R·S·G·B AMATEUR RADIO

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOLUME 28 No 2 PRICE 1/6

AUGUST 1952

ADVANTAGES OF THE 'ENGLISH ELECTRIC' METAL C.R. TUBES

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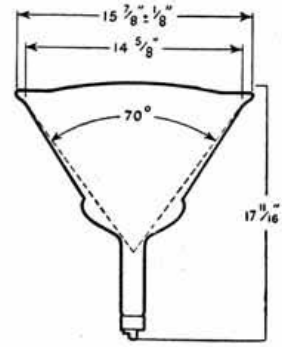

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R.S.G.B. BULLETIN

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CONTENTS

R.S.G.B. QSL BUREAU: G2MI, BROMLEY, KENT

Forthcoming Events

REGION 1

Bury.—September 11, 7.30 p.m., Y.M.C.A., The Rock.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A.
Crosby.—Tuesdays 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo, Liverpool.
Darwen & Blackburn.—September 26, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Liverpool.—September 6, 2.30 p.m., Larkhill Mansion House, West Derby.
Manchester (M. & D.R.S.). — September 1, 7.30 p.m., Brunswick Hotel, Piccadilly.
Preston.—August 29, September 12, 7.30 p.m., Three Tuns Hotel, North Road.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—August 25, September 8, 8 p.m., Y.M.C.A., off Eastbank Street.
Stockport (S.R.S.).—Alternate Tuesdays, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.).—August 19, September 2, 7.30 p.m., Kings Head Hotel.
Wirral (W.A.R.S.).—August 20, September 10, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley. — September 26, October 10, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—August 26, September 26 (A.G.M.), Cambridge House, 66 Little Horton Lane.
Catterick and Richmond. — Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—September 10, 7.30 p.m., Black Bull, Market Place.
Gateshead. — Thursdays, 7 p.m., Y.M.C.A., Sutherland Hall, Durham Road.
Hull. — August 20 (General), September 10 (Beginners), 7.30 p.m., R.E.M.E. Canteen, Walton Street.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne. — September 15 (A.G.M.), 8 p.m., British Legion Rooms, 1 Jesmond Road.
Pontefract. — August 21, September 4, 8 p.m., Fox Inn Knottingley 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.—August 27, 8 p.m., Dog and Partridge, Trippet Lane. September 10, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Sunderland.—August 20, September 10, 7.30 p.m., 16 North Bridge Street.
York. — Thursdays, 7.30 p.m., Y.A.R.S. Club Rooms, Fetter Lane.

REGION 3

Birmingham South. — August 17, 10.30 a.m., Stirchley Institute.
Coventry.—August 22, September 26, 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick and Leamington.—August 21, September 18, 7.30 p.m., Dalehouse Lane.
Rugby.—September 2, 7.30 p.m., Public Library, St. Matthew Street.
Stourbridge (S. & D.R.S.).—September 2, 8 p.m., King Edward's School.
Worcester (W. & D.A.R.C.)—Thursdays, 7 p.m., City Library (basement), Foregate Street.
Wrekin (W.A.R.S).—Mondays, 8 p.m, Wrekin Service Club, Roseway, Wellington.
Malvern.—September 1, 8 p.m., Foley Arms.

REGION 4

Alvaston (D.S.W.E.S.).—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Nr. Derby.
Chesterfield.—August 26, September 9, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—August 20, A.G.M., 7.30 p.m., Room No. 4, 119 Green Lane; September 3, 10, 7.30 p.m., Derby College of Arts, Sub-basement, Green Lane.
Leicester (L.R.S.).—August 18, September 1, 15, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Loughborough.—August 20, September 17, 7.30 p.m., Great Central Hotel.
Mansfield (M. & D.A.R.S.).—September 7, 3 p.m., Swan Hotel.
Newark.—August 17, 31, September 14, 7 p.m. Northgate House, Northgate.
Northampton (N.S.W.C.).—Fridays, 6 p.m.; September 5, 7 p.m., Clubroom, 8 Duke Street.
Retford.—September 7, 3 p.m., Community Centre, Chapel Gate.
Worksop.—September 8, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—September 2, 7.30 p.m., Marconi College, Arbour Lane.
Ipswich.—August 27, September 10, 7.30 p.m., T.A. Drill Hall, Woodbridge Road.
Little Hallingbury.—September 7, *G6UT's Annual "Ham Party,"* 2.30 p.m., Normandale, New Barn Lane. Ladies welcome.

REGION 6

Gloucester.—Alternate Thursdays, 7.30 p.m., Spreadeagle Hotel.
High Wycombe.—August 26, 7.30 p.m., G6JK, 17 New Drive, Totteridge.
North West Wilts.—Fridays, 8 p.m., G3HXA, London Road Inn, Calne.
Portsmouth.—Tuesdays, 7.30 p.m., Signal Club Room, Royal Marine Barracks, Eastney.
Southampton.—September 6, 7.30 p.m., 22 Anglesey Road, Shirley.
Stroud.—Wednesday, 7.30 p.m., Subscription Rooms.
Swindon.—September 20, 7.30 p.m., Connaught Rooms (Off Regent Street).

REGION 7

Balham.—September 14, 2.30 p.m., 4 Lyham Close, Brixton Hill, S.W.2.
Barnes & Richmond.—September 9, 7.30 p.m., 308 Upper Richmond Road.
Bexleyheath (N.K.R.S.).—Second and fourth Thursdays, 7.30 p.m. Congregational Hall, Clock Tower.
Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66-68 High Road, Chiswick, W.4.
Bromley, Kent (N.W.K.A.R.S.).—September 7, 7.45 p.m., The Shortlands Tavern, Station Road, Shortlands.
Chingford.—Recess to find a new meeting place.
Croydon (S.R.C.C.).—September 9, 7.30 p.m., "Blacksmith's Arms," South End, Croydon.
Dulwich & New Cross.—September 1, 7.45 p.m., Cliftonville Tavern, Ilderton Road, S.E.16.
East London District.—September 28, 3 p.m., Ilford Town Hall.
East Molesey (T.V.A.R.T.S.). — September 3, 8 p.m., "Carnarvon Castle," Hampton Court.
Eltham & Sidcup.—August 26, September 9, 7.30 p.m., Broadway Cafe, Southend Crescent, High Street, Eltham, S.E.9.
Enfield.—September 21, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—September 23, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Guildford & Woking.—September 28, *G2ZC "Ham Party,"* 3 p.m., Royal Arms Hotel, North Street. A p.c. to 89 West Street, Farnham, if attending.
Hayes & Uxbridge.—September 5, 7.30 p.m., The Vine, Uxbridge Road.
Hendon & Edgware.—August 27, September 3, 10, 17, 8 p.m., St. Martins School, 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—September 4, 8 p.m., "Salisbury Arms."
Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m. Grafton School, Eburne Road, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.
Kensington & Shepherds Bush.—September 12, 8 p.m., Basement Flat, 38 Royal Crescent, London, W.11.
Kingston (K. & D.A.R.S.).—August 27, September 5, 10, 7.45 p.m., Penrhyn House, 5 Penrhyn Road.
Norwood.—September 20, 7.30 p.m., 35 Grangecliffe Gardens, South Norwood.
Purley (P. & D.R.C.).—August 28, 7.30 p.m., Railway Hotel, Purley.
Reigate (E.S.R.C.).—September 4, 7.45 p.m., 19 London Road.
Slough.—August 21, September 18, 7.45 p.m., "Golden Eagle," High Street.
Southgate.—September 10, 7.30 p.m., Arnos Secondary Modern School, Wilmer Way, New Southgate.
Sutton & Cheam.—August 19, September 16, "The Harrow," Cheam Village.
Watford.—September 2, 14, 7.30 p.m., "Cookery Nook," High Street, Watford.
Welwyn.—September 2, 8 p.m., Council Offices, Welwyn Garden City.

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. **(E.B.S.W.C.).**—Thursdays, 7.30 p.m., 27 Warren Avenue, Woodingdean.
Chatham (M.A.R.T.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.
Eastbourne.—September 4, 7.30 p.m., 333 Seaside.
Hastings (B. & H.R.C).—August 26, September 9, 23, Saxon's Cafe, Seafront.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.

(Continued on page 76.)

R·S·G·B·
BULLETIN

Volume 28 No. 2 August, 1952

Current Comment . . .

Constitution

MORE than a quarter of a century ago the group of individuals who comprised the governing body of the Radio Society of Great Britain addressed themselves to the task of drawing up a constitution for this then-young organisation. It is a tribute to their wisdom and foresight that the Articles of Association which they evolved have stood the test of time so well.

A constitution loses value, however, if it is either too rigid to be modified as the passing of time may require, or so elastic that an oligarchy can bend it to its own ends if it wants to do so.

Neither of these dangers has beset the Articles of Association of the R.S.G.B., and the result is that the original "constitution" can now be brought up to date while yet retaining much of the sound basic structure on which it first was built all those years ago.

This revision of the Articles of Association has cost successive Councils a great deal of cerebration, and the Society a fair amount of money in the securing of legal advice on many of the complex and technical issues that arise from such a task. But the job is now nearly done, and consultation last month with the Regional Representatives has helped the revised draft of the Articles along to an advanced stage. They must remain confidential and, as it were, "sub judice" for a little longer before they can be submitted to the membership for approval. But it shouldn't be long now.

Poor Conversationalists?

BEFORE the war an expression that had some currency was "formula QSO," meaning the type of contact that consisted of nothing more than exchanges of reports, the barest details of the equipment in use, perhaps a remark about the weather and then, finally, an extended peroration of farewell.

The expression might well be revived. All too many contacts accord so much to that formula that you can almost guess what the other fellow is going to say before he has said it!

In certain types of contest operation the quick-fire formula has its advantages—indeed, it is often indispensable; but in the average leisurely communication between Amateur Radio operators it surely ought to be possible to develop some degree of conversationalism. After all, when we amateurs meet in the flesh there is no stopping us when it comes to talking—as the womenfolk are not slow to tell us! Yet the same cannot be said when contact is made over the air.

Generally speaking it is the telegraphy operators who find themselves most inhibited when it comes to "speaking" *via* the key. Telephony operators seem to have more to say, though in saying it the tendency to garrulity—even to exhibitionism—is not always avoided; nor is the formal "formula" that makes for monotony.

By and large operating standards in this country are pretty high, but this fact should not blind us to the realisation that, both on key and 'phone, we tend to operate too much by habit—and that is to say, by formula. We can improve the content of our communication if we give more thought to what we are about to say and, like the best after-dinner speakers, come to a close promptly when we have said it!—J.H.

Low Power Field Day

LET us hope the weather will be fine on Sunday, September 7 for, on that day, the Society's Annual Low Power Field event will take place. Although not fierce, judged by National Field Day standards, the competition last year was sufficient to bring out some first-class operating. This year, with the unique Houston-Fergus Trophy being offered to the winner, a much bigger entry can be expected.

Low Power Field Day, perhaps more than any other event staged by the Society, calls for much skill and great resourcefulness. The fact that the whole station is not to weigh more than 20 lb. means that a deal of ingenuity must be employed in order to achieve maximum efficiency.

Lamentably, last year not one of the leading competitors offered the Society a detailed description of his equipment for publication. That was indeed a pity because, according to the brief descriptions which were included in the report of the event, many bright ideas were evolved to achieve success.

The Society will warmly welcome descriptions and photographs of the stations which took part in the 1952 event.—J.C.

Skybeams, Moonbeams and Howitzers

Part II

*By P. H. SOLLOM, B.Sc., A.C.G.I. (G3BGL, ex-VS7PS)**

In the second part of this article, the author concludes his description of adventures into the realm of the unconventional, with an analysis of the geometry of a world-wide communication system using the moon to reflect radio signals. This is followed by a discussion of a practical system for very short-skip transmissions and by data charts for two of the beam aerials described.

Moonbeams

A 24-element Skybeam comprising 12 broadside sets of two co-linear dipoles for the 28 Mc/s band was erected at VS7PS. The array was fed by a 300-ohm ribbon feeder at its centre of symmetry; since the feed-point impedance was 300 ohms, no matching was required. The height above ground was 0.25λ and all the elements could be reached easily. It was found that the same current flowed in each element. A few inconclusive observations were made of solar noise as the tropical sun passed vertically over the beam.

When the moon was in the beam, c.w. signals were transmitted, but were not heard three seconds later, after reflection from the moon, either in Ceylon or in England (where the moon was 10° above the horizon at the same time). The m.u.f. predictions showed that at this time the 28 Mc/s signals would penetrate the ionosphere, but calculations indicated that the echo received from such transmissions (power 100 watts, aerial gain 17 db) would be considerably below the noise level. It appears that the concave craters on the moon do not beam the reflected waves back to Earth! If the echoes were strong enough to be detected, it should be possible to receive them at any point on the Earth at which the moon is above the horizon; for example, communication from England to Australia would be possible.

During a lunar month, the declination of the moon varies from $+27\frac{1}{2}°$ to $-27\frac{1}{2}°$ and back again, *i.e.* the moon passes vertically only over latitudes between $27\frac{1}{2}°$ N. and $27\frac{1}{2}°$ S. To determine the wave-angles and moon position for a particular circuit, "small circles" corresponding to wave-angle are drawn on a terrestrial globe, taking the transmitter and receiver locations as poles for the two sets of intersecting circles; *e.g.* for 15° wave-angle the small circle is 75° of arc along the surface of the Earth in all directions from the transmitter. Communication would be possible whenever the small circles of wave-angle from the two stations intersect between latitudes $27\frac{1}{2}°$ N. and $27\frac{1}{2}°$ S. From astronomical predictions of lunar position, the time and date of possible communication would be known; the moon must be vertically over the intersection of small circles of wave-angle. All other data: bearings of the moon at the time, actual wave-angles for a particular day, possible duration of communication for a given beam width or for beams capable of following the movement of the moon, can then be determined. The angles at which the small circles of wave-angle intersect will give the skew of the plane of polarisation of the wave due to the relative geographical positions of the stations, assuming no other distortion of the plane of polarisation occurs at the moon on reflection. The Moonbeam at VS7PS was geographically polarised N.E.-S.W. for horizontal polarisation in England.

* *The Rowans, Green Street Green, Farnborough, Kent.*

Howitzers

A sharp high-angle beam, with its maximum radiation between wave-angles of 30° and 90°, is required for short distance point-to-point communication and may be applied to emergency-net operation and local broadcasting. Such a beam can be produced by a variety of aerial systems, but the mechanical arrangement or feeder system of a certain type may lend itself to a particular requirement. Simple aerials with high-angle lobes require efficient ground reflection for their operation, and this may make them unreliable with change in weather. The high-angle lobes are not sharp in such cases and unnecessary interference can result.

The "VS7PS Howitzer" (Fig. 4) was designed for a broadcast service to South India, 300 to 700 miles distance. Its mechanical arrangement was suitable for inclusion in a curtain of aerials of the stacked horizontal-dipole type. The wave-

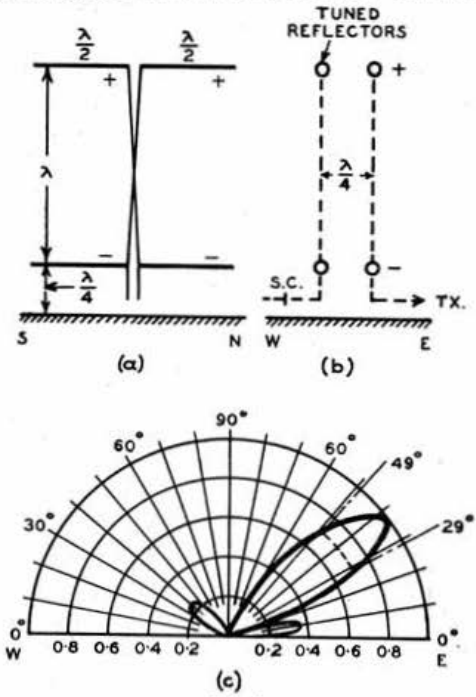


Fig. 4.

The VS7PS Howitzer, a high-angle beam for short-skip work having a gain of 13 db over a free-space 0.5λ dipole. (a) front elevation, (b) side elevation, (c) polar diagram in the plane of (b). The λ section of transposed feeder energises the stacks out-of-phase. A short-circuit on the reflector curtain feeder at 0.25λ to 0.4λ from the lower elements is adjusted experimentaly for optimum reflection.

angle of the main beam depends mainly on the phasing and spacing of the stacks. Height above ground is adjusted for minimum minor lobes consistent with the required main beam. The vertical-plane polar diagram of this beam in the direction of its maximum radiation is given in Fig. 4c. The reflector curtain is exactly similar to the radiator curtain in all details; the open-wire feeder is extended from it horizontally to accommodate the position of the short-circuit bar which tunes the reflector elements for minimum backward radiation. For reflectors spaced at 0.25λ, this is also the condition for maximum forward gain.

The broadcast service, using this high-angle beam aerial, gives good reception over the whole of India by multi-hop propagation. The performance of low-angle beams to cover North India was found to be unstable due to considerable changes in the heights of the F_2-layer, which is sometimes twice as high over South India as it is over North India or Ceylon. The effect of this in displacing the service area of a high-angle beam is much less than on that of a low-angle beam.

If a Skybeam array is divided into two halves, fed by independently matched feeders from a branch point on the main feeder, and one branch is made a little longer than the other, the beam tilts or slews towards this side. For correct operation equal power must be fed to the two halves of the array. Slews of as much as 20° are practicable with arrays having four co-linear or broadside elements (see Fig. 2, Part 1), *i.e.* the direction of maximum radiation can be slewed to lie anywhere between 70° and 90° wave-angle. The difference in the lengths of the two branches of feeder should be about 0.25λ for 10° slew and 0.5λ for 20° slew in the vertical plane containing the four elements.

Almost any desired beam-shape and direction can be obtained by suitably phasing an appropriate number of elements. Although this may require complicated feeder systems, the uniform height of the elements above ground greatly simplifies the mechanical problems. Best results will be obtained with high-angle beams when the direction of the main lobe is an intrinsic property of the arrangements of elements and phasing, and when ground reflection is used only to enhance it or to modify minor lobe pattern.

Aerial Data Charts

The performance of beam aerials is conventionally described with the aid of polar diagrams in the vertical and horizontal planes. It is difficult to visualise the space pattern of high angle beams from these diagrams. For example, the true horizontal-plane polar diagram of the 8-element Skybeams previously described is a four-lobed pattern which bears no relation to the shape of the main beam. A "horizontal" polar diagram may loosely describe one which represents the field variation around the edge of an inverted cone, *i.e.* variations at a fixed distance and wave-angle. The edge of the cone is a circle of latitude of a hemisphere about the aerial, the plane of which is horizontal. Numerous such "horizontal" diagrams are necessary in order to give a correct impression of the complete space pattern of a large array. Few diagrams of this type have been published, except for long-wire aerials [1].

A new type of chart was developed by the author to assist in the study of high-angle aerial systems. As these charts can be drawn for any aerial their application may be extended. As an introduction to this new type of chart, two specimen diagrams are given in Figs. 5 and 6 for two of the aerials described earlier. The advantages and properties of these circular charts will be considered in detail.

