

*R.S.G.B.*



# BULLETIN

**March 1951**

*The original front cover for this edition was not available.*

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## Radio Society of Great Britain

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## Forthcoming Events

## REGION 1

Ashton-under-Lyne.—April 1, 3 p.m., New Jerusalem Schools.  
Blackpool.—March 20, 7.30 p.m., G5ND, 161 Penrose Avenue,  
Marton; April 17, G2DXJ, 20 Fordway, Newton Drive.  
Bolton.—April 3, 8 p.m., Y.M.C.A.  
Bury.—April 5, 7.30 p.m., Y.M.C.A.  
Burnley.—April 4, 7.30 p.m., Mechanics Institute, Manchester  
Road.  
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., "The Tarran  
Hut," Y.M.C.A.  
Darwen & Blackburn.—April 6, 20, 7.30 p.m., Y.M.C.A.,  
Limbrick, Blackburn.  
Liverpool.—April 7, 2.30 p.m., 29 Derby Lane, Old Swan.  
Manchester.—April 2, 7.30 p.m., Reynolds Hall, School of  
Technology, Sackville Street.  
Oldham.—Alternate Wednesdays, 7.30 p.m., Civic Centre,  
Clegg Street.  
Preston.—March 30, April 13, 7.30 p.m., Three Tuns Hotel,  
North Road.  
Rochdale.—April 1, 3 p.m., Drill Hall, Baron Street.  
Southport.—April 16, 8 p.m., 38a Forest Road.  
Wirral.—March 21, April 11, 8 p.m., Y.M.C.A., Whetstone  
Lane, Birkenhead.

## REGION 2

Barnsley.—March 23, April 13, 7.30 p.m., King George  
Hotel, Peel Street.  
Bradford.—April 3, 17, 7.30 p.m., Cambridge House, 66  
Little Horton Lane.  
Catterick & Richmond.—Wednesdays, 7 p.m., Loos Lines,  
Catterick Camp.  
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.  
Doncaster.—April 11, 7.30 p.m., Black Bull Hotel, Market  
Place.  
Gateshead.—Thursdays, 7 p.m., Y.M.C.A., Sutherland Hall,  
Durham Road.  
Hull.—March 28, 7.30 p.m., R.E.M.E. Barracks, Walton St.  
Leeds.—Fridays, 7.30 p.m., Swarthmore Educational Centre,  
Woodhouse Square.  
Middlesbrough.—Thursdays, 7.30 p.m., All Saints' Hall,  
Grange Road.  
Newcastle-upon-Tyne.—March 19, 7.30 p.m., British Legion  
Rooms, 1 Jesmond Road.  
Rotherham.—Wednesdays, 7 p.m., Oddfellows' Hall, West-  
gate.  
Scarborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club,  
West Parade Road.  
Sheffield.—March 28, 8 p.m., "Dog & Partridge," Trippet  
Lane; April 11, 8 p.m., Albreda Works, Lydgate Lane.  
Slithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.  
Spennborough.—April 4, 18, 7.30 p.m., Temperance Hall,  
Cleckheaton.  
Wakefield.—April 4, 18, 7.30 p.m., Service House, Providence  
Street.  
York.—Wednesdays, 7.30 p.m., Community House, Fals-  
grave Crescent.

## REGION 3

Coventry.—March 16, April 20, 7.30 p.m., Priory High  
School, Wheatley Street.  
South Birmingham.—March 18, April 1, 15, 10.30 a.m.,  
Stirchley Institute.

Stourbridge (S. & D.A.R.S.).—March 23, April 3, King  
Edward's School.

## REGION 4

Derby (D. & D.A.R.S.).—March 28, April 11, 7.30 p.m.,  
Clubroom, Sub-Basement, Derby School of Arts and  
Crafts, 119 Green Lane.  
Leicester (L.A.R.S.).—March 19, April 2, 7.30 p.m., Holly  
Bush Hotel, Belgrave Gate.  
Loughborough.—April 11, 7.30 p.m.  
Mansfield (M. & D.A.R.S.).—April 1, 3 p.m., Swan Hotel.  
Newark.—March 18, April 1, 7 p.m., 160 Wolsey Road.  
Northampton (N.S.W.C.).—April 6, 7 p.m.; otherwise on  
Fridays, 6 p.m., Clubroom, 8 Duke Street.  
Nottingham.—March 19, April 2, 7.30 p.m., Lord Nelson  
Hotel, Carlton Street.  
Retford.—April 1, 3 p.m., Community Centre, Chapel Gate.  
Spalding.—March 29, 7.30 p.m., 10 South Parade.  
Workshop.—April 2, 7.30 p.m., King Edward Hotel.

## REGION 5

Chelmsford.—April 3, 7.30 p.m., Smith's Radio Shop, 184  
Moulsham Street.  
Southend.—March 21, 7.45 p.m., G3CQL, 29 Station Road,  
Leigh-on-Sea.  
Southend (S. & D.R.S.).—March 16, Room 1, Municipal  
College, Southend. "Radio Interference Suppression,"  
Dubiliers: April 13, Room 1, Municipal College, Pockock  
and Hudson Cups Contests, "Home-built Gear."

## REGION 7

Barnes & Richmond.—April 10, 7.30 p.m., 22 Lowther Road,  
Barnes.  
Brentwood.—March 30, April 13, 8 p.m., Drill Hall, Ongar  
Road.  
Chingford.—March 29, April 12, 8 p.m., A.T.C. H.Q.,  
Pretoria Road.  
Croydon (Surrey R.C.C.).—April 10, 7.30 p.m., "Black-  
smith Arms," South End, Croydon.  
Dulwich & New Cross.—April 2, "Kentish Drovers," Rye  
Lane, S.E.15.  
East Ham.—March 29, April 12, Q.T.H. from T.R.  
East Surrey R.C.—April 5, Barn Room, 8 Lesbourne Road,  
Reigate.  
East London District.—March 18, 3 p.m., "The Licence  
and Log," Mr. W. W. Gunning, G.P.O. Radio Branch.  
Edgware (E. & D.R.S.).—Every Wednesday, 22 Goodwin  
Avenue, Mill Hill.  
Enfield.—April 15, 3 p.m., George Spicers School, Southbury  
Road.  
Finsbury Park.—March 20, 7.30 p.m., 164 Albion Road,  
Stoke Newington, N.16.  
Gravesend.—Every Wednesday, 7.30 p.m., 30 Darnley Road.  
Guildford.—April 1, NOT March 25, 3 p.m., Royal Arms  
Hotel, North Street.  
Hampstead.—April 20, 1 Broadhurst Gardens, N.W.6.  
Hayes & Uxbridge.—April 6, 7.30 p.m., "The Vine,"  
Uxbridge Road.  
Hoddesdon.—April 5, 19, 8 p.m., "The Salisbury Arms."  
Holloway (G.R.S.).—Mondays, Wednesdays and Fridays, 7.30  
p.m., Grafton School, Eburne Road, N.7 (one minute  
from the "Nag's Head").

(Continued on page 351)

## Great Clearance Offer OF BRAND NEW & PERFECT Cathode Ray Tubes & Valves

### CATHODE RAY TUBES

CV No.	Civilian No.	Dia. in inches	Focus	Defn.	EHT	O.K. for T.V.	Price	Rail, Pkg. & Insur.
279	—	2.75	E.S.	E.S.	1450	Expmntl.	10/-	2/6
600	5CP1	5	E.S.	E.S.	2 kV.	Yes	25/-	2/6
601	5BP1	5	E.S.	E.S.	2 kV.	Yes	27/6	2/6
817	3EP1	3	E.S.	E.S.	2 kV.	Yes	15/-	2/6
—	VCR528	11.5	E.S.	Mag.	6 kV.	No	60/-	12/6
1140	VCR140	12	Mag.	Mag.	4 kV.	Yes	90/-	12/6
1384	—	11.5	E.S.	E.S.	4 kV.	Expmntl.	40/-	10/-
1511	VCR511	11.75	E.S.	E.S.	4 kV.	Expmntl.	60/-	10/-
1516	VCR516A	9	Mag.	Mag.	5 kV.	No	40/-	10/-
1522	VCR522	1.75	E.S.	E.S.	800 V.	Yes	15/-	1/6
2880	EM14/1	3	E.S.	E.S.	800 V.	Yes	17/6	1/6
3776	—	5.25	E.S.	E.S.	4 kV.	Expmntl.	20/-	2/6
				Mag.				

#### Acorn Valves:

Type 956, 2/6 each, 20/- per dozen.  
Type 958A, 3/- each, 24/- per dozen.  
Types 9004, 9005, 3/6 each.

**Output Pentodes. Type CV321.** Surplus Equivalent of the KT66. 6/6 each, 60/- per dozen. No extra charge for matching.

**Mullard MW 22/3 Television Tubes** 9" diam., Magnetic. Usual price £11/10/- To clear, £6/17/6, plus 12/6 carriage, packing and insurance.

**VCR 517C C/R Tubes** 6 1/2" diam.: Green/Blue Screen. Excellent for T.V., 20/- Base 2/6, carriage, packing and insurance 5/-.

In addition we offer the following tubes (for one month only) at the ridiculous price of 5/- each (preferably to callers only as packing, carriage and insurance amounts to 7/6). Types available. **ACR1, ACR2, ACR2X, ACR8, ACR1381.**

**VCR 97 C/R Tubes.** Have slight cut-off making them unsuitable for T.V. use, otherwise perfect, 10/- each. Base, 2/6, plus 5/- carriage, packing and insurance.

**12" Electrostatic Television Tubes.** Type 63D/S, Green Screen, 3 kV. Max. EHT, £3/10/-. Base 2/6, plus 15/- carriage, insurance and packing.

**UHF Oscillators, Type RL18,** 5/- each, 40/- per dozen.

**Thyratrons, Type CV 1141,** 6/6 each, 50/- per dozen.  
**Type CV 22,** 20/- each.

**1-kilowatt Pentodes, Type 861,** 20/- (callers only).

**UHF Triodes, Type 7193,** 1/6 each, 12/- per dozen.

**Bayonet Base (Side Contact) Output Valves, Type EL50,** 6.3 V., 5/- each, 36/- per dozen.

**Output Triodes, Type DET 5.** An excellent replacement for PX25, 10/- each, 75/- per dozen. Type P27/500, practically identical with the PX25A, 10/- each, 75/- per dozen.

**25 watt Pentodes, Type PT 25H,** 4 V. 400 V., 3/- each, 24/- per dozen.

**Miniature Valves CV3830 (XH 1.5),** 2/6 each, 20/- per dozen, 9002, 9003, 3/6 each.

**Transmitting and Special Purpose Valves.** Special Offer. Types 8012, 830B, 878, 705A, 843, 1625, 1616, 4C27, 703A, EL266. Any of the above, 5/- each.

**Type E1148,** 1/6 each, 12/- per dozen.  
**Type CV52,** 4/6 each.

**Bayonet Base (Side Contact) Low Noise H.F. Pentode, CV1123 (EF8), (VR123),** 6.3 V., 5/- each, 36/- per dozen.

**T.R. Box, Type CV115,** 5/- each.  
**Magnetron, CV186,** 10/- each.

**ARP3 Valves, 13 V. 2AHF Pentodes,** 3/- each, 24/- per dozen.

**V/M Pentodes CV1124 (MSPEN),** 4 V. 7-pin base, 5/- each, 36/- per dozen.

**EHT Rectifiers, Type 2X2/879,** 2/6 each, 20/- per dozen.

#### SPECIAL OFFER—NOW AVAILABLE

**C.R. Tubes, Type ACR13 (CV1385).** A perfect replacement without alteration for the VCR97. Guaranteed free from "cut-off," price 35/-. Send 3d. for latest valve list of hundreds of types at lowest prices.

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6V6G, 6V6GT, 12J5, 5U4G, 77, 80, 84, 12SG7, 12SK7, 12C8, 12SK7, 12SH7, 38, 1A5GT, 1LC6, 154, 1T4, 3A4, 6AG5, 7E7, 7H7, 7Q7, 7R7, 1Q5, 5Y4G, 5Z4, 6B8, 6B8G, 6K6GT, 6K7G, 6K7GT, 6AB7, 6F6G, 6J7G, 6L7, 6SL7GT, 6N7GT, 6SQ7GT, 6SK7, 6SG7, 6U5, 6S57, 6R7, 6SF5, 1CSGT, 1LD5, 1LN5, 1E7G, 37, 0Z4A, 713A, 3B7, 3D6, 717A, 1626, 6A7, 6B7, 6C5, 6J5, 6C8, 6C6, 6D6.

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152-153 FLEET STREET, E.C.4. Phone: CENTRAL 2833—and at—207 EDGWARE RD., W.2. Phone: AMB 4033  
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**All Post Orders to 740 HIGH ROAD, TOTTENHAM, N.17**  
Phone: TOTTENHAM 5371

**CONVENTION IS COMING**

**M**EMBERS who attended pre-war Conventions of the Society—and in spite of Anno Domini there are still a lot of them about—will require no persuasion to support the Festival of Britain Year event, arranged to take place in London next June. If their private arrangements permit, they will be there.

Those who have yet to experience the thrill and excitement of a R.S.G.B. Convention may perhaps wonder what it is all about. For the uninitiated, Convention is a social-cum-technical event with sufficient business introduced to make it really interesting. Convention affords a golden opportunity for the renewal of old and the forming of new friendships. It offers wide scope for technical discussions and for the exchange of ideas on topics of mutual concern. It has even been known to provide Provincial members and overseas amateurs with an excuse to visit the Metropolis!

In pre-war days London Conventions were restricted to members of the Society, except for a sprinkling of distinguished guests at the Convention Dinner. In recent years, however, a feeling has gained ground—particularly amongst Provincial members—that ladies (who are not members) should be allowed to participate in the various social functions. The Manchester Convention of 1949 followed that pattern and the 1951 Convention will follow suit.

The programme of events being arranged by the Convention Committee will include visits to Government Establishments (such as the D.S.I.R. Radio Research Station at Slough), coach trips to the B.B.C. Station at Brookman's Park, conducted tours of the factories of prominent radio manufacturers, and social events of many kinds, including river trips and theatre parties.

A high-light of the weekend will be the *Conversazione* and Film Show to be held on the Friday evening at the Coventry Street Corner House. This event will revive happy memories for hundreds of old timers who were present at similar pre-war functions. The Con-

vention Dinner, with its traditional "swindle," will take place on the Saturday evening, followed on the Sunday by an informal luncheon, a business meeting and a tea party. Just before tea, prizes valued at more than £100 will be distributed to lucky ticket holders.

For the benefit of Provincial members and overseas amateurs the Society is holding in reserve a limited number of rooms at a well-known Central London hotel. To ensure that the rooms are definitely available when required, a substantial deposit has been paid by the Society as a token of earnest and good will.

The full programme of events, together with a list of charges, will appear in the April issue of the BULLETIN. In the meantime, as a guide for those who intend to support Convention, the following can be taken as the approximate charges for the chief events: *Conversazione* (7s. 6d.), Dinner (15s.), Luncheon and Tea (10s. 6d.), Hotel (20s. per person per night).

Members who require hotel accommodation are urgently requested to forward a **definite order with full remittance made payable to the Society** to Mr. J. Hunter, G6HU, 63 Aintree Crescent, Barkingside, Essex. In addition, all members who intend to be present at Convention are asked to send a **Postcard** to Headquarters stating the number of their party and the main events (*Conversazione*, Dinner, Luncheon and Tea) which they expect to attend. The Postcard will not commit the member concerned but the information it contains will prove of great help to the Committee in developing their plans.

The organisation of a function of this nature is no easy task but the burden will be greatly lightened if members will co-operate in the manner indicated above.

Postcards should be addressed to:

Organising Secretary,  
R.S.G.B. Convention Committee,  
New Ruskin House,  
Little Russell Street,  
London, W.C.1.

and should be posted by March 31.

A detailed order form will appear in the April issue.

**CONVENTION DATES—JUNE 21 to JUNE 24**



# CRYSTAL-CONTROLLED EXCITER for the 70 cm. band

Interest in the 70 cm. (420 Mc/s.) band continues to increase rapidly. Many amateurs, however, still hesitate to build equipment for this band because of the mistaken belief that special techniques and lathe work are necessary. In this article G5CD describes the design, construction and performance of a compact exciter/transmitter unit which depends upon modern valves rather than upon special circuitry to give a useful R.F. output at 70 cm. Later the same author will give full details of a compact "no plumbing" receiver of high sensitivity.

**T**O meet the demand for a reasonably simple but effective 70 cm. unit which can be used either as a complete transmitter or to drive an additional power amplifier stage, here is a compact design embodying modern valves and components. The circuit—see Fig. 1—comprises a crystal oscillator, three multiplier stages and one final power trebler giving an output of the order of 5 watts. All components are mounted on a chassis 13½ in. long by 3½ in. wide by 2¼ in. deep. Power supplies are not included since in most cases portable as well as fixed station operation is envisaged.

## 1st Multiplier (V2)

The first multiplier stage employs the recently released type 5763 miniature transmitting beam power amplifier: operating as a doubler with an 18 Mc/s. crystal, or as a trebler with a 12 Mc/s. crystal. The anode circuit is tuned to 36 Mc/s. by a small series gap condenser across a centre tapped coil; this enables the grid of the succeeding valve to be driven from the end of the coil farthest from the anode, thereby approximately balancing the circuit.

A series screen resistor is employed to drop the

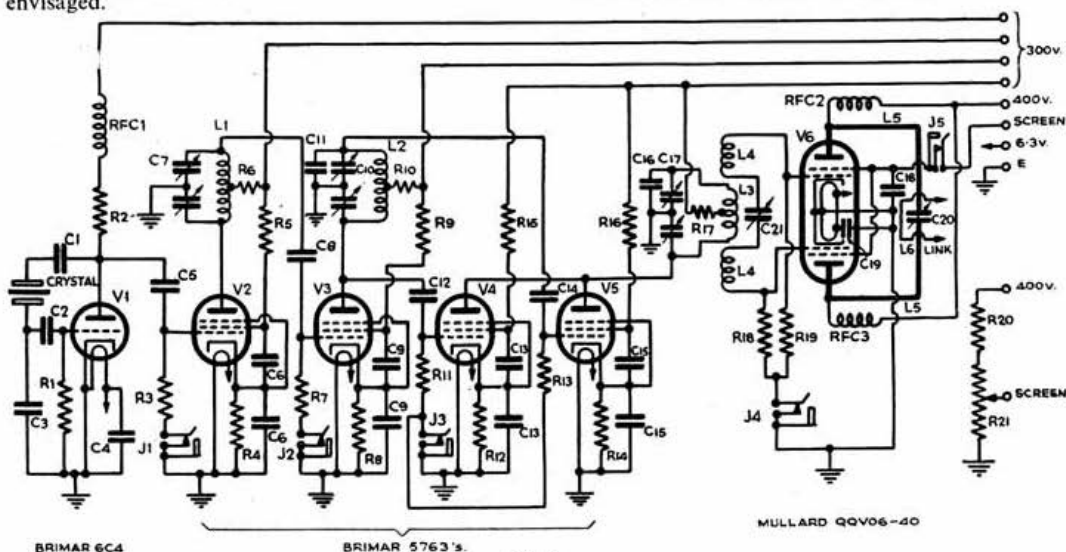


Fig. 1  
Circuit of 420 Mc/s. exciter unit.

To facilitate operation during T.V. programme hours, crystal frequencies have been chosen so that harmonics do not fall in or around the British Television channels.

## Crystal Oscillator (V1)

The crystal oscillator employs a miniature triode type 6C4 in a Pierce oscillator circuit, chosen in preference to a triode or other oscillator arrangement in order to minimise frequency drift. An 18 Mc/s. crystal is suggested for the London and Midland areas and a 12 Mc/s. crystal for those areas using T.V. channels 2 and 3. Crystals for either of these frequencies may be inter-changed without retuning the unit provided the resulting output frequencies are similar. A series resistor in the anode lead protects the valve should it fail to oscillate.

screen potential to 250 volts; cathode bias protects the stage in the event of lack of drive.

## 2nd Multiplier (V3)

The second multiplier stage, which also employs a 5763 valve, provides an output at 72 Mc/s. This stage is basically similar to the first except that the centre tapped output circuit is required to give a balanced output to the third stage. Additional balance to offset the 5763 output capacity is supplied by a 5 µF. condenser (C11) across the appropriate section of the series gap tuning condenser.

## 3rd Multiplier (V4 and V5)

To obtain adequate 144 Mc/s. drive for the power trebler, a high efficiency doubler stage is required. Two 5763 valves are therefore operated in a push-push circuit, designed to overcome inevitable R.F. loss. The anode circuit of this

\* 20 Hoop Lane, London, N.W.11.

stage is similar to that of V3 except that the balancing capacity (C16) is increased to 10  $\mu$ F, while the anode coil is inductively coupled to the grid of the final valve.

