June 1951

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OFFICIAL JOURNAL OF THE

Radio Society of Great Britain

Editor:
JOHN CLARRICOATS

Editorial Office:
NEW RUSKIN HOUSE,
LITTLE RUSSELL STREET,
LONDON, W.C.1

Telephone: Holborn 7373

Advertisement Manager:
HORACE FREEMAN

Advertising Office:
THE NATIONAL PUBLICITY CO., LTD.
358 STRAND, LONDON, W.C.2

Telephone: Temple Bar 0948-9

Issued free to members. *Hon. Editor:* ARTHUR O. MILNE **Published on or about the 15th of each month.**

Vol. XXVI No. 12 JUNE 1951

Contents

Forthcoming Events

REGION 1

Ashton-under-Lyne.—July 1, 3 p.m., New Jerusalem Schools.
Blackpool.—July 17, 7.30 p.m., Barclays Bank Chambers, 2 Birley Street, 2nd Floor.
Bolton.—July 3, 8 p.m., Y.M.C.A.
Bury.—July 12, 7.30 p.m., Y.M.C.A.
Burnley.—July 4, 7.30 p.m., Mechanics' Institute, Manchester Road.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., The Tarran Hut, Y.M.C.A.
Darwen & Blackburn.—June 22, July 13, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Oldham.—Alternate Wednesdays, 7.30 p.m., Clegg Street.
Manchester.—July 2, 7.30 p.m., Reynolds Hall, School of Technology, Sackville Street.
Liverpool.—June 23, July 7, 2.30 p.m., The Mansion House, Queen's Drive, West Derby.
Preston.—June 22, July 6, 2.30 p.m., Three Tuns Hotel, North Road.
Rochdale.—July 1, 3 p.m., Drill Hall, Baron Street.
Southport.—June 18, July 2, 8 p.m., Y.M.C.A. (off Eastbank Street).
Wirral (W.A.R.S.).—June 20, July 4, 8 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—June 22, July 13, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—June 26, 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.—July 11, 7.30 p.m., Black Bull, Market Place.
Gateshead.—Thursdays, 7 p.m., Y.M.C.A. Sutherland Hall, Durham Road.
Hull.—June 27, 7.30 p.m., R.E.M.E. Canteen, Walton Street.
Leeds.—June 22, Swarthmore Educational Centre, Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., All Saints Hall, Grange Road.
Newcastle-upon-Tyne.—June 18, 8 p.m., British Legion Rooms, 1 Jesmond Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Scarborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.
Sheffield.—June 27, 8 p.m., Dog and Partridge, Trippet Lane; July 11, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—July 11, July 25, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Wednesdays, 7.30 p.m., Community House, Falsgrave Crescent.

REGION 3

Birmingham South.—June 17, July 1, 15, 10.30 a.m., Stirchley Institute.
Coventry.—June 22, 7.30 p.m., Priory High School, Wheatley Street.
Stourbridge (S. & D.A.R.S.).—June 22, Informal, Corn Exchange Vaults; July 3, King Edward VI School.

REGION 4

Derby (D. & D.A.R.S.).—June 20, July 4, 18, 7.30 p.m., Sub-Basement, Derby School of Arts & Crafts, 119 Green Lane.
Leicester (L.A.R.S.).—June 18, July 2, 16, 7.30 p.m., Holly Bush Hotel, Bellgrave Gate.
Loughborough.—July 11.
Mansfield (M. & D.A.R.S.).—July 1, 3 p.m., Swan Hotel.
Newark.—June 24, July 8, 7 p.m., Northgate House, Northgate.
Northampton (N.S.W.C.).—July 6, 7 p.m.; otherwise Fridays, 6 p.m., Clubroom, 8 Duke Street.
Nottingham.—June 25, July 9, 7.30 p.m., Lord Nelson Hotel, Carlton Street.
Retford.—July 1, 3 p.m., Community Centre, Chapel Gate.
Spalding.—June 28, 7.30 p.m., 10 South Parade.
Worksop.—July 2, 7.30 p.m., King Edward Hotel.

REGION 5

Chelmsford.—July 6, 7.30 p.m., Smith's Radio Shop, 184 Moulsham Street.
Southend.—June 20, 7.45 p.m., G2BHA, 27 Park Road, Southend.

REGION 7

Barnes & Richmond.—July 10, 7.30 p.m., 22 Lowther Road, Barnes.
Barnet & Whetstone (B. & D.R.C.).—Wednesdays, 8 p.m., Hopedene, The Avenue, Barnet.
Bexley (N.K.R.S.).—June 25, July 9, 7.30 p.m., Freemantle Hall.
Brentwood.—June 22, July 6, 8 p.m., Drill Hall, Ongar Road.
Chingford.—June 21, July 5, 8 p.m., A.T.C. H.Q., Pretoria Road.
Croydon (Surrey R.C.C.).—July 10, 7.30 p.m., "Blacksmiths Arms," South End.
Dulwich & New Cross.—July 2, "Kentish Drovers," Rye Lane, S.E.15. "Mobile Radio Demonstration," by Mr. R. L. Glaisher, G6LX.
East Ham.—June 19, July 3, 57 Leigh Road.
Edgware (E. & D.R.S.).—Wednesdays, 22 Goodwin Avenue, Mill Hill.
Enfield.—July 15, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—June 19, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Guildford & Dorking.—July 15, visit to Automatic Telephone Exchange. Meet at Royal Arms Hotel, North Street, Guildford, 3 p.m.
Gravesend.—Wednesdays, 7.30 p.m., 30 Darnley Road.
Hayes & Uxbridge.—July 6, 7.30 p.m., "The Vine," Uxbridge Road.
Hoddesdon.—July 5, 8 p.m., "The Salisbury Arms."
Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.
Kensington & Shepherds Bush.—July 13, 8 p.m., 38 Royal Crescent, W.11.
Lewisham (R.A.R.C.).—Every Wednesday and Thursday, 7 p.m., Childeric Road School, New Cross. No regular meetings in July.

(Continued on Page 472)

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CV1072 Mercury Vapour Rectifiers (GU50) **7/6** each
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R·S·G·B

BULLETIN

For the advancement of Amateur Radio

VOLUME XXVI No. 12 JUNE 1951

A HISTORIC EVENT

ON April 12, 1951, a small Committee, set up by the Council of R.S.G.B., started to plan the operations of the I.A.R.U. Region I European Bureau. Behind these few words lies, possibly, the future hope of Amateur Radio in Europe: time alone can tell. This Committee, under the leadership of Mr. S. K. Lewer, G6LJ, a Past President of R.S.G.B., was formed as a result of the decisions taken at the 25th Anniversary Congress of the International Amateur Radio Union held in Paris last year. The Headquarters of this Union of National Societies has always been, and still is, in the U.S.A. by the grace of the A.R.R.L., who have provided the funds for its work. In Paris, last year, it was generally felt, however, that the problems of Europe were sufficiently specialised to require attention on the spot. It was then that we realised that the other Societies of Europe were looking to us, the R.S.G.B., as an organisation with great resources and experience, to give a lead. Thus the European Branch, or Bureau, was formed which the Council of R.S.G.B. has agreed to operate for its first year.

The fundamental, indeed the vital, task of the I.A.R.U. is to maintain the existence of our hobby. In the bluntest terms, if we wish to retain and extend the amateur frequency bands, we must support the work of the Union. The clamour for frequencies continues to increase; at International Telecommunication Conferences these demands come from commercial and political sources, through representatives who, in many cases, are non-technical, with no interest in—possibly no knowledge of—Amateur Radio. Unless continuous pressure is maintained, the Amateur Service may be squeezed out: any ground lost today is lost for ever.

As an example consider the case of shipping. In Europe there is more coastal shipping per head of population than anywhere else in the world. This traffic uses the lower frequencies and makes a permanent claim on the 1.7 and 3.5 Mc/s. bands. It is only through the persistent work of I.A.R.U. and R.S.G.B. that we still retain these valuable amateur frequencies.

The R.S.G.B. has always maintained good relations with the various authorities and has often in the past, at its own expense, taken effective action on behalf of the amateurs of the Commonwealth and Europe. In Europe few of the National Societies have the resources or access to authority to enable them to do much work alone. By means of the Bureau we can strengthen them greatly and thereby the whole cause.

As the Region I Bureau Committee is an international body it has asked the Council for full delegation of powers. It will preside over the normal routine and special work of the Bureau and will seek to keep contact with Member Societies through the medium of a publication, issued twice yearly, in which information will be exchanged and proposals displayed. It will be in English, with occasional use of other languages for important items.

SEE YOU AT CONVENTION?
JUNE 21-24, 1951

The actual detail work of the Bureau has, of course, been building up for nearly a year. An important section of this work concerns the co-ordination of arrangements for Contests. The Bureau will be responsible for the Annual European DX Contest, and it has already made arrangements for a European V.H.F. event which it is hoped will stimulate the use of the 144 Mc/s. band and develop our knowledge of its characteristics.

The cost of operating the Bureau for its first year will be borne by the R.S.G.B. It is hard to guess what will be needed but much of its work will depend on voluntary effort. The Council has been criticised for offering enough financial support to ensure that the Bureau will not fail for lack of funds. Large as this offer may seem, it reduces to less than one shilling per member. For this small sum the Bureau will help to maintain the right of all amateurs to be on the air. It is interesting to reflect that one large European society has already appreciated that such money will be well spent and has advanced its subscription rates for this purpose. F.C.

THE USE OF PI-COUPLING NETWORKS

including a new multi-band tank circuit

The pi-coupling network has been useful to the radio amateur for many years in the form of the Collins Universal Aerial Coupler, and has also gained vogue as a low-pass filter for T.V.I. reduction. Here G2HDU discusses some less familiar applications; emphasising the value of the circuit for harmonic reduction. Full details are also provided of a new multi-band tank circuit which presents a further advance towards simplified band-changing in amateur transmitters.

POST-WAR development of amateur transmitter design has strongly reflected the influence of two basic requirements: (1) the necessity to reduce harmonic radiation to an extremely low level in order to prevent interference with television and other V.H.F. transmissions; and (2) the desire to simplify band-changing, without serious loss of efficiency, in general purpose transmitters operating in the frequency range 3.5 to 30 Mc/s. Both of these fundamental problems have been tackled vigorously, not only by the development of new techniques but also by a fresh examination of well-tried circuit techniques. The pi-network provides an interesting example of this latter process. Though successfully used for many years as a universal matching device for coupling transmitters to aerials of widely differing impedances, the employment of this device within the transmitter itself has, until comparatively recently,

By C. W. CRAGG, Grad.I.E.E.
G2HDU

received little attention from most radio amateurs. Yet the pi-coupler, correctly used, offers several important advantages.

Harmonic Reduction

An examination of the pi-network circuits [Fig. 1 (a) and (b)] shows that the arrangement is essentially a low-pass filter; indeed, it is often used as such. This fact may be turned to good account in the reduction of unwanted harmonic output from a transmitter as, for example, when faced with a difficult case of T.V.I. It can be shown, theoretically, that the harmonic output from a transmitter stage using a coupler of this type in its anode(s) circuit is less than that with a normal parallel-tuned circuit, by a factor of $1/n^2$ when n is the order of the harmonic (1). Now this means, of course, that the second harmonic output is one quarter, the third harmonic output one ninth, the fourth harmonic output one sixteenth, and so on, of what they would be if a parallel-tuned circuit of the same Q was used. Since T.V.I. is often caused by a high order of harmonic, it can thus be seen that very considerable relief may follow from the replacement of a parallel-tuned circuit by a pi-network.

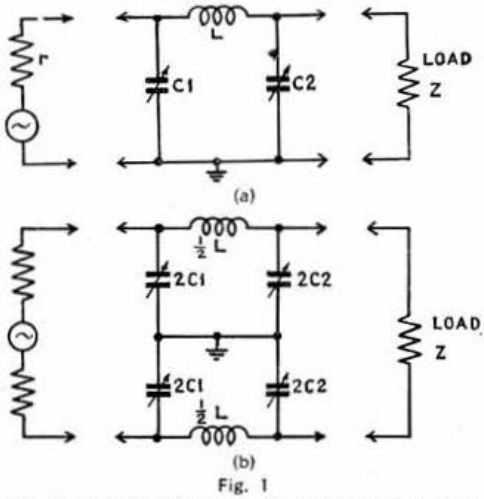

Fig. 1

(a) Normal pi-section network, unbalanced to earth.
(b) Balanced arrangement of the network.

Furthermore, should one particular harmonic be the cause of the television interference, the coil can be parallel-tuned to this frequency, as shown in Fig. 2. Increased attenuation is thereby obtained at the unwanted frequency, although at the expense of a lower value of attenuation of the higher order of harmonics.

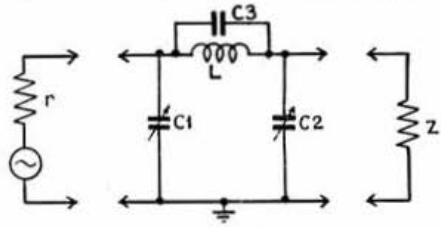

Fig. 2.

Modification of the network to give greater attenuation at one particular frequency.

It is also interesting to note that the use of a condenser connected directly between anode and cathode of a power amplifier valve has been advocated by several writers as an aid to the reduction of harmonic output. When a pi-network is used, C1 will serve this purpose, as well as its normal tuning function. To obtain maximum benefit, however, the connecting leads to C1 should be kept as short as possible.

Inter-stage Coupling

When considering the application of pi-networks to amateur transmitter design, it should be remembered that the value of such circuits is not restricted to the output stage. They may also be used with advantage in the frequency multiplying circuits to reduce harmonic radiation from these stages and to reduce the transference of undesirable harmonics to the grid circuit of the P.A. stage. A suitable arrangement is shown in Fig. 3. For a limited tuning range, as is normally the case in an amateur-band transmitter, only C1 need be

variable, with C2 either a fixed or pre-set type.

Under certain conditions the network may be used as a broad-band coupling circuit. This application has been fully described by Sandeman (2) in a series of articles which cover many other broad-band coupling arrangements. In practice, however, the amateur will find that it is not possible to realise low enough values of C1 and C2, except on the lower frequency bands, since the valve capacities necessarily associated with the circuit will usually prove excessive when attempts are made to use this arrangement on the higher frequency bands.

A Multi-Band Tuner

An adaption of the pi-coupling network to a multi-band tank circuit which will tune continuously from 3.5 to 30 Mc/s. has been successfully used at G2HDU in connection with the push-button exciter described recently in the BULLETIN.(3) This arrangement is shown in Fig. 4. The values of the inductances and condensers

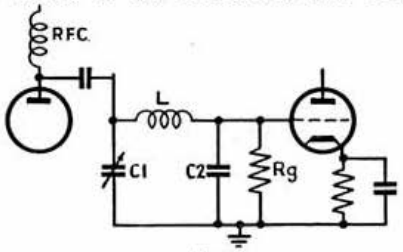

Fig. 3.

The network used for inter-stage coupling in a transmitter. This arrangement will reduce the amplitude of unwanted harmonics.

specified are designed for use with a pair of 807 valves in parallel, but will probably prove suitable for other types of P.A. valves. With this circuit, two separate output terminals are required, one for the 3.5 and 7 Mc/s. bands and the other for the 14, 21 and 28 Mc/s. bands. On the two lower frequency bands, C1 is set to maximum, tuning being carried out with C2, and aerial loading with C3. As with other types of multi-band circuits, the small inductance L1 has little effect at the lower frequencies. On the higher frequency bands, however, L1 becomes the tuning inductance, with the larger coil, L2, acting as a R.F. choke. In this case, C1 acts as the tuning condenser, C2 as the variable loading condenser, while C3 has practically no effect on the tuning. To avoid magnetic coupling between the two coils, L1 and L2 are mounted at right angles to one another.

Tuning is carried out as with the normal Collins

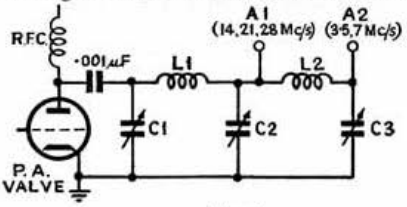

Fig. 4.

The multi-band tank circuit used at G2HDU to provide cutput over the entire range from 3.5 to 30 Mc/s. without switching or coil changing.

Values suitable for two 807 valves in parallel:
C1 100 μμF.
C2 400 μμF. variable. (The two-gang 200 μμF. type used in the T1154 transmitter can be used with the sections in parallel.)
C3 1,000 μμF. variable. (Standard two-gang 500 μμF. broadcast type can be used with the sections in parallel.)
L1 7 turns, 2" diameter, 2" winding length, 14 S.W.G.
L2 15 turns, 2" diameter, 3" winding length, 14 S.W.G.

coupler. The aerial-loading condenser (either C3 or C2 according to the band) is set at maximum capacity and the tuning condenser (C1 or C2) adjusted until the usual anode-current dip is obtained. The capacity of the aerial loading condenser is reduced slightly, and the tuning condenser re-adjusted for dip which should be slightly less pronounced than at the previous setting. This process is repeated until the P.A. stage is loaded to the correct amount, or alternatively, until the aerial ammeter shows a maximum reading.

The harmonic output of this tank circuit is particularly low provided that the earthy sides of all three variable condensers are returned directly to the valve cathode using the shortest possible leads.

Artificial Quarter-Wave Line

An interesting effect occurs when all three reactances in the pi-network (Fig. 1) are made equal at the operating frequency (*i.e.* $X_L = X_{C1} - X_{C2}$). Under this condition the network acts as a quarter-wave line of impedance numerically equal to X_L, and may be used to replace a normal quarter-wave line. For some applications, it has the advantage of being much more compact than the normal line and is well worth considering where a quarter-wave line is required for matching purposes, or where it is necessary to introduce a 90 degree phase-shift as, for example, where the radiation pattern of an aerial array is to be changed.

References

(1) TERMAN, *Radio Engineers' Handbook*, p. 632.
(2) SANDEMAN, *Wireless Engineer*, September, October, November and December, 1941.
(3) CRAGG, *R.S.G.B. Bulletin*, March, 1951.

Amateur Television

AS the result of a request made by the Society for the release of additional channels for Amateur Television, the Post Office have agreed to allow frequencies within the 1215-1300 Mc/s. amateur band to be used for this purpose. The Post Office have decided, however (presumably as a precautionary measure), to impose a guard band of 10 Mc/s. at each end of the band, which means that emissions must be confined to the band 1225-1290 Mc/s. The maximum power allowed will be 150 watts D.C. input to the last stage.

The release of this band for television transmission is strictly on a basis of non-interference with other services, notwithstanding the fact that the Atlantic City Regulations assign the 1215-1300 Mc/s. band exclusively to amateurs on a world-wide basis.

The Helping Hand

PRIOR to the 1939-45 war the Society published a series of articles under the above general title. Later on, the articles were brought together in a Society publication entitled *The Helping Hand to Amateur Radio.*

The need for a modern version of *The Helping Hand* has been apparent for some time, particularly in view of the large number of newcomers to Amateur Radio who aspire to a licence and who require guidance on points of basic importance.

With this in mind the Editor will be pleased to hear from any qualified member who is prepared to contribute a series of articles (each of about 2,000 words) designed to assist the beginner. Each article, whilst complete in itself, should be capable of being included, if thought desirable, in a future Society publication. The copyright of each article will be purchased by the Society at the standard rate of £2 2s. per 1,000 words.

A SIMPLE OHM-METER UNIT

By G. BRIDDON (BRS4427)*

THE ohm-meter unit described in this article was designed to provide, as simply as possible, a means of measuring all resistance values normally encountered in Amateur Radio. It was intended to be attached temporarily to a meter too valuable to be monopolised for the one purpose, but it could, of course, be used with its own meter or incorporated as the "ohm-meter" side of a general-purpose testmeter.

Design

Two alternative circuit arrangements are shown, in Fig. 1. As the component values depend entirely on the resistance and full-scale current of the meter used, they have been given in terms of these two factors so that numerical values can readily be calculated to suit any particular meter.

Figure 1 (a). On the "high" resistance range the test terminals are connected in series with a battery and limiter resistance and the meter terminals. The zero-adjuster is connected in parallel with the meter and operates on all ranges. The "medium" range is covered by switching a shunt across the meter so that only one-hundredth of the total current passes through the meter, and by reducing the limiter resistance proportionately; in this way the resistance values covered are one-hundredth of those covered on the "high" range. Similarly, on the "low" range the limiter resistance is reduced to one ten-thousandth of its original value and the meter shunted so as to pass only one ten-thousandth of the total current.