Power-level Contours

The performance of an aerial in all directions can be found by calculating the relative field strength for each direction in space at a fixed distance from it, *i.e.* for points on the surface of

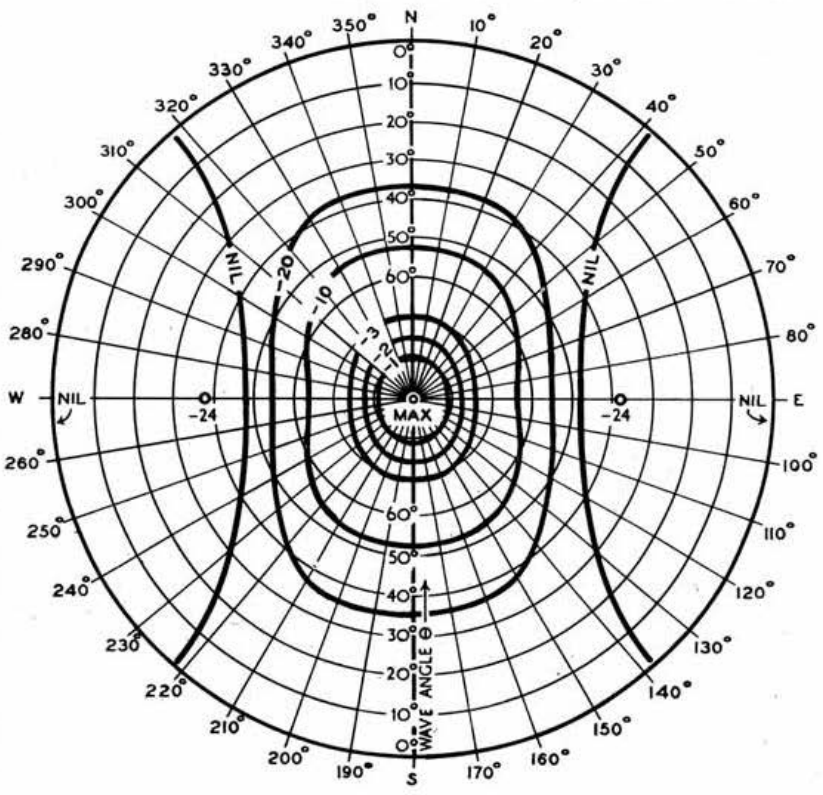


Fig. 5.

VS7PS aerial data chart. This chart shows the relative power radiated in all directions in space around the 8-dipole Skybeam with special element spacing for reduced minor lobes (Fig. 3, Pt. 1), when at 0.125λ height above ground. The chart is similar to a great circle map centred on the aerial, but the radial distance scale is replaced by a scale of wave-angle. The curves on the chart are contours of equal power intensity analagous to map contours of ground height. The useful beam is bounded by the −3 db or half-power contour. From the chart, the directivity of this Skybeam is 28.7 and its gain is 14.6 db over an isotropic source or 12.5 db over a free space 0.5λ dipole.

a hemisphere lying on the Earth, with the aerial at its centre. A point on the hemisphere can be defined by co-ordinates of latitude (wave-angle) and longitude (bearing or direction). The hemisphere is represented on a chart on which the field strengths can be plotted for each point for which calculation is made. The calculated field strengths are expressed in terms of percentage of the maximum field strength which is taken as reference. These figures can be transformed into corresponding power levels (percentage or decibel) relative to the maximum power intensity. For example, a point which has a field strength of $\frac{1}{2}$ or 50 per cent. of maximum has a power level of $(\frac{1}{2})^2$ or $\frac{1}{4}$ (or 25 per cent.) of the maximum power intensity, or is 6db down. All points having the same power level are joined by lines on the chart which are analagous to map contours. Contours can be drawn for as many levels as are required, but for simplicity only the levels of -1, -2, -3, -10, -20, db and nil have been shown on Figs. 5 and 6.

Various methods of representation of a hemisphere on a plane chart are available. In one method, equal areas on the surface of the hemisphere are represented by equal areas on the chart. Using the contour technique, and this method of presentation, Hayes and MacLarty[2] have given power distribution diagrams of stacked-dipole arrays. This equal area projection simplifies graphical computation of directivity and gain, as the area integrations can be obtained directly using a planimeter. However, only the forward or backward performance of an array fitted with reflectors can be drawn on one chart.

The circular data chart now introduced shows the whole hemisphere in a way that provides a picture of aerial performance most readily co-ordinated with a great-circle map centred on the transmitter. The technique used to obtain the contours is purely graphical, but a description of the method is beyond the scope of this article. Polar graph paper is used for preparing the chart; the most suitable type has its radial scale divided as finely as the circular scale at the circumference, which should be at every one or two degrees to facilitate plotting. The circular scale represents the longitude of the hemisphere which if orientated correctly is the same as the bearing on a great circle map. The radial scale is used as the scale of latitude of the hemisphere, or wave-angle. This scale is most convenient if it is uniformly divided; graph paper of this type is readily available.

The linear scale of wave-angle is, in general, a non-linear scale of distance measured from the centre (90° wave-angle), depending upon the layer height. The non-linearity of the wave-angle scale when used as a distance scale is, however, negligible for all practical purposes up to 30° from vertical incidence, *i.e.* between 60° and 90° wave-angle, which is also the normal limit of application of Skybeam technique. The central portion of the circular chart may therefore be used to show power levels directly for any distance up to about 200 miles, using a scale of seven miles per degree of wave-angle for an F_2-layer height of 185 miles. Linearity of the central portion of the chart is a property possessed only by this form of plotting the hemispherical co-ordinates, and it considerably facilitates the study of Skybeam service areas. Over the same range, it is unlikely that any material difference will exist in respect of the shape or size of the service area, between a great circle map centred on the transmitter, and any other type of map of the area.

Directivity and Gain

Each small "square" on the polar graph paper represents a portion of solid angle at the surface of the hemisphere. If each "square" has sides representing two degrees, its area is four square-degrees. Because degrees of longitude are not degrees subtended at the centre of a hemisphere but at the centre of the appropriate circle of latitude, a scale factor must be applied to convert the area of the "squares" into solid angle. The factor is the cosine of the wave-angle of the "square." The solid angle at the surface of the hemisphere is

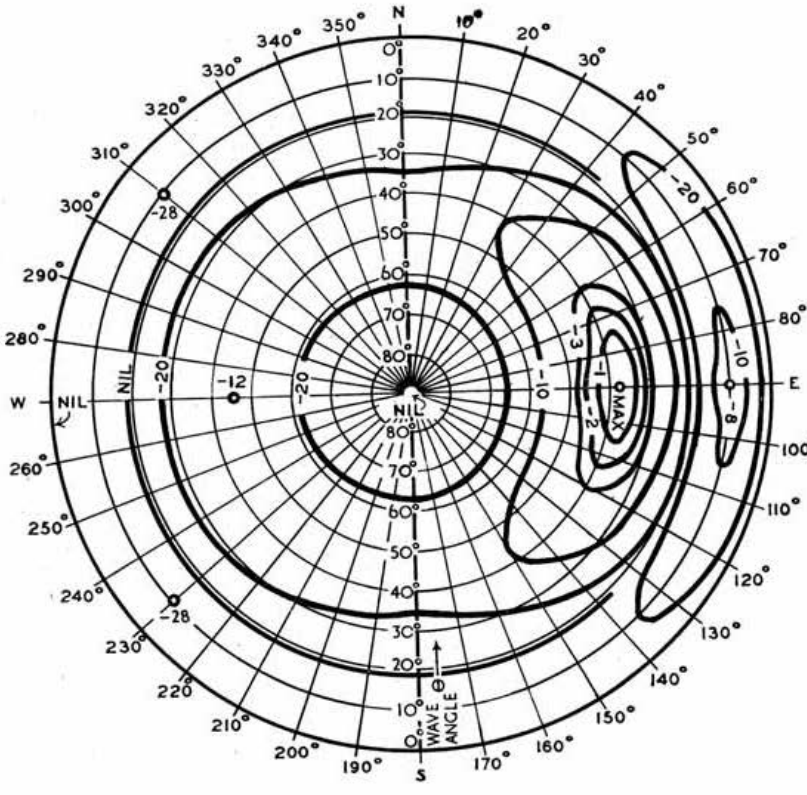


Fig. 6.
Aerial data chart for the VS7PS Howitzer (Fig. 4). The useful beam is bounded by the −3 db or half-power contour. A cross-section through the contours along the E–W line gives the relative power intensity at any wave angle in this direction (Fig. 4c). A cross-section of the contours at a constant radius (constant wave-angle) gives the relative power intensity in any direction, *i.e.*, the horizontal polar diagram at that wave-angle. From the chart, the directivity of the Howitzer is 32.5, and its gain 15.1 db over an isotropic source or 13 db over a free-space 0.5λ dipole.

evaluated by counting the "squares" and applying the appropriate factors; this is done for each power level averaged between contours. Sufficient accuracy can be obtained by assuming an average value of the cosine of wave-angle for a range of wave-angles of four degrees.

The directivity of an aerial is defined as the ratio of maximum radiation intensity to the average radiation intensity. The average radiation intensity is obtained by summing the products of solid angle and power level for all power levels (percentage), and then dividing by the total solid angle of a sphere, 4π, or 41253 square degrees. The maximum radiation intensity is 100 per cent.

An approximate formula [3] for the directivity of a single lobed beam is:

$$D = \frac{41253}{\theta.\phi}$$

where θ and ϕ are the half-power beam widths in degrees (some figures are given in Table 1, Part 1). The formula is more accurate for sharp beams.

The gain is equal to the directivity if losses in the aerial are neglected. The 0.5λ dipole in free space is often taken as the reference aerial for definition of gain; its directivity is 1.64 and its gain 2.15 db. The gain of any other aerial over this is therefore its absolute gain, minus 2.15 db.

The gain of the 8-dipole Skybeam with special element spacing for reduced minor lobes (Fig. 3, Pt. 1) at a height of 0.125λ has been computed from a detailed version of Fig. 5 and is 12.5 db over the 0.5λ free-space dipole; the gain of the Howitzer (Fig. 4) over the same reference is 13 db. These figures are accurate to within 0.5 db; greater accuracy can be obtained by drawing a larger and more detailed data chart. Normally, however, exact results are derived from theoretical calculations involving mutual impedances.

Calibration

The maximum field strength at a given distance from a 0.5λ free-space dipole can be calculated, and is given by the formula:

$$E_{max} = \frac{138}{d} \cdot \sqrt{W} \quad millivolts/metre \ [4]$$

where d is the distance in miles, and W the power in the aerial in kilowatts.

For an aerial with gain G (numerical) over the 0.5λ free-space dipole, the maximum field strength is:

$$E_{max} = \frac{138}{d} \cdot \sqrt{WG} \quad millivolts/metre$$

For any space direction from this aerial θ, ϕ (co-ordinates of wave-angle and bearing) the field strength is:

$$E_{(\theta,\phi)} = \frac{138}{d} \cdot \sqrt{WG \frac{P}{100}} \quad millivolts/metre$$

where P is the power level of the contour passing through (θ, ϕ) expressed as a percentage of the maximum power intensity.

Sections through the Data Charts

A section may be taken through the data chart contours at a fixed radius to obtain the horizontal polar diagram (at that wave-angle) in which the distance from the origin is proportional to the contour level at the appropriate bearing. A section through the contours along any diameter gives the vertical-plane polar diagram in the direction of the diameter. One contour chart is therefore a comprehensive presentation of aerial data, giving, at a glance, the relative performance of an aerial in all directions. Correlation of a graph relating wave-angle and distance (*e.g.* Fig. 1, Part 1) with these charts enables the service area of any beam to be outlined on a great circle map.

Acknowledgements

The author would like to record his thanks and appreciation of the assistance and co-operation extended him by many other amateurs in the experimental work described in this article; in particular: VS7AD, BE, BJ, BR, EP, FG, GD, GR, GV, IC, LB, MP, NG, NX, PM, PW, RA, RF, SG, SN, WA, who monitored Skybeam transmissions and forwarded reports; VU2JP, ET, 7AH who reported reception of Howitzer and other beam transmissions; and to VQ4RF, G2YZ, G3GDI, G3GNV and G5UX for reporting on special tests.

Finally, the author wishes to thank the Ceylon Government for permission to publish the details of the aerial developments made by him for "Radio Ceylon" while working for that Government under contract.

References

(1) For example, P. S. Carter's paper on "*The Vee Aerial*"—*Proc. I.R.E.*, 1932.

(2) L. W. Hayes and B. N. MacLarty, "*The Empire Service Broadcasting Station at Daventry*," p. 330, *Journal I.E.E.*, Vol. 85, September, 1939.

(3) Formula from "*Antennas*," p. 25, by John D. Krauss.

(4) Formula derived from expression (5–81) given in "*Antennas*," p. 141, by John D. Krauss.

Franco-British Television

ONE of the problems which had to be overcome in the recent successful series of Franco-British television programmes from Paris was that of converting the French 819-line system to the British standard of 405 lines. Theoretical considerations show that the conversion of one television signal to another is impossible, unless the picture-information is recorded in some way. In the B.B.C. convertor, installed at Cassel, the 819-line picture from Paris was "recorded" by displaying it on the face of a cathode-ray tube having a phosphor with a decay time comparable with the frame-scanning period, and then re-scanning the picture with a B.B.C. 405-line camera. The use of a phosphor with long persistence (zinc beryllium silicate was used) has the advantage that the exposure time is increased, resulting in a greater signal output from the camera.

Paris itself has two television systems, one operating on 819 lines and the other on 441 lines. A similar type of convertor is used whenever the same programme is transmitted by the two systems

Liberian Broadcast Reception Survey

THE Government of Liberia is anxious to ascertain whether the Government Broadcasting Station, ELBC, at Monrovia, is sufficiently powerful for transmissions to be received in the U.K. The transmissions are made daily on a frequency of 6.025 Mc/s.

Radio amateurs and short-wave listeners who are willing to assist in this survey are invited to write to the Liberian Government Public Relations Officer (2), 20 Hereford Road, Ealing, London, W.5, who will forward the necessary details and refund postal expenses.

DEVELOPING THE R107

By W. FARRAR, B.Sc. (G3ESP)*

The R107 is one of the few ex-Service receivers currently available which can be used without modification or addition to provide c.w. and 'phone reception on 160, 80, 40 and 20 metres—hence its widespread popularity among amateurs. In this article G3ESP describes how the equipment may be easily modified to expand its usefulness, providing complete send-receive action by the operation of one switch, and using part of the receiver as a microphone pre-amplifier.

THE modification to the R107 to be described consists of the nineteen systematic steps listed below, and entails re-routing of some of the wiring, the addition of a jack and two resistors, and replacement of a panel switch. When complete, the receiver audio stages can be used as a microphone pre-amplifier, and receiver-muting, plus control of transmitter units is achieved. The modification in no way affects the performance of the receiver.

The modified circuit is shown in Fig. 1. Tagboards C and D are located at the rear of the i.f.-a.f. and power-unit chassis respectively, linked together by a bunch of wires. For the purposes of comparison, the circuit is drawn in a similar way to the original circuit as printed in the official R107 handbook, to which the reader may refer, if necessary.

Modification Procedure

The following instructions are given in the order of practical convenience:

(1) Disconnect the loudspeaker and remove it from the panel. Remove completely the black wire which is connected to chassis.

(2) Disconnect the *Sidetone* switch S5b and remove it from the panel, leaving in place the green-white wire which goes down through the chassis.

(3) Remove the *Muting and Sidetone* socket, unbolting from it the tag panel with the 100 ohms resistor (R1c) which is left connected to the large 4 μF. condenser (C22a) just behind. The black wire from socket to chassis should also be removed.

(4) In place of S5b fit a d.p.d.t. toggle-switch (S8a). Depending on the type available, it may be necessary to file the rectangular panel hole to $\frac{1}{4}$-inch round. Refer to Fig. 1 for the labelling of this switch, which will perform the send-receive action.

(5) Connect the green-white wire (see 2 above) to tag "e" on this switch. Connect resistor R1c to tag "c," and connect tag "b" to a convenient chassis point.

(6) Cut a small metal plate to mask the hole previously occupied by the *Muting and Sidetone* socket, and mount on the plate a microphone jack.

(7) Across the jack connect a 1 megohm resistor (R19a). The sleeve contact of the jack should be connected to tag "b" of the send-receive switch.

(8) Soldered to one tag of the *A.F. Gain* control (VR2a) will be found a number of black wires. They should be disconnected from the tag, but left connected to each other. Using screened wire with the outer braiding earthed, connect the now vacant tag of the gain control to tag "a" of the send-receive switch, thence to the tip contact of the microphone jack.

(9) Disconnect the wires from both tags of the *Lamp* socket (top centre of main front panel), then connect the upper tag to the "+" tag behind the test panel, and the lower one to the junction of R1c and the 4 μF. condenser (C22a).

(10) Turn the receiver up so that it rests on its panel handles. Disconnect the links between tags 5, 8 and 9 on tagboards C and D. These are to be reconnected differently at a later stage.

(11) From tag "d" of the *Send-Receive* switch run a wire through a chassis grommet and under the power unit chassis to tag D12. Disconnect the wire going to tag D5 and reconnect it to tag D11.

(12) Disconnect the red wire from the *R.F. Gain* control (VR1a) and reconnect it in series with a 50,000-ohm resistor (R20a). Connect wires from each side of this resistor to tags C11 and C12 (it does not matter which wire goes to which tag).

* "Stanton," Hemsworth Road, Ackworth, Pontefract, Yorks.

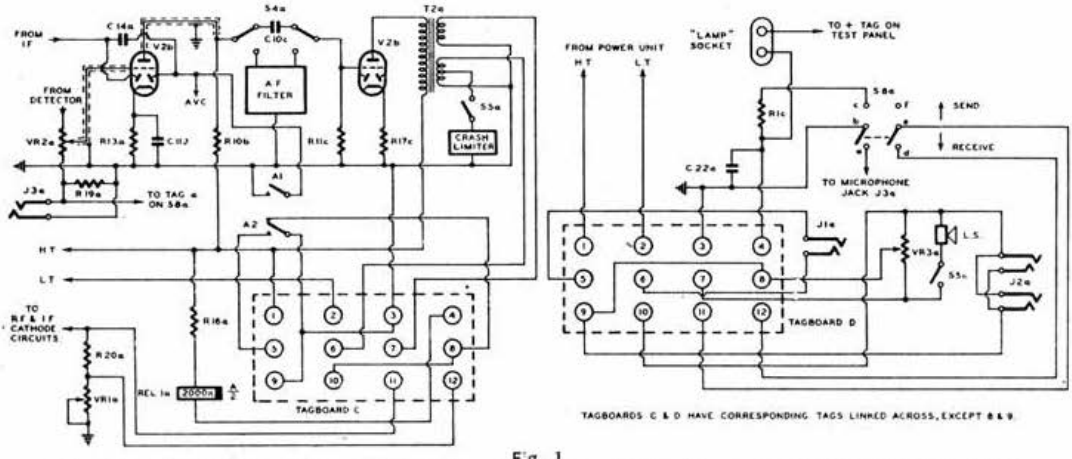


Fig. 1
Simplified circuit diagram of modified section of receiver. (Tagboards are as seen from the rear of the i.f.–a.f. and power unit chassis.)

The loudspeaker can now be replaced and the wire from the adjacent on-off switch connected to it.

(13) Under the power-unit chassis will be found a wide braided screen running from front to rear. A black wire passes through this from tag D3 to *Tel. Output* volume control (VR3a) and thence to chassis. Disconnect this wire from tag D3 and reconnect it to tag D10. D3 should be earthed to the nearest tagboard fixing screw.

(14) Remove the black wire between VR3a and chassis. Run a wire from the vacant loudspeaker tag through one of the chassis grommets and connect it to the tag on VR3a to which black wires are connected.

(15) Connect together the following pairs of tags: D8 to D9; C10 to C8; and C9 to C3.

(16) Disconnect the *Line* jack (J1a) from chassis (near VR3a), extend the wire, and connect it to tag D5.

(17) Disconnect and remove the wire running from tag C5 to a tag on the output transformer (T2a).

(18) A section of the underside of the i.f-a.f. chassis is shown in Fig. 2. Remove the wire from the relay contacts A1 to the grid circuit of valve V2b. Connect the same relay contact to tag 3 of the valveholder V2b.

(19) Link the following pairs of tags: C5 to D5; C10 to D10; C11 to D11; and C12 to D12.

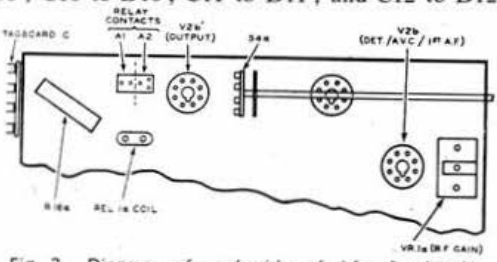


Fig. 2. Diagram of underside of i.f.-a.f. chassis.