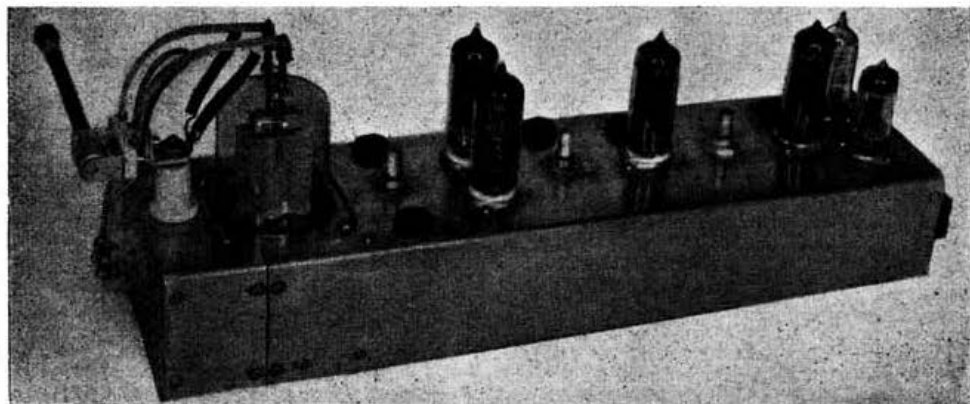
### Power Trebler (V6)

The final trebler stage employs the new double tetrode type QV06-40, which has a V.H.F. performance markedly superior to the commonly used 832. This improvement is due to the use of a common cathode and common screen grid, which reduce common lead impedances and give lower interelectrode capacities and higher anode dissipation. The QV06-40 is similar to the U.S.A. type AX9903 marketed by *Amperex*.

The drive is applied in push-pull from a split series tuned circuit inductively coupled to the previous stage. Grid leaks of 47,000 ohms are employed and a negative D.C. bias of 100 volts

available. The wide copper strips, even with connectors soldered to them, are sufficiently flexible so as not to strain the valve connections: they serve also to conduct the heat away from the anodes. In practice the 144 Mc/s. component in the final tank circuit was found to be extremely low.

A hairpin link of 16 S.W.G. wire is closely coupled to the output tuned circuit and can be connected via 300-ohm ribbon feeder to the P.A. or directly to the aerial as required. The anode should be connected to an H.T. supply of about 400 volts; the screen is most satisfactorily fed, as shown, through a potentiometer network, which can be adjusted to set the input to any desired figure. A suitable series resistor can, however, replace this potentiometer if desired, its value being calculated from measurements made whilst the valve is operating at the chosen input. No



Top view of chassis showing layout of valves and components.

is provided by grid rectification. It has been found that a useful output can be obtained with a parallel tuned circuit, but since such a circuit is only about 1 in. long from the top anode connections it is inconvenient for coupling. A series tuned circuit comprising two silver-plated copper strips 3 in. long by  $\frac{1}{4}$  in. wide tuned at the end with a variable condenser of approximately 2  $\mu$ F, maximum capacity was therefore adopted. In the original model this tuning condenser was made from a neutralising condenser with a suitable extension spindle, but it would be preferable to use a tiny butterfly type if such were generally

cathode bias is provided since it was found that the safe dissipation of the valve was not exceeded even with no drive. Where the unit is to be used for telephony operation, either directly into the aerial or with a grounded-grid P.A. circuit, modulation may be applied to the H.T. line in the usual manner; upward modulation being readily obtainable.

### Construction

At G5CD the chassis was constructed of 18 S.W.G. silver-plated brass sheet but there is no reason why copper or aluminium should not be

### COMPONENT LIST

#### CONDENSERS

- C1, 2, 5, 8, 12, 14, 47  $\mu$ F. T.C.C. type SCT1.
- C3, 150  $\mu$ F. S.M. U.I.C. type 40ISM.
- C4, .01  $\mu$ F. paper T.C.C. type 543.
- C6, 9, 13, 15, 2  $\times$  1,000  $\mu$ F. T.C.C. type 20TH 310/W.
- C7, 10, 17, 25 + 25  $\mu$ F. Eddystone type 583.
- C11, 5  $\mu$ F. T.C.C. type SCD1.
- C16, 10  $\mu$ F. T.C.C. type SCD2.
- C18, 1,000  $\mu$ F. T.C.C. type CTH310.
- C19, .003  $\mu$ F. paper T.C.C. type 543.
- C20, neutralising condenser Eddystone type 481.
- C21, 10  $\mu$ F. air trimmer Wingrove & Rogers type C3201.

#### RESISTORS

- R1, 47,000 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R2, 22,000 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R3, 7, 11, 13, 100,000 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R4, 8, 120 ohms.

- R5, 9, 15, 16, 10,000 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R6, 10, 1,000 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R12, 14, 17, 100 ohms *Erie*  $\frac{1}{2}$ -watt insulated.
- R18, 19, 47,000 ohms *Erie* 1-watt insulated.
- R20, 20,000 ohms *Erie* 2-watt insulated.
- R21, 25,000 ohms potentiometer 2-watt.

#### INDUCTANCES

- L1, 12 turns  $\frac{1}{16}$  in. mean dia. 16 S.W.G. spaced 1 dia.
- L2, 4 turns  $\frac{1}{16}$  in. mean dia. 16 S.W.G. spaced 2 dia.
- L3, 3 turns  $\frac{1}{16}$  in. mean dia. 16 S.W.G. spaced 2 dia.
- L4, 4 turns  $\frac{1}{16}$  in. mean dia. 18 S.W.G. enamelled spaced 1 dia. (each).
- L5, Two strips  $\frac{1}{16}$  in. by 0.048 in. copper silver plated 3 in. long.
- L6, Hairpin loop 16 S.W.G. coupled over 2 in. length.

#### VALVES

- V1, *Brimar* 6C4.
- V2, 3, 4, 5, *Brimar* 5763.
- V6, *Mullard* QV06-40.

#### MISCELLANEOUS

- X, 12 or 18 Mc/s. crystal S.T.C. type 4013/1.
- J1, 2, 3, 4, 5, midjet jack *Igranic*.
- V1, B7G valve holder *McMurdo* BM7U.
- V2, B9A valve holder *McMurdo* BM9U.
- V3, 4, 5, B9A valve holder *McMurdo* FM9U.
- V6, B7A valve holder *Whitley Electric Radio Co.*
- RFC1, *Eddystone* type 1010 R.F. choke.
- RFC2, 3, Wound 24 S.W.G. enamel wire on  $\frac{1}{16}$  in. former 1  $\frac{1}{2}$  in. long. Lead through Insulator. 2 in. long. 2 B.A. Johnson type *Webbs Radio*. Connector strip 8-way.

used: in the case of aluminium, however, care should be taken with the earth bonding to ensure a good contact. A chassis drawing, Fig. 2, gives the essential dimensions. The valve holders for the crystal, the 6C4 and the first multiplier stage can be of the moulded or wafer type but those for V3, V4 and V5 should be of low loss material, such as P.T.F.E., and should be mounted so that the grid and anode leads face the correct direction. The tuning coils, which are wound according to the specification given in the component list, can be mounted on the tuning condensers with short leads. With the exception of the trebler grid series tuning condenser (C21), which is suspended in the wiring, all tuning condensers are mounted on the chassis.

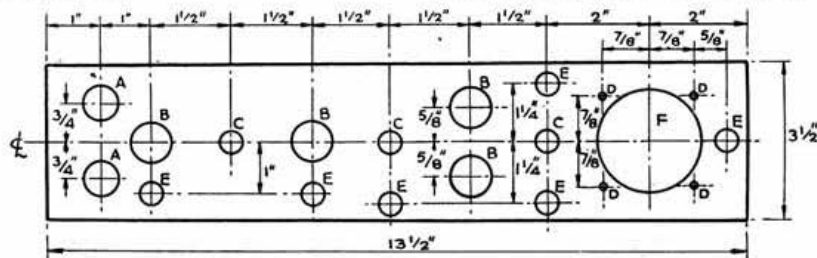


Fig. 2

Plan view of chassis showing position and designation of holes, except valve holder fixing.

Diameter of holes :

2 Holes A— $\frac{5}{16}$ in. dia.	4 Holes D— $\frac{9}{64}$ in. dia.
4 " B— $\frac{1}{8}$ in. "	6 " E— $\frac{7}{16}$ in. "
3 " C— $\frac{3}{8}$ in. "	1 Hole F—2 in. "

The valve holder for the QQV06-40 is sunk below the chassis by means of pillars comprising long 4 BA screws with 1 in. lengths of tubing serving as spacers. The 2 in. diameter hole in the chassis provides clearance for the valve. This arrangement avoids the top of the valve being unreasonably high above the chassis and facilitates the placing of the output tuned circuit which, with its condenser (C20), is supported on a small right angle bracket fixed to the top of a lead-through insulator. This lead-through also serves for the H.T. connection, which is made to the tuned circuit via two R.F. chokes.

If an output load impedance other than 300 ohms is employed it may be better to series or parallel tune the link coupling loop. In practice, however, no improvement resulted when this was tried into a 300-ohm circuit.

In a future issue of the BULLETIN, it is hoped to describe a suitable P.A. unit for use with the exciter.

The exciter was shown on the R.S.G.B. stand at the Fourth Amateur Radio Exhibition and was demonstrated at a London lecture meeting of members given at the I.E.E. in January.

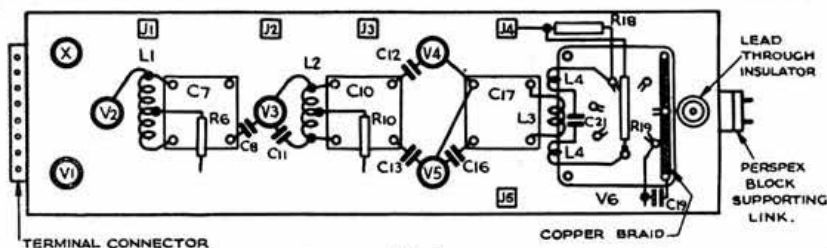


Fig. 3

Underside view of chassis showing wiring and coil positioning.

Jacks are provided in each grid circuit for checking the drive and also in the QQV06-40 screen lead. Meters in the anode circuits can be provided externally as required.

Each 5763 valve has its cathode and screen connections by-passed with a tiny double unit 1000  $\mu$ F. condenser of which the common lead is connected to cathode. The earthed rotor of the tuning condenser and the balanced circuit eliminate the need for anode by-pass condensers. The heater line is tied to chassis on the 6C4 valve socket and also on the QQV06-40 socket. The cathode of the latter valve is grounded to tags on the top of each adjacent pillar by means of a strip of  $\frac{3}{16}$  in. wide copper braid.

TABLE 1

Stage	Anode Current (mA)	Total Anode plus Screen Current (mA)	Screen Current (mA)	Grid Current (mA)
Crystal Oscillator	7.5	—	—	—
1st Multiplier . .	—	35	—	0.3
2nd Multiplier . .	—	30	—	1.2
3rd Multiplier . .	—	80	—	2.25
Power Trebler . .	60	—	1.8	4



# PUSH-BUTTON BAND-SWITCHING

By C. W. CRAGG, Grad. I.E.E. (G2HDU)\*

A major revolution in the development of broadcast and communications-type receivers was the adoption of switched band-ranges to replace the laborious task of changing coils. Today a similar revolution is taking place in the design of amateur transmitters. Band-switched exciters and multiple-tuner power amplifiers are under discussion—or construction—everywhere. Here is an important contribution to the subject: a new and relatively simple application of a press-button system to an exciter unit covering 3.5 to 28 Mc/s. No rotary switches with long R.F. leads and attendant complications, compact layouts, simple alignment and wide application are some of the features of this original circuit.

**T**his article describes what is believed to be a new application of push-button switching to provide easy band-changing in the frequency multiplying stages of an amateur transmitter.

In order to cover the bands from 3.5 to 28 Mc/s. (including the long-awaited 21 Mc/s. band), a unit is employed consisting of five buttons, one for each band. This push-button unit is of the type where one button is pressed at a time, and on pressing any particular button, the one previously operated is automatically released. Since each button operates only a single-pole change-over switch, the number of switch contacts is considerably less than is required with any form of rotary switch. This in turn leads to circuit simplification, shorter wiring, and reduces the likelihood of switch troubles.

than briefly—the P.A. stage, which is a conventional amplifier using a pair of 807 valves in parallel.

## Circuit

The simple exciter circuit is shown in Fig. 1. The three tuning condensers, C4, C7 and C12, are brought out to the front panel. The five coils, L1-L5, are of the ordinary receiving type with adjustable dust-iron cores. Input is fed from a V.F.O., via 75-ohm cable, to a broad-band input circuit<sup>(2)</sup> consisting of L1, C1 and the grid of the first doubler valve. Fixed bias is applied to the grids of all valves, and the drive to the output stage is controlled by varying their screen voltages.

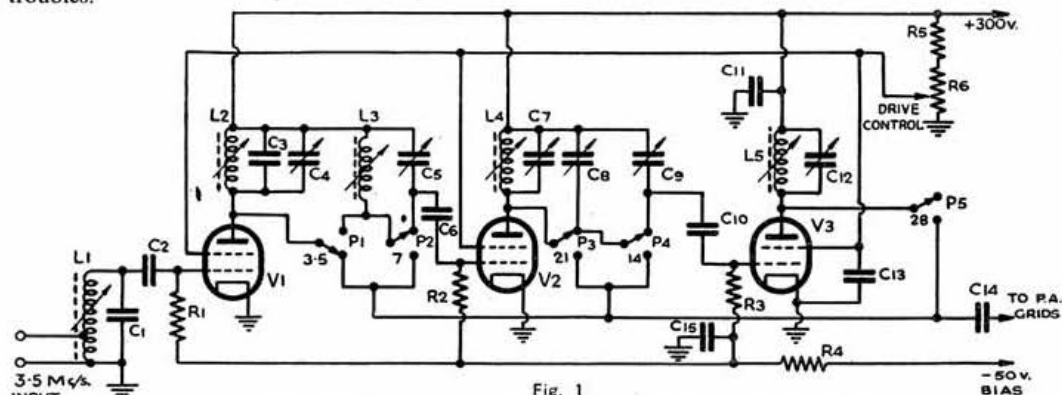


Fig. 1  
Circuit of push-button driver stages, shown with 3.5 Mc/s. button pressed.

R1	220,000 ohms
R2	100,000 ohms
R3	22,000 ohms
R4	2,000 ohms
R5	1,000 ohms
R6	50,000 ohms wire-wound variable
C1	20 $\mu$ F.
C2	100 $\mu$ F.
C3	50 $\mu$ F.
C4	25 $\mu$ F. variable
C5	3-30 $\mu$ F. trimmer

V1	6V6
V2	6L6
V3	6L6
C6	100 $\mu$ F.
C7	15 $\mu$ F. variable
C8	3-30 $\mu$ F. trimmer
C9	3-30 $\mu$ F. trimmer
C10	100 $\mu$ F.
C11	.01 $\mu$ F.
C12	15 $\mu$ F. variable
C13	.001 $\mu$ F.
C14	300 $\mu$ F.
C15	.01 $\mu$ F.

Coil data is given in the table.

P1-P5 Five sets of push-button contacts, each single-pole change-over, self-restoring type (as used on TR1133 and 1143).

The method of switching is adaptable to broad-band, gang-tuned, or separately tuned circuits, while—if desired—the drive unit could be made very compact. At G2HDU this system is used in conjunction with a multi-band tank unit<sup>(1)</sup> in the P.A. stage, so that a very rapid band-change indeed is achieved. All that is necessary is to press the button required, and adjust the P.A. tuning control. It is not proposed, however, to describe—other

To understand the operation of the system, consider what happens when the 3.5 Mc/s. button is pressed (the circuit is shown in this condition); since the anode tuned circuit of V1 is pre-tuned to 3.5 Mc/s. (i.e. L2, C3 and C4), the push-button switch (P1) connects the 3.5 Mc/s. output of this stage through C14 to the P.A. grid, at the same time disconnecting drive from V2. L3 and C5 are also, in effect, out of circuit since there is no magnetic coupling between L3 and L2. The

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anode currents of V2 and V3 are cut off by the fixed bias. Thus in this switching condition V1 acts as a straight buffer amplifier (it should be added that no trouble from T.P.T.G. oscillation is experienced in V1 possibly because its screen-grid voltage is set at a low value to obtain the correct drive to the 807 valves).

As the 7 Mc/s. button (P2) is operated P1 is

input capacity of the P.A. stage. The 28 Mc/s. tuned circuit consists of L5 and C12, from which output is fed to the P.A. as in the previous cases.

It can thus be seen that operation of any button produces drive to the P.A. on the appropriate frequency. The trimmers C5 and C9 may be omitted provided that C4 and C7 are made larger in capacity. The addition of C5 and C9 is a

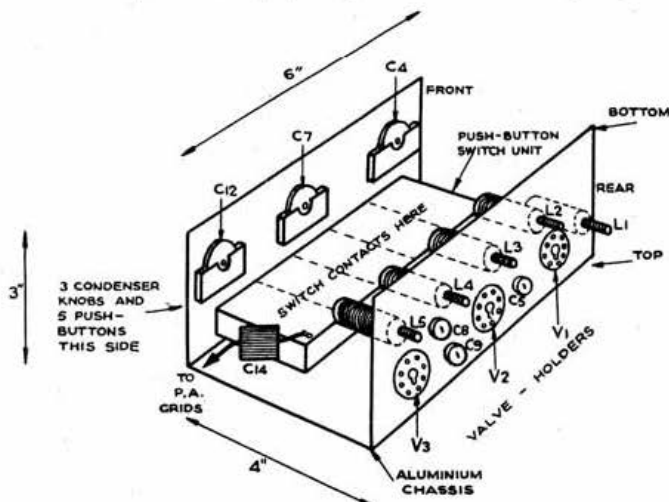


Fig. 2.  
Underside view of frequency-multiplier unit with valves removed.

automatically released. The effect is to place L2 in parallel with L3 which is pre-adjusted to raise the frequency of the V1 anode circuit to 7 Mc/s. V1 now acts as a frequency doubler, and drive is fed directly to the P.A. stage as before. The grid of V2 remains isolated, so that both it and V3 are still cut-off by the fixed bias.

On operating the 14 Mc/s. button (P4), we now have the V1 anode circuit disconnected from the P.A. stage, and drive applied to V2. C5 is added to compensate for the 807 input capacity, so that the anode circuit of V1 still tunes to 7 Mc/s. Meanwhile the anode circuit of V2 consists of L4, C7 and C8, which are arranged to resonate at 14 Mc/s. V2 thus acts as a doubler, with its output applied to the P.A. No drive is applied to V3 which remains cut-off.

When the 21 Mc/s. button (P3) is pressed, C8 is removed from circuit, so that the anode circuit of V2 tunes to the third harmonic of its grid frequency (i.e. 21 Mc/s.).

Operation of the remaining button (P5) causes the anode circuit of V2 to revert to the 14 Mc/s. condition, with C9 added to compensate for the

refinement to enable C4 and C7 to tune at the same setting on all bands, or to be ganged if desired.

### Construction

The construction of the frequency doubler unit is shown in Fig. 2. Layout closely follows the circuit diagram, which greatly assists short wiring.

An aluminium chassis 3 in. x 4 in. x 6 in. without ends was used, with the push-button switch and tuning condensers mounted on the front edge. The remaining components were mounted on the rear apron as shown, with the three valves projecting at the back. No parts were mounted on the top of the deck. Output to the P.A. grids was taken from the push-button switch at the higher frequency end to ensure shortest possible wiring for the 28 Mc/s. circuits.

No trouble was experienced with this unit once the correct coil turns had been ascertained. A very compact driver unit could be made on these lines using the miniature 6AQ5 or similar valves.

The panel layout of the complete transmitter at G2H DU is shown in Fig. 3, whilst the rear view appears in Fig. 4. The driver unit is mounted on the lower central portion of the panel with the three valves protruding at the rear, and with the preset capacitors and inductors easily accessible. Above the small chassis is mounted a tray which carries all components associated with the P.A. anode circuit. The output valves are sunk through this tray in the conventional manner, and are supported and screened by a small trough-shaped chassis as shown. Since this method of construction ensures good screening between the P.A. anode circuit and all the drive circuits, no neutralisation of the 807 valves is necessary.

### Alignment

The alignment of the coils and trimming condensers in the driver unit is quite straightforward, as follows: The P.A. meter is set to read grid current in the 807's, and all adjustments are carried out to obtain maximum readings on this meter. All the power supply potentials are applied with

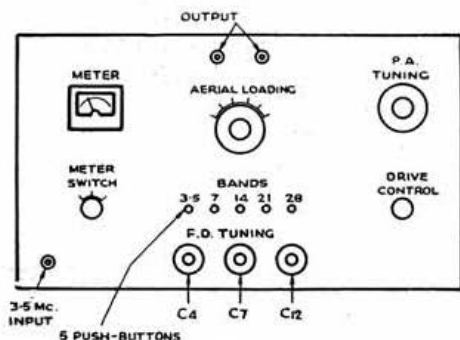


Fig. 3

Panel layout of the transmitter at G2H DU (19in. x 10½ in. panel).

the exception of the anode and screen voltages of the output valves. C4, C7 and C12 are set to mid-scale. Drive from a source at about 3.65 Mc/s. (i.e. near the middle of the 3.5 Mc/s. band) is applied to the input socket. Alignment then proceeds according to the following table:

Operation	Press-Button	Align
1	3.5 Mc/s.	L1 & L2
2	7 Mc/s.	L3
3	21 Mc/s.	C5 & L4
4	14 Mc/s.	C8
5	28 Mc/s.	C9 & L5

The alignment must be carried out in the order given. It is no use trying to adjust the unit for 14 Mc/s. before the 21 Mc/s. band has been correctly aligned. If at any time during the alignment the grid-current meter reads full-scale, the drive is reduced to a suitable value by adjustment of the drive control (R6).

