round receiver suitable for general listening and—within the limitations outlined here—for amateur band work. With a two-stage regenerative preselector (which could be home built for the purpose) it would compare favourably with any set not fitted with electrical band-spread—for it should be remembered that the price of the "Trophy 8" is only 12 guineas, the matching speaker in its cabinet being two guineas extra.

C.W.R. Notes

A MEETING of Group A regional controllers of the Civilian Wireless Reserve, Royal Air Force, was held at the Air Ministry on January 28, under the chairmanship of the Chief Instructor, Squadron-Leader H. W. St. John, D.F.C. In addition to the C.W.R. staff and the operating personnel on GJW and GFO—R.A.F. control stations for the C.W.R.—there were also present the representatives of the Amateur interests concerned.

Each controller gave a report on the progress of his group and many matters connected with the internal affairs of the C.W.R. were discussed, on which decisions were later taken by the Advisory Committee.

Though at this meeting the chairman indicated that all C.W.R. members would be expected to transfer to the R.A.F. Volunteer Reserve—which gave some present the impression that the C.W.R. as such would cease to exist—we have been given to understand that since the meeting the authorities propose that the C.W.R. training programme will continue eventually as a R.A.F.V.R. entity, and its active members should transfer to the Volunteer Reserve whenever or wherever possible. In effect, the Royal Air Force expects a steady infiltration of trained C.W.R. members into the Volunteer Reserve, though there is no question of compulsion involved.

The reports presented to the meeting by the various controllers showed that the C.W.R. organisation is in a healthy condition, that local training is well advanced in many areas, and that transmitting licensed members are being joined up in the organisation as rapidly as possible consistent with adequate instructional facilities being available. In this respect, the controllers and deputy controllers are doing useful work.

The Month's Club News

WE THANK the secretaries and publicity correspondents of 34 clubs for passing us their material by the 15th, also for one or two second letters dealing with later news, which we have tried to incorporate. It will be seen that more societies than ever are availing themselves of these pages and consequently it is becoming increasingly difficult to give space to all. We shall however continue to do our best, but when so many separate reports have to be written into two pages, briefness will be understood.

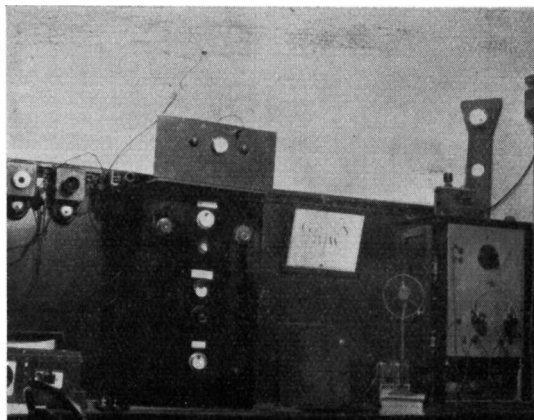
The above is in no way meant to discourage even more club news—please keep us posted with all you have, leaving the problem of presentation to be solved by us.

● North

Thirty-five ASHTON-UNDER-LYNE amateurs turned up to learn something about the manufacture of meters when Messrs. Ferranti, Ltd. provided the speaker. A series of talks has been arranged on SW radio fundamentals for the beginner. Ex-G2KN is now G4AW; another change affects 2CDY, who has the old-timer-sounding call of G6DV.

The efficient-looking station shown here belongs to BOLTON Y.M.C.A. Radio Club. The radio room

is open at all times, but Friday is the meeting night. The transmitter (G8WY) is being modified for tri-tet operation and will shortly be heard on 20 metres. G3AC is lecturing on aeri-als, to be followed by a



talk on cathode-ray tubes by C. Holt. Morse is being taught.

Continuing the second instalment of BRADFORD SW Club's efforts to assist in the MAGAZINE 1.7 Mc Tests, here are the brief stark facts: Six members gathered at midnight prior to the first day's test, and after expressing satisfaction with the arrangements, these stalwarts decided to take a light nap. The dreams of WAC during the first ten minutes of "Europe calls" must have been very real, for it was not until 5.45 (75 minutes late) that they came round. A call was hurriedly put out, during which it was discovered that something was wrong; by the time a faulty condenser was located two valves and several resistances were beyond use. The previous night G2SU had given members a talk on aerial couplers—"Fuses" might have been a more appropriate title! It was very bad luck.

The Royal Naval Wireless Reserve as a voluntary service is preferred by the majority of DONCASTER members, consequently Morse tuition is a regular feature. 2AMT has joined this society and 2FJO passes to a two-letter call. A sale of gear is contemplated to improve the general financial situation.

Scottish news is confined this month to a proposed club for the west, where GM3PB and 2FSD of KILMARNOCK appeal for support in an effort later to be developed on broad lines. May the former's letter-box at 7, West George Street, rattle busily for a few days!

It appears that LINCOLN and District SW Society is not too happy in the matter of attendance. With 10 AA's, 6 G's, a receiving contest in the offing, Morse practice available and thoughts of applying for a club licence, this should not be so. Better news next month, we hope.

An old friend in D. H. Tomlin tells us that SHEFFIELD SW Club are going strong, most of the members being keen for transmitting experience. To cater for this trend appropriate lectures are now regular events.

SOUTHPORT Amateur Transmitters' Association has a fair share of the frequencies available to the amateur. 1.7 Mc has not yielded its full quota of DX, nevertheless G5KX hopes for southern reports, which will be acknowledged; 28 Mc was the band used for an interesting QSO between G2IN and G8TD via WIBBX, and similar endeavours are scheduled for future Sundays; G2IN and G5ZI are waiting for co-operation on 56 Mc and wonder if Newport is too far away! During a discussion last month these two members stood by the superhet in opposition to G6YR and G8QG, who are TRF supporters. G6YR has worked 100 countries, while 2DAU reports having "worked" the GPO for a full call.

● Midland

The next report might easily fill our two pages, but as BIRMINGHAM's Midland Amateur Radio Society, one of the best organised clubs in the country, generously refrains from submitting individual reports of its 120 members (75 per cent. on the air) we breathe again! Messrs. Voigt Patents, Ltd. (loudspeakers) will provide a lecture on the 14th, when all interested readers are invited. £8 was raised at a junk sale for the Hospital Radio Fund.

CANNOCK and District Amateur Radio send welcome thoughts of coming field days—it will be interesting to see if others beat them to it, for 1939 promises much activity in this direction. G5BJ and G2LB have discussed at a recent meeting the

design and construction of a communication receiver. 1.7 Mc has support in this part of Staffordshire.

As yet we have no further news of N. Staffs. Amateur Radio Society's transmitter, but for listening interest STOKE-ON-TRENT win. H. Owen of "DX Corner" fame is a member, though at present he is worried about not hearing W6, 7 and VK on 160 metres! Will any amateur with a bent for stargazing please co-operate for observations on sun-spot phenomena?

● West

G8BK has recently demonstrated the Hallcrafters "Sky Champion" to GLOUCESTER Radio Club. This member has heard television sound at 96 miles.

87, Marlborough Road, SWINDON is the scene of encouraging meetings of a comparatively new club, which may now be regarded as permanent. Local records are being made, as G3JO with less than 10 watts (CO/FD) received 579x from VK; G3HS, also using 14 Mc QRP, records his first W/VE QSO's. Wisely, the 1.7 Mc band is used for local work.

New Year's Day was the turning point for the TONYREFAIL and District Radio Society, for since the hamfest at GW3CR on that day good progress has been made. The roll shows an upward curve with four full calls and three AAs. There is to be no easing off, for they realise that the time is ripe for wider activities.

