

R.S.G.B.



BULLETIN

March 1953

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balanced, distortion-free

reproduction



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R.S.G.B. BULLETIN

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MARCH

1953



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THE R.S.G.B. IS A MEMBER SOCIETY OF THE I.A.R.U. AND ACTS AS THE REGION 1 BUREAU OF THE I.A.R.U.

Forthcoming Events

REGION 1

Barrow (B.A.R. & T.S.).—Mondays, 7.30 p.m., Castle House, Walney Island, Barrow-in-Furness.
Blackpool (B. & F.A.R.S.).—March 24 (A.G.M.), 7.30 p.m., 161 Penrose Avenue, Marton, Blackpool.
Bury.—April 9, May 14, 7.30 p.m., Y.M.C.A., The Rock, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Thursdays, 8 p.m., Scouts' Hall, East Street, South Road, Waterloo, Liverpool.
Darwen & Blackburn.—March 20, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Isle of Man (I.O.M.A.R.S.).—April 1, Broadway House, Douglas.
Liverpool.—March 14, 28, 2.30 p.m., Larkhill Mansion House, West Derby, Liverpool.
Manchester (M. & D.R.S.).—April 6, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—March 23, April 20, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—March 17 (A.G.M.), 8 p.m., Blossoms Hotel, 2 Buxton Road, Stockport.
Warrington (W. & D.R.S.).—March 17, April 7, 7.30 p.m., King's Head Hotel, Warrington.
Wirral (W.A.R.S.).—March 25, April 8, 22, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—March 27, April 10, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—March 17, 31, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—April 8, 7.30 p.m., Black Bull, Market Place.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne.—March 16, 7.30 p.m., British Legion Rooms, 1 Jesmond Road.
Pontefract.—March 19, April 2, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—March 25, 8 p.m., Dog and Partridge, Trippet Lane; April 8, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spennorth.—March 25, April 8, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—April 3, 7.15 p.m., Stirchley Institute (Room 7).
Coventry.—March 27, 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick & Leamington.—April 16, 7.30 p.m., Dalehouse Lane.
Stourbridge (S. & D.R.S.).—April 7, 8 p.m., King Edward's School.
Worcester (W. & D.A.R.C.).—Thursdays, 7 p.m., City Library (basement), Foregate Street.
Wrekin (W.A.R.S.).—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Nr. Derby.
Chesterfield.—March 24, April 7, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—March 18, 25, April 22, 7.30 p.m., Derby College of Arts and Crafts (sub-basement), Green Lane.
Leicester (L.R.S.).—March 16, April 20, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—March 18, April 1, 7.30 p.m., Technical College, Cathedral Street.
Loughborough.—March 18, 7.30 p.m., Gt. Central Hotel.
Mansfield (M. & D.A.R.S.).—March 29 (April Meeting), 3 p.m., Swan Hotel.
Newark.—March 29, April 12, 7 p.m., Northgate House, Northgate.

Northampton (N.S.W.C.).—Fridays, 7 p.m.; April 3, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—March 20, 7.30 p.m., Trent Bridge Hotel.
Peterborough.—April 1, 7.30 p.m., New Inn, New England, Peterborough.
Retford.—March 30, 7 p.m., Community Centre, Chapel Gate.

REGION 5

Chelmsford.—April 7, 7.30 p.m., Marconi College, Arbour Lane.
Ipswich.—March 25, April 8, 7.30 p.m., T.A. Drill Hall, Woodbridge Road.
Lowestoft (L. & B.A.R.C.).—March 25, April 8, 7.30 p.m., Y.M.C.A.

REGION 6

Cheltenham.—April 2, 8 p.m., 128 Prestbury Road.
Gloucester.—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
High Wycombe.—March 24, 7.30 p.m., G6JK, 17 New Drive, Tottenham.
Oxford.—Alternate Wednesdays, 7.30 p.m., The Club Room, Magdalen Arms, Illey Road.
Portsmouth.—Tuesdays, 7.30 p.m., Signals Club Room, Royal Marines Barracks, Eastney.
Southampton.—April 4, 7.30 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford, Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, Chiswick High Street, W.4.
Balham.—March 19, 7.30 p.m., Alexandra Hotel, Clapham Common, South Side, S.W.4.
Barnes, Putney & Richmond.—April 14, 7.30 p.m., 337 Upper Richmond Road, East Sheen, S.W.14.
Bromley (N.W.K.A.R.S.).—April 3, 7.45 p.m., Shortlands Tavern, Station Road, Shortlands.
Chingford.—March 24, April 10, 8 p.m., "70 cm"—Dr. Koster (G3ECA), A.T.C. H.Q., Pretoria Road.
Croydon.—April 14, 7.30 p.m., "Blacksmiths Arms," South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road, Dorking.
Dulwich & New Cross.—April 14, 7.45 p.m., "Professional Finish on Amateur Equipment"—E. Yeomanson, G3IR, "The Walmer Castle," Peckham Road, S.E.15.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East Ham.—March 17, April 2, 14, 8 p.m., 57 Leigh Road.
East London.—March 29, 3 p.m., Ilford Town Hall, "Receiver Accessories," W. H. Allen, M.B.E. (G2UJ).
East Molesey.—April 18, 8 p.m., "D.F. Equipment"—G. T. Peck, "Carnarvon Castle," Hampton Court.
Eltham & Sidcup.—March 23, April 6, 7.30 p.m., Holy Trinity Hall, Hurst Road, Sidcup.
Enfield.—April 19, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—March 17, April 21, 7.30 p.m., 164 Albion Road, N.16.
Guildford & Woking.—March 22, 3 p.m., Royal Arms Hotel, Guildford.
Harlow (H. & D.R.S.).—March 17, 31, April 14, 8 p.m., War Memorial Institute; March 24, April 7, 8 p.m., 6 High Street.
Hendon & Edgware (E. & D.R.S.).—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kensington & Shepherd's Bush.—April 10, 8 p.m., 38 Royal Crescent, W.11.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—March 21, 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Slough.—March 19, April 16, 7.45 p.m., Labour Hall, Chandos Street.
Southgate & Finchley.—April 19, 7.30 p.m., Arnos School, Wilmer Way, N.11.
Sutton & Cheam (S. & C.R.S.).—March 17, "The Harrow," Cheam Village.
Uxbridge.—April 3, 7.30 p.m., "The Vine," Hillingdon.
Watford (W.A.R.S.).—March 17, April 7, 7.30 p.m., "Cookery Nook," The Parade.
Welwyn.—April 7, 8 p.m., Council Offices, "420 Mc/s."

REGION 8

Brighton (B.D.R.C.).—Thursdays, 7.30 p.m., 27 Warren Avenue, Woodingdean.
Chatham (M.A.R.T.S.).—Mondays, 7.30 p.m., Club H.Q., Five Bells Lane, Rochester; March 23, 7.30 p.m., "Red Lion," Rochester.
Hastings (B. & H.A.R.C.).—March 24, April 7, 7.30 p.m., Saxons Cafe, Denmark Place, Hastings.

(Continued on page 404)

R.S.G.B. BULLETIN

Volume 28 No. 9

March, 1953

Current Comment . . .

Emergency

IN the editorial of January, 1952, we commented on the stirring story of how the Italian radio amateurs had come to the rescue during the flood disaster in the valley of the River Po. In the course of that Editorial we used these words: "We are so apt to consider communications in this country as foolproof that we are inclined to regard such emergency as beyond the realms of possibility. This is possibly quite true. No doubt the good citizens in the Po Valley thought so too. Still, it does no harm at least to be trained in the technique of being prepared."

Might we not now add "No doubt the good citizens of Mablethorpe, Sutton, Jaywick and Canvey Island and a dozen other places thought so too."

Elsewhere in this issue, we read what unprepared, unorganised radio amateurs were able to achieve during a disaster so immense that, had we even hinted at its possibility in January, 1952, we should have been accused of alarmist exaggeration of the worst kind! We ended that Editorial with these words: "Human lives may depend on what we do about it now."

"It can't happen here," we were told. Yet, only a few months later, at the very height of the summer holiday season, came the ghastly shambles of Lynmouth. Apart from the poor souls who were whisked away to their deaths by that mighty wall of water, what was the first casualty? COMMUNICATIONS. Only a few months later came the most terrific natural disaster suffered by this country for centuries. This time, with immense material havoc, a heavy death roll occurred and again precious time was lost by lack of communications.

By a grim turn of fate, almost the first casualty was the G.P.O. coast station at Sutton-on-Sea, an almost brand new, up-to-date, show-piece of a station, rendered useless in a few minutes by the raging sea. Let no one accuse the Post Office of being unprepared, for even *they* cannot work miracles.

Precautions against a serious breakdown at a coast station were already in being. In fact, a mobile coast station has been in existence for many years and has been maintained in a state of constant readiness, but it had to be got to the scene of the disaster from a central point; meanwhile, men's lives were in danger. No one can predict where some accident will strike at vital communications. Take North Foreland Radio, for example,

sited as it is within an area of constant jet-aircraft activity. Not long ago one of these machines came crashing down on the little village of St. Peter-in-Thicket killing and causing dreadful havoc, not half a mile from GNF. Suppose such an accident were to involve the station while the mobile station was doing duty at Louth? But perhaps we are now guilty of alarmist exaggeration!

Still, it is a sobering thought that had the British Delegation and the two R.S.G.B. representatives at the Atlantic City I.T.U. Conference not fought grimly for the retention of amateur facilities on "Top-Band," many brave men might now be lying drowned at sea. The country, too, would be the poorer by the loss of several valuable ships, now safe and sound because a few men with the necessary "know-how," coupled with imagination and initiative, jumped to it and did not wait to be asked or told what to do.

Members will recollect that, when we offered to organise an Emergency Amateur Communications Service some three years ago, we were not exactly snubbed but the treatment we received was not far removed from it. The statement which came from the then Minister of Transport was a smug assurance that every eventuality was adequately covered. The Minister was satisfied . . . etc. We feel, somehow, that his successor in the light of these recent events must have a rather different attitude of mind. From the correspondence we have received from members it is apparent that they are in no mood to be put off by any Ministerial "ho-hum" but are pressing the Society to organise an emergency service without any further ado, with or without official blessing. We incline to this view and consider that whatever the authorities may say or think, an organised service, ready to click into place immediately, is a much better proposition than trying to improvise at the height of an emergency, when people are in peril of their lives.

So that something can be got going without further delay, we ask all members who are keenly interested to register their names at Headquarters. Envelopes should be marked "Emergency Service."

Let us show that we can set up an efficient, well trained and enthusiastic organisation which will cost the country nothing whatever to equip or maintain—a voluntary service which, like the Red Cross, St. John Ambulance, Boy Scouts, the W.V.S. and many others, can be called upon, when required, as much as a matter of course as the U.S.

(Continued on page 397)

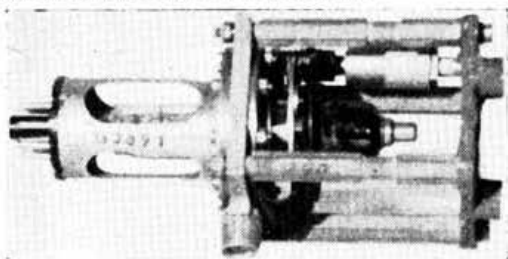
Amateur Microwave Experiments

Part I

To the experimentally inclined radio amateur, the microwaves present a similar challenge to that which faced the "old-timers" of 30 years ago when the "short waves" were being dismissed as useless. In this series of articles the author describes, from his own experience, the way to commence operations on the highest frequency amateur band.

THE first reported activity in the amateur centimetric allocations was that by W2RJM and W2JN who succeeded in establishing telephony contact in the 10,000 Mc/s band over a distance of two miles in 1946⁽¹⁾. Later the same year, QST reported a new record of 7.65 miles⁽²⁾, set up by W4HPJ/3 and W6IFE/3.

In 1949, G3BAK and G3LZ started experimenting, and on January 20th, 1950, made the first amateur contact on 10,000 Mc/s in the U.K.⁽³⁾. The same year, G3APY/P and G3ENS/P made contact over a distance of 27 miles, which is still the world record for this band.⁽⁴⁾ Since 1950, work has continued at G3BAK and G3LZ, and new equipment is steadily being acquired, principally from ex-Government sources. It is the object of this series of articles to describe both the simple as well as the more complex gear now in use and to make some reference to the practical aspects of microwave measurements.



The British CV129 Klystron.

General Notes on Equipment

At centimetric wavelengths—where near-optical conditions may be achieved with compact aerial systems—waveguides, klystron valves and paraboloids are used. Many amateurs are already familiar with these devices from knowledge gained during the last War. No more will be said of the theory of operation at such wavelengths than is necessary to understand the general theme of these articles.

* 6 Isis, Damhead Hall, Glazebrook, Manchester.

Valves. Two of the more readily available types of reflex klystron valves are illustrated. The photograph shows the British CV129 and Fig. 1 the American 723A/B. Their unmodified characteristics are given in Table 1.

Klystron valves are used to generate frequencies above 3,000 Mc/s. At such frequencies the transit time (the time taken for electrons to pass between the various electrodes in a conventional valve) is no longer negligible compared with the periodic time of oscillation.

Reflex klystron valves, which make use of the transit time effect, operate in the following manner. In a typical klystron (Fig. 2), electrons are emitted by the cathode, the electron stream being controlled by a negative potential on the grid. The electrons are accelerated through the cavity grids and repelled by the negative potential of the reflector. If the valve is assumed to be already oscillating, an r.f. voltage will be present across the cavity, which is mechanically tunable and has two grids spaced in its centre. Electrons travel between these two grids in a time which is short compared with the period of oscillation; their velocity is altered by the r.f. voltage on one of these grids. From the cavity emerge "bunches" of electrons, which are repelled by the reflector and arrive back at the cavity after a short period of

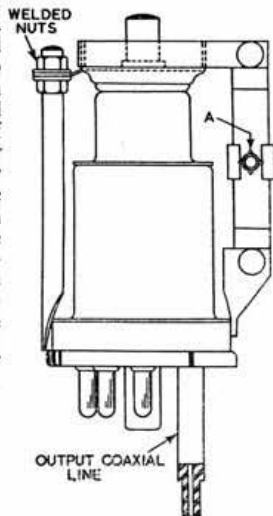


Fig. 1.
The 723A/B showing the position of the welded nuts referred to in the text. Stud A is the mechanical tuning control.

Table 1.

Type	Output mW	Nominal Frequency Mc/s	Mechanical tuning	V cav.	V refl.	V grid	I cath. mA
723A/B	20	9375	$\pm 2\% = \pm 180$ Mc/s	300	-20 to -300	—	18 to 25
CV129	100	9375	$\pm 2\% = \pm 180$ Mc/s	1600	-100 to -500	0 to -50	8
CV87	70	9375	Same as CV129 (approximately)				

time. The negative voltage on the reflector determines how far the "bunches" will travel into the space between the cavity and the reflector. At a certain reflector voltage, the "bunches" will arrive back at the cavity at the correct moment to sustain oscillation. The "bunches" of electrons can also arrive back at the cavity after longer intervals of time, producing less favourable conditions. Thus, as the reflector voltage is varied, the valve will oscillate in various "modes," which are usually referred to as, for example, the "160 V mode" or the "110 V mode." These voltages are the approximate reflector voltages which permit oscillation.

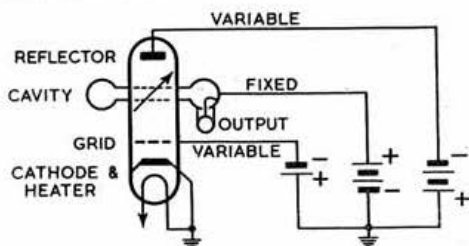


Fig. 2.—A typical reflex Klystron.

The operating characteristics of the 723A/B are shown in Fig. 3, from which it may be seen that only for one value of reflector voltage will the transit time be correct for oscillation at the resonant frequency of the cavity in each of the modes, although the valve does not stop oscillating with small departures from these conditions. Changes in reflector voltages, however, cause small frequency changes. Electronic tuning is therefore possible, the amount of such tuning being increased by lowering the mode of oscillation voltage and/or increasing the cavity voltage. Use is made of this property for automatic frequency control, modulation and pulsing purposes.

Both the 723A/B and the CV129 are tunable electronically as well as mechanically. Turning the mechanical control of the 723A/B anti-clockwise raises the frequency of oscillation while the same action in the CV129 lowers the frequency. The base connections for these valves are given in Fig. 4.

Modification of the 723A/B and CV129 Klystrons

The mechanical tuning ranges of these valves (Table 1) are insufficient to permit operation above 9,600 Mc/s unless the pre-set adjustments are altered.

723A/B. Of the three makes available, the *Western Electric* and *Raytheon* types are more likely to lend themselves to successful modification

to permit operation in the amateur band than those made by *Ken-rad*.

The weld (see Fig. 1) should be carefully filed off, so that the two nuts securing the movable rim may be moved. The nuts are then run outward and re-locked. This action has the same effect as mechanical tuning, but on a larger scale. The nuts on *Western Electric* valves should be moved about $1\frac{1}{2}$ turns and on *Raytheon* valves about 2 turns. This should tune the valves to approximately 10,000 Mc/s; an anti-clockwise rotation of the tuning bellows will produce a further move of 50-60 Mc/s into the band. The majority of the small number of *Ken-rad* klystrons tested by the author, ceased to oscillate below 10,000 Mc/s. The output of a modified 723A/B varies considerably, being about one quarter to three quarters of the original 20 mW.

CV129. This valve has a rated output of 100 mW and is suitable for serious work. The pre-set adjustment consists of two cup washers and two spring washers, spaced 180° on the rim, which alter the dimensions of the cavity.

The fine frequency control is set at about the half-way position before commencing modification. On some of these valves it is possible to tighten-up the pre-set screws by one turn which results in the cavity tuning to 10,040 Mc/s. However, by

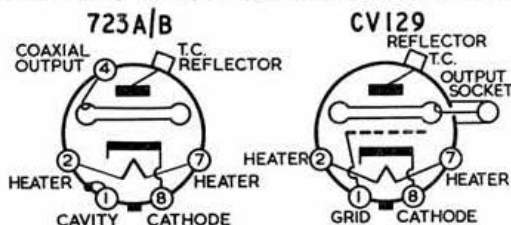


Fig. 4.—Base connections of the 723A/B and CV129. In the 723A/B the grid is built as a focusing electrode and is not brought out to a base pin. The cavity of the CV129 is not connected to a pin.

carefully removing the cup washer and leaving the spring washer on each side of the valve, two complete turns of the screw are possible, which enables a frequency of about 10,130 Mc/s to be reached. Some form of output indicator is desirable during this operation because the output varies considerably when the two screws are adjusted to different depths. (*Warning:* This valve has a dangerous potential on both the base and top cap. Great care should be taken during the adjustments which should be made with the power on. The valve may be held in a vice and a well-insulated screwdriver used to turn the screws.)