In conclusion, it is believed that the frequency multiplier unit herein described presents a new approach to band-switching, with the following advantages; the unit may be very compact; it uses a minimum number of switch contacts, thereby allowing of shorter wiring, better efficiency, and reliability; the method of switching may be applied to gang-tuned, broad-band, or separately tuned stages; alignment is very simple.

V1 may be used as a V.F.O. if desired. One method is to use it as a Clapp oscillator, with the grid circuit tuned to 1.8 Mc/s.

### Coil Data

L1	100 turns	30 S.W.G. pile wound. Tapped 20T. from earthy end.
L2	41 turns	25 S.W.G. pile wound.
L3	21 turns	20 S.W.G. two layers close wound.
L4	8½ turns	16 S.W.G. two layers close wound.
L5	4½ turns	16 S.W.G. one layer close wound.

All coils on receiving type formers ½ in. dia. 1½ in. long, with adjustable dust-iron core approximately ½ in. x ½ in. All windings occupy ½ in. winding length. Enamelled wire.

### References

- (1) "Multi-Band Tank Circuit," *QST*, March, 1948. See also R.S.G.B. BULLETIN, April, 1950.
- (2) "Broad Band Coupling Circuits," Sandeman, *Wireless Engineer*, September, October, November, December, 1941.

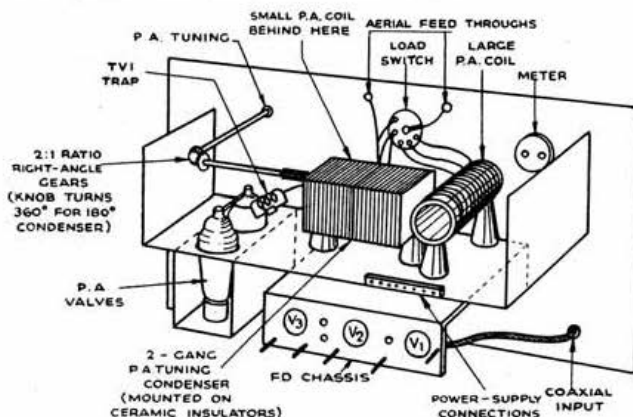


Fig. 4.  
Rear view of the transmitter showing relative positions of the push-button multiplier unit and P.A. stages.

## Amateur Radio and the Festival of Britain

### The Call Will Be GB3FB

AS the result of a suggestion made by the Society to the Festival authorities, the G.P.O. have agreed that the Amateur Radio station to be operated from the Land Travelling Exhibition shall use the call-sign GB3FB instead of G3FB, as previously announced. A special QSL card of distinctive design has been produced by the Festival authorities and will be illustrated in an early issue.

### The Birmingham Station

Mr. Victor Desmond, G5VM (Immediate Past President), has agreed to accept responsibility for the operation of the Amateur Radio station when the Exhibition visits Birmingham in August.

Holders of 150-watt licences resident within easy reach of Birmingham are invited to attend a meeting at the Sydenham Hotel, Pershore Street, Birmingham, at 7.30 p.m. on Tuesday, May 8, to discuss plans for operating the station.

### The Land Travelling Exhibition Station

The following schedule shows the venues and dates when the Land Travelling Exhibition station will be in operation:

- Manchester, May 4-27 (Mr. I. D. Auchterlonie, G6OM, in charge).
- Leeds, June 23-July 15 (Mr. C. A. Sharp, G6KU, in charge).
- Birmingham, August 4-26 (Mr. V. M. Desmond, G5VM, in charge).
- Nottingham, September 15-October 7 (Mr. J. J. Curnow, G6CW, in charge).

The Exhibition transmitter (a 100-watt job) is being built by *Teleradio (1943) Ltd.*; *Panda Radio Co.* are supplying the aerial tower and Selsyn drive, whilst *Stratton & Co. Ltd.* and *Q Max (Electronics) Ltd.* are providing receivers. A full list of the equipment to be used at the station will be published shortly.

# I.F. REGENERATION ON THE BC455

By R. J. DONALD (G3DJJ)\*

THE "Command" series of *Bendix* receivers have been available on the "surplus" market for a considerable time; their low price and compact layout have tempted many members—G3DJJ included—to purchase one with a view to portable requirements, particularly as conversion for 12V. operation, and the fitting of front panel controls and headphone jack are straightforward. Results, however, when the receiver is tested on the 7 Mc/s. band are usually considered far from satisfactory. The selectivity appears to be hopelessly inadequate for a crowded band, no matter how carefully the I.F. transformers are peaked.

General inquiries soon elicited the information that other would-be users of the BC455 had finally been forced to change the I.F. transformers and re-wind the coils: but such a process is not one to be lightly undertaken. For this reason it was decided to try, instead, a simple regenerative I.F. system which, it was thought, would improve selectivity without the need for drastic modification of the receiver.

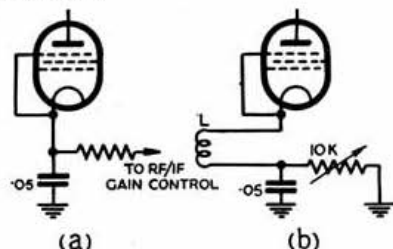


Fig. 1

Cathode connections of the first I.F. stage. (a) Before modification; (b) after modification. L is the cathode "tickler" coil (see text).

Since a regenerative stage is much more prone to distortion on strong signals, it was decided to apply regeneration to the first I.F. stage. This could be done in many ways: the only essential is that feedback—either inductive or capacitive—should be introduced. In some cases, it is sufficient simply to add capacity (in the form of two wires twisted together, or a 3-30  $\mu$ F. trimmer) between the anode and grid pins of the valve, thus forming a T.P.T.G. oscillatory circuit. For optimum performance, however, fairly tight coupling with a low stage gain is better than running the valve near maximum gain conditions with loose coupling. The slightly more complicated "tickler" system shown in Fig. 1 (b) was therefore adopted.

## Modifications

To modify the BC455, the two screws securing the first I.F. transformer should be removed permitting the transformer assembly to be withdrawn from its socket. Remove the four screws from the bottom of the shielding can and withdraw the coils. It will be found that there is only one tuned winding which is connected in the anode circuit of the frequency changer valve, and which doubtless accounts for some lack of selectivity. The grid winding contains more turns than the primary and is either untuned, or approximately tuned, to the intermediate frequency by the internal

capacity of the valve. Now wind about four or five turns of cotton covered copper wire of suitable gauge (about 26 S.W.G.) and bring the leads to the two unused solder tags at the bottom in the assembly. This winding should be at the "cold" or H.T. end of the tuned winding—i.e., the end nearest to the grid winding. The turns should be firmly secured with *Denfix* or a similar low loss adhesive. Solder two flexible leads to the ends of the "tickler" winding and pass these through the vacant holes in the base. Re-assemble the transformer and plug it back on to the chassis, passing the two leads through vacant holes in the mounting.

The only alterations to the wiring of the BC455 are as follows: the cathode of the first 12SK7 I.F. valve, which goes to the common variable bias resistor, should be disconnected and the wire cut off short; the lead to the treble .05  $\mu$ F. condenser should be removed; one lead from the "tickler" winding should be attached to the cathode and one to the now vacant section of the treble .05  $\mu$ F. condenser. From this point a lead should be taken to a 10,000-ohm variable resistor, the other side of which should be grounded. Set this control at mid-scale and switch on; varying the control should bring the set in and out of oscillation. If it does not, reverse the "tickler" connections and try again.

It will now be necessary to re-align the I.F.s, as the added stray capacity will have de-tuned the first stage. With the stages correctly aligned and the regeneration control fairly well advanced, it will be found that the selectivity of the first I.F. is very good indeed, and regeneration smooth and free from howls. The regeneration control can be fitted to the side of the case, above the first I.F. valve—there is just room, provided a small type component is used. A large-diameter knob should be fitted for easy control.

It is not advisable to use a long aerial with any of the "Command" receivers—about 12 feet seems the optimum for the type of aerial-coupling used. Under these conditions, selectivity is quite adequate for portable use: not perhaps up to the standard of a normal communications receiver, but fully useable. With low current consumption, both in filament requirements and H.T., it becomes the ideal receiver for easy transport, while its low cost reduces anxieties during periods of rough handling.

The same system is applicable to many types of receivers which suffer from a lack of selectivity and will do much to improve an otherwise inferior performance.

## British Radio Components' Show

MORE than 100 concerns are to participate in the 8th annual private exhibition of British radio and electronic components, organised by the Radio and Electronic Component Manufacturers' Federation, to be held at Grosvenor House, London, from April 10 to 12.

Admission is limited to ticket-holders. Readers who have a professional, industrial or trade interest in components should apply for tickets to R.E.C.M.F., 22 Surrey Street, London, W.C.2.

\* 2 Canfield Road, Brighton 7, Sussex



# THE POOR MAN'S "R-9er"

By FREDERICK NESS (G3ESV) \*

IF the sensitivity of your receiver is disappointing on the 14 Mc/s. band, then you need a pre-amplifier. The unit described by A. G. Wood (G5RZ) in the December, 1949, issue of the R.S.G.B. BULLETIN is ideal for this purpose. But if something much simpler is required then this article offers a possible solution.

An EF54 is used as a fixed-tuned signal booster. This valve is capable of high gain when run at full ratings (anode and screen, 250 volts; grid bias -1.5 to -2 volts), and has an inherently low noise level. Self-resonant coils could have been used, but they are more troublesome to adjust and they tune too broadly for a band only 400 kc/s. wide (soon to be reduced to 350 kc/s.). A pre-amplifier giving a high gain *outside* the required band can easily spoil the image-rejection of the associated receiver, especially if the L.F. of the latter is only around 465 kc/s. The use of some capacity improves the Q of the tuned circuits; increases the gain, and lessens the band-width. No re-tuning in use is called for, however, as calculation shows that with an inductance of about  $2\mu\text{H.}$ , a capacity change of only 4 or 5  $\mu\text{F.}$  is required to tune across the band. Moreover, the tight coupling of the input and output links tends to damp the tuning, so that when once set for the middle of either the C.W. or 'phone portion of the band, the iron slugs can be forgotten.

## Coil Data

The coils are wound on 7/16in. diameter, slug-tuned polystyrene formers. The tuned-winding is put on first, with slight spacing between turns. The coil is then "doped" with polystyrene varnish (there is no need to buy any; just dissolve a few small scraps of polystyrene in 2oz. of benzene, obtainable from your chemist). When this has dried, the coupling coils L2, L4 are inter-wound between the turns of the tuned windings at the earth end. This is not common practice, but it is

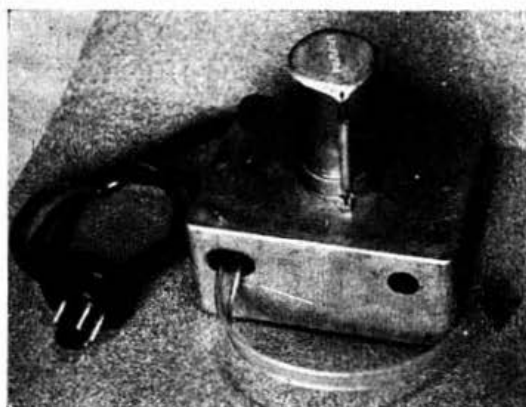


Fig. 2.  
View of the pre-amplifier.

done on purpose here to secure the necessary tight coupling. The best signal-to-noise ratio is obtained when the aerial is slightly over-coupled; tight coupling to the output link ensures the maximum signal transfer to the receiver. The unit can be coupled to the main receiver with a short length of 300-ohm line.

The pre-amplifier is constructed in an Eddystone die-cast box (Cat. No. 650), as shown in Fig. 2. The valve is mounted centrally and on the underside a shield across the valve-holder divides the box into two compartments. This is essential for stability.

The EF54 has no external suppressor connection, but makes up for it by having four cathode pins. Pin 4 is by-passed to earth; pin 5 takes the bias resistor R1; pins 7 and 8 are joined and by-passed to the same earth point. Since the screen operates at 250 volts, common decoupling for anode and screen can be employed as shown. The job is so simple that once the necessary holes have been made, it can be finished in an hour or so.

## Adjustment Procedure

Adjustment on a signal is easy. As a precaution, measure the voltage across R1; if it reads 1.8 volts all is well. Screw-on the base of the box and connect up the power supply, aerial and output links. Because of the very high gain, the unit will probably oscillate until the aerial is connected; it then becomes quite stable. Tune the receiver to a steady signal in the middle of the band. Then peak the signal by means of the slugs. It will be necessary to reduce the R.F. gain on the receiver as the signal-booster is gradually brought to resonance. When the best position of the slugs is found, a spot of paint or Durofix will hold them in position.

To get an idea of the gain given by the unit, find an S5 signal. Then without touching the controls quickly change the aerial over to the receiver. You will find the signal right down in the noise and barely readable. The gain of the original unit is estimated at 3 to 4 S points, while the noise level is not appreciably greater. And you will find that, instead of working with the receiver R.F. gain control fully on, there will always be some gain in hand. The performance is not equal to that of the original R-9er, but for simplicity and ease of construction, combined with high gain, it is hard to beat.

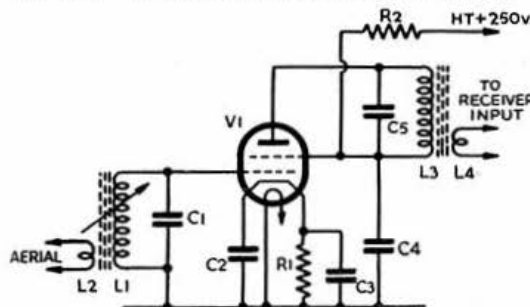


Fig. 1.  
Circuit Diagram of the Poor Man's "R-9er."

C1, C5	50 $\mu\text{F.}$ ceramic (or mica)
C2, C3, C4	0.001 $\mu\text{F.}$ mica
R1	150 ohms, $\frac{1}{2}$ -watt.
R2	2,000 ohms, 1-watt.
L1, L3	13 turns 26 S.W.G. enamel, spaced to occupy $\frac{1}{2}$ in.
L2	5 turns 34 S.W.G. enamel or silk covered, interwound with the bottom 5 turns of L1.
L4	4 turns 34 S.W.G. enamel or silk covered, interwound with the bottom 4 turns of L2.
V1	EF54.

Coils wound on 7/16th" diameter, slug-tuned formers. Wire sizes are not critical; and the slug can be adjusted to cover minor variations in windings.

\* Rev. F. Ness, M.A., Upholland College, Wigan, Lancs.



# In the Workshop

MANY amateurs, attracted by the considerable advantages offered by beam aerial arrays for transmission on 14 Mc/s. and above, spend much time and expense in the construction of the array, optimistically leaving the question of rotating it until later. Too often, this problem proves much more difficult than originally anticipated, with the result that the array is finally erected as a single or bi-directional fixed beam.

This month, therefore, it is proposed to review a few of the simpler methods of beam rotation and the workshop practice involved in their construction. We shall refrain from comment on the various *de luxe* "motorised" systems which, unless based on the ingenious application of particular "surplus" devices, are expensive and call for a high order of engineering knowledge. The ideas reviewed here should prove within the scope of those amateurs with limited resources—though, at the same time, the possibilities of applying any stray mechanism which may be available—such, for example, as the back axle of a small car—should never be overlooked.

For any system, there are certain fundamental considerations. It only requires the briefest period of practical experience to convince most amateurs that a rotary system is only appreciated to the full when the means of control is located *inside* the shack. Hauling on wet ropes or turning a heavy pole while peering hopefully into a black and murky sky may provide a temporary—and in some cases the only—solution, but is unlikely to satisfy anyone for long.

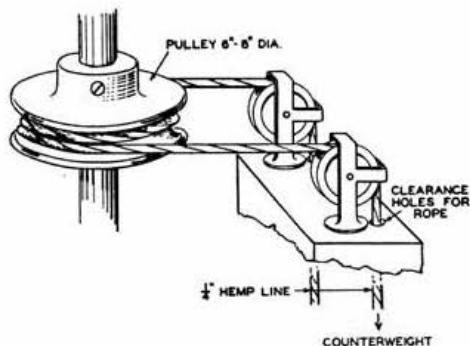


Fig. 1.

A rotary drive of the beam head type.

## Beam Head Drive

Fig. 1 shows a simple arrangement of pulley and rope drive which is applicable to beams mounted on a short bearing at the head of the mast or tower. A large pulley 6 in. or 8 in. in diameter is mounted on the short beam shaft as shown. These pulleys are readily obtainable at tool stores, with various standard-sized holes. The smaller pulleys are the common "screwed-shank" variety obtainable from the ironmonger, but (as shown) should be the type having two guides for the rope. These pulleys are mounted on a wooden block suitably disposed and fixed to the mast or tower structure. Their angle, with respect to the large aluminium pulley, should be arranged to give a clear lead for the rope to this pulley.

A good quality hemp cord, well creosoted and waxed, should be used, with two turns taken round the large pulley to ensure against slipping. One

side of the line may be connected to a fairly heavy counterweight to maintain tension. Adjustment of rotation is then made solely on the other side of the line. This counterweight arrangement is recommended since it is not easy otherwise to hold one side of the line in each hand and maintain an even tension. The "hauling" line may be fixed to a shackle attached to a stiff spring secured to the mast, thereby allowing flexibility in high winds. A little ingenuity can, of course, be used to bring the line into the shack, but, in general, the method is favoured where the aerial system is, by circumstances, well removed from the shack.

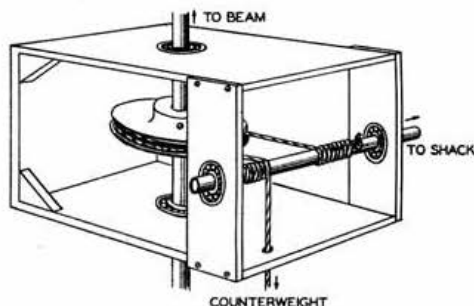


Fig. 2.

Simple "base of mast" rotating gear.

## Base of Mast Gearing

Fig. 2 shows a more elaborate, though still essentially simple, mechanical scheme for rotating a beam from inside the shack. The system is only applicable where the beam itself is mounted on a long shaft brought to the base of the mast. If the base of the mast is within, say, 10 ft. of the shack, the operating shaft, which can be a length of  $\frac{1}{2}$  in. conduit or screwed barrel, may be brought into the shack and rotated by a suitable hand wheel.

It will be seen from the sketch that the scheme is really a simplified version of a gear-box, transferring motion through a right-angle. A length of cord passes several times round the operating shaft, thence twice round the large pulley, and returns to the operating shaft; the direction of the turns being such that "wind" and "unwind" takes place when the shaft is turned. A large aluminium pulley similar to that described in the head-drive system is required. For heavier beams a diameter of 8 in. is recommended, and for lighter types, 6 in.

In Fig. 2 the shafts are shown mounted on ball-races. This may appear somewhat of a luxury in the face of the rest of the simplified engineering; suitable part-worn races, quite good enough for the job, are, however, usually obtainable at almost "gift" price from the local garage and it is not difficult to find them with the correct hole diameter for normal shafts. If necessary the shafts can be "ridged" with a cold chisel to give a reasonable driving fit.

The wooden housing is drilled, with an expansion bit, to give a tight driving fit for the races. It is desirable to fit collars to the shafts to prevent their movement through the races, but the simpler expedient of drilling and inserting taper pins is probably good enough. The wooden framework or housing should be made from hardwood if possible and the dimensions planned to suit the particular circumstances. This framework should be heavily creosoted when finally in position and the job may be completed by covering in the open

sides of the box with plywood or metal panels to make it reasonably weatherproof.

The cord should be of fine hemp and treated with grease and dusted resin. A friction block consisting of a piece of hardwood, bored-out to the operating shaft size, split and screwed together with wood screws, is necessary to enable a counterweight of, say, 25 lb. to be used for maintaining a tension in the cord without causing the system to rotate. This scheme is very desirable since, with careful adjustment, it can be so arranged that the beam will just turn itself into a high wind and "flex" itself automatically.

The shaft which is brought into the shack can be fitted with a handwheel for rotation (an old car steering wheel is excellent). A suitable indicating device is described in the January, 1951, issue.

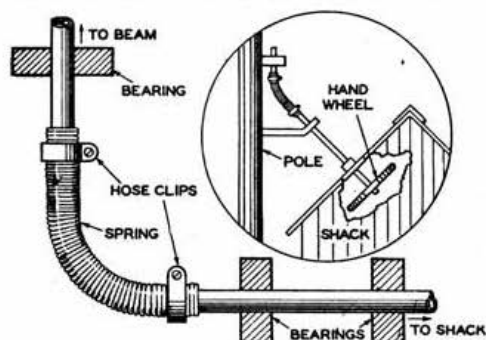


Fig. 3.

A "universal" drive for light arrays. Inset: preferred method of mounting.

### Universal Drive

Fig. 3 shows perhaps the simplest of all schemes for rotating a light beam system through an angle from its axis. It will be seen that the "gear-box" of the previous system is replaced by a heavy spring, mounted between the vertical beam shaft and the control shaft. While the arrangement will operate through a right-angle turn, it is particularly effective when used as shown in the inset sketch, where the control shaft is at an obtuse angle to the beam shaft.

The spring can be reasonably easily obtained; in fact the type commonly used for closing doors is quite suitable. The last few turns at the ends can be softened to allow them to be forced over the shafts to which they can be secured by means of hose-clips of the screw-thread type used on cars.

The only vitally important point to observe is the provision of adequate bearings to take care of the "restoring force" of the spring, which, as will be readily appreciated, may be considerable. As in the case of the previous system it may be necessary to provide a friction block to restrict movement, while the same method of rotation by means of a hand-wheel can be applied.