The main advantage of this arrangement is that readings for all ranges can be taken from one scale. Thus, if the scale is calibrated on "medium" range, "high" and "low" range readings are obtained by multiplying or dividing the scale reading by 100. The disadvantages of the circuit are two-fold. Firstly the meter shunt on the "low" range has a very low resistance and may be difficult to manufacture accurately; secondly, the battery may, on the "low" range, have to supply a very large current (approaching ten thousand times the full scale current of the meter itself). Such a battery may be inconveniently bulky.

Figure 1 (b). This arrangement overcomes the two difficulties just mentioned. The "high" and "medium" ranges are similar to the previous circuit but on the "low" range the same ("one-hundredth") shunt and limiter resistance are used as on the "medium" range, and the test terminals are connected in *parallel* with the meter. Thus a meter shunt of extremely low value is avoided and no excessive current is demanded from the battery. The disadvantage of this arrangement, apart from the more complicated switching required, is that a separate scale has to be provided on the "low" range since (i) the scale on that range runs "in reverse" from the "high" and "medium" scales, and (ii) the coverage on the "low" range is determined entirely by the resistance of the meter and usually bears no relation to the coverage on the other ranges.

As an example of the kind of results to be expected, let us assume that it is proposed to use a 250-μA. meter of 500 ohms resistance to give resistance readings up to at least 1 megohm. The

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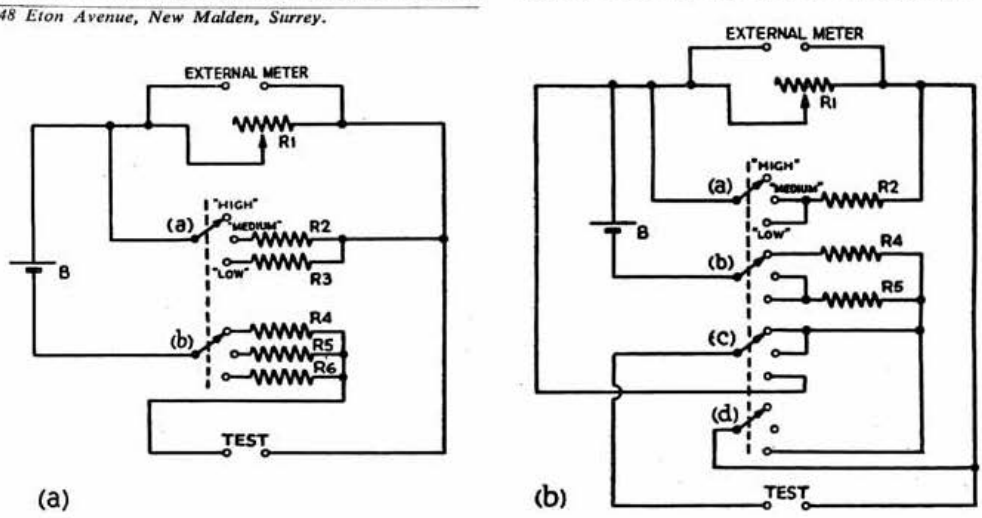


Fig. 1. Alternative Circuit Diagrams of the Unit.

If it is assumed that the highest resistance value to be measured is R*h* megohms, and that the meter has a full-scale current of I*m* μA., and a resistance of R*m* ohms, then the required component values are given by:—

$$B = \frac{Im\ Rh}{100} \text{ volts (the nearest practical value should be chosen)}$$

$$R1 = 100\ Rm \text{ ohms} \qquad R3 = \frac{Rm}{9{,}999} \text{ ohms} \qquad R5 = \frac{R4}{100} \text{ ohms}$$

$$R2 = \frac{Rm}{99} \text{ ohms} \qquad R4 = \frac{900{,}000\ B}{Im} - Rm \text{ ohms (approx.)} \qquad R6 = \frac{R4}{10{,}000} \text{ ohms}$$

battery voltage needed works out at 2.5 V.; let us take 3 V. as a more practical figure. Then if Fig. 1 (b) is adopted a meter shunt of 500/99 ohms and limiter resistances of (say) 10,500 ohms and 105 ohms will be needed. The ranges covered will be roughly 100 ohms to 1 megohm ("high"), 1 ohm to 10,000 ohms ("medium") and 0.05 ohm to 500 ohms ("low"). If Fig. 1 (a) is adopted (and this will require a 3 V. battery capable of giving 2.5 A.) an additional meter shunt of 500/9,999 ohms and a limiter resistance of 1.05 ohms will be needed and the "low" range will run from about 0.01 ohm to 100 ohms. (It is assumed for these calculations that the maximum and minimum resistances which can be read on any range are respectively 100 times, and 1/100 of, the mid-scale reading. This is true for a clearly-calibrated meter scale of, say 4 in. or more in length. An appropriate allowance may have to be made if the meter scale is appreciably shorter than this, or is not too clearly calibrated).

Construction

The construction of such a simple unit should present no difficulties but a few practical points will repay attention. The connections to the test resistance and to the meter *must* make good low resistance contacts. Switch wafer (a) and, in Fig. 1 (b), wafer (c), must also be above reproach in this respect. The zero-adjuster should be a logarithmic potentiometer or it may not give satisfactory control on the "low" range. In the case of Fig. 1 (a) the battery must be of adequate size to withstand the very heavy current drain on the low range. With the circuit values given, the zero-adjuster will cease to function when the battery voltage drops to about 0.9 of its nominal voltage, and the battery, though still useful for other purposes, will then have to be replaced. This serves as an additional safeguard against errors due to momentary fluctuations which often occur in the current given by a battery which has passed its prime, especially when the current drain is heavy.

Calibration

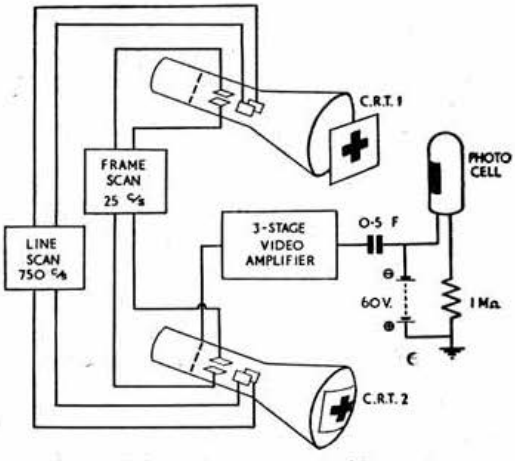
It is a matter of personal choice whether an "ohms" scale is inserted on the face of the meter itself or whether a calibration curve or conversion table is compiled. With Fig. 1 (a) only one scale is necessary (provided that the 100 to 1 ratio between the limiter resistances for adjacent ranges has been accurately maintained) and, as already mentioned, this is most conveniently calibrated for the "medium" range. With Fig. 1 (b) one scale is necessary for the "high" and "medium" ranges, and another, reverse-reading scale, for the "low" range.

If the values of the limiter resistances and of the meter resistance are accurately known, the scales can be calibrated from simple Ohm's law calculations. Otherwise calibration is best carried out by comparison against another instrument, preferably of the bridge type.

AMATEUR TELEVISION

A SIMPLE system of flying-spot amateur television, which will enable transparencies, such as lantern slides, photographic negatives or stencils, to be televised in closed circuit, is described by J. W. Salie (PA0SC), in the April issue of *Electron*, official organ of V.E.R.O.N. The circuit comprises two electrostatic cathode-ray tubes, which are scanned in synchronism by a common time-base circuit, saw tooth frequencies being 750 and 25 cycles per second for line and frame respectively (*i.e.* a 30-line picture).

War surplus green-trace tubes, such as the VCR 91, can be used, but the rather long persistence of the phosphor may limit horizontal definition. It has been found that a blue fluorescent screen will give better results when used in the C.R.T.1 position (Fig. 1.). A photo-electric cell (the types quoted are *Philips Photocel* 3530, or *Photomultiplier* 931a) is placed so that it faces the raster of one of the tubes, the "camera," and the output from the cell is developed across a one megohm resistor and applied to the grid of the other tube, the "monitor," *via* a 3-stage video amplifier, as shown in the diagram.



Simple flying-spot amateur television system.

A photographic negative or transparency placed in front of the "camera" raster (C.R.T.1) will modulate the brilliance of the scanning spot in accordance with the density and shading of the transparency detail, thus producing a video waveform from the photo cell, which, amplified, will in turn modulate the monitor tube (C.R.T.2).

Turning a negative into a positive picture is, of course, a simple matter of phase reversal, and either the grid or cathode of the monitor tube may be driven, depending on the picture polarity required. The time-base circuit for both line and frame consists of two EF50 valves in a transitron paraphase arrangement, providing a sweep voltage of about 700 V. between deflector plates.

The system, although simple, forms an interesting basis for further experiment.

THE MOVING-COIL SPEAKER AS MICROPHONE

By ERIC JOHNSON (G2HR)*

FOR some time past the writer has used a small moving-coil speaker as a microphone for "Top Band" work. Various types have been tried, ranging from the miniature "tweeter" to large 10 in. models. Although a miniature speaker is probably better for DX work by virtue of its increased "top" response, most amateurs will prefer to sacrifice this advantage in favour of something better than "communications" quality on 1.8 Mc/s. It has been found that a good balance is obtained with a 5 in. model.

Frequency Response

Perfect reproduction of speech requires a frequency response ranging from about 100 c/s. to at least 10,000 c/s. It is a fact, however, that little will be lost if frequencies under 200 c/s. are suppressed. Most of the "boominess" associated with moving-coil microphones lies within this

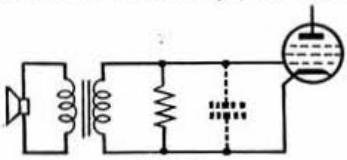


Fig. 1.
Showing damping resistor which also "swamps" the reactance of the inter-electrode capacitance.

range. Intelligibility is conveyed rather by the upper frequencies. Here we may find ourselves in a dilemma. In these days of crowded bands a wide response means excessive side-band interference. At a risk of starting a controversy, however, the writer is of the opinion that more latitude may be permitted on "Top Band" which, after all, is primarily used for local "rag-chewing."

Clear-cut speech requires full reproduction of sibilants, the spectrum of which, in the main, lies above 3,000 c/s. It is perhaps not generally appreciated, however, that "top" response is equally important for the natural rendering of the "explosive" consonants such as "P," "B" and "T." These consonants form a steep wave-front and are very rich in the higher harmonics; in other words, the microphone and amplifier must be reasonably good on transient response.

The Loudspeaker

There is not much one can do about the speaker itself; it will either be good as a microphone or definitely "out!". Unless one has considerable mechanical ability it is best left alone. Diaphragm doping and rewinding of the speech-coil are apt to land one in deep water, and it is preferable to admit that the manufacturer knows best—even although the speaker is to be used for a different purpose.

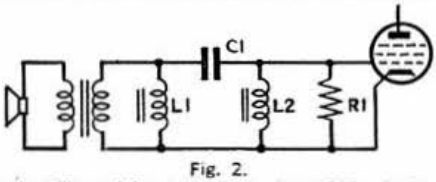


Fig. 2.
Pi-section filter giving cut-off at about 200 c/s. L1 and L2 8 Henrys each, R1 10,000 ohms, C1 .04 μF.

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Coupling to Amplifier

Generally speaking, the existing speaker transformer is suitable for coupling to the first stage. It should be remembered, however, that it is probably designed to work into a load of several thousand ohms, which is very much less than the input resistance of the first stage. The transformer secondary should therefore be loaded with a resistance of the order of the normal working load. At first sight this would appear to be throwing away gain unnecessarily. The resistance, however, has a two-fold effect. By swamping the reactance of the inter-electrode capacitance—which could be low enough to be important at the higher frequencies—"top" response is maintained. Secondly, the speaker is now electrically damped which, as is well known, improves transient response (see Fig. 1).

Bass Cut

As pointed out earlier, frequencies under 200 c/s. contribute little to intelligibility. True, bass suppression will, in a measure, destroy the "roundness" in speech, but this loss will probably be unnoticeable unless one is acquainted with the normal speaking voice. Conventional means of tone-control for cutting the lower frequencies are helpful but inevitably cause a loss in the middle

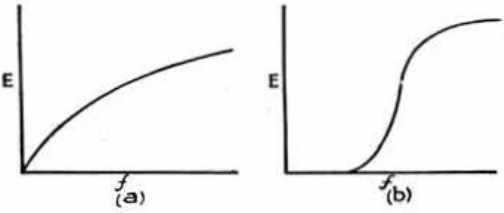

Fig. 3.
(a) Response curve of typical R-C filter showing gradual "tailing-off."
(b) Response curve of Pi-section high-pass filter showing sharp cut-off at a predetermined frequency.

register. As an example, a drastic reduction in grid-coupling capacitors is a palliative, but suffers from the defect that the distinction between bass and middle-cut is not sufficiently sharply discriminative. The obvious solution is to arrange for a sharp cut-off at a pre-determined frequency.

High-Pass Filter or Pi-Section

A solution to the problem lies in the use of a high-pass filter between the speaker secondary and the input to the first stage. Such a filter can either be an *L* or Pi-Section, the latter being preferred as giving a sharper cut-off.

The design does not present much difficulty, and depends on the following two formulæ, where *f* is the cut-off frequency in c/s., *C* is the capacity in μF., *L* the inductance in henrys, and *R* the load resistance in ohms:

$$(1)\quad f = 10^6/4\pi RC$$

$$(2)\quad f = R/2\pi L$$

If it is decided to make the cut-off frequency 200 c/s., the required capacity is very nearly .04 μF., and the inductance 8 henrys with a load resistance of 10,000 ohms, as shown in Fig. 2. The comparatively low grid resistor, coupled with the insertion-loss of the filter, will inevitably cut down the gain, and it may be necessary to use another stage of speech amplification. In the writer's case adequate amplification is obtained by employing a 6AC7 in one stage only. It has been found desirable, in the interests of maximum gain, to control the bias from the panel by means of a variable cathode resistor. With very high gain valves this adjustment has been found to be critical.

Response Curves

As previously pointed out, the use of so-called tone-controls of the conventional R-C and R-L types are not sufficiently discriminating. Fig. 3 shows the theoretical response curves of an R-C filter and a Pi-section. The advantage of the latter is obvious.

Negative Feed-back

The use of negative feed-back, with its many undeniable advantages, is a vexed point in any circuit using methods of tone-compensation. For communications work the average amateur tolerates a far higher degree of harmonic distortion than would be admissible in broadcast reception. Remember that negative feed-back levels out overall response, and it is open to argument whether it is preferable to suffer a little extra distortion—which on the amateur bands would probably go unnoticed—or widen the response, which we have gone to some pains to restrict.

A certain amount of feed-back is useful with a Pi-section filter, as, if it is properly designed, the cut-off will be quite sharp, and negative feed-back will not restore any frequencies which to all intents are gone! The gradual "tailing-off" response of a R-C filter will, however, undoubtedly be lifted and it is here where feed-back should be used with caution.

BANDSPREADING TO ORDER

*By R. M. McROBB, A.M.I.Mech.E. (G5LF)**

MOST radio amateurs approach the subject of bandspreading in a very haphazard manner. Whether it is for a receiver, a V.F.O. or a P.A. we usually say "a 15 $\mu\mu$F. variable will do" or something like that; if the condenser does not give enough or too much bandspread, we change it for another which is either larger or smaller. None will deny that this is a very unscientific method and that the guesswork involved is unworthy of Amateur Radio. Bearing that in mind, the writer decided to seek for a method which would eliminate guesswork, give a sure and certain answer and yet not be too mathematical or complicated for the average experimenter. A surprisingly easy method was evolved which gives the requisite answer accurately and with a minimum of calculation.

Fundamentals

It is first necessary to remember that for each and every frequency there is a constant which for the purposes of this description will be called K. This constant is peculiar in that if a circuit is tuned to a particular frequency the product of the inductance (in microhenrys) of the coil and the capacity (in micro-micro-farads) of the tuning condenser must equal the constant for that frequency. So long as the *circuit* remains tuned to that frequency, coils may be changed indefinitely (retuning with the condenser of course) and yet the product of the coil inductance (μH.) and condenser capacity ($\mu\mu$F.) always equals K for that frequency.

Example: The constant K for 7.0 Mc/s. is 516.944. Now supposing we have a coil 2 in. diameter and 2 in. long with 16 turns of 16 S.W.G. wire. From tables[1] this coil is known to have and inductance (L) of 9.12 μH. Then the amount of capacity required is:

$$\frac{K}{L} = \frac{516.944}{9.12} = 56.6\ \mu\mu\text{F. approx.}$$

As indicated above, any tuned circuit where the product of the inductance of the coil and the capacity of the condenser (using the proper units of course) equals 516.944 *must* be tuned to 7.0 Mc/s.

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Finding "K"

Now to describe how K may be obtained for any desired frequency. Radio text-books give a simple formula showing that for any given frequency f:

$$K = \frac{25{,}330.3}{f^2} \quad \text{(where } f \text{ is in Mc/s.)} \quad \text{or,}$$

$$K = \left(\frac{159{,}200}{f}\right)^2 \quad \text{(where } f \text{ is in kc/s.)}$$

For example, consider 7.0 Mc/s. again:

$$K = \frac{25{,}330.3}{7^2} \qquad \text{or } K = \left(\frac{159{,}200}{7000}\right)^2$$

$$K = \frac{25{,}330.3}{49} \qquad \text{or } K = (22.75)^2$$

$$K = 516.944.$$

This shows the alternative methods. Now the constant K for any given frequency is also equal to $L(\mu\text{H.}) \times C(\mu\mu\text{F.})$. The 7.0 Mc/s. example will again illustrate this point. Let us suppose that it is desired to tune to 7.0 Mc/s. with an actual capacity of 60 $\mu\mu$F. across the coil (including stray circuit and valve capacities).

Then:
$$L = \frac{K}{C} = \frac{516.944}{60} = 8.63\ \mu\text{H.}$$

A coil 1½ in. in diameter and 2 in. long with 20 turns of 20 S.W.G. wire has an inductance of 8.66 μH.[1]. Or, a coil is available 3 in. in diameter and 3 in. long with 12 turns of 14 S.W.G. wire. It has an inductance of 7.65 μH.[1].

Then
$$C = \frac{K}{L} = \frac{516.944}{7.65} = 67.77\ \mu\mu\text{F. } \textit{total} \text{ capacity across the coil.}$$

Bandspread

It is now possible to proceed with the bandspread calculations—which are quite simple. The method may be applied with equal facility to the fundamental frequency of a V.F.O., a doubler stage, a power amplifier and, last but not least, receivers. The 7.0 Mc/s. band will serve for a first example and the coil used in the first illustration with its parallel capacity of 56.6 $\mu\mu$F. will

be considered. The amount of bandspread required is 300 kc/s. (7 to 7.3 Mc/s.) and the data for the two frequencies are given below.

TABLE 1

	7.0 Mc/s.	7.3 Mc/s.
K	516.944	475.399
L	9.12 μH.	9.12 μH.
C	56.6 $\mu\mu$F.	52.1 $\mu\mu$F.

It should be noted that the controlling factor (if such it is called) in determining the capacities needed for bandspreading is the higher frequency limit of the range. The starting point, therefore, is 7.3 Mc/s. which, with the given coil, requires 52.1 $\mu\mu$F. of capacity to tune to resonance. Thus a variable condenser of 50 $\mu\mu$F. nominal capacity will be near full capacity (making allowance for valve and stray circuit capacity) when the circuit is tuned to 7.3 Mc/s. To tune to 7.0 Mc/s. an additional capacity of 4.5 $\mu\mu$F. is required. A miniature variable condenser of 5 $\mu\mu$F. maximum capacity will therefore spread the band over almost 180 degrees of the tuning scale.

An example for the 1.8 Mc/s. band is given below.

TABLE 2

	1715 kc/s.	2000 kc/s.
K	8,600	6,332.57
L	44 μH.	44 μH.
C	195 $\mu\mu$F.	144 $\mu\mu$F.