Modified Operation

The modifications are now complete, and the result of the changes is as follows. When the send-receive switch is in the "receive" position (*i.e.*—down) the receiver functions normally, with output obtainable from either the loudspeaker or 'phone jacks, but not from the line jack. With the switch in the "send" position (up), the loudspeaker and headphones are disconnected by the internal relay, the output being transferred to the line jack. The microphone jack is connected in series with the a.f. gain control, and a 50,000-ohm resistor is brought in series with the r.f. gain control, which biases the r.f. and both i.f. valves to cut-off. This mutes the early stages of the receiver, but to prevent any possibility of breakthrough by strong signals, the detector diode is

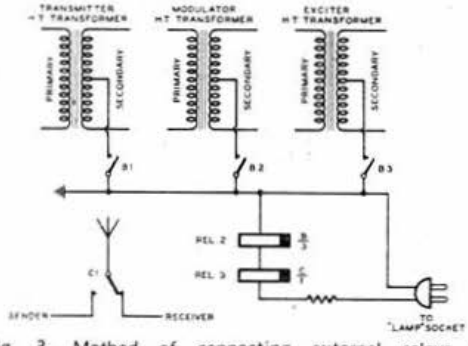


Fig. 3. Method of connecting external relays for send/receive switching of transmitter and aerial.

COMPONENT LIST

C10c: .01 μF. mica.	R1c: 100 ohms ½-W.
C11j: .1 μF. tubular	R10b: 20,000 ohms ½-W.
C14a: 100 μμF. mica	R11c: 100,000 ohms ½-W.
C22a: 4 μF. paper	R13a: 1,000 ohms ½-W.
J1a: Line jack	R16a: 15,000 ohms 3-W.
J2a: Phone jack	R17c: 500 ohms ½-W.
*J3a: Microphone jack	*R19a: 1 megohm ½-W.
L.S.: Loudspeaker	*R20a: 50,000 ohms ½ W.
S4a A.F. Filter (D.P.D.T.)	Rel. 1a: Internal relay, 2,000 ohms
S5a: Limiter (S.P.S.T.)	T2a: Output transformer
S5b: Sidetone (S.P.S.T.)	VR1a: R.F. gain 4,000 ohms
S5c: Loudspeaker (S.P.S.T.)	VR2a: A.F. gain ½-megohm
*S8a: Send/receive (D.P.D.T.)	VR3a: Tel. output 500
V2b: AR21 (EBC33)	

* *Components added in modification.*

earthed by means of the internal relay.

In use, the line jack is connected to the modulator input either through a step-up transformer (line output impedance is 600 ohms), or into the cathode circuit of the first modulator valve. A gain control will be needed in the main modulator.

The cutting-off of the r.f. and i.f. valves on "send" saves some 15 mA. of h.t. current, which can be used, if desired, to operate high-resistance low-current relays for switching on and off the transmitter, exciter and modulator, and also for changing over the aerial from transmitter to receiver. One multi-pole relay should suffice for transmitter switching, with a change-over type for aerial switching. These should be wired in series with each other and with a resistor of suitable value and wattage rating, and be connected to a plug which is inserted in the former *Lamp* socket on the test panel (Fig. 3). Putting the send-receive switch to "send" will cause these relays to operate.

If the built-in 3-inch speaker is not required for reproduction, it can be disconnected and wired through a suitable step-up transformer as a moving coil microphone, in place of the microphone jack described earlier.

The modification can be completed in a few hours. The only tricky part (if it can be so called) occurs in modifying the wiring at the a.f. gain control—but a pencil-bit soldering iron may be used here to advantage. The time and effort spent is amply repaid by the simplified station control provided, and the saving in expense of a pre-amplifier and power supply.

In conclusion, the writer's thanks are due to G3FFZ for kindly lending the R107 manual, as it was in studying this that the idea and method of modification originated.

Mr. W. A. Scarr

THE Immediate Past President (Mr. W. A. Scarr, M.A., G2WS) has been appointed British Council Representative for North-East India and expects to sail for Calcutta on September 27.

During his tour of duty abroad Mr. Scarr hopes to have many opportunities of furthering the work of the Society and of Amateur Radio generally. He also plans to continue his v.h.f. activities.

Mr. Scarr takes with him the best wishes of all members.

Congratulations

MEMBERS who know them, will wish to join in congratulating Past President E. Dawson Ostermeyer, G5AR, and Mrs. Ostermeyer, of South Woodford, London, E.18, on their Golden Wedding, celebrated on July 23 last.

Mr. Ostermeyer was Honorary Treasurer of the Society for many years and was President in 1937. He was elected an Honorary Member in 1938.

Battery-Operated Valve Voltmeter

By T. M. RODWELL (G3DRG)

THE valve voltmeter described in this article should find many uses in the shack, or in the workshop of the amateur constructor of radio and television receivers. The instrument, being battery-operated, is entirely portable, and independent of the mains for power. Originally an a.c. mains model was designed, but after due consideration, it was decided that a battery-operated instrument possessed several advantages apart from the question of portability. Input resistance can be kept high, without fear of induced mains hum becoming a problem, and there is no danger of obtaining false readings on universal receiver chassis, or a.c. sets having a leaky mains transformer.

For the benefit of readers who prefer to derive their power from the mains supply, a small auxiliary rectifier unit is described, which may be built into the instrument if desired.

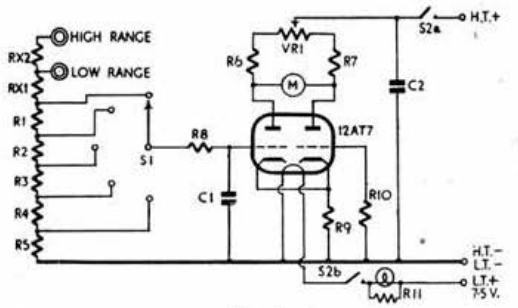


Fig. 1
Circuit diagram of valve voltmeter

R1	8 megohms	C1	0.01 μF., 4000 V. working
R2, 8, 10	1 megohm	C2	0.1 μF., 350 V. working
R3	800,000 ohms	S1	Single-pole 5-way ceramic switch
R4, 5	100,000 ohms	S2 (a & b)	D.P.S.T. switch
R6, 7	50,000 ohms	M	0–500 microammeter.
R9	1,000 ohms.		
R11	10 ohms		
RX1	20 megohms		
RX2	3–5 megohms		

Circuit Arrangements

The valve voltmeter is of the direct-reading type, with five basic ranges: 0-1, 0-10, 0-50 and 0-100 volts, but by using a different input socket, these ranges can be multiplied.

The heart of the instrument consists of a 0-500 microampere centre-zero reading moving-coil meter. The use of a meter of this type is not essential; a normal 0-500 μμA movement may be used instead. In this case the scale length of the instrument will be doubled, and a double-pole double-throw switch must be fitted to enable negative voltages to be read with the d.c. probe. The centre-zero movement has the advantage that

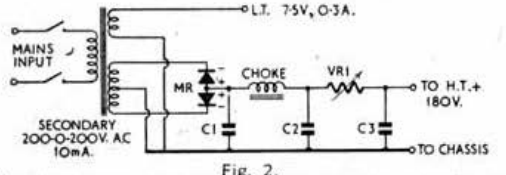
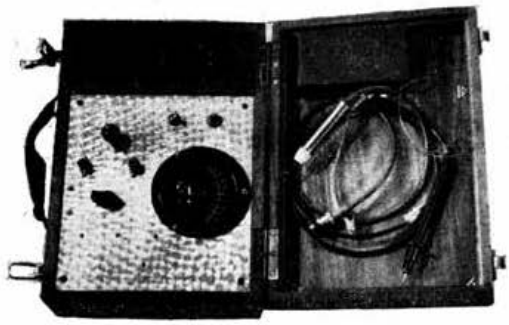


Fig. 2.
Circuit diagram of suitable rectifier unit for mains power supply. C1, 2, 3, 8 μF. electrolytic; VR1, 20,000 ohms wirewound variable (adjusted to give 180 V. h.t. on load); Choke, 10 H. 10 mA; MR—full-wave metal rectifier.



The valve voltmeter with d.c. and r.f. test-probes installed in portable carrying case.

either a negative or positive reading may be taken at will without fear of damaging the instrument.

The valve used is a 12AT7, the deciding factors in its choice being its small size and high mu of 55. Heater consumption is only 300 mA—an important consideration when battery power is employed. Power supplies are obtained from two small 90-V h.t. batteries connected in series to provide 180 V, and a 7.5 V l.t. battery of the type used in all-dry receivers. Current consumption is 2 mA h.t., and 300 mA l.t.

The circuit of the voltmeter is given in Fig. 1 and that of the auxiliary mains power unit in Fig. 2. It should be noted that the resistors used in the probes and the attenuator must be of a high-stability type with one per cent. tolerance.

The condenser C1 in the input circuit should have extremely good insulation; for this reason the writer used a 0.01 μF 4,000-V working type.

The purpose of the bulb in series with the l.t. supply is to act as a barreter, preventing excessive current drain when first switching on. It also serves as a pilot light.

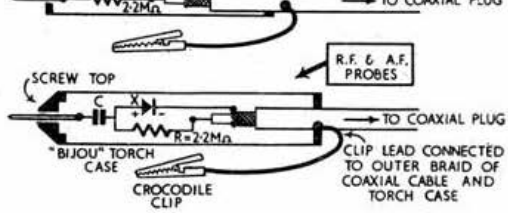


Fig. 3.
Details of probe construction. The r.f. and a.f. probes are identical except for condenser C, which is a 0.001 μF tubular ceramic in the r.f. probe and a 0.1 μF. paper in the a.f. probe. The crystal diode X is a *G.E.C.* CEX 35.

Construction of Probes

There are three probes—one for d.c., one for r.f. up to about 100 Mc/s, and one for general a.f. work. The r.f. and a.f. probes are constructed in *Ever Ready* "Bijou" torch cases, and the method of assembly should be quite clear from the sectional diagram (Fig. 3).

The d.c. probe is an ordinary test-prod having a 2.2 megohm resistor mounted so that its wire end comes into contact with the circuit to be tested. In the r.f. and a.f. probes, *G.E.C.*

GEX 35 crystal diodes are used as rectifiers, and again include 2.2 megohm resistors, which serve to isolate the circuit under test from the capacity of the coaxial cable used for the test-lead. All probes are terminated with *Belling-Lee* coaxial plugs, which connect to coaxial sockets on the body of the valve voltmeter.

When using crystal diodes for reading r.f. or a.f., it is not advisable to measure voltages above 50 V.

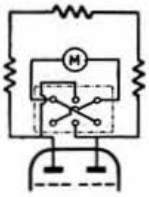


Fig. 4.
Modification to meter connections when centre-zero meter is not used.

Calibration

After switching-on, the instrument should be allowed to warm up for about half-a-minute. The pointer is then adjusted to zero by means of VR1. With the range switch in position 1, a voltage of 1 V should be applied across the d.c. probe (using a battery and potentiometer), and the input checked with another voltmeter of known accuracy. If the instrument does not read one volt with full-scale deflection, RX1 must be adjusted until this occurs. All other ranges will then be automatically in calibration. Note that RX1 is adjusted in value by substituting resistors, or combinations of resistors, until the desired reading is obtained. The value quoted in the component list should be suitable in the majority of cases.

Calibration of the range which provides a multiple of the basic ranges may be carried out by plugging the d.c. probe into the high-range socket, and inserting a resistance RX2, the value of which will depend on the degree of multiplication required. In the prototype, a resistance of 5 megohms gave a multiplication of five. No opportunity has been found for checking the accuracy of the instrument on r.f. or a.f., but it should read peak voltage.

The method of construction is not critical. The prototype was made up on a metal panel and small chassis, the whole being mounted in a wooden case originally used to house a piece of war-surplus gear.

Radio Amateurs' Examination—Instruction Courses

COURSES of instruction have been arranged at the colleges or institutes listed below for the benefit of those who wish to study for the Radio Amateurs' Examination. The courses are held in the evening, and have been planned in conjunction with the Local Education Authority. Further details, if required, may be obtained from the Principal of each college, except where otherwise stated.

Ilford Literary Institute (High School for Girls), Cranbrook Road, Ilford (adjacent Gants Hill Station, Central Line). *Radio Amateurs' Examination Course* (Wednesdays) — an eight-months course for those intending to take the examination; *Morse Code and Operating Procedure* (Mondays) —a six-months course for those who wish to learn Morse up to G.P.O. requirements. Arrangements have been made for official Post Office Morse tests to be conducted at the Institute; *Amateur Radio Refresher Course* (Tuesdays)— a six-months course of revision. Fee for each course is 10s. Enrolment at the Institute from 7 p.m. to 8.30 p.m. September 8-11, but names should be sent to C. H. L. Edwards (G8TL) 10 Chepstow Crescent, Newbury Park, Ilford, Essex, in the first instance.

Wembley Hill Evening Institute, High Road, Wembley. Preparation for the Radio Amateurs' Examination by A. Bayliss. B.Sc., G8PD. *Morse* —7 p.m. to 8 p.m.; *Theory*—8 p.m. to 10 p.m., on Monday evenings. After the examination in May, 1953, classes will be confined to practical work until the end of the session. Enrolment will take place at Park Lane School, Park Lane, Wembley, from 7 p.m. to 9 p.m. during the week September 15-19.

* * *

AS the result of the initiative of the Surrey Radio Contact Club, the Croydon Education Committee has agreed to organise a course of instruction for the Radio Amateurs' Examination. The class will be held on Wednesday evenings at the Croydon Polytechnic, Scarbrook Road, Croydon, from 7 p.m. to 9 p.m. Enrolment dates are September 15, 16 and 17.

Education for Entry to the Radio Industry

FULL-TIME three-year courses for radio-technicians, organised by the Ministry of Education, will start in September, 1952, at five centres in London, the Midlands and the North.

The courses are an indication of the concern felt by the radio industry and the Government at the present shortage of trained technical personnel, aggravated by the increasing use of electronics, and the rearmament programme. They have been devised to meet the needs of the industry, the objective being to provide students so well trained in the theory and practice of electronics that they will be able, on completion, to take their places at once as assistants to qualified research and development engineers.

The entry age will be 16 or 17 years. Details of the courses are obtainable from the principals of the colleges concerned,namely: Northern Polytechnic, Holloway Road, London; Norwood Technical College, Knights Hill, London, S.E.27; E.M.I. Institutes, Ltd., 46 Pembridge Square, London; Coventry Technical College, The Butts, Coventry; and Bolton Technical College, Manchester Road, Bolton.

Stockholm Conference on V.H.F. Sound and Television Broadcasting

REPRESENTATIVES of 31 countries recently attended a Conference in Stockholm to consider the assignment of very high frequencies for sound and television broadcasting in Europe within the three bands allocated for those purposes at Atlantic City in 1947, namely—41-68 Mc/s (Band 1), 87.5-100 Mc/s (Band 2), and 174-216 Mc/s (Band 3).

In Band 1, the Conference accepted the assignments which the U.K. has made for the five high-power and five low-power television stations planned by the B.B.C. Provisional proposals for the future development of sound and television services in Bands 2 and 3 were submitted. The U.K. delegation also secured alternative sets of frequencies for a.m. and f.m. services in Band 2.

An agreement was subsequently signed on behalf of the administrations of 21 of the 31 countries represented at the Conference, the non-signatories being Portugal, the U.S.S.R., and eight other Eastern European countries. The Stockholm plan will come into force on July 1, 1953.

DX TOPICS

THE MONTH ON THE AIR

by A. O. Milne* G2MI

Twenty-One Megs

AT the time of writing, 21 Megs had been available to British Isle amateurs for nearly a month—long enough to take stock of its potentialities and to see what it has offered to those who have taken the trouble to turn their doublers into triplers and put up a new aerial.

In general the band produces very little of interest in the early mornings, except FA and FF, but by lunch time the PY's come through at good strength and seem to remain in for most of the rest of the day. The south-west has provided most of the workable DX with ZD9AA at 1500 G.M.T. as the "plum." Incidentally he is now on every Sunday afternoon. East African stations usually come in well late in the afternoon with VQ4HJP the predominant signal. There have been a few openings to the U.S.A.—mostly rather late at night—and some short skip to Europe giving S9 conditions for isolated stations. Fading has been a little troublesome but not so deep or so complete as on 28 Mc/s. We have not heard any Australasian signals ourselves, but understand that one or two VK's have been worked.

Most of the G's who have been active on the band (G2MI, 2PL, 2VD, 3KP, 6BB, 6KP, etc.), have already worked four or five continents and 20 to 30 countries apiece.

G2BJY claims that he made the first G-YI contact on July 8, when he worked YI3BZL. He has also worked 5A2CF, 9S4AX, HZ, PY, SU, VQ4, ZC4, ZE, ZS, EA, F, G, HB, I, OE, PA, SM, YU, W1 and W2. Those heard but not worked were JY1OG, KP4CC, TF5SF, CT3AB, VK2AWU, EL2DR/MM, ZS5MP, ZS6FN and several OQ's.

G2VV, who has worked 10 countries, comments that it is never safe to assume that the band is dead because nothing is audible. A CQ will often produce a DX reply from an apparently empty band. He says OLU (21000 kc/s.) is a good pointer to band conditions. When that station is strong, the band is good. Almost anything audible is workable and power input seems to make little difference.

G3JW is another one who has made a good start with FA, DL, G, GM, I, 9S4, PA, PY, OZ, ZC4 and ZS already in the bag.

Amateurs in several European countries, notably France and Italy, are now allowed to use phone, and a number have been coming in well between 21200 and 21450 kc/s. The South Africans have the band on the same terms as ourselves.

G6BB has remarked on the help he has received from G2PL and G6KP. He also has a good score with 9S4AX, TF3SF, PY2AQ, TF3MB, KP4CC, ZC4RS, ZC4RX, and no less than five W's.

G8OJ made an excellent start by working G, GC, GM, GW, CT3, EA, HB, I, ON, 9S4, OZ, PA, MI, KP, W2, ZC4, ZB1, ZE, VQ4, 5A2 and ZS.

One strange effect is the behaviour of medium distance stations, like DL2RO, ZC4XP, etc. They usually appear quite suddenly at about S5-6, one gets contact, and then signals on both sides fade out. A few minutes later signals come up to S9, remain with minor fluctuations for perhaps half an hour, then steadily die away.

Unfortunately we have been given 21 Mc/s at a time when conditions are in the worst possible trough, but mark our words—this band is going to be, what the Americans call, "a honey." In a year or two it will have all the attractions of both 14 and 28—the reliability of the former and the strong signals of the latter.

Notes and News

G8FC gives a few interesting frequencies for 14 Mc/s, notably HS1WAR, 1850 G.M.T., 14042; KG6ACJ, 1500, 14025; VK5DP, 1500, 14025; CP1BK, 2200, 14023 and CE3NG, 0010, 14152.

The Bermuda Challenge Trophy Contest takes place on August 23/24 commencing at 2100 G.M.T. and ending at 2100 G.M.T. Operation will be on both 'phone and c.w. Bermudan amateurs have decided to run their annual field day each year to coincide with N.F.D.

The Tangier Radio Club is now in being. All stations are using the new prefix CN2. EK1CW is now CN2AP and EK1RR is CN2AS.

GM3DHD tells us of the death of VS1AX. Many DX'ers will remember genial John, the man from Dundee, who was due to retire and return to his native Scotland next year.

FP8AW was operated by W0AIW and provided a new country for many during July. ZS1FD, who is now operating from ZS3FD on low power, has worked regular schedules over 2,000 miles with an input of 4.5 watts. G5VT has worked YA1AA who said, "Please wait card." We wonder! Who was G3PGH/MM? He was heard several times on 14 Mc/s calling CQ with a very rough note.

A Sutton listener, J. A. Harvey, asks 'phone stations not to "gabble." He says it is often quite impossible to identify a call sign at the end of a transmission because of the way in which it is said. After all, it is a call signal, intended to make clear who is sending, so please—a little better enunciation, O.M.'s.

The 5A2's are complaining of the high power American Service amateurs who clutter up the 14 Mc/s band with what are nothing more than military telegrams. We couldn't agree more, but fear it is just that in certain respects the American conception of Amateur Radio is not the same as ours.