The output of the CV129 seems to change very little, provided the screws are set as described. After modification, the fine frequency control moves the frequency about 20 Mc/s.

Practical Operation of Klystrons

The 723A/B will operate from power supplies of the receiver type; it is usual to run the cavity (which is connected to the outer case of the valve) at a positive potential of about 250 V, with the cathode at earth potential. The reflector is fed from a potentiometer network across a stabilised supply of about -200 V. The output of the klystron is fed through an enlarged hole in pin 4 of a standard octal base, via an insulated bush to a waveguide and thence to the aerial system.

The CV129 is usually run with the cavity at earth potential, the cathode at a high negative potential and the reflector at the correct negative voltage with respect to cathode. The grid—the

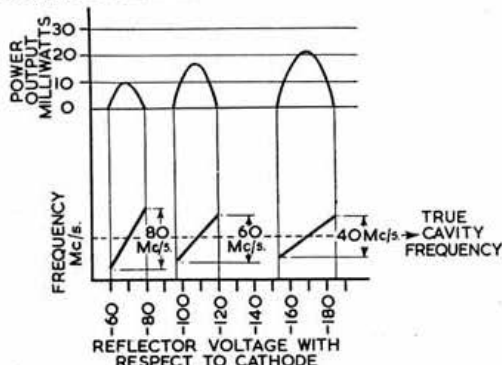


Fig. 3.—Characteristics of the 723A/B Klystron.

electrode of which is brought out to a pin in this valve—controls the cathode current by means of its small negative potential with respect to the cathode. A small loop, inserted and locked into the output socket on the valve, feeds the output to a co-axial cable. For maximum output, the plane of the loop should be in line with the length of the valve. If the valve has been removed from surplus equipment, such as the TR3529 or TR3530, an output lead will already be in position.

The maximum cathode current of the CV129 is 8.5 mA, with an increase of about 0.5 mA when the valve is oscillating and loaded.

Further information on the theory of the klystron valve has been published elsewhere.^(5, 6, 7)

Crystal Diodes

The superheterodyne receiver is almost universally used for both a.m. and f.m. reception at 10,000 Mc/s. The mixer is generally a silicon crystal, suitable types for use at this frequency being the CV111, 1N21, 1N22, 1N23 and 1N23A, although the first two were designed for use below 3,000 Mc/s. The lowest noise figures are obtained with a crystal current of 0.5 mA to 0.7 mA, using a local oscillator power of one or two milliwatts. British and American types of crystals are mechanically interchangeable, but the polarity of the indicating meter has to be reversed when a change is made from one to the other. A highly efficient mixer cavity available on the surplus market is the 10DB/6492, which has a variable short circuiting plunger and can be used for a variety of purposes by the amateur. Mixer arrangements will be described later.

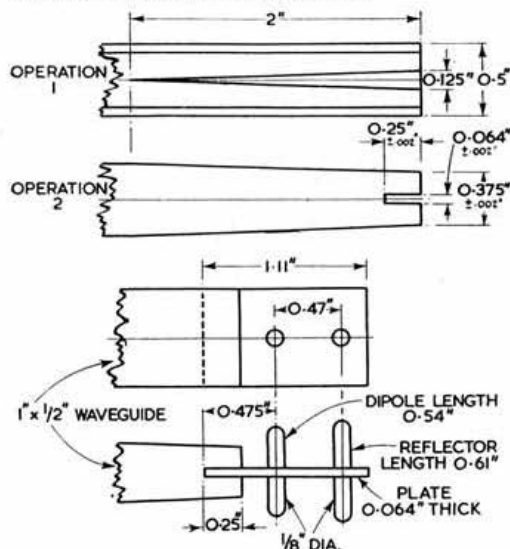


Fig. 5.—Constructional details of a 2-element beam for use with a paraboloid on 10,000 Mc/s.

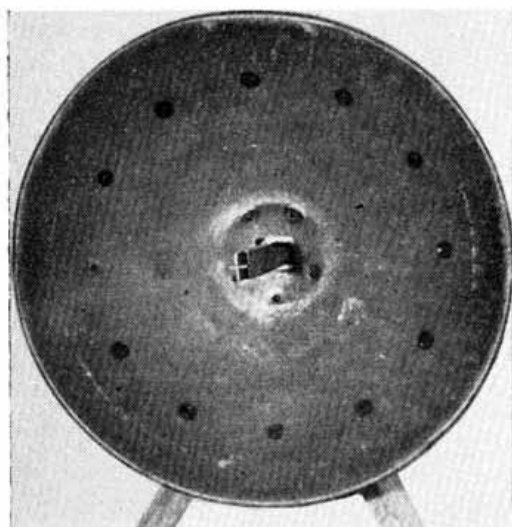
Aerials

Aerials of small physical size and very high gain are possible at 10,000 Mc/s. An ex-Government radar paraboloid type APS-3 which has a focal length of 5.6 in. and an 18 in. aperture is illustrated. The actual radiator and reflector arrangement is a simple two element beam fitted to the end of a piece of standard American waveguide which has been tapered. This arrangement may be made in the average amateur workshop; Fig. 5 shows the method of construction. Operation 1 gives the dimensions of the triangular

slot to be cut in the two narrow sides of the waveguide, which is then closed up and soldered or brazed. The second slot, required for holding the dipole and reflector plate, is then cut to the dimensions shown in operation 2.

The dipole is placed at the focal point of the paraboloid.

Other ex-Government aerial systems suitable for use in this band are Air Ministry Scanners Types 10 and 13, both of which are truncated paraboloids fed from the underside by means of a matched feed. No details of performance are available.



The APS-3 paraboloid.

Another system is to use the radiation from a series of slots in a length of waveguide to illuminate either a parabolic reflector to give a highly directional beam, or arranged to give a pattern 360° in the horizontal plane and a narrow pattern in the vertical plane. The manufacture of suitable aerial systems for operation in this amateur band is not difficult. Both the theoretical and practical aspects are dealt with in the April and May, 1951, issues of the R.S.G.B. BULLETIN.

References

- (1) *QST*, February, 1947.
- (2) "The World Above 50 Mc/s." *QST*, September, 1946.
- (3) R.S.G.B. BULLETIN, February, 1950.
- (4) R.S.G.B. BULLETIN, November, 1950.
- (5) *Proc. R.S.G.B.*, Winter, 1948.
- (6) *Principles of Radar*, Massachusetts Institute of Technology.
- (7) *Microwave Technique*, R.S.G.B.

(To be continued)

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A Three-Element Close-Spaced Reversible Beam

By R. T. JAGO, (G2JG).*

Each year members in East London compete for the G5AckR Trophy—awarded for the best piece of constructional work. The reversible beam described in this article won the trophy for G2IG last year.

THIS description of a 20 metre three element close-spaced beam will, it is hoped, interest amateurs who have not sufficient space for the conventional type of rotary.

It will be seen from Fig. 1 that the elements, which are spaced $\frac{1}{4}$ th wave apart, are suspended between two 16 ft. spreaders. The driven element is a folded dipole and both parasitic elements are cut to director length so that by adding a suitable length of wire or rod to either of them they may be changed to reflector dimensions. This is the basis of the reversibility of the beam.

in practice this has not occurred, although the beam has been used over a long period.

In order to maintain the spacing of one inch in the fold, spacers were inserted at approximately 4 ft. intervals. If the dipole is carefully constructed these spacers could be omitted, but there would then be a tendency for the conductors to twist when taking the strain. Pyrex insulators were used for suspension and the method of make-off is shown in Fig. 1.

The parasitic elements were made of 16 s.w.g. wire.

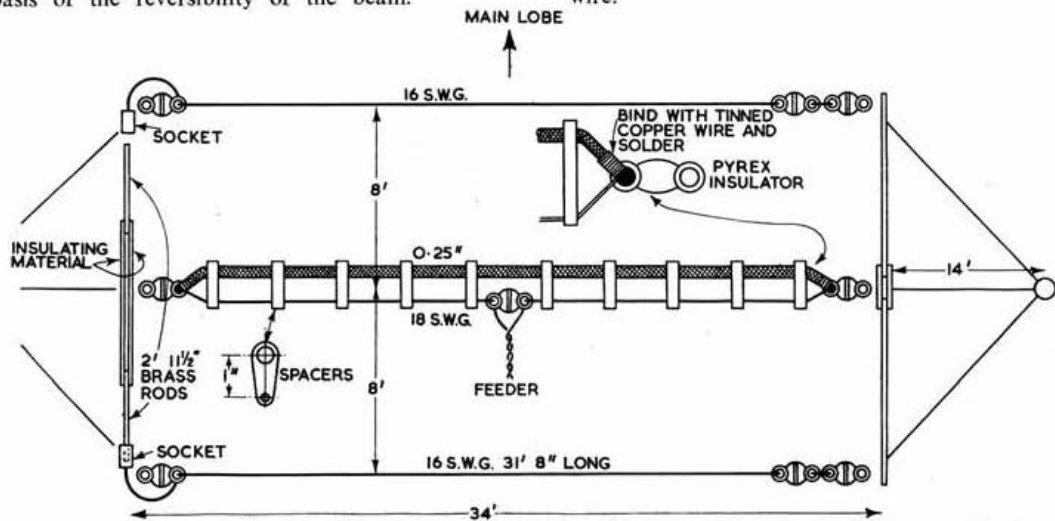


Fig. 1.—The general layout of the beam, with (inset) method of making off folded dipole to Pyrex insulator.

The Driven Element

When designing the aerial it was decided to make the driven element as simple as possible. Reasonable matching was essential and the use of standard feeder was considered desirable.

Examination of the Abac on page 64 of the October, 1947, issue of the R.S.G.B. BULLETIN showed that, for three elements, a folded dipole could be constructed with unequal diameters consisting of 18 s.w.g. for the feed wire and 0.25 in. diameter wire for the return, spaced 1 in., and that the impedance at the feed point would be 75 ohms.

As it seemed undesirable to use a heavy conductor in this form of beam, a search was made for a suitable shell of conducting material. The braiding of co-axial feeder appeared to be ideal. Accordingly, a piece about 36 ft. long was obtained, the inner conductor and polythene were removed, and a hemp line, impregnated with creosote, was drawn through the braiding. This produced a flexible and light conductor $\frac{1}{4}$ in. diameter which could be easily constructed into a folded dipole. It had been anticipated that in wet weather the dipole might buckle due to contraction of the rope inside the braiding, but

Element Lengths

The elements were cut for a frequency of 14.2 Mc/s using the following formulæ:

$$\text{Driven element (feet)} = \frac{468}{F_{Mc/s}} = 33 \text{ ft.}$$

$$\text{Director} \quad (\text{feet}) = \frac{450}{F \text{ Mc/s}} = 31 \text{ ft. } 8 \text{ in.}$$

$$\text{Reflector (feet)} = \frac{492}{F \text{ Mc/s}} = 34 \text{ ft. } 7\frac{1}{2} \text{ in.}$$

Difference between director and reflector—2 ft. 11½ in. *Note:* This includes the connection from the parasitic element to the socket for the rod.

Reversing Mechanism

The switching mechanism is accommodated on one of the spreaders and is operated by two hanging cords (Fig. 2).

As it was not found possible to move the additional length from one director to the other, two lengths were used—one adjacent to each director—and so arranged that when one is connected the other is dead. Due to mechanical difficulties it was decided to move the rods parallel

* 24 Headley Drive, Ilford, Essex.

to, and below, the spreader. This may have the effect of slightly distorting the main lobe of the beam but, if it does, it is insignificant.

Contact to the end of the parasitic element is made by means of the split end of an $\frac{1}{8}$ in. rod sliding into a socket. This is fitted into the end of a 12 in. glass tube of the type used to separate plates in large secondary cells. A small brass washer, soldered to the rod, keeps it central in the tube. The tube is attached to the spreader by binding tape and spaced-off for $\frac{1}{2}$ in., the gap being packed with sorbo rubber.

The sliding switch assembly between the two lengths of rod is made of polythene, ebonite and wood, the overall length being 2 in. less than the distance between the sockets to provide the necessary gap. The straps carrying the sliding section are made of $\frac{1}{2}$ in. wide 16 s.w.g. aluminium strip.

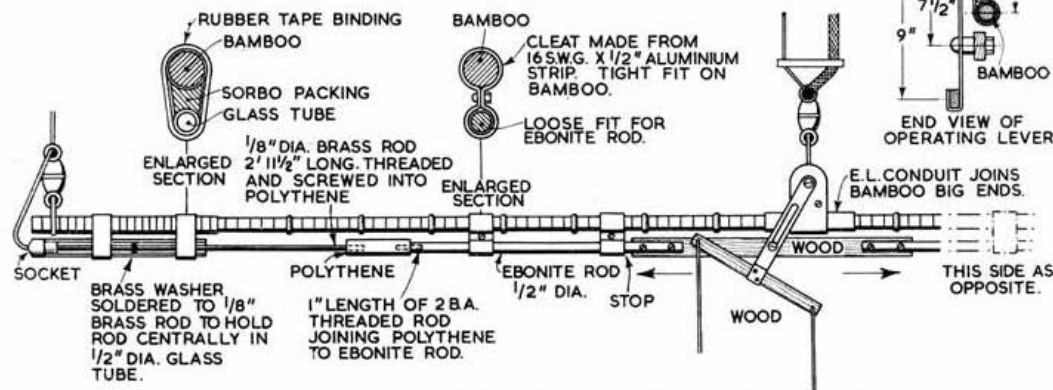


Fig. 2.—The switching assembly attached to the spreader (not to scale).

Spreader

Bamboo spreaders are used. Timber, paxolin rod or tube are too heavy, not rigid enough and warp after a little use. Several firms market 9 ft. bamboo sticks approximately $1\frac{1}{4}$ in. diameter at about 3/- each. Four should be chosen having butt ends that will fit into an 8 in. length of $1\frac{1}{4}$ in. electric conduit. Two 9 ft. sticks fitted together in this manner make a strong, light spreader, with tapering ends. If painted and bound between the notches, the sticks will give years of service. Two layers of adhesive tape should be bound over the spreaders at the make-off points of the elements to prevent slip.

Each spreader should have three strainer ropes, one at each end and one in the middle. The joining point of the ropes should be at least 14 ft. behind the spreader.

General

Construction is very simple and should be tackled in the following order:

1. Dip the ropes in creosote and leave to drain for three days.
2. Make, plug and paint the spreaders.
3. Make the elements.
4. Make the straps to hold the switch assembly.
5. Make the operating lever.
6. Fit the sockets.

When the paint is dry and the ropes are thoroughly drained, the construction may be easily completed.

Testing and Trimming

Much time and patience can be expended in trimming without any absolute result, but a good rough check can be made as follows. Lower one

end of the beam to about 8 ft. from the ground, strain it taut and couple it to the transmitter at the design frequency. It should now be possible to strike a neon lamp to a brilliant glow on the end of the driven element. Estimate the amount of r.f. and transfer the neon to the end of the director where it should register as much or a little more. If this is not so, the director is either too short or too long—probably the latter. The reflector is next tested and is about correct for length when, holding the neon by the glass bulb, it just strikes, but when holding it by the metal part it will not strike.

Although the tests provide only a rough indication, it is a fact that when these conditions exist the beam will give a very good performance. It may not, however, be possible to strike the neon on the parasitic elements if an input power much below 150 watts is used.

An idea of the efficiency of the beam can be obtained when using it for reception. Reversing the beam should produce a very marked difference in signal strength if the station is broadside on to the beam.

Results

At G2JG, the beam is suspended 33 ft. above the ground between two masts 66 ft. apart, the direction being 20 degrees east of north so that it gives directivity approximately east or west at will. Reversing the beam while transmitting to local stations has produced a difference in signal strength of 30-35 db. Stations in the Middle East have given S9-plus signal reports when the beam has been directed eastwards, but they could not resolve the signal when it was directed westwards.

Other Bands

The beam should be equally effective on 21 Mc/s and 28 Mc/s if cut to the correct dimensions. On 21 Mc/s the spreaders should be 12 ft. long and on 28 Mc/s 8 ft.

Hong Kong Amateur Radio Society

AT the Annual General Meeting of the Society held in December last, the following were elected to the 1953 Council: *President*: M. H. Duke, VS6BJ; *Hon. Secretary*: R. W. Clegg, VS6CH; *Hon. Treasurer*: P. J. O'Brien, VS6AE; *Council Members*: C. T. Fung, VS6CG, and J. E. Jeckway, VS6CL.

Radio Society of Bermuda

THE Radio Society of Bermuda has altered the date of its Annual Field Day to coincide with N.F.D. on June 13-14, 1953.

Operation Floodtide

How U.K. Radio Amateurs helped during the Great Floods of 1953

Told by F. R. Peterson (G3ELZ)*

In many parts of the world radio amateurs have rendered yeoman service in times of disaster by flood and tempest. Elaborate emergency services have been set up by amateur organisations, particularly in the U.S.A., so that, whatever the disaster, vital messages may be handled quickly and efficiently. Despite lack of organisation, engendered by assurances from Government sources that "it can't happen here," British amateurs maintained communications during the recent flood disaster on the East Coast in a manner worthy of a great tradition. If any lesson is to be learnt from the events chronicled here let it be this: it CAN happen here and the U.K. needs a National Emergency Amateur Radio Communications Service, NOW.

THURSDAY, January 29th, 1953, was like a spring day in Grimsby, with the sun high in a blue sky. It really looked as if winter was over. But how soon all this was to change! By the Saturday morning, a strong wind, rising to gale force in a few hours, was beginning to cause concern. By teatime, radio amateurs reading their evening papers, after seeing that their aerials were still in position and the guy wires slackened, were shocked to read of the disaster which had befallen the *Princess Victoria* in the Irish Sea.

Ships in Distress

On the Lincolnshire coast, thoughts naturally turned to the men at sea, and receiver dials were spun across 160m and the shipping band. R. H.

* Town Representative for Grimsby and Cleethorpes, 58 Peaksfield Avenue, Grimsby, Lincs.

Here is a recent photograph of Reginald A. Hutcheson-Collins (G3AXS), of Grimsby, whose splendid work during the recent flood disaster earned for him the high praise of shipping, police and public utility services. Mr. Hutcheson-Collins served in the Royal Navy as a chief petty officer-telegraphist in the last war, and was mentioned in despatches.

The Top Band transmitter is in the TUS unit at the bottom right of the photograph. Other equipment shown includes a 12-valve communications receiver, a switched all-band 120 watt transmitter and associated modulator. The aerials at present in use are a 200ft. long-wire and a 7 Mc/s dipole.