K is calculated as before. *L* is the inductance of a coil 3 in. in diameter and 4 in. long with 32 turns 18 S.W.G. wire.(1) *C* is obtained, of course, by dividing *K* for each frequency by 44 μH. In this case the bandset capacity, for 2000 kc/s., would be 150 $\mu\mu$F. and, to tune to 1715 kc/s., a bandspread condenser of 60 $\mu\mu$F. would spread the 285 kc/s. over almost 180 degrees of the tuning scale. This looks ridiculously easy—and actually is so. The principal points which must be remembered are: (1) the effect of valve and stray circuit capacities; and (2) the actual minimum capacities of bandspread condensers. The minimum capacity of a variable air spaced condenser is usually of the order of 10 per cent. of the maximum. This is why a 60 $\mu\mu$F. condenser was selected in the previous example.

Values of *K* for the frequency limits of the bands for which bandspread is likely to be required are given below.

TABLE 3

Mc/s.	K	Mc/s.	K
0.875	34,500	7.0	516.944
1.0	25,330.3	7.3	475.399
1.715	8,600	14.0	129.236
2.0	6,332.57	14.4	122.185
3.5	2,067.78	28.0	32.309
3.8	1,752.5	30.0	28.1448

The values of *K* were calculated using 7 figure logarithm tables except those for 0.875 Mc/s. and 3.8 Mc/s. which are slide-rule calculations.

(1) All coil details are taken from *Coil Inductance Tables* (compiled by the writer and published by Technical Inspection).

YOU'LL BE SORRY IF YOU MISS CONVENTION.

The Sun Shone

ONCE again National Field Day was blessed by perfect weather throughout the British Isles. Blue skies and warm sunshine coupled with reasonably good radio conditions contributed to an enjoyable and happy weekend for hundreds of members and their friends. Many high scores have been reported including one nearly four-figure total claimed by a prominent southern group who won the event a year or so ago.

Properly captioned photographs of *general interest* and brief technical descriptions of novel items of equipment used during N.F.D. will be welcomed by Headquarters.

The B.S.R.A. Exhibition

AT the 1951 private Exhibition of the British Sound Recording Association held last month at the Waldorf Hotel, London, twenty-two manufacturers displayed and demonstrated an impressive variety of disc, tape and film recording equipment and associated apparatus, including gramophone units, pick-ups, microphones and amplifiers. A special feature was an exhibition of home-constructed recording and audio equipment entered by members, in an amateur capacity, in competition for the President's Trophy and other prizes.

Simon Equipment, Ltd., displayed a large twin-channel monitoring system designed for continuous 24-hour operation and used for recording air-traffic control telephony at civil airports. The recording grooves, 120 on each side, are embossed on to a continuous 80-ft. loop of 35 mm. film, providing 8 hours continuous recording at one loading.

The Williamson amplifier was among many similar items shown by *Goodsell Ltd.*, while the *Acoustical Manufacturing Co.* exhibited their special Q.U.A.D. high-fidelity amplifier and corner ribbon loudspeaker. Portable tape recorders were shown by several firms, including *E.M.I.* and *M.S.S. Recording Co., Ltd. Wirek Electronics Ltd.*, displayed a battery-operated personal recorder of extremely compact design.

A programme of demonstrations took place in the Ballroom adjoining the main Exhibition Hall.

The Exhibition was opened by Sir Ian Fraser, C.B.E., M.P., after which the Association, which serves to unite professionals and amateurs interested in electro-acoustical engineering, held its A.G.M. and Annual Dinner.

London Members Luncheon Club

GUEST speaker at the May meeting was Mr. Schotten, an Austrian short wave listener who spoke of the difficulties which the amateurs of that country have to contend with at the present time.

Visitors to London are assured of a warm welcome at future meetings of the Club, which meets monthly at the Kingsley Hotel, Bloomsbury Way, London, W.C.1. The Club will next gather during Convention—Friday, June 22—when a very large attendance is expected.

Rubber Stamp of Emblem

NEW Members are reminded that a rubber stamp of the R.S.G.B. emblem, suitable for imprinting on to QSL cards and correspondence, is available from Headquarters, price 5s. 6d. post free.

By "DONEX"

In the Workshop

In this article, the third of the present series dealing with U.H.F. radiating systems, the dipole is introduced into the paraboloid reflector described last month. Avoiding the expensive complexities of wave-guide technique and plumbing, "Donex" describes the construction of small dipole-heads for microwave operation in a simple concise manner that will be appreciated by those who wish to experiment with paraboloid beams.

IN the construction of small dipole-heads at U.H.F., the question of linear dimensions assumes great importance, and work must be in no way slipshod. A compromise between size and rigidity is necessary. In view of the limited power that may be dissipated in the P.A. stage of the transmitter, every milliwatt of R.F. energy must be conserved for the radiating system by careful and efficient electrical means.

Construction

Fig. 1 illustrates the general details of a dipole-head for frequencies of 420 Mc/s. and higher. It will be seen that a primary requirement is a rigid mounting or "boom" for supporting the structure within the paraboloid. This may consist of a length of so-called ¼ in. gas piping (overall diameter about ½ in.), brass for preference. It is threaded ¼ in. gas thread for such a distance as will allow a plus or minus 1 in. adjustment to bring the dipole-head accurately to the focus of the paraboloid. The internal bore of the piping should take conveniently most varieties of smaller 70-ohm coaxial cables.

Dipole Mounting

The dipole is mounted in a box structure of polythene ¼ in. in thickness, which can, if necessary, be made up from three ¼ in. pieces cemented together with polythene cement, the holes being drilled or cut out before cementing.

Ideally, the boom of ¼ in. piping should be threaded in to the box, but a satisfactory alternative is to drill the hole in the box smaller than required, then file until the tube is a tight push-in fit. An application of polystyrene cement will make a tight joint.

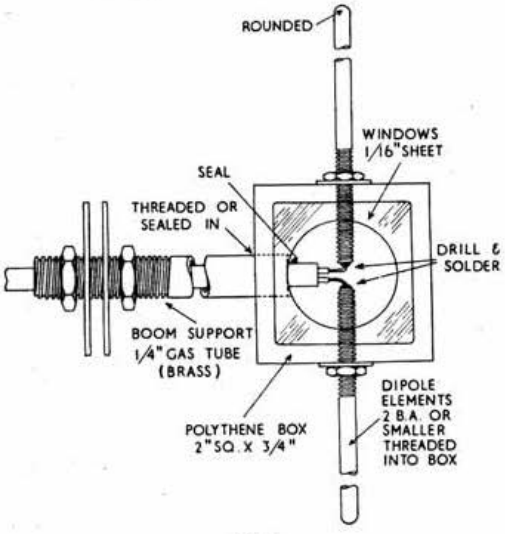


Fig. 1.
A dipole-head for a paraboloid as described in text.

The Dipole

The elements of the dipole may be made from 3/16 in. brass rod for the lower U.H.F. bands, and 1/8 in. for the higher. The rods should be threaded to give an adjustment of plus or minus 1 cm. when screwed into the box (as shown in Fig. 1), the opposite ends being rounded off smoothly. For convenience in making the preliminary adjustments to the desired frequency, nuts and washers may be used to connect the coaxial line to the rods, leaving the final soldering until later.

The rods are locked in position by nuts and washers, the joints being sealed against the ingress of moisture by applying a small amount of Bostic "C" beneath the washers before tightening-up the nuts. The box itself should be sealed by preparing two polythene "windows" which should be cemented over the hole at each side of the box. The necessity for care in carrying out this sealing cannot be too greatly stressed, because leakage losses due to moisture at these frequencies are serious, and detract from the already too small amount of R.F. available for radiation.

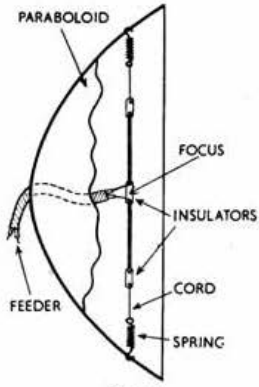


Fig. 2.
A simple dipole-paraboloid test rig.

Mounting

The dipole - head is mounted within the paraboloid by means of nuts and large washers with sufficient excess thread on the tube to provide one inch of adjustment either way. This process is applicable to both the wire - netting type of paraboloid built upon a wooden structure, and the "wire-wound" type having a metal disc at the centre, as described last month.

The exit of the coaxial cable from the tube into the box should be sealed with a liberal application of Bostic "C" or Chatterton's compound, and the exit of the actual wires from the cable itself should be coated with polythene cement.

This design can obviously be varied to suit requirements. The dimensions shown are tentative and may be scaled down for the higher frequency bands, but the same technique can be applied.

Simple Test Rig

As much work will be done in the shack when testing the whole arrangement, a simple and quickly made radiating system has been devised which will obviate making up the more elaborate assembly just described, and is particularly useful for 70 cm. operation.

Fig. 2 shows the construction. Using No. 14 S.W.G. bare copper wire, a dipole is cut to the

desired frequency as accurately as possible. The small insulators should be of polythene, or some other suitable material which may be to hand. Lengths of strong light cord are fastened to the insulators at the extremities of the dipole, and two short stiff springs are attached temporarily to the cords.

The whole assembly is mounted inside the paraboloid, at the point of focus, by hooking the springs to appropriate positions on a diameter, and then drawing the cords to a suitable tension, at the same time ensuring that the mid-point insulator of the dipole is centrally disposed. The coaxial cable may then be introduced through a hole in the centre of the paraboloid reflector, the conductors being soldered neatly to the dipole elements close to the centre insulator. The cable should be "tied-off" behind the paraboloid to avoid tension which might alter its position with respect to the focus. Adjustment of the dipole with respect to the focus may be made by hooking the springs on to different points of the paraboloid structure.

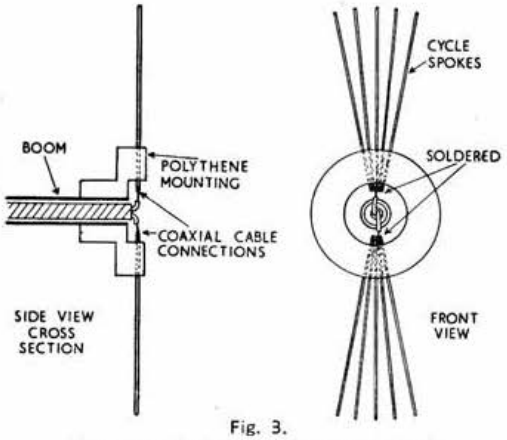


Fig. 3.
The cage-dipole applied to a paraboloid.

A Wide-band Dipole

The arrangement shown in Fig. 3 is quite well known on the lower frequency bands as a "cage-dipole," and illustrates how a single dipole-head may be adapted to provide a wider resonance band. Preliminary tests have shown that this feature is extremely useful at U.H.F., and for some reason loads the P.A. much more readily and effectively. The general construction is apparent from the sketch, and the dimensions can be adjusted as required to meet the frequencies to be used. As in the previous design, the boom supporting the head may consist of 1/4 in. gas piping, and should be screwed into (or drive-fitted to) the head mounting, which should be of polythene or other convenient insulating material with a low power factor.

The drawing shows the head mounting as turned in a lathe, but the circular shape is not essential, and many alternative forms are possible. Cycle spokes make excellent dipole elements, being stiff and straight and nickel-plated. Some care is needed when drilling the holes for the elements: they need not be tapped, but should permit a tight push-fit for the spokes, which can then be sealed in, after final adjustment, with polystyrene cement.

The spokes should be joined and soldered together at the inner ends, and connected to the coaxial cable as before. Finally, a cover plate may be fitted to seal the cavity against moisture.

R.S.G.B. Amateur Radio Call Book

THE first edition of the *R.S.G.B. Amateur Radio Call Book*, about which an announcement appeared last month, will close for press on June 30th, 1951. This means that no guarantee can be given that entries which reach the Call Book Editor after that date will appear in the first edition although every effort will be made to include changes of address received up to a date very shortly before publication.

In response to many enquiries it is planned to include in the First Edition a list of EI callsigns but it will not be possible to publish the names and addresses of B.R.S. and Associate Members.

As some members seem to be under the impression that the *R.S.G.B. Amateur Radio Call Book* is being restricted to details of R.S.G.B. members only, it is necessary again to emphasise that the publishers are anxious to include details of *every* licensed Amateur Radio station situated in the British Isles. At this stage, however, the inclusion of British Empire calls—a number of which have been received—is not contemplated, although it may be possible to publish them in future editions.

The Call Book Editor (Mr. J. P. P. Tyndall G2QI) wishes to thank the many members who have offered him both assistance and good wishes for the success of the project. He is also grateful to those public-spirited members who sent long and comprehensive lists of local members who hold a licence.

The address of the Call Book Editor is 174 The Drive, Ilford, Essex.

Morse Improvement Transmissions

BEGINNING Sunday, July 1, Morse Improvement transmissions will be radiated from G5XB (Reading) as follows:—

09.30-10.00 B.S.T.	Sundays	1950 kc/s.
23.00-23.30 B.S.T.	Fridays	1742 kc/s.

The transmissions will start at 15 w.p.m. with the call, "CQ CQ CQ RSGB MORSE IMPROVEMENT TRANSMISSION DE G5XB G5XB G5XB" repeated three times and followed by "FIFTEEN WORDS PER MINUTE FOLLOWS," The text, taken from recent issues of the BULLETIN, will occupy 7 to 10 minutes. The procedure will be repeated at speeds of 20 and 25 words per minute. Transmissions will end with the identification and call sign sent at 15 w.p.m.

It is hoped that these transmissions, which will be continued experimentally for three months, will provide useful practice for members who wish to improve their copying speed.

Reports will be welcomed by the originator, Mr. S. Cook, G5XB, at "Burghfield," Wood Lane, Sonning Common, near Reading, Berks.

Push-Button Tuning Units

APROPOS the paragraph published in our last issue, Mr. C. W. Cragg, G2HDU, reports that suitable push-button tuning units can be obtained from *Clydesdale Supply Co.*, 2 Bridge Street, Glasgow, C.5; *H. Brown*, 100 Cleveland Street, Doncaster; *H. L. Smith and Co.*, 287 Edgware Road, London, W.2 and *Western Products, Ltd.*, 71 Great George Street, Liverpool, 1. Mr. Cragg thanks all who responded to his request for information.

The R.A.F. description of the complete unit is "Controller Electric Type 1A, Ref. No. 10J/7."

Amateur Radio at the Festival of Britain Land Travelling Exhibition

GB3FB in operation at the City Hall, Manchester. More than 300 contacts were established in spite of intense local electrical noise.

ALTHOUGH much has been said in the Press and on the radio about the eagerly awaited Festival of Britain, radio amateurs will feel a special pleasure at their participation in the festivities through the medium of the Amateur Radio Station at the Land Travelling Exhibition. The opportunity is here to view, to hear, and to contact GB3FB as the Exhibition visits the industrial centres of the Midlands.

The Exhibition was opened in Manchester on May 5 by the Lord Privy Seal (Rt. Hon. Mr. R. R. Stokes, M.P.), in the presence of the Mayors of several neighbouring towns. It remained open for three weeks, and will open again in Leeds on June 23. The responsibility for bringing the station into operation, and maintaining its efficiency during its stay in Manchester, was laid on the broad shoulders of Ian Auchterlonie, G6OM, who, overcoming many difficulties, had GB3FB on the air at the appointed time.

That Amateur Radio is of interest to a large section of the public was demonstrated by the constant crowd of spectators around the stand, and indeed, a local newspaper reported that the two displays of greatest interest were the mannequin parade and the amateur station! Had it been possible to devote a little more of the Exhibition Hall's ample space to the accommodation of GB3FB, an even better opportunity would have been afforded to view the equipment and QSL cards.

Welcome Co-operation

In the early stages, great credit must be given to the several firms who responded generously by providing at short notice equipment found to be necessary when the station came to be assembled. Among these were *Belling and Lee, Webb's Radio,* and *Salford Electrical Instruments.* The Festival authorities had arranged that the components, from various sources, should arrive during the week prior to the opening, so that last minute omissions had to be rectified quickly. Harry Whalley, G2HW, gave much time and valuable assistance during this initial period. Two days before the opening, G6OM was confronted with the news that the roof of the Hall was declared by the City Architect to be unsafe to support a 30 foot tower (with 10 and 20 metre beams provided by *Panda Radio*). It then became necessary to find a local contractor who would erect, at short notice, supports for three dipoles. When the 40 metre aerial was tested it was found that it would not load the transmitter. Inspection disclosed that a rigger had cut six feet of wire from one end of the dipole "to make it fit in better"!

The QRM Problem

Great difficulty was experienced by the operators from local electrical QRM, and replies known to be made from such places as PY, VP8, and the more distant parts of W, were often quite inaudible at GB3FB. The G.P.O. assisted in tracing the sources of interference, but they proved to be so numerous that the only adequate remedy would have been to close down the Exhibition and neighbouring activities! However, an encouraging start was made when W1ME provided the initial QSO, during the first few minutes. His QSL was received by air mail within five days. During the first ten days, 200 contacts with 20 countries were made, including several with the U.S.A., but there is no doubt that, given normal reception conditions, some enviable DX would have been possible, helped by the use of the Festival call sign.

The transmitters in use were a *Teleradio* "Ambassador," completely band-switched, and an MX 50 supplied by *Webb's Radio.* Receivers were an *Eddystone* 750 and a *Q-Max* Q5/10X. Among other equipment provided were an *E.M.I.* Absorption Wavemeter, and an oscilloscope by *Metropolitan-Vickers.*

Where is CQ?

The station was manned with enthusiasm by local amateurs, 35 of whom placed their names on G6OM's rota, at least one of them travelling from a distance of 40 miles. Many questions were asked by visitors, ranging from "Where is this station 'CQ' which I often hear being called on my set?" to those of a highly technical nature! Mention must be made of the excellent co-operation of Mr. Sharp, of *City Displays,* and of Messrs. Innes and Swain, of the Festival of Britain organisation.

G2WQ.

Worth having—one of the special QSL cards used to confirm QSOs with GB3FB.

SOUTH BANK EXHIBITION

A Radio Amateurs' Guide to the focal point of the Festival of Britain

IN 1947 His Majesty's Government decided that the centenary of the Great Exhibition of 1851 should be marked by means of national displays in the Arts, Architecture, Science, Technology and Industrial Design, so that Great Britain and the world could pause to review British contributions to world civilisation in the arts of peace.

To demonstrate these contributions made by British advances in Science and Technology it was necessary that they should be exhibited in practical and applied forms against a background representing the living, working world of today. To provide a setting for the presentation of this theme the South Bank Exhibition was conceived.

Measured in terms of acreage the South Bank site occupies much less space than many of the great Exhibitions of the past but its scope is immeasurably greater.

AMATEUR RADIO FESTIVAL PROGRAMME

The Land Travel Exhibition — **Call Sign GB3FB**

June 23–July 14: Leeds (Woodhouse Moor).
Aug. 4–Aug. 25: Birmingham (Bingley Hall, King Alfred's Place).
Sept. 15–Oct. 6: Nottingham (Broad Marsh).

Bristol — **Call Sign G6YA/A**

July 7–21: Memorial Ground.

Cardiff — **Call Sign GW3WIF**

July 4–18: Welsh Industries Fair.

Camberwell — **Call Sign G3ACC/A**

Aug. 26–Sept. 15: South London Art Gallery, Peckham Road, Camberwell, London, S.E.5.

Darlington — **Call Sign G3FYI/A**

June 10–July 10: South Park.

Portsmouth — **Call Sign G3DIT/A**

July 7–21: Portsmouth and Southsea Trades Fair and Exposition.

Uxbridge — **Call Sign G2FMF/A**

June 29–July 9: Uxbridge Industrial Exhibition.

During the next four months—and particularly during the next two weeks—many Provincial and overseas radio amateurs will be visiting London and will wish, during their short stay, to see as much of the South Bank Exhibition as possible. There is a danger, however, because of the vast number of aspects depicted, that they will leave without having seen the many items of radio interest.

In this article certain of these items are listed and an indication given as to where they may be found.

Transport and Communication Pavilion

The majority of the exhibits which are likely to interest radio amateurs are housed in the Transport and Communication Pavilion—a glass-fronted building facing the Dome of Discovery.

In the Transport section (first floor) is to be seen a demonstration of marine navigational radar using recorded signals from an actual London-Antwerp voyage *(Metrovic)*, a 100-watt marine transmitter for M.F. and H.F. Services *(Redifon)*, a specially prepared chart for use with the *Decca* Navigator system, of which examples of equipment in current use are shown, and several medium and short wave transmitters and receivers *(International Marine Radio)*.