● South

Using a 240B CO/MOD a member of BRIGHTON Branch WFSRA exhibited his gear and received encouraging criticism, using a GPO carbon microphone. The club's PA stage is nearing completion.

We hear quite a lot about feeders for the amateur aerial, but EASTBOURNE members have been privileged to learn from Dr. W. E. Smith about HF cables as used commercially. After his demonstration a sample of cable designed for 45 Kw transmitters was shown, and co-axials were also dealt with in detail.

Representing Devon, the EXETER Society have heard at their last two meetings a G.E.C. lecturer explaining the calculations for and suitability of various SW aerials; also material on "USW Communication Links." An outside attraction consisted of a visit to the local telephone exchange.

The SUSSEX SW and Television Club have arranged fortnightly Morse classes (March 9 is the next), also a series of cathode-ray lectures (March 28 and April 11). On Feb. 24, F. C. Charman, G6CJ, the well-known experimenter, addressed members on "Aerials from the Amateur Standpoint"; G. Marcuse, G2NM, famous among old timers, was in the chair. This club is lucky in being able to call on such support.

"Have you heard" WEYMOUTH's G8WQ? If so, then operators G5XR, 2XQ, 2YJ, 2TZ, 5MU, 4DA, 3ZL or 2DGB will verify and be glad to do it—1.7, 7 or 14 Mc 'phone or CW, 15 Hope Street. The two members mentioned last month have passed the test and others are following. Thanks for the card, too.

● London and Home Counties

A full programme has been fixed by the new officers of BRENTWOOD and District Radio

Society, which meets at G8KM on alternate Thursdays. Reports are asked for on the society's 160-metre 6L6 CO/6L6G MOD (1306 kc). Our QSL album gets a further card; thanks, 2CYW.

A change in the Surrey Contact Club's meeting place has proved necessary, due to increased numbers. The next meeting (14th) will be at 74 George Street, CROYDON, where subsequently the meetings will take place on the first Tuesday in the month. Mr. Grinstead showed members last month how The Mullard Valve Co. were tackling the problem of valve manufacture along competitive lines. HF technique is receiving close attention, as also is the question of competing with the imported product.

Another AA of DEPTFORD Men's Institute SW Radio Club has a full licence—G4DC, he being the sixth. There have been hitches with recent lectures, but it is hoped to bring these forward now that illness is past. 2CMK is all out for the GPO test.

Mote Mount (just off the Barnet By-pass) is the site for EDGWARE SW Society's part in a coming field event. Discussions are proceeding regarding this and G2QY, 3HT, 6PM and 6ZO are to be closely concerned. Messrs. Hamrad and Webbs have both given demonstrations during February. G2AI is speaking on aerials and an exhibition of members' apparatus follows.

Westinghouse metal rectifiers were explained to GRAVESEND Amateur Radio last month, and all SW-minded local readers are invited to help swell the ranks.

Will anyone interested in the formation of a short-wave society in the HARROW district please get in touch with 2FRC, 52 Nibthwaite Road, Harrow.

Enthusiasm is at a high level if the allocation of call-signs to KINGS LANGLEY and District amateurs is any indication. 2FRH is a newcomer who travels from Tring. 2DFT is now G5BB. G3NR and G3PV have been testing low-power 7 Mc ground-waves. G3MI now explores 1.7 Mc. 2FFR has tried his hand at bug key construction. G8TK QSOs 7 Mc W's. G3PV is looking forward to portable tests and hopes for outside help. "West Herts used to be known as a dead spot in Amateur Radio!" says our correspondent.

G5XB is designing MAIDSTONE's eight-valve communication superhet, and new transmitter and work benches are under construction. The March programme is full: 7th, Voigt loud-speakers; 14th, G2UJ continues his "56 Mc Operation" lecture; 21st, Films; 27th, Practical Evening; 29th, all Kent readers are to be made welcome at 244 Upper Fant Road at 7 p.m. on this day for a social "Ham Evening"; prominent amateurs are to speak, and free refreshment will be provided. Previous application for a ticket is the only stipulation.

The next meeting of NEW MALDEN Radio Society is March 6. The February event was a demonstration of the Voigt loudspeaker.

G2VO of Yorkshire, while in London on business, has been interested in PECKHAM SW Club's equipment and members hope he will find time to address them. The club transmitter now has a home-made transverse-current microphone that produces good quality speech.

The AGM of ROMFORD resulted in a re-election of the retiring officials and admission of 2DVA to membership. Entertaining and instructive was a

debate by two members, when one asked the other questions such as might occur to a novice. Messrs. Hivac, Marconi, Tungram and Vacuum Scientific Products have promised lectures in the coming months.

A receiver is to be built by SLOUGH SW Club, as a start towards gear for a proposed AA licence. 2FAU has dealt with oscillators in a talk. Morse practice is run at each alternate Thursday meeting.

Measuring and testing instruments for amateur use were demonstrated by G5KH at SOUTHALL Radio Society's February gathering. The range of apparatus was extensive and included cathode-ray equipment, all of which he covered fully in a very capable manner.

Better news from WILLESDEN this month. As soon as a few more people are willing to join larger premises will be taken; in the meantime 86, Dibden House, W.9, at 8 p.m. Wednesdays, is the temporary arrangement.

—S. W. C.

Addresses of Secretaries of Clubs reported in the above notes.

- ASHTON-UNDER-LYNE—K. Gooding, G3PM, 7, Broadbent Avenue, Ashton-under-Lyne.
- BIRMINGHAM—F. E. Barlow, 2FKU, "Draheford," Poolhead Lane, Wood End, Tanworth-in-Arden, Worcs.
- BOLTON—N. D. Whitehead, 125, Deansgate, Bolton.
- BRADFORD—G. Walker, 2AWR, 33 Napier Road, Thornbury, Bradford.
- BRENTWOOD—B. A. Pettit, G3VD, The Laurels, Worrin Road, Shenfield, Essex.
- BRIGHTON—F. R. Jupp, 2FAD, 35 Brading Road, Brighton, Sussex.
- CANNOCK—D. M. Whitehouse, G2YV, Trumwyn, Cannock.
- CROYDON—A. B. Willsher, 14 Eytton Gardens, Wallington, Surrey.
- DEPTFORD—G. Edwards, G2UX, 14a, Louisville Road, Upper Tooting, S.W.17.
- DONCASTER—A. Dickinson, 2FJO, 111 Sprotboro Road, Doncaster, Yorks.
- EASTBOURNE—T. G. R. Dowsett, 48 Grove Road, Eastbourne, Sussex.
- EDGWARE—F. Bell, 2DQQ, 118 Colin Crescent, Edgware, Middlesex.
- EXETER—W. J. Ching, 9 Sivell Place, Heavitree, Exeter.
- GLOUCESTER—G. G. E. Lewis, 30 Kitchener Avenue, Gloucester.
- GRAVESEND—R. S. Martin, G2IZ, 41 Mayfield Road, Gravesend.
- KILMARNOCK—GM3PB, 7, West George Street, Kilmarnock, Kings Langley, Herts.
- LINCOLN—S. M. Gambles, 2DHG, 1 Lindum Ter., Lincoln.
- MAIDSTONE—P. M. S. Hedgeland, 2DBA, "Hill View," 8 Hayle Road, Maidstone, Kent.
- NEW MALDEN—J. D. Kingston, G3VK, 51 High Drive, New Malden, Surrey.
- PECKHAM—I. J. Orange, 11 Grenards Road, Peckham, S.E.15.
- ROMFORD—Rowland C. E. Beardow, G3FT, 3 Geneva Gardens, Chadwell Heath, Essex.
- SHEFFIELD—D. H. Tomlin, 32 Moorsyde Avenue, Walkley, Sheffield, 10.
- SLOUGH—R. Sly, 16 Buckland Avenue, Slough.
- SOUTHALL—H. F. Reeve, 26 Green Drive, Southall.
- SOUTHPORT—R. Rogers, G6YR, 21 Chester Avenue, Southport.
- STOKE-ON-TRENT—P. Weaver, 626 London Road, Oakhill, Stoke-on-Trent.
- SUSSEX—E. C. Cosh, Anslyn, Mill Road, Angmering; C. J. Rockall, G2ZV, Aubretia, Seafield Road, Rustington.
- SWINDON—D. T. Boffin, G3HS, Lindsey House, Coxwell Street, Faringdon, Berks.
- TONYREFAIL—E. Powell, GW3QB, 44 Pritchard Street, Tonyrefail, Glam.
- WEYMOUTH—E. Kestin, 55 St. Mary Street, Weymouth.
- WILLESDEN—G. H. Talbot, 2FTD, 5 Linden Avenue, Kensal Rise, N.W.10.