W6KIP would like to get into touch with ex-VU2PB. Can anyone oblige? A card from FB8ZZ reposes in the Bureau, addressed to G6XAR, for a contact on May 1st, 1951, 14 Mc/s c.w. The report given is 489. No time is stated. Any claimants? Those interested in the Helvetia XXLI certificate should have worked

* 29 Kechill Gardens, Hayes. Bromley, Kent.

HB1MQ/VS who was in the Wallis Canton from August 10th to 12th inclusive.

G5JL who bravely sticks to seven says there were several good mornings during July for W. VK2, ZL4, CO2OK, 7028, 0530; YV6AO, 7030; TA3AA, 7030; and 4X4DH, 7045 were worked. B.R.S. 13386 of Northampton sends the following addresses: MI3LV, Box 374, Asmara; YU4BN, Box 420, Sarajevo; OD5AD, Box 1202, Beirut, Lebanon.

G2HLB complains that his call is being pirated by someone giving the name of Gordon. From G6RH we hear that 3A2AH's call has also been pirated. 3A2AM may soon be on 7 Mc/s 'phone. 3A2AK was operated during July by F8BS and F9LQ. 3A2AQ was F7BB. Two interesting but doubtful ones heard were CR1OA, 14095 on July 19th and ZA3KAA on 14070. G2VV reports hearing SM8TK/MM at the l.f. end of 14, off Santiago, Chile. GM2DBX had a good month with ET3R, CP5EQ, CP3CB, FP8AM, 4W1MY and VP9G. Those who got away were VP2AF and VP7NT. All on 14.

The DX fraternity owe a real debt of gratitude to HZ1MY who has given so many of us the chance to work a new one with his expeditions to Yemen and French Somaliland. Thanks O.M.

Who's Who

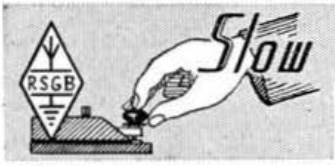
Amateurs in Dutch West Indies are now fully licenced and here is a list of those active: PJ2AA, S. J. Heeringa (Geo.), Dakota Airport, Aruba; PJ2AB, R. C. Abendanon, B-926, Lago Heights, San Nicolas, Aruba; PJ2AC, A. Kooiker (AB), Dakota Airport; PJ2AD, J. M. Kelkboom (Joaquin), P.O. Box 9, Orangistad, Aruba; PJ2CA, S. Reitma, Dam 2, Juliana Lorp, Curacao; PJ2CB, H. L. Sterke, F. D. Rooseveldweg 246, Curacao. PJ2AA is the QSL manager and 2AD is Secretary of their local Society. This news comes from W5FNA.

OD5AJ who is at P.O. Box 352, Tripoli, Lebanon, says Amateur Radio is booming in OD-land. B.R.S. 19607—YI2FD—should soon be supplementing the efforts of YI3BZL. SU1FD is temporarily QRT. VS2DB (S. A. Faulkiner, Box 660, Penang, Malaya), is on daily from 1430-1600 G.M.T. looking for British Isles contacts. He is the new VS2 QSL manager.

From G4CP we hear of W5AGB/FM—"Floating Marine!" The operators have a BC610 on an ice floe which is steadily drifting towards the North Pole. They claim to be the world's only true FM station! VQ4BU is now VQ3BU, whilst Ted Jones, MD2PJ/5A2TI/SU1PJ, is now back home and hopes soon to have a G-call. ZC4DT/VT1AC/MP4KAA also expects to be back in England shortly.

* * *

That is the lot for this month chaps. Remember. This is *your* magazine and M.O.T.A. is *your* feature. It doesn't write itself. You write it. More news, more news. That is the crying need, not just lists of calls but information. Why cannot some of our leading DX men lend their support? Sincere thanks go to those who have loyally sent in their stuff each month, but there ought to be very many more.



Slow Morse Practice Transmissions

The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E. (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

* *Each station will operate in turn.*

B.S.T.	*Call*	*kc/s*	*Town*
Sundays			
09.00	G3LP	1850	Cheltenham
10.00	G6MH	1990	Southend-on-Sea
10.30 *	G3AAZ, G3EPK, G5UM	1780	Welwyn
10.30	G3GIO	1915	Guildford
11.00	G2FXA	1900	Stockton-on-Tees
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
20.30 *	G6LX, G3BLP	1875	Croydon
21.00	G3BHS	1720	Eastleigh, Hants
21.00	G3BLN	1900	Bournemouth
22.00	G3GIO	1915	Guildford
22.15	G2BRH	1900	Ilford
22.30	G8TL	1896	Ilford
Tuesdays			
19.00	G3IBL	1883	Derby
19.30 *	G3HGY, G5PP, G5SK	1830	Coventry
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2BND	1890	Dalston, E.
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3GIO	1915	Guildford
22.45	GM3GUS	1800	Dunfermline
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea

B.S.T.	*Call*	*kc/s*	*Town*
Wednesdays *(continued)*			
19.00	G3ADZ	1900	Southsea
19.30 *	G3HBX, G6XA	1870	Warwick
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3GIO	1915	Guildford
Thursdays			
19.00	G3NC	1825	Swindon
19.30	G3GRM	1815	Derby
19.30 *	G2DOF, G5DTG, G3ENH, G6KI, G8JI	1830	S. Birmingham
20.00	G3FVH	1920	Hull, Yorks
21.30	G6DL	1760	Birmingham
22.00	G2NK	1730	St. Mary Cray
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
22.45	GM3GUS	1800	Dunfermline
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3CSG	1870	Wirral
21.00	G3BHS	1720	Eastleigh, Hants
22.00 *	G3AUT, G3AUF, G3CBV, G3GTX	1785	Rugby
22.00	G3GIO	1915	Guildford
Saturdays			
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford
23.00	G2FXA	1900	Stockton-on-Tees

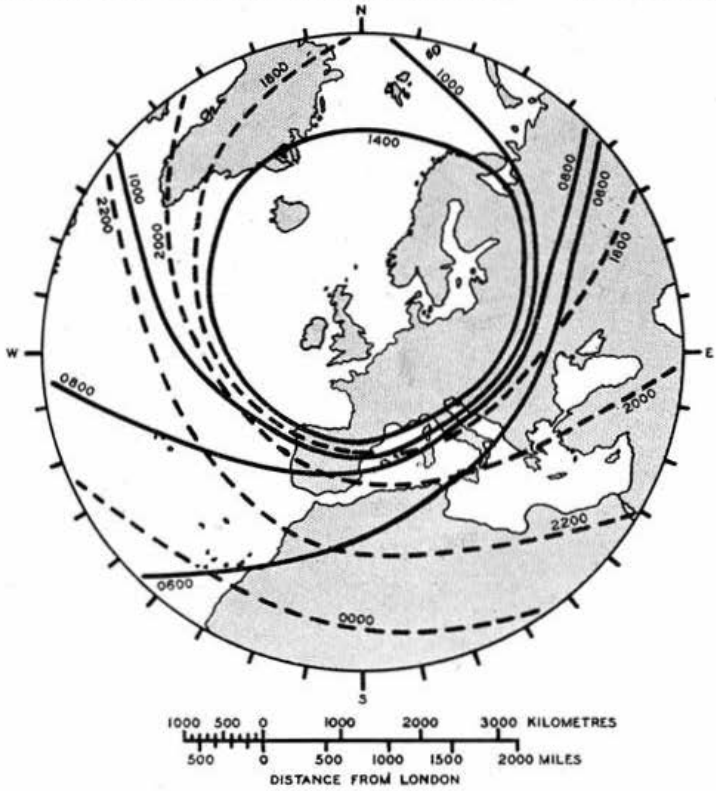
MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED

Skip Distance Predictions for the Amateur Bands

*By P. H. SOLLOM, B.Sc., A.C.G.I. (G3BGL)**

IF the skip distance for a particular frequency is defined as that distance for which the frequency is the m.u.f., it is known as the maximum skip distance; the actual skip or region of zero sky-wave signal is always slightly less.

The method used for computing a chart of maximum skip distances at various times during the day for a given frequency band was described in the April issue. The predictions are based on data supplied to the Society by the Department of Scientific and Industrial Research. Points on a great circle map plotted for the same time are joined together by a curve showing the fringe of the skip zone at that time.



The curves on the accompanying map, centred on London, show predictions, for September, 1952, of the fringe of the skip zone for transmissions in the 14 Mc/s band from S.E. England *via* the F_2 layer, at various times throughout the day (expressed in G.M.T.). At any given time signals may be received from points between the appropriate curve and the edge of the map. The solid curves are for the period when the skip is shortening; the broken curves are for the period when the skip is lengthening.

Skip distances from Ireland are similar to those measured from London in corresponding directions, but will occur about 45 minutes later. Skip distances from Scotland are, in general 200-500 km. longer than those measured from London in corresponding directions.

Used in conjunction with the Skip Distance Map, published last month, the trend in conditions can be followed. Since the hours of sunrise and sunset are continually changing, and as the sunspot cycle proceeds on its way, it is to be expected that the predicted maximum skip distances (which are for an average day) will be too short at the beginning of the month, and too long at the end, or *vice versa*, depending upon this trend.

* *The Rowans, Green Street Green, Farnborough, Kent.*

The Worked All Europe Award

WITH reference to the Worked All Europe Award, details of which appeared on page 29 of the July issue, Mr. James McCall, GM3HGA (Lerwick, Shetland Isles) states that as countries in Russian-controlled territory (Nos. 43 to 51 in the list) can no longer be worked from Western Europe, a substitute list of countries, compiled by DL7AA, has been issued by D.A.R.C. The list is as follows:

43	DL8 (Soviet Zone of Germany)
44	GM (Shetlands)
45	LA (Northern Norway)*
46	OH8 (Northern Finland)*
47	SM2 (Northern Sweden)*
48	GM (Orkneys and Hebrides)
49	SM1 (Gotland)
50	OZ (Bornholm)
51	DL7 (Western Berlin)

* *Area above the Arctic Circle.*

Applicants resident in the "substitute countries" are not permitted to count contacts with stations in their own country for W.A.E. purposes.

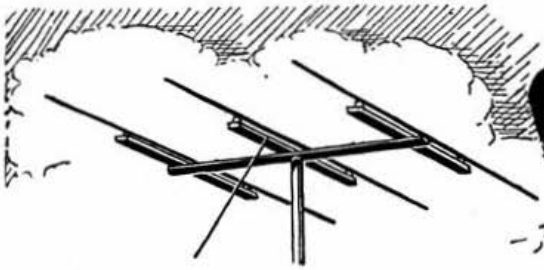
Mr. McCall comments that he and the other two amateurs active in the Shetlands (GM3HTH, Lerwick and GM3ANG, Sumburgh) have been kept busy with European schedules since the Islands became a "substitute country" for W.A.E.!

New R.E.P. Awards

TWO new awards, available to licensed amateurs who are members of their National I.A.R.U. Society, are announced by R.E.P., the national Amateur Radio organisation in Portugal.

The first, introduced to celebrate the Society's 25th Anniversary (1927-52) and called the *Insular and Continental Portugal Award* (D.P.C.L.), requires proof of contact with 50 stations in the various Portuguese provinces (including Azores and Madeira) since January 1, 1952. The second—*Diplomo do Mundo Portgues, Worked Portuguese World* (D.M.P.-W.P.W.)—is awarded to amateurs who have worked one station in each of the prefix zones CT1, 2, 3, CR4, 5, 6, 7, 8, 9, 10 since July 29, 1947. Telegraphy or telephony is permitted on any of the authorised amateur bands.

A certificate will be sent to each successful applicant. Further details can be obtained on application from Rede dos Emissores Portugueses, Travessa Nova de S. Domingos 34,1, Lisboa, Portugal.



AROUND THE V.H.F.'s

24cm Record Again Broken

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

MANY readers will remember that, some three years ago, several remarkable long-distance contacts were achieved on 70cm by G6DP and G2JT operating portable from mountains in Wales and Scotland. The British record of 130 miles, and incidentally the first GM/GW two-way QSO on 70cm was held by them at that time. Owing to the fact that more than a little mountaineering was called for in those tests the gear had to be extremely light and compact and, in order to keep weight to a minimum, operated at low power from dry batteries.

On July 12, 1952, these two amateurs gained the 24 cm record with a contact between G2JT's fixed station at Werneth, Oldham, and GW6DA/P situated on Carnedd Llewelyn, North Wales, over a distance of 81 miles on a frequency of 1217 Mc/s, thus beating the previous record of 75 miles set up by G8DD and G3QC nearly two years ago. At the portable station a CV90 oscillator worked as a superregen. detector with a 6C4 quench stage for reception and with another 6C4 modulator for m.c.w. transmission. Filament current and receiver h.t. were derived from dry batteries while a hand generator supplied the h.t. voltage to the transmitter with a total input to the oscillator/modulator of between four and five watts.

The aerial was a 4-element Yagi with mesh reflector coupled by about a foot of 70-ohm twin line to the cavity probe of the CV90. At G2JT two transmitters were available: a somewhat similar CV90 modulated s.e.o. (with rather more input than was possible at the portable site), and the other a crystal-controlled job with a 446A "lighthouse" valve as the final doubler to 1217 Mc/s. The r.f. output from the c.c. transmitter was lower than that from the s.e.o. The receiver at 2JT was a crystal controlled superhet. converter with a crystal mixer in a cavity resonator feeding into a communications receiver at 14 Mc/s. Several Yagi aerials were available, but the most successful arrangement was found to be a dipole with "front reflector" mounted in a parabolic reflector, despite the fact that the diameter of the latter was only 27 in. Signal strengths of GW6DP/P and G2JT respectively were S7 and S8 with S5 from the c.c. rig. It was possible readily to read 'phone from the fixed station.

There was dense mist on Carnedd Llewelyn at the time, combined with a cold gale; for operating, shelter had to be sought behind the summit cairn and later a few feet down the leeward side of the mountain which, luckily, was the right side for G2JT. Despite the extreme physical discomfort of working under such conditions communication was maintained for over two hours while tests were carried out.

It is clear from these tests and from those conducted over the past weeks between the two fixed stations separated by 30 miles, that only very low power is needed to put-over a good signal, and with c.c. for transmitter and receiver at both ends results should be comparable with those obtained on 70cm.

Two points arise from this experiment: first, that, in the hands of a determined and experienced operator, light and simple gear can be made to give an excellent performance, even on frequencies exceeding 1000 Mc/s, and second, that the very real problems of successful crystal control on these frequencies, both for transmitter and receiver, are capable of solution by amateurs employing normal amateur-constructed gear. We offer our hearty congratulations to both G2JT and G6DP on their outstanding performance.

The Two-Metre Band

During the three weeks ending July 6, EI2W (Dublin) worked 20 new G's, bringing his score up to 126 stations in all. In the European V.H.F. Contest on July 5/6, 17 contacts were made with an average distance of 206 miles per QSO —an extraordinary performance which goes to show what DX is possible for a well-situated station operating on the two-metre band. During this contest G3BLP and G5YV were outstanding signals, but G3EHY remains the most consistent signal—S9 plus most of the time, falling to S7 when conditions are really poor. Most contacts have been made with the aid of a "5 over 5" with delta matching to the feeder which appears to be superior to the stacked array used at some stations. A "7 over 7" wide-spaced Yagi type of beam is in course of construction and should be in use early in August.

GM3BDA (Airdrie) continues to put a very loud signal into Dublin and is seldom heard at less than S9. EI2W intends operating on a frequency of 145.81 Mc/s from the middle of September onwards. Perhaps others will follow his example and help to populate the many empty kilocycles at the h.f. end of the band.

EI2W recommends a system of calling on 'phone in which both call signs are repeated frequently, for example, "G8IC Doncaster calling EI2W" rather than numerous repetitions of the call of the desired station. This should make identification easier during periods of fading as well as facilitating beam adjustments. Incidentally, EI2W has cards on hand, pending mailing addresses, for G2JT, 3AOO, AUS, AUU and DUP.

G5MP (Hythe, Kent), operated portable near Dover during the European V.H.F. Contest. Conditions were poor and patchy with severe fading. The most consistent station heard was ON4BZ (Brussels) who reported G5MP/P at S9 hours after all other British stations had fallen to inaudibility. ON4BZ heard two Danish stations just before the contest commenced, an SM, several stations in the Paris area, a DL6 at about 600 km range and some G's around noon on the Sunday.

* 32 *Earl's Road, Tunbridge Wells, Kent.*

G2DKH (Stanley, Co. Durham), finds it almost impossible to work anything from his home location and so operates portable from a hill-top site nearby. During the past two months about 40 different stations have been worked ranging from Kent and Surrey in the south to Scotland in the north. On July 4 regular skeds. were carried out with G8AO/MM from noon, when the ship was leaving Sunderland, until after midnight when it had reached a position well south of the Humber.

One of the most consistent 'phone transmissions on the two-metre band is that from G2PU (Cambridge), who worked between July 4 and 10 DL3QA, DL3TD (144.81), DL6FX (144.24), DL6SV (144.90), ON4BZ, ON4XB, OZ2IZ (144.21), OZ7WA (144.36), PA0BAL, EO, EQ, FC, FP (144.79), IKS, WI and PE1PL (144.01).

During the 11-day period ending July 5, G3EHY (Banwell, Somerset), managed to work GM3BDA on five occasions, signals at times being very strong considering the distance of 335 miles. On June 30 the Scottish station was heard for over two hours working stations in Lancashire, all of whom could be read in Banwell off the backs of their beams together with G3BW (Whitehaven, Cumberland). GI2FHN/P, portable in Co. Antrim, was worked on c.w. just before noon on July 6 at a distance of 265 miles. His input was 15 watts. Four nights later a QSO lasting 30 minutes was enjoyed with GI3GQB (Newtownards, Co. Down). Later G3DA/P (Great Dunn Fell, Westmorland) was added to the log. ON4BZ was heard at S6 on 'phone on July 1.

G6XX (Goole, Yorks) found conditions poor during the period July 1 to 19 with the exception of the 5th and 6th when PA0HA and PE1PL were worked; G3DA/P in Westmorland was contacted at S8 both ways on three occasions despite the intervening range of mountains. G6XX makes a plea for more operation during TV hours, since building a T.V.I.-proof 2m. transmitter should not be too difficult a task. He points out that many people have to get up early in the morning, and with the present late television hours find themselves with practically nothing to work unless prepared to sit up very late.

The 70 cm Activity Plan in Operation.

A newcomer to the band, G3BVU (Witney, Oxon.) has only been operating since July 8 but in the intervening three weeks has worked 17 stations in six Regions including G2BAT (Falmouth) and G5YV (Leeds). His exciter makes use of five 6J6 valves arranged as harmonic oscillator, two p.p. trebler stages and a pair in p.p. as a final buffer, the latter modulated for local working and driving an 832 with 40 watts input for c.w. The receiving side comprises a cascode r.f. stage, 6AK5 (triode) mixer, 6J6 oscillator/trebler and a 6C4 cathode follower providing output to the 8 Mc/s i.f. amplifier.

Taking advantage of the high pressure system which existed around June 10, G6LI (Nr. Grimsby, Lincs.) had no difficulty in making a number of contacts with Scotland. ON4BZ was also well received. July 4, when again the barometer was high, produced signals from DL, OZ and PA as well as GW3ENY and GW5MQ, but calls directed towards the South of England had no effect. On the following day the band was lively and well occupied from 1600 B.S.T. onward. Several Dutch stations were worked at good strength followed by DL1JH (Kiel) who was S7 both ways at 2000 B.S.T. British signals were practically all from the north and north-west and G2AJ was the only London station audible.