In the Communication section a number of items of historic interest are displayed, including an early Wheatstone Morse Transmitter and Receiver and a Hughes Printing Telegraph (G.P.O.). In this same section will be found several examples of the latest types of teleprinters as well as a "Mufax" facsimile receiver used for receiving wired or radioed pictures up to 11 in. wide *(Muirhead)*. There is also a working demonstration of a picture telegraph receiver *(Muirhead)*.

Also in this section are displayed one of the original Fleming diodes (1904) and the triode designed by H. J. Round. There is also a large photograph of Mr. A. A. Campbell Swinton (First President of the Wireless Society of London), together with an enlargement of a page from "Nature" dated June 18, 1908. In that issue, Mr. Campbell Swinton predicted that "Distant Electric Vision" would be achieved with the aid of Kathode rays.

Numerous examples of early receivers, valves, microphones and headphones are shown in company with such modern equipment as an Eddystone 680 receiver *(Stratton)*, a BRT 400 *(G.E.C.)* receiver, and a number of V.H.F. transmitter-receivers.

The original 10 cm. cavity magnetron (1940) is exhibited alongside a model showing modern methods of magnetron construction *(G.E.C.)*. Wave guide assemblies *(Kelvin & Hughes)*, polythene cables and micro-wave components *(T.C. & M. Co.)* depict modern V.H.F. techniques, whilst an airborne "Gee" receiver *(Cossor Radar)* and an airborne Search Receiver *(E. K. Cole)* typify new developments in the radar field.

Instrument Landing equipment, Precision Approach equipment *(Standard)*, Harbour Control Radar and Radar Surveillance equipment, the latter providing control of aircraft up to a range of 50 miles *(Cossor)*, illustrate some of the important recent advances which have been made in achieving safety of life in the air.

Numerous items of V.H.F. and Television equipment are shown including a portable 6 channel V.H.F. transmitter/receiver *(A. T. & E. Co.)*, and the special hospital Television Camera equipment developed by *E.M.I.*

Sound reproduction enthusiasts will find much to interest them, including the original *H.M.V.* Gramophone Trade Mark Model (1898) and an original hand-turned gramophone. Modern methods of sound reproduction are represented by tape and disc recorders of various types and by examples of gramophone equipment.

B.B.C. exhibits include several models of projected developments.

Dome of Discovery

The top-most gallery in the Dome houses the section known as "Outer Space" and "The Ionosphere." It is here that the visitor is shown, by means of a working model, how radio waves are reflected by the Appleton and Heaviside layers. Also in this section will be found an automatic ionospheric recorder covering the range 0 55 Mc/s. to 25 Mc/s. *(Union Radio)*.

Modern methods of obtaining weather information are represented in the Meteorological section (also in the top gallery) by a balloon-borne transmitter, giving continuous data of temperature,

humidity and pressure *(Whiteley Electrical)*, a radio-sonde ground station *(Salford Electrical)*, and a radio-sonde transponder *(Mullard)*.

A full size reproduction of the radio cabin of a modern polar expedition will be found in the Exploration section on the ground floor. The items of equipment shown are of an Admiralty pattern.

Advice to Visitors

The best times for visiting the South Bank Exhibition are before lunch and during the late evening. Organised parties of schoolchildren tend to make the going rather heavy between 12 noon and 6 p.m. The best *day* for a visit is Tuesday when admission is by ticket (price 10s.) obtainable in advance.

For Convention visitors staying at the Imperial Hotel, Russell Square, or other hotels in the same neighbourhood, the easiest route to the South Bank Exhibition is *via* the Kingsway Tram Subway from Bloomsbury. Book to the Bailey Bridge at Charing Cross and enter *via* the Embankment Gate.

Exhibition of Science

In addition to the South Bank Exhibition an Exhibition of Science is being held at South Kensington in connection with the Festival of Britain. This exhibition, housed in an annexe to the Science Museum in Exhibition Road, is most comprehensive.

The Science Museum can be reached by Piccadilly tube from Holborn, Leicester Square and Piccadilly. Book to South Kensington Station.

The special QSL card to be used by the Uxbridge and Hayes Group to confirm contacts with the Uxbridge Industrial Exhibition Station.

Welsh Industries Fair

The enthusiasm of Cardiff members organising the R.S.G.B. Amateur Radio stand at the Welsh Industries Fair greatly increased when they heard that the King and Queen had graciously consented to visit the Fair on July 18. High hopes are entertained that the R.S.G.B. stand will be inspected by Their Majesties during the visit.

An amateur-built transmitting station will be in operation on all bands, whilst Government surplus equipment of general and amateur interest will be demonstrated in operation. The South Wales Constructors' Competition will also yield some first-class equipment for exhibition.

All contacts made with the Exhibition station will be confirmed by a special QSL card of similar design to that used for GB3FB. These cards as well as the log book are being donated by Mr. Eric Martin, G6MN. The station—which will identify itself with the words " Here is the Welsh Industries Fair Amateur Radio Station "—will be controlled by Messrs. G. F. Wilson, GW3BZH, and S. Howell, GW5FN/A, who will have the assistance of other operators. The call sign will be GW3WIF.

Mr. Ian D. Auchterlonie, G6OM, who was in charge of the Amateur Radio Station whilst the Land Travelling Exhibition was in Manchester, thanks all who assisted with the erection and operation of the equipment.

Direction Finding Contest

THE first qualifying event of the 1951 programme was held in the High Wycombe area on Sunday, May 20, when no less than twenty-two teams, of which seven were successful, participated. Entrants had travelled from Birmingham, Rugby, Oxford, Reading, Luton, Southend and the Greater London area.

The transmitter was concealed in a thicket in King's Wood, Totteridge, only three-quarters of a mile from the starting point. It is significant that almost an hour and a half, including 18 minutes of transmission time, elapsed before the first competitor reached the transmitter and that, like most of the others who were successful, he approached the site from under a hedge rather than along the one and only footpath into the thicket!

After the event the company, nearly 80 strong, sat down to a most welcome meal at the Little Abbey Hotel, Great Missenden, when local prizes (available through the generosity of G4NT), were presented to the first three competitors and to the first lady to reach the transmitter.

The organiser (Mr. Peck) expressed his thanks to all but one person concerned in a very successful event. The omission—Mr. Peck himself—was made good by Mr. T. L. Herdman, G6HD, who thanked him on behalf of the Contests Committee for a job well done.

Arrival times of the successful entrants were:

1.	Mr. W. F. Holdaway, B.R.S.15208 (Chadwell Heath)	1521 (B.S.T.)
2.	Mr. R. K. Seabrook (Southend)	1537 B.S.T.
3.	Mr. P. V. W. Jude, B.R.S.9340 (Reading)	1538 B.S.T.
4.	Mr. H. R. Webb (Oxford)	1541 B.S.T.
5.	Mr. J. K. Finch, B.R.S.15688 (High Wycombe)	1541½ B.S.T.
6.	Mr. R. D. Charlton, G3CPC (Twickenham)	1549 B.S.T.
7.	Mr. J. Salter, G3DQC (High Wycombe)	1629 B.S.T.

Radio-Controlled Models at The Model Engineer Exhibition

RADIO-CONTROLLED model aircraft, ships and tanks will be the main feature of *The Model Engineer* Exhibition, 1951, to be held at the New Royal Horticultural Hall, Westminster, from August 22 to September 1. There will be demonstrations of a radio-controlled launch, a radio-controlled destroyer, a radio-controlled tank which fires small calibre shells from its guns, and (it is hoped) a radio-controlled airship and D.U.K.W.

Championship cups, Club Team cups, and silver and bronze medals will be awarded for prize-winning exhibits. Entry forms and rules may be obtained from The Manager, *The Model Engineer*, Exhibition Offices, 23 Great Queen Street, London, W.C.2; they must be completed and returned by Monday, July 16.

THE MONTH ON THE AIR

*By A. O. MILNE (G2MI)**

"Top Band" Retrospect

THE following notes have been compiled by VE1EA from his "Top Band" log during the 1950-51 season. From December 31 to March 11 he made contacts with Asia, HZ1KE; Africa, EK1AO; Europe, G3DIY, G3PU, G5JU, G5RI, G6BQ, G6GM, G8NF, GW3ZV and GW3FSP; and North America, KV4AA. He heard many other British stations between 1750 and 1800 kc/s, but most of them were too weak to identify. It was useless to look any higher than 1800 kc/s. because of telephony interference from amateurs in the United States. He considers that conditions for the season were generally poor and not to be compared with those of 1939.

Contacts were usually made between 0500 and 0630 G.M.T., North Africa being worked just before the first G's began to come through. The earliest EK1AO contact was made at 0311 on January 28, and the latest at 0530 on March 11. A number of British stations, including G2DPZ, G2PL, G5HB and G6QB, were heard but not worked. The loudest British signals were G6GM and GW3ZV, both at 579 C.W., '3ZV also being worked on 'phone at R5S5.

Notes and News

Please be patient when trying to work GB3FB—if the other locations are anything like Manchester, where the station was situated in the City Hall, a building chock-full of unsuppressed electrical equipment. Signals under S9 were virtually unreadable, and telephony contacts almost impossible.

There still seems to be no likelihood of British amateurs in the Suez Canal Zone being licensed. If only the Service authorities would show a little determination, we feel certain something *could* be done. We can't imagine American amateurs being kept off the air in similar circumstances!

BRS18980 reports M1B active again at 588 around 1900 G.M.T. LZ2RP is a new one, whilst PK4DA puts in a strong Super-modulated signal during the late afternoons. GC3HFE, with 8 watts input, already has 44 countries to his credit, in spite of the fact that his aerial is overtopped by numerous telephone wires. HE9LAA, FKS8 and SV0 are among his best so far.

Apologies to YI3BZL and YI3ECU: the former's DX score was inadvertently credited to the latter in the March issue. 'BZL says that dust storms, prevalent at this time of the year, completely blot out the bands, and that terrific QRM is the reason for several broken QSOs. G2DPY (Shoreham) demonstrates that 15 watts on 7 Mc/s. can still go places, examples from his log being ZD4AB, VP9AK, HK5CR and YK1AA. He has heard an Italian commercial station ID1GN which, apparently, pounces on the band from time to time and tries to work amateurs. Further contacts were with ZC4KN on 7035, and HZ1BJ, who gave his name as John.

Bob Pybus has had a card from VP2SE on St. Vincent: this station has not yet worked G. VS2DA/G2FRM hopes shortly to visit Car Nicobar Island. Full details of call sign, date and frequencies will be published as soon as they are known. G3BHQ (Chesterfield) has worked 103 countries, mostly on 7 Mc/s., including CM, IS1, PJ5, PY, VP9, VQ3, ZB2, ZL and ZS3. He has also heard FY7, HH, HK, KP4, KZ5, LU, TI, YK, ZD4, ZM6 and ZS. Warren Snyder, DL4FA—still trying for an F7 call—hopes to visit England this year. GM3CIX (Glasgow) has been one of those unfortunates who drift from one set of lodgings to another, but at last he has a permanent QTH. In spite of difficulties, he has managed to collect a B.E.R.T.A. and D.X.C.C. Certificate and to work 34 zones. He comments on the inability of some amateurs to copy the 6 w.p.m. slow Morse transmissions, and says the same individuals are noted for their blah, blah 'phone transmissions.

G2AVP, now active as VQ4CM, wishes to contact stations in Doncaster, Southport, Chelsfield (Kent) and Sunbury-on-Thames. It would seem that he has fallen on his feet, as his first list of DX includes HS1VR, FB8IZ, FG7XA, FP8BX, FR7ZA and VQ8CB—or has he just been working the locals? CR4AI on the small island of Sal in the Cape Verde group is on 14010 C.W., with an excellent signal. Ken Smethurst, G3GPE/MP4BAD, now resident in Oldham, Lancs, is to be married this month. Congrats., O.M.! He still has some MP4 cards, although QSLs have been sent out to everyone worked.

G6XS (Ashton-under-Lyne) has just collected his final card for E-DX; a feat accomplished with a single 807 P.A. He reports having heard XU6F on 14090 at 1730 G.M.T., who gave his QTH as near Canton. PK4DA on 14052 at 1540, and UN1AE on 14030 at 1650 are worth looking for. Alan Roocroft asks for information on CN2AA, active on 14 Mc/s. C.W., who comes in at 589 and gives his QTH as Tangier. BRS18017 gives the frequencies of VE8MB on Cornwallis Island as 14320 kc/s., and quotes UA9KKA as a good signal on 14030.

First Phone W.A.Z.

G8IG, who has just worked Zone 19, looks like being the first WAZ 'phone of all time, his contact being with UA0KMB, who has already QSL'd on C.W. G2FRY (Oldham) has added FP8BX and YI3ECU to his collection.

At the Hobbies Exhibition of the Bexley Rotary Club, the North Kent Radio Society staged an exhibition, pictured above, in which items of equipment (constructed by members), valves, components, and QSL cards were displayed. An Amateur Radio station, G3ENT/A, was operated, and many contacts made.

* *29 Kechill Gardens, Hayes, Bromley, Kent.*

W2GT states that the A.R.R.L. will not credit contacts for D.X.C.C. with AR, EP and EQ, FI, HS, J, OE, PJ or PK, because of a queer objection by the F.C.C. American amateurs are not allowed to work these prefixes, but may contact military personnel in Japan and Austria. This seems particularly hard on the Austrian amateurs, who would have been licensed long ago but for the stubbornness of one of the occupying powers. 'GT adds that VP5BH in the Cayman Islands works around 14050, but drifts badly. He understands that TI9GRC will soon be active on Cocos Island—some more good work on the part of the Guayaquil Amateur Radio Club, no doubt.

A1193 (Cambridge) says VQ4RF now has a beam on this country and is using Super-modulation, at the high end of 14. He mentions conditions on May 15, when Europeans were S9 plus on 14 Mc/s. EI9A and EI2S were both copied at S9-10. G3FMA, in his first report to this column, comments on the erratic conditions. On Sunday, May 13, for example, EAs, Is, DLs, etc., were S9, and amongst them all was PK3JF, whom he managed to work. He cites a new one on 14, EL1OA, who gives his QTH as c/o Firestone Rubber Co. Plantation, Harbel, Liberia. ZD1SW

Contests Diary

June 16-17	-	420 Mc/s. Tests.
July 8	-	144 Mc/s.—Field Day.
September 9	-	Low Power Field Day.
September 30	-	D/F Field Days—National Final.
October 6-7	-	Low Power (3.5 Mc/s.)
Nov. 10-11	-	"Top Band" (1.8 Mc/s.)
December 1-2		All European DX.
December 8-9		All European DX.

be in Zone 18. G3APZ gives some useful QRAs: FQ8AC—Box 175, Bangui, French Equatorial Africa; FP8BX—Paul Detchverry, Iles Saint Pierre et Miquilon, c/o P.T.T., *via* Canada; and MD2D, who says he is in Tripoli (Box 66). VQ8CB has been heard on 14020.

A1180 offers AR8AB, 14116 at 1850 G.M.T., and CT3AC, 14271 at 2120 G.M.T., both on 'phone. G3APX (Grimsby) gives ZD2TBS's QTH as Tom Bell, Anglo/Oriental Nigeria, Ltd.,

The operating position at VK5FL, well-known Australian DX station. An 813 in the final, modulated by push-pull 811s, delivers 100 watts to a 3-element rotary beam. Receivers are Eddystone 504 and 680. The owner and operator is Ross Harris here seen swinging a "bug" key.

—a very consistent signal—was also contacted. He says that W2UWC, who is maritime mobile, hopes to spend several weeks ashore in Goa, and will make every effort to come up with a CR8 call.

VP8AD is now LU8AAA in Buenos Aires. ZL1HY comments on ZD9AA's failure to work New Zealand. Along with several other ZLs, he copied ZD9 many times at S8, usually around 0715 N.Z.T. Signals came in over the long north-westerly path. On January 1, 1950, he heard him at 0745 N.Z.T. over the short route. He suggests that QRM was the main bugbear and asks ZD9AA, when he really gets going again, to try one or two early morning session around 0300-0700 G.M.T., just to give the ZLs a break.

G3AJP has just received cards from EQ3FM, FM7WE, FQ8AC, FF8AC and PJ5RE, and would welcome any available information on FO8MM. In answer to G3EFY's query, both he and G3BID have had a card from FD3RG. Noting the offer of a certificate for working twelve VK3s, he says he would like to get *one* VK3 card, let alone twelve! Be patient, O.M., they take about eighteen months to come through. BRS7594 also has FD3RG's card, and his list for the month includes CP3CB, 14360 at 0700; CP5EK, 14270, EQ2L, 14120 at 1815; HH2RP and VP1GM at 1700 on 14365 kc/s. He has his doubts about the VP. On 28 Mc/s. he has heard one of the Chilean pirates CE7ZN, as well as CR6CB, FF8PG, HH2W, TI2TY, VS9AA, VP3CW and ZD1SW.

G2HKU, continuing his good work on low power, now has a sizeable string of VKs to his credit, together with UA9KCC, who is thought to Bukuru, Nigeria. Some of his DX might be worth looking for, especially W7KWA in Reno, Nevada. CR7AF, VT1AC, VO6VB (at Goose Bay), and many others come from his log for the month.

GM3GDX draws attention to KG4AO, 14047 at 2150, and reminds us that this counts separately. He wonders who SU6XN on 14053 might be (QTH given as Cairo). G3BHQ, who seems to favour 7 Mc/s., has done so to good effect. FP8BX, VT1AC, as well as PY, CO and LX, go to prove it! He reports that VT1AC would like to contact Brighton, his home town.

G6QX confirms that 28 Mc/s. has shown some signs of life, but deprecates the tendency of the DL 'phones to come down into the C.W. band. He has worked VP8AI, who said best conditions there are in the spring—which is our autumn. He mentions one type who, when unable to QSO KL7PI, held his key down on the frequency in an attempt to stop his own contact! Shades of the "Ham Spirit!"

Who's Who and Where

G2HKG used to keep a regular schedule with GM3EYP in Dundee on 7 Mc/s. This suddenly ceased. Then, shortly after midnight on April 6, he heard and answered a CQ de VP8AP on that band. Imagine his surprise when '8AP started asking him how his 1155 was going on, etc. Yes, it was GM3EYP at the key! VP8AP uses two 813s in the final, but at the time of writing is temporarily off the air due to trouble with his Diesel engine. Incidentally, G2HKG has worked VK3APV twice when that station was using only 5 watts and a rhombic.

"Butch" Orrell, ex-MT2E, will not, after all, be operating from Aden. He has been posted to Kamaran Island in the Red Sea, where he hopes to operate as VS9AO/K. KZ5IP is now back in the U.S.A. as W8BQV, and will QSL all outstanding QSOs.

N.Z.A.R.T.

The New Zealand Association of Radio Transmitters is celebrating its Silver Jubilee this month with a Convention in Auckland. Hearty congratulations to our sister society on the other side of the world.

The Pacific Islands

ZM6AK states that at the present time there are only three amateurs in Western Samoa: ZM6AA (14310 kc/s.) exclusively on 'phone, whose first, second and third British Isles contacts were G2AJ, G2MI and GM3DHD; ZM6AR—a new arrival, and ZM6AK—both on C.W. 'AK, who is ex-ZL1FT and still holds that call, says that Great Britain is extremely hard to contact. Other South Seas news comes from Eric Trebilcock, BERS195: VR1G, 14 Mc/s. at 1230 G.M.T. is on British Canton Island; VR5GA, 14 Mc/s. 'phone, 0600 G.M.T.; VR2CG, 7 Mc/s. C.W., 0730 G.M.T.; KW6AR, 14 Mc/s. C.W., 0700 G.M.T.; ZK1AB, 14 Mc/s. C.W., 0900 GM.T.; and KB6AQ, on American Canton Island, are a few worth looking for. FK8AI, C.W., FK8AB, C.W., and ZK1BA, 'phone, 7 Mc/s., 0900 G.M.T.; KR6DN, 14 Mc/s. C.W., 1200 G.M.T.; and FO8AB on 28 Mc/s. 'phone are also good. ZK1BC and ZK1AB are in Raratonga. ZK2AA is on Niue and ZK1AA on Aitutaki. VR1A is in the Gilbert Islands, VR5PL on Tonga, and FO8AC in Tahiti. QRM from W's is one of the big problems in these areas. ZK2AB was on leave during May, so that seems to dispose of the S9 ZK2AB heard in Britain around 1700 B.S.T. who said he was using 0.5 watt!

Amateur Radio in Parliament

Congratulations to Allen Fairhall, VK2KB, on his recent re-election to the Australian Federal Parliament.