**SEND FOR NEW 1939 LISTS OF
S.W.R. SPECIALITIES**

RACKS & PANELS, CONDENSERS,
TRANSFORMERS, MICROPHONES,
CRYSTALS, TAYLOR TUBES and
everything for the TRANSMITTER
at the RIGHT PRICE.

SHORT WAVE RADIO, LTD.
97 PARK LANE, LEEDS, 1. Tel. 24689.

Authorised Stockists of

Hallicrafter Receivers

- SUPER SKY RIDER £32.
- CHALLENGER SX18 £25.
- SKY CHAMPION £15 15 0.

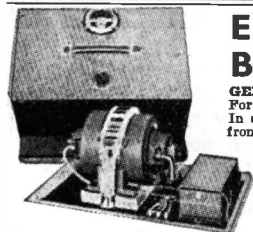
All Eddystone Components in Stock

including the latest

Eddystone Communication Receiver

- Type E.C.R. £45.

H.P. Terms available.



**ELECTRADIX
BARGAINS**

GENUINE E.D.C. ROTARY CONVERTERS.
For A.C. Receivers on D.G. 230 v. A.C. output.
In silence cabinet, with filter. All sizes in stock
from 50 watts to sets for televisions of 450 watts.

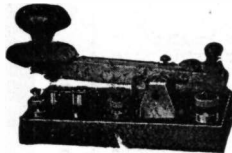
D.C. MAINS MOTOR GENERATORS.
D.C./D.C. 220 v. to 30 v. 10 amps. £7/10/-.
M.G. Crompton, D.C./D.C. 100 volts to 17
volts 6 amps. £4/7/6. 200 v. to 16 v. 5
amps. £5. Estro M.G. ditto to 6 volts
½ amp. 45/-. Motor Generators for all
outputs up to 60 amps.

MOTORS FOR A.C. MAINS. Midget 220 volts, 10/6. 1/60 H.P. with pulley,
Type 50, 1,500 revs., 18/6. Enco. Induction 1/10 H.P. Motors, 2,500 revs., 35/-.
Self-starting ½ H.P. 1,425 revs., 55/-, etc., etc. D.C. Mains Motors, 1/40 H.P.
110 v., 12/6; 220 v. series Type K.B., 1,750 revs., 15/-. Ditto, G.E.C., 230 v., 2,000
revs., 16/-. Croydon 1/12 H.P., 110 v., 18/-; 220 v. shunt, 1,700 revs., 22/6.

SPARE COILS. For Test Work. ½ in., ¾ in., and 1 in. gap, sq. type, for 6-volt
battery, 10/6.

RELAYS. Single Pole Change Over Relays. No. 5 type 309s, 80 or 450 ohms,
polarised, S.P.C.O. 3 blade, 2 volts, 20 m.a., 7/6. G.P.O. Sounder Type Relays on
mahogany base, with double heavy contacts for transmitting, coil resistance 20 ohms,
or 200 ohms., 15/-.

L.A.B. GALVANOMETERS. Vertical Ballistic with mirror on coil, quite new, by
Tinsley, 30/-. Silvertown, horizontal 3½ in. Galvos., 7/6. Vertical telegraph type
Central Zero Scale, 4/6. Instrument leads with spade ends 6d. pair.



**TRANSMITTERS, MORSE AND SIGNAL
KEYS.** Royal Air Force model, balanced
action, all solid brass bar, tungsten contacts
indicator Type KBBL, a guinea key for 7/6.
Other keys from 4/6 to 30/-. Learner's outfit
complete, 4/6. Ask for special illustrated Key
List, "K.W." Send 1jd. stamp.

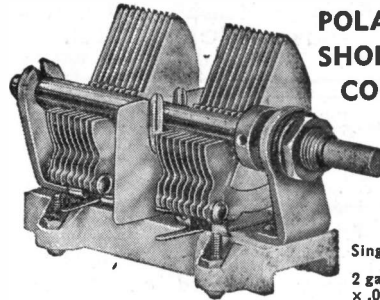
PORTABLE FIELD TELEPHONES.—Army Type, in pigskin case, for speech,
key for code. No. X135, half price, 30/-; or two with 1 mile D2 unbreakable war
cable, £5.

If unable to call, send for Bargain List "S.W." for March.
16 illustrated pages, or write stating your wants

ELECTRADIX RADIOS
218, UPPER THAMES STREET, LONDON, E.C.4

Telephone: Central 4611

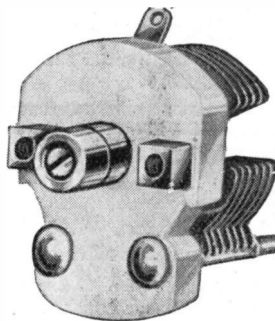
POLAR
**SHORT-WAVE
COMPONENTS**



**POLAR TYPE "E"
SHORT — WAVE
CONDENSERS**

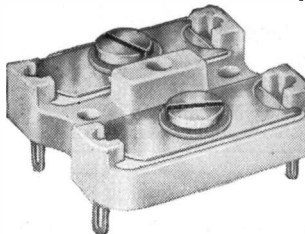
Soldered brass vanes
mounted on
"Steatite" base.
Available for base-
board or panel
mounting.

- Single (.00016) **5/-**
- 2 gang (.00016
x .00016) - **10/6**



**AIR-DIELECTRIC
TRIMMER
CONDENSER**

- | | | |
|---------------|--------------------------|--------------|
| Ceramic base. | Soldered
brass vanes. | |
| 25 mmfd. max. | ... | } 4/- |
| 50 " " | ... | |
| 75 " " | ... | |
| 100 " " | ... | |



**POLAR
MICA-DIELECTRIC
TWO-GANG
TRIMMER**

- | | | |
|-----------------------|----------------------------------|--------------|
| Ceramic base. | Brass vanes. | |
| Capacity variation: — | | |
| 30-100 mmfd. | } Price
(all capa-
cities) | } 2/- |
| 60-200 " " | | |
| 90-400 " " | | |
| 150-550 " " | | |
| 250-650 " " | | |

Send for fully illustrated catalogue of Polar
and N.S.F. Components.

WINGROVE & ROGERS LTD.

12, DARTMOUTH STREET,
LONDON, S.W.1.

POLAR WORKS - OLD SWAN - LIVERPOOL.



BAND SWITCHED TRANSMITTERS

	AC MAINS	10 or 25 WATTS	
6L6-T20	CW or Phone; Plate Modulation; Tuning Meter; 160/80, 80/40 or 40/20 Mounted Microphone; ... Crystal & Holder		£14 14 0
	CW only		£9 0 0
6L6	160/80, 80/40 or 40/20 CW only		£5 10 0
	160, 80, 40 or 20 and CWR or RNVR Band CW only		£5 15 0
	Two Crystals and Holders required, each		15 6

Free Particulars of above and other transmitting components from

CENTRAL RADIO & TELEVISION LTD.