Collins (G3AXS), whose work is on ship radio installations, was one of those on silent watch. At about 1840 G.M.T. he was listening to Humber Radio in contact with the *S.S. Levenwood*. The ship required the aid of tugs and urgent medical advice for the First Officer who was ill. Humber Radio acknowledged this request and then called North Foreland asking that station to listen on 164m. G3AXS, realising that something was wrong, tuned to 1825 kc/s just in time to hear Humber ask North Foreland to deal with the message as his land lines were down. Then silence! It seemed obvious that Humber Radio had closed down involuntarily, so G3AXS telephoned Mablethorpe Exchange and asked them if they knew that the land lines to the station were down. They did not, and thanked him for the information. The question now arose: what was going to happen to the *S.S. Levenwood* which was still frantically calling Humber Radio but getting no reply? After some hesitation, G3AXS rather nervously tuned his "Top Band" transmitter to 1650 kc/s, called the *Levenwood* and asked if there was anything he could do to help. When the *Levenwood* gratefully replied, G3AXS told the operators to listen on 1735 kc/s, to which frequency he retuned his own transmitter. He then telephoned the Grimsby and District General Hospital, obtained the necessary advice, and passed it on to the Master of the *Levenwood*. After this, he arranged for a tug to go to the assistance of the vessel, and reported to the Master that this had been done. He then said he would stand by on "Top Band" for any further distress traffic. An hour later, the Master of the *Levenwood* reported that the tug was no longer required, as the ship was again under control. G3AXS was, however, asked to remain on watch for him. At about midnight, the Master informed

G3AXS that the First Officer was comfortable, but asked for the listening watch to be kept on for a little longer.

Grimsby amateurs quickly realised that the situation locally would become serious for Humber ports shipping with Humber Radio out of action. Already the *M.V. Menapia*, which had broken adrift from, and could not establish radio contact with the tug which was towing her off Flam-borough Head, was in difficulties. G3AXS promptly telephoned the owners of the tug and also informed Cullercoats Radio of what had happened. The Master of the *Levenwood* having reported that he could manage for the time being, G3AXS decided to snatch a few hours' sleep.

Lightship Adrift

Early on Sunday morning, G3AXS checked to see if Humber Radio was on the air again. Alas, there was no signals from that station. Then came news that the *Humber Light Vessel* had broken adrift and was running before the gale with the *S.S. Melrose Abbey* desperately trying to render assistance and to contact Humber Radio. G3AXS put in a call to Humber Radio only to discover that all communications between Grimsby and Mablethorpe had broken down. He therefore telephoned the Humber Conservancy Board at Hull and informed them of the plight of the *Humber Light Vessel*. The Board asked G3AXS for the position of the vessel, at the same time telling him that they had already instructed their ship to go to the assistance of the lightship. G3AXS called the *S.S. Melrose Abbey* and obtained the required information which he passed to the Board. The Master of the *Melrose Abbey* asked G3AXS to stand by. At about the same time an unknown vessel was heard giving the information that the "Red Cliff Buoy" was floating rapidly down river. Humber Conservancy Board were informed of this by telephone and they requested that any further information about the Buoy should be passed on to them. The Board asked G3AXS to request the *Melrose Abbey* to pass on to all shipping the new position of the *Humber Light Vessel*.

At about 1100 G.M.T. the Grimsby steam trawler *Bombardier* was heard calling Humber Radio for the assistance of a tug. Her steering gear was out of action and the trawler was drifting although trying to anchor to rig emergency steering. The tug owners were informed of this mishap by land line.

A little later the *Levenwood* reported that the First Officer was now out of immediate danger and that the ship was safe.

The *M.V. Menapia* was, however, still in distress and drifting. The tug which had been despatched to her aid had been diverted to help another ship which was in an even worse plight. The *Humber Light Vessel* had by now made good anchorage and the *Melrose Abbey* therefore proceeded on her course. Listening watch was then kept on the *Bombardier*. Although she was in a critical condition it was realised that nothing further could be done for the moment.

Ship's Aerial Faulty

By mid-afternoon the *Menapia* was reported to be in dire distress and required urgent assistance. The tug owners, who were informed by telephone, immediately despatched another tug to the assistance of the crippled vessel. Meanwhile, the *Menapia* was trying without success, to

give her position to North Foreland Radio, but owing to an aerial fault on the ship the transmission could not be heard by that station. North Foreland were thereupon informed by land line and expressed gratitude for the information.

North Foreland informed shipping of the position of the *M.V. Menapia*, but because of the aerial fault and the amount of other traffic on the distress channel, she could not receive properly and continued to call for assistance. A tug in the vicinity of the *Menapia* was therefore called by G3AXS and asked to pass on the fact that assistance was on the way. Dutch distress traffic was now to be heard although locally things seemed to be rather more organised. The *S.T. Bombardier*, with the aid of emergency steering gear, had managed to reach safe anchorage in the Humber and was waiting for a tug to assist her to negotiate the congested shipping channels which were full of vessels sheltering from the gales. The *Bombardier* was called and told that assistance was on the way and that her changed position had been given to the tug owners. The *Bombardier* asked that a listening watch should be maintained on her until the tug arrived. The tug reached the vessel about 2300 G.M.T.

No Contact with Mablethorpe

While all this was going on, Grimsby amateurs tried to establish contact with their colleagues in the Mablethorpe area. Calls were sent out for three hours, but no contact could be established. The writer therefore got together some portable equipment so that it would be ready to take anywhere should it be necessary, but none of the Grimsby amateurs was approached by the Authorities.

Another Distress Call

This was thought to be the end of the emergency, but on Monday evening at 2100 G.M.T. the *M.F.V. Roda*, another local fishing vessel, was heard calling Humber Radio for help as she had run aground due to the *Humber Light Vessel* being out of her proper position—a fact the skipper did not know because Humber Radio was off the air. After the *Roda* had called for 45 minutes, during which time no Government radio station had replied to the distress call, G3AXS established contact on 1825 kc/s. The police were informed and they dealt with the lifeboat arrangements. In the meantime the tide had receded and left the *Roda* high and dry so that the Coastguard was able to walk out and board her. He then called G3AXS and asked him to pass on the information by land line. A stand by watch was maintained until news was received that help was no longer required.

The *Roda* emergency was much simpler to handle, because by then local amateurs had their own hastily-set-up distress system organised and had made arrangements with the Hull R.S.G.B. Group which made it possible for the two groups to handle practically any situation which might arise.

* * *

The tailpiece to this story is that it seems to be a habit with G3AXS to be in this sort of thing, for he helped during the Hawaiian disaster in 1946 when, under the call sign VS6DY, he provided, in association with K6ROJ (Ella and Paul Christianson), the only means of communication with the outside world from the Island of Oahu.

Hull Amateurs Lend a Hand

IN the foregoing account of the part played by G3AXS and others during the recent emergency, reference is made to liaison with the Hull R.S.G.B. Group. Amateurs in that town hearing Grimsby stations handling traffic from ships at sea and, concluding that something serious had happened, made contact by land-line and radio. Thereafter the two groups worked in close co-operation.

G3EFR—associated with the local Rediffusion service system, which incidentally was put out of action temporarily—heard ships in the mouth of the Humber calling Humber Radio in vain, and decided that something must be done. He telephoned the C-in-C Fishery Protection, based on Hull, and offered the services of amateurs associated with his company to provide staff for a station to operate on 1650 and 500 kc/s. This official was unaware that Humber Radio (GKZ) had closed down, so he reported to his superiors who alerted the local R.N.V.(W.)R. group, at the same time asking the local amateurs to provide help in keeping the Naval Reserve station on the air continuously. So it was that G3EFR, G3ECE and G3FKK found themselves using 200 watts of 'phone! The R.N.V.(W.)R. men worked from 2000 G.M.T. until midnight and the amateurs from midnight until 0800 G.M.T.

Members of the Grimsby R.N.V.(W.)R. Group later took over, and they in turn were relieved by the staff of GKZ. The operators of that station, it is now known, fought a heroic battle to keep going when the floods came roaring in.



The Aberdeen Amateur Radio Society is offering a specially designed three-coloured Coronation Year Award—of which the above is a reproduction—to radio amateurs who succeed in contacting at least four stations operated by members of that Society.

Coronation Year Activities

Headquarters will be glad to give publicity to any special events being arranged by R.S.G.B. Groups and Affiliated Societies during Coronation Year.

* * *

Chelmsford Exhibition: June 6-7. An Amateur Radio station will be in operation.

Ready for Emergencies

The following Leader appeared in the Scarborough Evening News and Daily Post on Thursday, February 19, 1953.

BRITAIN can be rightly proud of the humanitarian work its voluntary organisations carry out. There is that great work of the Royal National Lifeboat Institution, which has ringed our coasts with boats and men ready to go out on their life-saving tasks at any hour of the night or day. Wherever crowds gather there are the men and women of the St. John Ambulance Brigade and the British Red Cross Society. In emergencies such as the flood disaster there are the women of the Women's Voluntary Service, ready to perform a multitude of tasks. And so the list could be extended to organisations large and small, all with the same design—to serve their fellows. Almost all these organisations work with official approval, and in very many cases the work they do is closely integrated with the services provided from official sources.

But there is one set of people who for many years have been offering their services for use in an emergency but have been constantly refused. They are Britain's radio amateurs—the men who spend their spare time talking across the country, and across continents, through their radios.

Before the war, and since, they have presented schemes to the authorities for the setting up of an emergency radio network, a network

composed of low-power transmitters which would not rely on the mains for the supply of current, and which could maintain vital communications in the time of an emergency. Their proposals have been turned down by the Ministry of Transport, which was advised by the C.P.O. that it was quite capable of handling any emergency without the aid of the radio amateurs. Despite that assurance there was a gap in vital communications when the Humber Radio coastal station was flooded out, and two or three amateurs, at the risk of losing their transmitting licences, filled that gap, and brought aid to ships in distress.

Doubtless the G.P.O.'s attitude is dictated by its determination to prevent anything happening which might infringe on its monopoly in the communications world. That would not be in jeopardy if the proposed emergency network was set up. Such networks operate in many countries, and during flood disasters in the United States many lives have been saved by the efforts of these amateurs. If such a network was given official blessing in this country it might be that it would be never needed, but that is a poor reason for its rejection. Every clear-thinking person will wish the Radio Society of Great Britain success when it next approaches the authorities with its proposals.

The Radio Amateurs' Examination

Model Questions and Answers

Part 8. Modulation

ALTHOUGH a new licensee is not normally permitted to use telephony during the first year of his licence, questions on modulation are frequently set in the examination.

What is meant by modulation? How is the degree of amplitude modulation present on a carrier wave expressed?

A steady wave-train generated by a transmitter is called a carrier wave (see Fig. 1A). This wave may be interrupted in accordance with a pre-determined code to produce intelligence—continuous wave telegraphy. Alternatively the amplitude or frequency of the wave may be

By

B. W. F. MAINPRISE
B.Sc. (Eng.), A.M.I.E.E. (G5MP)*

varied, as is the case in telephony. The effect of changing the steady state of a carrier wave is called *modulation*.

In the case of amplitude modulation, an audio frequency voltage is superimposed on an operating voltage (such as an anode or a grid voltage) in one of the radio frequency stages in such a way as to produce a wave-train of varying amplitude (see Fig. 1B). Modulation produces a succession of crests and troughs in the previously steady carrier wave; the extent to which the wave is modulated is termed the *depth of modulation* or the *modulation factor*. It may be expressed as a percentage or as a decimal fraction, viz, 80% or 0.8.

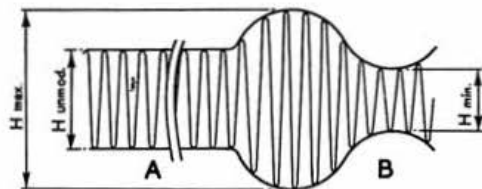


Fig. 1.—(A) An unmodulated carrier wave. (B) With modulation superimposed on the wave-train, the amplitude of the carrier varies.

The actual value is obtained by measuring the amplitudes of the carrier before and during modulation. Thus, from Fig 1B,

Percentage depth of modulation =

$$\frac{H_{\text{max}} - H_{\text{unmod}}}{H_{\text{unmod}}} \times 100 \text{ or}$$

$$\frac{H_{\text{unmod}} - H_{\text{min}}}{H_{\text{unmod}}} \times 100$$

Both expressions give the same result when modulation conditions are correctly adjusted.

Explain, with the aid of a circuit diagram, how anode modulation of an amplitude modulated transmitter may be achieved.

An anode modulation circuit is shown in Fig. 2. V1 is the modulator valve, coupled by a transformer T to the r.f. output stage V2. For convenience, a single valve operating in Class A is shown as the modulator valve; for large audio frequency outputs two valves operated in Class A push pull (or more usually in Class B) would be chosen. V2 is operated under Class C conditions with a grid bias equal to twice that required to cut off the anode current when no drive is applied.

In operation, the microphone output voltage is amplified by one or more stages (not shown) before reaching the grid of the modulator valve. This audio frequency voltage causes the anode current of V1 to swing above and below its steady value. This in turn produces voltage variations across the anode load (transformer T). These voltage variations are superimposed by the transformer onto the anode voltage of V2, causing the voltage to swing above and below its steady value. Thus, if the anode voltage on V2 is 400

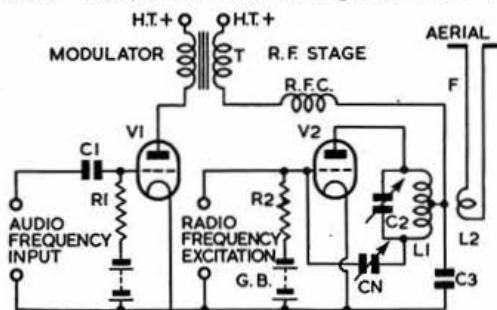


Fig. 2.—Simple p.a. stage and modulator. C1, modulator grid condenser; C2, p.a. tuning condenser; C3, decoupling condenser; CN, neutralising condenser; R1, R2, grid leaks; L1, p.a. tank coil; L2, aerial coupling link; RFC, radio frequency choke; T, modulation transformer.

and the modulator supplies a voltage swing of 350V, the anode voltage of V2 will range between 750 and 50V. If the range were from 800V to zero, the stage would be said to be modulated 100%.

At the instant the anode voltage is doubled, the anode current will be doubled, the instantaneous power being four times the unmodulated carrier power. Ample emission is therefore necessary in V2 whilst the condensers in the anode circuit of the modulated stage must have a voltage rating at least twice that of the anode supply.

For 100% anode modulation, V1 must provide an audio-frequency output equal to half the d.c. input to the r.f. stage, e.g. 5 watts, if the input to the latter is 10 watts.

The anode current of the r.f. stage, read on a milliammeter in the h.t. lead, should remain unchanged with modulation. Any flicker will indicate over-modulation or faulty adjustment. If the depth of modulation is 100% the aerial power will be 1.5 times the unmodulated value and the aerial current will increase by $\sqrt{1.5}$ times, giving a reading approximately 1.22 times the unmodulated value, assuming sine wave voltages.

* 48 Earlsfield Road, Hythe, Kent.

Contrast the relative merits of anode modulation and grid modulation of an a.m. transmitter.

Anode modulation has the advantage of being applicable to an r.f. stage working at high efficiency as a Class C amplifier. With this system, 100% modulation, with high quality, is obtainable. The disadvantage of anode modulation is that the modulator must provide an audio frequency power output up to half the d.c. input of the r.f. stage. This generally entails high pre-amplification of the output from the microphone, a high anode voltage and heavy iron-cored components.

Grid modulation—whether applied to a control-grid, screen-grid or suppressor-grid—necessitates the r.f. stage being operated at a deliberately reduced output and efficiency. On the other hand, only a small audio frequency output is necessary; consequently the modulator and its pre-amplifier may be of economical construction both as regards current consumption and weight. This system is widely used for mobile equipment, although distortion is generally encountered if the modulation depth exceeds about 75%.

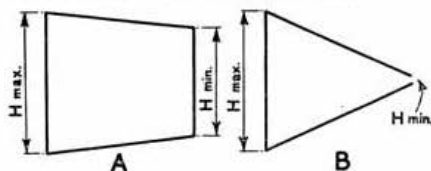


Fig. 3.—The patterns obtained on a cathode ray tube when used to measure the depth of modulation as described in the text. (A) Considerably less than 100% modulation. (B) Practically 100% modulation.

Describe briefly how the depth of modulation of an amplitude modulated transmitter can be measured.

One suitable method is to couple a cathode-ray tube to the transmitter and to examine the pattern produced on the screen. Besides enabling the depth of modulation to be judged, this method will also disclose the presence of phase shift and harmonic distortion.

The vertical deflection plates of the cathode-ray tube are link coupled to the tank coil of the modulated r.f. stage, the degree of coupling being adjusted till a vertical line of suitable height is produced on the screen. The horizontal deflection plates of the tube are connected across the output of the modulation transformer, a blocking condenser of about 1 μ F being used to isolate the tube from the d.c. potential of the r.f. stage. A potential divider will probably be required to reduce the audio frequency voltage to a value which will give a suitable horizontal deflection.

When the modulation is correctly adjusted, the pattern on the screen will take the form of a trapezium, the upper and lower sides of which form straight lines sloping towards the horizontal axis (see Fig. 3A).

Measurement of the vertical sides will enable the depth of modulation to be calculated from the expression:

$$\text{Percentage depth of modulation} = \frac{H_{\text{max}} - H_{\text{min}}}{H_{\text{max}} + H_{\text{min}}} \times 100$$

When H_{min} just disappears to leave a triangular pattern, 100% modulation is indicated (Fig. 3B).

In what ways can an amplitude modulated transmitter cause interference to stations on adjoining wavelengths? What steps may be taken to minimise such interference?

(1) Overmodulation

The purpose of the modulator valve in an anode modulated system is to swing the anode voltage of the modulated r.f. stage above and below the steady value provided by the power supply. The maximum permissible swing is between twice the steady value and zero. The depth of modulation is then said to be 100%. Greater output from the modulator valve would result in the carrier being interrupted at rapid intervals (over-modulation). This will produce distortion and a "broad" signal which can cause severe interference on adjoining wavelengths. By limiting the output from the modulator, the general level of modulation is kept below 100% and interference is avoided. An over-modulation indicator allows the operator to guard against the production of such interference.

(2) Excessive range of audio frequencies

The effect of modulation is to cause additional frequencies to be present on either side of the carrier frequency. Thus, if a station is operating on 1000 kc/s, and the microphone and audio frequency amplifier pass frequencies up to, say, 5000 c/s, the transmission will extend from 995 kc/s to 1005 kc/s thereby interfering with other stations which may be working between these limits. These additional frequencies, which arise through modulation, form the lower and upper sidebands of the transmission. In the case of broadcasting, high quality transmissions necessitate wide sidebands but for communication work they may be reduced, without undue loss of intelligibility, by limiting the audio frequency range of the output from the modulator. This may be achieved by circuit design to favour response below about 2000 c/s, or by providing a low-pass filter to attenuate higher frequencies.

Incorrect operation of audio frequency circuits, such as the overloading of valves or the magnetic saturation of transformer cores, may result in the generation of harmonics (and consequent sidebands containing high frequencies) which interfere with adjoining transmissions.