Congratulations to G3WW on winning the *Radio Amateur* V.H.F. Contest. As the "Ladder" will show, G3WW was kept pretty busy during July and it is next to impossible in the space available to do more than mention a few points from his extensive report. As usual he managed to find quite a number of new or little-known stations to work—little-known, at least in the southern part of the country, and it might be of interest to mention some of them: G2BAT (Falmouth) FCV (Orford, Warrington), FXK (Staffs.), 3AYT (Hyde, Ches.), CSC (Prescot, Lancs.), CWV (Nr. Birmingham), EOH (Enfield), GMX (Timperley, Ches.), HII (Liverpool), IEX (Henlow, Beds.), 8DA (Gloucester). G2HCG (Northampton) is trying n.b.f.m. Welcome back to G2KG who has not been heard on the band for a long time. G4LX (Newcastle), on 144.117 Mc/s each evening after television, hears many stations, but finds he cannot raise them. When in QSO with G8AO/MM off Flamborough Head on July 4, G3WW was RS58 with both G4LX and GM3EGW.

G6RH (Bexley, Kent) worked OZ2FR at 2305 B.S.T. on July 4. Reports were RS58 both ways. Ten minutes earlier a number of DL's from the Hamburg area were heard, together with a Norwegian station—the first so far reported in this country—which could not be definitely identified owing to fading. According to OZ2FR it would seem that the station concerned was LA7G. G6RH has a QQVO6-40 running 60 watts, anode-modulated, into a "4 over 4" array.

G3BW (Whitehaven, Cumbs.) found conditions in late June and early July excellent and contacts were made (among others) with G2FAN (Ryde, I.O.W.), 3ABH (Poole, Dorset) and G5MA (portable in Sussex). Outstanding signals on the band were G2AJ, 3BLP, EHY, FAN, WW, 4MW, 5BM, 5MA/P, 5TP, 6NB/P and 6XM. G3BW intends operating portable during the second 144 Mc/s Field Day on September 21.

Similar conditions were experienced by B.R.S. 1579 in Bolton, Lancs., who is situated 650 feet a.s.l. and in an excellent position for 2m reception from all directions except towards the north. Between June 10 and July 17, 62 English, three

Welsh (including GW3BOC/P), EI2W and five Dutch stations were heard.

Well-known on the 2m band, when he was situated at Daventry, GM3BA now operates from Salsburgh where he is associated with the television station at Kirk o' Shotts. He is active on both 2m and 70cm, the QQVO6-40 final acting as a p.a. or tripler as required. The aerial position leaves something to be desired, but results so far achieved have been quite encouraging with a number of GM's and GW5MQ on 2m, and cross-band QSOs with GM6KH and GM6WI in Hamilton and West Glasgow. GM6WL intends to operate portable at Lowther for the September 2m Field Day and to have 70cm equipment available on the site. He makes the suggestion that other portable stations might also take advantage of this opportunity. Anyone interested in arranging skeds with Scottish stations on either 2m or 70cm is invited to get in touch with GM3BA, c/o Mrs. Cawoll, 31 Quarrelhead Avenue, Salsburgh, near Motherwell. He is in a fairly central position and will be pleased to put people in contact with suitable stations.

G3FGR (Worthing, Sussex), now active on 2m, worked G3AGA (Falmouth) on June 24—about 215 miles. G3EMU (Canterbury), after a long period of hearing nothing (due to receiver difficulties) was surprised to hear F, ON and PA all in one evening.

G3BHS (Eastleigh, Hants) reports that G2ATT, DSW, 3CGE, CTM, DTT, ESS, EUQ, GAV, GOP and HXJ are active on 2m in the Southampton area. Of these G3CGE and 3GOP are also equipped for 70cm and the latter in particular would welcome skeds. G4DC is mentioned as putting in a very good 'phone signal with the aid of his new beam and QRO.

G8AO/MM

We much regret that due to incorrect information it was stated last month that this station is limited, by the terms of the Marine Mobile licence, to working with certain specified 2m stations only. This is not entirely correct and our apologies are offered to G8AO for any inconvenience caused to him thereby. The facts are as follows. When at sea, signing /MM, G8AO calls G2XC, G4DC and G3BLP at three minutes past the hour, G3VM and G3WW at 18 minutes past, G5YV and GW5MQ at 33 minutes past and G3CYY and G4LX at 48 minutes past the hour. If at these times no contact is made with the stations called, reply may be made to any other stations that may call. When at sea silent periods must be observed for three minutes at each quarter of the hour. Operation is normally in the evenings but activity during the day may be arranged.

When in port the call becomes G8AO/MA and operation is then as a normal amateur station. The frequency is 144.18 Mc/s. The apparatus on board comprises an 18 watt transmitter with 832 final, a converter with a two-stage e.g.t. amplifier and a remotely-controlled beam on a telescopic mast which may be raised to a maximum of 35 feet above the water. Certain teething troubles have been experienced with the gear but these are being brought under control. So far the log includes contacts with F, GW, ON and PA while signals have been heard from DL3 and OZ. G8AX was the first /MM contact.

Scout Radio

G2FKZ has just completed the prototype apparatus to conform to the terms of the new Amateur Radio (Scout) Licence. This project was sponsored by the Reading Scout Group (who have been allotted the call G3SAH) for the control station (five watts input). Patrols use the same call followed by a number up to 5, and may operate within a radius of 10 miles from the control station with input up to one watt. Frequencies will be between 145.85 and 146.0 Mc/s and each control, together with its patrols, will use a common frequency. Operation is confined to c.w

Regional V.H.F. Ladder

TWO-METRE BAND

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

Call & Location	Worked—Regions	Stations	Countries
G5YV: Leeds, Yorks.	13	118	8
G3EHY: Banwell, Som.	13	37	5
G3WW: Wimblington, Cambs.	12	76	8
G3BW: Whitehaven, Cumbs.	11	32	3
G2FNW: Melton Mowbray, Leics.	9	42	2
G2DKH/P: Stanley, Co. Durham	8	26	3
G3BHS: Eastleigh, Hants.	8	22	2
G6XX: Goole, Yorks.	7	37	2

The 70cm Band

G5YV (Leeds) is about to start up on this band. The transmitter is complete and with an 832 tripler and "City Slicker" array with reflectors has worked G3DA/P (Westmorland) crossband on 2m at a distance of 75 miles. We look forward to seeing G5YV as well represented on the 70cm "Ladder" as he is this month on 2m!

G3EHY was heard by G2DD and G8SM during the morning of June 29, but two-way working was not possible. Tests with GW2ADZ continue and a number of contacts were made during the past month.

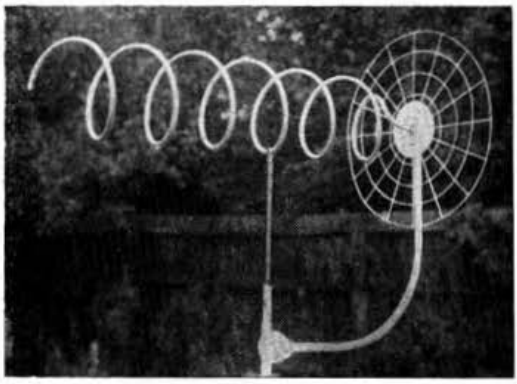
G3FRG (Worthing, Sussex) was unable to take part in the R.S.G.B. 70cm Tests owing to last minute trouble with the transmitter.

12 Centimetres

With a view to assisting them in their propagation observations on 2m and 70cm, G2FKZ and G3IXL are interested in setting up a net on the 12cm band, using pulse-width modulation. Anyone who is interested in such observations, and also in the possibilities of the 12cm band as a communication channel for short-haul working, is invited to get in touch with G2FKZ. The scheme at present envisaged is that multiplex working will be possible between stations in the net, one channel being for communication and another for relaying the signals on which observations are being made.

Corkscrews and Dartboards

To the uninitiated the photograph appearing on this page may cause some speculation. The somewhat surrealist combination of an outsize in corkscrews attached to a dartboard is in fact G5CD's version of a 70cm helical beam. Polarisation is circular and right-handed (see these notes for last month), the diameters of the helix and ground plane 8 in. and 21 in. respectively and the overall length 40 in. The array is fed with 130-ohm coax. and presents a constant impedance over a frequency range of 400 to 500 Mc/s. Gain is between 10 and 14db and the beam width 45° for 6db down. The forward gain and directivity are of the same order as with a 6-element Yagi but with the advantage that the maximum is less sharp and the sides of the pattern steeper. No difficulty was experienced in matching the beam to the transmitter at any point of the 70cm band and no dimension was found to be very critical.



"Corkscrew and Dartboard"
The helical 70 cm aerial at G5CD.

A New Two-Metre Publication Projected.

There is no collected record in existence at the present time of work and achievements on the 2m band, but EI2W intends to remedy this deficiency by publishing a book "for two-metre enthusiasts by two-metre enthusiasts." If all goes well the book should be available early next year and will be offered at a price which no more than covers the cost of production. Specialised articles on aerials, transmitters and receivers written by authorities on the various subjects will be included in addition to descriptions and photographs of leading stations on this side of the Atlantic together with lists of frequencies and other data of interest to workers on the band. There will also be an extensive and up to date record of what has been accomplished on two metres since the band was released in Great Britain, Northern Ireland and Eire.

In order that the book shall be truly representative of its subject, readers are invited to send details of their stations and photographs of two-metre interest to Mr. H. L. Wilson. P.C., EI2W, The Limes, Plunkett Avenue, Foxrock, Co. Dublin, by not later than August 31st next.

Scandinavian Two-Metre Contest

News has just come to hand that the Danish society, EDR, has arranged a 2m contest for August 16 and 17. An award will be made to the station outside Scandinavia making the highest score working stations in Scandinavia, scoring being on the basis of one point for each kilometre separating the stations. The periods of operation will be 1900 to 2200 B.S.T. on the 16th, and 0900 to 1100 and 1300 to 1600 B.S.T. on the Sunday. Reports will consist of the RS or RST followed by a three-figure serial number starting at 001 for the first contact, 002 for the second and so on, together with the QTH. Logs should be sent not later than September 20 to E.D.R. Contests Committee, Post Office Box 335, Aalborg, Denmark, and include the time (in B.S.T.), station worked, code group received, code group sent, distance in kilometres, whether 'phone or c.w., and details of the equipment employed.

Regional V.H.F. Ladders

In the list of Regions and Countries or Areas forming them, published in the rules for the *Regional V.H.F. Ladders* on page 544 of the June issue, Merionethshire and Montgomeryshire were inadvertently omitted and should have been included in Region 11. Radnorshire (Region 10) was also omitted.

* * *

The number of reports sent in this month was most gratifying. It has not been possible to quote all as fully as we should have liked but correspondents may rest assured that their contributions were much appreciated and helped in presenting the story of much increased activity on the v.h.f.'s. Reports for the September issue by August 20, please.

"First Steps on Two"

A CONSIDERABLE amount of correspondence has been received by the Honorary Editor (Mr. Jack Hum, G5UM), following the publication of his article, "First Steps on Two," in the June issue. A further article arising from this correspondence is being prepared and will be published shortly.

Nocturnal D/F Contests

APROPOS the claim put forward by the Romford Group in our last issue that the Nocturnal D/F Hunt to be held during the night of August 23/24 will be the first post-war event of its kind, Mr. A. W. W. Timme, G3CWW (D.R. for West London) states that the Edgware and District Radio Society held a night-time D/F contest more than a year ago and that the winner was Mr. S. Fryer, G3ERO. A similar contest is included in the current year's programme of the Edgware Society.

Mr. L. A. Griffiths (D/F Secretary of the Slade Radio Society, Birmingham), also states that his Society has organised a D/F night test each year since 1947. Mr. Griffiths explains that the rules used by Slade Radio competitors are more searching than those laid down for R.S.G.B. D/F Contests, in as much as his Society awards points for accuracy of bearing, shortest distance covered and time on arrival.

Silent Key

It is with much regret that we record the passing of Norman Deadman (G3EWD) under very tragic circumstances. Norman, who was found dead in his car on July 9, operated an exceptionally well-equipped station at Oxhey, near Watford, and was widely esteemed, as one of sunny temperament, well endowed with much that life could offer. He was a gifted musician and was organist of Watford Parish Church.

To his wife and little boy our sympathies are offered G5UM.

The Radio Amateurs' Examination

Model Questions and Answers

Part 1.—Introduction

AN applicant for an Amateur Transmitting Licence must first pass the Radio Amateurs' Examination, unless he can show approved qualifications which may grant him exemption.

The purpose of this examination is to ensure that the applicant has studied the licence regulations, and that he has some grasp of the basic principles governing the working of typical amateur station equipment. Although the required standard is fairly elementary, the period of preparation for the examination serves to deter casual applicants with little real interest in the understanding and adjustment of apparatus—the conduct of whose stations might, in consequence, lead to annoyance or to interference with other services.

By

B. W. F. MAINPRISE

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

From an analysis of the questions set during recent years it would seem that candidates may reasonably expect one question on each of the following subjects:

1. Licence regulations, such as the prevention of interference, restrictions to authorised wavebands, etc.
2. Frequency measurement and control, essential to ensure that the transmitted frequency is kept within the permitted allocations.
3. A simple calculation such as Ohm's Law applied to series or parallel circuits, or a calculation on the reactance of a circuit.
4. A receiving circuit.
5. A transmitting circuit.
6. Valve properties and simple operation.
7. Basic modulation methods or measurements.
8. Simple aerial and feeder systems.

Choice of Text-books

Beginners preparing for the Radio Amateurs' Examination should obtain a copy of *Electrical and Radio Notes for Wireless Operators* (Air Publication No. 1762, H.M. Stationery Office, Kingsway, W.C.2. Price 3s. 6d.). This covers an excellent range of basic principles, while employing only the simplest of mathematics. Other suggested text-books are *Short Wave Radio*, by J. H. Reyner, *Radio Simplified*, by J. Clarricoats (both published by Pitman), and *Outline of Radio*, by various contributors (published by Newnes).

In addition, the beginner should join his local Municipal or County Library and borrow any other elementary text-books that may be available. These libraries will obtain on loan any technical work for which they may be asked. More will be said of this service and on the choice of text-books for higher examinations in due course. Generally speaking, books should not be purchased, initially, unless they are very low priced; often a book may appear excellent when first taken down from the shelf, but subsequently proves disappointing in its coverage or its suitability for a given course of study.

Ohm's Law

Ohm's Law is of fundamental importance and occurs in most calculations on circuit operation. It is best stated as follows:

The ratio of the voltage across a circuit, divided by the current through the circuit, is constant.

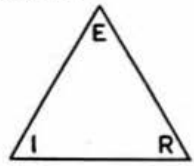


Fig. 1. Simple mnemonic for Ohm's Law. If a finger is placed over the required quantity, the relationship of the remaining quantities is immediately shown.

One can then proceed—if required—to define the resistance of a circuit by adding:

This constant is called the resistance of the circuit.

Writing Ohm's Law in the usual symbols of E and I for voltage and current respectively, we have

$$R = \frac{E}{I}$$

which, by cross-multiplication, gives the alternative relationships of

$$I = \frac{E}{R} \text{ and } E = I \times R.$$

For those whose mathematics are such that they cannot be relied on to write down even the above three relationships with certainty, the following device can be recommended. A triangle is drawn, and starting at the top this is labelled E, I, and R in alphabetical order, proceeding in an anti-clockwise direction (Fig. 1). If the relationship which gives R is required, a finger is placed over R in the diagram, and the answer is seen to be E/I. Should I be required this letter is covered by the finger and the relationship E/R is indicated. Similarly if E is required, it is covered and IR is seen to be the answer.

Reading Matter

When preparing for an examination, it is never sufficient merely to read through pages of text. A pencil and paper should be at hand and all the major statements, together with equations and their method of solution, should be written out and borne in mind. It is a wise practice for a beginner to imagine that he will have to act as instructor the following day, and to persevere in mastering the text until he feels confident of being

Table 1.—Basic Formulæ

	In Series	In Parallel
Resistors	R=R1+R2	1/R=1/R1+1/R2
Inductances	L=L1+L2	1/L=1/L1+1/L2
Capacitances	1/C=1/C1+1/C2	C=C1+C2

* *48 Earlsfield Road, Hythe, Kent.*

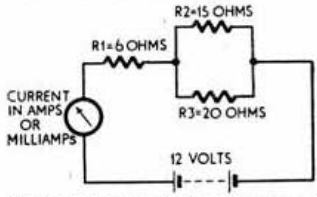
able to explain it to colleagues, with sketches if required.

Pages 9 to 15 of the A.P. 1762, which deal with resistance in general, series and parallel grouping, and internal resistance, should be carefully studied. As will be seen in Table 1, calculations involving inductances of coils connected in series and parallel are treated in the same way as for resistances, provided their fields do not link, *i.e.*, there is no mutual induction. The capacitances of condensers are treated in the reverse way, however: for parallel connection the values are added, while for series connection their *reciprocals* are added and the result inverted.

The resultant (or equivalent) value of two or more resistances in parallel always works out at a smaller value than the smallest of the individual values. A check should be made at the end of such calculations to ascertain that this is the case, and the same check should be made when working out the value of condensers in series.

Example

A circuit is made up of a 6-ohm resistor connected in series with a branch comprising a 15-ohm resistor in parallel with one of 20 ohms. What current will flow when the circuit is connected across a 12-volt battery?



[*Hints:* (i) Always start by drawing the circuit diagram and inserting all values given as above; (ii) calculate first the equivalent value of any parallel-connected resistances, then add this value to any series resistances to obtain the total external resistance of the circuit.]

Considering the branch circuit formed by R2 and R3 we have:

$$\frac{1}{R}=\frac{1}{15}+\frac{1}{20}=\frac{20+15}{300}$$

Inverting both sides of the equation:

$$R=\frac{300}{35}=8.57 \text{ ohms.}$$

(Note, as a check, that this is smaller than either R2 or R3.) Add the series resistance of 6 ohms giving a total external resistance of 14.57 ohms. The circuit resistance and voltage are now known; application of Ohm's Law will at once give the current.

$$I=\frac{E}{R}=\frac{12}{14.57}=0.824 \text{ A}=824 \text{ mA.}$$

Other types of calculation will be considered in Part 2.

A Simple Shielded Link Coupler

*By H. MILLINGTON (GW2BMN)**

THE majority of modern designs for T.V.I.-proof transmitters employ link couplers. Coaxial cable, though satisfactory for the one-turn type of link, is not suitable when, for low-frequency operation, additional turns are required. A multiple-turn shielded link coupler of this type can be made up as follows.

A length of metal braiding is required (this can be obtained from a piece of coaxial cable by stripping the rubber and pulling out the polythene core), in which a hole should be made on one side by pushing the point of a pencil through the braided strands. The position of the hole should be such that the length AB (Fig. 1a) is equal to the circumference of the coil to which the link will be fitted.

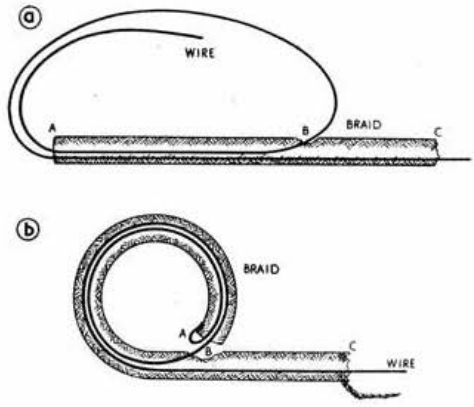


Fig. 1.

(a) The first step in the construction of a shielded link coupler; the metal braiding pierced at B and threaded with d.c.c. wire; (b) The finished link, ready for binding with empire tape prior to installation.

A length of d.c.c. wire is then pushed through the braiding from C to A, sufficient wire being used to make-up the required number of turns in the link winding (plus soldered connection) at A, and to allow for connection to the circuit (at C). The link end of the wire should then be pushed through the hole at B (Fig. 1a), so that it emerges again at A, forming a two-turn link—this process being repeated according to the number of turns required. The braiding can now be looped, at the same time pulling the wire tight so that end A approaches point B (Fig. 1b). A small gap should be left as shown in the diagram.

Finally, the loose wire at A should be cut short and soldered to the braiding. After binding with empire tape, the shielded link is ready for installation.

* *24 Mount Pleasant, Menai Bridge, Anglesey*

The British North Greenland Expedition

THE amateur call sign to be used by Captain J. S. Agar (R. Signals), who is in charge of radio on the above Expedition, will be G3AAT/OX. The station expects to operate on 3.5, 7 and 14 Mc/s during October.