70, OTLEY DRIVE, ILFORD, ESSEX.

2FKN, Member CWR.

Phone VAL 3891.

FOX 15T**PHONE & C.W. TRANSMITTER**

10-15 Watts RF. Output, Plate Modulation, Self-contained Power Pack, 4 Valves

Price **£10**

Complete with 7 and 14 Mc Coils, Mounted Crystal, Microphone Mounted on Stand.

WRITE FOR ILLUSTRATED LITERATURE DESCRIBING THIS AND OTHER FOX PRODUCTS

To G6JQ,

FOX RADIO COMPANY,
THRUSSINGTON - LEICESTER
PHONE, REARSBY 266.

HAM SHORT-WAVE SUPPLIES.

(Peter Bradley, G8KZ)

348, Portobello Road, Kensington, W.10
Ladbroke Grove UND. Bus 15 or 52.

Try me for immediate delivery of HAMRAD lines.
I am the Sole Stockist for N. and W. London.

Agent for Hallicrafters, Meissner, National, Telconax, Eddystone, Raytheon, Gammatron, Hytron, Bulgin, Dubilier, T.C.C., and other well-known Ham requirements.

PERSONAL and PROMPT ATTENTION, ALWAYS.

Phone LADBROKE 3143 or
Write for my latest lists

Your Newsagent can supply all Back Issues as follows: Vol. 1, Nos. 1—12, 1/- each. Vol. 2, Nos. 1—6, 9d. each. No. 7 to date, 6d. each. Add 1d. each copy for postage if applying direct to the Back Number Dept., The Short-Wave Magazine, Ltd., 84-86 Tabernacle Street, London, E.C.2.



Make certain that your QSL and SWL Cards are correctly mailed.

The RADIO AMATEUR CALL BOOK is essential to "hams" and to owners of all-wave sets. It is the only radio callbook published that lists all radio amateur stations throughout the entire world. Also contains a World map showing international radio prefixes, High frequency press, time and weather schedules, etc., the "Q" and "RST" codes.

DECEMBER ISSUE NOW ON SALE. Price 6/- per copy post free. List of other books on "ham" radio free on request.

G5KA (Dept. SM.3) 41 Kinfauns Road, Goodmayes, Ilford, Essex.

SPECIAL CLEARANCE SALE OF AUTOMATIC MORSE CODE SENDERS

C.V. Patent. No practice or preparation is necessary for anyone—even a child—to send immediately in any order perfect Morse signals at speeds from 5–30w.p.m. Will operate buzzer oscillator or transmitter, 41 characters. International code. Fitted with high grade buzzer and key for alternative manual sending. Indispensable to those learning the Code.



INSTRUMENT COMPLETE 7/6. Post 9d.

MIDLAND INSTRUMENT CO.,
75, GROSVENOR ROAD, BIRMINGHAM, 17

DENCO**TROLITUL INSULATION**

The ideal insulator for S.W. use—extremely low loss, yet easily worked with ordinary tools.

Sheet— $\frac{1}{8}$ ", 1d.; $\frac{1}{4}$ ", 1½d., per square inch.
Rod— $\frac{1}{4}$ ", ¾d.; $\frac{3}{8}$ ", 1½d.; $\frac{1}{2}$ ", 3d., per inch.
Tube— $\frac{3}{8}$ ", 1", 1½"; 2½" (prices not fixed at Press time).

Send ½d. stamp for lists on

TROLITUL and LOW LOSS COMPONENTS.
234 BURRS ROAD, CLACTON, ESSEX.

Tel.: 770.

H • A • C	<p>The "H.A.C." one-valve Short-Wave receiver, famous for over 5 years and used by many ham transmitters for their sole receiver,—has now been brought completely up-to-date and can be purchased in kit form. No soldering or other experience is necessary, and the completed receiver provides powerful world-wide reception with a really silent back-ground. The complete kit of quality precision S.W. components, accessories, and full instructions</p> <p>★ COSTS ONLY 12/6. (post 6d.) ★</p> <p>Descriptive folder giving full information, logs, testimonials, etc., gladly SENT FREE ON REQUEST. Sole distributors:—A. L. Bacchus, 109, Hartington Rd., London, S.W.8.</p>	H • A • C

CLASSIFIED ADVERTISEMENTS

2d. per word, minimum 3s. All advertisements must be prepaid. Cheques and postal orders to be made payable to "The Short-Wave Magazine, Ltd."

QSL CARDS, PRINT, ETC.

G6MN, THE OLD TIMER, for SWL, BRS, A.A., QSLs. Also Log Books. Samples from G6MN, Workshop.

QSL's FROM 4s. 6d. 250. Samples Free. Satisfaction guaranteed.—ATKINSON BROS., Printers, ELLAND.

HAVE YOUR FOTO on your QSL-SWL Cards. Postage stamp stick-on fotos, 4s. per 100. Shack fotos, 3½-in. x 2-in. 5s. per 100. Send stamp for sample.—G. BAYNES, 1, Upper Dane Road, Margate, Kent.

SITUATIONS VACANT & TUITION

"ENGINEER'S GUIDE TO SUCCESS" shows how to qualify in Television, Sound Recording, Radio Engineering and Servicing, Wireless Communications, etc., by studying at home with The T.I.G.B. Write to-day for this Great Guide—FREE—which contains the world's widest choice of engineering courses—over 200—and alone gives the Regulations for Qualifications such as A.M.I.E.E., A.M.I.R.E., A.M.I.T.E., A.M.I.W.T., C. and G., etc. The T.I.G.B. Guarantees Training until Successful.—THE TECHNOLOGICAL INSTITUTE OF GREAT BRITAIN, 105, Temple Bar House, London, E.C.4. (Founded 1917. 20,000 Successes).

BOOKS, CATALOGUES, ETC.

Ghirardi's "World Time Indicator," 2s. 8d. Free Catalogue of Service Accessories, Books, Valves.—HOLIDAY & HEMMERDINGER, LTD., 74-78, Hardman Street, Manchester, 3.

REPAIRS & CONSTRUCTION

Loud Speaker, Transformer and Choke REPAIRS. 24-Hour Service. SINCLAIR SPEAKERS.—Alma Grove, Copenhagen Street, London, N.1. Ter. 4355.

I CAN HELP YOU. New Construction Service. Components catalogue free.—2ATV, 86, Dibdin House, Maida Vale, W.9.

RECEIVERS AND COMPONENTS

3,000 SPEAKERS from 5s. 6d. each, P.M. and energised 4-in. to 14-in. including several Epoch 18-in.—SINCLAIR SPEAKERS, Alma Grove, Copenhagen Street, N.1.

VARIABLE DIRECTIONAL AERIALS.—See p. 31 February Issue S.-W.M. 1½d. stamp for details.—A. W. MANN, 62, Costa Street, Middlesbrough.

SECOND-HAND BVA VALVES, all types 75% below list. Brand new BVA valves, bankrupt stock, 33¼% below list. Brand new D104 and AC head amplifier, complete for £6.—G5MK, 69, Allerton Grange Way, Leeds, 7.

HAMRAD AGENTS.—Prompt Post Service. Send for list.—G5GJ, 51, King Street, Thorne (New premises); G3LS, East View Terrace, Seaton Carew, West Hartlepool.

TRANSMITTING RACKS AND CHASSIS complete with panels in any metal and finish to your own requirements. Keenest prices and prompt service. THE UNIVERSAL PRODUCTIONS, Rigby Lane, Bromsgrove, Worcs.