(3) Presence of frequency modulation

If an oscillator is modulated, some frequency modulation of the carrier will result; therefore modulation must be applied to an amplifier stage and precautions taken to ensure that the frequency generated by the oscillator stage remains undisturbed. Such precautions would include an oscillator design of high stability; filtering of the anode and screen supplies (so that modulation voltages are removed), and the use of a buffer stage between the oscillator and the modulated r.f. stage.

Lancaster Hobbies' Exhibition

AMATEUR Radio will be well represented at the Lancaster Hobbies Exhibition, to be held during the period April 8-11. The organiser is A. L. Thwaites (G3HHR), who has the help of other local amateurs. All being well the Exhibition station, using the callign G3BAP/A, will be on the air from 2 p.m. to 9 p.m. each day. Special QSL cards will be used to confirm all contacts.

Royal New Zealand Air Force

EXCELLENT ground-staff opportunities exist in the R.N.Z.A.F. for experienced ex-R.A.F. technicians between the ages of 21 and 40. Applicants are considered for Aircraftman and Corporal ranks for which the pay ranges from £7 10s. to £11 11s. a week, plus free rations and quarters.

Further details may be obtained from R.N.Z.A.F. Headquarters, John Adam Street, London, W.C.2.

THE MONTH ON THE AIR


 by *A.O. Milne*
G2MI

New Prefixes

WE have been advised by Mr. Wade (ex-G5PC) —one-time P.M.G. for British North Borneo—that the prefix for that country was changed by the authorities some years ago to ZC5. For some reason the Amateur Radio Societies were not informed. Apparently the change was made because confusion had arisen between Sarawak and B.N.B. Incidentally changes in the Colonial Prefix List are made by the Colonial Office, which seems to have little contact with the radio world. However, we have now been to some pains to find out what alterations have taken place.

VS2 and VS3 are both allocated to Malaya.

VS4 to Sarawak.

VS5 to Brunei.

VS7—at present allocated to amateurs in Ceylon—has also been allocated to experimental stations in Malaya. It is possible, therefore, that amateurs in Ceylon may be given the prefix 4P, although there would seem to be no reason why 4P should be not used for Malaya.

VS8 is allocated to experimental stations in British Honduras although this is an Asiatic prefix.

VR7-VR9 are unallocated, but are available for issue to Pacific Islands.

ZC1 and ZC6 are now cancelled.

It should be noted that "Experimental stations" are not the same as "Amateur stations."

Notes and News

G3IDN is the call sign of the R.Aux.A.F. club station at Eastbourne. The Club hope to operate portable in Germany this summer.

VU2CQ (Bombay) who works c.w. on 21.030 Mc/s says the band opens up about 0600 G.M.T. but there is not much DX before 0930. He has raised most of Europe.

B.R.S. 19781 (Hexham) has had his report on the reception of the 7.015 Mc/s signals from VK6WT at 2140 on December 20 confirmed. VK6WT is active on Fridays from 1230 to 2300 G.M.T.

G3FXB (Hove) who reports hearing Ws on 14 Mc/s at S9 from midday until 2000 G.M.T. during the first week-end of the A.R.R.L. phone contest, worked W2SAI on 3.8 and VE2WW on 7 Mc/s. DX on 3.5 c.w. includes KP4KD, EA9AP, SU1MF, AP2K, 5A2TU, KV4AA and PJ2AA. VO1D has been worked on phone. FXB has noted a slight reduction in Spanish b.c. QRM on 7 but thinks it may be due to conditions. On 14, he has worked 11AHR/9A2 in San Marino on phone and VK1JC (14080) on c.w.

G3DO has found 14 very good, particularly for Africa, around 1730 G.M.T. He has worked ZS7C, ZS7D, ZS8D, ZS9G, OQ0DZ (Ruanda Urundi) FM7WD (2145) and HR1BG (1920) on phone. ZS7C and ZD9AA have been worked on 21 Mc/s phone.

B.R.S. 7594 (Yeovil) reports that 3.5 has been

quite good, with W1, 2, 3 and 4 coming in about midnight. 14 has carried most of the DX in the early evening. The best heard have been CR6AJ, AI, FB8BA (1655, 14198), BG (1653, 14198), KG6ADZ (0906, 14297) and ZS3AB (1825, 14140). The 21 Mc/s band has been very flat during the week but between 1300 and 1700 G.M.T. on Sundays CR7RF, FF8GP, VP6SD, VP9AV, VP9BD, ZC4DW, ZD9AA and ZS7C have been heard. 7594 says the Ws will be allowed to use phone on 21.250-21.450 Mc/s from March 28, but so far no official confirmation of this has been received from A.R.R.L. 28 Mc/s has been completely dead.

Apropos the remarks last month about the Bristol Festival of Britain Station (G6YA/A) we learn that cards may be claimed from **G3RB**, although all contacts have been QSL'd. **G2CHI** has been assured by LZ1UA that all G stations who worked LZ1KAB will receive cards as soon as they are received from the printers. He gathers that this applies to all licensed LZ stations.

If you want to be a W.A.S.P., you have only to work all Sicilian provinces (5) and send your cards to IT1CTZ, 35, Bentivegna Street, Palermo, enclosing 4 I.R.C.s.

Top Band

John Hall, B.R.S. 19107 (Addiscombe) has concentrated on Trans-Atlantic work since January 1. His bag includes 71 stations in W1, 2, 3, 4, 8, 9, 0, VE1, 2, 3, KG4, KV4 and KP4. In addition, ZC4XP was heard at RST579 between 0230 and 0500. KG4AF was 579 on February 13 at 0600 and 1898 kc/s. KV4AA and KV4BB have been heard several times. John has QSLs from VE2AIE (15 watts) and W8GDQ (45 watts), W2HCW, W2RYJ, W3EIS and W8GDQ (S9) have all been received on phone. He says W8GDQ's mast is a magnificent affair, 137ft. high.

From **G3GDW**, whose son is in Cyprus, we hear that the following stations were heard out there during the R.S.G.B. Top Band Contest: G2AOL, FGD, HPF, JF, QT, G3FAB, BMY, FST, FVX, EVV, GGN, GPW, GVM, HVX, IJC, IRR, G4AU, G5JU, G6BQ, ZN, G8KP, MD, WF, G13HFT, GW3FSP. Signal strengths ranged between 449 and 599.

G5JO worked W0NWX at 0715 on January 18, receiving 339.

S.S.B. DX

G3IMW says the first Trans-Atlantic s.s.b. contact on 3.8 Mc/s was made between OZ7BO and W2PEO early in February. G3IMW believes he made the first G-W and G-VE s.s.b. QSOs on February 7 at 2345 and February 12 at 2216 with W11ZY and VE1DZ respectively. Since then, W11ZY has had s.s.b. contacts with DL6WL, G3COJ, G3CWC, G3FHL, G3FDG, OZ7BO, G3CU, G3EPL and G3FRN. All the s.s.b. contacts were 100 per cent. No a.m. stations were able to get across at the times indicated.

(Continued on page 392)

AN OFFICIAL LIST OF COUNTRIES

AC3	Sikkim	KP4	Puerto Rico	VP5	Jamaica
AC4	Tibet	KP6	Palmyra Group, Jarvis Island	VP5	Turks & Caicos Islands
AG2	(See I)	KR6	Ryukyu Islands (e.g., Okinawa)	VP6	Barbados
AP	Pakistan	KS4	Swan Island	VP7	Bahama Islands
(AR8)	See OD	KS6	American Samoa	VP8	Falkland Islands
C	China	KT	Americans in Tangier	VP8	South Georgia
C3	Formosa	KV4	Virgin Islands	VP8	South Orkney Islands
C9	Manchuria	KW6	Wake Island	VP8	South Sandwich Islands
CE	Chile	KX6	Marshall Islands	VP8	South Shetland Islands
CM, CO	Cuba	KZ5	Canal Zone	VP8	Antarctica
CN	French Morocco	LA	Norway	VP9	Bermuda Islands
CP	Bolivia	LA	Svalbard (Spitzbergen)	VQ1	Zanzibar
CR4	Cape Verde Islands	LI, MC1, 2, MD1, 2, MT1, 2	Libya	VQ2	Northern Rhodesia
CR5	Portuguese Guinea	LU	Argentina	VQ3	Tanganyika Territory
CR6	Principe, Sao Tome	LX	Luxembourg	VQ4	Kenya
CR7	Angola	LZ	Bulgaria	VQ5	Uganda
CR8	Mozambique	M1	San Marino	VQ6	British Somaliland
CR9	Goa (Portuguese India)	MB9	(See OE)	VQ8	Chagos Islands
CR10	Macau	MC1, 2	(See LI)	VQ8	Mauritius
CT1	Portugal	MD1, 2	(See LI)	VQ9	Seychelles
CT2	Azores Islands	MD3	(See I6)	VR1	Gilbert & Ellice Islands & Ocean Island
CT3	Madeira Islands	MD4	(See I5)	VR1	British Phoenix Islands
CX	Uruguay	MD5	(See SU)	VR2	Fiji Islands
DL, DJ	Germany	MD6	(See Y1)	VR3	Fanning Island
DU	Philippine Islands	MF2	(See I)	VR4	(Christmas Island)
EA	Spain	M13	(See I6)	VR5	Solomon Islands
EA6	Balearic Islands	MP4	Kuwait	VR6	Tonga (Friendly) Islands
EA8	Canary Islands	MP4	Oman	VS1	Pitcairn Island
EA9	Spanish Morocco	MP4	Qatar	VS2, VS3	Singapore
EA0	Spanish Guinea	MP4B	Trucial Oman	VS4	Malaya
EI	Eire (Irish Free State)	MS4	Bahrein Island	VS5	Sarawak
EK	Tangier Zone	MT1, 2	(See LI)	VS6	Brunei
EL	Liberia	OA	Peru	VS7	Hong Kong
EP, EQ	Iran (Persia)	OD (See AR8)	Lebanon	VS9	Ceylon
ET	Ethiopia	OE, MB9, FKS8	Austria	VS9	Aden & Socotra
F	France	OH	Finland	VS9	Maldiv Islands
FA	Algeria	OK	Czechoslovakia	VU	Sultanate of Oman
FB8	Amsterdam & St. Paul Islands	ON	Belgium	VU4	India
FB8	Kerguelen Islands	OQ	Belgian Congo	W, K	Laccadive Islands
FB8	Madagascar	OX	Greenland	XE	United States of America
FC	Corsica	OY	Faeroes	XZ	Mexico
FD8	French Togoland	OZ	Denmark	Y1, MD6	Burma
FE8	French Cameroons	PA	Netherlands	Y1	Afghanistan
FF8	French West Africa	PJ	Netherlands West Indies	Y1	Iraq
FG8	Guadeloupe	PK1, 2, 3	Java	Y1	(See FUS)
FI8	French Indo-China	PK4	Sumatra	YK	Syria
FK8	New Caledonia	PK5	Netherlands Borneo	YN	Nicaragua
FKS8	(See OE)	PK6	Celebes & Molucca Islands	YO, YR	Roumania
FL8	French Somaliland	PK6, 7	Netherlands New Guinea	YS	Salvador
FM8	Martinique	PX	Andorra	YT, YU	Yugoslavia
FN	French India	PY	Brazil	YV	Venezuela
FO8	French Oceania (e.g., Tahiti)	PZ	Netherlands Guiana	ZA	Albania
FP8	St. Pierre & Miquelon Islands	SM	Sweden	ZB1	Malta
FQ8	French Equatorial Africa	SP	Poland	ZB2	Gibraltar
FR8	Reunion Island	ST	Anglo-Egyptian Sudan	ZC2	Cocos Islands
FU8, Y1	New Hebrides	SU, MD5	Egypt	ZC3	Christmas Island
FY8	French Guiana & Inini	SV	Greece	ZC4	Cyprus
G	England	SV	Crete	ZC5	British North Borneo
GC	Channel Islands	SV5	Dodecanese (e.g., Rhodes)	ZD1	Sierra Leone
GD	Isle of Man	TA	Turkey	ZD2	Nigeria
GI	Northern Ireland	TF	Iceland	ZD3	Gambia
GM	Scotland	TG	Guatemala	ZD4	Gold Coast, Togoland
GW	Wales	TI	Costa Rica	ZD6	Nyasaland
HA	Hungary	TI	Cocos Island	ZD7	St. Helena
HB	Switzerland	UA1, 3, 4, 6	European Russian	ZD8	Ascension Island
HC	Ecuador	UA9, 0	Socialist Federated Soviet Republic	ZD9	Tristan da Cunha & Gough Island
HC8	Galapagos	UB5	Asiatic Russian S.F.S.R.	ZE	Southern Rhodesia
HE	Liechtenstein	UC2	Ukraine	ZK1	Cook Islands
HH	Haiti		White Russian Soviet	ZK2	Niue
HI	Dominican Republic		Socialist Republic	ZM	New Zealand
HK	Colombia	UD6	Azerbaijan	ZP	British Samoa
HL	Korea	UF6	Georgia	ZS1, 2, 4, 5, 6	Paraguay
HP	Panama	UG6	Armenia	ZS3	Union of South Africa
HR	Honduras	UH8	Turkoman	ZS7	Southwest Africa
HS	Siam	UI8	Uzbek	ZS8	Swaziland
HV	Vatican City	UJ8	Tadzhik	ZS9	Basutoland
HZ	Saudi Arabia (Hedjaz & Nejd)	UL7	Kazakh	3A1, 2	Bechuanaland
I	Italy	UM8	Kirghiz	3V8	Monaco
I, AG2, MF2	Trieste	UN1	Karelo-Finnish Republic	4W	Tunisia
IS, MD4, MS4	Italian Somaliland	UO5	Moldavia	4X4	Yemen
I6, MD3, M13	Eritrea	UP2	Lithuania	5A	Israel
IS	Sardinia	UQ2	Latvia	9S4	Libya
JA, KA	Japan	UR2	Estonia		Saar
JA9	Bonin & Volcano Islands	VE, VO	Canada		
JY	Jordan	VK	Australia (including Tasmania)		
K	(See W)	VK1	Heard Island		
KA	(See JA)	VK1	Macquarie Island		
KB6	Baker, Howland & American	VK9	Papua Territory		
KC6	Phoenix Islands	VK9	Territory of New Guinea		
KC6	Caroline Islands	VK9	Norfolk Island		
KG4	Palau Islands	VO	(See VE)		
KG6	Guantanamo Bay	VP1	British Honduras		
KH	Mariana Islands	VP2	Leeward Islands		
KJ6	Hawaiian Islands	VP2	Windward Islands		
KL	Johnston Island	VP3	British Guiana		
KM6	Alaska	VP4	Trinidad & Tobago		
	Midway Islands	VP5	Cayman Islands		

RETAIN THIS LIST FOR CHECKING YOUR DX CLAIMS.

Who's Who

GW3ALE who has been operating as VS7AL, was due home on March 15. Y12FD has also returned home. There are a lot of cards for him at the QSL Bureau. Y13WH is still active. VS9AW is now living in Tunbridge Wells but there is hope that another station will soon be active in Oman. VS9AS (ex-G2BMU-GC2BMU) is a new call in Aden.

VQ2W is ex-G3EDW. G6WX recently called at Gibraltar where he met Fl./Lt. Burke (G3BAB) who is reorganising ZB2A. That station should soon be active on 28, 21 and 14. Roy Sullivan (ZC4RS), now home again, has left the 1.7 Mc/s tests in the hands of ZC4XP.

VQ4DX (Box 581, Nairobi) is active on c.w. on 7 and 14 using 30 watts. He plans to use 21 and 28 Mc/s with 100 watts soon. His G call is G3HQB. VQ4DX is associated with the East Africa P.T.T.

Flood and Storm

Up to the time of going to press, news had been received of the following amateurs who live in the flooded areas:

G2FT (Mablethorpe) was completely washed out and all his mains transformers ruined.

G2HKU (Sheerness) lost all his gear except the

HRO. He and his family are at present living in one bedroom.

G3CFK (Great Yarmouth) suffered damage to his equipment and lost many QSL cards.

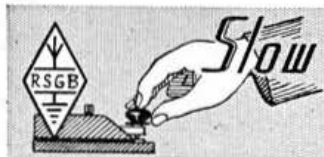
G3AJP (Great Yarmouth), G3HXM (Hunstanton), G5BD (Mablethorpe) and G5VQ (Westcliff) are all safe, and suffered no damage.

GM3GAY and GM3GCH (Banff) both had their business premises flooded. Some of these fellows may be in need of components which may be in your junk box. If you can spare anything which might be useful, why not drop one of them a line?

Hospital Call

MR. E. B. GRIST is at present operating an amateur station under the call sign G3GJX/A from his bed in the Feilden Ward, Wingfield-Morris Orthopaedic Hospital, Oxford. The transmitter in use is a 15 watt c.o./p.a. feeding a 100 ft. long wire aerial via a pi-section coupler. The receiver is a BC348.

Mr. Grist already possesses crystals for 7005, 7013, 7025 and 7045 kc/s, but would be grateful for the loan of other 7 Mc/s c.w. crystals. He expects to be in hospital for about six months and says that QSL cards and listeners' reports are as eagerly awaited by the other patients as by himself.



Slow Morse Practice Transmissions

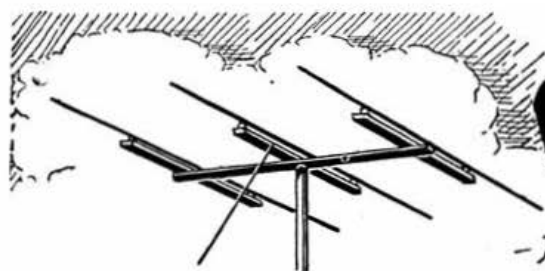
The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E. (C8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

* Each station will operate in turn.