It is hoped that these simple ideas will help to stimulate the natural ingenuity of the amateur—but, remember, ingenuity should not be abused. "Heath Robinson" efforts which are not based on sound engineering principles will seldom prove to be of lasting value and may represent a very real danger to other members of the community!

**Closing Date for N.F.D.  
Licence Applications  
APRIL 2nd 1951**

### Amateur Radio Exhibition

THE Fifth Annual R.S.G.B. Amateur Radio Exhibition will be held at the Royal Hotel, Woburn Place, London, W.C.1, from Wednesday, November 28, until Saturday, December 1, 1951. The Exhibition will again be managed by Mr. Horace Freeman (Parrs Advertising, Ltd., 121 Kingsway, W.C.2.), who will be pleased to hear from manufacturers who have not previously exhibited.

### London Members' Luncheon Club

AT the February meeting of the Club the following officers were elected for the current year: Chairman, Stanley E. Vanstone, G2AYC; Vice-Chairman, Reg. Hamman, G2IG; Hon. Treasurer, Clem Jardine, G5DJ; Hon. Secretary, Frank W. Fletcher, G2FUX (11a Ickenham Road, Ruislip, Middlesex—Phone Ruislip 2763).

The retiring Chairman, Ken Alford, G2DX, thanked the members present for their support and expressed the hope that the Club would go from strength to strength. Due to business commitments outside London, Bill Corsham, G2UV, was unable to continue in office as Hon. Secretary.

Messrs. Alford and Corsham were cordially thanked for their past services.

After the business meeting, Mr. Crowther, G3DOG, spoke on his recent visit to the Caribbean area, where he had the opportunity of meeting fellow amateurs in Jamaica, Trinidad and Martinique.

London members who have not yet joined the club, as well as visiting amateurs, are assured of a hearty welcome at future meetings. A telephone call to the Hon. Secretary will ensure a seat.

Future meetings of the Club are scheduled to take place at the Kingsley Hotel, Bloomsbury Way, Holborn (opposite Headquarters), on the following Fridays: March 16, April 20, May 18, June 15, July 20 (12.30 p.m. for 1 p.m. lunch—price 5/6).  
G2FUX

## Ten Minute Quiz

This month's posers for the radio enthusiast.

1. What superceded the Lucerne Plan of 1934 and when?
2. Does the rotor of a squirrel cage A.C. motor use slip rings or a commutator?
3. The radiation resistance of a  $\lambda/2$  dipole with a reflector spaced at  $0.3\lambda$  is 80 ohms. What happens to the radiation resistance when the spacing is decreased to  $0.1\lambda$ ?
4. What R.M.S. current should a  $0.1 \mu\text{F}$ . condenser pass when connected across 230 volts 50 c/s. mains?
5. Which is the "odd man out"?  
Grey; Pink; Red; Blue; Violet.
6. What is a Barretter?
7. What is  $\text{SiO}_2$ ?
8. What type of condensers should be used in a D.C. Amplifier?
9. Name the countries to which the following callsign prefixes belong:  
(a) CP; (b) HP; (c) SP; (d) ZP.
10. What is the time limit on the submission of B.E.R.U. Contest logs?

Now turn to page 342 and see whether you have beaten the Question Master.—H.E.B.

# THE MONTH ON THE AIR

By A. O. MILNE (G2MI)\*

## Royal Amateurs

IT is with much interest that we learn from Major Ken Ellis, HZ1KE (via G8FF) that two new amateur stations are now on the air from Saudi Arabia. One is being operated by His Royal Highness Prince Abdullah Faisal, with the call HZ1AF, the other by His Royal Highness Prince Talal, with the call HZ1TA, from Riyadh. Both stations will be active on 14 Mc/s. 'phone and both operators are on the way to becoming members of the R.S.G.B. (Thanks G8FF O.M.).

## More "Top Band" News

Apologies to Peter Pennell, G2PL, who we now learn made the first "top band" contact with Turkey (TA3FAS) last year. Incidentally, G6LB, who was the first to do it this season, made no personal claim to be the first ever.

From Finland comes a report that OH2PK heard G2ATM, 3PU, GW3ZV, G5HB, G5JU and G6GM during the "top band" contest on January 20, 1951. Eight nights later, G2AOL, 2IM, 2PL, 3EPU, 5RI and 8LU were logged by OH2PK with signal strengths from S5 to S8. He also heard W1BB, W2ESO and VE1AE, whilst G6GM was copied at 579 on February 13. OH2PK would like to arrange some cross-band tests.

W2ESO worked G2PL, 6BQ, 6GM, 8NF and GW3ZV during the "top band" contest between 0715-0809 G.M.T. and thinks he must be top-scoring W!

## Notes and News

DX conditions during February improved quite a bit, especially on 14 Mc/s., although 28 Mc/s. remained very poor indeed. The 3.5 Mc/s. band produced a wealth of W's and VE's and opened up for DX as early as 2115 G.M.T. on occasions, according to BRS16304, who also mentions the excellent reception of medium band American broadcast stations in the early hours of the morning.

G5FA, who worked 58 countries during the first three weeks of the year, wants to be the first to raise 100 in a month!

YI3ECU with 15-40 watts input to a pair of 807's has worked 74 countries in three months. He uses an aerial only twelve feet high with ordinary flex as a feeder, and this receiver is an SX28. Unfortunately 14 Mc/s. goes "dead" in Iraq around 2100 G.M.T. and 28 Mc/s. produces only about two signals a month.

G3ATU reports that PK4DA is now using S.S.B. 'phone and putting in a very solid signal. He recently heard TDRK with a T7 note on 14050 kc/s. giving his QTH as U.S.A. Air Mission, Guatemala City. He mentions the consistent signal radiated by VS7NX from 2000 G.M.T. to midnight on 7 Mc/s. VS7NX himself reports that he has W.A.C. on 7 Mc/s.; his DX includes FM7, VR2, UF6, CR7, ZS7 and KZ.

BRS16304 has logged EL2R, EL2X and EL6A on 14 Mc/s. and says ZS9F has been an outstanding signal on 28 Mc/s. He reports that Somalia stations now use the prefix I5 and that I5ZC has been heard working I1BMO. He has also heard Algerian amateurs using the prefix 4A8 instead of FA. How we dislike these new monstrosities of call signs, of which 3V8, 4X4 are examples.

VS2AA, using one of his famous aerals, enjoyed himself during the A.R.R.L. contest and on 7 Mc/s. knocked off 35-W6's and 2-W7's, the best report being 589.

BRS18948 of Glasgow finds that the W6's come in well around 1700 G.M.T. on 14 Mc/s. He also comments on the large number of EA8's now active.

BRS18017 gives a few frequencies worth watching. UA0GF at 1600 G.M.T. (14030); FL8AG (14020); VS2CT, 1600 G.M.T. (14040). He has cards from EA6AF, TF5TP, CR7BC and F9QV (Corsica). Talking of cards reminds us that there are a number of QSLs at the Bureau addressed to a Mr. K. Holmes, ZEL2H, who used this combination as a means of identification for his listener reports whilst with the R.A.F. in Southern Rhodesia. Does anyone know his present QTH?

Mr. Unwin of Cambridge remarks that even 14 Mc/s. has had its moments during the past month, for example, PY4AGZ at S9+10 on 'phone at 1800 G.M.T.

From ZL2GX comes the news that ZL 'phone stations may now use 14150-14200 kc/s. Commenting on GM3EST's D.X.C.C. award, G3ETU gives the date of his September 25, 1950, and wonders if this can be beaten.

GM3GDX offers FP8BX at 2045 (14070) and FY7YB at 2120 (14025) as his best selections for the month. Best QSO's, all new ones for him, were with VK3, CN8, ZC4, EA8, KZ5 and MI3. He gives the QTH of EA8BD as Box 175, Las Palmas.

Associate 1180 logged W6YYT/MM in QSO on February 18. During the contact he heard W6YYT say it is rumoured that MM stations may have to go off the air. Information please? A 1180 has done quite well on 28 Mc/s. having logged KZ5, HC, TI, ZE, ZD4 and ST mostly in the mornings and early afternoons. On 14 Mc/s. he has heard VE8OE at 1907 (14180); VP6SD at 1920 (14200); YN4CB at 2214 (14280); JA2MB at 2340 (14180); KG4AE at 2204 (14230); and EL9A at 1814 (14310).

GM3CSM's recent best are UM8KAA at 1400 (14060); JA2KW at 1630 (14008); CS3AA at 1830 (14005); VT1AC, who QSL's (14135); HS1VR at 1400 (14060); QTH c/o Signal Corps, Bangkok; VT1AF at 1550 (14098); VQ6BFC at 1830 (14084); and KC6WD at 1115 (14118). He requires a card from EL3A. QST please copy! Total countries worked to date, 165, with 154 confirmed.

W2GT reports on a few useful ones to watch on 7 Mc/s.—namely KJ6AI, CR5AC, FY7YB, VP5BE and EA0AB, all around 7030 kc/s.

G3BQJ sends a summary of activity in the Darlington area beginning with his own 97 confirmed, closely followed by G2CKN with 85.

G6YC has VRIC's card and will allow others to look at it for a small charge! G3BIS, G3EQH, G3GEJ, G3CDM and G8IA are all active.

## Amateur Movements

ZB1AM/G3GKT is now QRT but hopes soon to be active with a ZE call.

VU2BC/VS2BE/G6BW/VS1BC/G2BQ, is now MD2BC and with 10 watts input to a rather low dipole has been getting out well. He is the new QSL Manager for Tripolitania, having taken over from MT2E who is now in Aden.

\* 29 Keelull Gardens, Hayes, Bromley, Kent.

G6VF reports that ex-G4RV is now in Vancouver and is on the air with a B2 under the call VE7ZY.

G6XS and G6RH report from ZS6BT that ZD9AA is active once more with Red Fenton at the key. At present the input is only 13 watts on 7020 kc/s. He hopes soon to be on 14 Mc/s.

VS1DK/G2APN and VS6BW are now in this country. 1DK is a much-travelled Government official with more than 1½ million miles "on the clock."

AP5B has been transferred to India and is now in Bombay. G5FN, one of the stalwarts of the Medway area, will soon be GW5FN/A. GC2BMU is now permanently in G, thus, Alderney is now without an amateur transmitter.

VP7NQ has left Bahamas and his address is now 35 Friends Road, Norwich.

### New Countries

We are advised that Saarland, and Amsterdam and St. Paul Islands will become two new additions to the Countries list. The official news and qualifying dates will be announced by the A.R.R.L. in the April issue of *QST*. Sicily is *not* being added.

### Pirates, etc.

ZE3JJ (ex-G3CHP) who now has 93 countries to his credit considers that VQ9AA is a "phoney." There has been no Naval H.Q. in the Seychelles since 1946 and the naval radio station has been off the air since 1947. In any case a British Naval "type" would not use the expression, "Navy office" which is an Americanism. Our guess is that the offender is located in the middle west of U.S.A., which opinion is strengthened by the fact that nearly all the cards which have come in for him are from W's.

The following are unlicensed: V57AH, AQ, AV, BO, EV, HB, JG, LT, ND, NF, TG, TJ, TS, VR, WD and ZR.

It is now definite that 3A2AB is the only amateur station ever to operate in Monaco. CZ2AC, it will be remembered, was apprehended in Switzerland, even though he had sent out cards purporting to come from Monaco.

### Caribbean Journey

Most of us, at one time or another, have dreamed of a tour round some of the amateur stations with whom we have been in contact. Dick Crowther, G3DOG, who is one of those who can combine business with pleasure, has just returned from a trip which included lunching with FM8AD and FM7WF (and incidentally collecting cards for previous QSO's from both!), meeting VP4TB in Trinidad, attending a meeting of the Radio Association of Jamaica (with VP5AD, AK, AR, BI, BL, DX, FR, MU and RS present), when a specially composed Ham Radio Calypso was rendered. He also found time to meet VP6SD and 6PV on the island of Barbados, and had a chat by 'phone with VP2AD in Antigua.

Amongst the news collected was that FY7YA will soon be on the air, jointly operated by Lucius Prudent and Marius Delapine in Cayenne, and that FG8OA will shortly be active from Guadeloupe. The operator, Andre Latil, works in the local Pan American Airways office. VP4TB is the power behind the efforts to get some of the rare countries on the air, via the ramifications of P.A.A.

### Flash

During the "Top Band" test on March 11, ZL1AH heard W1BB, RST549 and W9CUQ, RST329. ZL1AH (ex-G3AH) also believes he heard G6GM, RST219. ZL1MP (ex-GW6AA) was a witness (via G5WR).

## Slow Morse Transmissions

Regular slow Morse transmissions have proved of considerable benefit to many aspiring amateurs, but more volunteers are still required for districts not already covered and to allow a temporary respite to those who have given their services for several years.

Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. Lamborn Edwards, A.M.I.E.E. (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

### As from April 15, B.S.T. will operate.

G.M.T.	Call	kc/s.	Town
<b>Sundays</b>			
10.00	G6MH	1990	Southend-on-Sea
10.00	G5XB	1950	Reading
10.00	G3AEZ	1847	Dorking
11.00	G3ADZ	1900	Southsea
11.00	GM3AVA	1860	Falkirk
12.00	G3CWW	1730	Hendon, N.W.4
21.00	G2FIX	1812	Nr. Salisbury
22.00	G2FXA	1900	Stockton-on-Tees
<b>Mondays</b>			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G3AIX	1760	Birmingham
19.30	G3GYW	1922	Westcliff-on-Sea
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3DSR	1750	Derby
21.00	G3ESP	1850	Wakefield, Yorks
21.00	G3BLN	1900	Bournemouth
21.00	G3BHS	1820	Eastleigh, Hants
22.00	GM4MF	1860	Falkirk
22.00	G3AEZ	1847	Dorking
22.15	G8TL	1896	Ilford
23.00	G3EIW	1760	London, S.E.18
<b>Tuesdays</b>			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G5XB	1905	Reading
19.30	G2CPL	1900	Lowestoft
21.00	G3DMP	1850	Wakefield, Yorks
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2FXA	1900	Stockton-on-Tees
22.30	G6JB	1820	Salcombe, Devon
23.00	G3EIW	1760	London, S.E.18
<b>Wednesdays</b>			
18.45	G3CQL	1990	Leigh-on-Sea
19.00	G3ADZ	1900	Southsea
20.00	G2NY	1850	Preston
20.00	G3AFD	1783	Southampton
22.00	G3DLC	1800	Grays, Essex
22.00	GM4JQ	1860	Falkirk
23.00	G3EIW	1760	London, S.E.18
<b>Thursdays</b>			
18.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G3BUJ	1990	Southend-on-Sea
20.00	G3FVH	1920	Hull, Yorks
20.00	G3NT	1805	Northallerton
21.00	G2AQN	1850	Ossett, Yorks
21.30	G6DL	1760	Birmingham
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3ARU	1990	Wansford, E.12
22.00	G3AEZ	1847	Dorking
22.30	G3OB	1803	Manchester
23.00	G3EIW	1760	London, S.E.18
<b>Fridays</b>			
13.00	G3AXN	1870	Southend-on-Sea
14.00	G3ADZ	1900	Southsea
19.00	G3BLN	1900	Bournemouth
19.30	G2CPL	1900	Lowestoft
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G2AMV	1870	Wirral
21.00	G3RB	1850	Ossett, Yorks
21.00	G3BHS	1820	Eastleigh, Hants
22.30	G6JB	1820	Salcombe, Devon
23.00	G3EIW	1760	London, S.E.18
<b>Saturdays</b>			
22.00	GM3OM	1860	Falkirk
23.00	G2FXA	1900	Stockton-on-Tees
23.00	G3EIW	1760	London, S.E.18

**OTHER AMATEURS ARE ASKED TO AVOID CAUSING INTERFERENCE TO THESE TRANSMISSIONS**





# AROUND THE V.H.F.'s

Continental Activity Reports

By W. H. ALLEN, M.B.E. (G2UJ)\*

## The Two Metre Band

GENERALLY speaking the 2 metre band exhibited normal winter conditions during January and February. Remembering that conditions during 70 cm. Activity Week (December 30 to January 7) were poor, the following observations forwarded by G3EHY (Banwell, Som.), covering two metres during that period are of special interest. In the early morning of January 4 conditions to the north were good for distances up to 150 miles, but nothing was heard towards the east or south-east. On the 5th and 7th stations up to 100 miles away were worked to the north and south-east. Barometer readings varied from 28.4 to 29.2 inches and the average temperature was 45 degrees over the period of the tests.

Apart from the foregoing, G3EHY reports that January showed occasional openings, notably on the 14th for an east-west direction and on the 21st, 22nd, 23rd, 28th, 29th and 30th when G8SB, near Manchester, was worked at strengths up to S9 on 'phone both during the early part of the evening and again around midnight. Following a record "low" barometer of 27.4 inches on February 4, conditions started to improve three days later, and on the 11th, stations in the London and Cambridge areas were coming through well and many contacts were made. During the month G8SB and G3GHI (Purley, Surrey), were the most consistent stations heard at Banwell.

## The V.H.F.'s in Scotland

GM3EGW (Dunfermline) reports that only a few stations are active in the south-east of Scotland, with three—GM3GIV, 4QV and 6XW—all in Stirlingshire, on two metres. GM4QV is also interested in 70 cm, on which band he worked GM3ENJ (Dunfermline) last year. There are at least six stations active on 2 metres in the Glasgow area in the shape of GM2BPW, 3EHI, 3FOW, 3GAB, 5VG and 6ZV, with GM6WL leading a 70 cm. group. Dunfermline is well represented on 2 metres with GM3EGW, 3ENJ and 3FYB, 'ENJ being fortunate in having a QTH nearly at the top of the 450 ft. high Kingseat Hill facing south to the Forth. He was heard by G6LI (Grimsby) last summer on 2 metres. GM3EGW, despite the handicap of an indoor aerial immediately below a lead roof, contacted G3COJ (Hull) at a distance of 200 miles last year.

Regarding the apparent absence of auroral conditions on 2 metres in the U.K.—mentioned in the November, 1950, BULLETIN—GM3EGW noticed unmistakable auroral distortion on 20 metre signals from Edinburgh on December 15 and found that GM3DBA (Airdrie), who was working Glasgow on 2 metre 'phone, was almost unreadable because of rapid flutter. These conditions lasted from approximately 2300 to 2340 G.M.T., and although several calls were made with the aerial beamed north no results were forthcoming. This effect ties up with similar conditions reported by

G4FB and G6UH last month, and was preceded on the previous day by a high hiss level on 2 metres.

## 70 cm. Notes

G8KZ (London, W.10), is radiating 'phone and C.W. on 436.05 Mc/s. and using a C.C. converter with a CV 102 crystal mixer. The signal and oscillator injection circuits of the latter are "cavities" taken from a "Glide Path" receiver. The 6C4 C.O., on 17 Mc/s., is followed by two 6J6's which multiply the frequency to 408 Mc/s., the I.F. being 26 to 30 Mc/s. for which an RME 69 receiver is employed. The aerial is somewhat unconventional, as it is the normal 2 metre 6-element Yagi. This arrangement produces three equal lobes, and with 20 watts input to an 832 tripler results in RS 58 reports in each direction with G5TP (Stoke Row, Oxon.) at 40 miles.

Commencing on March 1 and continuing nightly until further notice, regardless of conditions, G3EHY will transmit from 1840 to 1850 G.M.T. on 435.75 Mc/s. with his beam in the London direction. The output of the transmitter will be approximately 6 watts, and various types of array will be employed from time to time.

G8SM (East Molesey, Surrey), who reports a notable improvement in activity on this band, has worked G3BOB (Hayes, Kent), G5DT (Crayford, Kent) and G8KZ in addition to the "regulars." One of the latter is G2DD (Stanmore, Middlesex), with whom a nightly sked, is run.

Some experimental results due to G2DD and 8SM make interesting reading. They include comparison between a CV 53 working in a co-axial circuit and the "standard" 832 tripler. The efficiency of the e.g.t. valve is considerably higher than the 832, but the output—some 2 watts—and signal strength are similar. Lecher lines have been found not only more convenient, but equal in efficiency to the more mechanically complicated co-axial circuits although the latter appear to have advantages from about 450 Mc/s. upwards.

Another investigation concerned the relative efficiencies of a heavily silver-plated Lecher line and one of similar dimensions of dirty brass. No difference was noticeable. It is fairly certain that other workers on the V.H.F.'s will have some observations to make on these points and their views will be welcomed.

The single co-axial tuned circuit to be found in the "Glide Path" receiver has been used successfully for matching the unbalanced output from a co-axial tank circuit to a 300 ohm balanced line.

## French 70 cm. Skeds.

F8GH (Beauvais) and F9AE (Neuilly, nr. Paris), 434.79 and 435.0 Mc/s. respectively, are active almost every evening and give test transmissions from 2030 to 2040 French Time, followed by a listening period with beams turned towards this country. Both stations would welcome skeds. at any time after 1900 French Time, but state that their C.C. converters only tune around 435 Mc/s.

\* 32 Earls Road, Tunbridge Wells, Kent.