Tailpiece

Our apologies to anyone whose notes arrived too late for inclusion, but you were warned! 73.

(Continued from next column)

use the 7, 14 and 28 Mc/s. bands. Maximum power is 100 watts.

Wiring up the transmitter and equipment racks in **MARS** H.Q., Pentagon Building, Washington D.C., required the identification and connection of 287 pairs for each station—not counting aerial and power cables. . . . **Royal amateur HZ1TA** (H.R.H. Prince Talal al Saud) of Saudi Arabia has enrolled as a Corporate Overseas Member of the R.S.G.B. Another Prince on the air is AC3PT. . . . To save cobalt, which is a strategic defence material used in focus-magnets, RCA have introduced a new type of television picture tube with electrostatic focusing. . . . Allocation of **U.H.F. channels for television** is under consideration by the F.C.C. It is anticipated that microwave 'vision services will be in operation by late 1952. . . . Several requests from members for the syllabus of the **G.P.O. Amateurs' Examination** (written paper) prompt the reminder that full details appear in the booklet "The Transmitting Licence.". . . A reader suggests a suitable signing-off tune for musically-minded amateurs—"I'll CQ in my Dreams."!

QUA

A "SPACE-SHIP" where, looking out at the planets of the solar system, the mixed hum of terrestrial broadcast transmissions can be heard, is one of the special features of the **B.B.C. Festival of Britain Exhibition,** open from 11 a.m. to 10 p.m. each weekday until September 30 at 201-202 Piccadilly, W.1 (admission 1s.). A selection of the latest TV, radio and recording equipment is on show, including a live television camera which enables visitors to "see themselves as others see them," on monitor screens.

For the mathematically minded—a display showing the experimental determination of e/m, where e is the charge on an electron, and m its mass, is one of the exhibits in the **Dome of Discovery** at the Festival of Britain South Bank Exhibition. Comprising a cathode-ray tube with suitable deflection components, the apparatus is intended to illustrate the work of Professor J. J. Thompson.

G2DHV reports that the **British Two Call Club** has a membership of 90 and several meetings have been arranged during the Festival of Britain for members' ragchews. The club is open to all ex-overseas amateurs who have held two or more amateur calls.

Mr. F. A. Herridge, BRS 12474, states that **"Ham's Interpreter"** (referred to in the March issue), may be obtained direct from the author, OH2SQ (Mr. Pentti Aarnio, Tapiolantie 21, Helsinki, Finland), by sending him six International Reply Coupons.

More about the **St. John Ambulance Brigade. . . .** BRS 12240 took his first Ambulance examination with the High Wycombe Division in 1932, has been with that Division ever since, and is now Divisional Superintendent. G5PY was a member for several years during the war. G3CU is still an active member with 15 years service, not an ex-member as stated here last month.

A receiving aerial array 200 feet in diameter is in use at Jodrell Bank, near Manchester, for the detection of radio "noise" emanating from outer space. Above the general background hiss, the positions of several point sources (some of constant intensity, others fluctuating rapidly), have been determined with considerable accuracy. One of these, the Nebula in Andromeda, 750,000 light years distant, is the point of origin of radio noise comparable in intensity with that emitted by our own sun. But many point sources occur in blank areas of space where there are no stars or nebulæ to generate random electromagnetic waves. Writing in the **Radar Bulletin,** Arthur C. Clarke, B.Sc., F.R.A.S., television lecturer on rocket propulsion and allied subjects, suggests that these point sources may in fact be **radio stars,** emitting little or no energy in the visible spectrum, but generating powerful radiation in the metre and centimetre wavelengths. If our own sun had been such a star, radio communication could never have developed on earth, since all signals would have been completely swamped by this background of interference. The majority of radio noise signals picked up at Jodrell Bank started on their journey long before any form of intelligent life existed on this planet.

In Denmark, new licensees are only permitted to work on 3.5-3.6 Mc/s. (C.W.); 3.6-3.94 Mc/s. ('phone). Approved amateurs, after having acquired the necessary technical standard, are permitted to

(Continued in previous column)

U.S. MILITARY AMATEUR RADIO SYSTEM

THE Military Amateur Radio System headquarters network control system, in the Pentagon Building, Washington, D.C., was opened recently in the presence of high-ranking civilian and Service personalities.

Fig. 1.
General view of the Army Master Control position and transmitter installed in the Military Amateur Radio System Headquarters, Pentagon Building, Washington, D.C.
[*Photo : U.S. Army*

Membership of M.A.R.S., previously limited to Service and Reservist personnel, has been extended to permit other qualified amateurs to join. Members are given training in Service procedures to build up a reserve of skilled personnel for the Armed Services.

Fig. 2.
The rotary beam array on top of the Pentagon Building, Washington, D.C.
[*Photo : U.S. Army*

Service frequencies are assigned to the network in addition to those in the amateur bands. On these military frequencies, which are generally very close to amateur bands, military call-signs are assigned.

The Army and the Air Force each run separate networks and these meet physically in the M.A.R.S. headquarters network control station. This station is therefore really two stations in one.

Fig. 1 illustrates the Army master control position and transmitter. A duplicate installation for the Air Force net is back-to-back in the same building. For each station there is a 1,000 watt transmitter and associated equipment including a rotary beam array, a master control position and two QSO booths.

There are two equipment racks, one on either side of the transmitter, flush mounted into the wall in each master control room. The first rack contains aerial multi-coupler, *Magnachord* recorder and control panel, beam control panel, transmitter control panel and a BC221 frequency meter. The second rack contains a *Hallicrafters* S-36 receiver, a *Hammerlund* SP 600 JX receiver, patching panel, *Collins* 32-V1 and a *Plex*-10 amplifier specially modified.

The master control consists of the following: a 9 position, 2 channel, audio wiring amplifier, capable of utilising inputs from microphones, turntables, remote lines and recorders; two *Collins* 75-A receivers each with its own Panadaptor; a *Collins* 32-V2 used as a driver for local transmitters; a single-sideband selector which may be used with either of the receivers; and a control panel for beam rotation and indication, speaker selection, speaker volume control, transmitter control, remote controls for tape recorder operation and other associated items.

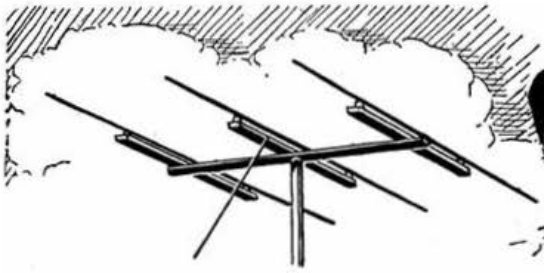
The rotary beam array is featured in Fig. 2.

E.S.C.

HAVE YOU POSTED YOUR CARD TO THE R.S.G.B. CALL-BOOK EDITOR? IF NOT, DO SO TODAY.

Treasure Hunt

MR. PETER PITTS, G3GYE, who is shortly sailing with the "Capt. Kidd" expedition to the South China Seas, would be glad to have information and constructional details of metal-detecting equipment. Correspondence should be sent c/o M.Y. "La Contenta," Rye, Sussex.



AROUND THE V.H.F.'s

New European Two Metre Records

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

Third 70 cm. Activity Period

ACTIVITY was particularly low during the first part of the period, but picked up towards the end. As the Society's 420 Mc/s. Tests take place on July 8, no further Activity Period will be arranged until September, details of which will be given at a later date.

Radio conditions during the period (May 5-12) were not good, although there were signs that the elusive DX might have materialised had the weather turned a little warmer. The difficulties of making contacts, due to the width of the band to be searched, are referred to by several operators. G3EHY thinks that operation would be discouraged should any form of frequency planning be introduced whereby stations would not be able to employ the crystals at present used in their 2 m. transmitters.

A list of stations active on 70 cm., together with their frequencies, is asked for by several correspondents. A tentative list, based upon reports received this year, has already been compiled by the present writer, but of the 48 known calls only 24 have forwarded their frequencies. A comprehensive register of stations able to operate on the band would be of great value to operators. If you are interested please send full details as soon as possible so that a list can be published or circulated next month. Those who write in, are asked to say whether they can use 2 m. or any other band as a communication channel for making skeds., etc.

Comments

G3EHY was active during all the test periods but worked only GW3HCH, one of his "regulars." The only other station heard during the week was on the 5th, when an S1/2 signal appeared at 1906 B.S.T. coming from the south east (frequency 435 Mc/s.). The call was not identified, but the significant point was that the temperature had risen from 52 degs. in the afternoon to 60 degs. in the early evening. No signals were heard when the temperature again reached the 60's—on May 11—although the 2 m. band was open for at least 150 miles to the north and east. On the following day a call was put out with a request for answers on 2 m. At 1532 B.S.T. a very weak signal was heard calling 3EHY from a south easterly direction—on 2 m.—but the transmission faded before the call could be read: the temperature at the time was 65 degs.

The R.S.G.B. Two Metre Contest

Some excellent evening openings occurred during May, but they were conspicuous by their absence on the 19th and 20th when the Contest took place! To make up for this lapse, things improved considerably on the Sunday morning, when a number of stations in the north of England were worked from the London area. GW2ADZ was a consistent signal at G2UJ during that time, and contact was effected despite deep fading at critical moments. 2UJ's signals were reported RST 579 with the Welsh station varying between S1 and S5. It is not known at the time of writing whether any outstanding DX feats were accomplished during the contest.

Many stations, however, did not seem to realise that G-DX conditions were as good as they were, and as G3VM (Norwich) remarked, "It was tough going trying to raise the multitude of distant stations working their locals." As an example of the level of activity 45 stations were logged at G2UJ during, unfortunately, rather brief visits to the band, while there was evidence of at least another 45 active.

G8SM disagrees with the decision to restrict the contest to C.W. only and says that although he has always used C.W. in contests in the past he cannot recall having suffered from 'phone interference.

Two Metre News and Views

G3WW (Wimblington, Cambs.), who worked 78 stations between April 5 and May 13, reported good conditions on April 5/6, 19 and 21/22 and again on May 11/12. Among the stations heard and worked during that period were: G2BMZ (Torquay, Devon), 2FO (Stockton-on-Tees, Durham), 2FZU (Derby), 2HGR (Nr. Bolton), 2XS (Mansfield, Notts.), 3CAD (Staffs.), 3DLA/A (Chiddingfold, Sy.), 3DMK (Catterick, Camp, Yorks.), 3ELT (Manchester), 3FSL (Gloucester), 3HAZ (Birmingham), 4VH (Malvern, Worcs.), 5IW (Worcester), 5YV (Leeds), 8GL (Northallerton), 8SB (S. of Manchester), GW2ADZ and GW5MQ. In addition ON4BZ was heard on 'phone at RS 56 on May 12. In the *Short Wave News* Contest on April 21/22 3WW worked 38 stations in 20 counties although able to operate only for part of the time.

G3FKO is now operating from Bath on 145.24 Mc/s. with an input of six watts to a CV1510 P.A. Unfortunately he is handicapped, from the point of view of aerials, by living on the second storey of a 4-storey block of flats, and so far has only worked G3EHY, FIH and GW3EJM. His station must be among the smallest at present in use, for the complete transmitter and the whole of the receiver (cascode R.F. stage, 10 Mc/s. and 465 kc/s. I.F.'s and A.F. section) is contained in a box measuring only 8in. x 8in. x 3½in.! He is thus ideally placed for Field Day, coupled with the fact that the power requirements are only 50 mA. at 200/250 volts. (How about a description for the Bulletin?—Ed.) It is understood that G8DX (Bath), has completed a 2 m. receiver and intends to be on the band shortly.

East Anglia was favoured with a narrow duct to Holland and Belgium on the evening of May 12. Although a large number of PA's were active, G2CPL, 3CFK, 3VM and 4PV appeared to be the only stations able to work them.

Given reasonable weather conditions, G5JU will be operating portable during the Two-Metre

* *32 Earls Road, Tunbridge Wells, Kent.*

Field Day from Carmarthenshire. The site has not yet been fixed, but it will be at a good height above sea level. He will operate on his normal frequency of 144.65 Mc/s., but 145.21 Mc/s. will also be available. He hopes that stations will swing their beams now and again towards the south west corner of Wales for a contact with a new county on two metres.

G2FKZ (London, S.E.22), is now operating on 2 m. with 100 watts to an 829 in twin coaxial lines. The aerial consists of six driven elements plus reflectors and the receiver is an an all-6J6 job pending the construction of a c.c. converter.

Another 70 cm. station now on 2 m. is G3FZL, also in London, S.E.22, who has 60 watts input to an 829 P.A. in a twin coaxial line circuit. The 5-element Yagi aerial is 45 ft. above ground.

G3EHY found conditions from April 20 to 25 good for all parts of the country and plenty of DX was worked up to distances of 250 miles.

G3NL (Malvern) is working stations on 2 m. in Cheltenham, Gloucester and Birmingham, using a 6J6 converter and modified SCR 522 transmitter. G3BGR and CVK (Worcester) are still awaiting their first QSO on the band; skeds. with 3NL having so far not materialised. While regretting the loss of G3GHL, the Worcester Group wish him every success in his new appointment in Leicester.

GC2CNC, operating on 145.13 Mc/s., contacted G8IL (Salisbury, Wilts.), at 22.15 B.S.T. on May 24 for the first two metre two-way between England and the Channel Islands. Signals from GC2CNC had been heard on several occasions by G2XC, 3FAN and 8IL. It is understood that GC3FSN is also on the band.

The 70 cm. Band

The importance of a good aerial system, combined with the maximum height obtainable, is emphasised by G2DD and G3EHY. The former found that a very modest increase in height of only 4ft. or so, made an astonishing improvement in range both on reception and transmission. He is shortly going from the present height of 39ft. to 50ft. and is hoping that improvement follows at least a linear law! His present score is 400 contacts with 25 different stations. Using transmissions from GW3HCH, G3EHY has brought signals from the Welsh station up from S4 to S8 by careful matching of the aerial and feeder system to the receiver. This was, naturally, a long job, demanding a considerable store of patience, but the results have fully justified the effort. The aerial in question consists of 16 half-wave elements in two stacks of eight, with a wire mesh reflector spaced .3 of a wavelength away. All the driven elements are end fed.

G2FKZ has been keeping skeds. with GW2ADZ on Monday evenings from 2000 to 2020 B.S.T., and listens daily, when conditions appear to be hopeful, for G3EHY's transmissions from 1840 to 1900 B.S.T. He is active every Sunday morning from 1030 to 1330 B.S.T. and on most evenings from 2000 to 2200 B.S.T., and is prepared to undertake fixed time skeds. for any period with stations preferably over 75 miles away. 70 cm./2 m. cross-band working can be arranged if necessary.

THIRD 70 CM. ACTIVITY PERIOD

Ref. No.	*Call and Situation*		*Frequency*	*Stations*	
				Heard	*Worked*
1	G2DD	Stanmore, Mddsex.	436.16		2, 3, 5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 22, 23
2	G2FKZ	London, S.E.22.	436.0		1, 7, 10, 11, 12, 14, 17, 19, 20, 21, 22
3	G2HDJ/A	Ashford, Mddsex.	436.4	14, 23	1, 22
4	G2QY	Pinner, Mddsex.	435.10		
5	G2RD	Wallington, Sy.	435.53	2	1, 10, 23
6	G2WJ	Nr. Dunmow, Essex.	435.78		
7	G2WS	Beckenham, Kent.	434.7	11	2, 19
8	G3CGQ	Luton, Beds.			
9	G3EHY	Banwell, Som.	435.75		24
10	G3FP	Thornton Heath, Sy.	436.49	14, 18, 19	1, 2, 5, 11, 12, 13, 15, 16, 22, 23
11	G3FZL	London, S.E.22.	435.24	4, 15, 20	1, 2, 10, 12, 16, 17, 19, 21, 22, 23
12	G4CG	Wimbledon, Sy.	435.20	5, 21	1, 2, 10, 11, 13, 14, 18, 22
13	G4HT	Ealing, W.5.			
14	G5CD	London, N.W.11.	435.60		1, 2, 12, 16, 21, 22
15	G5DT	London, W.1.			
16	G5PY	London, S.W.12.	435.40		
17	G5TP	Stoke Row, Oxon.			
18	G6CB	Wimbledon, Sy.			
19	G6HD	Beckenham, Kent.	435.12	16	1, 2, 7, 11, 22
20	G6PG	Dartford, Kent.	435.30		
21	G6YP	London, S.E.5.		16	1, 2, 11, 14, 15, 17, 22
22	G8KZ	London, W.10.	435.05		
23	G8SM	East Molesey, Sy.	435.7	17	1, 5, 10, 11, 22
24	GW3HCH	Newport, Mon.			9

On most days, G3BW (Whitehaven, Cumberland), 232 miles to the north, and G2CPL (Lowestoft), 224 miles to the east were worked with reports up to S8 both ways. With a slowly falling barometer and thermometer, conditions deteriorated for the next two weeks, but with a welcome rise in both temperature and pressure from May 11 to 13 results again improved. 'EHY endorses the views expressed in this feature last month in regard to the use of QHL/QLH procedure, and remarks upon the uncertainty which must exist as to the length of call necessary to attract the attention of a station sending a CQ unless that station states the method to be adopted in searching the band for replies.

GW3ENY (Llandudno—ex-Walton-on-Thames), is active daily from 2215 B.S.T. until midnight. Apart from six stations heard during the period of good conditions on May 11 he is having little success, but is hoping that a newly erected 6-element stack at 50ft. will effect an improvement.

G3HII (Liverpool), has been on the band since April 8 and so far has worked G2DCI, IN, JT, OI, 3ATZ, BOC, BPJ, BW, BY, CSC, DA, FMI, 5VN/A, GW2FVZ and GW5MQ. His transmitter is a DET 19 power tripler with an input of 20 watts to a 4-element Yagi. The frequency is 144.175 Mc/s.

The beam in use at present is a 12-element stack with mesh reflector and a coaxial Balun for coupling and tuning. The receiver which covers 431 to 438 Mc/s. with a bandwidth of 10 kc/s., employs a CV88 R.F. stage.

G2HDJ/A hopes to be active regularly on 70 cm. from now on. He has about two watts output from an 832 tripler and a receiver with crystal mixer and resonators taken from a "glide-path" receiver.

The transmitter line-up at G2RD comprises a 6V6 C.O./tripler, two EL91 doublers, an 829 tripler and a CV82 power doubler with five watts input. The receiver is a modified type ASB8 and the aerial a 16-element beam.

G3FZL has a 12-element colinear stack with two bays of six elements side by side with a mesh reflector $\frac{1}{8}$ wave behind. A concentric Balun transformer connects the junction of the two feeders to a two-stub tuner which is employed to match the array to semi-air-spaced 100 ohm co-ax. cable. A *S.T.C.* type 3B401/J doubler forms the output of the transmitter, and runs at 25 watts input with an efficiency of 30 per cent. G6HD has replaced his V.F.O. by crystal control and in consequence now possesses a much improved note. G8SM has twice heard a carrier on G3EHY's frequency, but has not yet managed to identify a call sign.

Two Metres in Eire

We are indebted to *I.R.T.S. News* and to G6UH for the following information regarding two metre transmissions from Eire. The frequencies at present in use are: EI2W 144.06 and 145.32 Mc/s. ('phone only), EI3L 144.25 Mc/s. ('phone and C.W.), EI8G 145.62 Mc/s., EI8P 144.3 Mc/s. ('phone only). It is understood that EI2P and 9N are also active, but their frequencies are unknown. The Eire stations are normally active between 2200 and 2300 B.S.T.

STOP PRESS

First G/OZ Contacts on Two Metres

At 2147 B.S.T. on June 1st, G3WW (Wimblington) and OZ2FR (Baekke) made what is believed to be the first contact between England and Denmark on 2 metres. The QSO was on telephony the Danish station being R5 S8 at G3WW. G3WW was R5 8/9. Just before this contact took place (at 2120 B.S.T.) OZ2FR heard G6LI (R5 S7) calling GM3OL. Shortly afterwards G6LI contacted OZ2FR and OZ6PX (Kolding).

First G/SM Contact on Two Metres

At 2244 B.S.T. G5YV established contact with SM7BE (Lund) and was heard to confirm with him that this was the first SM/G QSO on two metres. SM7BE was also heard by G6CW, who earlier in the evening had contacted OZ6PX. SM7BE subsequently confirmed hearing G6LI two hours before G5YV was worked—G6LI was thus the first English station to be heard in both Denmark and Sweden on 2 m.