G.M.T.	Call	kc/s.	Town
Sundays			
09.00	G3LP	1850	Cheltenham
09.30	G3ICX	1925	Sutton Coldfield
10.00	G6MH	1990	Southend-on-Sea
	G3AAZ	1780	Welwyn
10.30 *	G3EPK		
	G3EWG		
	G5UM		
10.30	G3GIO	1915	Guildford
	G3CYS	1990	Pontefract
	G3ESP		
10.30 *	G3HCX		
	G3HNC		
	G3IDT		
	G3US		
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	G1SUR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
	G3BFP	1875	Croydon
20.30 *	G3BLP		
	G6LX		
21.00	G3BHS	1720	Eastleigh, Hants
21.00	G3BLN	1900	Bournemouth
22.00	G3GIO	1915	Guildford
22.15	G2BRH	1900	Ilford
22.30	G8TL	1896	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3IBL	1883	Derby
	G3HGY	1815	Coventry
19.30 *	G5PP		
	G5SK		
20.30	GW3BKP	1745	Wrexham
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2BND	1890	Dalston, E.
22.00	G3GIO	1915	Guildford
23.00	G2XG	1735	Chingford

G.M.T.	Call	kc/s.	Town
Wednesdays			
14.00	G3ADZ	1910	Southsea
19.00	G3ADZ	1900	Southsea
19.00	G3GZA	1837.5	Bristol
19.30 *	G3HBX	1870	Warwick
	G6XA		
21.30	G3HRC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3HYN	1850	Cambridge, Glos.
22.00	G3GIO	1915	Guildford
22.45	GM3GUS	1800	Dunfermline
Thursdays			
19.00	G3NC	1825	Swindon
	G2DOF	1830	S. Birmingham
19.30 *	G3DTG		
	G3ENH		
	G6KI		
	G8JI		
20.00	G3FVH	1920	Hull, Yorks
20.30	GW3BKP	1745	Wrexham
21.30	G6DL	1760	Birmingham
21.30	G3ICX	1925	Sutton Coldfield
22.00	G2NK	1730	St. Mary Cray
22.00	G3GIO	1915	Guildford
22.00	G3IFX	1910	Derby
22.30	G3OB	1803	Manchester
23.00 *	G3LA	1915	Brentwood
	G4AK		
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3CSG	1870	Wirral
21.00	G3BHS	1720	Eastleigh, Hants
22.00	G3GIO	1915	Guildford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED



AROUND THE V.H.F.'s

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

The Two Metre Band

A NUMBER of band openings which exhibited many of the characteristics observed in January, occurred during February.

G3HBW (Wembley, Middx.) worked **F8AA**, **F8GH** and **ON4BZ**, all at S8/9 on January 17 as well as **G3IUK** (Derby). Many fruitless calls failed to raise **G2HQ/P**, believed to be in the Sheffield area, who was RST 569 on the 18th. **G3NL** (Gt. Malvern, Wores.) was contacted on January 25. The band was again in good fettle four days later and yielded QSO's with **F8GH** and **G3FIH** (nr. Bath), but **G4GR** (Marshfield, Mon.), although a consistent 589, could not be attracted.

February 16 produced further good conditions and, notwithstanding **3HBW**'s beam had suffered gale damage, a number of stations were heard including **G2FZU**, **3IUK** and **5RW**, all in Derbyshire, **3BKQ** (Leicester), **6CW** (Nottingham) and **2DDD** (Littlehampton, Sx.).

G2FZU (Ilkeston) was worked by **G3GBO** (Denham, Bucks.) on January 23 for his first contact with Derbyshire, while January 29 produced **ON4BZ** among others. **G2DDD**, who was one of the early workers on the 5m band, also figures in **G3GBO**'s log, his signals coming in RST 569 on the evening of February 8 when, after a day of gales and sleet, the temperature suddenly rose at about 2200 G.M.T. On February 15, when conditions were reported good in various parts of the country, **G3GBO** worked **G3ANB** (Brightlingsea, Essex), **2FFG** (Sheffield, Beds.), **3GOP** (Southampton), **3HAZ** (Birmingham) and **2CNT** (Cambridge). Unsuccessful attempts had been made for about three weeks to work **G3YH** (Bristol) before he was raised for the first time on February 16 at 07.15. This direction had always been very poor in the past so the sked will be continued to see how signals fare during what is hoped will be the better weather to come. **G3GBO** would be pleased to hear from any station in South Wales willing to join in this morning test or at some other time by arrangement.

G4SA (North Bucks.) told **G2UJ** during a contact on February 15 that he had worked a number of stations earlier that evening ranging from **G3FEX** (Bramber, nr. Steyning, Sx.), **3HVO** (Dorset) and **3ASC** (Southampton) to **G5YV** (Leeds) and **G3IOO** (Oswestry). **G3FUM** (Kingsclere, Hants.) also found conditions quite good. At **G2UJ**, there was a noticeable increase in signal strength from stations just outside local range, but none of the more distant ones were audible.

G2CNT (Cambridge) is now regularly on 2m and 70 cm and may be heard on 145.18 Mc/s most evenings between 1930 and 2330 G.M.T. unless he is on the higher frequency band. He also found February 15 very good, logging **G2DSW** (Southampton), **G3GHE** (Rotherham) and **G3FEX**.

Another Cambridge station is **G3IIT** who uses 15 watts to an 832 with a 3-element Yagi 30 ft

above the ground. He made 73 contacts with 30 stations between January 1 and February 16, among which were **G2WJ**, **3AHP**, **AVR**, **BLP**, **HVO**, **4AU**, **DC**, **5UM**, **YV**, **6CW**, **LL**, **QN**, **RH** and **ON4BZ**. **G3IIT** lives within a hundred yards of **G2XV** but they find little difficulty in working on the band at the same time.

G3FEX (Bramber, nr. Steyning, Sx.), active again after an absence of a couple of months, has an SCR 522 running 20 watts on either 144.81 or 144.91 Mc/s. The receiver has been modified to a valve line-up of **6AK5** (r.f.), **9003** (mixer) and **6J5-9002-9003** c.o. and multiplier stages. By employing a crystal on 8285.62 kc/s the band is tuned on the main receiver between 28 and 30 Mc/s, so that with the aid of a **BC221**, accurate frequency checks may be made. The aerial is a 4-element Yagi 40 ft high; normal times of operation are 1830 to 2300 G.M.T. most weekdays and all day on Sundays. So far, 118 stations have been worked of which 94 have QSL'd: the missing cards would be much appreciated.

G8PX (Oxford), who appears in the Regional Ladder for the first time, has a much-modified SCR 522 transmitter and a Cascode converter into an AR88. The converter uses a triode-connected **6AK5** and **6J6** for the r.f. stage, a **6J6** 7 Mc/s c.o. and frequency multiplier followed by a further



"At the January meeting of the London U.H.F. Group we discussed skeleton slots."

* 32 Earls Road, Tunbridge Wells, Kent.

6J6 as f.d. and triode mixer. A 6AG5 i.f. amplifier passes the signal on to an AR88 tuning between 18 and 20 Mc/s.

Two Metres "Down Under"

Considerable 2 metre activity in Australia is reported by our contemporary *Amateur Radio*, the journal of the Wireless Institute of Australia. On October 2 last, VK3RR was heard by ZL3AQ on 145.6 Mc/s shortly after 0800 G.M.T. at a distance of about 1,900 miles. In ZL3, the early evening was very warm and calm with the barometer at 30 in; local signals up to 50 miles were very well received. VK3RR's 'phone was reported as RS55/6. There are 14 active 2 m stations in ZL3.

70 cm Topics

The following activity report covering January 20 to February 20 has been supplied by **G2RD** (Wallington, Sy.) Only stations worked or heard by 2RD or his contacts are included: G2DD, FKZ, MV, QY, RD, WJ, XV, 3ECA, FP, 4KD, 5AA, CD, DT, RD, 6NF, YP, 8KZ.

G2CNT (Cambridge) is using a CV82 tripler to 435.54 Mc/s, driven by his 2 m transmitter, a 12-element stack of dipoles and a crystal mixer receiver. Most evenings are divided between operation on 2 m and 70 cm. He is available any time on Sundays. Both sides of a QSO between G2WJ (nr. Dunmow, Essex) and G3BKQ (Leicester) were heard at about midnight on February 18 when both stations mentioned that signal strength on 70 cm was then better than on the 2 m band.

G8PX (Oxford) whose 2 m activities are reported upon earlier, expects to be on 70 cm shortly. At present he is using an indoor beam with which only cross-band tests have been carried out but an outdoor array should be in position soon. The SCR522 2m transmitter drives a CV53 in an RF105 unit as a power tripler and the converter comprises a 6BQ7 p.p. e.g.t. stage, a 1N34 crystal mixer in a cavity and a 6J6 oscillator. Two crystals are available enabling the required part of the band to be covered between 27 and 30 Mc/s on an AR88. G8PX wishes to record his appreciation of the assistance regarding 70 cm converters and other apparatus he obtained from G2FKZ and G2WJ at the R.S.G.B. Amateur Radio Exhibition last year.

During December, **G5DT** worked the following stations on 70 cm. The figures after the call-signs indicate the number of contacts made with each station. G2DD (16), MV (5), FKZ (3), RD (9), WJ (2), 3ECA (2), FP (8), GDR (2), 4KD (1), RO (2), 5AA (2), RD (4), 6NF (16), YP (1).

Shooting the Moon on Two Metres

As we go to Press, there is news of experiments, involving the reflection of 2 m signals from the Moon, which have been going on in the United States for some time. Using power of the order of 1 kW to a stacked rhombic aerial 250 feet per side with a very low angle of radiation, **W3GKP** and **W4AO** have succeeded in recording the reflection of $\frac{1}{2}$ second pulses spaced 3 seconds apart. The transit time for signal and echo for the round trip of nearly 500,000 miles was approximately 2.5 seconds. Is it possible that these signals have been heard on this side of the Atlantic?

We are indebted for the above information to James W. Brearley, now in this country, who has been assisting in the evaluation of the results of the experiments. It is understood that a full report of the tests will appear in the March issue of *QST*.

Regional V.H.F. Ladder

TWO-METRE BAND

To qualify for entry in the Two-Metre Regional V.H.F. Ladder, members must have worked stations in at least seven R.S.G.B. Regions since July 1, 1952. The rules, and a list of Regions and Counties or Areas forming them, were published on page 544 of the June, 1952, "Bulletin."

Psn.	Call & Location	Worked		
		Regions	Stations	Countries
1.	G3BW <i>Whitehaven, Cumb.</i>	15	63	5
2.	G3WW <i>Wimbleton, Cumb.</i>	14	227	9
3.	G5YV <i>Leeds, Yorks.</i>	13	212	9
4.	G2HIF <i>Wantage, Berks.</i>	13	109	7
5.	G5DS <i>Sirbiton, Surrey.</i>	11	182	6
6.	G4RO <i>St. Albans, Herts.</i>	11	136	4
7.	G3FAN <i>Ryde, I.O.W.</i>	11	115	4
8.	G2FNW <i>Melton Mowbray, Leics.</i>	11	78	3
9.	G6LI <i>Ludborough, Lincs.</i>	11	59	6
10.	G2YB <i>Caversham, Berks.</i>	10	176	4
11.	G6TA <i>Balham, S.W.12.</i>	10	154	2
12.	G3HBW <i>Wembley, Middx.</i>	10	113	4
13.	G3FD <i>London, N.14.</i>	10	80	7
14.	G6XX <i>Goole, Yorks.</i>	10	63	3
15.	G6YU <i>Coventry, Warks.</i>	10	46	3
16.	G3GBO <i>Denham, Bucks.</i>	9	160	4
17.	G2AHP <i>Perivale, Middx.</i>	9	107	2
18.	G2FJR <i>Sutton Bridge, Lincs.</i>	9	83	3
19.	G8PX <i>Oxford.</i>	9	78	2
20.	GW8UH <i>Cardiff, Glam.</i>	9	60	3
21.	G2DKH/P <i>Stanley, Co. Durham.</i>	9	45	4
22.	G3ACS <i>Manchester 8.</i>	9	36	3
23.	G3BHS <i>Eastleigh, Hants.</i>	9	35	2
24.	G5MR <i>Hythe, Kent.</i>	8	55	5
25.	G3FIJ <i>Colchester, Essex.</i>	8	42	6
26.	G3BVU <i>Witney, Oxon.</i>	8	42	1
27.	G3COP <i>Southampton, Hants.</i>	7	46	2

V.H.F. Aerials

G8DM (Faringdon, Berks.) suggests that results on 420 Mc/s as compared with 144 Mc/s would be more satisfactory if the aerial gain on the higher frequency were to be increased to compensate for the shorter wavelength in use. The position is that an aerial in a given field strength picks up a voltage proportional to its length and the power received (or radiated) is, therefore, proportional to the square of the length. Thus, if it is assumed that on 28 Mc/s the transmitting and receiving arrays have a combined gain of 5 db over dipoles, a 144 Mc/s circuit with similar overall gain would pick up only 1/25th as much energy from a given field strength.

To correct the balance, the 2 m channel would require an additional 14 db of gain, or a total of 19 db, to equal the results obtained on 28 Mc/s. On decreasing the wavelength to 70 cm the position worsens again to the extent of nearly 10 db, making the formidable figure of 29 db over the gain required at 28 Mc/s. To produce such a gain

with normal aeriels would require an enormous number of elements which, apart from the difficulty of feeding them, would produce a very sharp pattern which would complicate searching to an impossible degree.

Working on these lines G8DM has designed an aperture type of array employing a parabolic cylinder of wire netting five wavelengths across and five wavelengths high which, allowing for some loss due to non-uniform illumination of the reflector, should be good for some 20 db. To minimise feeder losses it is proposed to use a single wire *G-string* type of feeder. Provided that the horizontal pattern of the beam does not become embarrassingly narrow, this seems to be tackling the problem on the right lines and we look forward to hearing more of the project. (Article please, O.M.—Ed.)

* * *

For appearance in the April BULLETIN reports should arrive not later than March 21.

2m & 70cm Wide Open!

CONDITIONS on both 2 m and 70 cm at the beginning of March were those normally expected in summer. On 2 m, Northern stations were being received in London at excellent strength on the morning of March 1. During the evenings of March 1 and 2, DL, F, ON, OZ, PA and SM were worked from various parts of the country and LA4BR was heard. DL3VJ heard OK1AA and G5YV worked a DL7 in Berlin—a distance of nearly 650 miles. On March 5 at 21.00 G.M.T. OZ2FR (Baekke) worked GC3EBK (Guernsey) at a distance of approximately 620 miles. On 70 cm G2WJ (Dunmow) heard DL3FM (Essen) and worked him crossband from 2 m on March 2 at 2030 G.M.T. GW2ADZ and G2WJ, among others, worked ON4UV on 70 cm phone.

The main characteristic of the opening was the complete absence of fading, even on the most distant signals.

"Ronette" Crystal Products

AN opportunity occurred recently to carry out tests on a range of *Ronette* microphones and a *Ronette* pick-up. The microphones—all piezo-crystal types—were tested on the air on 2 m and 80 m and by means of tape recordings. The types tested were the H.M.5 hand-microphone, the 088/5 ball-microphone and the S/742 studio-microphone.

The H.M.5 is very suitable for normal amateur use having a clear natural-sounding response extending from 30 c/s to 7,500 c/s. It has a high output voltage compared with many similar types of other makes. This factor considerably eases the design of speech amplifiers. The H.M.5 is extremely robust and is produced in an attractive grey-hammered finish.

The 088/5—particularly recommended by *Ronette* for use with recorders—gave very pleasing results when used with a tape recorder. Although the voltage output is somewhat lower than that of the H.M.5, the instrument tested appeared to give a more extended frequency response. It exhibited no directional effects when mounted normally on a vertical stand.

The S/742 is designed for those who require a really high-quality microphone. The frequency response is 30 c/s to 16,000 c/s. The sample on test received high praise both on the air and on recordings. The S/742 can be stand-mounted or

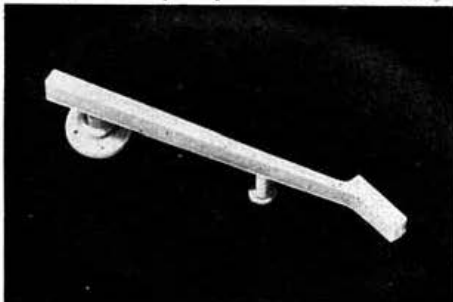
suspended from its cable, being extremely light and small. The finish and appearance are of the highest order and would do credit to any station or studio—professional or amateur.

A feature of all *Ronette* microphones is their vacuum-sealed crystal unit making them suitable for use in tropical areas. Another interesting point is that they are available with any one of 52 different frequency characteristics, making it possible to select a characteristic to suit individual designs and purposes. They can be mounted on any type of stand having a 5/8 in. 27-thread.



An example of the wide range of "Ronette" Microphones.

The *Ronette* Miniweight crystal pick-up is supplied in two parts—the arm and an insert. The inserts are interchangeable for standard 78 r.p.m. and long-playing records. The stylus is sapphire and the inserts have a response of 30 c/s to 14,000 c/s. Frequency characteristics may be



The "Ronette" Miniweight crystal pick-up.

altered by using different resistance loads. The pick-up arm, which is of an ivory plastic material and gracefully proportioned, swivels on a small ball-race. Change-over of an insert is extremely simple, being effected by means of a single knurled screw. A protection guard for the sapphire when not in use is supplied with each insert. The sample tested was found to be a big improvement over another type of crystal pick-up.

The general impression of these *Ronette* products is that they are very well made and extremely good value. Prices of the instruments tested are as follows: H.M.5, £4 7s. 6d.; 088/5, £4 10s.; S/742, £9 5s.; Miniweight pick-up, £5 19s. 6d. complete with 78 and L.P. inserts.

* * *

Ronette products are available from *Mail Order Supply Co., Ltd.*, 33 Tottenham Court Road, London, W.1, who will be glad to furnish more detailed information on request.

**PLEASE PAY YOUR SUBSCRIPTION
PROMPTLY WHEN DUE.**

Amateur Television Topics

By M. Barlow (G3CVO)*

MUCH constructional work has been done during the winter. For example in Blyth, Northumberland, G3ACK has completed a telestill scanner using a G.E.C. 3 in. blue-trace tube; he has also acquired a 5527 Iconoscope. The new camera and the 70 cm transmitter are being constructed simultaneously, in order that a regular two-way TV link with G3BLV (Sunderland) shall be established later.

A camera tube is being used by G5KS in Bradford, where there is already a TV group including G2FCL, G3FX and G3AZU. G5KS would like to hear from anyone possessing an old 16mm film projector mechanism suitable for conversion into a telecine unit. G3ETI (Wirral) has improved the performance of his camera unit by suitable filtering of the power supply. His plans for a Liverpool TV Convention and 70 cm meeting, are well advanced; it will probably take place in July but full details will be announced later.

According to G3DFL, activity in Birmingham is very low, only two other TV enthusiasts being known to him. Their telestill scanner is working well and they will be pleased to demonstrate it to anyone interested. In Lincoln, the T.R. (G2FOW) has an active group interested in TV. Near Boston, Lincs., George Short has completed his new camera which is producing excellent pictures. He has not yet repaired the unit which was smashed on its way to the Amateur Radio Exhibition last November.

In the West Country, Grant Dixon's colour camera is nearly complete, and it is expected that at least part of the apparatus will be working in time for the Ross-on-Wye Hobbies Exhibition in April. In Plymouth, G5ZT is putting out regular 70 cm TV transmissions, but still has only one viewer. Is there no one else in the area who can build a 70 cm converter?

In Oxfordshire G8PX (the C.R.), G2AOK and G3EHB—all active on 70 cm—are to build a telestill scanner first, and then a live camera unit. G2BM1 (Hillingdon, Middlesex), has similar ideas and is moving shortly to the top of the highest hill in the neighbourhood in preparation!