The First World Scouters Indaba, 1952

The special badge worn by Scouters who attended the Indaba.

SCOUTS from more than 50 nations attended the First World Indaba held at Gilwell Park, Chingford, during mid-July. Brilliant weather marked the occasion.

It was appropriate that Amateur Radio should be represented at such an international gathering. Credit for this enterprise is due to the Chingford R.S.G.B. Group who accepted, with alacrity, an invitation from the Boy Scouts Association to set up a station. The site selected—on high ground within the Park—provided a magnificent view of London and proved to be an ideal location for the erection of aerial systems.

The station—which operated under the specially allocated call sign G3GP (G3 Gilwell Park)—was established in a large marquee and consisted of a 150-watt T.V.I.-proof transmitter, modulator and power pack built by F. Ingleby, G3EHD; a 150-watt transmitter loaned by Panda Radio Co., Ltd.; and an Eddystone 680X receiver loaned by Stratton & Co., Ltd. Also available were AR88 and HRO receivers loaned by F. Hooson, G3YF, and J. Hollington, G4GA respectively. Three 50-foot masts carried a 3-element fixed beam and a 14 Mc/s. dipole fed with 80 ohm cable. It had been planned to use a Panda beam and tower, but circumstances arose which made it impossible for it to be delivered in time.

The efficient and neat appearance of the station evoked much favourable comment from scouters and general public alike. Particularly warm praise came from the Chief Scout (Lord Rowallan) who visited the station in company with Mr. S. E. V. Luke of the Colonial Office, the General Secretary of the R.S.G.B. (John Clarricoats, G6CL), and Council Member, C. H. L. Edwards, G8TL. shortly after the Indaba opened. Lord Rowallan expressed the view that the station was even more attractive in appearance and better appointed than the one set up by the Chingford Group during 1951 on the occasion of the International Boy Scouts Patrol.

During the time the station was in operation contacts were established with amateurs in many countries, the operators frequently remaining on duty until a very late hour in order to allow the Scouts to enjoy the thrill of hearing their own countrymen speaking from their native lands.

The Chief Scout (Lord Rowallan), K.B.E., M.C., T.D., D.L., with Mr. S. E. V. Luke, C.M.G. (Assistant Under-Secretary Colonial Office) and the General Secretary.

The wide range of equipment available during the Indaba can be judged from this picture taken inside the marquee.

The organisation of the Amateur Station was in the capable hands of a Committee which comprised A. V. Greenwood, G3DCQ (the Chingford T.R.); J. Hollington, G4GA; J. Davie, G2XG and F. Ingleby, G3EHD. Great credit is also due to the operators J. Martin, G3HLV; F. Hooson, G3YF; and C. Ford, G3FDS, who were assisted by members of the Committee.

The Indaba was closed on July 24th by H.R.H. The Duke of Gloucester.

Technical Training at the Radio Show

A TECHNICAL training display, organised by the Technical Training Committee of the Radio Industry Council, will be a feature of the Radio Show to be held at Earls Court from August 26 to September 6, 1952. Demonstrations of radar techniques, television circuitry, radio measurements, basic electricity, optics, valve manufacture, aerial performance, wave-guide properties, and other subjects will be given by the sponsoring organisations, which include a number of Technical Colleges and Institutes.

SOCIETY NEWS

Licence Matters

THE Society has been advised by the Post Office that the whole problem of impact of the implementation of the Atlantic City Allocation table upon the amateur bands in the United Kingdom is under close examination, and that a full statement on the subject can be expected within the next few weeks. It is anticipated that this will deal with such matters as the release of the band of frequencies between 3635 and 3685 kc/s and the release of the remainder of the 21 Mc/s band, including the removal of the ban on the use of telephony.

The Society has also been advised that its request for power in excess of 25 watts to be permitted in the 420-460 Mc/s band, is being given favourable consideration by the Post Office and aeronautical interests. A statement dealing with this matter and with the Society's request for Frequency Modulation to be permitted on the 14 Mc/s and lower frequencies is also expected shortly.

The Society has again protested to the Post Office about the continued interference caused by "intruders" in "exclusive" amateur bands and also about the interference caused by key clicks and parasitics radiated by stations operating on frequencies close to the 14 Mc/s band. In the case of British stations, appropriate steps have been taken to put matters right but unfortunately the United Kingdom Government does not seem able to take effective action against foreign stations which break International Telecommunication Convention agreements.

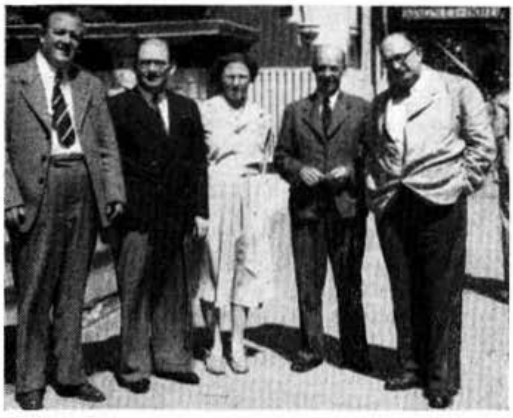
Norman Keith Adams Prize and Bevan Swift Memorial Premium

THE Council has been pleased to award the Norman Keith Adams Prize for the current year to Mr. D. N. Corfield, D.L.C.(Hons.), A.M.I.E.E., for his papers entitled "A Compact 70-cm Receiver" and "A Survey of 70-cm Equipment" published in the July and September, 1951, issues of the BULLETIN.

Mr. Corfield is a Vice-President of the Society and a Member of the Society's Technical Committee. He served on the Council for six years during and just after the last war.

The Council has also been pleased to award the Bevan Swift Memorial Premium for the current year to Mr. H. Whalley, M.Sc., A.M.Brit., I.R.E., for his paper entitled "Design of Pi-Network Tank Circuits" published in the April, 1952, issue of the BULLETIN. Mr. Whalley thus becomes the first winner of the Bevan Swift Memorial Premium.

The awards will be presented at the Annual General Meeting in December.



Council Members Fred Lambeth (G2AIW), Leslie Cooper (G5LC) and W. A. Scarr (G2WS), with the General Secretary and Miss Gadsden outside the Kingsley Hotel, London, venue of the recent Regional Representatives' Conference.

R.S.G.B. Publications and Affiliated Societies

IN view of the fact that a measure of dissatisfaction exists in certain parts of the country regarding the decision of the 1951 Council to allow trade discounts on R.S.G.B. publications to Affiliated Societies but not to R.S.G.B. Town Groups, the present Council has decided that the practice of allowing special discounts to other than recognised booksellers and established radio dealers shall cease.

"Television Interference"

THE Society has now received from Mr. Phil Rand, W1DBM, a liberal supply of his booklet *Television Interference*, copies of which may be obtained from Headquarters on receipt of 9d. in stamps to cover the cost of postage and packing.

The booklet, which runs to 80 pages, contains much useful technical information, including reprinted articles from *QST* and *CQ* on the subject of T.V.I., and is profusely illustrated throughout.

London Members' Luncheon Club

THE best attendance for many months was recorded at the July meeting of the Club held on the 18th of that month at the Kingsley Hotel, London, W.C.1. with Stanley Vanstone, G2AYC, Chairman of the Club, presiding.

A particularly warm welcome was extended by the London members present to an old friend in the person of the Rev. H. A. M. Whyte, VE3BWY, ex-G6WY, who was accompanied by his wife (Olive) and eldest son (David). Mr. Whyte returned to Toronto early in August.

Other visitors from abroad included Don Torbert, W6YCW/DL4QH, and Arne Pramberg, SM5IF. The English Provinces and Scotland were represented by R. F. G. Thurlow, G3WW, (Cambridgeshire), Louis Cornish, B.R.S. 7200 (Devonshire) and Tom Elliott, B.R.S. 10053 (Ayrshire).

Following the luncheon, Messrs. Whyte, Pramberg, Torbert and Thurlow addressed the Club on matters of topical interest.

The Club is due to meet again on Friday, August 22, at the Kingsley Hotel. Seat reservations should be telephoned prior to that day to Miss May Gadsden at R.S.G.B. Headquarters (HOL 7373).

Secretary's Vacation

THE General Secretary will be out of London until August 29. During his absence it is requested that correspondence requiring his personal attention shall be kept to a minimum.

Leicestershire and Rutland County Meeting

THE Empire Hotel, Fosse Road, North Leicester, was the venue for the Leicestershire and Rutland County Meeting held in sunny weather on Sunday, June 29, 1952. The event was organised by the Leicestershire C.R. (Capt. V. H. Thomas, G2CUR) and the Leicester T.R. (Mr. A. L. Milnthorpe, G2FMO). About 55 members were present from Birmingham, Coventry, Derby, London, Mansfield and Nottingham (outside the county), and from Coalville, Leicester, Loughborough and Melton Mowbray (within the county).

The hour before lunch was given over to informal discussions, and afforded many opportunities to renew old friendships and make new ones. During the luncheon a number of informal toasts were proposed and acknowledged.

The official party from Headquarters included the Immediate Past-President (W. A. Scarr, G2WS), the Hon. Treasurer (D. A. Findlay, G3BZG), and the General Secretary (John Clarricoats, G6CL). Council Member C. H. L. Edwards, G8TL, was also present in a private capacity. Other visitors included the Region 3 Representative (J. N. Walker, G5JU), the Warwickshire C.R. (R. Palmer, G5PP), the Coventry T.R. (J. R. Tuck, G6TD), the Derby T.R. (F. C. Ward, G2CVV), the Notts C.R. (A. Goode, G2DTQ), and the Mansfield T.R. (F. N. F. Bewley, G8HX). There was also a full attendance of Leicestershire Representatives, including the C.R. (G2CUR), and the T.R.'s for Leicester (G2FMO), Loughborough (G. Mason, G3CKF), and Melton Mowbray (S. Clark, G8CZ). The President (L. Ridgway, G2RI), Chairman (C. A. Penniston, G3GVK) and Publicity Officer (C. L. Wright, G3CCA) of the Leicester Radio Society were also present.

Business Meeting

The business meeting was opened by the Regional Representative (Dr. E. S. G. K. Vance, G8SA), who thanked the organisers and all others associated with them in the arrangements for the event, including those who had donated prizes for the raffle. He also expressed thanks in advance to those who had agreed to lecture to the meeting, and to the film show operators. The members of the official party were then introduced.

Mr. Scarr, after conveying the greetings of the Council, spoke on international aspects of Amateur Radio work., referring especially to the part the Society is playing in connection with the I.A.R.U. Region I Bureau.

Mr. Findlay dealt with financial matters, and mentioned the steps being taken to revise the Articles of Association.

The General Secretary recalled the occasion of the last official meeting held in Leicester during 1944. He afterwards discussed licence matters generally, and explained the steps the Society was taking to obtain permission for the use of high power on 420 Mc/s, Frequency Modulation on 14 Mc/s and lower, and the release of the band 3635-3685 kc/s. He also spoke about the BULLETIN and H.Q. problems.

Questions on a variety of topics were answered by members of the official delegation. The business meeting then concluded. Tea followed, after which the draw for prizes took place. A lecture on 70cm work—given by R. Palmer, G5PP, and J. Tuck, G6TD, of Coventry—brought to an end a happy and pleasant Amateur Radio event in Leicester.

"Doc"

NORTH WESTERN REGIONAL MEETING

SUNDAY, SEPTEMBER 14, 1952

BRADFORD HOTEL, TITHEBARN STREET, (near Exchange Station) LIVERPOOL

Programme:

Assemble	12 noon
Lunch	1.00 p.m.
Business Meeting	2.30 p.m.
Tea followed by a raffle	5.00 p.m.
Lecture - Demonstration on Miniature Aerials, by the President (Mr. F. Charman, B.E.M., G6CJ)	6.30 p.m.

Tickets (Lunch and Tea) 9/-, from either the Regional Representative (Mr. B. O'Brien, G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire), or from local representatives, not later than Sept. 8, 1952.

BERKSHIRE COUNTY MEETING

SUNDAY, SEPTEMBER 28, 1952

GREAT WESTERN HOTEL, READING.

Programme:

Assemble	2.15 p.m.
Business Meeting	3.00 p.m.
High Tea	5.00 p.m.
Technical Lecture and Entertainment	6.00 p.m.

During the afternoon a cine show will be provided for the ladies at the Abbey Gateway.

Tickets (Adults 12/6, Children 7/6) from the C.R. (Mr. Frank Hill, G2FZI, "Cheriton," St. Mary's Road, Mortimer Common), the Reading T.R. (Mr. L. A. Hensford, G2BHS, 30 Boston Avenue, Reading), the Newbury T.R. (Mr. A. W. Grimsdale, G3CJU, 164 London Road, Newbury), or the Hon. Treasurer, Reading Radio Society (Mr. E. R. Tufnail, 53 Bulmershe Road, Reading), not later than September 23.

BRISTOL COUNTY MEETING

SUNDAY, OCTOBER 5, 1952

GRAND HOTEL, BROAD ST., BRISTOL 1

Tickets 11/6 each (Luncheon and Tea) will shortly be available from local representatives, direct or by post.

Full details of the programme (which will include a visit to Bristol University, a lecture by the President, and an evening visit to the West Region B.B.C. Headquarters) will be published in the September issue. There will also be a draw for prizes.

Tests and Contests

Low Power Field Day, 1952

THE rules for the Low Power Field Day to be held on September 7, 1952, are exactly the same as for last year's event. Once again it is hoped that the contest will provide an incentive to the ingenuity of intending competitors, encouraging the development of miniature equipment of high efficiency. No special provisions are made for obtaining the necessary portable licence, and entrants 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 7, 1952.

2. The event will be confined to fully paid-up Corporate Members of the Society in the prefix 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 15, 1952.

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

17. The Housten Fergus Trophy will be awarded to the winning station, at the discretion of the Council.

Low Power Field Day
September 7, 1952

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.....

Second Two-Metre Field Day, 1952

THE only change in the rules for the second two-metre field event of 1952, to be held on September 21, concerns multiple-operator entries, which are acceptable provided the conditions regarding signature are observed (see Rule 8).

Rules

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

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

3. Entrants must operate according to the terms of their licence; the input to any stage of the transmitter must not exceed 25 watts.

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

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

6. Contacts with unlicensed stations will not be permitted to count for points. Proof of contact may be required.

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

The unique Houston Fergus Trophy—constructed in silver—will be held for one year by the winner of the Low Power Field Day.

Two-Metre Field Day
September 21, 1952

Name..... Call Sign.....
Home Address..... Claimed Score.....
Site of Station.....
National Grid Full Six Figure Reference.....
Transmitter..... Receiver.....
Aerial System(s).....

B.S.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Estimated distance	Points claimed
					TOTAL	

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.

Signed.....

8. Multiple-operator entries will be accepted provided that :

(i) the call sign and signature of the operator concerned is recorded for each contact ;

(ii) the declaration is signed by only one operator, who will be regarded as the entrant.

9. The event will start at 11.00 B.S.T. and finish at 20.00 B.S.T. on Sunday, September 21, 1952.

10. Power supply must not be derived from public or private supply mains.

11. No part of the station may be situated in any building existent on the site prior to the date of the event.

12. No apparatus may be erected on the site prior to the day of the event.

13. An exchange of reports (RS or RST) as well as location will be required before points for contact may be claimed. The location given must consist of distance and direction from the nearest town or village, e.g. "RST 569 6SE Caterham" (i.e. 6 miles south-east of Caterham).

14. Points will be scored on the following basis :

Distance	*With Portable Stations*	*With Fixed Stations*
Up to 50 miles	*2*	*1*
50 ,, 75 ,,	*4*	*2*
75 ,, 100 ,,	*6*	*3*
100 ,, 150 ,,	*8*	*4*
150 ,, 200 ,,	*10*	*5*
200 ,, 250 ,,	*12*	*6*
Over 250 ,,	*16*	*8*

15. Entries should be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, and should bear a postmark not later than September 29, 1952.

16. A miniature cup will be awarded to the winning station, at the discretion of Council, and the runner-up will receive a Certificate of Merit.

Two-Metre Open Contest, 1952

THE closing date for entries was inadvertently omitted from the rules for the Two-Metre Open Contest, 1952 (p. 29, July issue). In view of this fact, the Contests Committee has decided to accept entries bearing postmarks up to August 25, 1952.

D/F Field Days

DETAILS of the last of the present series of Qualifying Field Days—to be held on September 7, 1952—are as follows:

Organiser :	R. H. Newland, 10 Holmstall Avenue, Edgware, Middlesex.
Call Sign :	G3CWW/P.
Frequency :	1782.5 kc/s.
Assembly Point :	Hendon Park, 200 yards east of Hendon Central Station (Northern Line). N.G.R. 51/232885.
Map :	Ordnance Survey, New Popular Edition, Sheet 160.
Assembly Time :	1330 B.S.T.

High tea will be provided at Bono's Restaurant, Hendon Central, at a cost of 4s. per head. Intending competitors should notify the organiser by Monday, September 1, stating the number in their party, and whether tea is required.

* * *

OF the fifteen teams taking part in the Qualifying Field Day held on July 6, nine succeeded in locating the hidden transmitter. The arrival times of the leading competitors were as follows: Mr. G. C. Simmonds, 1453 ; Mr. F. Holdaway, 1454 ; Mr. N. B. Simmonds, 1455 ; Mr. S. Phillips, 1503 B.S.T. As Mr. Holdaway had already qualified in a previous event, Messrs. G. C. Simmonds, N. B. Simmonds and Phillips now go forward to the National Final on September 28.

Sixth All-European DX Contest, 1952

THE Danish National Society (E.D.R.) announces that the Sixth All-European DX Contest—to be run under the auspices of that Society—will take place over the week-ends December 6-7 (telegraphy) and December 13-14 (telephony).

A copy of the rules can be obtained by direct application to E.D.R., P.O. Box 79, Copenhagen. They will also be reproduced in the October issue of this Journal if space permits. E.D.R. is this year celebrating its Silver Jubilee.

Contests Diary

August 17	D/F Qualifying—High Wycombe and Oxford*
September 7	Low Power Field Day / D/F Qualifying—Edgware*
September 21	144 Mc/s Field Day (No. 2)
September 28	D/F National Final*
October 4-5	Low Power
November 8-9	"Top Band" (No. 2)

** For Rules see page 503, May issue*

E.D.R. Jubilee Contest

THE Contests Committee of E.D.R. have announced the results of the Danish Jubilee Contest held during May, 1952. The Committee, commenting on the entries submitted, observe that even the leading foreign entrant—G8KP—worked less than half the number of participating Danish stations. This, they suggest, was due to prevailing poor conditions, which resulted in many lost contacts.

The ten leading entrants were : G8KP (322 points) ; OH2YV (308) ; OK1HI (228) ; SM5DW (216) ; PA0VD (216) ; F9DW (192) ; G5XY (180) ; DL1GN (162) ; SM7BDK (153) ; DL1RX (144). In addition to those listed the following British stations took part in the contest : G2AJB (108) ; G5VQ (77) ; G8JR (55).

LOW POWER FIELD DAY PHOTOGRAPHS REQUIRED FOR PUBLICATION

The new Certificate of Merit now available free of charge from Headquarters for use by R.S.G.B. Groups and Affiliated Societies in connection with local contests and other events.

COUNCIL PROCEEDINGS

Résumé of the Minutes of the Proceedings at the Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, June 10, 1952, at 6 p.m.

Present.—Messrs. H. A. Bartlett, L. Cooper, C. H. L. Edwards, D. A. Findlay, J. H. Hum, F. G. Lambeth, H. McConnell, A. O. Milne, W. A. Scarr, R. Walker, P. W. Winsford and John Clarricoats (General Secretary).

Apologies for absence were submitted on behalf of the President (Mr. F. Charman) and Mr. T. L. Herdman.

Chairman.

Mr. Milne acted as Chairman from 6 p.m. until 6.30 p.m. and Mr. Cooper from 6.30 p.m. until the end of the Meeting.

Certificates of Merit.

Resolved to accept an estimate in the sum of £8.15.0 for printing 1,000 Certificates of Merit.

Membership.