At 0001 B.S.T. the following morning G3WW was called by OZ1WP on N.B.F.M. Half an hour later (at 0036 B.S.T.) G3WW worked OZ6PX and remained in contact with him for 23 minutes. His signals were R5 S8/9.

OZ2FR is using 50 watts to an 829B, a 10 element beam, fed by 300 ohms line, and a cascode converter.

According to G6LI the Danish opening was continuous and fadeless—like a ground-wave. Many Dutch and Belgium stations were also worked.

Slow Morse Transmissions

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

B.S.T.	*Call*	*kc/s.*	*Town*
Sundays			
10.00	G6MH	1990	Southend-on-Sea
10.00	G5XB	1950	Reading
10.00	G3AEZ	1847	Dorking
10.30	G3GIO	1915	Guildford
11.00	G2FXA	1900	Stockton-on-Tees
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
13.00	G3AXN	1870	Southend-on-Sea
14.00	G3ADZ	1910	Southsea
19.00	G3NC	1825	Swindon
19.30	G3AIX	1760	Birmingham
19.30	G3GYW	1922	Westcliff-on-Sea
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3DSR	1750	Derby
21.00	G3ESP	1850	Wakefield, Yorks
21.00	G3BLN	1900	Bournemouth
21.00	G3BHS	1820	Eastleigh, Hants
22.00	GM4MF	1860	Falkirk
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.15	G8TL	1896	Ilford
Tuesdays			
13.00	G3AXN	1870	Southend-on-Sea
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G5XB	1905	Reading
21.00	G3DMP	1850	Wakefield, Yorks
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G3GIO	1915	Guildford
22.00	G2BND	1890	Dalston, E.
22.30	G6JB	1820	Salcombe, Devon
Wednesdays			
14.00	G3ADZ	1910	Southsea
18.45	G3CQL	1990	Leigh-on-Sea
19.00	G3ADZ	1900	Southsea
20.00	G2NY	1850	Preston
22.00	G3DLC	1800	Grays, Essex
22.00	GM4JQ	1860	Falkirk
22.00	G3GIO	1915	Guildford
Thursdays			
18.00	G3AXN	1870	Southend-on-Sea
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G3NC	1825	Swindon
19.30	G3BUJ	1990	Southend-on-Sea
20.00	G3FVH	1920	Hull, Yorks
21.00	G2AQN	1850	Ossett, Yorks
21.30	G6DL	1760	Birmingham
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
Fridays			
13.00	G3AXN	1870	Southend-on-Sea
14.00	G3ADZ	1900	Southsea
19.00	G3BLN	1900	Bournemouth
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G2AMV	1870	Wirral
21.00	G3RB	1850	Ossett, Yorks
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G3GIO	1915	Guildford
22.30	G6JB	1820	Salcombe, Devon
Saturdays			
22.00	GM3OM	1860	Falkirk
22.00	G3GIO	1915	Guildford
23.00	G2FXA	1900	Stockton-on-Tees

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

Regional Representatives' Conference

A MEETING between the Council of the Society and the Regional Representatives was held at the Kingsley Hotel, London, W.C.1, on Saturday, April 28, 1951.

The following Members of Council were in attendance: The President (Mr. W. A. Scarr, M.A., G2WS, in the Chair), the Executive Vice-President (Mr. F. Charman, B.E.M., G6CJ), the Honorary Treasurer (Mr. A. J. H. Watson, F.S.A.A., G2YD), the Honorary Secretary (Mr. L. Cooper, G5LC), the Honorary Editor (Mr. A. O. Milne, G2MI), the Immediate Past President (Mr. V. M. Desmond, G5VM), Messrs. W. H. Allen, M.B.E. (G2UJ), A. P. G. Amos (G3AGM), W. N. Craig, B.Sc. (G6JJ), C. H. L. Edwards, A.M.I.E.E. (G8TL), T. L. Herdman, B.A. (G6HD), P. A. Thorogood (G4KD) and P. W. Winsford (G4DC).

The following Regional Representatives were in attendance: Messrs. G. Webster (No. 1—G5GK), C. A. Sharp (No. 2—G6KU), D. A. G. Edwards (No. 3—G3DO), E. S. G. K. Vance (No. 4—G8SA), R. F. G. Thurlow (No. 5—G3WW), F. A. Jefferies (Acting No. 6—G8PX), W. H. Matthews (No. 7—G2CD), R. J. Donald (Acting No. 8—G3DRD), H. A. Bartlett (No. 9—G5QA), F. Hamer (No. 10—GW8BW), F. G. Southworth (No. 11—GW2CCU), J. Douglas (No. 12—GM2CAS), W. Baker (No. 13—G3AFL), D. Macadie (No. 14—GM6MD) and N. H. Lowden (No.15—GI2HLT).

The General Secretary (Mr. John Clarricoats, G6CL) and the Assistant Secretary (Miss May Gadsden) were also in attendance.

Procedure

Prior to the Conference the Regional Representatives were invited to submit motions covering all aspects of the Society's work. The undermentioned Agenda of Business was drawn up on the basis of the motions which had been received:

1. The Government of the Society and the Scheme of Representation.
2. The R.S.G.B. Bulletin.
3. Staff and Headquarters.
4. Subscription Rates.
5. Organisation and Finances of Local Meetings.
6. Relation of the Society to Affiliated Societies.
7. Services to Members.
8. Revision of Articles of Association.
9. Other Business.

Recommendations to the Council

Two important resolutions passed at the Conference relate to the future governing of the Society and to the appointment of a full time professional Editor for the BULLETIN.

All resolutions adopted at the Conference are to be submitted to the Council as Recommendations.

Report of the Meeting

A verbatim report of the Conference, extending to nearly 100 pages of typed foolscap, is now being examined by those members of the Council who have been deputed to prepare a summary for publication in the July issue of the BULLETIN.

Sheffield O.R.M. well supported

THE British Restaurant, Sheffield, became on Sunday, May 20, 1951, the venue of the first O.R.M. to be held in that city for many a long day. The event was supported by more than 100 members, including the Regional Representatives from Regions 1 (Mr. G. Webster, G5GK) and 4 (Dr. E. S. G. K. Vance, G8SA) and a number of County, Town and Area Representatives from within and without the Region. The opening session was devoted to informal discussions, when old friendships were renewed and new ones made.

Headquarters was represented by the Executive Vice-President (Mr. F. Charman, B.E.M., G6CJ), who had the support of Messrs. A. O. Milne, G2MI, C. H. L. Edwards, G8TL, P. A. Thorogood, G4KD, the General Secretary (Mr. John Clarricoats, G6CL) and the Assistant Secretary (Miss May Gadsden).

Business Meeting

The business meeting was presided over by the Regional Representative (Mr. C. A. Sharp, G6KU), who extended a warm welcome to the official delegation from London, and to all who had made long journeys to attend. He referred to the fact that members were present from such widely separated places as Doncaster, Darlington, Middlesbrough and Hull, within the Region, and from Mansfield and Manchester outside the Region.

The chief speaker was the General Secretary who, during the course of his address, which lasted for more than an hour, reported fully upon the recent Regional Representatives' Conference and upon proposals for the future running of the Society. He also gave information on the BULLETIN and on many matters of topical interest. Miss Gadsden then spoke on the various routine office problems with which she and her staff have to cope, concluding with a request for co-operation in helping to reduce unnecessary labour.

Mr. Charman followed with an address on the international aspects of the Society's work, during which he explained the purpose of the proposed Region 1 (I.A.R.U.) Bureau. Mr. Milne then discussed the QSL Bureau and explained some of the ways in which members can lighten the load of those charged with the task of running the Bureau. Mr. Thorogood referred to the work of the National Convention Committee and gave details of the many attractions which will be offered to those who attend Convention.

A question and answer period was followed by an attractive tea. During this function the official delegates sat amongst the body of the membership to get to know them better.

Aerials Lecture

After tea, members assembled to hear Mr. Charman give his classic aerials lecture with demonstrations. This was delivered in his own inimitable style, interspersed with much good humour. At the end of the lecture, which lasted for nearly two hours, Mr. Charman answered a number of technical questions.

Before the assembly broke up, the Regional Representative thanked Mr. Charman and the other representatives from Headquarters for their attendance, assuring them that their presence had helped to make the meeting one of the best ever held in the North-East of England. Mr. Sharp also thanked Mr. John Petty, G4JW, the Sheffield T.R., and Mr. J. Featherstone, the Yorkshire West C.R., for their help in organising the event.

As members began their homeward journeys, many must have felt that yet another link in the bond of friendship had been forged between themselves and the Council of the Society, to the good of the Amateur Radio movement in general and to the R.S.G.B. in particular.

"KAY-YOU."

First Low Power Field Day

THE R.S.G.B. Low Power Field Day, to be held on September 9, 1951, promises to be of great interest to all low power enthusiasts. The main purpose of the Field Day is to encourage the development and construction of lightweight portable equipment, and it is anticipated that the event will provide an incentive to the ingenuity of intending competitors, resulting in the design and construction of miniature transmitters and receivers of high efficiency. The rules, which appear below, are straightforward, but entrants should note that there are no special provisions for obtaining the necessary portable licence, and they should make their own arrangements with the G.P.O.

Rules

1. The event will commence at 11.00 B.S.T. and finish at 18.00 B.S.T. on Sunday, September 9, 1951.

2. The event will be confined to fully paid-up Corporate Members of the Society in the preifix zones G, GC, GD, GI, GM and GW. Such members may enter individually, or several may combine to enter a station.

3. Operation will be restricted to C.W. (A1) on the 3.5 and 7 Mc/s. bands.

4. Only one contact with a specific station may be made on each band during the Contest.

5. Each contact shall include an exchange of RST and QTH.

6. Entrants receiving frequent tone reports lower than T8 may be disqualified.

7. Each transmission must include the letters LFD and the figure 3 or 7 according to the band in use, e.g. LFD 3 K.

8. Equipment shall be entirely independent of the electrical system of any vehicle, and of any supply mains.

9. The total weight of all equipment shall not exceed 20 lb. The following items, if provided, must be included in this weight: receiver, transmitter, power supply, batteries, headphones, key, frequency meter, aerial wire, insulators, earthing device, and spares—in fact, all radio and electrical apparatus and accessories taken to the site.

10. Subject to the weight limit, there are no restrictions on the number, type or height of aerials that may be used.

11. Entrants not holding licences for portable operation must make their own arrangements with the G.P.O. Entrants must comply with the terms of their transmitting licence.

12. Scoring: **Five points** *will be awarded for each contact with other portable stations, and* **one point** *for each contact with a fixed station.*

13. Proof of contact may be required, and competitors must be prepared to satisfy the Contests Committee that their equipment conformed to the rules.

14. Contacts with unlicensed stations will not be permitted to count for points.

15. Entries should be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, and should bear a postmark not later than Monday, September 17, 1951.

16. Entries should be made in the form set out below, and the declaration must be signed.

Low Power Field Day

September 9, 1951

Name..... *Call Sign*.....
Home Address.....
Site of Station.....
Transmitter..... *Receiver*.....
Aerials..... *Power Supplies*.....
Other Equipment.....
Total Weight..... *lb.*

B.S.T.	Call Sign of Station Worked	My Report on His Signals	His Report on My Signals	Location	Points Claimed
				TOTAL	

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest. I also declare that the weight of my apparatus as defined in Rule 9 was.....lb. I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.

Signed.....

Direction Finding Field Days

DETAILS of Qualifying Field Days are as follows:

July 1, 1951

Organiser: Mr. L. Critchley (T.R.), 36 Waterloo Road, Peterborough.
Call Sign: G2NJ/P.
Frequency: 1890 kc/s.
Assembly Point: Car Park adjacent to Royal Restaurant, Stilton, on Great North Road. N.G.R. 52/163289.
Map: Ordnance Survey, New Popular Edition, Sheet No. 134.
Assembly Time: 13.30 B.S.T.

Intending entrants are requested to notify the T.R. of their intention to compete, not later than June 25th, 1951, stating the total number in the party who will require tea (which has been arranged for 17.15 B.S.T. at a cost of 2s. 6d. per person).

* * *

July 15, 1951

Organiser: Mr. P. N. Prior, c/o B.T.H. Recreation Club Office, B.T.H. Co., Ltd., Rugby Warwickshire.
Call Sign: G3BXF/P.
Frequency: 1875 kc/s.
Asembly Point: Outside the "Red Lion" Inn, Hillmorton (approximately two miles east of Rugby). N.G.R. 42/533736.
Map: Ordnance Survey, New Popular Edition, Sheet 132.
Assembly Time: 13.30 B.S.T.

Intending entrants are requested to notify Mr. Prior of their intention to compete, not later than July 7, 1951, stating the total number in party who will require tea.

Practice D/F Contest

MEMBERS are invited to take part in a practice Direction Finding Contest which will be held near Romford on Sunday, June 17. The starting point will be on Havering Village Green, three miles north of Romford (Map No. 161, N.G.R. 513,931), and all competitors must be at the assembly point by 13.45 hours B.S.T. The frequency used will be 1922 kc/s., and the call sign G3FNL/P. Rules will be similar to those of the R.S.G.B. 1951 D/F Contests.

Because this is only a practice contest, no notification of entry is required, and no prizes are offered. Tea has not been arranged, but there will be ample grass space with parking facilities not far from the transmitter site for competitors who wish to picnic.

Queries should be addressed to Mr. R. N. Grubb, G3FNL, 64 Deyncourt Gardens, Upminster, Essex (phone Upminster 3082).

"Helvetia 22" Award

MEMBERS striving for the "Helvetia 22" award may like to know that HB9EU will be working on 7 and 14 Mc/s. from the "rare" Cantons of St. Gall (SG) and Appencell (AR) between July 9 and 14 under the call HB1EU, and on July 14 and 15 from the Canton of Glaris (GL) using the calls HB1EU, 1LJ and 1MQ. The above information came to hand *via* G8KP.

Tunbridge Wells O.R.M.

ARRANGEMENTS have been made to hold an O.R.M. in Tunbridge Wells on Sunday, September 30. A detailed programme will appear in the August issue of the BULLETIN.

HEADQUARTERS CALLING

COUNCIL, 1951

President :
WILLIAM A. SCARR, M.A., G2WS.

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

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

Hon. Secretary : L. Cooper, G5LC.

Hon. Editor : Arthur O. Milne, G2MI.

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

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

General Secretary : John Clarricoats, G6CL.

April Council Meetings

Résumé of the Minutes of the Proceedings 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, April 10, 1951, at 6 p.m.

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

Apologies were submitted for the absence of Messrs. V. M. Desmond and P. A. Thorogood.

Finance.

Resolved to accept and adopt the Cash Account for the month of March, 1951, as submitted by the Honorary Treasurer.

Membership.

Resolved (a) to approve:—
62 applications for Corporate Membership ;
19 applications for Associate Membership, including 3 from Juniors ;
(b) to grant Corporate Membership to 10 Associates who had applied for transfer.

Civil Defence.

It was reported that a meeting had been arranged between representatives of the Society and Mr. Geoffrey de Freitas, M.P. (Parliamentary Secretary to the Home Office), to discuss a proposal by the Society that radio amateurs should be given an opportunity of participating in Civil Defence communications.

Convention.

Convention Dinner arrangements were dealt with, including the preparation of a toast list and a list of distinguished guests to whom an invitation would be extended.

Reading Meeting.

The President, the General Secretary and Messrs. Allen, Amos, Cooper and Craig were authorised to attend a meeting of Berkshire members in Reading on May 5, 1951.

British Call Book.

The Council agreed to accept, in principle, an offer made by Mr. J. Tyndall, G2QI, to prepare a British Call Book. The Secretary was authorised to obtain an estimate from South London Press for printing the proposed call book and to discuss the project in greater detail with Mr. Tyndall. [This matter was fully reported upon last month.—ED.]

Typewriters.

After receiving a report from the General Secretary on the condition of the typewriters in use at Headquarters it was resolved to authorise the purchase of two new machines at a total cost not exceeding £150.

Revision of Memorandum and Articles of Association.

The Secretary reported that the Committee appointed to prepare a first redraft of the Memorandum and Articles of Association had practically completed its task, but before submitting the draft to Council, guidance on certain matters of policy was required.

Consideration was given to a report prepared by the Secretary on behalf of the Committee. The Council expressed an opinion on each of the points referred to in the report.

It was agreed that the date of the Special Council Meeting to discuss proposed revisions to the Memorandum and Articles of Association should, if possible, be fixed at the next regular meeting of the Council.

Questionnaire.

The Secretary reported that approximately 3,400 questionnaires had been returned and that work of checking the forms had been undertaken by Messrs. Allen, Charman, Cooper, Craig, Edwards, Herdman, Thorogood and Winsford.

Mr. Herdman agreed to prepare a summary of the results for submission to the Council at a Special Meeting on April 18.

A.G.M. and Kindred Matters.

Consideration was given to correspondence from the following representatives and others:—

(a) Mr. N. H. Lowden (Region 15 Representative), containing a Report of a Regional Meeting held in Belfast.
(b) Mr. C. A. Sharp (Region 2 Representative) and the Northumberland C.R., containing views and opinions expressed at meetings of the North-East Amateur Transmitting Society.
(c) Cheltenham T.R., setting out resolutions passed at a meeting of Cheltenham members.
(d) Dunfermline Radio Society, setting out the views of that Society concerning a letter circulated by the Grafton Radio Society.
(e) Malvern T.R., setting out resolutions passed at a meeting of Malvern members.
(f) Sussex C.R., containing a Report of a meeting of Sussex Town and Area Representatives.
(g) Mr. J. Tyndall, containing observations on the Questionnaire.
(h) Mr. Myatt, containing views on A.G.M. and kindred matters.
(i) Dulwich and New Cross T.R., setting out resolutions passed at a meeting of the Dulwich and New Cross Group
(j) Mr. F. Hamer (Region 10 Representative), concerning an earlier circular relating to a Regional Meeting held in Cardiff.
(k) Petersfield and District A.R., setting out resolutions passed at a meeting of Petersfield and District members.
(l) Chester and District Amateur Radio Society, setting out the views of that Society concerning a letter circulated by the Grafton Radio Society.

The Council took careful note of the various opinions expressed in the letters and instructed the Secretary to thank those concerned.

Mr. R. F. G. Thurlow.

The Secretary reported that Mr. Thurlow (Region 5 Representative) had written disagreeing with the views of the Society's legal adviser on the legality of his (the General Secretary's) membership of the G.P.O. Liaison and General Purposes Committees. The President also reported that he had received a long letter from Mr. Thurlow on the same subject. It appeared from Mr. Thurlow's letter that he intended to raise the matter formally at some future occasion. The Council agreed to take no action at present.

General Purposes Committee.

Mr. Charman, in the absence of Mr. Watson (who had left the meeting), presented the Report of the General Purposes Committee which met on December 7, 1950.

Resolved to receive the Report and to defer consideration of the Recommendations contained therein until after the questionnaires had been analysed and decisions taken.

The Recommendations related to the publication in the BULLETIN of details of the services given to members and the desirability of making the BULLETIN available to the general public.

Membership and Representation Committee.

The Secretary, in the absence of Mr. Desmond, presented the Report of the Membership and Representation Committee which met on March 15, 1951.

Resolved to receive the Report.

It was reported that the Recommendations contained therein had been approved at the previous meeting.

The Recommendations related to Regional Boundaries and to a Circular to Representatives.

The meeting terminated at 10.15 p.m.

* * *

Résumé of the Minutes of a Special 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 Wednesday, April 18, 1951, at 6 p.m.

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

Apologies were submitted for the absence of Messrs. V. M. Desmond and A. J. H. Watson.

Regional Representatives' Conference.

A draft Agenda of Business for the forthcoming Regional Representatives' Conference, which had been prepared by a special Committee of the Council, was approved for distribution to the Regional Representatives.

Resolutions passed at a meeting of Region 1 Representatives were considered, as were resolutions passed at various meetings held in South London.

A programme of procedure for the Conference was adopted.

It was agreed to engage a qualified shorthand-typist to record the proceedings of the Conference.

Questionnaire.

A preliminary analysis of the questionnaires was submitted and examined. [The analysis was published in the last issue of the BULLETIN.—ED.]

North-East Amateur Transmitting Society.

The Secretary submitted a circular from the above Society addressed to the Grafton and other Radio Societies.

Resolved to receive the circular.

Hayes Group.

Mr. Edwards reported upon difficulties which had arisen in regard to the Hayes Group due to the reluctance of the T.R. to reply to correspondence.