London Area

G2WJ and his "staff," together with G2FKZ and G3CVO recently visited G3FNL (Dulwich) to discuss TV. G3FNL is building vision equipment and G2FKZ the 70 cm transmitter for what promises to be a very well equipped Amateur TV station. The Dagenham group, under G3AKJ, are already preparing for this year's Show. A second camera is being built, and the existing equipment generally overhauled. The group now has 12 active members.

G2WJ/T now transmits on 436 Mc/s a television picture of the call-sign every Saturday at 1800 G.M.T. For the first 10 minutes the beam is directed north from Dunmow towards Cambridge. During the second 10 minutes transmission, it is turned southwest to London.

Northern Ireland Activity

Signals from G13FWF/T (Lisburn) have been logged at S9 plus on a receiver 20 miles away, but so far he has not succeeded in transmitting

pictures to Scotland. He still uses the 8012 resonant line rig driven from an 832 trebler.

Overseas News

From Wellington, New Zealand, ZL2RP reports that the band 94-99 Mc/s may be used for experimental TV; the licence costs £2 2s. The N.Z. Electronics Institute is building a 200 watt station which will be housed in the Wellington Technical College.

Gordon Angille, Chairman of the Television Society of South Africa, reports that there are three amateur TV stations in Cape Town, one in Durban and one in Johannesburg. No extra fee is charged for permission to use television, the normal amateur licence (10/- p.a.) covering TV in the 144 Mc/s band and above. With a 30 watt transmitter, using 405 lines, a service area of about 10 miles is possible; 5527 cameras are used exclusively.

Many overseas TV amateurs are expected to visit the U.K. this year; they are assured of a warm welcome.

It's Topical

THE latest licence figures issued by the G.P.O. show that there are now more than **2,000,000 TV licences** in force in the U.K.

The Tenth Private Exhibition of components, valves and test gear, organised by the **Radio and Electronic Component Manufacturers' Federation**, will be held in London from April 14-16. Admission will be by ticket only.

"Radar on Ice" is not the name of yet another ice show, but the title of an interesting article, in the March 1953 issue of the *Wireless World*, on the **use and limitations of radar** in detecting ice formations likely to be dangerous to shipping.

The **B.B.C. European Service** on 232 metres is now radiated from the high power transmitter at **Osterloog**, near Norden, Germany. Programmes, which continue to originate in London, are fed to the transmitter by land line. The same programme is also relayed by a **v.h.f. station** on 89.5 Mc/s in Berlin.

The B.B.C. has announced that to enable **public exhibition sets** to be tested, the television transmitters will be on the air one hour before the Coronation broadcasts start at 10.15 a.m. on June 2.

A new TV camera with a lens capable of producing close-ups of objects more than **half a mile away** is now in use by the B.B.C. At Doncaster races earlier this year, the camera allowed viewers to follow the horses round the course from starting post to finish.

The **Petula Expedition** is the name of a scientific expedition which is to drift across the Atlantic from Dakar to South America next autumn. Radio equipment will be carried and it is hoped that operation in the amateur bands may be permitted.

LONDON MEETING

Institution of Electrical Engineers,
Savoy Place, W.C.2.

Friday, March 20th, 1953.

"V.H.F. AERIAL DEVELOPMENTS."

By F. Charman, B.E.M. (G6CJ)

Buffet Tea from 5.30 p.m. Lecture 6.30 p.m.

* Cheyne Cottage, Dukewood Drive, Gerrards Cross, Bucks.

SOCIETY NEWS

Special Resolution Not Carried

AT the Special General Meeting held on February 27, 1953, the Special Resolution relating to subscription rates, entrance fees and life composition fees was declared not carried.

Section 141 of the Companies Act 1948 requires that a Special Resolution shall be passed by a majority of not less than three fourths of such members as, being entitled so to do, vote in person or, where proxies are allowed, by proxy, at a Special General Meeting.

The voting on the Special Resolution was as follows:

For the Resolution 2,247 votes
(including 1,991 proxies)

Against the Resolution 1,017 votes
(including 966 proxies)

Percentage 68.8 per cent.

An earlier amendment to make the ceiling figure 25s. for Home Corporate Members and to omit the Entrance Fee was defeated by **1,792 votes** (including 1,545 proxies) against **221 votes** (including 138 proxies). A full report of the meeting will appear next month.

Recorded Lecture Library

THE Society is considering compiling a Library of Recorded Lectures, available to groups of members who are unable, owing to distance or expense, to attend lectures in London and other large towns. The lectures will be recorded on tape at meetings of the Society; other recordings will be made by well-known lecturers on radio subjects.

All tapes will be recorded on a Scophony Baird Mark 2 Twin Track Recorder and will be loaned only to groups who can use such a machine for the play back.

Baird Television Ltd. (Electronic Engineering Sound Recording Sales and Service), Lancelot Road, Wembley, have kindly offered to endeavour to arrange for the loan of one of their instruments to groups unable to borrow one elsewhere. The Company has agents in most parts of the country. Applications for the loan of recorders should be made direct to Mr. Rule at the address given above.

The first two recordings, now available, are lectures entitled "V.H.F.," by Sir Noel Ashbridge, and "The Engineer and Society," by Capt. P. P. Eckersley. Both were made at Ilford meetings of the East London Group.

Applications to borrow lecture-tapes should be addressed to C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

NOW IN STOCK!

THE RADIO AMATEUR'S HANDBOOK

(Published by the American Radio Relay League)

1953 (30th) Edition 608 pages

Price 31/6 Post Free

Immediate Delivery from R.S.G.B. Headquarters

Contests Diary

1953

March 28-29	B.E.R.U. (Telegraphy)
April 11-12	B.E.R.U. (Telephony)
May 2-3	144 Mc/s Open
May 3	D.F. Qualifying (Edgware)
May 31	D.F. Qualifying (Peterborough)
June 13-14	National Field Day
June 21	144 Mc/s Field Day (No. 1)
June 28	D.F. Qualifying (High Wycombe/Oxford)
August 16	D.F. Qualifying (Rugby/Slade)
August 30	144 Mc/s Field Day (No. 2)
September 6	Low Power Field Day
September 6	D.F. Qualifying (Romford/Southend)
September 13	420 Mc/s Tests
September 27	D.F. National Final
October 3-4	Low Power
November 7-8	"Top Band" (No. 2)

Special General Meeting. December 19th, 1952.

TWO Members have suggested that the Minutes of the Special General Meeting held on December 19, 1952, and published in the January 1953 issue of the BULLETIN, are misleading in certain respects. They suggest that the paragraph "Mr. O'Brien, G2AMV . . . demanded a poll" should follow the sentence, "A show of hands showed a large majority in favour of the resolution." To meet the wishes of the two Members in question the master copy of the Minutes has been amended.

EDITORIAL (Continued from page 379)

Amateur Radio Emergency Corps when disaster strikes the community.

It is appropriate that high tribute should be paid to the magnificent work performed by the radio amateurs of the Netherlands, who organised a nation-wide emergency network and toiled night and day for nearly two weeks. The full story is not yet available but we hope to publish it in the BULLETIN at an early date.

Finally, we invite all who used their Amateur Radio equipment in any way to relieve distress during the floods to tell us about it. No question of action for licence infringement arises. We have too much faith in the good sense of the G.P.O. for that. In any case, Public Opinion is the final arbiter in such matters. Licences are very necessary when they apply to well-regulated, orderly times but they go by the board like many other rules and regulations when human lives are in danger. In such circumstances people use their common sense. If they are trained to use it in the best possible way, then so much the better. If the occasion never arises then no one is going to complain.

A.O.M.

**MENTION THE BULLETIN WHEN
WRITING TO ADVERTISERS.**

THE SOCIAL SIDE

London Members Luncheon Club

MR. JOHN WHEELER, VS9AW, the first person ever to operate an amateur transmitting station from the Sultanate of Oman, and Major G. C. Watson, R.E.M.E., DL2QF, recently back from Germany where he was the DL2 QSL Manager, were welcomed guests at a meeting of the Club held on February 20, 1953. The Chairman (Mr. Stanley Vanstone, G2AYC) presided.

Following luncheon, Mr. Wheeler recounted some of his Amateur Radio experiences whilst operating from "rare DX" and mentioned in passing—as though it were an everyday occurrence—that his "Top Band" signals were logged at S9 in Brazil during the tests he carried out recently with VS1EV, VS1ES, VS7EA, VS7WA, MP4HBK and VQ4AQ. Major Watson also addressed the Club and expressed his pleasure at being able to take part in its activities.

During the next few months it is anticipated that a great many overseas amateurs will be visiting London for the Coronation festivities. The Chairman and Members of the Club hope that London amateurs who have knowledge of the movements of visiting amateurs will make a special point of reminding them that the Club meets once a month at the Bedford Corner Hotel, Tottenham Court Road, London, W.C.1. Full details can be obtained from Miss May Gadsden at R.S.G.B. Headquarters.

Captain P. P. Eckersley at Ilford

ON Sunday, February 22, nearly 150 members attended the Ilford Town Hall for their usual P.S.A. (Pleasant Sunday Afternoon) when—on this occasion—the guest speaker was Capt. P. P. Eckersley, late Chief Engineer, B.B.C.

His discourse was on the role of the Engineer in Society—communal sociology—a philosophical discourse on the part played by the scientist, technician, and ordinary man in the world today, and further—their places as they should be in the world to come. Ever since his many sides became evident via Two Emma Toc-Wriddle in the early 1920's, we have been aware of the extent of P.P.'s artistry and ideals, but, as far as the East London R.S.G.B. District is concerned, this is the first time we've had it from the "horse's mouth"—a simile which would have quickened the wit of his utterances. The "Huxley" in his ancestry became quickly evident; the chromosomes of the "Great Mind" on men's behaviour still lives on, pointing the way to freedom and a good life.

Unusual meat for radio amateurs, but quite digestible as served by P.P.E.—the helpings could even have been greater—in fact the audience, like Oliver, did ask for more. The flashes of humour—the snippets from his contacts with the world's great men—his early days at the B.B.C. and before, all made exhilarating listening.

Some discussions, in similar mood, followed and we are sure that Capt. Eckersley likes us as we like him. From the number of visits we've had it looks as if he is to be our regular "feature."

A recording of this and previous addresses have been made on tape and should be available soon, provided suitable arrangements can be made for circulation throughout the Society.

W.H.M.

The City and Guilds College Radio Society

AN attendance of nearly 100 was recorded at the Annual Dinner of the City and Guilds College, Radio Society, held on Monday, February 16, in the Ayrton Hall of the College.

The Chair was taken by the President of the Society (Mr. C. E. Strong, O.B.E.) who had the support of the Head of the Electrical Engineering Dept. (Professor Willis Jackson, D.Sc., D.Phil.), the Student Chairman (P. K. N. Ward), the Hon. Secretary (R. Leek) and the Hon. Visits Secretary (T. C. Reeve).

Among the many guests were Sir Archibald Gill, Sir Harry Garner, Dr. R. L. Smith-Rose, Dr. Eric Megaw, Brig. E. J. H. Moppett, Col. J. F. Longfield, Mr. Harold Bishop, Mr. Paul Adorian, Mr. T. E. Goldup, Mr. E. M. Lee and Mr. John Clarricoats.

During the evening it was announced that Mr. Adorian had accepted the Presidency for the ensuing year.



Professor Willis Jackson, speaking at the City and Guilds Radio Society Dinner. Also in the photograph, from left to right: T. E. Goldup (Past President), P. K. N. Ward (Student Chairman), C. E. Strong, O.B.E. (President) and R. Leek (Hon. Secretary).

Prior to the Dinner, the guests were given an opportunity of inspecting the projects being undertaken in the College laboratories after which the whole company adjourned to the main lecture theatre to hear Mr. Strong's Presidential Address. He chose as his subject the responsibilities of a chief engineer. Much valuable advice was given to the student Members of the Society.

The news that Prof. Willis Jackson is shortly to take up an important post in industry will be received with mixed feelings by educationalists who recognise the sterling quality of the work which he has undertaken as Head of the Electrical Engineering Dept. in the City and Guilds College. The Radio Society in particular will miss his guiding influence.

North Cornwall Hamfest

ANORTH CORNWALL Hamfest will be held at the Cove Cafe, The Quay, St. Agnes, on Sunday, March 29. Tickets, price 5/6 each (children under 14, 3/-), are obtainable from J. E. Bowden (G2AYQ), Albany House, Goonown, St. Agnes, Cornwall.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, at 12.30 p.m. on March 20, 1953.

Visiting amateurs especially welcome.
Telephone table reservations to HOL 7373
prior to day of luncheon.

Tests and Contests

First Top Band Contest, 1953

The first R.S.G.B. Contest of Coronation Year was favoured with an extremely high level of activity. Although a total of 133 logs and check logs were received, it was clear that a number of other people made good scores but did not submit entries. At least 375 stations were recorded active during the period of the contest.

The Leading Stations

For the fourth time in succession the first two positions were occupied by GW3FSP and G2JF, with positions once more reversed in their battle for supremacy. They are again challenged by 6BQ, 5JU and 5TN, with 3BKF moving up from ninth place in the last event to joint third with 6BQ this time.

The equipment used by the leading stations was the same as detailed in the January issue of the BULLETIN; the transmitter used by G3BKF, the newcomer among the leaders, was EF91 e.c.o.—E.F.54 f.d.—807 p.a. feeding a half-wave aerial; the receiver was a home-built double superhet.

Conditions

Conditions were rather better than during the November, 1952 event and the increased activity resulted in severe QRM during the first few hours—GW3FSP remarks that under such conditions he finds it easier to dispense with his full "BK" system, as the tremendous background noise tends to disturb concentration!

No Transatlantic contacts were made this time; in fact only two U.S. stations—W1BB and W3EIS—were heard. HB9HT, OH3NY, DL2RO and several OK stations were reported active.

Scoring System

The few comments made on the scoring system were largely unfavourable and were mostly from entrants outside Region 7 who objected to the reduction to one point after 20 contacts with a particular Region—this rule was originally designed to handicap slightly entrants in Region 7! The only entrants to contact more than 20 stations in any one Region other than Region 7 were GW3FSP and G5TN, in both cases with Region 2.

All comments have been duly recorded and will be considered when the rules for the November contest are framed.

Comments

In a number of instances the usual high standard of log keeping associated with Top Band Contests was not maintained; in fact some quite careless inaccuracies were noted. The Committee hopes that this was a temporary lapse.

The operating standard was good but several competitors remarked upon the very bad key clicks audible over most of the U.K. from one station in Southern England, and the old-fashioned "rock-crusher" note of a station in the North of England; the latter did not prevent the operator receiving consistent T9 reports, however!

Activity was more evenly spread out over the band, with many more signals than usual below 1800 kc/s. There is, however, still room for improvement in this direction.

The Committee wish to thank all who supported the contest with entries and check logs.

Results

Position	Call sign	Region	Points	Scoring Contacts	Position	Call sign	Region	Points	Scoring Contacts
1	GW3FSP	10	364	205	61	G2BTO	01	204	102
2	G2JF	08	340	185	62	G3CPA	07	202	113
3	G3BKF	05	328	180	63	G3HTI	04	199	102
	G6BQ	07	328	180	64	G3FXB	08	196	102
5	G5TN	09	327	172	65	G6UT	05	194	100
6	G5JU	03	326	180	66	G3HIR	07	193	113
7	G4AU	07	313	180	67	G3GHC	03	190	99
8	G3BMY	03	311	170	68	G6TD	03	187	98
9	G8KP	02	310	170	69	G4XC	04	186	93
10	G3US	02	309	170	70	G3IND	07	182	105
11	G3EBH	04	299	167	71	G3CYS	02	180	89
12	G3IAS	07	296	171	72	G3NT	02	173	89
13	G3AGQ	09	293	162		G3HIW	07	167	99
	G6ZN	02	293	156	73	G3BCP	07	167	96
15	G5PP	03	285	155		G8BN	07	167	90
16	G3HKC	03	281	152	76	G3COJ	02	166	86
17	G2AOL	07	279	157	77	G2QI	07	165	91
18	G3ERN	07	275	153		GW3IHL	11	165	83
19	G5MR	08	271	148	79	G3FCU	07	161	97
20	G5MP	08	267	147	80	G3HDZ	07	159	90
	G3ELZ	04	267	133	81	G3IRU	07	157	87
22	GW3QN	11	265	145		GM3ALZ	12	157	79
23	G3DYQ	08	263	142		G2ZZ	07	154	90
	G3EVV	07	262	154	83	G2HCZ	07	154	89
24	G6VC	07	262	147		G2AYG	01	154	77
	GM6RI	12	262	141	86	G3IXX	07	153	90
27	G3HVX	03	260	142	87	G3IWC	07	152	88
28	G5UM	07	258	142	88	G2FGD	06	148	109
29	G2DVD	08	257	146	89	G3FZC	07	147	76
30	G2YU	05	255	127		G3FCL	07	147	79
31	G3CWW	07	254	147	91	G3GDW	09	145	72
32	G8WF	02	247	131	92	G3GIM	07	144	78
33	G3GFG	06	246	141	93	G4CM	07	141	85
34	G2HBG	04	245	129	94	G3CNO	06	137	68
35	GW3HJR	10	244	138	95	G3BRL	07	129	70
36	G3HXI	03	242	133	96	G2ZR	09	126	63
37	G3FNK	04	241	129	97	G3HIX	07	123	67
38	G3ILT	07	240	137	98	G3IIS	05	122	63
	G2HPF	05	240	131		G13HFT	15	122	61
40	GM3IGW	14	239	124	100	G3HKX	07	116	66
41	G8ON	04	233	123	101	G3HDQ	01	108	57
42	G3AID	06	231	127	102	G5AO	08	106	53
	G2NJ	04	231	122	103	G2VJ	07	105	62
44	G3IGZ	07	229	132	104	G3JUS	07	102	59
45	G3HQO	08	228	120	105	G3GZA	09	100	50
46	G3AKY	02	226	120	106	G3ACC	07	98	58
47	G3DDM	06	221	117	107	G6HD	07	97	54
48	GM6FB	14	220	115	108	G3GLV	01	92	47
49	G3GZJ	07	218	127		G3JAM	07	90	48
50	G2CVV	04	217	111	109	G3IWS	01	90	45
	G2ACZ	02	217	110		G8BM	01	90	45
52	G3GZB	07	215	124	112	G6NK	07	88	44
53	G3FST	07	213	118		G3IWA	07	88	44
54	G5JL	07	212	113	114	G3HZG	07	86	43
55	GM6IZ	12	211	112	115	GM4CK	13	84	42
56	G8JM	07	210	120	116	G3HTP	07	74	37
57	GW3CKB	10	208	112	117	G2AJB	04	64	32
	G3FOP	03	206	113	118	G3HYJ	05	44	22
58	G8MD	01	206	107	119	G2NH	07	42	21
	G5JO	05	206	104	120	G3FVW	02	40	20

Check Logs: G2IO, 2VB, 3BCC, 3CXM, 3ESP, 3FIO, 3GPW, 4LX, GM3HNW, HB9HT. Disqualifications under Rule 5 (late entries): G3IAF, 3IOR, 5SX.