NOW IS THE TIME

to bind Volume II. The SHORT-WAVE MAGAZINE SELF-BINDING CASE will preserve the 12 issues and also be an asset to your bookshelf. Obtainable from 84-86 Tabernacle Street, London, E.C.2. The price is 3/6 (by post 4/-).

GW3GL ————— EVERYTHING IN RADIO FOR THE AMATEUR

I SPECIALISE IN SUPPLYING COMPONENTS FOR SHORT-WAVE WORK.

Call or send me your enquiries. Large stocks carried. Orders by post promptly attended to.

Sole North Wales Agent to Hamrad Wholesale.

THE APIARY, CONWAY, N. WALES

TRANSFORMERS.

Send us that burnt-out Transformer to be altered or re-wound with the same materials and skill that have made WODEN Transformers World famous.

CATALOGUES FREE ON REQUEST.

WODEN TRANSFORMER COMPANY,
ST. JOHN'S SQUARE, WOLVERHAMPTON.

WELLWORTH

STOCKISTS FOR:— EDDYSTONE, VARLEY, B.T.S. (Trophy Receivers), BULGIN, BRYCE, HEAYBERD, T.C.C., DUBILIER, PEAK.

HIVAC, AVO, ROLA, CENTRALAB, W. & B., ERICSSON, SIGNAL (KEYS) and many others. Send us YOUR Requirements.

8. WITHY GROVE,
MANCHESTER. 4.

Telephone: BLA. 1557.

READERS'

SMALL

ADVERTISEMENTS

FOR SALE, new 4v SW Battery Superhet (Chassis), adj. req. new valves and first-class SW comps. 40s.—Apply BSWL 1083, 19 Astley Road, Birmingham, 21.

MAGNAVOX emerg. speaker 10-in, 1250 ohm; Amplion PM speaker; Armstrong 7v AW 1937 chassis compl.; all cheap.—67, Kingsmill Drive, Kenton, Middx.

PHILIPS DC Eliminator, 135v, heavily smoothed 8s. 6d.; Sm. Choke and 4x4 mF Cond (for Rx), 5s., carr. pd.; 465 kc Transf. 2s.—2DJO, 4 Hill St., Aberdeen.

1938 ALL-WAVE H.M.V. sup-het 6 valve, cost 12½ gns., take 6 gns.—L. Linney "Orlando," Upper Hale Road, Farnham, Surrey.

SALE, 2 SW Rx's, 1 b'spread 1-v-1, 35s.; 1 Eddystone "Everyman 4," 45s.; both complete valves, coil.—70, Scotch Street, Armagh, N. Ireland.

WHAT OFFERS? 6v and 12v vibrators, cost £1; also transformers condensers, valves, etc.; Cheap.—A. Nicholas, 141, Kingsley Road, Hounslow, Middx.

FOR Sale, "Complete Electrical Engineering," 48 parts and data sheets, £2 10s. or nearest.—S. Russell, The Green, Long Itchington, nr. Rugby.

SALE or Exchange for SW components; August 1937 to Sept. 1938 of "The Motor," complete. Offers?—E. W. J. Wood, 73 Eton Road, Ilford, Essex.

SURPLUS: 56 Mc RX (HF-Det-IF), £2; Car Trans/RX; Telesc. Aerial, Meter, £3; RK20 and Fil Tr., 30s.—G5UK, 19 Meadway, Westcliff-on-Sea.

5-METRE push-pull self-excited TX, complete with battery-operated tubes. The TX with a story! 10s.—G5KA, Goodmayes, Ilford, Essex.

"SHORT-WAVE Magazines" wanted, Vol. 1, Nos. 1-12, in good cond., write stating price.—T. Knight, Jr., Caxton House, High Street, Hoddesdon Herts.

FERRANTI AC Eliminator type E.I., output 200 v, 1½ mA, 30s.; Ferranti AF5 transformer 6s. 6d.—6, Gresty Terrace, Crewe.

NINE 1F Transf., 5 Tuning, 6 Reactn. Cons., 1 3-Gang Cond., Valve Holders and Coils, value £3, take £1 lot or sep. 2FNU, 38 Wellington St., Gloucester.

LOTUS Remote Control Loudspr. Relay for 4 rooms, value 45s.; also Varley Constant Square Peak Coil, 15s.; swap for SW recvr.—Davis, 14 Stuart St. Merthyr.

MAZDA LZIDD, 3s. 6d.; Hivac VP215, new, 5s.; two Formo SW Coils 15-52 m., with base, 3s. 6d.—Apply BSWL1083, 19 Astley Road, Birmingham, 21.

WODEN (Webbs) HT Transformer, 450-0-450v., 150 mA. Cash or exchange Modulation Transformers. Offers?—2AAS, The Wong, Horncastle, Lincs.

RME69 and RME Speaker little used, as new, £30, or nearest; Hallicrafters Sky Chief 6 months' use, £3.—2 Cliff Road Gardens, Leeds, 6.

MULLARD PZI-35 with base, cost £5 5s.; yours for £1 10s.; guaranteed new and unused.—G5KA, Goodmayes, Ilford, Essex.

5-METRE 3-tube super regen.; commercially built; all Eddystone compts., nearest to £3.—G5KA, Goodmayes, Ilford, Essex.

BENJAMIN "B" Uni. Output Choke and Ben "B" Trans. What offers? or exchange.—A. G. Goble, 53 Aldworth Road, Stratford, E.15.

- 1 Advertisements must be accompanied by 6d. in stamps or P.O. made payable to "The Short-Wave Magazine, Ltd." and crossed.
- 2 A maximum of four lines only will be allowed, including name and address.
- 3 Trade and Box Number advertisements cannot be accepted.
- 4 We reserve the right to refuse any advertisement.
- 5 We cannot act as an intermediary for an advertiser in this section.
- 6 Advertisements must reach this office not later than the 15th of the month preceding the month of issue.

VALVES! 36E, D2105W, 4s.; 210HF, L210, PM2A, S215, 1s. 6d.; Mi4, FC13, 2s.; M54B, 2. 6d.—BSWL89, 42 Cranbourne Road, Salt Hill, Slough, Bucks.

2 AC/P, MH, 53, 2 P625, 220VSG, all 3s. 6d. ea. New P610's 1s. PM12A, PM22A, 5s. E'stone 4v cab. 10s.—Wilson, 511 Cambusnethan, Wishaw, Lanarks.

SALE.—Battery, 3-tube 'Phone TX, less xtal; 1 to 4v. RX Kit, incl. Pickup, Mike, Spkr., DC Elim., £3 10s. lot.—3, Hingeston Street, Birmingham, 18.

CLEARANCE of Surplus Gear. For Bargain List send stamp to:—GM61W, Park, High Blantyre, Lanarkshire.

100-WATT Push-pull Final with-Valves & Fil xfmr, grid & tank Coils for 10, 20, 40m; 1,000v supply. £5.—GM30L, Westland, Pleasance Av., Dumfries, Scotland.

SELL.—2-Gang Condr. (Ex-Trimmers), Sol. Dielec. Reac. Cond. (750 mmF), Dual Coil (screened), Pot. (20000 ohms). Offers?—I. B., 85, Jeanfield Rd., Perth.

FOR SALE.—All-World-Two, adapted for 10 metres, 20 and 40-Metre Coils, as good as new, £3, or nearest offer.—Ricketts, 16 Cromwell Road, Yeovil.

MULLARD PM12, 5s. 6d., Triotron P225 3s., Triotron ZD2 2s., or 10s. the lot.—2BKL, 65 Headroomgate Road, St. Annes-on-Sea, Lancs.