Resolved to declare the office as vacant.

QSL Facilities.

The QSL Manager (Mr. A. O. Milne) explained that for some time past he had been handling QSL cards received from affiliated societies. He felt that it would be desirable to regularise the position.

Resolved to authorise the R.S.G.B. QSL Bureau to handle QSL cards received from the Club Stations of Affiliated Societies.

The meeting terminated at 9 p.m.

Representation

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

County Representative

Region 4 :
Lincolnshire.—G. B. Raithby, G8GI, The School House, Martin, Lincoln.

Town Representative

Region 7 :
Balham.—A. R. Dyer, BRS.11,228, 28a Isis Street, Earlsfield, S.W.18.

Vacancies

Messrs. R. E. Durrant, G2AAA, and F. H. Wrigley, G2BDO, have resigned as County Representatives for Northamptonshire and Somersetshire respectively. Mr. G. M. Ward, G3BOB, has resigned as Town Representative for Bromley and Beckenham.

Nominations for their successors should be made in the manner prescribed in the September, 1949, issue of the BULLETIN and sent to reach the General Secretary by June 30, 1951.

Changes of Address and Call Sign

Region 12.—Address of Mr. J. A. Clark, GM2HIK (T.R. for Forfar) is now The Boal, Reswallie, Forfar.
Region 14.—Address of Mr. W. R. Eadie, GM4JO (T.R. for Glasgow Postal Districts), is now 32 Mitre Road, Glasgow W.4.
Region 9.—Mr. E. G. Wheatcroft (C.R. for Devonshire) is now G3HMY.

Talking Book Scheme

ALTHOUGH more than 300 members responded to the appeal, published in the September, 1950, issue of the "Bulletin," for volunteers to assist in connection with the Talking Book Scheme operated by the National Institute for the Blind, certain parts of the country—notably Brighton, Hove, Worthing, the whole of Wales, the Eastern Counties, Devon, Cornwall and the North of England—are not yet covered.

Members who are willing to advise present and future users of the Talking Book Library in the correct operation of their record players are asked to write to the National Institute for the Blind, Talking Book Dept., 12 Oval Road, Camden Town, London, N.W.1.

Cinema Television Demonstration

AT the Summer Meeting of the Television Society held on June 2 members witnessed a demonstration of large-screen television at the Penge Cinema. During the afternoon session at Norwood Technical College several short papers on television were read.

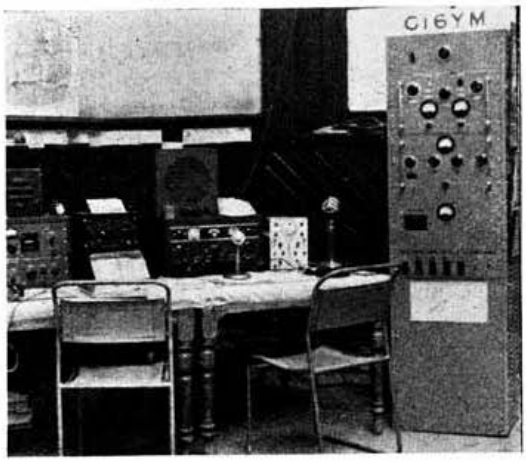
Spotlight on . . . .

AFFILIATED SOCIETIES

THE Council of the R.S.G.B. may admit Societies interested in the science of Radio Communication to the privileges of Affiliation. Societies seeking affiliation must be well established and properly constituted. The Council will require a list of the officers and a statement showing the strength of membership.

- A copy of the **R.S.G.B. Bulletin** will be sent to a specified address each month on payment of an annual subscription of 5s. in addition to the affiliation fee of 5s.
- Affiliated Societies which operate a Club station may use the R.S.G.B. QSL Bureau, but individual members, unless members of the R.S.G.B., may not use the Bureau except to claim cards.
- Activity reports of general interest are published in the **R.S.G.B. Bulletin.** Closing date for reports is the 25th of the month preceding publication.
- R.S.G.B. publications may be purchased by Affiliated Societies at wholesale prices (minimum order £2).
- Affiliated Societies may state on correspondence that they are affiliated to the R.S.G.B.
- Affiliated Societies may not participate in the R.S.G.B. National Field Day, nor in the organisation of local R.S.G.B. activities.
- Members of an Affiliated Society may attend local R.S.G.B. meetings, but, unless members of the R.S.G.B., cannot vote.

AROUND THE REGIONS



The station of the Y.M.C.A. Radio Club at the Amateur Radio Exhibition held last month in Belfast.

Brighton & District Radio Club

Having co-operated with the local R.S.G.B. Group in N.F.D. and held the usual "inquest," the Club now settles down to a full summer programme. On June 19 Mr. Atkinson will give a further talk and demonstration on "Radiesthesia." A week later Mr. Harrop will describe his Universal Test-meter for the amateur. Visitors to the locality will be most welcome at Club Headquarters, The Eagle Inn, Gloucester Road, Brighton 1.

Bristol

Local members visited the B.B.C. Welsh Region transmitters at Washford Cross on May 5 in company with a group from Weston-super-Mare. A visit to Burnham Radio is planned for an early date.

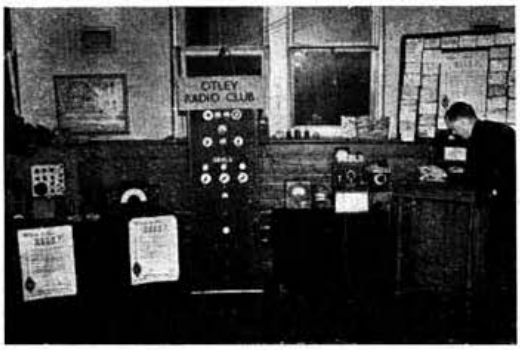
The G5FS Trophy has been won for the second year running by Mr. Lewis, BRS 16886, who entered rack type frequency measuring equipment known to be accurate to within 500 cycles on all amateur bands up to 28 Mc/s.

W5LTX from Louisiana and VS1DL, who will shortly be on the air with a G call, have attended recent meetings.

All future meetings of the Group will be held at Carwardine's Restaurant, Baldwin Street.

City of Belfast Y.M.C.A. Radio Club

A wide range of equipment was displayed at the Amateur Radio Exhibiton recently organised by the Club, at which the Club station—call GI6YM—was operated. Many Continental and some DX contacts were made on 14 Mc/s. 'phone. More than 100 GI amateurs signed the visitors' book.



An Amateur Radio station—G3DLD—was operated at the Hobbies Exhibition promoted recently by the Rotary Club of Otley. Equipment exhibited included a rack-built transmitter of 120 watts input, SX25, S640, R1155 and R107 receivers, and a BC221 frequency meter. Many contacts were made on 10 and 40. The station, with its organiser, G3DLD, is pictured above.

Coventry Amateur Radio Society

Future meetings will take place on alternate Wednesdays at the new H.Q.—Y.W.C.A. Hostel, Queen's Road, Coventry. Next meeting, and key date, is at 7.30 p.m. on June 25. Inquiries should be addressed to the Hon. Secretary, K. Lines, G3FOH, 142 Shorncliffe Road.

H.M.S. Ganges Amateur Radio Club

The new Secretary is Instructor Lieutenant D. R. A. Hill, and correspondence intended for him should be addressed c/o P.O.s' Mess, H.M.S. Ganges, Shotley, Ipswich.

Kingston & District Amateur Radio Society

A *Mullard* film-strip lecture on "The Construction and Manufacture of Radio Valves" was recently given to the Club. "Ham Communication Receivers," "High Fidelity Reproduction and Long Playing Records" (by *Decca Ltd.*), and "Radio Controlled Models" are titles of future lectures. Membership is now more than 50, and meetings are held fortnightly at 7.45 p.m. on Wednesdays at Penrhyn House, 5 Penrhyn Road, Kingston.

Malta Amateur Radio Society

At the A.G.M. in April the following Officers were elected: President, Mr. R. Galea, ZB1E; Hon. Secretary, Mr. Spafford, ZB1BZ; Hon. Treasurer, Mr. Schinas. Ex-members living abroad can join the Society and receive the minutes and magazine for a subscription of 5s. per annum. Correspondence should be addressed to the President, 26 Collegiate Street, Birkirkara, Malta.

Midland Amateur Radio Society

During a talk on "Radio Communication from a P.O.W. Camp in Germany" given recently by Ernest Shackleton, M.B.E. (G6SN), examples of the improvised gear built by the lecturer and his fellow prisoners were shown. In May Messrs. C. H. Banks and J. Hickman lectured on "High Fidelity Tape Recording," and gave an interesting demonstration.

Smiling faces at the recent Southend-on-Sea Hamfest. Left to right at rear: G2KT, G6NU, Mr. Bradish, G2DQ, G3ELB and G6CH; front: BRS 925 and G5ZH.

North Kent Radio Society

Last month the Society exhibited and operated an Amateur Radio station at the Hobbies Exhibition, Bexleyheath, organised by the Bexley Rotary Club. Using the Society's call, G3ENT/A, many contacts were made on 80 and 160. Meetings take place at 7.30 p.m. on the second and fourth Mondays each month at the Freemantle Hall, Bexley. The Hon. Secretary is L. E. J. Clinch, 8 Windsor Road, Bexleyheath, Kent.

Otley

At a Hobbies Exhibition organised by the local branch of the Rotary Club, an Amateur Radio station, operated by G3DLD and two S.W.Ls., became a focus of interest for radio enthusiasts in the area. As a result, a Radio Club has now been formed. Correspondence should be addressed to Alec Lawson, 6 Somerville Terrace, Otley, Yorks.

Plymouth

Arrangements have been made for a series of talks on subjects of technical interest to be given at future meetings of the Plymouth Group. Meetings are held on the third Saturday in each month.

R.A.F. Amateur Radio Society

At the A.G.M. held in April at No. 6 Radio School, R.A.F., Cranwell, W/Cdr. W. E. Dunn, O.B.E., G2LR, was elected President for the ensuing year. An amendment to the Constitution and Regulations discontinues recognition of "Sections" of the Society: those already existing will revert to their original status as independent or affiliated clubs. Ex-R.A.F. personnel may apply for admission to the Associate Grade, and inquiries should be addressed to the Hon. Secretary (Admin.), R.A.F. Amateur Radio Society, No. 6 Radio School, R.A.F., Cranwell, Lincs.

Ravensbourne Amateur Radio Club

The Club transmitter is nearing completion. Membership is now 27. There will be no regular meetings at Childeric Road School during July, August and September, but field days are being arranged, details of which may be obtained from the Chairman, G. Haylock, G2DVH.

Reading Radio Society

It was decided at the recent A.G.M. to hold future meetings on the second and last Saturdays of each month.

Southend and District Radio Society

More than 100 members and friends attended the Annual Hamfest last month, when the programme included competitions, games and dancing. Prizes were distributed by Mrs. Barnard, who with her husband attended as guest representatives of *Wireless World*. At a recent meeting Mr. Walters, of *Belling & Lee*, lectured on "Television Aerials and Interference." This month members of the Society will visit the Medway A.R.T.S.; a return visit is provisionally planned for August.

South Manchester Radio Club

"Super Modulation," "Receiver Technique" and "Radio Interference Suppression" were the subjects of three lectures given to the Club during May. A D/F Contest took place on June 9.

Spen Valley Radio & Television Society

A spring outing to Skelton Radio Station and a lecture on the human ear by specialist, John Otty, were recent highlights of the Society's programme. June attractions will include a visit to the factory of *Mains Radiograms Ltd.*, and talks on "Audio Engineering" by G8OK, and "Electrolytics" by Mr. A. Smith.

Stourbridge & District Amateur Radio Society

Apparatus entered for the J. Timbrell Junior Trophy was described by members at a recent meeting. The award was won by J. Hogg, G2OG. Meetings continued to be well supported. The Secretary is W. A. Higgins, 28 Kingsley Road, Kingswinford.

Swansea

Corporate members resident in Swansea are cordially invited to nominate one of their number to serve as Town Representative. The nomination should be supported by five Corporate members and accompanied by a letter from the nominee agreeing to serve.

Mr. F. Hamer, GW8BW, South Wales Regional Representative, will be pleased to attend a meeting in Swansea if arrangements can be made.

Thames Valley Amateur Radio Transmitters' Society

The Society's annual outing will take place on June 17 at West Wittering-on-Sea. This is a bucket and spade party, and all R.S.G.B. members are welcome. Cars will be parked at the west end of Scribes Field.

Torbay Amateur Radio Society

A junk sale in aid of N.F.D. funds was a feature of a meeting held last month. The new Secretary is Spencer-Turner, 53 Parkfield Road, Torquay.

Walsall & District Amateur Radio Society

"Single Sideband Suppressed Carrier Working" and "Radio Advances since World War I" have been subjects for talks by members at recent meetings. A Club power pack has been completed as the first step towards a licensed station. The Hon. Secretary (F. J. Merriman, G2FPR, 123 Wolverhampton Road, Walsall) reports that, as a result of the recent Exhibition, the Walsall Town Council has agreed to have QSL cards printed for all local amateurs.

Welsh Industries Fair

In connection with the Welsh Industries Fair which is to be held at the Pavilion, Sophia Gardens, Cardiff, from July 4-18, both the Cardiff T.R.—Mr. G. F. Wilson, GW3BZH, 120 Cardiff Road, Llandaff, Cardiff—and Mr. S. Howell, GW5FN, 46 Africa Gardens, Cardiff, will be pleased to answer any enquiries from intending visitors.

Cardiff members will meet informally in "The British Volunteer," The Hayes, Cardiff, at 7.30 p.m. on Monday, July 9, when visiting amateurs to the Fair will be cordially welcomed.

Wirral Amateur Radio Society

Recent activities included a Gadgets and a D/F Contest. On June 20 a junk sale will take place. Prospective members should write to the Secretary, A. H. Watts, 38 Sandymount Drive, Wallasey.

West Suffolk Amateur Radio Society

Inquiries concerning the above-named newly formed Society should be addressed to C. A. King, 44 Bishop's Road, Bury St. Edmunds. At a recent meeting two American Air Force officers demonstrated a *Hallicrafter* SX71 receiver.

Worthing & District Amateur Radio Club

The Club meets at 7.30 p.m. on the second Monday in the month at the Adult Education Centre, Worthing. Correspondence should be addressed to the Hon. Secretary, F. Betterley, 42 Anweir Avenue, Lancing, Sussex.

The "Professional" Amateur

DEAR SIR,—The letter from G3EII headed "The 'Professional' Amateur," reproduced in the May issue of the BULLETIN, casts a slur on a number of reputable firms who deal with amateur equipment and who advise their clients through the medium of their advertisements in the BULLETIN that they are either amateurs themselves or have amateurs on the staff.

It is well known that one cannot advertise on the air, under terms of the licence, but many amateurs prefer to know that the firms they deal with have amateurs on the staff who appreciate the many snags and who *know what they are selling*. We have helped many "hams" with problems free of charge, as no doubt many other concerns have done, and it is undesirable that suspicion should be cast on the innocent. Let G3EII come out into the open and report to R.S.G.B. headquarters any cases he comes across of amateurs advertising over the air their products, and then headquarters can take appropriate action.

Yours faithfully,
A "HAM" TRADER.

[Name and address supplied.—ED.]

On Nattering

DEAR SIR.—I am inclined to deplore the "in deadly earnest attitude" assumed by some of the "Powers that Be." At the present time this attitude is a bit of an anachronism. Think, for instance, of a certain Portuguese XYL near Oporto who "natters" daily. This she does with ease and grace and with considerable skill in the national language of the amateur to whom she is speaking. Or, perhaps, nearer home, an amateur in Ealing—a born natterer—whose sayings are often reproduced in a contemporary of the "Bull."

In marking time on the technical propensities of the amateur, and his undoubted usefulness in time of national emergency, are we not losing sight of the international friendships which are brought about by Amateur Radio contacts? (Query "nattering.") These friendships which engender goodwill and understanding are extremely important and moreover are wholly positive.

Yours faithfully,
C. R. GREEN (G5LN).

London, W.2.

The Transmitting Licence

DEAR SIR,—I bought recently a copy of your little booklet, "The Transmitting Licence," and I here take the opportunity of congratulating you on the way in which you give full details for obtaining the Amateur Licence and the conditions attached to same, as I think a number of S.W. listeners wishing to become Amateurs have only a hazy idea of how to obtain a licence.

Yours faithfully,
JAMES O'HARE.

Paisley, Scotland.

LONDON MEMBERS' LUNCHEON CLUB

THE date of the June meeting as announced last month has been changed to coincide with the Convention, so that Provincial visitors may have the opportunity to attend. A record gathering is anticipated. Prospective guests are asked to reserve their place at the table by ringing CUFFLEY 2751 (Mr. D. C. Jardine, G5DJ), or HOLborn 7373 (Headquarters).

THE DATE: Friday, June 22.
THE TIME: 1 p.m. (Assemble 12.30).
THE PLACE: Kingsley Hotel, Bloomsbury Way, London, W.C.1. (opposite Headquarters).

NEW MEMBERS

The following have been elected to membership:—

Corporate Members (Licensed)

G2AUB N. I. NEAME, 3 Rudyard Road, Woodingdean, Brighton 7, Sussex.
G2HLL †F. H. PICKARD, Stonegate Farm, Meanwood, Leeds 6, Yorks.
G3AGO A. M. BRYANT, 223 Coxtie-Green Road, Brentwood, Essex.
G3DIV *P. J. POLLARD, 6 Annington Road, Eastbourne, Sussex.
G3DVH J. R. MASON, 5 Ashcroft, Beecroft Estate, Dunstable, Beds.
GW3GAK C. A. BAKER, 41 New Station Road, Whitchurch, Cardiff.
G3GGN F. T. SHUTE, 15 Sunny Close, Sea Place, Worthing, Sussex.
G3GMM E. McFARLAND, 34 Maple Avenue, Audenshaw, Nr. Manchester.
G3GQU *E. J. C. POTTER, 42 Duke of York's R.M. School, Dover, Kent.
GW3GSJ E. E. HEWINS, 65 Glamorgan Street, Barry, Glam., Wales.
GI3GTO S. McKEOWN, 35 Clara Park, Belfast, N. Ireland.
GM3GTP A. RUSSELL, 1357 Dumbarton Road, Glasgow, W.4.
G3GUP E. T. HOWELL, c/o 136 Beacon Road, Luton-Chatham, Kent.
GM3GUY R. W. METRUSTY, Feoch, Craigston Road, Johnstone, Scotland.
G3GZH R. E. BROWN, 210 Edward Street, New Cross, S.E.14.
G3HDE †J. R. HOWARD, 53 Lucknow Street, Fratton, Portsmouth.
G3HDM P.O. TEL. S. G. CAMPBELL, 25 Mess, H.M.S. Sheffield, c/o G.P.O., London
G3HET J. W. FORSYTH, 29 Weetwood Avenue, Wooler, Northumberland.
G3HFD S. BIGGIN, 44 Nether Avenue, Grenoside, Sheffield.
GW3HGB J. MILLS, 24 Westgate, Cowbridge, Glam., Wales.
G3HHW H. BURNS, 8 Harcourt Street, Workington, Cumberland.
GW3HGL *B. CLARK, 49A Penrhyn Avenue, Rhos on Sea, Colwyn Bay, N. Wales.
G3HIU F. H. DEWICK, 47 Gloucester Road, Wolverton, Bucks.
G3HJD D. H. CARELESS, 5 Clifton Mansions, Wallisoote Road, Weston super Mare, Somerset.
GW3HJR *R. M. MORRIS, Flat 3, 306 Newport Road, Cardiff, Wales.
G3HJT V. TOTTEN, 77 Horsham Avenue, Bournemouth, Hants.
GM3HJV D. M. McINNES, 3a Airport, Wick, Caithness, Scotland.
G3HKO †D. A. WOOD, 5 Spencer Avenue, Coventry.
G3IMW S. J. WHITFIELD, Whitethorns, South Hill Avenue, Harrow, Middlesex.
G4VF R. FERGUSON, 57 Roxwell Road, Chelmsford, Essex.
G4VZ C. C. REDSHAW, P.O. Radio Station, Dorchester, Dorset.
G6VV †A. V. DYER, 96 Bladingdon Avenue, Bexley, Kent.
G8UA †H. TEE, 406 Higher Brunshaw, Burnley, Lancs.