The Cheltenham Amateur Radio Society Station in operation during the recent affiliated Societies' Contest.

Direction Finding Field Days, 1953

A MEETING was held in London last November to discuss the 1952 events and to formulate rules for 1953. As a result, two major changes were decided on. First, the hidden transmitter may now be anywhere on the specified map, and, second, the National Final will be won by the competitor who first locates *two* hidden transmitters in succession. The second station will not come on the air until after the first entrant has arrived at the first. The programme for 1953 is shown in the Contests Diary.

As in previous years, the first three competitors to locate the hidden stations, not having qualified in earlier contests, will be eligible to compete in the National Final, the organisation of which will be carried out by the Contests Committee, who will also provide Official Umpires for all qualifying events.

The 1950 Council Trophy will be awarded to the winner of the National Final, provided he is a fully paid-up member of the Society.

Rules

1. Qualifying events will be open to members of the R.S.G.B. and of Affiliated Societies, and will be held on Sunday afternoons, commencing at 1400 B.S.T. and concluding at 1630 B.S.T. The National Final will start at 1330 B.S.T. and conclude at 1600 B.S.T.

2. Transmissions will take place on fixed, published, frequencies in the 1.8 Mc/s band, with not more than 10 watts input, and power will remain constant throughout the test. Identification signals will be given in Morse for the first two minutes of the first transmission, followed by three minutes telephony. Transmissions shall be audible at the start and competitors will be permitted to leave at the end of the five-minute period detailed above. Permission to leave will be indicated by the official umpire raising a white flag. In the event of the signal not being audible at the start the official umpire will keep the competitors together, and when the signal is heard, will advise the competitors of the latest known conditions. The next sending period will be substituted for the starting period, at the end of which the official umpire will raise the white flag.

3. Transmission times :—

1400 to 1402 Morse
1402 to 1405 Telephony
1420 to 1424 Telephony
1435 to 1438 Telephony
1450 to 1452 Telephony

Subsequent transmissions, which will be speech modulated, will take place at irregular intervals, but with a minimum continuous transmission of two minutes, and a maximum silent period of 15 minutes at the discretion of the organiser.

4. The aerial will be connected directly to the transmitter without the use of non-radiating feeders. The transmitter will not be operated by remote control.

5. The hidden station will be located at a fixed point at least 50 yards from any inhabited building, and directly accessible to the competitor without entering, crossing, or trespassing upon property in private occupation or passing through a gateway. Organisers will specify an Ordnance Survey Map, New Popular Edition, scale 1 in. to the mile, covering both the starting point and the transmitter location.

6. Each competitor must sign-on at the starting point on both the starter's sheet and an entry form. This entry form will contain a copy of the entry, and the winner of the event will be the entrant whose entry form is first accepted by the official umpire. Only the competitor who actually locate the transmitter. Any member of a party arriving at a transmitter prior to the competitor, or found searching the vicinity, will entail disqualification of the party. Competitors arriving at the transmitter shall disperse under the direction of the official umpire.

7. Only one receiver tuned to the 1.8 Mc/s band shall be carried by any party during the test, and the competitor, at the time of his arrival at the hidden transmitter, must have his receiving apparatus with him and, if required, demonstrate that it is in working order. No transmitting equipment shall be carried during the test. In the event of extra receivers and transmitters being permanently installed in a competitor's car, these shall be immobilised to the satisfaction of the official umpire.

8. Two independent R.S.G.B. official umpires will be present, one at the start, and the other at the hidden transmitter, for each of the qualifying events. In the case of dispute, their judgment shall be taken as final.

9. The National Final will be held over ground not within 5 miles of the centre of any town in which a qualifying event has been held. Two transmitters (A and B) will be used.

The starting point and the position of Transmitter A may be anywhere on the specified 1 in. Ordnance Survey map. Transmitter B will be within 10 miles of Transmitter A. Entrants will not be checked in at B until they have first checked in at A. Transmitter A will operate on a published fixed time schedule. Transmitter B will operate on an irregular and secret schedule and will not transmit until a competitor has located Transmitter A.

Two-Metre Open Contest, 1953

Alteration of Dates

AS the French (R.E.F.) and Swiss (U.S.K.A.) Societies are holding Two-Metre contests during the week-end May 2/3 the R.S.G.B. Contests Committee has brought forward the date of the Two-Metre Open Contest by one week so that it will coincide with the other two events. The rules are similar to those which applied last year.

Rules

1. The event is open to fully paid-up members of the R.S.G.B. resident in the British Isles (G, GC, GD, GI, GM and GW).

2. Only the entrant will be permitted to operate his apparatus during the event.

3. *Contacts may be made on telephony, c.w. or m.c.w.*

4. An entrant must operate in accordance with the terms of his licence.

5. The station must be operated from the same site for the duration of the event. The National Grid Full Six Figure Reference must be given, except for Northern Ireland and Channel Islands entries.

6. Only one contact with a specific station will count for points.

7. *Contacts with unlicensed stations will not be permitted to count for points. Proof of contacts may be required.*

8. Entries should be written on lined foolscap or quarto paper, or typed on plain paper, and must be set out in the form shown below :

Name..... Call Sign.....

Home Address..... Claimed Score.....

Site of Station.....

National Grid Full Six Figure Reference.....

Transmitter..... Receiver.....

Aerial System(s) _____

[illegible]

Declaration : I declare that my station was 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. will be final in all cases of dispute.

Signed.

9. The event will start at 1800 B.S.T. on Saturday, May 2, and finish at 2000 B.S.T. on Sunday, May 3, 1953.

10. An exchange of RST or RS reports as well as location will be required before points for the contact may be claimed.

11. For each contact, points may be claimed equal to the number of miles between the two stations.

12. Entries must be posted to reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, not later than May 11, 1953.

13. The Mitchell-Milling Trophy will be awarded to the winning entrant. Certificates of Merit will be awarded to the entrants placed second and third.

During Coronation Year.
Identify Yourself on the Road
by Flying the
R.S.G.B. PENNANT
Price 5/9 Post Free.

Fifth All-European DX Contest, 1951

THE judging of the All-European DX Contest, 1951, has now been completed, and the final results, by countries, are shown below. Unless otherwise stated, the scores refer to the c.w. section. As will be seen, there were very few entries in the Telephony section.

It is regretted that delay has occurred in the publication of results but this was due to the

cumulative effects of a number of unavoidable circumstances. In view of the very small support for the event, those entries which would normally have been disqualified because they were not accompanied by the necessary declarations or were received late, have been accepted on this occasion.

The leading station(s) (indicated by *) in each section in each country will receive certificates.

England			Finland			Saudi Arabia		
*G2VD	17284		*OH5OE	288 ¹		*HZ1HZ	1360 ¹	
*G3FXB	15778		*OH3RA	248 ³				
*G3DYQ	12272		*OH2MC	210 ¹				
G2BW	6903		OH6NR	186 ³				
G8KP	5841		Phone			*EA1AB	8103	
G5JU	4653		*OH6NZ	105		*EA3DF	2142	
G2AJB	1958		OH6NR	18 ³		*EA4CR	2112 ²	
G3EEM	210 ¹					EA3FK	1911	
Phone						EA3CK	648	
*G2AJ	7070					Phone		
						*EA3FG	855	
Scotland			Germany			EA2CK	144	
*GM6IZ	2964		*DL7AA	17141		EA3HS	946 ²	
			*DL2RO	16587				
			*DL7DF	11250				
			DL1JW	11139				
			DL1YA	3321				
			DL6GB	2139				
			DL6GG	243				
			DL6DF	232				
			Phone					
			*DL3DC	540				
Wales			Gibraltar					
*GW3FSP	14616		*ZB2I	315				
GW5SL	2573							
Algeria			Holland					
*FA9RW	10520		*PA0VB	13600				
			*PA0DA	1092				
			*PA0WAC	1050				
			PA0VDV	418				
			PA0UL	12 ²				
Australia			Hong Kong					
*VK5FH	17608		*VS6BJ	154				
VK2GW	3348 ²							
Canada			Iceland					
*VE1EK	2736 ²		*TF3SF	2418 ²				
			*TF3NA	2079 ²				
			*TF3AB	1513				
			TF3SG	27				
Canary Is.			Israel					
Phone			*4X4BX	116424				
*EA8BE	336		4X4DF	53558				
			4X4AT	7946 ¹				
			Phone					
			*4X4AK	2580				
Ceylon			Italy					
*VS7NG	2574		*IIAHR	5032				
VS7GV	40		IIBUQ	132				
			Phone					
			*IIBOI	1914				
			IIAHR	1648				
			IIAMU	1200				
Chile			Madeira					
*CE3AG	1008		*CT3AB	2574				
			CT3AA	1236				
Cyprus			New Zealand					
*ZC4XP	65042		*ZL1QW	460				
Czechoslovakia			Norway					
*OK1HI	26752		*LA6U	6636				
*OK1LX	825		*LA3HA	1456				
*OK1SV	672		*LA9IB	1060				
OK1ZM	360		LA1RD	675				
OK1FO	330		LA6FA	12				
OK1AXW	90							
OK1AEH	75 ²							
OK1VR	18							
OK1OHV	8							
OK3HM	3							
Phone								
*OK1HI	539							
Denmark			Poland					
*OZ4KX	5134		*SP3PF	6942				
*OZ2E	2346 ²							
*OZ1W	2268							
OZ7G	868							
OZ5PA	504							
OZ7ML	12							
Phone								
*OZ3ML	3							
OZ3Y	3 ³							
France			Puerto Rico					
*F7AR	9512		*KP4CC	15047				
*F9ND	1710		KP4KD	6831				
*F9DW	660		KP4JE	570 ³				
Phone								
*F9DW	90							
French Morocco			Rumania					
*CN8BL	1599		*YO3RF	900				
CN8CS	1484		YO6VG	812 ²				
			YO3RI	288 ²				
French West Africa								
*FF8AG	2160							

Check logs were received from: G2MI, G6BB, HB9LA, IIER, KZ5CW, OH8NU, PA0FB, PA0KD, PA0UV, SM5HH, SM6RS, SM7YO, W6BAX, ZD6DU, and ZE4JC.

C.U. IN B.E.R.U.

Telegraphy Section
MARCH 28—29

Telephony Section
APRIL 11—12

Council Proceedings

Résumé of the Proceedings at the Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, January 13, 1953, at 6 p.m.

Present.—The President (Mr. L. Cooper in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, F. Charman, C. H. L. Edwards, D. A. Findlay, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, A. O. Milne, H. McConnell, L. E. Newham, P. W. Winsford and John Clarricoats (General Secretary).

Welcome to New Members

The President cordially welcomed the newly elected Members of the Council and congratulated the other Members of the Council on their re-election. The President also explained that the Proceedings of the Council are confidential until the appropriate *Résumé* has been approved for publication. Badges of office were then presented to the President and Immediate Past President and to the newly elected Officers and Members of the Council.

Membership.

Resolved:—

- to elect 48 Corporate Members and 18 Associates;
- to grant Corporate Membership to 7 Associates who had applied for transfer.

Amateur Radio Exhibition, 1952.

Resolved:—

- to receive the Report of the Committee appointed to supervise the Amateur Constructors' Section and the operation of the Amateur Radio station GB3RS;
- as a mark of appreciation for services rendered to the Society, to pay the subscriptions when due of eight members who assisted at the Exhibition.

Amateur Radio Exhibition, 1953.

Resolved, subject to accommodation being available, to hold the Seventh Annual Amateur Radio Exhibition at the Royal Hotel, London, during the period November 25-28, 1953.

Articles of Association.

Resolved to send the final redraft of the Articles of Association to the Society's legal advisers for their comments.

It was agreed to await a reply from the Society's legal advisers before deciding upon the date when the final redraft is to be submitted to the membership in the form of a Special Resolution.

Coronation Year QSL Cards.

Consideration was given to a letter from a member in which he suggested that the Council should sponsor the production of a special Coronation Year QSL card embracing the Union Jack and embodying photographs of H.M. The Queen and H.R.H. The Duke of Edinburgh.

It was agreed to advise the member in question that the Council feels that the production of Coronation Year QSL cards should be left in the hands of recognised specialist firms of printers.

Finance.

Consideration was given to a statement submitted by the Hon. Treasurer dealing with estimated Expenditure and Income for the current financial year. Consideration was also given to a "break down" analysis of the total Expenditure as set out in the Audited Accounts for the year to June 30, 1952.

After a lengthy debate, during which each Member of the Council expressed his views on the general question of subscription rates, it was resolved to publish in the February issue of the *BULLETIN* a statement based on the information supplied by Mr. Findlay together with an analysis of total expenditure for the year to June 30, 1952.

[The statement appeared in the February issue of the *BULLETIN*.—ED.]

Committees of the Council.

The Committees of the Council for the year 1953 were constituted.

I.A.R.U. Region I Bureau Committee.

Resolved to nominate Messrs. F. Charman, J. Clarricoats, L. Cooper, R. H. Hammans and A. O. Milne, to serve on the Region I Bureau Committee, and to delegate to that Committee the power to co-opt other Members to serve thereon.

I.A.R.U. Region I Conference.

Resolved to inform the I.A.R.U. Region I Bureau Committee that the R.S.G.B. supports a proposal to hold an I.A.R.U. Region I Conference in Lausanne during May, 1953.

Zonal Boundaries.

In answer to an enquiry the President explained that the grouping of Regions put forward at the last Regional Representatives' Conference was tentative. At the appropriate time the Membership and Representation Committee would be asked to consider the matter and report to the Council.

The Meeting terminated at 9.45 p.m.

Coronation Relay

FOR six years—from 1930 until 1935—an important feature of Amateur Radio within the British Empire was the Annual Loyal Relay. During those years His Royal Highness the Prince of Wales, K.G. (now H.R.H. the Duke of Windsor, K.G.), was Patron of the R.S.G.B. Annually in June, Amateur Radio organisations throughout the Empire originated messages conveying loyal birthday greetings to His Royal Highness. The messages were relayed to Society Headquarters via Amateur Radio channels where they were collated and taken to York House, London, on the morning of our then Royal Patron's birthday.

This year the Council of the Society has decided to organise a Coronation Relay—the first of its kind ever attempted. National and local radio societies throughout the British Commonwealth are to be invited to send messages of loyal congratulations to Her Majesty Queen Elizabeth, so that they reach Society Headquarters a few days before her Coronation on June 2.

Messages should originate from the President or Chairman of the appropriate Society and should take the following form:

To R.S.G.B., London.

From (Name of Organisation).....

via.....(here follows the call-signs of all stations handling the message).

Date of origin....., 1953.

Text of Message (not to exceed 50 words)

Signed.....(Office)

The Coronation Relay is being organised on behalf of the Council by Mr. Herbert A. Bartlett (G5QA), "Londrie," Birchy Barton Hill, Exeter, Devon.

The Council feels certain that the Relay will arouse widespread interest throughout the Commonwealth.

It is of historic interest to recall that only two of the six United Kingdom amateurs closely associated with the first Loyal Relay in June, 1930, are still active. They are Mr. Fred W. Miles (G5ML) and Mr. L. Howard Thomas (G6QB).

On the occasion of the last Loyal Relay (June, 1935) Mr. Frederick Charman (G6CJ)—now the Society's Immediate Past President—had the honour of handling four of the messages.

REGIONAL AND CLUB NEWS

ABERDEEN AMATEUR RADIO SOCIETY.—Meetings are held at 6 Blenheim Lane at 7.30 p.m. on Fridays, to which R.S.G.B. members are cordially invited. *Hon. Secretary:* G. Jamieson, 66 Elmfield Avenue, Aberdeen.

BRISTOL.—There was an attendance of 60 at the February meeting when Herb. Bartlett, G5QA (Council Member and Region 9 Representative) opened a discussion on the proposed changes in the subscription rates. D. V. Newport (G3CHW) gave a lecture on "Instruments and their Amateur Applications." *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bristol 7.

BRITISH TWO CALL CLUB.—The following were elected in the recent ballot: *President:* Major D. A. MacDonnell, R. Signals (G8DK); *Vice-President:* Major J. M. Drudge-Coates, R. Signals (DL2RO). *Hon. Secretary:* G. V. Haylock (G2DHY), 63 Lewisham Hill, London, S.E.13.

CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB.—The Club will next meet at the "Jolly Waterman" on April 10 at 8 p.m. *Hon. Secretary:* T. A. T. Davies (G2ALL), Meadow Side, Camberton, Cambridge.

CHELtenham.—At the meeting on March 5, members who attended the S.G.M. on February 27 gave a report of the proceedings and an informal discussion followed. G5BM, chairman of the local N.F.D. committee, reported on the progress of preparations for this year's event.

CHELtenham AMATEUR RADIO SOCIETY.—Meetings are held at St. Mark's Community Centre on Fridays. *Hon. Secretary:* E. A. J. Miles (G3GCR), "Hamble," 8 Elmfield Road, Cheltenham.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—At the A.G.M. the following officers were elected: *Chairman:* S. Dalton; *Vice-Chairman:* E. Paddock; *Hon. Secretary:* N. Richardson, 1 Victory Villas, Newton Lane, Upton; *Committee Member:* J. W. Swinnerton (G2YS). MD2B, now stationed locally, is a new member. On March 17, G2YS will give a talk, illustrated with the aid of a tape recorder, entitled "As others hear us."

COVENTRY.—A lecture entitled "Only an inch of wire," given by G8PN, aroused much interest at the January meeting. Preparations for National Field Day were also discussed. The next informal meeting will be held at 51 Richmond Street, Coventry, on April 10 at 7.30 p.m.

COVENTRY AMATEUR RADIO SOCIETY.—The 21st Anniversary Dinner, at which the Society's trophies were presented, took place on February 27. Meetings will be held at the Y.W.C.A., Queen's Road, on March 30 ("Mathematics—Which?") and April 13 ("Readers Digest").

DERBY & DISTRICT AMATEUR RADIO SOCIETY.—At the A.G.M. the following officers were elected: *Chairman:* C. M. Swift (G3LUK); *Hon. Secretary:* F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby; *Hon. Contests Secretary:* K. J. Pegg (G3FSH); *Hon. Treasurer:* W. R. Chaffe (G2DLJ); *Committee Members:* F. Clay (G3IBL), C. Rodgers (G3IJ), T. Darn (G3FYG), G. Mather and B. J. Brown.

EAST SURREY RADIO CLUB.—The Club meets at the British Legion, Redhill, at 8 p.m. on Mondays (Morse Class) and Thursdays (Practical Work). *Hon. Secretary:* L. G. Knight (G5LKC), Radiohome, Madeira Walk, Reigate.