G.P.O. Sounder for Sale, cost 17s. 6d., also 45 consecutive "Practical Wireless" magazines (1938).—Crawford, 6 Alice Street, Stockton Road, Sunderland.

"S.W.M." Class B One-Valver with Valve and 2 Coils., 30s. or nearest.—G. Brownlow, 135 Kneller Road, Whitton, Middx.

VALVES.—41MXP, 3s.; ACO44, 3s.; 210SPT, 2s. 6d.; 210VPT, 2s. 6d.; PT2, 2s.; PP220, 2s.; PM1F, 1s. 3d.; PM2, 1s. 6d.—G2LF, 2 Harbord Rd, Sheffield, 9.

TX.—Class B Battery, complete with Crystal, Mike and Key ('phone and CW), also parcel of parts, 30s.—L. Gear, 2DKO, 18 The Downs, Wimbleton, SW20.

TRANS., 500-0-500, 150 mA, 4 4-v. LTs, all CT 15s.; Hi-Q Rotary coil unit, 8s.; 0-100 mA meter, 5s.—L. Linney, "Orlando," Upper Hale Rd, Farnham, Surrey.

Two, 0-100 Milliameters (MC), 9s. each; Battery Valve Emission Tester, Bulgin, 10s.; Mains Gear, TX Parts; state wants.—G3AO, Sale, Manchester.

SALE or Swap.—Epoch Cinema Speaker, SC 15 ohm, handle 20 watts, 6 v. field. What offers?—C. J. Guscott, 523 Lincoln Road, Peterborough.

CALLBOOK, Fall 1937, 3s. or offers.—D. Gray, Culvers Close, Winchester, Hants.

MORSE Recorder Wanted; cash or exchange.—Orton, 71 Market Street, Ashby-de-la-Zouch.

SELL, Bug Key, perfect condition, 15s.—Write or call, Timbers (G5TR), 10 Faramatta Street, Rawtenstall, Lancs.

9-VALVE AC Com. Super, 5-100 m., switched, BFO, bandsread, sale £10 or swap for TX.—2AJN, "Mauville," Linksfield Road, Ipswich, Suffolk.

Wanted.—Eddystone Cab. (1034), Browns or Ericsson 4000 ohm 'phones, TX Gear (battery); exch. BC parts or buy.—2FNU, 38 Wellington St., Gloucester.

WANTED.—7 Mc Xtal and Holder, cheap.—A. G. Goble, 53 Aldworth Road, Stratford, E.15.

JANETTE Rotary Converter, 110 watts, 230 DC in, 230 AC out, completely overhauled, £3 10s.—G5KA, Goodmayes.

BARGAINS! headphones 2s., LF transf. 1s., microphone 4s.; Wanted, Mains 2-stage pre-sel. and a p-pack.—42 Cranbourne Rd., Salt Hill, Slough, Bucks.

METER Wanted (flush only), Xntr. Rack, Panel, Mod. Mainz Transf., Power Pack.—State lowest price, 2ARL, 3 Devonshire Road, Morecambe.

ULTRA-VIOLET and Infra-Red Ray Lamp, 240c. AC, one month old, cost 60s., bargain 37s. 6d.—2BCX, 8 Harton Avenue, Gorton, Manchester, 18.

HEAYBERD DC Eliminator, 2 va. taps, 1 fixed, 15, 25, 50 mA; cost 55s., accept 17s. 6d., brand new.—27 Mortimer Lane, Basingstoke, Hants.

Q.C.C. 7280 kc Xtal, Encl. Holder and Base, 10s.; Telev. ant. with reflect., mtchg. stub for 72-ohm line, £1.—Clarke, 9 Northwood Road, Tankerton, Kent.

0-60 MI mA Meter, 5s.; new BEPU Class B, 4s. 6d.; 2-valve RX, fones, etc., 40s.—Wilson, 511 Cambusnethan; Wishaw, Lanarks.

LISSEN Bandsread 3, complete, 30s. Wanted, Sky Buddy, Premier 5v5 or similar RX.—2BKL, 65 Headroomgate Road, St. Annes-on-Sea, Lancs.

TX—MOD—RX—GENE, all metal port., key, mike, 3 Weston MC, 1 aerial meter, ideal NFD, 12v acc., £12.—G2UK, 19, Meadway, Westcliff-on-Sea.

5-VALVE B.T.S. Batt. Superhet, 12-80m, reac. for CW. Stentorian Speaker, perfect for DX, £3.—G2YV, Trumwyn, Cannonk, Staffs.

913 C-R Tube, compl. on copper chassis, P. Pack and 50c sweep, lens magnification. £2 15s. plus carriage.—2DBQ, Ghyll Bank, Whitehaven.

10-WATT CC 7 Mc TX, complete Power Pack, Mod., Mike and Key. Ready for Air, 80s.—Wilson, 511 Cambusnethan, Wishaw, Lanarks.

LARGE quantity of TX and RX Gear for Sale very cheap, send for list to GM30L, Westland, Pleasance Avenue, Dumfries, Scotland.

WEARITE Superhet Coils, Ae., HF and Osc, 465 kc, 4 bands, with Yaxley Switch (unused), 15s.—Coates, 5 Park Terrace, Whitby, Yorks.

SEPTEMBER 1938 Callbook, 4s.; ARRI, Handbook 1937, 3s. 6d.; 50 recent copies "Wireless World." Offers?—2FNU, 38 Wellington Street, Gloucester.

MAZDA DC2/Pen, 3s., DC2/SG 1s. 6d. new boxed SG215 5s., QP240 and base 2s. 6d., Ostar Ganz M43 and base 7s. 6d., U920 4s.—2DJO, 4 Hill St., Aberdeen.

WANTED.—0-1 mA Meter; Hot-wire Aerial Ammeter; V/mA Test Meter to 400 volts, cheap.—2DJO, 4 Hill Street, Aberdeen.

G.E.C. Home B'caster 10s., 2 AC packs (4v LT), 13s. ea. DC Packs 5s. 6d. ea. 60w tapped resistances, 1s.—Wilson, 511 Cambusnethan, Wishaw, Lanarks.

PETO-SCOTT Adaptor-Converter with Valve, 13 to 70 metres (battery), little used. Cost 34s. 6d., accept 12s. 6d.—37, Mortimer Lane, Basingstoke, Hants.

TX.—Pen, RFP60, 15s.; 2 Ferranti B2 Chokes, 2s. 6d. ea.; Western Turntable, 110v. 60 cycle, new 20s., C/F.—G3AO, Sale, Manchester.

SHORT-WAVE BROADCASTING STATIONS

Abbreviations: S—Sunday; M—Monday; T—Tuesday; W—Wednesday; Th—Thursday; F—Friday; Sa—Saturday.
All times GMT, twenty-four hour system.