## Norwegian Amateurs and the V.H.F.'s

Alf Strandli, LA2EC, of Oslo, sends a report of past and present V.H.F. activity in Norway. LA2F and 2Z were the pioneers, and as early as 1932 contacted one another at a distance of 20 miles on the 5 metre band. In 1948, using frequencies between 56 and 60 Mc/s. and taking advantage of 10 to 15 sporadic E openings, LA1F, 1V, 6J and 7F worked stations in this country, Paris, Southern France, Italy and Czechoslovakia, LA7Y holding the DX record with a two-way contact with Toulon, France, at 1,121 miles. He also worked Marseilles with a 2 watt transmitter. In the summer of the following year, 6 metre transmissions from LA7Y were heard by 4X4ES in Haifa.

In January, 1950, permission to use the 5 metre band was withdrawn and work on 2 metres commenced. The scarcity and high prices of suitable V.H.F. components is responsible, to a large extent, for the lack of extensive V.H.F. activity in Norway, but LA1V, 2F, 3AA, 5FA, 5N and 7Y, all in the Oslo area, are doing what they can to foster enthusiasm.

Topographically the country is such as to interfere with propagation on the 2 metre band to a far greater extent than is the case in most other European countries, and in consequence no sensational results have so far been achieved. At a meeting held in Oslo last year to discuss 2 metre operation it was decided to employ vertical polarisation until such time as horizontal polarisation became necessary, such as for contacts outside the country.

LA7Y is reported to have a 32-element array, and LA2F is running a 150 watt transmitter with C.C. and anode modulation. LA5N has a 2 metre rig in his car.

We hope the fine record enjoyed by LA amateurs on the V.H.F.'s in the past will be added to by similar achievements in the future, and look forward to publishing further details in due course.

## Two Metres in Denmark

With reference to a paragraph in this feature in the January BULLETIN regarding 2 metre activity in Denmark, we are indebted to Peter Bradley, G8KZ, for the following information. Stations known to be active are OZ2BX, ES, FR, WP, 3EP, 5AB, HV, MK, Q, 6UN, 7EP, KM, TK and 9H, most of whom employ crystal control; no "noise boxes" are in use. OZ7KM (Copenhagen) reports a contact with OZ2WP, 175 miles away on the island of Fyn, and reception of signals from OZ2FR (Baekke) at 200 miles. SCR 522 equipment is popular but supplies are limited.

## French V.H.F. Contest

R.E.F. have arranged a contest to take place from midday Saturday, April 7, to midnight on Sunday, 8, covering the 72, 144 and 435 Mc/s. bands. All times given are G.M.T. Although British amateurs are not permitted to transmit on 72 Mc/s., some may be in a position to receive on that frequency, and useful data might be obtained from comparative observations covering the three frequency bands to be employed.

In order to co-ordinate activity, R.E.F. recommend that transmissions should be divided as follows over the three bands:

- 72 Mc/s. 0-3-6-9-12-15-18-21 Hours.
- 144 Mc/s. 1-4-7-10-13-16-19-22 Hours.
- 435 Mc/s. 2-5-8-11-14-17-20-23 Hours.

To ensure adequate coverage in all directions the French stations are urged to adopt, so far as possible, a definite time schedule in regard to transmissions from other European countries. The system suggested is:

From the hour to 15 minutes past, listen for: East and North - East France, Luxemburg, Belgium, Holland, Denmark, Germany, Sweden, Norway and Finland.

From 15 to 30 minutes past each hour, listen for: West, North and North-West France, Great Britain and Ireland.

From 30 to 45 minutes past each hour, listen for: Paris area, Lyonnaise and Switzerland.

From 45 to 60 minutes past each hour, listen for: South-East, South and South-West France, North Africa, Italy, Spain and Portugal.

Rules include:

**Calling:** "CQ REF de . . ." French stations will add their section number after the call sign and Swiss stations two letters denoting their Canton.

**Check Group:** The report—RST or RS for C.W. and 'phone respectively—will be followed by a running serial number commencing at 001.

Reports and QSL cards referring to the contest should be sent to the Contest Manager, R.E.F., 72 Rue Marceau, Montreuil (Seine).

## U.S.K.A. Contest

Simultaneously with the R.E.F. contest referred to above, the Swiss Society, U.S.K.A., is holding a contest on the 144-146 Mc/s. band. A1, A2 and A3 (i.e., C.W., M.C.W. and Telephony) are permitted, and a code group comprising the RST or RS report followed by the serial number of the contact must be exchanged. Points are scored at one per kilometre distance between the contacting stations. Logs, which must include call-sign, name, address, height above sea level and a full description of the station, should be sent to reach the VHF-TM, Mr. Adrien Nogared, chemin de la Beaume 19, Evillard/Bienne, by April 20.

The dates and times for this contest are: April 7, 1600—2100 G.M.T.; April 8, 0400—1600 G.M.T.

## Two Metre Contest

The second annual two metre contest organised jointly by the *Amalgamated Short Wave Press* and the Amateur Division of *E.M.I. Sales and Service, Ltd.* will take place during the week-end, April 21-22. It will be remembered that this contest—to be run again on a "merit" basis designed to give a fair chance to all competitors—excited considerable interest among 2 metre enthusiasts last year, and it is hoped that full support will again be forthcoming.

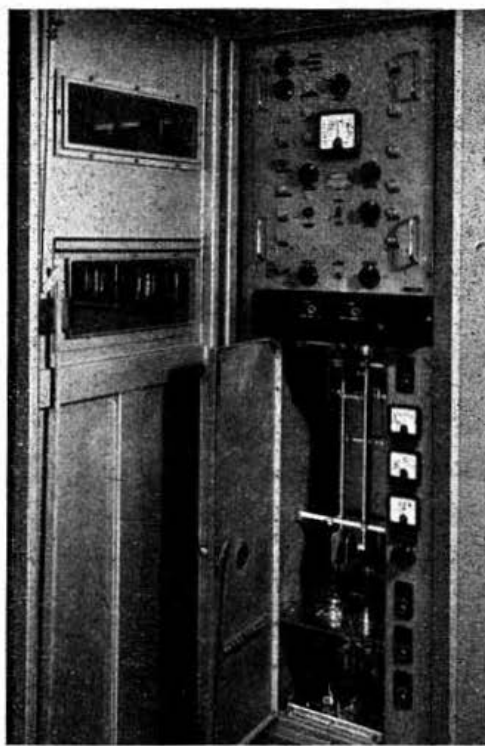
The times of operation will be from 1200 B.S.T. time on April 21 to midnight on the following day, and contacts may be on C.W. or 'phone. A running serial number will be used, starting at 001 followed by the RST or RS report and QTH. Logs should include the height of the station above sea level and of the aerial above ground, and details of receiver, transmitter and power employed together with a note of the distance in miles of each contact and the total number of "contest miles" obtained. Further details may be obtained from *Short Wave News*, 57 Maida Vale, London, W.9, to which address logs should be sent.

## Silent Key

All V.H.F. men will regret to learn of the passing of Mr. A. J. Marriott, G8UZ, of Sutton-in-Ashfield, Notts., one of the pioneer workers on the 12 cm. and later on the 3 cm. bands. For a time in September last, he, in association with G3APY, held the British record for two-way working on 12 cm. and the world record for 3 cm. with a distance of 12 miles in each case.

## WROTHAM EXPERIMENTAL

By J. P. HARRIS



A view of the "F.M.Q." drive unit (top) at the Wrotham F.M. station. Below this are two conventional R.F. amplifiers to give 250-watt drive to the main amplifier stages.

[Photo: Courtesy B.B.C.]

FOR several years experimenters—particularly those interested in high fidelity—have been puzzled by the apparent lack of progress in the development of V.H.F. broadcasting in this country. It has long been accepted that transmitters operating in the crowded medium-wave band, with 9 kc/s.—or less—separation between stations, could never hope to accommodate the range of audio frequencies required for first-class reproduction. From overseas have come a flood of conflicting reports on the results achieved by frequency modulation equipment during the past ten years or so. Today there are over 800 F.M. stations in the United States, 20 in Germany, and regular or experimental services in a number of other countries. Yet, first-hand information on F.M. broadcasting is still scarce in the U.K. and for this reason a recent opportunity to visit the experimental V.H.F. station at Wrotham Hill, 20 miles south-east of London, was not to be ignored.

Frequency modulation first began to attract public attention in the United States around about 1940, but, owing to the war, practical experiments on broadcast equipment in the United Kingdom had to be postponed. In 1945, however, the B.B.C. Engineering Research Department began a series of tests. By this time some of the early claims for F.M. were beginning to be questioned by many experts and the early B.B.C. transmissions—from Alexandra Palace—did not show conclusively whether A.M. (amplitude modulation) or F.M. would be superior for V.H.F. broadcasting in this country. It was decided, therefore, to carry out comparative tests at high power and it was for this purpose that the Wrotham station came into existence. A site 730 ft. above sea level was

chosen and a 470 ft. mast erected. The new transmitter began operating in July, 1950, and the present series of tests are to last at least twelve months. Normal range is about 50 miles. A limited number of F.M. receivers have been made available to selected listeners—the majority of them being members of the B.B.C. staff.

For the benefit of those who wish to listen to the Wrotham station (A.M. 93.8 Mc/s., F.M. 91.4 Mc/s.) here is the normal 6-day schedule of transmissions:

1100—1200 (Relay of B.B.C. "Light" programme).  
1300—1400 (Relay of B.B.C. "Light" programme).  
1400—1430 (F.M. transmitter, carrier only).  
1430—1630 (Relay of B.B.C. "Light" programme).  
1800—Close down.

Mondays, Tuesdays and Thursdays—Relay of B.B.C. "Third" programme.

Wednesdays, Fridays and Saturdays—Relay of "Home" programme. In addition, experimental transmissions are made outside these times. There are, at present, no Sunday transmissions.

### The Transmitters

Of particular technical interest is the Marconi F.M. transmitter which has a power output of 25 kW. (believed to be the most powerful transmitter of its type in the world) and which operates on a mean carrier frequency of 91.4 Mc/s. with a maximum deviation of plus/minus 75 kc/s. The heart of the transmitter is the "F.M.Q." (Frequency Modulated Quartz) unit. The crystal oscillator (3808.33 kc/s.) is connected through a quarter-wave network to two 6F37s forming a balanced modulator. These reactance valve modulators produce a deviation of about plus or minus 3 kc/s. To improve the signal-to-noise ratio, 50 micro-seconds pre-emphasis is applied to boost the higher audio frequencies. In this respect the B.B.C. "F.M. standards" differ from those found in the United States where 75 micro-seconds pre-emphasis is usual. The radio frequency output is then multiplied twenty-four times (three doublers followed by a TT15 double tetrode tripler) giving an output of 4 watts at the required carrier frequency. This unit forms, by itself, quite a serviceable F.M. transmitter and in the early tests was found to put a strong signal into Tatsfield, 13 miles away, with only a simple dipole aerial. The unit also contains a 19041.66 kc/s. crystal oscillator (five times that of the fundamental frequency) to aid in setting up the correct deviation. Below this compact unit are mounted two conventional R.F. amplifiers, a C144 double tetrode giving an output of 50 watts followed by two TT16 tetrodes giving an output of 250 watts.

From this point the transmitter begins to depart from normal techniques, as familiar to most amateurs, and to resemble more closely the

# IMENTAL STATION

**VKER (G3VA)**

ably since the Beveridge Report placed special emphasis this country. To provide technical information on the Press representatives were recently given an opportunity Wrotham, Kent. Here is a report on items of special amateurs.

"power house" expected at B.B.C. installations. There are four single-ended earthed-grid amplifiers with coaxial-line tuning elements, the final stage consisting of two giant BR128 valves in parallel to give an output of 25 kW. at an efficiency of some 65 per cent. This high order of efficiency is in part due to the utilisation of the excessive grid drive produced by the preceding stage; normal efficiency for the BR128 at this frequency is said to be of the order of 55 per cent. with about 6 kV. applied to the anode. Airblast cooling is used.

The A.M. transmitter, which has an unmodulated output of about 18 kW., is basically similar to the F.M. transmitter except that the reactance modulator valves are taken out of circuit. Unlike the F.M. transmitter, however, a high power audio amplifier and modulator is required (one of the reasons why the capital cost of F.M. equipment is considerably less than with A.M.). Modulation is applied to the last two R.F. stages.

## Control Equipment

Both transmitters are controlled and monitored from an adjoining kiosk which has windows looking out on the main transmitter hall. The simplicity of the control desk for the F.M. transmitter is particularly noticeable. Also available in this room is a Marconi V.H.F. monitor for checking the deviation and mean carrier frequency of the F.M. transmitter, although these characteristics are also measured at Tatsfield. Frequency stability has to comply with the international requirement (plus or minus 2.75 kc/s.) and no difficulty is experienced in keeping within these limits. A rough check on the afternoon of the visit showed the transmitter to be within 400 c/s. of its correct frequency. Interlock indicators, similar in principle to those fitted at the Sutton Coldfield TV station, are used on both transmitters to facilitate rapid fault finding. A spare "F.M.Q." unit is kept in readiness for replacement on either transmitter.

## Aerial

On top of a 360-ft. lattice tower is mounted a cylindrical aerial section 110-ft. long and 6½-ft. in diameter. In this section are 32 slots arranged in 8 tiers, each tier having 4 slots spaced at 90 degree intervals round the circumference. Each slot is 8 ft. high and 1 ft. wide and function as "folded slots." All 32 slots are fed in phase (with an accuracy better than 90 per cent.) and the division of power results in comparatively low voltage stresses. This aerial system, which radiates horizontally-polarised waves, has a broad-band coverage of 87.5-95 Mc/s. with a mean power gain of 8 db compared to a simple dipole. This power gain does not deviate by more than plus or minus 1 db in any horizontal

direction. One word of warning to V.H.F. enthusiasts who might consider such an omnidirectional array as the answer to all their problems—the feeders and matching, it is understood, take an enormous amount of adjusting!

Unlike the amateur, the B.B.C. regards temperature inversions as a liability. It is obvious that if a large number of V.H.F. broadcasting stations are set up all over the country there will be a number of shared channels so that when propagation conditions are "abnormal" some interference may result. The Engineer-in-Charge at Wrotham, however, did not seem unduly worried at the prospect and was inclined to regard such inversions as very sporadic (144 Mc/s. enthusiasts might not agree). The B.B.C. are engaged in compiling a mass of data on V.H.F. reception at various centres throughout the country to check on the amount of such interference which may be expected. Undoubtedly these records, if available, would be of interest to all V.H.F. enthusiasts. Incidentally a report on some early F.M. transmissions at low power was received from Edinburgh.

## Quality

So much for the station, itself, but what of the results achieved? Do they suggest that there is really a need for high quality F.M. in this country? Well, the transmitter specifications provide one clue. On the F.M. transmitter these are:

60-15000 c/s., harmonic distortion not more than 1 per cent.

30-60 c/s. and 15-20 kc/s., harmonic distortion not more than 1½ per cent.

It was stated that these figures were easily achieved.

On the A.M. transmitter the corresponding figures are:

60-10000 c/s., harmonic distortion not more than 3 per cent.

30-60 c/s. and 10-15 kc/s., harmonic distortion not more than 3½ per cent.

But—and there are several rather serious buts—the F.M. transmissions from Wrotham and elsewhere are likely to be limited for some time to come by the frequency range and characteristics of the G.P.O. land lines. Although two high quality circuits are available from London, even these introduce considerably more distortion than occurs at the transmitter, while provincial land lines, as used for inter-Regional relays would immediately re-introduce the cut in high audio frequencies which it is the aim of F.M. to restore. A possible solution to this problem might be the development of micro-wave radio links. Then again high fidelity reproduction will require a new approach towards receiver and speaker design for standard sets. There is already talk of F.M./A.M. V.H.F. adapters for use with ordinary commercial receivers—but how many of the present standard models are likely to do justice to the full-range of frequencies transmitted? And, finally, how many of the general public yet appreciate high fidelity when they hear it? Not many judging by the popularity of broadcast receivers fitted with "tone" controls skilfully designed to remove the last traces of high audio frequencies!

## This Month's Howlers

From G3DEL. Overheard on the air. "I hear old G3 --- radiates on a 66ft. Zip!"

The mains voltage in the United States is 110 volts A.C. except in Washington which is D.C.



**Dan Scherer, W2NVH**, Editor of the Radio Amateurs' Programme transmitted each Sunday by the Voice of America, tells us that the scope of this 15-minute broadcast is being broadened to cover items of interest to all who engage in short wave activities. Propagation information, construction and circuit techniques now form the basis of many of the programmes. The latest schedule is: Sundays, 1915 G.M.T. on 11870, 15270, 17780 and 21500 kc/s. (U.S. stations) and 6110, 7200 and 9700 kc/s. (B.B.C. relays).

An amateur publication of more than passing interest is the "Ham's Interpreter" compiled by OH2SQ aided by a number of European enthusiasts including G2AFO. The booklet gives lists of selected words and phrases current in Amateur Radio in English, French, Spanish, Italian, German, Swedish and Finnish. Members who read overseas journals or who wish to try conducting QSOs in any of the above languages or who, perhaps, are just looking for a suitable phrase with which to ensure that their QSL cards catch the eye of a DX rarity, will find this booklet a gold-mine of information which is normally hard to come by. It is not known whether this publication is yet available commercially in this country, but OH2SQ's address is Mr. Pentti Aarnio, Tapiolantie 21, Helsinki, Finland.

**Chilton Electric Products, Ltd.**, of Hungerford, Berks, who claim to be one of the few manufacturers producing an **electric dry shaver** that does not cause radio or television interference, have offered to supply members with reprints of a non-technical article on "Interference Suppression" which recently appeared in *The Pianomaker*. Other amateurs who have repeatedly lost VK stations at 8.17 a.m. each morning while a neighbour shaves, will welcome any attempt to spread the good word on the "suppression" of these pernicious (from a radio viewpoint) machines.

More than half of the 106 television stations in the United States can be linked by cable or radio relays. . . . New HQ station (K4AF/K4USA) of the U.S. Military Amateur Radio System (which now has more than 3,000 members) is installed in the Pentagon Building, Washington D.C. and can be operated by visiting amateurs. . . . The late VE2HE transmitted the first TV signals in Canada last September on 53.51 Mc/s. Good signals were received 21 miles away. . . . There are now about 46,000 radio-equipped taxicabs in the U.S. and 1,200 American ship-borne radar installations. . . . Tests carried out in New York recently on 450 and 150 Mc/s. suggest that the higher frequency is equally suitable for mobile telephone coverage in large cities.

### The Telcon Story

TO mark the occasion of the Telcon Centenary Celebrations the Directors of *The Telegraph Construction and Maintenance Co., Ltd.*, have published an account of the many contributions made by their Company to the development of cables of all types since it was formed 100 years ago. Of particular interest to the student of history are the chapters which describe the making and laying of the first Atlantic cables.

"The Telcon Story" is profusely illustrated, printed on art paper and well bound. Enquiries for copies should be addressed to the Company at 22 Old Broad Street, London, E.C.2.

AS a result of discussions between the Secretary to the National Industrial Development Council of Wales and Monmouthshire, and Society representatives, the Cardiff membership has been invited to participate in the Welsh Industries Fair to be held during the period July 4-14th.

The Cardiff group plan to operate an amateur station from the Fair and to exhibit a number of items of amateur-built equipment. A special feature will be a "Swords into Ploughshares" section which will feature converted Service equipment. To stimulate amateur construction, a TCS12 transmitter and receiver donated by Mr. Frank Sully, GW3CAY, will be awarded to the South Wales amateur constructing the best item for exhibition.

The Cardiff T.R. (Mr. G. F. Wilson, GW3BZH, 120 Cardiff Road, Llandaff) will be pleased to arrange for overseas visitors to inspect local amateur stations.

Full information regarding the Fair and the facilities of the City are obtainable from the Information Bureau, City Hall, Cardiff.

## Contests Diary

From	G.M.T.	To	G.M.T.	Contest
Mar. 17	0001	Mar. 18	2400	A.R.R.L. DX Contest ('phone)
Mar. 31	1500	Mar. 31	2300	Affiliated Societies Contest (C.W.)
Apr. 1	1500	Apr. 1	2300	Affiliated Societies Contest ('phone)

### Thanks Mid Island Radio Club

THE Society was recently advised by the A.R.R.L. that the Mid Island Radio Club of New York were anxious to purchase four one-year subscriptions to *QST*, to be presented as gifts to four different British Radio Societies as a memorial to their first Club President, the late J. Paul Thomas, W2UBW. Accordingly the names of all the Societies affiliated to the R.S.G.B. were placed in a box and four were picked out at random. The fortunate four are Harlow and District Radio Society, Queensbridge Radio Club, South Shields Amateur Radio Club and Yeovil Amateur Radio Club.

This generous and kindly gesture on the part of the Mid Island Radio Club is most warmly appreciated by the Council and by the members of the four Societies concerned.

## Ten Minute Quiz

Answers to the questions set on page 335.

1. The Copenhagen Plan: March 15, 1950.
2. Neither—A.C. Power is applied to the stator windings.
3. The radiation resistance drops to just under 15 ohms.
4. Approximately 7.25 mA.
5. Pink is not used in the standard Colour Code for resistors and condensers.
6. A current-stabilisation device generally consisting of a fine iron wire element in an evacuated glass bulb.
7. Quartz (Crystals).
8. None at all.
9. (a) Bolivia; (b) Panama; (c) Poland; (d) Paraguay.
10. Eight days from close of contest.

## Long Service Honoured

AT the February meeting of the Council, Stanley A. Karl, B.Sc. (G6LJ), was elected an Honorary Member of the Society. At the same meeting Henry Archibald Maish, B.Sc. (Eng.), A.M.I.E.E. (G6OT); David Nisbet Corfield, D.L.C. (Hons.), A.M.I.E.E. (G5CD); and James William Mathews, Assoc. Brit. I.R.E. (G6LL), were elected Vice-Presidents of the Society.