Resolved:—

(a) to elect 74 Corporate Members and 28 Associates;
(b) to grant Corporate Membership to 3 Associates who had applied for transfer.

Applications for Affiliation.

Resolved to grant affiliation to the Blackpool and Fylde Amateur Radio Society and to the Wells and District Radio and Television Society.

London Lecture Meetings.

Resolved to reserve accommodation in the Tea Room at the Institution of Electrical Engineers on the following dates: October 31, November 21, 1952, January 30, February 27, and March 20, 1953.

Annual General Meeting.

Resolved to reserve the Lecture Theatre at the Institution of Electrical Engineers for the Annual General Meeting on December 19, 1952.

The 21 Mc/s Band.

It was reported that the attention of the G.P.O. had been drawn to the fact that several European administrations had released the whole of the 21 Mc/s band to amateurs. The G.P.O. had been asked when the remainder of the band would become available to U.K. amateurs.

Portable and Alternative Address Facilities.

The Secretary gave details of the new facilities and explained that they had been granted as the result of prolonged negotiations between the Society and the G.P.O. Several Members of the Council expressed the view that the new facilities would prove of great benefit to amateurs.

London Region Meeting.

It was reported that a Regional Meeting would be held in London on November 1, 1952.

Affiliated Societies.

The Secretary was authorised to accept

(a) an invitation from the Brighton and District Radio Club to lecture on The History and Development of Amateur Radio on July 15;
(b) an invitation to attend a dinner in Birmingham on October 25 to mark the 25th Anniversary of the Slade Radio Society and the 21st Anniversary of the Midland Amateur Radio Society.

Note the Dates:

SIXTH ANNUAL R.S.G.B. AMATEUR RADIO EXHIBITION

Royal Hotel, Woburn Place, London, W.C.1

NOVEMBER 26 to 29, 1952.

Frequency Measuring Test.

It was reported that 70 entries were received from 5 countries and that the leader (who used home-built equipment) had an average error of less than 1 part per million.

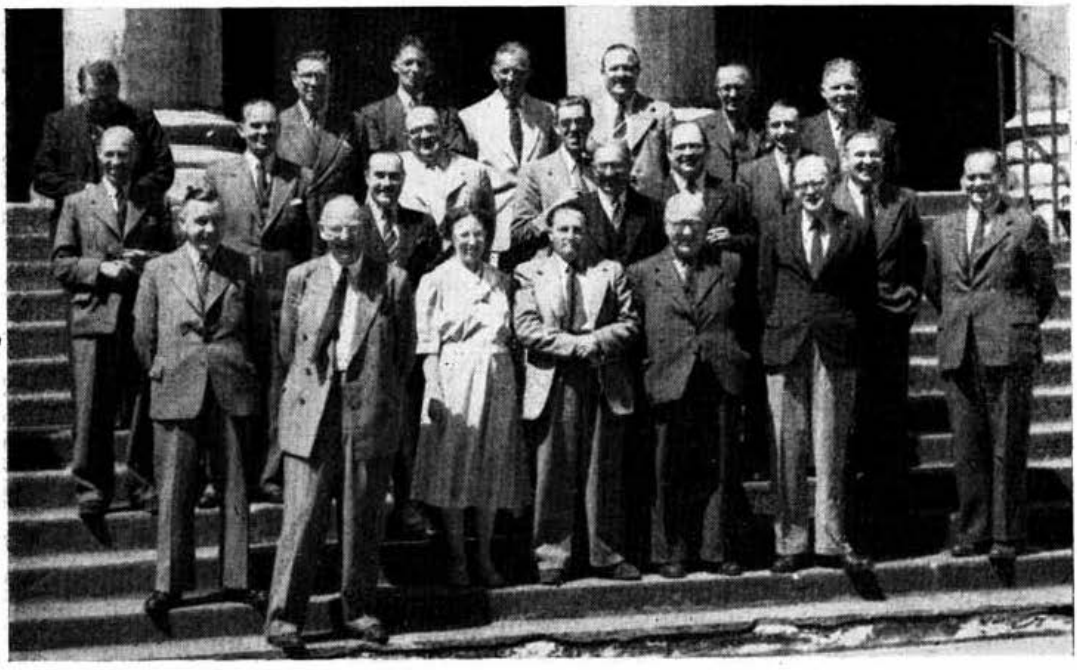
R.R.s' Conference.

The procedure to be adopted at the forthcoming R.R.s' Conference, called to discuss the revisions of the Articles of Association, was approved.

Cash Account.

Resolved to accept the Cash Account for May, 1952, as submitted by the Honorary Treasurer.

The Meeting terminated at 9 p.m.



Last month the Regional Representatives met the Council in London to discuss proposed revisions to the Society's Articles of Association. Here, in this group photograph, are all the R.R.s, except David Macadie (GM6MD) (who could not attend) and all the Members of Council, except the photographer P. W. Winsford (G4DC), H. A. Bartlett (G5QA) and J. Hum (G5UM). *First Step:* F. G. Southworth (GW2CCU). *Second Step:* S. H. Foster (GI3GAL), Miss May Gadsden, C. H. L. Edwards (G8TL), Dr. E. S. G. K. Vance (G8SA), J. N. Walker (G5JU), John Banner (GW3ZV). *Third Step:* C. A. Sharp (G6KJ), W. H. Matthews (G2CD), L. Cooper (G5LC), D. A. Findlay (G3BZG). *Fourth Step:* W. A. Scarr (G2WS), R. F. G. Thurlow (G3WW), John Clarricoats (G6CL), F. Charman (G6CJ), B. O'Brien (G2AMV). *Fifth Step:* John Douglas (GM2CAS), Arthur Milne (G2MI), H. G. Hunt (G3ECV), R. Walker (G6QI), F. G. Lambeth (G2AIW), Hugh McConnell (GM2ACQ) and R. J. Donald (G3DJD).

Aberdeen

The Aberdeen R.S.G.B. Town Group meets on the first Friday, and the Aberdeen Amateur Radio Society on the remaining Fridays of each month, at the club premises in Blenheim Lane, near Queens Cross, Aberdeen.

Bristol

More than 50 members attended the July meeting when H. Gratton, G6GN, concluded his talk on the DX bands with some useful advice on operating practices. Later, D. V. Newport, G3CHW, described various modifications to the r.f stages of a typical communications receiver to improve its performance. He also gave details of a convertor for the 21 and 28 Mc/s bands.

A skittles match on July 22 resulted in a win for the local Group over the Bristol and District Amateur Radio Society.

B.T.H. (Rugby) Recreation Club—Radio and Television Section

The Section took part in the R.S.G.B. D/F Qualifying Events at Coventry and Peterborough and succeeded in qualifying for the National Final on September 28. In a recent D/F contest which commenced at 7 p.m., the first team arrived at 8.03 p.m. despite the fact that the transmitter—after sending out the first call—moved a distance of five miles before it came on the air again. *Hon. Secretary:* P. N. Pryor, Electronics Engineering Dept., The B.T.H. Co., Ltd., Rugby.

Medway Amateur Receiving and Transmitting Society

The annual Hamfest of the M.A.R.T.S., held at 207 Luton Road, Chatham, on July 6, under the chairmanship of W. E. Nutton, G6NU, attracted an attendance of more than 200 amateurs with their families and friends. Council member C. H. L. Edwards, G8TL, Region 8 Representative, R. J. Donald, G3DRD, and Representatives from three other Regions—B. O'Brien, G2AMV (No. 1), F. Southworth, GW2CCU (No. 11) and S. H. Foster, GI3GAL (No. 15)—were among the many visitors. Others came from Ipswich, Clacton, Ramsgate, Margate, Canterbury, Southend and Worthing. Old timer J. E. Nickless ("Nic" of G2KT), a regular supporter of these functions, was given a very hearty reception.

The raffle, organised as usual by G6NU, was a great success. Among the 30 or more prizes (conservatively estimated as being worth £50) were a complete TGY1 transmitter, a megger, a ribbon microphone, a modulation transformer, a chassis, and a speaker cabinet.

The ladies responsible for the catering received well-deserved thanks for their contribution to a successful event. Refreshments were provided free. Copies of photographs taken at the Hamfest are available, on application, from G6NU, 42 Richmond Road, Gillingham, Kent.

Midland Amateur Radio Society

Twenty countries were worked during a successful field week-end recently organised by the Society. The weather was perfect. There will be no meetings during August. *Hon. Secretary:* G. W. C. Smith, 84 Woodlands Road, Birmingham, 11.

North Eastern Amateur Transmitters Society

The A.G.M. is to be held at 8 p.m. on Monday, September 15, at the British Legion Rooms, 1 Jesmond Road, Newcastle.

Brighton and District Radio Club

Last month the General Secretary lectured to members of the Brighton and District Radio Club on "The History and Development of Amateur Radio." Here are some of the members of the club with G6CL.

[Photo by courtesy "South Shields Gazette"

The Mayor of South Shields (Alderman Mrs. M. J. Sutton), with Mr. W. Dennell, G3ATA, and Mr. J. R. Tyzack, G3ELP, at the Amateur Radio station exhibited and operated by the South Shields Amateur Radio Club at a recent garden fete.

Purley & District Radio Club

On August 28, C. E. Newton, G2FKZ, will lecture on "Tropospheric Propagation." Arrangements are in hand for a visit to the B.B.C receiving station at Tatsfield in October. Meetings are held on the fourth Thursday at the Railway Hotel, Purley, commencing 7.30 p.m. *Hon. Secretary:* A. Frost, 18 Beechwood Avenue, Thornton Heath, Surrey.

R.A.F. Locking, Amateur Radio Club

The Club now has six senior members and about 20 juniors. Morse instruction and technical lectures are given by the senior members at Club meetings on Thursday evenings.

The Club station (call G3IRS) operates regularly on 3.5 and 7 Mc/s and occasionally on 14 Mc/s. All contacts have been QSL'd but only a small number of incoming cards have been received. *Hon. Secretary:* W/O G. A. Williams, G3HFL, R.A.F. Locking, near Weston-Super-Mare, Somerset.

Rochdale Radio & Television Society

The Society's activities are at present concentrated on redecorating the new club-room at 1 Law Street, Sudden, Rochdale. *Hon. Secretary:* J. Riley, 1 Darley Bank, Britannia, Bacup.

Salisbury & District Short Wave Club

Two successful D/F days were held recently, much ingenuity and originality being displayed in the design of equipment. A notably successful entry in both events was a team from the local R.E.M.E. Amateur Radio Club. The club station now operates on all bands, including two metres. New members are warmly welcomed at the weekly meetings—held on Tuesdays at 7.30 p.m. *Hon. Secretary:* V. G. Page, 32 Feversham Road, Salisbury.

Slade Radio Society

Talks on "Electronic Computers" and "Nuclear Physics" were highlights of recent meetings held at the new club-room (Church House, High Street, Erdington, Birmingham). The midnight D/F test, combined this year with the M.A.R.S. field week-end, proved as popular as ever. "Cathode-ray Oscilloscopes" is the subject of a lecture to be given on September 12. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham.

South Manchester Radio Club

Recent activities have included a successful D/F contest, a talk on the design of transformers and chokes, and a lecture on "Pulse Communication Systems" by L. A. Potter, G3ESK. *Hon. Secretary:* F. H. Hudson, 21 Ashbourne Road, Stretford, Manchester.

South Shields Amateur Radio Club

The Club recently participated in a Garden Fete at the Trinity House Social Centre, Laygate, South Shields, by staging an exhibition of Amateur Radio equipment and operating a station under the call G3ELP/A. The station was visited by the Mayor of South Shields (Alderman Mrs. M. J. Sutton). The transmitter, loaned by J. R. Tyzack, G3ELP, was operated on 3.5 Mc/s and 14 Mc/s with 60 watts input on phone and 80 watts on c.w. An Eddystone S640 receiver was used. Aerials were a dipole for 14 Mc/s and a 132 ft long wire for 3.5 Mc/s. Other apparatus and display material was provided by G3ATA, G3EJD, G4WG, G6VG, G8AO, and B.R.S. members Wyatt and Skethaway. The President of the Club is Capt. E. Clarke, G8AO.

Stockport Radio Society

Welcome guests at the July meeting were the C.R. (H. M. Synge, G3BOC) and the Region 1 Representative (B. O'Brien, G2AMV), who expressed their pleasure that the Society was again active. During the Region 1 Field Day on August 24, the Society will operate a portable station under the call G3AOO/P. *Hon. Secretary:* G. R. Phillips, 7 German Buildings, Buxton Road, Stockport.

Chessington Party

Regular visitors to this event will have noticed the error in last month's announcement, for which we apologise. This party has, of course, been held at Chessington Zoo for the past three years. The next party is due to take place on September 14. Those who intend to go along should advise F. G. Lambeth, G2AIW, 21 Bridge Way, Whitton, Middlesex, so that tea may be arranged.

The R.S.G.B. Region 1 Representative (Basil O'Brien, G2AMV), and the West Lancashire C.R. (H. M. Synge, G3BOC) recently visited the Stockport Radio Society. In this photograph G2AMV and G3BOC are seated (left to right) at the central table with G6UQ and G3FYE (Chairman and Hon. Secretary respectively). Others in the group include B.R.S. 19553 (Stockport T.R.), G2ARX, 3QV, 3FOE and 3BYP.

Surrey Radio Contact Club

The Club—a focal point of radio interest in the Croydon area—welcomes R.S.G.B members at meetings. At the July meeting a symposium on the subject of aerials was presented by D. Deacon, G3BCM ("Long Waves"), J. Roscoe ("The W8JK"), and G. Bird, G4ZU ("Compressed Beams"). A practical working demonstration with model aerials was provided by R. Dabbs, G2RD. The Club meets at the Blacksmith's Arms, 1 South End, Croydon. *Hon. Secretary:* S. A. Morley, 22 Old Farleigh Road, Selsdon, S. Croydon.

Sussex Field Day

This event will commence at 10 a.m. on August 24 and finish at 8 p.m. C.W. only will be used on the 1.7, 3.5 and 7 Mc/s bands. Full details from the Sussex C.R. (G. W. Morton, 42 Southfarm Road, Worthing).

Warrington & District Radio Society

Past activities have included a day's outing to the North Wales coast and a talk by G. Leigh, G2FCV, on valves and their application to two-metre equipment.

Western Short Wave Club

The Club meets at 7.30 p.m. on Monday and Wednesday evenings at Skaterigg Farm, Skaterigg Road, off Crow Road, Glasgow. Morse classes are in progress, and the Club station—call GM3HYI—is active on 14 Mc/s c.w. A D/F contest will take place on September 20; intending entrants should notify the *Hon. Secretary:* R. F. D. Moir, 18 Haldane Street, Glasgow, W.4.

Wirral Amateur Radio Society

"Police Radio" and "Troubles with a Tape Recorder" were subjects of recent talks by H. Caunce, G6KS, and J. Swinnerton, G2YS, respectively. A successful junk sale, at which £14 changed hands, was the highlight of a recent meeting. The Junior Section, under the guidance of G3CSG, G3ERB and G3IIH, is well supported, activities being mainly concerned with receiving. *Hon. Secretary:* A. H. Watts, 9 Coronation Drive, Bromborough, Cheshire.

Worthing and District Amateur Radio Club

The Annual General Meeting of the Club will be held on Monday, September 8, at 8 p.m., in the Adult Education Centre, Union Place, Worthing.

Worthing Bucket and Spade Party

More than 50 licensed amateurs and their families spent an enjoyable day at Worthing on July 27 when the Annual Sussex Bucket and Spade Party took place under the auspices of the C.R. (G. W. Morton, G3DRC) and the Worthing & District Amateur Radio Club.

R.S.G.B. Executive Vice-President Leslie Cooper, G5LC, proposed, Council Member P. W. Winsford, G4DC, seconded, and Region 8 Representative, R. J. Donald, G3DJD, supported a vote of thanks to the organisers for providing a most enjoyable day.

Next year the party will be held at Eastbourne on July 26.

York County Meeting

Harry Beadle (G8UO) points out that there was an official meeting in York during 1939, which was two years later than the date mentioned in the report of the recent Yorkshire County Meeting.

Representation

Vacancies

Mr. V. H. Thomas, G2CUR, has resigned as Representative for the counties of Leicestershire and Rutland.

Messrs. F. C. Robertson, GM3GIV, A. E. Cullington, G3HEZ, and D. Collins, B.R.S.17378, have resigned as Representatives for the towns of Falkirk; Ipswich; and Oxford respectively.

Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by September 30th, 1952.

Correction.

Region 2—York

Address of Mr. G. F. Nottingham, G3DTA should read: 51 Carr Lane, Acomb.

FORTHCOMING EVENTS.—(Continued from page 50)

Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.

Worthing (W. & D.A.R.C.).—September 2, 8 p.m., Adult Education Centre.

REGION 9

Bath.—August 18, September 19, 7 p.m., Y.M.C.A., Broad Street.

Bristol.—September 19, 7 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.

Exeter.—September 5, 7 p.m., Y.M.C.A., 41 St. David's Hill.

North Devon.—September 4, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Penzance.—September 4, Railway Hotel.

Torquay.—August 16, 7.30 p.m, Y.M.C.A., Castle Road.

West Cornwall.—August 21, September 4, "Fifteen Balls," Penryn.

Weston-super-Mare.—September 2, 7.30 p.m., Y.M.C.A.

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

REGION 10

Cardiff.—September 8, 7.30 p.m., "The British Volunteer," The Hayes.

REGION 13

Edinburgh (L.R.S.).—August 21, September 4, 18, 7.30 p.m., Edinburgh Chamber of Commerce, 25 Charlotte Square.

REGION 14

Falkirk.—August 29, September 12, 7.30 p.m., The Temperance Cafe, High Street.

REGION 15

Belfast.—September 6, 7.30 p.m., Y.M.C.A., Wellington Place.

LETTERS TO THE EDITOR

The Society assumes no responsibility for the views expressed herein by correspondents.

"Skybeams, Moonbeams and Howitzers"

DEAR SIR,—With reference to the article *Skybeams, Moonbeams and Howitzers*, by P. H. Sollom, in the July issue of the BULLETIN, there are a few points which call for some comment and, possibly, further clarification.

(1) The calculations given and shown in the diagrams are, of course, purely theoretical and assume:—

(a) a perfectly conducting earth and

(b) a perfectly reflecting layer.

Neither of these are found in practice outside the laboratory.

(2) For better comparison the received signals should be given in either of the two units mentioned, *viz.* decibels or S points and not in both.

(3) Apropos the "Direction Finding Defeated" paragraph, it would certainly have been a phenomenon well worth noting if a reliable, or even a second-class bearing could have been obtained in these circumstances. The two points against such a phenomenon happening are:—

(a) from my knowledge of the Negombo D/F station the aerial system is of the Marconi/Adcock type and therefore this aerial and that of the transmitter are, from the polarisation point of view, in quadrature and

(b) unless a *direct* signal is received from the transmitter the D/F station can only give a bearing of the point of reflection. With the type of D/F station under consideration there is always a "cone of confusion" about the D/F station's zenith and this cone may have an included angle of up to 60° (It is sometimes known as a "cone of silence"—silence applying to D/F intelligence and not necessarily to signals as such.) The point of reflection of the signal from the transmitter is well within this cone.

(4) Could the author give his reasons for the statement that "ribbon feeder is quite unsuitable"—apart from the fact that a 7½ kW transmitter is involved? To obtain an open-wire transmission line of up to 2,000 ohms impedance will require such spacing that an element of radiation is bound to take place from the lines.

(5) Table 1 is also of theoretical origin and for practical considerations may require modification.

The disadvantage of such theoretical calculations and curves is one which is, perhaps, not fully appreciated by a number of amateurs. For example, the average amateur who wishes to take advantage of erecting an array or particular aerial system, generally constructs one with a view to obtaining gain in certain directions. He is limited in his power input to such a system and usually wishes to utilise this power to its maximum. Most theoretical polar diagrams are based on calculations of the field strength obtained from "equal current in each element" when compared with a simple dipole or the like. It would surely be more helpful to such an amateur if comparative polar diagrams and/or figures were given for "equal power" in the various aerial systems.

Such a conversion may well account for the results an amateur obtains and which he does not consider are up to calculation!