M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
31.36	9,565	WINK, Millis, 1000-0400.
31.37	9,560	OAXAT, Lima, 1630-1830.
31.38	9,560	DJA, Zeesca, 0505-1600, 2150-0350.
31.41	9,550	W2XAD, Schenectady, 2315-0300.
31.41	9,550	VUB2, Bombay, 0220-0320, 0600-0830.
31.41	9,550	HVJ, Vatican City.
31.41	9,550	OLKBA, Prague, temporarily discontinued.
31.41	9,550	TPB11, Paris-Mondial, 0415-2300.
31.45	9,540	DJN, Zeesca, 0505-1600, 2150-0350.
31.46	9,535	Schwarzenburg, Bern, 1800-1900.
31.46	9,535	JZ1, Tokio, 1930-2100.
31.47	9,531	VPD2, Suva, 1030-1200.
31.48	9,535	W2XAF, Schenectady, 2100-0500.
31.48	9,535	LKC, Jeloj, 1000-1200.
31.48	9,530	VUC2, Calcutta, 0706-0906.
31.49	9,530	ZBW3, Hong-Kong, 0430-0615, 0500-1430.
31.50	9,523	ZRH, Roberts Heights, 1030-1200.
31.51	9,520	OZF, Skamieback, 0100-0400.
31.55	9,510	H5BPJ, Bangkok, Th 1300-1500.
31.55	9,510	GSB, Daventry, 1830-2100, 2115-2300, 2320-0200, 0220-0420.
31.58	9,500	OPD, Lahti, 1705-2200.
31.58	9,500	VK3ME, Melbourne, M-Sa 0900-1200.
31.58	9,500	NEWW, Mexico City, 2300-0600.
31.63	9,484	EAR, Madrid, 2100-2400.
31.69	9,465	TAP, Ankara, Turkey.
31.79	9,437	COCH, Havana, 1300-0500.
32.02	9,369	NOY, Chengtu, 1445-1530.
32.15	9,330	OAXNJ, Lima, 1700-0500.
32.26	9,300	HIG, Trujillo City, 1200-1400, 1700-1930, 2100-0200.
32.61	9,200	COBX, Havana, 1300-0130.
32.98	9,125	HAT4, Budapest, M at 0000.
32.97	9,100	COCA, Havana, 1300-0500.
33.00	9,091	PJC2, Curacao, S 1536-1736, weekdays 1136-0136.
33.32	9,030	COBZ, Havana, S 1242-0500 (M), other days 1242-0600.
33.50	8,955	COKG, Santiago de Cuba, 2200-2300, 0230-0330.
33.53	8,950	HCJB, Quito, 2145-0315 ex. M.
34.62	8,665	COJK, Camaguey, 0100-0200.
34.68	8,650	HJ4AB, Medellin.
34.97	8,580	YNPR, Managua, 1800-1930, 0930-0215.
38.00	7,854	HC2JSB, Guayaquil, 2245-0115.
39.40	7,614	CR6AA, Lobito, M, W and Sa 1915-2115.
40.49	7,410	YDA, Bandoeng, 0130-0700.
40.65	7,380	NECR, Mexico City, M 0000-0100.
44.31	6,780	HHH, San Pedro de Macoris, 1740-1840, 2340-0140.
44.64	6,720	PMH, Bandoeng, 0930-1600, S 0230-0630, 0930-1600, or 1630.
44.94	6,690	TIEP, San Jose, 2100-0500.
44.94	6,675	HQ, Geneva, S 1915-1930, 1930-1945.
45.00	6,666	HC2RI, Guayaquil, S 2345-0045; W 0215-0415.
45.25	6,630	HIT, Trujillo, 1740-1840, 2340-0240.
45.31	6,618	"El Prado", Riobamba, F 0200-0400.
45.39	6,610	YNIG, Managua, 1830-1930, 2300-0300.
45.70	6,565	HIF5, Puerto Plata, 2240-0040, 0240-0440.
45.80	6,550	TIRCC, San Jose, T, Th, Sa 2300-0000; S at 1600; M 0100-0200.
45.81	6,555	HI4D, Trujillo, M and Sa 1655-1840, 2140-0040.
45.83	6,645	YV6RB, Bolivar City, 1530-1700, 0000-0230.
46.01	6,520	YV4RB, Valencia, 1530-1830, 2230-0230.
46.30	6,480	HI1L, Trujillo, 2240-0240.
46.30	6,479	H18A, Trujillo, 1340-1640, 1940-2140, S 0210-0310.
46.40	6,465	YV3RD, Barquisimeto, 1200-1300, 2200-0230.
46.51	6,450	HI4V, San Francisco de Macoris, 1640-1840, 2240-0140.
46.73	6,420	YV6RC, Bolivar City, 1500-1730, 2230-0230.
46.73	6,420	HI1S, Santiago de los Caballeros, 1610-1840, 2240-0040.
46.80	6,410	TIPC, San Jose, 1200-1430, 1700-1900, 2100-0430.
46.88	6,400	TGQA, Quezaltenango, 0200-0400, S until 0600.
46.88	6,400	YV5RH, Caracas, 1530-1830, 2230-0330.
47.06	6,375	YV5RF, Caracas, 1700-1900, 2200-0300.
47.17	6,360	YV1RH, Maracaibo, S 1330-1930, weekdays 1600-1830, 21.00-0400.
47.39	6,330	COCW, Havana, 1200-0500.
47.50	6,316	HI2, Trujillo, 1630-2000, 2230-0200.
47.62	6,300	YV4RD, Maracay, 2100-0100.
47.77	6,280	HIG, Trujillo, 1200-1400, 2040-0140.
47.85	6,270	YV5RP, Caracas, 0100-0400.
48.00	6,250	YV5RJ, Caracas, 1530-1730, 2130-0330.
48.05	6,243	HIN, Trujillo, 1640-1940, 0010-0210.
48.11	6,235	HRD, La Ceiba, S 2100-2300, weekdays 0100-0400.
48.15	6,230	OAX4C, Lima, 2200-0400.
48.15	6,230	YV1RG, Valera, 2230-0230.
48.31	6,210	YV1RI, Coro, 1530-0230.