\* \* \*

Mr. Lewer became interested in radio during 1920 and obtained his first transmitting licence in 1923. He joined the R.S.G.B. in 1924 and contributed several articles to Vol. 1 of the *T. & R. Bulletin*. He attended the first I.A.R.U. Congress held in Paris in 1925 and represented Great Britain on the sub-committee dealing with call-signs and prefixes. He was elected to the Council of the Society in 1940, became Acting Vice-President in 1944 and President in 1947. He attended the Atlantic City (I.T.U.) Conference in 1947 as a Delegate of the I.A.R.U. and was Chairman of the Administrative Committee at the I.A.R.U. Congress held in Paris last year. He has served on the Technical Committee of the Society for the past ten years and in addition to making many contributions to R.S.G.B. publications, is the author of several technical books.

\* \* \*

Throughout his long association with the Society — he joined in 1926 — Mr. Clark has been a frequent contributor to the *BULLETIN* whilst his services as a lecturer have been in great demand. In 1934 he became a member of the Committee set up to produce the *Guide to Amateur Radio* and later became a member of the Technical Committee. Mr. Clark served on the Council from 1937 until 1947 during which time he held the office of Honorary Treasurer for two years and Honorary Secretary for five years.

His outstanding work in the technical field was recognised last year by the award of the Norman Keith Adams Prize presented for his paper entitled "An Impedance and Power Meter for the 144 Mc/s. Band."

Mr. Clark is currently Chairman of the Technical Committee of the Society.

\* \* \*

Mr. Corfield was Hon. Secretary of the Loughborough College Radio Society from 1923 until 1926 and operated the Society's station 2PI on 1,000, 440 and 180 metres. He obtained his first personal transmitting licence in 1926 and joined the R.S.G.B. the same year.

In 1934 Mr. Corfield (like Mr. Clark and Mr. Mathews) became a member of the Committee set up to produce the *Guide to Amateur Radio*, from which Committee was created the present Technical Committee. He was President of the Golders Green & Hendon Radio Society in 1935 and 1936, and on the Council of the R.S.G.B. for nine years between 1939 and 1950. Throughout that time he was (and still is) a member of the Technical Committee.

Mr. Corfield has contributed many important technical articles to the *BULLETIN*. He is also a co-author of *Valve Technique and Service Valve Equivalents*.

\* \* \*

Mr. Mathews obtained his first transmitting licence in 1925 and joined the Society shortly afterwards. In 1926 he commenced experiments in crystal control and from 1927 onwards made ex-

tensive contributions to the development of the 5 and 10-metre bands. In 1928 he became the first British amateur to contact an American station on 10 metres. His 10-metre work was recognised by the Council by the award of the Wortley-Talbot Trophy in 1928 and the Powditch 28 Mc/s. Trophy in 1930-31.

Mr. Mathews served on the Council and on various Committees from 1928 until 1950, with only short breaks, and is at present a Member of the Technical Committee. He is a co-author of two R.S.G.B. technical publications and has made many contributions to the R.S.G.B. *BULLETIN*.

## Affiliated Societies

SINCE the publication of the lists of affiliated Societies in the December, 1950, and February, 1951, issues of the *BULLETIN*, the following amendments have been reported:

- \* **NORTH EAST AMATEUR TRANSMITTING SOCIETY**, c/o Mr. J. W. Hogarth, 4 Fenwick Avenue, Blyth, Northumberland.
- \* **PYE SHORT WAVE RADIO SOCIETY**, c/o Mr. T. L. Simpson, Pye Ltd., Cambridge.
- \* **WALSALL & DISTRICT AMATEUR RADIO SOCIETY**, c/o Mr. F. J. Merriman, 123 Wolverhampton Road, Walsall, Staffs.
- \* **WORTHING & DISTRICT AMATEUR RADIO CLUB**, c/o Mr. F. H. Bettelley, 42 Annweir Avenue, Lancing. (Lancing 3150.)

\* Change of name or address only.

## Radio Valve Practice

Based on the recommendations of the B.V.A.

- Published ratings should be closely observed.
- Valves should normally be mounted base down and in a vertical position; where mounted horizontally, the filament of directly heated valves and the major axis of the grid of indirectly heated valves should be vertical.
- Ventilation should be sufficient to ensure a safe bulb temperature at all times.
- It is undesirable to use spare socket-contacts as connecting tags in the circuit wiring.
- Heater or filament voltages should not vary by more than 7 per cent. from the rated values.
- The potential difference between the cathode and heater should not normally exceed 150 V. except with valves specially designed for A.C./D.C. operation.
- Cathode keying which may result in a large potential difference between the heater and the cathode should be avoided; where essential a resistance not exceeding 0.25 MΩ should be connected between heater and cathode.
- There should always be a D.C. connection between each electrode and cathode; and the resistance of this connection should be the minimum practicable.
- Precautions should be taken to ensure that the heat dissipated at the electrodes is the minimum possible; excessive dissipation may be caused by incorrect tuning of associated circuits, unnecessarily high no-signal currents, parasitic oscillations, etc.
- An adequate limiting resistance should always be placed in series with a rectifying valve when used in conjunction with a condenser-input filter.



# DIRECTION FINDING FIELD DAYS

By J. M. S. WATSON (G6CT)\*

THE programme of D/F events to be published next month, will include a list of local practices and open events to be held in many different parts of the country, culminating in a National Final later in the year. The following remarks are intended to assist those who intend rebuilding their equipment for D/F work and to give advice to others just making a start. Newcomers to this most enjoyable side of Amateur Radio will be welcomed at any of these events.

For many reasons the 1.8 Mc/s. band is a prime favourite for D/F work although the V.H.F. bands are also used.

## The Receiver

The first requirement is a receiver of high sensitivity which can either be constructed or converted from ex-Service equipment. The instrument must be robust and of good stability, entirely portable and as light in weight as possible. A B.F.O. is essential so that bearings can be taken whilst listening to the carrier. During D/F Field days and to assist in easy identification the transmitter call sign is often sent slowly in Morse.

## Taking Bearings

The only form of aerial with marked directional properties is the familiar loop or frame. When correctly matched and balanced to the receiver such a device produces a polar diagram of the same pattern as that produced by a half-wave aerial, except that maximum pick-up will occur when the plane of the aerial points towards the transmitter, and minimum pick-up when it is rotated through 90 degrees. It will be appreciated that there are two minimum positions 180 degrees apart and two maximums also 180 degrees apart. Bearings are usually taken on the minimum signal position, because the null or no-signal point is more marked and much easier to detect. In order to determine in which of the two possible directions a transmitter may lay it is necessary to change the polar diagram to a cardioid (heart shape) and to take a sense bearing.

## Equipment Needed

In use, a highly sensitive receiver will be swamped when the transmitter is approached, but if the frame aerial is shunted (by means of a selector switch) with a resistance, of either 5,000 or 25 ohms, swamping will be avoided by providing two steps of reduced sensitivity. The shunt will not affect the D/F properties. Another useful addition is a valve voltmeter or "R" meter. Guarded from overloading by the shunts, the meter can be made highly sensitive to show, at close range, a change in strength over a few yards.

Once the receiver and aerial are working properly the all-important testing period commences. As buildings, overhead wires and even underground cables have varying effects on bearings, an open and clear site is essential when testing the accuracy of the D/F properties of equipment. Tests should also be carried out using stations whose exact location is known, and during daylight when only the ground wave can be received. The mixture of ground and reflected waves at night often give very misleading and inaccurate bearings.

For comparatively short range work the normal Ordnance Survey Map "One-inch to one-mile," is used. It is often useful to mount the map on a flat board so that the sides of the board correspond with the magnetic points of the compass. Bearings can then be quickly plotted without any mental arithmetic, but *don't forget the magnetic deviation.*

## Trust your Equipment

With practice, and by adhering to the golden rule of believing what your equipment tells you, the actual task of locating a transmitter will not be difficult.

For D/F contests a team of three or four persons is a great help. The receiver operator is usually the leader. A good map reader, who always knows exactly where he is and who knows the best way from point A to point B is of great value. For road events a separate car driver should be employed, whilst there is always room for someone who will act as general help and plotter. The thrill of finding a completely concealed transmitter in 400 square miles of unknown country within an hour of starting off, and after less than 10 minutes total transmission time, seals the enthusiasm for D/F work.

If your interest has been roused you will probably wish to ask many technical and other questions. The writer will be pleased to put members in touch with their nearest Town Group or Affiliated Society interested in this work.

## SJAB on V.H.F.

THESE four letters are not the call sign of a radio station, but stand for the St. John Ambulance Brigade which since 1947 has employed V.H.F. telephony for communicating with its ambulances operating in Guernsey—the first system of its kind in the British Isles.

This service has recently been expanded to include high speed launches for rescue work along the coasts of the Channel Islands, some of the most dangerous around Britain. As well as giving aid to aircraft forced down in the sea and to victims of cliff accidents in places accessible only from the water, these launches assist also in the removal of sick people from the smaller islands for specialised medical attention.

This vital work has been made more effective by the installation of a two way V.H.F. radio system—supplied by the General Electric Company—on the vessels, and in the provision of lightweight "walkie-talkie" apparatus which may be carried on the back of the operator. The sea-borne equipment consists of a 15/20 watt transmitter-receiver powered by a 12 volt accumulator, and on test reliable contact was maintained between the headquarters station at Rohais and a launch on the far side of Herm and Sark. The portable gear showed its ability to operate satisfactorily even under the lee of cliffs despite its low power of 0.25 watt.

## Around the Trade

The Automatic Coil Winder & Electrical Equipment Co., Ltd., announce that the price of the "AVO" Signal Generator was increased as from March 7 to £30. This price applies to both mains and battery operated models.

\* The Robins, Keymer Road, Burgess Hill, Sussex.

# I.A.R.U. NEWS

THE important proposals discussed at the 1950 Paris Congress form the subject of a special issue of the *I.A.R.U. Calendar* recently circulated to all member-societies. There are two formal proposals—both sponsored by the R.S.G.B.—on which all societies are asked to vote. No. 73 proposes adoption of the R.S.G.B. voluntary band plan for 21 Mc/s. as a basis for world planning as soon as the band is released; No. 74 proposes that representation at future International Telecommunication Conferences should be along the lines of the Paris recommendations as reported in the August, 1950, issue of the *BULLETIN*. In presenting this second proposal, however, I.A.R.U. Headquarters notes that the adoption of the principle of Regional delegates financed on the basis of licence percentages might cause hardship to the small societies of Region III. The special *Calendar* also reports that the R.S.G.B. Council has agreed to accept in principle the invitation of the Paris Congress to establish at R.S.G.B. Headquarters a Central Bureau for Region I and is prepared to accept financial liability at a cost not exceeding £500 for operating the Bureau for a period of one year. The comments of member-societies are requested on this suggestion, which is endorsed by I.A.R.U. Headquarters.

The normal half-yearly *Calendar* shows that membership in the I.A.R.U. now totals 42 societies. This represents an increase of two on the 1949 total, four new societies having been admitted and two—*Newfoundland Amateur Radio Association* and *Ceskoslovenski Amateri Vysilaci*—deleted. The recent change in the political status of Newfoundland has meant that I.A.R.U. representation for that country has now passed to the Canadian Section of the A.R.R.L. C.A.V. has resigned from the Union owing to the rejection of their request that matters relating to the Stockholm Peace Appeal should be raised in the *Calendar* and the refusal of A.R.R.L. to distribute QSL cards bearing political propaganda. Mr. A. L. Budlong, WIBUD, Secretary of the Union, in acknowledging this resignation, writes: "I very much regret that C.A.V. has felt it necessary to submit a letter of resignation from I.A.R.U. Certainly it is based on misunderstanding, for if any group has a common international bond, it is that of the radio amateur. We retain this bond regardless of the political positions or acts of our respective countries." Two new societies are proposed for membership: *Association des Amateurs*

*Emetteurs du Maroc* (A.A.E.M.)—total membership 87 of which 61 are licensed amateurs; and *Radio Club Dominicano* (R.C.D.)—total membership 60.

Other news in the *Calendar* includes a report that the Extraordinary Administrative Radio Conference (which may prove of major importance to the radio amateur) has now been postponed tentatively to August, 1951, at Geneva, with this date and location subject to confirmation by the administrative council of the I.T.U. this coming spring. It is also reported that U.S. amateurs have been informed that Indonesia and Japan (excluding amateur stations of occupation forces) forbids all radio communications between their amateur stations and those in other countries. Administrations which forbid all amateur radio operation are: Indo-China, Iran, Lebanon, Netherlands Antilles and Thailand.

During 1950 I.A.R.U. Headquarters issued a total of 916 W.A.C. certificates of which 376 were endorsed for telephony operation. Altogether more than 8,000 W.A.C. certificates have been issued.

Following a meeting between members of the *Radio Club Argentino* and the President of the Republic, legislation has been introduced favourable to the amateur community, including a declaration that amateur activities are in the national interest, special import privileges and possible Government financial assistance for delegates at future international radio conferences.

The Danish Society (E.D.R.) reports that important changes have recently taken place in amateur licence regulations in that country. Additional frequencies between 3,800-3,940 kc/s. will be available on a temporary basis and in future two classes of licence will be issued: a "small" licence (Morse test 8 w.p.m.) limited to 3.5 and 144 Mc/s. (C.W. and telephony) and an "ordinary" licence (Morse test 12 w.p.m.) for all the usual bands. Maximum input will be 50 watts for telephony and 100 watts for unmodulated telegraphy. Narrow-band frequency modulation with a maximum deviation of plus/minus 4 kc/s. will be permitted on all bands open to telephony operation. The technical examination in Denmark takes the form of a verbal test on electricity, radio communication and operating procedure.



**South Birmingham Social**

The third annual social for South Birmingham members and their families took place on January 20. An excellent meal was followed by a display of dancing, singing, games and raffles.

## Top Band Contest Results

THE night of January 20-21 saw another enjoyable—but none the less strenuous—contest on the 1.8 Mc/s. band with the usual close finish. Though activity was at a somewhat lower level than in the November contest, over 350 stations took part. It is realised, of course, that quite a number of these did not spend the whole night operating, but came on for either the first or the last few hours, or for both. Nevertheless, it seems a pity that less than eighty submitted logs. Most of the check logs, and several of the entries listed well down the table, came from members who were unable to put in the full time. Many more such logs would be welcomed.

### Leading Stations

Mr. J. C. Foster, G2JF, of Ashford, Kent, who has won certificates for second and third places in the last two events, has climbed the last rung of the ladder, and is to be congratulated on winning the contest. He made 147 contacts, using a V.F.O., two buffers and a 10-watt P.A. to feed a half wave aerial with quarter wave Zepp feeders. The receiver was an H.R.O.

Second place is taken by Mr. A. Bowman, G3FAB, of Coventry, with a similar four-stage transmitter feeding a 200 foot aerial, and an AR88 receiver. He made 150 contacts, the largest number of any entrant.

Another regular entrant, Mr. H. Benson, G8NF, of Slaithwaite, Yorks, comes third. His 140 contacts were made with a V.F.O.-P.A. transmitter and a 1½ wave aerial. The receiver was a CR 100, much modified.

The winner of the last two contests, Mr. H. J. M. Box, G6BQ, is placed fourth, closely followed by an entrant making his first contest effort, Mr. D. E. Davies, GW3FSP. He has previously submitted a check log, but certainly deserves congratulation

### Top Band Contest, January, 1951

Psn.	Call-sign	Reg.	Pts.	Psn.	Call-sign	Reg.	Pts.
1	G2JF	08	563	37	G3DDM	08	360
2	G3FAB	03	555	38	GW5BI	10	355
3	G8NF	02	550	39	G3CDK	07	352
4	G6BQ	07	547	40	GM8MJ	14	343
5	GW3FSP	10	544	41	GM3EHI	14	335
6	G8KP	02	540	42	G3VM	05	331
7	G3BDQ	08	517	43	G12FHN	15	326
8	G6ZN	02	493	44	G2YU	05	324
9	G6UC	13	488	45	G2CPL	05	297
10	G5BF	04	478	46	G3ENY	07	288
11	G5HB	09	460	47	G2QI	07	279
12	GW3JI	11	458	48	G3FCU	07	256
13	G2DTD	06	455	49	G3FST	07	255
13	G6HD	07	455	50	G3GSS	01	254
15	G6VC	07	445	50	G3GZA	09	254
16	G3AUT	03	436	52	G2BOF	07	248
17	G3BTP	07	432	53	G2CV	07	247
18	G3YF	07	426	54	GM3GUC	13	238
19	G4DC	07	425	55	GW3EPM	10	237
19	G5TO	02	425	56	G5MY	04	224
21	G5YN	09	418	57	G3GHC	03	221
22	G5ZX	03	417	58	G3GVM	08	215
23	G2LC	05	408	59	G3BF	08	207
24	G5TN	09	407	59	G16YW	15	207
25	G2DLJ	04	402	61	G2HOX	07	199
26	G3AGQ	09	401	62	G2XP	07	176
27	G3BIK	02	399	63	G3FNK	04	172
28	G3AKY	02	394	64	G2CVV	04	165
29	G6WH	03	391	65	G3FAT	01	156
30	G3BKE	02	383	66	G3BUJ	05	153
30	G5JL	07	383	67	G3GKP	07	146
32	G2AOL	07	376	68	G3FVC	09	138
33	G4IS	01	369	69	G5IJ	07	116
33	G5MR	08	369	70	G3GEN	09	113
35	G2NJ	04	364	71	G3HRH	07	84
36	G8IP	07	362	72	G3AFL	13	50

Check logs are acknowledged with thanks from the following: G2JB, G3UR, G6JJ, G6ZT and G8BM.

on attaining fifth position in his first serious attempt.

### Conditions and DX

Many entrants commented that conditions were less favourable than in November. This impression could, to some extent, be due to the reduced activity, and, in particular, to the marked absence of European stations. OK1AWA was on the band for about two hours, but was only contacted by four entrants! Only one other European call sign, D3EDD, was mentioned, apart from the British Isles. Towards the end of the contest, however, five transatlantic contacts were made, W2ESO and W3FNF were worked by G8NF and VE1EA, W1LYV and W2ESO by G6BQ. Other DX stations reported heard were EK1AO, FA8BG, KZ5DE and W2UKS.

### Comments

Several entrants remarked on the heavy interference caused by amateur telephony. Criticism is levelled against some competitors who send T9 reports, almost irrespective of the note on which they are reporting, and against some who, using "break-in," failed to send the call sign of the station to which they were replying. In the words of one entrant: "Break-in is O.K. once you know who you are working!"

### Political Propaganda on QSL Cards

THE recent prompt and determined action by the Council in this matter has had a most satisfactory effect. It is pleasing to record that whereas the flow of cards from the offending countries has in no way diminished, the propaganda cards have ceased abruptly. We are glad to note that a number of other I.A.R.U. Societies took similar but independent action to our own to combat this most dangerous menace to our movement.

### Diplôme de l'Union Française

IN the January, 1951, issue of the BULLETIN it was stated that claims from members for the above award should be made through R.S.G.B. Headquarters. In the light of experience and in view of the somewhat complicated nature of the rules, members are now asked to submit their claims direct to Réseau des Emetteurs Français (D.U.F.), 72 rue Marceau, a Montreuil-sous-Bois (Seine), France, enclosing two International Reply Coupons for the return of the cards.

### The G5KH Trophy

THE London Regional and District Representatives have recently accepted from Mr. Horace Cullen, G5KH, a silver trophy for annual competition within the London Region. The precise event to which the trophy will apply has not yet been finally decided, but it is anticipated that it will be awarded in connection with either N.F.D. or a Region 7 Field Day.

The London R.R. (Mr. W. H. Matthews, G2CD) and his colleagues wish to place on record their best thanks to Mr. Cullen for his most generous offer.

### Radio and Television News

THE Society regrets that it is unable to accept subscriptions to the U.S. monthly publication *Radio and Television News*.

It had been hoped to make a financial arrangement with the publishers, similar to that which the Society has with the A.R.R.L., in regard to the method of remitting subscriptions, but the proposals put forward were not accepted by the publishers.

## AFFILIATED SOCIETIES' CONTEST

**I**N view of the general approval of the rules for the first contest for Affiliated Societies held last year, no changes have been made for the second contest, to be held on March 31 and April 1.

The leading Society will be recommended for the award of the "Edgware Trophy," and a Certificate of Merit will be awarded to the R.S.G.B. member forwarding the best check log.