GRAVESEND AMATEUR RADIO SOCIETY.—At the A.G.M., E. C. Woods (G3FST) was elected *Chairman*. The *Hon. Secretary* is R. E. Appleton, 23 Laurel Avenue, Gravesend. Twenty new members were enrolled during 1952.

HOVE.—The new T.R. is Eric Basilio (G3HVH), 111 Vale Road, Portslade. A meeting will be held shortly to decide on the boundaries of the new Group, which plans to take part in N.F.D., possibly from the Devil's Dyke.

MANCHESTER & DISTRICT RADIO SOCIETY.—Meetings are held on the first Monday of each month in the Brunswick Hotel, Piccadilly, at 7.30 p.m. *Hon. Secretary:* K. Brockbank, 17 Burleigh Road, Stretford, Lancs.

MEDWAY AMATEUR RECEIVING & TRANSMITTING SOCIETY.—The next meeting at the "Red Lion," Rochester, is on March 23. On other Mondays, the Club Headquarters, Five Bells Lane, Rochester, is open for Morse Code Classes and practical work. *Hon. Secretary:* D. H. Brett, 1 Connaught Road, Chatham.

MIDLAND AMATEUR RADIO SOCIETY.—Meetings are held at the Imperial Hotel, Birmingham, on the third Tuesday in each month. *Hon. Secretary:* P. L. Hunt (G3FWB), 39 Antrobus Road, Birmingham 21.

NORTH KENT RADIO SOCIETY.—At the A.G.M., H. Overton (G4CW) was elected *President*. Meetings are held at the Congregational Hall (opposite the Palace Cinema), Bexleyheath, on the second and fourth Thursday in each month. *Hon. Secretary:* C. J. Leal (G3ISX), 1 Deepdene Road, Welting, Kent.

PORTSMOUTH & DISTRICT RADIO SOCIETY.—Meetings are held at the Royal Marine Signals Club, Eastney Barracks, on Tuesdays at 7.30 p.m. Visitors are always welcome. *Hon. Secretary:* L. B. Rooms (G8BU), 51 Locks-way Road, Milton, Portsmouth.

QRP RESEARCH SOCIETY.—A c.w. "net" takes place on the first Sunday of each month on 3.5 Mc/s. Reports on

low-power "skeds" between members are invited. *Hon. Secretary:* J. Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

SLADE RADIO SOCIETY.—There will be a lecture on "Television Tubes" at the meeting in the Church House, Erdington, at 7.45 p.m. on March 20. A visit to a local electrical factory is arranged for April 3. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Birmingham 23.

SOUTH MANCHESTER RADIO CLUB.—Meetings will be held at Ladybarn House, Mauldeth Road, Fallowfield, on March 27 ("Reminiscences of an Old Timer") and on April 10 (Mullard Film Strip No. 5). The club station (G3FVA) is active on 3.5 Mc/s on Fridays when a lecture is not being given. *Hon. Secretary:* M. Barnsley (G3HZM), 17 Cross Street, Bradford, Manchester 11.

SOUTHEND & DISTRICT RADIO SOCIETY.—At the meeting to be held on March 6 in Room L, London Road-Queen's Road Annexe of the Municipal College, B. R. Webster will talk on "Commercial Receivers." *Hon. Secretary:* G. Chapman, 20 Leigh Hill, Leigh-on-Sea, Essex.

SPEN VALLEY RADIO & TELEVISION SOCIETY.—The following have been elected for the year 1953-4: *Chairman:* J. E. Church (G3BMC); *Vice-Chairman:* P. Denison (G8OK); *Committee Members:* J. Charlesworth (G3JJC), G. Crossley (G2CGR) and M. Eskdale (G2SU); *Hon. Secretary and Treasurer:* Norman Pride, 100 Raikes Lane, Birstall, Leeds.

TORBAY AMATEUR RADIO SOCIETY.—At a recent meeting of the Society, Tom Smith (G3EFY), C.R. for Devon, demonstrated an automatic control unit used by Gordon Martin (G3GWH) to control his 144 and 430 Mc/s transmitters and receivers. A modified form of telephone dialling is used. G3EFY also discussed the technical operation of the four main types of relays used in Amateur Radio work and showed a number of stripped-down types. Region 9 Representative, Herbert Bartlett (G5QA) was also present at the meeting. The Society hopes to co-operate with the local R.S.G.B. group on N.F.D. and plans to help with the organisation of the R.S.G.B. Devon Hamfest which is to take place in Torquay during the autumn. The Society meets at 7.30 p.m. on the third Saturday in each month at the Y.M.C.A., Torquay.

WARRINGTON & DISTRICT RADIO SOCIETY.—"The Teleprinter," by N. Atkins (G3EXG), and "Television Interference," by H. Whalley (G2HW), have been subjects of recent talks. *Hon. Secretary:* G. S. Leigh (G2FCV), 49 School Road, Orford, Warrington.

WEST LANCASHIRE RADIO SOCIETY.—Members are to visit Holme Moss TV station on March 20. Meetings are again being held at 8 p.m. on Tuesdays over Gordon's Sweetshop, St. John's Road, Waterloo, Liverpool 22. Visitors are invited to attend. *Hon. Secretary:* B. J. Whitty (G3HWX), 46 Argo Road, Waterloo, Liverpool 22.

REPRESENTATION

The following are additions to the list of County Representatives published in the December, 1952, issue:

Region 2

Yorkshire West

J. R. Petty (G4JW), 580 Redmires Road, Sheffield 10.

Durham

T. Orr (G3IV), 31 Grange Park Avenue, Sunderland.

* * *

The following are amendments to the list of Town Representatives published in the February, 1952, issue:

Region 1—Cumberland

West Cumberland Area.—H. S. Roberts (G3HSI), 93 High Road, Arrowthwaite, Whitehaven.

Region 6—Gloucestershire

Stroud.—A. A. H. Sparrow (G3EKD), Janarth, Farmhill.

Region 7—London South

Postal Districts of S.W. 2, 4, 8, 9, 11, 12, 17, 18.—W. A. Martin (G3FVG), 21 Brixton Hill, S.W.2.

Region 8—Sussex

Hove & District.—E. Basilio (G3HVH), 111 Vale Road, Portslade.

Region 14—Glasgow

City of Glasgow & Postal Districts.—W. Gilmour (GM3FPX), 30 Sutcliffe Road, Glasgow, W.3.

Stirlingshire

Falkirk.—O. M. Derrick (GM3OM), 261 Main Street, Larbert.

Vacancies

Mr. E. J. R. Cowles (G2AJU) has resigned as Representative for the County of Suffolk. Messrs. F. H. P. Cawson (G2ART), F. S. G. Rose (G2DRT), L. E. Flint (G3DMN) and R. Walker (G6QI) have resigned as Representatives for the towns of Southport and Formby, Spalding, Ipswich, and Barnet respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by April 30, 1953.

New Books

TELEVISION AND RADAR ENCYCLOPAEDIA. Edited by W. MacLanachan. Page size $8\frac{1}{2} \times 5\frac{1}{2}$ ". 216 pages, 224 illustrations. Published by Newnes. Price 30/-.

Sir Edward Appleton and Sir Robert Watson-Watt are two of the team of eight specialists who have combined to produce this comprehensive encyclopaedia. For some years the need for such a book has been felt among those whose work or recreation brings them into intimate contact with television and radar.

A book that is too useful to be kept locked away in a cupboard.

RADIO UPKEEP AND REPAIRS (7th Edition). By A. T. Wits. Page size $7\frac{1}{2} \times 4\frac{1}{2}$ ". 220 pages, 159 diagrams and illustrations. Published by Pitman. Price 12/6.

This very practical handbook—now almost a classic—has been revised and much new material added to bring it up to date. It explains in a simple manner how to locate and remedy faults and how to keep modern radio equipment in good working order. The uses of the ohm-meter and signal generator for servicing receivers are features of this new edition.

RADIO INTERFERENCE SUPPRESSION As Applied to Radio and Television Reception. By G. L. Stevens. A.M.I.E.E. Page size $8\frac{1}{2} \times 5\frac{1}{2}$ ". 132 pages, 65 diagrams and photographs. Published for "Wireless World" by Iliffe. Price 10/6.

Provides an up-to-date guide to the various methods of suppressing electrical interference with radio and television reception. The origins of interference and the theory of suppression technique are described and typical interfering appliances discussed.

Particular attention is paid to the problem of interference at television frequencies, and to suppression arrangements on motor vehicles and ships. The design and choice of suppressor components, methods of locating the source of interference and suppression at the receiver itself are also dealt with.

REMOTE CONTROL BY RADIO. By A. H. Bruinsma. Page size $8\frac{1}{2} \times 6\frac{1}{2}$ ". 104 pages, 74 illustrations. An addition to the Philips Technical Library. English distributors, Cleaver Hume Press Ltd., London, W.1. Price 8/6.

The radio amateur interested in the fascinating hobby of telechairs will find much to intrigue him in this new book, which describes amplitude-modulated and impulse-modulated systems of remote control by radio. The book was written after the author had demonstrated his radio-controlled ships at a number of international exhibitions. The text is in English.

Technical note: The impulse-modulation system adopted by the author has eight channels, which makes it possible for eight signals to be transmitted simultaneously, but independently, on one carrier wave.

WORLD RADIO HANDBOOK FOR LISTENERS. By O. Lund Johansen. Page size $8\frac{1}{2} \times 6\frac{1}{2}$ ". 124 pages. Printed in English. Published in Denmark. Available from Wm. Dawson & Sons, Ltd., London, W.C.2. Price 8/6.

Call signs, interval signals, operating times, frequencies and special programme features of all known broadcast stations are given, together with a long list of short-wave broadcast stations in order of wavelength and frequency. Particulars are also included of television stations operating a regular service.

A must for the listener interested in DX broadcasting.

THE RADIO AMATEUR OPERATORS' HANDBOOK. Compiled by the staff of "The Radio Amateur." Page size $8\frac{1}{2} \times 5\frac{1}{2}$ ". 48 pages. Published by Data Publications, London, W.9. Price 2/6.

Contents include: amateur prefixes, radio zone boundaries, call areas, local time conversion, mileage table, codes and abbreviations. There are also a number of maps and charts. H. E. Smith (G6UH) and S. Herbert (G3ATU) contribute articles on the v.h.f. and DX bands respectively.

A veritable *vade mecum* for the newcomer to Amateur Radio—and useful to the old-timer.

Around the Trade

An ingenious 24-hour clock, which indicates on one dial local time in 23 cities of the world, has been placed on the market by Smith's English Clocks Ltd. It costs £5 9s. 11d.

An improved triode heptode frequency changer, the ECH81, has been introduced by Mullard Ltd. It is of all glass construction and has a B9A (Novol) base. Its conversion conductance of 775 $\mu\text{A/V}$ and Equivalent Noise Resistance of 70,000 ohms make it of particular interest for use in communications equipment.

New Mullard Film

A full length documentary film which depicts in an impressive manner every important phase in the production of radio valves and television tubes, from the actual manufacture of the glass, fine wire and component parts through to the assembly, sealing, pumping and final testing, has been made by National Screen Service Ltd. for Mullard Ltd.

The film, which runs for approximately 45 minutes, shows the rigid scientific control which is exercised during the manufacturing processes and draws attention to the unusual combination of technologies necessitated. It well illustrates the many individual skills employed in the valve-making industry. Copies of the film are available, on loan, to R.S.G.B. Groups and Affiliated Societies from the Mullard Information and Educational Service, Century House, Shaftesbury Avenue, London, W.C.2.

**If you change your address
please notify Headquarters
promptly**

(Continued from page 378)

Eastbourne.—March 19, April 2, 7.30 p.m., 333 Seaside.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.
Maidstone (M.K.A.R.S.).—Fridays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.A.R.S.).—April 13, 8 p.m., Adult Education Centre.

REGION 9

Bath.—March 23, 7.30 p.m., Y.M.C.A., Broad Street.
Bristol.—March 20, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Exeter.—April 3, 7 p.m., Y.M.C.A., St. David's Hill.
North Devon.—April 2, Rose of Torridge Cafe, The Quay, Bideford.
Penzance.—April 2, Railway Hotel.
Plymouth.—April 18, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
St. Agnes.—March 29, 3 p.m., All Cornwall Hamfest, "Cove Cafe," The Quay, St. Agnes.
Torquay.—April 18, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—March 19, April 2, 16, Fifteen Balls, Penryn, Nr. Falmouth.
Weston-super-Mare.—April 7, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—April 13, 7.30 p.m., "The British Volunteer," The Hayes.

REGION 11

Holywell.—March 22, 7.30 p.m., Congregational Schoolroom.

REGION 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace.
Edinburgh.—March 19, April 2, 16, 7.30 p.m., Edinburgh Chamber of Commerce.

REGION 14

Falkirk.—March 27, April 10, 7.30 p.m., The Temperance Cafe.

Silent Key

It is with sadness that we report the death on February 4, at the age of 46, of Norman White, G3IS. He had a serious illness a year ago which weakened his heart.

Although active on most amateur bands at various periods, Norman was really a v.h.f. enthusiast, operating formerly on 59 Mc/s and more recently on 144 and 420 Mc/s.

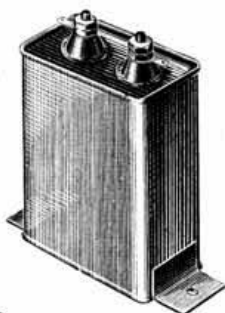
He joined the R.N.V.(W.)R. in the early days of that organisation and did valuable radio work during the last war. He had been a member of the Society since 1951 and supported local meetings when his health allowed.

To his wife and children, Peter, aged 13 years, and Pat, aged 8 years, we offer our deepest sympathies.
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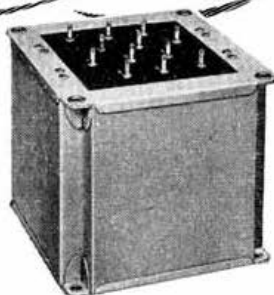
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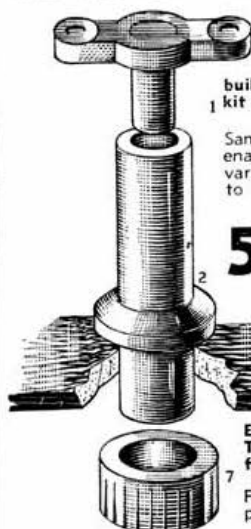
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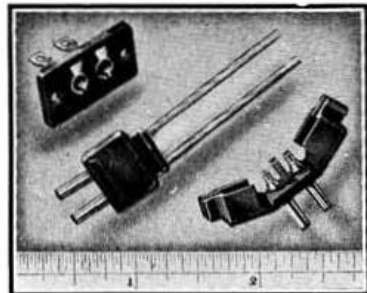
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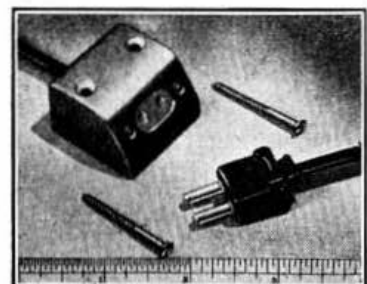
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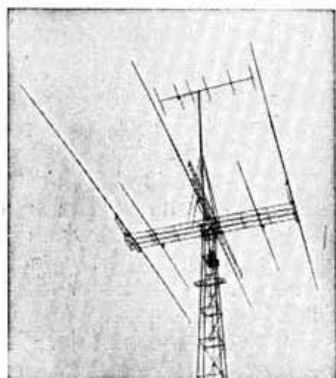
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EXCHANGE & MART SECTION

(Continued from page 411)

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UNUSED Eddystone cabinet assembly, 16½×8½×9. 30/-, Gay tuning unit, 3-5 Mc/s, make f.b., v.f.o., £1. KT8C, 6H6, 6J7, 7CS, 7F7, 7Y4, 4/-, RK34, (5), 7193 (5), 1/-, Varley transformer, 500 V 120 mA, 6.3 V 4 A, 4 V 5 A, 15/-, Add postage please. Wanted: Valve ATP35.—DUNCAN, 23 Noran Avenue, Dundee. (928)

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WANTED.—H.R.O. coils, receivers, power packs, AR.88Ds, AR.88Fs, SX.28s, BC.348s, AR.77s, etc.—Details please to R.T. & I. SERVICE, 254 Grove Green Road, Leytonstone, E.11. (LEY 4986.) (101)

WANTED.—BC.610 Hallicrafters, ET.4336 transmitters, SX.28s, AR.88s, receivers and spare parts for above. Best prices.—P.C.A. RADIO, The Arches, Cambridge Grove, London, W.6. (891)

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RADIO OFFICER required by the East Africa High Commission for the Directorate of Civil Aviation for one tour of 30-48 months in the first instance. Commencing salary according to age and experience in scale £667 rising to £929 a year (including temporary allowance). Gratuity between £74 and £96 for each year of service on satisfactory completion of final service unless officer is placed on pensionable establishment. Outfit allowance £30. Free passages. Liberal leave on full salary. Candidates should possess the First Class Certificate of Proficiency in Radio Telegraphy issued by the Ministry of Civil Aviation or alternatively an Operator's Licence of equivalent standard provided they have had at least 5 years' operating experience and can operate at 25 words a minute. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.32494.G. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (916)

CROWN AGENTS FOR THE COLONIES

RADIO OFFICER required by Nigeria Government Posts and Telegraphs Department for one tour of 18-24 months in the first instance, either (a) on agreement with a prospect of permanent and pensionable employment on salary £750 rising to £1,175 a year (including expatriation pay) or (b) on a temporary contract basis on salary £807 rising to £1,269 a year (including expatriation pay) with a gratuity up to £37 10s. according to salary for each 3 months' service. Commencing salary according to age and experience. Outfit allowance £60. Free passages for officer and wife and assistance towards cost of children's passages or their maintenance in this country. Liberal leave on full salary. Candidates must possess a Postmaster-General's Certificate in Radio Telegraphy, or an Air-Operator's Certificate or an equivalent Service qualification. They must have a thorough grounding in I.C.A.O. codes and procedures and have had recent experience with an administration or air operating company outside West Africa in operating wireless and direction finding ground stations for air services. Apply at once by letter, stating age, full name in block letters and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29270.G. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (896)

CROWN AGENTS FOR THE COLONIES

WIRELESS STATION SUPERINTENDENT required by the Government of Nigeria for the Posts and Telegraphs Department for one tour of 18 to 24 months in the first instance with prospect of permanent and pensionable employment. Commencing salary (including expatriation pay) according to qualifications and experience in scale £750 rising to £1,175 a year. Outfit allowance £60. Free passages for officer and wife and assistance towards cost of children's passages or their maintenance in this country. Liberal leave on full salary. Candidates (under 40 years) must have had wide practical experience of modern radio techniques and equipment, in particular v.h.f. equipment, and preferably also v.h.f. multi-channel equipment. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.28927.G. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (885)