Corporate Members (Overseas)

DL2RF J. M. SHARP, 11th Hussars P.A.O., B.A.O.R.11.
EI3S J. P. SCULLY, 30 O'Daly Road, Drumcondra, Dublin.
HB9EU R. FAESSLER, Roemerhof 901, Windisch (AG), Switzerland.
OZ8T B. OTZEN, Godthabsvej 123, Copenhagen F., Denmark.
VE1QZ O. A. SANDOZ, Box 411, Dartmouth, N.S., Canada.
VE2ADX J. HARPER, 4935 King Edward Avenue, Montreal 29, Quebec, Canada.
VE2ALL M. J. LENDRUM, 3665 Jeanne Mance Street, Montreal, Quebec, Canada.
VE2APD J. G. DODD, 1003 Moffat Avenue, Verdun 19, Prov. Quebec, Canada.
VE2ANE V. E. SAUNDERS, 4980 Barclay Avenue, Montreal 26, Quebec, Canada.
VE2CB C. SUNDERLAND, 1491 Crawford Bridge Avenue, Verdun, P.Q., Canada.
VE2IS F. L. ROBERTS, 37 47th Avenue, Lachine, Quebec, Canada.
VE2JK A. ASHTON, 655 Osborne Avenue, Verdun, P.Q., Canada.
VE2XP H. L. EBERTS, 83 Chesterfield Avenue, Westmount, Montreal, P.Q., Canada.
VS1DV C. E. SALTON, Postal Services Department, G.P.O., Singapore 1.
W3NL R. V. ANDERSON, 2509 32nd Street S.E., Washington, D.C., U.S.A.
W4OJE J. WYLIE, 1261 A.T.S., A.P.O. 231, c/o Postmaster, New York City, U.S.A.
W6WWW C. R. MANGUM, 12031 Wagner Street, Culver City, California.
ZE3JQ M. H. HITCHCOX, Y Flt., 394 M.U., R.A.F. Heany, Bulawayo, S. Rhodesia.
ZS6Q H. A. CHENIK, P.O. Box 745, Johannesburg, S. Africa.

* * *

DL2QQ CPL. O. N. JOHNSON, 14 Squadron, R.A.F., Fassberg, B.A.F.O., B.A.O.R. 23.
DL2RE J. J. NORTON, 111 Ashbury Road, Liverpool 14, Lancs.
HP1LB G. BOWEN, P.O. Box 3808, Ancon, Canal Zone.
VP7NH L. W. THOMPSON, P.O. Box 1280, Nassau, Bahamas, B.W.I.
VS1YL MRS. J. M. SMITH, 764 Mountbatten Road, Singapore.
VT1AC D. A. TAYLOR, Box 54, Kuwait, Persian Gulf.
VU2CJ M. J. MENECKJI, Mehta House, Apollo Street, Bombay, India.
ZB1BF V. GENOVESE, 8 St. Benedict's Flats, Zimelli Street, Hamrun, Malta.
ZC4KN CAPT. K. E. WHITE, R. Signals, 2 Wireless Regt., M.E.L.F. 3.
ZS6XQ L. NEL, c/o 7th Floor Medical, Boston City Hospital, Boston, Mass., U.S.A.

Corporate Members (British Receiving Stations)

207 †H. O. CRISP, The Dower House, Northbourne, Bournemouth.
17749 †MAJOR W. H. I. STEVENS, RTD., 47 New Road, Northbourne, Bournemouth
19118 L. ROSSER, 462 Elswick Road, Newcastle on Tyne 4.
19119 J. ROSCOE ABBOTT, B.Sc., School House, Withern Alford, Lincs.
19120 M. D. BROWN, 1 Mapperley Park Drive, Nottingham.
19121 M. G. LOCKE, Aldworth House, Tennyson Lane, Haslemere, Surrey.
19122 G. MAYO, 77 Commonside, Sheffield 10.
19123 C. J. E. PETHERICK, 9 Bridgeland Street, Bideford, N. Devon.
19124 M. A. F. GILL, 75 Bedale Road, Sherwood, Nottingham.
19125 J. ROBERTS, 22 Andrew Street, Bury, Lancs.
19126 L. A. MILLS, 37 Coventry Road, Ilford, Essex.
19127 R. D. DENTON, 10 South View Drive, South Woodford, London, E.18.
19128 R. McN. WILLIAMS, 79 St. Chad's Road, Derby.
19129 G. F. WEST, Breakers, Hayle Towans, Hayle, Cornwall.
19130 J. H. PARRY, 8 Rhosberse Road, Adwy, Coedpoeth, Nr. Wrexham, N. Wales.
19131 D. ORMSTON, 4 Hayburn Avenue, Hull, E. Yorks.
19132 R. A. MANLEY, Kithyra, New Road, Griffithstown, Mon., S. Wales.
19133 H. S. BACHE, 18 Weirfield Road, Exeter, Devon.
19134 J. BURKIMSHER, School Road, Hathersage, Sheffield.
19135 J. WHITEHEAD, 54 Railway View, Gt. Harwood, Nr. Blackburn.
19136 D. A. A. OSBOURNE, 58 Frederica Road, Winton, Bournemouth.
19137 A. C. LOADER, 25 Launds, Rochdale Road, Golcar, Huddersfield.
19138 D. PRESTON, 72 St. Paul's Road, Clifton, Bristol 8.
19139 A. L. WILLIS, Reservoir House, Cwmavon Road, Blaenavon, Mon.
19140 E. MILLER, 30 Forest View Road, East Grinstead, Sussex.
19141 R. F. SMITH, 7 Council House, Fivehead, Nr. Taunton, Somerset.
19142 R. V. CROSBY, W.O.II, 321431, 16/5 Lancers, Attchd. Staffs Yeomanry, Booth Street T.A. Centre, Stoke on Trent, Staffs.
19143 D. W. ORMAND, 3 Quarndon House, Leopold Road, Felixstowe, Suffolk.
19144 T. A. MUNN, 118 Chesterford Road, Manor Park, London. E.12.
19145 T. L. BISS, 38 Ripon Road, Harrogate, Yorks.
19146 S. E. McCLARY, 7 The Strand, St. Mary's, Isle of Scilly.
19147 BRUCE CARTER, 22 Sycamore Road, Reading, Berks.
19148 D. J. ROPER, 294F, M.Q. R.A.F. Stn., Henlow, Beds.
19149 L. W. BECKETT, Caxton House, High Street, Uckfield, Sussex.
19150 *R. H. CHILTON, 15 Norton Avenue, Lipson, Plymouth.
19151 *J. E. COOTE, 56 Dinsdale Avenue, King's Estate, Wallsend on Tyne, Northumberland.
19152 *J. G. HOUGHTON, Yew Tree Cottage, 6 Arno Road, Oxton, Birkenhead, Cheshire.
19153 A. R. HOOK, 89 Castle Hill, Beccles, Suffolk.
19154 R. A. SMITH, Landour, High Street, Brading, I.O.W.
19155 *D. M. CLELAND, Parkview, Newhouse, Motherwell, Scotland.
19156 *R. P. KELLY, 11 Graylands Road, Walton, Liverpool 4.
19157 *A. J. HAGON, 1 Purley Close, Barkingside, Essex.
19158 *J. B. M. HAIN, 228 Balby Road, Doncaster.

19159 *J. H. WADE, 30 Daniels Road, Nunhead, Peckham, London, S.E.15.
19160 *S. L. SMITH, 20 Portland Street, Newport, I.O.W.
19161 E. MINCHINGTON, Sherwell, Henty Avenue, Dawlish, S. Devon.
19162 W. H. GUNDILL, Sawley House, Dewsbury, Yorks.
19163 P. J. WHITE, 7 Oak Road, Lache Estate, Chester.
19164 J. F. LUCAS, 6 Selby Road, Ealing, London, W.5.
19165 N. RATCLIFFE, 67 Higher Croft Road, Lower Darwen, Blackburn.
19166 G. MCKEE, 66 Byres Road,. Kilwinning, Ayrshire, Scotland.
19167 J. D. NIAS, Roselyne, Burnetts Lane, Horton Heath, Eastleigh.
19168 D. G. K. GUY, R.A.F. Station, Fairlight, Hastings, Sussex.
19169 CAPT. E. PEEL, 64 Palace Road, East Molesey, Surrey.
19170 A. S. WILLIAMS, 54 Mina Road, Bristol 2, Glos.
19171 L. W. G. MARSH, Ia Beach Road, Emsworth, Hants.
19172 A. H. E. WILLIAMS, Bradley, The Ridge, Yatton, Somerset.
19173 H. DUXBURY, Sugarfield Cottages, Pickup Bank, Nr. Darwen.
19174 K. L. TAYLOR, 79 Avondale Road, Ipswich, Suffolk.
19175 T. W. LANGLEY, 2 Grinton Avenue, Welbeck Street, Prince's Avenue, Hull.
19176 W. V. SHEPARD, 174 Gristhorpe Road, Selly Oak, Birmingham 29.
19177 V. R. WOODWARD, Richmond Cottage, Newbridge, Yarmouth, I.O.W.

Corporate Members (British Empire Receiving Stations)

787 †F. S. SAXON, R.R. No. 2, Weston, Ontario, Canada.
788 V. RAJLOO, 169 Brewster Road, Ipoh, Malaya.
789 R. E. BOCCHI, Flat 1, 72 Dingli Street, Sliema, Malta.
790 M. H. HURST, Radio Section, R.A.F. El Firdan, 10 M.E.A.F.
792 H. ROBINSON, 5 Lahore Lines, Malir Cantonment, Nr. Karachi, Pakistan.
793 S. BANERJI, 8/6A Cornfield Road, Calcutta, India.
794 W. G. PENBERTHY, The Wedal, Welgelegen Road, Mowbray, Cape Town, S. Africa.
795 M. ARIFFIN, 23C Rifle Range, Ipoh, Malaya.
796 M. BUPATHY, Medical Officer, Karadibavi, Via Palladum, Coimbatore, Madras.

Corporate Members (Foreign Receiving Stations)

227 E. S. YAW, Mackenzie, Demerara River, British Guiana, S. America.
229 F. M. MEEGAN, 46 McSwiney Street, Dundalk, Eire.
230 W. SCULLY, St. Theresa's Avenue Road, Dundalk, Co. Louth, Eire.

Associates and Junior Associates

D. W. ALLEN, 49 Livingstone Road, Thornton Heath, Surrey.
L. E. BALLARD, 126 South Park Road, Maidstone, Kent.
D. CHINAMOI, 169 Norfolk Crescent, Sidcup, Kent.
D. M. DRAY, Radio House, Western Road, Bexhill on Sea, Sussex.
S. G. GILL, 23 South Avenue, Heath End, Farnham, Surrey.
F. W. GILLARD, 48 Leinster Gardens, London, W.2.
E. MILLER, 45 Sundon Road, Sundon Park, Luton, Beds.
J. P. MITCHELL, 94 Arundel Avenue, Sanderstead, Surrey.
P. M. MONTGOMERY, 60 Ellerton Road, Tolworth, Surbiton, Surrey.
D. I. MORRIS, 9 Ferring Close, Harrow, Middlesex.
J. MCKENDRY, 20 Newman Street, Ashton under Lyne, Lancs.
R. J. NEWMAN, 136 Norwood Road, London, S.E.24.
C. R. PALING, 56 Baron Street, Darwen, Lancs.
A. J. PICARD, 6 Bowrons Avenue, Wembley, Middlesex.
E. W. PICKSTON, Glendale, Headley Road, Woolley, Berkshire.
G. A. RIGBY, Melbrook, Branch Road, Mellor Brook, Nr. Blackburn, Lancs.
J. G. SCOTT, 55 Rydal Road, Heaton, Bolton, Lancs.
A. J. SHORT, 6 Rewley Road, Carshalton, Surrey.
M. D. SINCLAIR, Lamlash, Isle of Arran.
F. H. C. SMITH, 200 Ley Street, Ilford, Essex.
C. H. SPARY, 95 Herschell Road, Leigh on Sea, Essex.
T. A. TAYLOR, Natone, Alstone Road, Highbridge, Somerset.
M. G. THOMAS, 199 Woodhouse Road, Friern Barnet, London, N.12.
P. D. WALKER, 17 Laithe Road, Wibsey, Bradford, Yorkshire.
T. A. WALMSLEY, 12 Como Drive, Girlington, Bradford, Yorkshire.
W. E. WATERS, 32 Glen Road, Wadebridge, Cornwall.

* * *

R. C. ARNOLD, 36 Clarence Avenue, Queens Park, Northampton.
F. R. CLAMPITT, 8 Halton Bank, Eccles Old Road, Salford 6, Lancs.
C. H. CORFIELD, c/o 3 Meadway, Welwyn Garden City, Herts.
H. R. DAVIS, Oldeacre, North End, Yatton, Nr. Bristol.
R. C. ENEVER, 122 Lynn Road, Newbury Park, Ilford, Essex.
E. G. FROST, 6 Victoria Terrace, Leyland, Nr. Preston, Lancs.
L. H. GAESCHLIN, 38 Altyre Way, Beckenham, Kent.
D. S. HENDERSON, 10 Glenacre Drive, Largs, Ayrshire, Scotland.
R. G. LANGRIDGE, Chalet d'Or, Warren Avenue, Woodingdean, Brighton.
E. MARSHALL, 26 Victoria Crescent, Birkdale Road, Dewsbury, Yorks.
E. G. MARTIN, 19 Morgan Street, Canning Town, London, E.16.
†G. MILLER, 15 Welford Street, Salford 6, Lancs.
R. G. POPPI, 274 Kent House Road, Beckenham, Kent.
D. H. SULLIVAN, 28 Worfield Street, Battersea, London, S.W.11.
J. W. SWINBURNE, 18 Bidston Road, Oxton, Birkenhead, Cheshire.
G. THOMPSON, 48 King Edward Road, Oldfield Park, Bath, Somerset.
H. TOMKINSON, Norwood, Bramhall Moor Lane, Hazel Grove, Cheshire.
W. F. D. WALKER, 13 Burfield Street, Hammersmith, London, W.6.
A. C. WELLS, 24 Magdalen Way, Gorleston on Sea, Norfolk.

* Denotes transfer from Associate Grade.
† Denotes re-elected.

FORTHCOMING EVENTS

(Continued from Page 443)

Norwood.—June 16, July 21, 7.30 p.m., G2VB, 35 Grangecliffe Gardens, South Norwood.
St. Albans.—June 20, July 4, 18, 7.30 p.m., Ottershaw, Upton Avenue.
Slough.—July 19, 7.45 p.m., "The Golden Eagle," High St.
Sutton & Cheam.—June 19, July 3, 7.30 p.m., Sutton Adult School, Benhill Avenue.
Welwyn.—July 3, 8 p.m., Council Chamber.

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. (E.B.S.W.C.).—Tuesdays, 8 p.m., 27 Warren Avenue, Woodingdean.
Chatham (M.A.T.R.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.
Eastbourne.—July 6, Christchurch Club Rooms, Hanover Rd.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical College.
Portsmouth (P.D.R.C.).—Tuesdays, 7.30 p.m., Royal Marine Signals Club, Eastney Barracks.
Reading (R.R.S.).—June 30, 160 metres D.F.; July 28, Radio Control of Models, Abbey Gateway.
Southampton.—July 7, 7.30 p.m., 22 Anglesea Road, Shirley.

REGION 9

Bath.—June 25, 7 p.m. at 12 Pierrepont Street.
Bristol.—June 22, 7 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Exeter.—July 6, 7 p.m., Y.M.C.A., 41 St. David's Hill.
Gloucester.—Alternate Thursdays, 7.30 p.m., Spread Eagle Hotel, Market Parade.
North Devon.—July 5, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.
Plymouth.—June 16, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.
Torquay.—June 16, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—June 21, July 5, "Fifteen Balls," Penryn.
Weston-super-Mare.—July 3, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—July 9, 7.30 p.m., "The British Volunteer," The Hayes.

REGION 14

Falkirk.—June 29, 7.30 p.m., Temperance Cafe, High Street.
Glasgow.—June 27, 7 p.m., 39 Elmbank Crescent. No meetings during July.

NEW BOOKS

APPLIED ELECTRONICS ANNUAL, 1951. (*International Year Book and Directory for Radio and Electronics.*) Edited by R. B. Blaise, A.M.Brit.I.R.E. Page size 9¼" x 7¼"; 264 pages. Numerous illustrations. Published by British-Continental Trade Press Ltd., 222 Strand, London. Price 40/-.

"*Applied Electronics Annual, 1951*" lives up to the claim made for it by the Editor, that it is a useful and comprehensive reference book. The Annual consists chiefly of a number of articles contributed by experts in various fields of electronic engineering. Subjects covered include "Telecommunication Developments" (A. W. Cole, *Marconi Wireless Telegraph Co. Ltd.*); "Printed Circuits" (G. W. A. Dummer, *T.R.E.*); "British Broadcasting Equipment" (H. D. Ellis, *B.B.C.*); "Sound Recording Equipment in Broadcasting Services" (H. Davies, *B.B.C.*); "Sound Recording and the Film Industry" (N. Leevers, *Leevers, Rich & Co. Ltd.*) and "Television Progress in the U.S.A." (J. H. Pattison, New York University).

Electronic Aids to Industry are outlined in an extensive survey prepared by the *British Institution of Radio Engineers*.

The Annual contains a list of Associations and Institutes in the Radio and Electronics Industry of the World; a list of Journals devoted to Radio and Electronics; lists of Radio Manufacturers and Component Part Suppliers and a comprehensive Buyer's Guide.

The Annual should prove invaluable to manufacturers, because it throws into bold relief many of the important applications of the Electronic Art. J.C.

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ELECTRONIC VALVES—BOOK II. DATA AND CIRCUITS OF RECEIVER AND AMPLIFIER VALVES. Translated by G. Ducloux. Page size 9¼" x 6¼"; 409 pages. Numerous illustrations and tables. Published by the Technical and Scientific Literature Dept. of Philips (Eindhoven). 21/-.

This, the second book in the *Philips'* Technical Library series, contains a survey, together with descriptions and data, of modern receiving, amplifying and rectifying valves, as well as of electronic tubes for other purposes, such as current stabilisers and regulators, their uses and application. Tables are also provided of other types of receiving valves, cathode ray tubes and special valves. A large number of receiver circuits are included, as well as descriptions of measuring instruments for laboratories, workshops and testing stations, *all as at January 1, 1940*.

ELECTRONIC VALVES—BOOK III (1st SUPPLEMENT). DATA AND CIRCUITS OF MODERN RECEIVER & AMPLIFIER VALVES. Translated by G. Ducloux. Page size 9¼" x 6¼"; 213 pages. Numerous illustrations. 12/6.

The 1st Supplement of the third book in the *Philips'* Technical Library series furnishes a review, with full descriptions and data, of receiver, amplifier and rectifier valves developed by *Philips* during the years 1940 and 1941, together with their applications and circuits. A variety of receiver circuits, incorporating the valves under review, are also provided as well as a description of measuring and auxiliary instruments for use in both plant and laboratory *as at January 1, 1942*.

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ELECTRONIC VALVES—BOOK IV (VOL. I). APPLICATION OF THE ELECTRONIC VALVE IN RADIO RECEIVERS AND AMPLIFIERS. By B. G. Dammers, J. Haantjes, J. Otte and H. Van Suchelen. Page size 9¼" x 6¼"; 24 plus 416 pages. 256 illustrations. 35/-.

This is the first of two volumes in the *Philips'* Technical Library series which will cover modern valve applications in receivers and amplifiers.

The present volume deals at length with R.F. and I.F. Amplification, Frequency Changing, Oscillator Tracking, Distortion and Detection. The 24-page preface includes a detailed explanation of the symbols employed in the text books.

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Books in the *Philips' Technical Library* series are distributed in Great Britain by *Cleaver Hume Press Ltd., London*.

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ELECTRONIC ENGINEERING MASTER INDEX 1949. Page size 9¼" x 6¼"; 296 plus XVI pages. Published by Electronics Research Publishing Co. Inc., 480 Canal Street, New York 13, New York. $17.50.

Contains bibliographical listings of research on electronics, atomics, optics, physics and allied fields. The 1949 Index includes 12,500 references from more than 400 U.S., Canadian and British de-classified documents and U.S. patents. There are over 600 subject headings and a cumulative subject cross-index, covering the 1925-45, 1946, 1947-8, and 1949 editions.

All important technical articles and a number of semi-technical articles which appeared in 1949 issues of the R.S.G.B. BULLETIN are listed in the index.