## Rules

1. The contest is open to all Societies in fully paid-up affiliation with the R.S.G.B.
2. The contest will be in two sections : first, C.W. (A1), and second, A.M. Telephony (A3). The C.W. section will be held between 3 p.m. and 11 p.m. G.M.T. on Saturday, March 31, and the Telephony section between 3 p.m. and 11 p.m. G.M.T. on Sunday, April 1, 1951.
3. Operation will be on the 3.5 Mc/s. band, according to the provisions of the R.S.G.B. Band Plan as follows : C.W., 3,500 to 3,600 kc/s.; Telephony, 3,600 to 3,635 kc/s., and 3,685 to 3,800 kc/s.
4. In each section, only one transmitter—which may be either the Society transmitter or that of one of the members—and not more than two receivers may be used (*i.e.* different stations may be used for the two sections, if desired).
5. The input to the anode circuit of the valve or valves delivering power to the aerial, or to any previous stage, must not exceed 25 watts.
6. Five points will be scored for contact with another Affiliated Society station, and one point for contact with any other British Isles station. The final score will be the sum of the scores for the two sections.
7. Only contacts with stations in the British Isles (Prefixes G, GC, GD, GI, GM and GW) will be permitted to count for points.
8. Competitors will call "CQ RSGB." An exchange of RST (or RS) reports and a self-assigned two-figure Society identification number will be required before five points for a contact may be claimed (*e.g.* RST 569 club 47).
9. Only one contact with a specific station will be permitted to count for points in each section of the contest.
10. Transmitter operators may be changed as often as is desired, provided the terms of the licence are observed.
11. Entries (preferably on foolscap or quarto paper) must be set out as shown below :

### AFFILIATED SOCIETIES' CONTEST, MARCH 31/APRIL 1, 1951

Name of Society ..... Call Sign(s).....  
Address(es) of Station(s) ..... Society Code No.....  
Transmitter .....  
Receiver(s) .....  
Aerial(s) .....

Date	Time	Call Sign of Stn. Worked	Report		Society Code No.	Sig- nature of Operator	Points Claimed
			Sent RST / RS	Recd. RST / RS			
Total ..							

*Declaration: I declare that the station(s) for which I was responsible was (were) operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. shall be final in all cases of dispute.*

Date ..... Signed .....  
Office.....

12. The entry form must be completed and signed by an Officer of the Affiliated Society, who will be held responsible for the conduct of the station(s).
13. The terms of the Transmitting Licence must be rigidly observed.
14. Any station reported operating off-frequency, or causing interference with over-modulation or spurious emissions, may be disqualified.
15. Any station consistently receiving tone reports lower than T9 will be disqualified.
16. The *Edgeware Trophy* will be awarded to the entrant with the highest total score. A Certificate of Merit will be awarded to the member of the R.S.G.B. submitting the best check log.
17. The decision of the Council of the R.S.G.B. will be final in all cases of dispute.
18. Entries must be postmarked not later than April 16, 1951, and addressed to the Hon. Secretary., R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1.

**June 21st to June 24th**



# No!

**This is not a design for a second "Skylon" at the Festival of Britain, but merely our way of saying that we are expecting to see R.S.G.B. members at least three deep at the 1951 Festival of Britain Convention. Watch for full details later. Meanwhile, reserve the dates June 21st to June 24th.**

## RSGB NATIONAL CONVENTION 1951



# HEADQUARTERS CALLING

## COUNCIL, 1951

### President:

WILLIAM A. SCARR, M.A., G2WS.

**Executive Vice-President:** F. Charman, B.E.M., G6CJ.

**Hon. Treasurer:** A. J. H. Watson, F.S.A.A., G2YD.

**Hon. Secretary:** L. Cooper, G5LC.

**Hon. Editor:** Arthur O. Milne, G2MI.

**Immediate Past President:** V. M. Desmond, G5VM.

**Members:** W. H. Allen, M.B.E., G2UJ, A. P. G. Amos, G3AGM, W. N. Craig, B.Sc., G6JJ, C. H. L. Edwards, A.M.I.E.E., G8TL, T. L. Herdman, B.A., A.M.I.R.E., G6HD, P. A. Thorogood, G4KD, P. W. Winsford, G4DC.

**General Secretary:** John Clarricoats, G6CL.

## January Council Meeting

*Résumé of the Minutes of the Proceedings at the Meeting of the Council of the Inc. Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, January 23, 1951, at 6 p.m.*

**Present.**—The President (Mr. W. A. Scarr) in the Chair, Messrs. W. H. Allen, F. Charman, L. Cooper, W. N. Craig, V. M. Desmond, C. H. L. Edwards, T. L. Herdman, A. O. Milne, P. A. Thorogood, A. J. H. Watson, P. W. Winsford and John Clarricoats (General Secretary).

### Welcome to New Members.

The President extended a warm welcome to the New Members of the Council (Messrs. T. L. Herdman and P. W. Winsford) and explained that the proceedings at meetings of the Council are confidential until the appropriate *Résumé* has been approved for publication or earlier approval given for a specific item to be mentioned publicly.

The President presented badges of office to the new members of the Council and to Mr. L. Cooper, the newly elected Honorary Secretary.

### Courtenay Price Trophy.

The President presented the Courtenay Price Trophy to Mr. F. Charman who, due to illness, was prevented from attending the Annual General Meeting.

### Finance.

Resolved to accept and adopt the Cash Account for the month ended December 31, 1950, and the Balance Sheet for the quarter ended December 31, 1950.

### Membership.

Resolved (a) to approve:—

63 applications for Corporate Membership,

20 applications for Associate Membership,

4 applications for Junior Associate Membership,

12 applications from transfer to Corporate Membership.

(b) That the Society shall pay the initial subscription of a blind applicant for Corporate Membership.

### Applications for Affiliation.

Resolved to grant affiliation to the Leeds Amateur Radio Society and the Weymouth & District Radio & Television Club.

### Political Propaganda.

It was reported that several members and groups of members had written to protest against the decision of the Council not to handle cards containing political propaganda.

Mr. Milne reported that, subsequent to the Czechoslovak and Hungarian Societies being advised of the Council's decision in this matter, recent cards received by the R.S.G.B. QSL Bureau from those Societies contained no political propaganda.

It was agreed to advise the writers of the various letters referred to above, that the matter of political propaganda on QSL cards is still under active and anxious consideration by the Council and that the Council hope to publish a statement after their February meeting. (See page 346.—Ed.)

### Historic Apparatus.

Preliminary consideration was given to a suggestion put forward by Mr. M. Child, that the Society should form a collection of historic Amateur Radio apparatus. It was agreed to defer full consideration of the suggestion for a period of six months.

### Technical Congress.

Consideration was given to a recommendation of the 1950 Council that the 1951 Council should decide whether or not it is possible or desirable to organise a Technical Congress in the Provinces during 1951. In view of other commitments it was agreed to defer full consideration of the recommendation for a period of one year.

### Amateur Radio Exhibition.

It was agreed to approach the Royal Hotel with a view to reserving the necessary accommodation for the Society to hold an Amateur Radio Exhibition during the week commencing November 26, 1951. (See page 335.—Ed.)

### Vice-Presidents and Honorary Member.

In recognition of their long and valued services to the Society, Mr. Cooper formally moved, pursuant to Article 12, that

Henry Archibald Maish Clark

David Nisbet Corfield

James William Mathews

be elected Vice-Presidents.

In recognition of his valued services to the Society, Mr. Charman formally moved, pursuant to Article 11, that

Stanley Karl Lewer (Past President)

be elected an Honorary Member.

It was explained that a Ballot must be conducted, at the next regular meeting of the Council, for the election of the members referred to in the motions.

### Official Regional Meetings.

Resolved to invite the Representatives for Regions 2, 4, 10, 11, 12 and 14 to suggest dates and venues for Official Regional Meetings and to extend a similar invitation to the Representatives for Regions 6 and 8 when appointed.

### Visits of Regional Representatives.

It was agreed to advise Mr. W. H. Matthews (the London R.R.) that the limit on the number of sponsored visits which he may make in any one year shall in his case not apply, in view of the special nature of the Region. Claims in respect of such visits will, however, be subject to the general limit of £10 p.a.

### Call Book and Operating Manual.

Consideration was given to a suggestion put forward by Mr. D. S. Mitchell that the Society should sponsor the production and publication of a British Isles Call Book and Operating Manual.

It was agreed to advise Mr. Mitchell that the Society is unable to take action on the suggestion, in view of the difficulty of obtaining full details of call signs, names and addresses. (Although the Post Office issues to the Society a full list of call signs, etc., the information is confidential.—Ed.)

### Advertising Arrangements.

The Council considered a letter from Parris Advertising Ltd. requesting that the responsibility for all Society advertising be transferred at a mutually agreed date to The National Publicity Co. Ltd.

Resolved to intimate to Parris Advertising Ltd. that the Council approves the arrangements set out in their letter and suggests that The National Publicity Co. Ltd. be instructed to assume responsibility for all Society advertising as from May 1, 1951.

### R.S.G.B. Scheme of Representation.

It was reported that three members of the North Staffs Group had raised objections to an editorial comment in the January issue of the BULLETIN that the R.S.G.B. Scheme of Representation does not recognise the offices of Chairman, Secretary and Treasurer.

It was agreed to invite the Region 3 Representative to attend an early meeting of the Group to explain how the R.S.G.B. Scheme of Representation operates.

### Committees of the Council, 1951.

The Committees of the Council were constituted as follows:—

**Contests.**—Messrs. Charman, Craig, Herdman and Winsford, with power to co-opt.

**Finance and Staff.**—Messrs. Cooper, Craig, Milne and Watson.

**G.P.O. Liaison.**—Messrs. Clarricoats, Lewer and Scarr.

**General Purposes.**—Messrs. Charman, Clarricoats, Edwards, Thorogood and Watson, with power to co-opt two further members.

**Membership and Representation.**—Messrs. Amos, Cooper, Desmond and Edwards.

**Region 1 (I.A.R.U.) Bureau.**—Messrs. Charman, Lewer, Milne and Scarr.

**Technical.**—Messrs. Allen, Charman, Cooper, Herdman and Milne, with power to co-opt.

It was agreed that the President shall be an ex-officio member of all Committees except the G.P.O. Liaison and Region 1 (I.A.R.U.) Bureau Committees, of which Committees he is a full member.



## Miniatures.

It was decided not to make retrospective awards of miniature trophies.

## Houston Fergus Trophy.

The Council accepted, with pleasure, an offer made by Capt. A. M. Houston Fergus (G2ZC) to present a silver trophy to the Society to mark the completion of 25 years' membership in the R.S.G.B.

It was agreed, subject to Capt. Fergus giving his approval, that the Trophy shall be presented to the winners of the annual R.S.G.B. Low-Power Field Day Contest.

## Reports of Committees.

The Council received a report from the Membership and Representation Committee and agreed to adopt the recommendations contained therein. The recommendations concerned proposed changes to certain Regional boundaries, and a revised version of the circular issued to Representatives. [Those Regional and County Representatives who would be affected by the proposed boundary changes were invited to submit their comments to Headquarters by not later than March 1.—Ed.]

## 1951 Convention Committee.

The Council received a report from the 1951 Convention Committee and gave consideration to the recommendations contained therein.

It was agreed to give publicity in the BULLETIN to a special Festival of Britain QSL card designed and produced by Mr. E. R. Martin and to forward a supply of publicity stickers to the R.R.s for distribution to their C.R.s and T.R.s.

In view of the paucity of suitable historical material available, the Council were unable to accept a recommendation concerning the production of a composite film, "Amateur Radio Through the Years," based on Society and members' films.

The Council rose at 10.35 p.m.

*The Meeting was resumed at 7.30 p.m. on Friday, February 2, 1951.*

*Present.*—The President (Mr. W. A. Scarr) in the Chair, Messrs. W. H. Allen, F. Charman, L. Cooper, W. N. Craig, C. H. L. Edwards, P. A. Thorogood, P. W. Winsford and John Clarricoats (General Secretary).

Apologies for absence were submitted from Messrs. A. P. G. Amos, V. M. Desmond, T. L. Herdman, A. O. Milne and A. J. H. Watson.

## Amateur Television.

The Council authorised the Technical Committee to convene a meeting with representatives of the Television Society and the British Amateur Television Club to discuss plans for the setting up of one or two amateur television stations to operate experimentally within the band 420-460 Mc/s. in order to ascertain whether or not there is serious danger of signals from amateur stations interfering with other services using that band.

## Headquarters Station.

The Technical Committee reported that for some time past they had been of the opinion that very little useful purpose was being served by the continued operation of GBIRS purely as a marker station. Bearing in mind that the station had been out of action for eight weeks recently, for technical reasons, during which time only one inquiry regarding its non-operation had been received at Headquarters, the Committee had come to the conclusion that the station should be closed down at an early date. In reaching that conclusion the Committee were aware that Mr. J. P. Hawker (who had maintained the station almost since its inception) was shortly to leave the employ of the Society.

The Council accepted a recommendation to close down the station, but asked the Technical Committee to make every effort to re-establish the station promptly.

## V.H.F. Pilot Station.

The Technical Committee were authorised to investigate the possibility of setting up a pilot station in the 144-146 Mc/s. band. The Committee had expressed the view that such a station would prove of great value to amateurs and others interested in V.H.F. propagation problems.

## I.A.R.U. Calendar No. 41.

The Council received I.A.R.U. Calendar No. 41 and agreed to record "Aye" votes in favour of the election to membership in the Union of the French Morocco and Dominican Republic national societies. [A précis of the contents of Calendar No. 41 appears elsewhere in this issue of the BULLETIN.—Ed.]

## Mid Island Radio Club.

It was reported that the Mid Island Radio Club of New York had offered to present a year's subscription to QST to four British radio clubs in memory of their first President.

It was agreed to select the four clubs by lot and to thank the Mid Island Radio Club for their kind offer.

The meeting terminated at 8 p.m.

## London Lecture Meeting

More than 100 members were present at the Institution of Electrical Engineers on Friday, February 23, when Mr. H. A. M. Clark, B.Sc. (Eng.), A.M.I.E.E. (G6OT), lectured on "Post-war Developments in Television." The lecture was illustrated by a number of slides, and accompanied by a series of interesting demonstrations which included the televising of the audience.

Mr. Clark acknowledged his indebtedness to the B.B.C. for the loan of camera equipment, and to the G.P.O., Standard Telephones & Cables Ltd. and Electric & Musical Industries Ltd. for the loan of cable samples, valves and equipment.

Messrs. Hedgeland, Newton and Hicks-Arnold were among those who contributed to the discussion.

Mr. Harold Wilkins, G6WN (a Vice-President of the Society), voiced the thanks of those present to the lecturer.

The Chair was taken by Mr. Arthur Milne, G2MI (Honorary Editor) who announced that Mr. S. K. Lewer (G6LJ) had been elected an Honorary Member, and Messrs. H. A. M. Clark, D. N. Corfield, and J. W. Matthews Vice-Presidents of the Society. The new Vice-Presidents, all of whom were present at the meeting, received the warm congratulations of their many friends.

## Representation

### New Region 8 Representative

The Council has been pleased to appoint Mr. R. J. Donald, G3DJD, 2 Canfield Road, Brighton, Acting Region 8 Representative. Mr. Donald was T.R. for Brighton and Hove in 1949 and until recently Editor of "The Brighton Link," official organ of the Brighton and District Radio Club.

### Additions or Amendments

The following are additions or amendments to the list published in the February, 1950, issue of the R.S.G.B. BULLETIN.

#### County Representatives

##### Region 1: Cumberland:

W. H. Hodgson, G3BW, 53 Hill Top Road, Arrowthwaite, Whitehaven.

##### Region 10: Monmouthshire:

G. R. Silverthorne, GW2BG,\* George Radio, Abergavenny.

#### Town Representatives

##### Region 1: Lancashire:

Darwen & Blackburn.—J. Simpson, G4JS, 1 Marsh Terrace, Darwen.

##### Region 2: Yorkshire:

Hull.—J. R. Borrill, G3FKK, 321 Priory Road.

##### Region 10: Monmouthshire:

Abertillery.—J. Price, GW2BUF,\* 23 Powell Street.

\* New appointments.

## Vacancies

Messrs. G. Brown, G5BJ, and W. Clegg, G8RP, have resigned as County Representatives for Warwickshire and E. Lancs respectively. Messrs. W. Beattie, GM8AT, and G. R. Thompson, GW3ELM, have resigned as Town Representatives for Aberdeen and Llandudno respectively.

Nominations for their successors should be made in the manner prescribed in the September, 1949, issue of the BULLETIN and sent to reach the General Secretary by March 31, 1951.

## Changes of Address

Region 3.—Address of Worcester T.R., J. Morris Casey, GRJC, is now: 4 Kennel Lane, Station Road, Fernhill Heath.

Region 8.—Address of Brighton T.R., A. E. Lambourne, G5AO, is now: 170 Old Shoreham Road, Hove.

## Correction

Region 5.—Name of Beccles T.R. is A. J. Barber, B.R.S.18397. (Incorrectly given as A. J. Baker in last list.)

## Croydon, Purley and London, S.E.

The T.R.s for the above town areas have mutually agreed that the boundaries of their respective areas shall be as follows:—

Croydon (T.R. Mr. R. L. Glaisher, G6LX)

Addington, New Addington, Shirley, Selsdon, Thornton Heath, Waddon, South, East and West Croydon, and that part of S.E.25 South of the Main Railway Line from Norwood Junction Station to Selhurst.

Purley & Coudon (Mr. L. C. B. Blanchard, BRS.3003)

Purley, Coudon and Sanderstead.

The T.R.s have further agreed that the parts of Wallington and Beddington which were in the Croydon and Purley-Coudon areas should be transferred to Sutton & Cheam. Alternatively that a new Town Group be formed to cover this area.

London, S.E. (T.R. Mr. W. D. Gilmour, G2VB)

Anerley S.E.20, Norwood S.E.19, West Norwood S.E.27, Sydenham S.E.26, Norbury and that part of S.E.25 North of the Main Railway Line from Norwood Junction Station to Selhurst.

# AROUND THE REGIONS

## Brighton and District Radio Club

A series of film strips dealing with valve manufacture and a talk by Mr. Bennington on V.H.F. propagation conditions are two of the highlights of the future Club programme. Visits are being planned to the local telephone exchange and power station. The Club station G3EVE is active on 3.5 Mc/s. c.w.

## Bristol

All future Bristol group meetings will be held in the Smoke Room of Carwardine's Restaurant, Baldwin Street, Bristol 1. The Regional Representative (Mr. H. A. Bartlett, G5QA), the Exeter T.R. (Mr. T. Smith, G3EFY) and G3GWH were welcomed to the February meeting, as were two visitors from far away Falmouth.

The tentative suggestion that Bristol should be transferred to Region 8 has met with strong disapproval locally. The Bristol membership has traditionally been associated with the West Country (Region 9) for many years and members living in that city are opposed to any change.

Due to the lengthy business meeting, the talk due to be given by G6GN on "Regulated Bias Supplies" was postponed until the March meeting. At the April meeting G3EHV will discuss 144 Mc/s. work.

## Chester & District Amateur Radio Society

At the A.G.M. held on February 6, all officers were re-elected. Membership stands at 36 with 9 licensed holders and several about to take the Morse test. Honorary membership has been granted to G4OS, the Society's first Chairman and a founder member, who is now in Canada.

The Society meets every Tuesday at 7.30 p.m. at the Tarran Hut, Y.M.C.A. Grounds, Chester.

A recording made by members of the Society was broadcast in the Voice of America Amateur programme on Sunday, February 18. It is the first time a British club has been so featured. The voices of G2YS, G3ATZ, G3FNV, G3EXT, G3GMT and other members were heard.

## Chesterfield and District

A radio section has now been added to the Chesterfield and District Scientific Society, the first general meeting being held on February 14, with Dr. Vance, G8SA (Region 4 Representative) as the speaker. Regular meetings will be held at Chesterfield Technical College (East Block). Details from the Secretary, Mr. K. Robinson (G3BHQ), 51 Hill Top Road, Old Whittington, Chesterfield.

## City and Guilds College Radio Society

The City & Guilds College Radio Society held its principal meeting of the year on Monday, February 19, at which the President, Mr. H. Bishop, C.B.E. (Chief Engineer of the B.B.C.), gave the annual Presidential Address on "Broadcast Engineering" at the College, of which he is a former student. In his address the President surveyed the generation, distribution, and transmission of broadcast programmes, and referred to the potentialities of V.H.F. broadcasting as an escape from the limitations of the Copenhagen Plan, and to the problems attending the provision of the television service.

More than 100 members and guests attended the subsequent Presidential Dinner in Imperial College Union, and in proposing a toast to the guests, the Student Chairman, Mr. A. J. H. Burton (G2CXB), announced that Sir Archibald J. Gill (President of the I.E.E.) had done the Society the honour of accepting the office of President for the next academic year. The toast was replied to by Commander C. G. Mayer, U.S.N.R., O.B.E., a former student of the College. Sir Archibald Gill proposed the toast to the Society, and referred to its long history, dating back to 1921. Mr. P. M. S. Hedgeland, M.B.E. (G2DBA) seconded, and the reply was

made by the Hon. Secretary, Mr. F. H. Steele, who reviewed the year's activity.

The many distinguished guests included Sir Noel Ashbridge (Director of Technical Services to the B.B.C.), Mr. W. K. Brasher (Secretary, I.E.E.), Dr. R. L. Smith-Rose (Director of Radio Research, the D.S.I.R.), Captain C. F. Booth (Chairman of the Radio Section of the I.E.E.), Mr. John Clarricoats (General Secretary, R.S.G.B.), and Professor Willis Jackson (Dean of the City & Guilds College).

## Coventry

At the February meeting, members warmly welcomed their new T.R., Mr. J. R. Tuck, G6TD. Meetings will be held on March 16 to discuss N.F.D., and on April 20 when Mr. C. O. Titley, G3BGG, will lecture on cathode coupled circuits.

## Coventry Amateur Radio Society

Recent meetings have been occupied by practical demonstrations of transmitting and receiving gear, using the Society's call-sign G2ASE.

The following programme has been arranged: April 9, "Mathematics—Why?" by T. R. Theakston, B.Sc.; April 23, Junk Sale.