M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
48.47	6,190	HVJ, Vatican City, 1900-1915.
48.47	6,190	TG2, Guatemala, generally as TGWA, also S 0500-0600.
48.59	6,174	XEXA, Mexico, 1430-1630, 2030-2230, 0500-0600.
48.62	6,170	W2XE, Wayne, 0500-0600.
48.72	6,158	YV5RD, Caracas, 1500-1700, 2000-0300.
48.78	6,150	HI5N, Moca City, 1140-1340, 1540-1940, 2140-0140.
48.78	6,150	CJRO, Winnipeg, S 2000-0300 (M); weekdays 2300-0500.
48.82	6,145	HJ4AB, Medellin, 1430-1900, 2100-0400.
48.86	6,140	SP48, Warsaw, Poland, 1900-2230.
48.86	6,140	W8NK, Pittsburgh, 0300-0500.
48.87	6,137	CR7AA, Lourenco Marques, 1700-2100.
48.94	6,130	CHNX, Halifax, 1100-0315.
48.94	6,130	VP3BC, Georgetown, 1515-1715, 2045-0015.
48.94	6,130	LKJ, Oslo, 1630-2200.
48.94	6,130	COCB, Havana, 1400-0600, S 1500-2300.
48.98	6,125	CXA4, Montevideo, 1500-1700, 1900-0100.
49.01	6,122	HP5H, Panama, 0000-0300.
49.02	6,120	O??, Helsinki, evenings.
49.02	6,120	NEUZ, Mexico City, 1400-1800, 2300-0630.
49.10	6,110	GSL, Daventry, 2320-0130, 0220-0425.
49.10	6,110	HJ6AB, Manizales, 2300-0500.
49.13	6,100	W3XAL, Bountbrook, 0200-0600.
49.18	6,100	YUA, Belgrade, between 0545-2230.
49.20	6,097	ZRK, Kilpeauvel, 1700-2100, S 1700-2020.
49.20	6,097	ZRJ, Maraisburg, 0445-0550, 0805-1230, 1400-1630. (see February issue).
49.30	6,085	HJ5AB, Cali, 1500-1800, 2200-0100.
49.31	6,083	VQ7LO, Nairobi, evenings until 1915.
49.32	6,082	OAX4Z, Lima, 2330-0530.
49.33	6,097	DJM, Zeesca, 2150-0350.
49.42	6,070	CFRX, Toronto, 0100-0500.
49.42	6,070	YV1RD, Maracaibo, 0000-0100.
49.46	6,065	SBO, Motala, 2115-2200.
49.50	6,060	W3XAU, Philadelphia, S 0400-0700; M, Th, Sa 0430-0600, T, W, F 0500-0600.
49.50	6,060	W8XAL, Cincinnati, 1045-0100, 0400-0700, S 1900-0100.
49.51	6,057	ZHJ, Singapore, 1040-1340; S 1540-1740.
49.59	6,050	GSA, Daventry, 1720-2100, 2115-2300.
49.63	6,042	HJ1AB, Barranquilla, 1600-0400.
49.67	6,040	W1XAL, Boston, 0000-0200.
49.67	6,040	W4XB, Miami, 1700-2000, 0200-0500, S 2100-2300, 0200-0500.
49.75	6,030	HP5B, Panama City, 1700-1800, 0000-0300.
49.76	6,030	RW96, Moscow.
49.83	6,020	DJC, Zeesca, 1800-2125.
49.83	6,020	XEUW, Veracruz, 2300-0600.
49.83	6,020	DJC, Zeesca, 1630-2125.
49.88	6,015	HJ3CA, Bogota, 1600-1900, 2300-0400.
49.92	6,010	CJCX, Sydney, 1200-1830, 2100-0130.
49.92	6,010	PRA5, Pernambuco, 2100-0200.
49.94	6,007	XVO, Rangoon, afternoons until 1500.
49.94	6,007	ZRJ, Maraisburg, 2030-2100, weekdays. S 1400-1700, 1715-2015.
49.94	6,007	ZRJ, Maraisburg, 2030-2100.
49.94	6,007	ZRH, Roberts Heights, 0415-0550, 1500-2030; S 1400-1700, 1715-2015.
49.96	6,005	HP5K, Colon, 1200-1400, 1630-1800, 2300-0400.
49.96	6,005	CFCX, Montreal, 1400-0415.
50.00	6,000	ZTC, Cape Town, evenings.
50.00	6,000	CXA2, Montevideo, 1530-0330.
50.00	6,000	XEBT, Mexico City, 1500-0500.
50.13	5,980	COCO, Havana, 1300-0500.
50.17	5,980	CS9WD, Lisbon, from 2100.
50.26	5,970	HJ4AB, Medellin, 0100-0430.
50.27	5,969	YV5RC, Caracas, 1600-1830, 2200-0330.
50.38	5,950	HI2S, Port-au-Prince, 2330-0300.
50.61	5,940	TG2X, Guatemala City, 0200-0300; S 0400-0600.
50.51	5,940	PJCI, Curacao, 2330-0130.
50.80	5,905	TILS, San Jose, 1700-1900, 2300-0400.
51.02	5,880	YV3RA, Barquisimeto, 1800-1900, 2300-0300.
51.06	5,875	HFN, Tegucigalpa, 1830-1915, 0030-0300.
51.15	5,865	HI1J, San Pedro de Macoris, 1740-1900, 2240-0300.
51.28	5,850	YV1RB, Maracaibo, 1345-1445, 1615-1800, 2145-0300.
51.46	5,830	TIGPH, San Jose, 1700-1900, 0000-0400.
52.45	5,720	YV2RA, San Cristobal, 1630-1730, 2300-0200.
60.05	4,995	VUD2, Delhi, 1230-1730.
60.98	4,920	VUM2, Madras, 1330-1700.
61.10	4,905	VUB2, Bombay, 1200-1730.
61.22	4,900	HJ3CAH, Bogota, 1630-1900, 2300-0400.
61.48	4,880	HJ4AB, Medellin, 2300-0400.
61.98	4,841	HJ3CB, Bogota, 1400-1900, 2300-0400.
61.98	4,841	VUC2, Calcutta, 1130-1700.
62.50	4,800	HJ1AB, Cartagena, 1330-0400; S 1400-0200.

(13.92-31.35 m Stations were given last month).

QUERY COUPON
S-W.M 3/39.

AT LAST !! A 6L6G OF BRITISH MANUFACTURE WITH A CERAMIC OCTAL BASE

In conjunction with Tungram, we are able to offer to British amateurs an extremely robust valve which will compare with the finest American types, and fitted with a ceramic base in place of the usual composition. It is well known that the old type of insulation employed for basing these tubes will not stand R.F., particularly at the higher frequencies being used to-day, and the introduction of this new tube will be welcomed as a real step forward.

That stumbling block "Price" has also been removed. 7/6 each, including postage.

SEVEN SHILLINGS AND SIXPENCE—NOT SEVENTEEN AND SIX!

TUNGSRAM VALVES POPULAR WITH THE AMATEUR

WEBB'S SUPPLY ALL THESE VALVES WITH CERAMIC BASES.

APP4G R.F. Pentode, 9 watts anode dissipation, ultra high slop suppressor grid brought out to separate pin, Ceramic base. 4 Volt 2 amp. filament. Max anode voltage 350 volt. Developed for and used by G.P.O., in special 4.4 metre transmitters. In Tri-tet very small crystal current. An excellent frequency doubler. Price 15/-

Specified by "R.S.G.B.," "Wireless World," "Short-Wave Magazine," etc., for amateur use.

OS-12/501 (6.3 v. .7 amp. Filament) R.F. Pentode, 12 watts anode dissipation, medium slope, suppressor grid brought out to separate pin, ceramic base.

As supplied to R.A.F. for ultra short-wave transmitter, has an extremely straight suppressor characteristic, ideal doubler or P.A. Valve, no necessity to neutralise. Price 22/6 As specified by "The Short-Wave Magazine."



O-15/400 R.F. Triode, 15 watts anode dissipation, medium slope, popular for many years with amateurs as a medium power final, or P.A. 4 volt 1 amp. filament. Price 10/6

Shown in R.S.G.B., Radiolympia "Utility 2 Transmitter."

OQ-15/600 (new type) Similar to O-15/400, but redesigned for ultra short-wave working, fitted with special grid and anode leadout arrangement and ceramic base. Specially tested for 5 metre working. 4 volt 1 amp. filament. Price 12/6

OP-38/600 R.F. Triode, nominal 35 watts anode dissipation, medium slope, specially designed for short-wave working with special grid and anode system. Fitted with ceramic base. Excellent high power final, capable of an output of 85 watts R.F. 7.5 volts 7.25 amps. filament. Price 17/6

A SPECIAL 10-15 WATT CRYSTAL CONTROL TRANSMITTER, designed originally for use with the C.W.R. and R.N.W.A.R., it is capable of operation on all amateur frequencies, in addition to the special frequencies allotted by the above reserves.

The entire instrument is built on an Eddystone Standard 19-in. panel with appropriate brackets and chassis. Crystal oscillator circuit employs a 59 tube driving a 59 as a neutralised P.A., giving an extremely stable C.C. note, with an R.F. output of up to 15 watts. Built on to the single chassis, in addition to the transmitter proper, is a power pack with ample output for efficient drive, and employing an 80 type rectifier.

Provision for keying in the cathode circuit of the second 59 is made, while the P.A. coil is fitted with an adjustable link suitable for attachment direct to 80-ohm feeder line.

PRICE OF INSTRUMENT COMPLETE with tubes, one set of coils for any band, but exclusive of crystal is

Valpey Crystals, 1.7, 3.5, or 7 m.c., in enclosed mounted holder 15/6 extra.

Additional sets of coils 7/6 per set.



C.W.R. TRANSMITTER.

£8 0 0

WEBB'S RADIO

(C. WEBB, LTD.)

14 SOHO ST., OXFORD ST., LONDON, W.1

**BIRMINGHAM DEPOT
41 CARRS LANE**

PHONE: GERRARD 2089