Yours faithfully,

J. E. CATT (G5PS).

King's Langley, Herts

"Around the V.H.F.s"

DEAR SIR,—Why do not R.S.G.B. members active on the v.h.f. bands support Mr. W. H. Allen's column in the BULLETIN? Surely their first loyalty or preference is to their own Society's magazine. This month (June) it looks as if G2UJ compiled his notes from *five* letters. *The Radio Amateur* v.h.f. column appears to have far more regular contributors, while the July issue of *The Short Wave Magazine* mentions sixty report letters and devotes *eleven* pages to v.h.f.

Even if 2UJ spent every evening exclusively listening on the v.h.f. bands, I doubt if he could gather enough information thereby to give an extensive review of v.h.f. activity over the area now covered, including EI, G, GC, GD, GI, GM and GW, let alone DL, F, ON, OZ, PA and SM.

Operators and members I have discussed this matter with agree that they read these v.h.f. columns not to learn who they themselves have worked, but where else they have been heard, and who has worked whom and where and when, and when and where the band was open, when it was not open to that particular reader—*e.g.* one Cambridgeshire amateur hears G-DX stations but cannot contact them: Newcastle and Scottish amateurs hear Cambridgeshire and Norfolk stations and call them repeatedly, even on schedule, but these Northern stations cannot be heard, although 2FO and 2DKH/P in Durham are being received at the same time at 559 and 579. Surely other operators in the N.E. and in Scotland, knowing of this state of affairs through the v.h.f. column, can usefully report their observations on these difficulties (and perhaps help as a relay station) through the column.

This is my own point of view: others may disagree violently, as does one R.S.G.B. member who says, "Who wants to read what others have done a month after the event, when all one need do is buy a good receiver!"

Yours faithfully,

R. F. G. THURLOW (G3WW).

Wimblington, Cambs.

[Editorial Note: For some reason or other the number of contributors to the current "Around the V.H.F.s" feature is considerably greater than usual. Perhaps Mr. Thurlow's timely comments will ensure a continuation of that happy state.]

Screen Modulation

DEAR SIR,—The system of screen modulation suggested by Mr. Dunn (G3PL) in the July issue, is, to my mind, unsuitable for operation in our crowded bands. The clamp-tube type of modulator, though simple, is far from suitable for amateur use because it is almost impossible to obtain linear modulation above about 50 per cent., and it is very much inferior to a properly matched and resistance-loaded screen modulator of the transformer-coupled type, in spite of the slight additional cost of a transformer.

The most important thing about any system of modulation is that it shall be capable, at least in theory, of *linear* modulation. It is *not* permissible to operate a system of modulation whose action involves the generation of larger positive peaks than negative troughs. Such a system is merely one which involves a clipping action not followed by the necessary filtering and as such is one which occupies a wider channel than is necessary, or fair, in our crowded bands.

The statement that controlled-carrier operation implies "super-modulation" is not true. This term is applied only to the Taylor, Doherty, and Terman-Woodyard systems, where one valve supplies the carrier and negative peaks while another supplies the positive peaks. This arrangement, when correctly adjusted, produces the same type of signal as a normal anode-modulated p.a., *i.e.* an amplitude-modulated carrier whose positive and negative peaks are equal (linear modulation), though this condition is less easily obtained than with anode-modulation. If a "super-modulated" transmitter is adjusted to give a controlled-carrier effect, the transmission will become non-linear and will spread.

The above points are explained quite clearly in *Some Facts of Modulation* by W1DF on p. 49, March, 1951, *QST*, one sentence of which states: "Distortion in the modulated stage itself cannot be filtered out, and invariably broadens the signal."

Yours faithfully,

G. C. BAGLEY (G3FHL).

Ironbridge, Salop.

Push-Pull 813s

DEAR SIR,—It would appear, from the letter of Mr. Vincent Penfold (G3JZ) published in the July issue, that there is still some misunderstanding on the relation between power input and signal strength. If a station illegally increased power from 150 watts to 600 wats, the increase in signal strength (other factors remaining unaltered) would be 10.log4, *i.e.* 6db, or one S-point.

I think there is no doubt whatever that these exceptional signals are due to the station having an exceptional location: high ground, free from surrounding objects which might give rise to "scatter," good reflecting soil, with plenty of space for the operator to put up a really good aerial system.

It is not a difficult matter to obtain efficient transfer of power from the p.a. to the aerial, but if all the above factors are lacking, only an average signal will result.

Yours faithfully,

V. G. P. WILLIAMS (G3FYY).

London, N.W.2.

N.F.D.—A Solution to the Power Problem?

DEAR SIR,—May I suggest a solution to the N.F.D. power problem in the adoption of multipliers for different inputs? For example, let contacts by a station using 5 watts or less count three points each, and those by a station using between 5 and 25 watts count one point (except, of course, on 1.7 Mc/s). The higher power would enable contacts to be made more easily on 14 and, perhaps, 7 Mc/s, while the QRP enthusiasts could hold their own on 3.5 and 1.7 Mc/s. This system appears to work quite satisfactorily in the U.S.A. and Canada.

Let us have none of the suggested arbitrary restrictions such as crystal control, maximum power consumption of 50 watts, banning of petrol electric generators, etc. If groups have sufficient enterprise and energy to erect efficient aerials, organise operator shifts, and so on, they deserve to put up a high score. Penalising them would tend to reduce N.F.D. to the state where all stations turned in similar scores, no matter how little or how much effort they made—which would be ridiculous.

The object of N.F.D. should be to give maximum enjoyment: it is a weekend in the country, not a serious practice for an emergency. If an atomic bomb were dropped, what would be the use of a number of QRP c.w. stations with no rehearsed emergency drill and no experience of originating and handling traffic?

Yours faithfully,

A. H. B. BOWER (G3COJ).

Hull, Yorks.

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements 2d. per word, minimum charge 3/-. Trade Advertisements 6d. per word, minimum charge 9/-. (Write clearly. No responsibility accepted for errors.) Use of Box number 1/6 extra. Send copy and payment to National Publicity Co., Ltd., 358 Strand, London, W.C.2. by 25th of month preceding date of issue.

A BARGAIN for you? Brand-new RK34/2C34, 16 W output at 250 Mc/s, six for 12s. 6d. Type 1G6 (1.4 V twin-triode output), 8s. 6d. each. Canadian C.43 500 W transmitter (made by Philco, U.S.A.), with amateur-built p.p., excellent condition, £45. Pair of UF-1 Jefferson-Travis transceivers (65-80 Mc/s), £15. Marconi Navy transmitters type 4Q, new, 150 kc/s-1,500 kc/s; callers preferred; 50s. each. Electrolytics, screw-type cans, 8 μF, 600/700 V, 4 for 6s. 6d.—ELECTRONICS, 220B Canterbury Street, Gillingham, Kent. (Tel. 59203.) (528

AMATEURS, short wave, television, send for free list components, instruments, aerials, etc. — THE RADIO EQUIPMENT CO. (Dept. RS), Castor Road, Brixham, Devon. (393

AR.88 required; prefer seller takes H.R.O. (complete) or S.20 in part exchange. Please state condition, amount of use and price.—G2BVN, 51 Pettits Lane, Romford, Essex. (512

AR.88D wanted by private buyer who will pay good price for receiver in first-class condition. Offers please.—Box 487, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (487

AR.88D, with S-meter, RCA speaker, perfect. DST 100 MK111, good condition. S.A.E. offers. London area. — Box 547, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (547

B29 circuit and gen. wanted.—RANDALL, Brandesburton, Driffield. (534

IMPORTANT NOTICE

All Exchange & Mart advertisements must be sent with remittance made payable to:

THE NATIONAL PUBLICITY CO., LTD.,

358 Strand, London, W.C.2.

Copy required by **25th** of month preceding date of issue. For Advertisement Rates see above.

BC.221 and spares, built-in stabilised p.p., £19. 522 transmitter/receiver, as new and complete all valves, less case, £10. Advance signal generator type E.1, as new, £14, or offers. S.A.E.—NUTTALL, White Brick Moor Farm, Barlborough, Nr. Chesterfield, Derbyshire. (514

BC.221.—Good condition, with charts, internal power pack, £18, less pack £15. — 5 Highwood Road, Parkstone, Dorset. (541

BC.221, stabilised p.p., nearest £20. Type 145 oscillator, £5. M.C.R.I. receiver, p.p. and coils, £7. Type 26 r.f. unit, modified 28 Mc/s, £2. Mullard 7 in. magnetic tube, £2.—G3MA, 40 Calton Road, Gloucester. (492

BC.312 with internal mains pack, QST modified, £18. New 813s with base, 50s. DET12, KT8, 10s. 828, 30s. Offers for 'phone/c.w. transmitter, bandswitched 10, 20, 40, 80 metres, Variac controlled input up to 300 W to p.p. TZ40s. Class B 807 modulator. Separate v.f.o. and remote-control unit. View evenings or weekends. — G3AAK, "Combemartin," Badger's Mount, Nr. Sevenoaks. (Badger's Mount 285.) (500

BC.453 Q fiver, modified with a.c. mains power pack, perfect, £2. New valves: TY1/50 (2), 15s.; 717A, 4s. 6d.; RK20A, 25s.; PT15 (3), 10s. Used, perfect: RK25, 7s. 6d.; 6SA7, 3s. 6d. Postage extra.—G2IK, 42 Norton Road, Bristol 4. (519

CANADIAN 58 set, vibrator pack, etc., £5. "Wireless Worlds," 1946/1947 bound; 1948/1950 unbound; "Short Wave Magazines," 1947/1951; £4 lot or offers separate volumes. Spartan-Emerson service manuals (2), offers. Wanted.—RF26/27.—HICKLING, Upper Welland, Malvern. (513

CERAMIC valve holders for 829s, 3/-. Receiver R.1294, 500-3,000 Mc/s with p.p., £5 10s. RCA rack mounting v.f.o. 2-20 Mc/s, £5 10s.—R. W. LIVERMORE, 256 Grove Green Road, Leytonstone, E.11. (544

COIL turret, 100 kc/s to 25 Mc/s, modulator and attenuator, ex-Pye signal generator. (20) 6AK5 at 10s. each, (3) 807 at 10s. each. Elliot 3 in. 100 microamp meter, 50s. S.A.E. details and valve list.—Box 529, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2 (529

COLLINS TCS.11 receiver, 1.5-12 Mc/s, brand new, metered p.p., l.s., space o.p. or v.r., separate cabinet, £15. New RF.26, one 28 Mc/s, one unmodified, 45s. each.—Box 493, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (493

DANISH communication receiver, six bands, 80 kc/s to 19.5 Mc/s continuous "S" meter, a.c., 200/30 V. £10. B.2 transmitter and coils, £3. Buyer collects. Savage transformers and chokes (2), 350-0-350 460 mA, 5 V 6 A CT, 37s. 6d. each; (2) 340-0-340 100 mA, 6.3 V 3 A CT, 5 V 3 A CT, 4 V 1 A CT, 27s. 6d. each. All tapped primaries. 10 H 250 mA, 20s.; (2) 20 H 100 mA, 12s. 6d. each; (3) CRT 3BPI, 15s. 6d. each; 58PI, 20s.; GL466A, 12s. Crystal calibrator, 1,000/100 kc/s, 200/30 V a.c., 40s. Crystals: 1,000 kc/s, 15s.; 7,000 kc/s and 5,000 kc/s, 12s. each.—SMITH, 3 Waterloo House, Addington Grove, London, S.E.26. (510

DST.100, unused, in original transit case. Complete with valves and crystal. What offers?—Box 509, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (509

EXCHANGE Eddystone S.640 for 35 mm enlarger, or sell for £20.—POWELL, 137 Trelowarren Street, Camborne, Cornwall. (530

EXCHANGE small rack-built transmitter; c.w. 20, 40, 80 metres, 35 W output, crystal or built-in v.f.o., p.p. self-contained. Exchange for transmitter or receiver with 6 or 12 V input; prefer collection.—Details, L. GROUT, 68 The Drive, Worthing. (521

FEW Telefunken, Valvo receiving and transmitting valves, mostly singles. Low price to genuine experimenters. State wants, S.A.E.—Box 525, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (525

FOR Sale.—BC.348, new condition, unscratched, built-in power pack, full working order, £25.—Box 546, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (546

FOR SALE.—Cossor oscilloscope, model 3339, £20. Pullin 100 series meter, £8. 2 Pullin panel meters, £2 each. Garrard gramo.-motor, £8. Collection of transmitting valves, relays, transformers, etc.; offers. Apply after 6 p.m. or weekend.—CHIFFEY, 39 Elm Park, Stanmore, Middlesex. (489

FOR SALE.—Eddystone 640 receiver. Very good condition, little used, with 6 in. speaker, "S" meter and instruction manual. £20. Delivered free, London area.—J. WATTON, 20 Edencourt Road, Streatham, S.W.16. (485

FOR SALE.—Oscillator unit 201M, including two disc seal triodes (CV.1256), 80s.; valves separately, 25s. each. APS.13, complete valves, 70s. R.28/ARC.5 v.f.h. receiver, complete valves, 50s. ZB.2, complete valves, 20s. G4 oscillator, no valves, 15s. Type 15 rotary transformer (12 V pack for SCR.522), 50s. 25+25 midget split stator condensers (8), 2s. each. 0-4 A, r.f. meters, Simpson, 5s. each. Valves: 8012, R.C.A., new, boxed, 10s. 6d. each; 815, slightly used, 15s.; 808 (2), 15s. each.—G5XB, 96 Wood Lane, Sonning Common, Reading. (524

FOR SALE.—R.107, R.1116 and p.p., No. 12 sender, all in good working condition. Wanted.—B.2 transceiver.—G3INT, Vinnycote, Milespit Hill, London, N.W.7. (488

FOR SALE.—40 valves, EF50s, etc., transformers, capacitors, cabinets, chassis, receiver, etc., cheap. State requirements or send for list.—7 Alison Street, Shaw, Near Oldham, Lancs. (491

FOUR tier rack transmitter, consisting 6L6-807 r.f. unit, three-stage speech amplifier with own power pack, 250 V; 350 V and 500 V power packs. Sell complete with valves, £30 or offer, or separately. Consider battery communications receiver in part exchange.—MATTHEWS, 14 Emmanuel Road, Sutton Coldfield, Warwickshire. (504

G.E.C. BRT.400 receiver. Indistinguishable from new and hardly used. £95 or offer. — Box 501, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (501

G3DGN and XYL desperately require accommodation, preferably unfurnished, in North London or Home Counties; reasonable rent.—G. I. TURNER, 9 Elm Park Road, Winchmore Hill, N.21. (535

HALLICRAFTERS 5-10 receiver for sale, complete with "S" meter, in first-class condition; £25 or near offer.—G5HK, Manor Farm, Brimington, Nr. Chesterfield. (520

HAM offers £40 for AR.88; £15 for BC.221. Also requires boxed valves. Will collect. — Box 490, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (490

HAM requires transmitter, receiver and BC.221 frequency meter. Collection arranged. — Box 497, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (497

H.R.O., excellent order, with power pack, spare crystal, £17 10s. Set 7 coils, bandspread and broadcast, and 21 Mc/s, £15 15s. Premier Vision receiver with valves, £4. 813 P.A. standard rack panel; 3 meters; fully screened; Clamp tube; T.V.I. filters; switched grid and plate; switched aerial coupler; in one unit and working, £7 10s. Clapp v.f.o. 19 in. table cabinet, built-in crystal calibrator, v.f.o. or crystal electronic key; B.B. output 3.5 Mc/s; built in p.p.; large full-vision dial and symmetrical panel layout; frequency calibrated; 7 valves; £12. S.A.E. — Box 495, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (495

H.R.O.-MX, power pack, coils for 100 kc/s-30 Mc/s (bandspread 80, 40, 20, 10); built-in noise limiter; £35.—G3GSS, 44 Gores Lane, Formby, Liverpool. (515

IMPECUNIOUS Ham requires Communications receiver, top through ten metres, good but cheap. — Box 533, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (533

(Continued on Page 84)

EXCHANGE and MART SECTION

(Continued from Page 83)

MAINS transformers, 850 V 170 mA, 4 V, 6.3 V. Parmeko 620 V 200 mA, 375 V 250 mA, 5 V 3 A twice. Premier modulation transformer. DST.100 instruction book. What offers? TU9B, 15s. Power pack, 175 V 60 mA, 6.3 V 3 A, 30s. New boxed 0-5 mA meter, 8s. 6d. 955 and holder, 7s. 6d. 6K8g. 10s. NR88 (RL18), 4s. 6d. 9001, 9002, 7s. 9003, 6s. 2C34 (RK34), 4s. S.A.E. with enquiries.—13 Chandos Street, Keighley, Yorkshire. (507

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications.—PHILPOTT'S METAL WORKS LTD. (G4BI,) Chapman Street, Loughborough. (99

MODEL 3/III transmitter/receiver, 2-20 Mc/s; 10 watts, 'phone/c.w. with key, phones, certified crystals, power pack for 12 V battery operation. Complete kit spares, £30. Prefer buyer collect, but deliver within 30 miles radius.—G3CZC, "Wymbra," Somerford, Willenhall, Staffs. (505

NATIONAL 1-10, coils, power pack, G.E.C. R/C bridge. New, offers or exchange for BC.221, Labgear electronic tester, or test equipment. — MOLesey 3267, Box 548, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (548

OFFERS wanted.—H.R.O. with five bandspread coils, including 21.0 to 21.5 Mc/s (genuine National make), brand-new condition.—Box 522, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (522

PATENTS and Trade Marks. Handbooks and advice free.—KINGS PATENT AGENCY LTD. (B. T. KING, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146A Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98

PROP pitch motors, a.c., 6/30 V; 3 wanted.—Details and price, ALLEN, 190 Strand, London, W.C.2. (550

QSLs and log book (P.M.G. approved); samples free. State whether G or BRS.—ATKINSON BROS., Printers, Elland. (97

QUALITY QSLs.—Largest range of samples, "G" or SWL.—Try G6MN, The QSL Printer, Worksop, Notts. (152

RK4D22's (2) with bases 50/- each; 813s (4) 45/- each; 832As (5) 25/- each; 6J6s, 6AG5s, 6AQ5s, 10/- each. All brand new, manufacturers boxes 70 other American valves, guaranteed, £15.—Box 540, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (540

SALE.—ARN.5 70 cm coax. lines, 17s. 6d. BC.788 70 cm mix/osc. lines, 17s. 6d. Transmitter lines, 7s. 6d. BC.453 r.f., i.f., coils. BC.348 coils, spares. BC.433, £2. BC.430 transmitter, 12s. 6d. BC.788, 30s. APQ.9 with 4-8012s, 50s BC.966 15-valve I.F.F. receiver, 45s. Wanted.—R1392, 6SG7s.—61 Gale Lane, Acomb, York. (494

SALE.—a.c. class "D" wavemeter, £6. AVO minor, d.c., £2 10s. Taylor meter, T.120A, £4. New ECH35s, 7s. 6d. each, and 6V6/g at 6s. 6d. each. Wanted.—Cabinet for BC.221; state price.—Box 503, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (503

SALE.—CNY.1, less receiver. Modified 40 W 'phone, separate p.p., Eddystone S.640 with "S" meter, excellent condition; CNY.1 L/S and headphones; £30 or nearest offer. Buyer arranges collection. — Box 502, NATIONAL PUBLICITY CO. LTD., 358 Strand, London, W.C.2. (502

SALE.—Professionally built 150 watt-band-switched transmitter crystal, final 813, 80/40/20/15/10 fully metered. Rack mounted 5 ft 3 in by 19 in by 14 in, cost over £200; offers nearest £65. Buyer collects.—Box 539, NATIONAL PUBLICITY CO., LTD., 358 Strand, W.C.2. (539

SX.28.—550 kc/s to 42 Mc/s. In original condition. Best offer accepted.—BM/FADE, London, W.C.1. (537

TBY.7 transmitter/receiver, 0.75 W output. Fine condition. £6 or offer. Wanted.—TS.216.—A. SOUNDY, 15 Magazine Place, Leatherhead. (508

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