## Dorking and District Radio Society

This Society issues a monthly Bulletin to its members and holds weekly meetings at its Club H.Q. at 5 London Road, Dorking. The Club call is G3CZU and the Secretary Mr. J. Greenwell (G3AEZ), 7 Soudes Place Drive, Dorking.

## Guildford & Woking

Local members are asked to note that the date of the normal monthly meeting has been put forward to April 1—no fooling.

## Ipswich

A most enjoyable evening was shared by thirty-one members of the group who supported the Annual Dinner held at the Oriental Cafe on January 3. Specially welcome were S/Ldr. Gilding and members of the Bawdsey (R.A.F.) Radio Club. *Southern Radio* and Mrs. Harris (wife of G3DPH) donated gifts for the draw.

## Kensington & Shepherds Bush

Members who have not yet attended meetings of this newly formed group will be warmly welcomed at a meeting to be held at 8 p.m. on April 13 at 38 Royal Crescent, W.11.

## North Kent Radio Society

Meetings are held at the Freemantle Hall, Bexley, every fortnight. On February 26 a talk on aerials, with model demonstration, was given by G3EIW, and on March 12 members enjoyed a film show. The Chairman is Mr. A. K. Wall, G2YZ, and the Secretary Mr. L. E. J. Clinch, 8 Windsor Road, Bexleyheath, Kent.

## South Manchester Radio Club

The S.M.R.C. is another club which issues a well-produced monthly magazine containing items of general interest as well as technical articles. A talk, "Feeders and their impedance matching," was given by Mr. Denny, G6DN, on February 16.

## Stourbridge & District Amateur Radio Society

Good attendances were recorded at recent meetings of the Society when Mr. Norman Harper, G4MI, and Mr. W. H. Rigg spoke, respectively, on home-made tape recorders and high-quality amplifiers.



Top Table

Sir Archibald Gill (fourth from left), Sir Noel Ashbridge (sixth), Mr. Harold Bishop (seventh), Prof. Willis Jackson (ninth), and Air Vice-Marshall E. B. Addison (eleventh), were among a number of distinguished guests at the City and Guilds Radio Society Dinner. The Student Chairman (Mr. John Burton, G2CXB) is between Mr. Bishop and Prof. Willis Jackson.

## Thames Valley A.R.T.S.

At the February meeting an excellent lecture and demonstration was given by Mr. Knott (G3CU) on "Single Sideband Suppressed Carrier Working." Mr. Alan Meas (G8SM) will speak on 70 cm. work at the meeting on April 4.

The Society is organising an "Amateur Radio" stand at the Teddington Rotary Club Hobbies Exhibition, to be held from March 15 to 17. Two transmitting stations will be on show, together with many exhibits and working demonstrations. Visitors will be welcome.

## Torbay Amateur Radio Society

Field Day matters were the chief topic of discussion at the February meeting. At the March meeting, to be held on the 17th, Club Contest entries will be judged. Trophies will be presented at the A.G.M. in April.

Visitors to Torquay, interested in Amateur Radio, are cordially invited to attend meetings of the Society, which are held on the third Saturday in each month at the Y.M.C.A., Castle Road, commencing at 7.30 p.m. The Hon. Secretary is Mr. K. J. Grimes, G3AVF, 3 Clarendon Park, Tor Vale, Torquay. (Telephone 88508.)

## Montreal Amateur Radio Club

An old friend of the R.S.G.B. and a member of several years standing, Colin Dumbrell, VE2BK, is the new President of the go-ahead Montreal Amateur Radio Club. Tom Cunningham, VE2CK, is now Vice-President; Hal Ward, VE2XZ, Treasurer; and Ethel Pick, VE2HI, Secretary.

Reporting on the A.G.M., Sid Chapman, VE2LV, writes: "After a hilarious session, during which we double-crossed the incoming executive by reducing the annual dues from 4 bucks to 3 bucks, I gave the meeting a good pep talk about the B.E.R.U. Contest." Incidentally, Colin and Sid have recruited a number of new members recently for R.S.G.B.

## Silent Keys

WITH deep regret we record the death on January 30 at the early age of 22 of Brian Baise-Fisher of Ditchingham. Mr. Fisher was Hon. Secretary to the newly formed Lowestoft and Beccles Amateur Radio Club, and it was in no small measure due to his enthusiasm that the Club got under way. His cheerful personality will be sadly missed at Club meetings. G2AJU.

It is also with sorrow that we record the sudden death on January 5, at the early age of 40, of Mr. F. G. Whinfrey, G8IW, of Woodhouse, Sheffield. Licensed in 1936 Mr. Whinfrey, who served in the R.A.F. during the war, was a keen C.W. operator who confined his activities mainly to 14 Mc/s. The heartfelt sympathies of his many friends are extended to Mrs. Whinfrey and her three children. J.T.

The death is also announced of Mr. Reuben H. Farmery, BRS.7186, of Eastleigh, Hants, as the result of a road accident. Mr. Farmery helped to form the Oxford and District Amateur Radio Society after the war and became its first Secretary. Upon leaving the district he was elected an Honorary Life Vice-President of the Society. Last year he and his wife journeyed up from Eastleigh to Oxford in order to assist one of the local stations in the domestic side of N.F.D. During the war Mr. Farmery served in India with the Royal Signals.

His tragic death will be mourned by many members, but by none more deeply than those who were associated with him in the Oxford and District Amateur Radio Society.

The sympathies of all his friends in the Society are extended to Mrs. Farmery, who has been widowed only 18 months after her marriage. F.A.J.

It is also our duty to record the passing of: B. J. Campling, of George, South Africa. K. Chatterjee, BRS.4488, of Wanstead, London. Philip H. Draycott, G3DLB, of Knotty Ash, Liverpool. Leonard G. Glyshay, BRS.12372, of Hindhead, Surrey. A. J. Marriott, G8UZ, of Sutton-in-Ashfield, Notts. Robert M. McDougall, BRS.1404, of Largs, Ayrshire, Scotland. John C. L. Wong, F.R.S.225, of Ipoh, Perak, as the result of a motor-cycle accident.

To the relatives and close friends of these deceased members we extend heartfelt sympathies in their great loss.

## LONDON LECTURE MEETINGS

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2.

Friday, March 30, 1951, R. H. Hamman (G2IG), "HIGH SELECTIVITY 'PHONE RECEPTION."

Friday, April 27, 1951, A. O. Milne (G2MI), will open a discussion on "LOW POWER PORTABLE EQUIPMENT."

All Meetings commence at 6.30 p.m. Tea will be served from 5.30 p.m.

Readers are reminded that the meetings listed are open to all members of the Society.

## Proposed Visit to Holland

FOR the benefit of members Mr. H. Andrews, G5DV, 175 Moorland Road, Weston-super-Mare, is organising a visit to Holland during the period from July 29 to August 12. Inquiries show that a two-weeks' trip, including fares, reserved seats and bed and breakfast (13 nights), will cost £15 5s. Interested members should write to Mr. Andrews for further details as soon as possible. Accommodation will be limited.

## To the Editor

### Perspex

DEAR SIR.—In the interests of scientific accuracy, I must point out that the author of the "Ten Minute Quiz" in the January issue of the BULLETIN is in error regarding the nature of Perspex.

This well-known material is Poly-methylmethacrylate. Methylmethacrylic ester, or methylmethacrylate as it is more usually known, is a liquid at ordinary temperatures and becomes Perspex when it is subject to a process of polymerisation.

Yours faithfully,

G. O. THACKER (B.R.S. 18286).

## FORTHCOMING EVENTS

(Continued from page 323)

Kensington-Shepherds Bush.—March 16, April 13, 8 p.m., 38 Royal Crescent, W.11.

Lewisham (R.A.R.C.).—Every Wednesday, Thursday, 7 p.m., Childeric Road School, New Cross.

New Barnet.—April 21, 7.30 p.m., "Bunny's Restaurant," Station Road.

Norwood & District.—March 31, 7.30 p.m., G2VB, 35 Grangecliffe Gardens, South Norwood. Bus 49, 68, 68a to All Saints' Church. A p.c. if attending.

St. Albans.—April 11, 8 p.m., "The Beehive," London Road. Slough.—April 19, 7.45 p.m., The Golden Eagle Hotel, High Street; April 29, 2.30 p.m., Hamfest, The George Hotel.

Sutton & Cheam.—April 3, 17, Sutton Adult School, Benhill Avenue.

Welwyn.—April 3, 8 p.m., Council Chambers.

Woolwich & Plumstead.—March 28, April 11, 8 p.m., Bull Tavern, Vincent Road, S.E.18.

### REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. Chatham (M.A.T.R.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.

Eastbourne.—April 6, 7.30 p.m., Christchurch Club Rooms, Hanover Road.

Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical College.

Petersfield.—March 22, 7.30 p.m., Y.W.C.A. Hostel, High St. Portsmouth.—Tuesdays, 7.30 p.m., Royal Marines' Signal Club, Eastney Barracks.

Southampton.—April 7, 7.30 p.m., 22 Anglesea Road, Shirley. Worthing.—April 2, 8 p.m., Adult Education Centre, Union Place.

Worthing (W. & D.R.S.).—April 9, 8 p.m., Adult Education Centre.

### REGION 9

Bristol.—March 16, 7 p.m., Smoke Room, Carwardine's Restaurant, Baldwin Street, Bristol 1.

Exeter.—April 6, 7.30 p.m., Y.M.C.A., 41 St. David's Hill. Gloucester.—Alternate Thursdays, 7.30 p.m., Spread Eagle Hotel, Market Parade.

North Devon.—April 5, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Plymouth.—March 16, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms. Torquay.—March 17, 7.30 p.m., Y.M.C.A., Castle Road.

West Cornwall (W.C.R.C.).—April 5, 19, "Fifteen Balls," Penryn.

Weston-super-Mare.—April 3, 7.30 p.m., Y.M.C.A.

Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

### REGION 14

Falkirk.—March 30, 7.30 p.m., Temperance Cafe, High St. Glasgow.—March 28, 7 p.m., 39 Elmbank Crescent.

# NEW MEMBERS

## AN INVITATION

★ THE R.S.G.B. INVITES THE SUPPORT OF ALL WHO ARE INTERESTED IN AMATEUR RADIO. WRITE TODAY FOR DETAILS OF MEMBERSHIP!

The following have been elected to membership:—

### Corporate Members (Licensed)

- G2ZR †J. W. RUSSELL, 45 Shakespeare Avenue, Bath, Somerset.
- G3AMI †B. C. HOWARD, 123 Randall Avenue, Cricklewood, London, N.W.2.
- G3DRF N. E. HALL, 32 Cissbury Ring South, Woodside Park, London, N.12.
- GM3DVD F. DORIS, 87 Thurston Road, Glasgow, S.W.2, Scotland.
- GM3DWX W. G. BEATON, c/o Black, 79 King Street, Aberdeen.
- G3ERN \*G. E. READ, High Street, Harlow, Essex.
- G3FFC A. CAVE, 187 Hallam Crescent East, Leicester.
- G3FQD E. C. ANDREWS, c/o The Old Cottage, Parvis Road, West Byfleet, Hants.
- G3GLA †B. J. MASE, Gable Cottage, Colney Road, Cingleford, Norwich.
- GW3GLN E. COLLINS, 31 Evelyn Street, Barry, Glam., Wales.
- G3GQR G. BURTON, 5 Hilltop, Breadsall, Nr. Derby.
- G3GSL F. RENNISON, 7 Addison Road, Toronto, Bishop Auckland, Co. Durham.
- G3GUV T. J. GRIFFIN, 10 Balder Street, Middlesbrough, Yorks.
- G3GVO †A. CALVERT, 37 Franks Lane, Chesterton, Cambridge.
- G3GWR A. G. STORMONT, 256 Carter-Knowle Road, Sheffield 7, Yorks.
- G3GXR J. MATTHEWS, 49 Crescent Avenue, Ashton-in-Makerfield, Lancs.
- G3GXQ W. E. ROBERTS, 8 Highbury Place, Leeds 6, Yorks.
- G3GXS H. NESS, Greengarth Hall, Holmbrook, Cumberland.
- G3GXT A. OVEN, 14 Greenhill Road, Timperley, Cheshire.
- G3GYA J. F. LEE, 64 Northfield Road, Hinckley, Leics.
- GM3GYB M. S. LEBBON, 11 York Place, Edinburgh 1, Scotland.
- G3GYM P. B. JONES, Temple Cottage, Green Lane, Warwick.
- G3GYQ C. J. SPACKMAN, 3 Corby Avenue, Swindon, Wilts.
- G3GYZ W. G. WOOLLER, 7 Neptune House, Neptune Street, London, S.E.16.
- GM3GZC \*C. H. FRASER, 7 Castle Drive, Dunstaffnage, Connel, Argyll.
- G3HBM S. D. WARD, 7 Regent Street, Burnham-on-Sea, Somerset.
- G3HBP J. W. SCOTT, Majestic Hotel, Bradford, Yorks.
- G3HCR K. E. JONES, 75 Denbigh Street, Westminster, London, S.W.1.
- G3HCW A. E. ASHBY, 40 Eastbourne Terrace, Baghill, Pontefract.
- G3HDL S. E. KELLY, 39 Priory Road, Anfield, Liverpool 4, Lancs.
- G3HDQ W. BAKER, 14 Vaudrey Drive, Cheadle Hulme, Cheshire.
- G3HEA \*J. V. BURKE, 116 Bedford Court Mansions, Bedford Avenue, London, W.C.1.
- G3HEN A. C. WHITE, 57 Ralph Road, Shirley, Nr. Birmingham.
- G3HER J. O. MANN, Moorlands, Scoriton, Buckfastleigh, S. Devon.
- G3HES K. G. PUGH, 115 Ryhall Road, Stamford, Lincs.
- \* \* \*
- G2HMG F. H. PALMER, Central Hotel, Thetford, Norfolk.
- G2UN W. E. C. BENSLEY, Glenlea, Grinstead Lane, Lancing, Sussex.
- G3CNF J. H. HURD, 3 Burnham Crescent, Wanstead, London, E.11.
- G3FRV \*R. G. B. VAUGHAN, 1 Alma Road, Carshalton, Surrey.
- G3FTN C. K. LEWIS, 31 Grange Road, Halesowen, Birmingham.
- G3FYX R. W. EMERY, 21 Brighton Road, Redland, Bristol 6, Glos.
- GM3GFO J. W. BLACKERY, 3 Kirkmay Road, Craill, Fife.
- GM3GSQ R. BELL, 56 Ashley Street, Glasgow, C.3, Scotland.
- GM3GUQ A. S. STIRLING, 19 Montgomery Street, Irvine, Ayrshire.
- G3GVP A. W. BLAKEMAN, Aston Villa 13, Moorlands Road, Cockerton, Darlington, Co. Durham.
- G3GYF A. J. F. POWELL, 19 Stratford Road, Stroud, Glos.

- G3GXX F. J. LEE, 13 Firecroft Road, Hook Rise, Surbiton, Surrey.
- G3GYS G. M. THORNHILL, 5 Shepherds Row, Gloucester Road, Stonehouse, Glos.
- G3HAG R. P. HUGHES, 6 Segrin Road, Roby, Liverpool, Lancs.
- G3HAR K. B. STEVENS, c/o Mrs. Pawsey, 41 First Avenue, Chelmsford, Essex.
- G3HAS H. A. STEELE, Oakdene, Camden Road, Carshalton, Surrey.
- G3HAZ R. REW, 73 Pamela Road, Northfield, Birmingham 21.
- GM3HBF W. B. FEELEY, 4 Warroch Street, Glasgow, C.3, Scotland.
- G3HBX C. H. TYSOE, 6 Paradise Street, Warwick.
- G3HDJ L. J. SMITH, 75 Pittville Avenue, Mossley Hill, Liverpool 18, Lancs.
- G3HDT \*J. D. GRAHAM, Clatherick, Duddo, Berwick on Tweed.
- G3HEH P. L. E. BENNETT, Flat 1, 54 Bassett Road, London, W.10.
- G3HEJ D. V. STANNERS, 24 Garrick Road, Northampton.
- G3HEP \*D. WADLOW, Willowby, Bay View Drive, Teignmouth, Devon.
- G3HEQ J. H. LOMAS, 33 Thorpe Lane, Almondsbury, Huddersfield, Yorks.
- GW3HEU \*D. RICKERS, 97 Ruabon Road, Wrexham, North Wales.
- G3HFK \*M. S. THAYER, 4 Lyham Close, Brixton Hill, London, S.W.2.
- GI3HFT J. M. MCBRIDE, 17 Adelaide Park, Belfast, N. Ireland.
- G3HPM \*P. J. MULLOCK, Poulton Hall, Near Wrexham, Wales.
- G4OD F. BELL, 71 Wilson Street, West Hartlepool, Co. Durham.
- G4WK L. J. GOULDEN, 33 Ethelbert Road, Canterbury, Kent.
- G6GU E. GAUKRODGER, 107 Wells Way, Keynsham, Near Bristol, Somerset.

### Corporate Members (Overseas)

- DL4SU S. ANTOSY, AFN Bayreuth, American Forces Network, A.P.O. 696-6, U.S. Army.
- VK2XU W. L. NYE, 163 Ramsay Road, Haberfield, New South Wales, Australia.
- VQ5CB B. C. KENNEDY, Police Department, P.O. Box 264, Kampala, Uganda, British East Africa.
- \* \* \*
- DL2QL 2548666 CPL. H. J. CROW, Royal Signals Attd., 7th Queen's Own Hussars, B.A.O.R. 8.
- KZ5ES A. E. STERLING, P.O. Box 337, Diablo Heights, Canal Zone.
- LU8CW J. M. AHUMADA, P.O. Box 3347, Buenos Aires, Argentina.
- ST2RD R. A. DAVIS, c/o Eastern Telegraph Co., P.O. Box 99, Port Sudan, Sudan, Africa.
- VE7HB A. J. GIBBLING, 14 Clyde Road, Burslem, Stoke-on-Trent.
- VK2ARH R. R. HOWE, 16 Gilliver Avenue, Vauluse, Sydney, Australia.
- ZD4AF W. HARRISON, Police Licensing Dept., P.O. Box 4, Takoradi, Gold Coast, B.W. Africa.
- ZS6QF J. C. VAN WYK, 28-3rd Avenue, Lambton, Germiston, S. Africa.
- W4NLY L. R. GEORGE, 309th Ftr. Escort Squadron, 31st Ftr. Escort Group, R.A.F. Station, Manston, Ramsgate, Kent.
- W6EAY E. FIRTH, 1012 North Coronado Terrace, Los Angeles 26, California, U.S.A.

### Corporate Members (British Receiving Stations)

- 19016 \*E. J. TOLEMAN, 35 Gower Road, Forest Gate, London, E.7.
- 19017 \*J. R. GIBB, 40 Leamington Road Villas, London, W.11.
- 19018 \*B. MADELEY, 28 Christchurch Road, Bournemouth, Hants.
- 19019 \*J. H. READ, 19 Game Street, Oldham, Lancs.
- 19020 R. H. NEWLAND, 1 Ladies Mile Road, Patcham, Brighton 6.
- 19021 G. MURRAY, 6 Agricola Road, Wingrove, Newcastle-on-Tyne 4.
- 19022 E. HAYTOCK, 5 Croft Road, Crossflatts, Bingley, Yorks.
- 19023 R. A. LIVERMORE, Cosy Cott, Rushmere Street, Rushmere, Nr. Ipswich.
- 19024 E. C. MCLIVENY, 21 Redcliffe Drive, Belfast.
- 19025 K. C. STURGESS, Gorwel, Colney Heath Lane, St. Albans, Herts.
- 19026 N. COOK, 70 Leicester Road, Oadby, Leicester.
- 19027 T. S. NOCKOLDS, 3 High Mill Road, Southtown, Great Yarmouth.
- 19028 G. B. MARTIN, 14 Hilda Street, Bensham, Gateshead 8.
- 19029 J. H. TREWAVAS, 10 Trevethan Rise, Falmouth, Cornwall.



- 19030 B. A. BENNETT, c/o Garats Hey Radio Club, Garats Hey Camp, Woodhouse, Loughborough, Leics.
- 19031 W. H. JACKSON, Ranigunge, Monkwood, Alresford, Hants.
- 19032 J. BURGESS, Upleatham, Atholl Place, Dunblane, Perthshire, Scotland.
- 19033 W. P. PACKHAM, 49 Longcroft Lane, Welwyn Garden City, Herts.
- 19034 G. CHAPMAN, Westminster Bank Ltd., Hadleigh, Essex.
- 19035 D. F. WICKENS, c/o Garats Hey Radio Club, Garats Hey Camp, Woodhouse, Loughborough, Leics.
- 19036 D. H. HARDY, 38 Pear Tree Lane, Loose, Maidstone, Kent.
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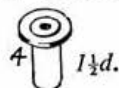
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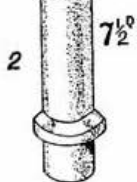
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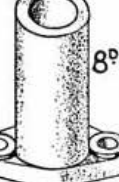
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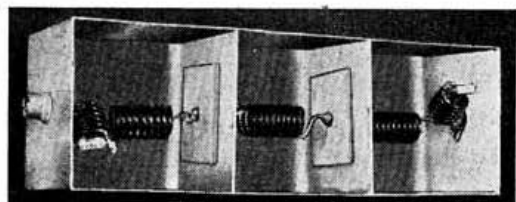
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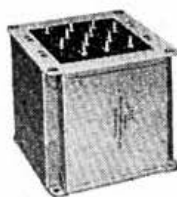
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