R·S·G·B AMATEUR RADIO BULLETIN

April 1953

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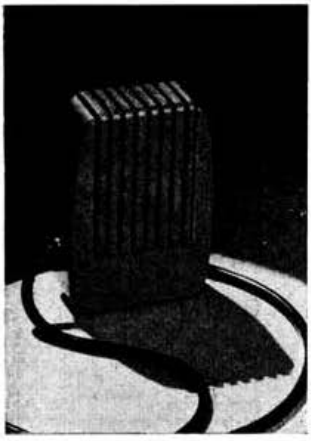

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R·S·G·B· BULLETIN

Vol. 28
No. 10
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PUBLISHED ON OR ABOUT THE 15th OF EACH MONTH AS ITS OFFICIAL JOURNAL BY THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN AND ISSUED FREE TO MEMBERS.

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Forthcoming Events

REGION 1

Barrow (B.A.R. & T.S.).—Mondays, 7.30 p.m., Castle House, Walney Island, Barrow-in-Furness.
Bury.—May 14, 7.30 p.m., Y.M.C.A., The Rock, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Thursdays, 8 p.m., Scouts' Hall, East Street, South Road, Waterloo, Liverpool.
Darwen & Blackburn.—April 24, May 22, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Isle of Man (I.O.M.A.R.S.).—May 6, Broadway House, Douglas.
Liverpool.—April 25, May 9, 23, 3 p.m., Larkhill Mansion House, West Derby.
Manchester (M. & D.R.S.).—May 4, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—April 20, May 4, 18, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—Alternate Tuesdays, 8 p.m., Blossoms Hotel, 2 Buxton Road, Stockport.
Warrington (W. & D.R.S.).—April 21, May 5, 7.30 p.m., King's Head Hotel, Warrington.
Wirral (W.A.R.S.).—April 22, May 6, 20, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—April 24, May 8, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—April 28, May 12, 7.30 p.m., Cambridge House, Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—May 13, 7.30 p.m., Black Bull, Market Place.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—April 28, May 12, 7.30 p.m., "Rampant Horse," Paisley Street.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—April 13, May 14, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—April 22, 8 p.m., "Dog and Partridge," Trippet Lane; May 13, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—April 22, May 6, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—May 1, 7.15 p.m., Stirchley Institute (Room 7).
Coventry.—April 24, 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick & Leamington.—April 16, May 21, 7.30 p.m., Dalehouse Lane.
Malvern.—May 4, 8 p.m., Foley Arms.
Stourbridge (S. & D.R.S.).—May 5, 8 p.m., King Edward's School.
Walsall (W. & D.A.R.S.).—April 22, 8 p.m., Walsall Technical College, Bradford Place (Joint meeting with R.S.G.B. Group.)
Worcester (W. & D.A.R.C.).—Thursdays, 7 p.m., City Library (basement), Foregate Street.
Wrekin (W.A.R.S.).—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts and Crafts (sub-basement), Green Lane.
Leicester (L.R.S.).—April 20, May 4, 18, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—April 15, 29, May 13, 7.30 p.m., Technical College, Cathedral Street.
Loughborough.—April 15, 7.30 p.m., Great Central Hotel.
Mansfield (M. & D.A.R.S.).—A.G.M., May 3, 3 p.m., Swan Hotel.
Newark.—April 12, 26, May 10, 7 p.m., Northgate House, Northgate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., May 1, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—April 17, 7.30 p.m., Trent Bridge Hotel.
Peterborough.—May 6, 7.30 p.m., New Inn, New England, Peterborough.
Worksop.—May 4, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—May 5, 7.30 p.m., Marconi College, Arbour Lane.
Ipswich.—April 29, May 13, 7.30 p.m., T.A. Drill Hall, Woodbridge Road.
Lowestoft (L. & B.A.R.C.).—April 29, May 13, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—May 7, 8 p.m., 128 Prestbury Road.
Gloucester.—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
Oxford.—Alternate Wednesdays, 7.30 p.m., The Club Room, Magdalen Arms, Iffley Road.
Portsmouth.—Tuesdays, 7.30 p.m., Signals Club Room, Royal Marine Barracks, Eastney.
Southampton.—May 2, 7.30 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford, Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, Chiswick High Street, W.4.
Barnes, Putney & Richmond.—May 12, 7.30 p.m., 337 Upper Richmond Road, East Sheen, S.W.14.
Barnet (B. & D.R.C.).—Wednesdays, 8 p.m., "Hopedene," The Avenue.
Bromley (N.W.K.A.R.S.).—May 1, "Shortlands Tavern," Station Road, Shortlands.
Chingford.—April 21, 8 p.m., A.T.C. H.Q., Pretoria Road.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road, Dorking.
Dulwich & New Cross.—May 5, 7.45 p.m., "Radio Activity," A. N. Morrison, "The Walmer Castle," Peckham Road, S.E.15.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East Ham.—April 28, May 12, 8 p.m., 57 Leigh Road.
East London.—April 26, 3 p.m., "The Super-Regen. Receiver," H. T. Stott, Ilford Town Hall.
East Molesey.—May 6, 8 p.m., "Portable Equipment," C. H. L. Edwards, "Carnarvon Castle." Hampton Court.
Eltham & Sidcup.—April 20, 7.30 p.m., "The Amateur Log and Licence," Holy Trinity Hall, Hurst Road, Sidcup.
Enfield.—April 19, May 17, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—April 21, May 19, 7.30 p.m., 164 Albion Road, N.16.
Guildford & Woking.—April 26, 3 p.m., Royal Arms Hotel, Guildford.
Harlow (H. & D.R.S.).—April 21, 8 p.m., 6 High Street; April 28, 8 p.m., War Memorial Institute.
Hendon & Edgware (E. & D.R.S.).—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—May 7, 8 p.m., Salisbury Arms.
Holloway (G.R.S.).—April 24, 7.30 p.m., Grafton L.C.C. School, Holloway, N.7, "Single Sideband Transmission," H. F. Knott (G3CU).
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Street, Ilford.
Kensington & Shepherds Bush.—May 8, 8 p.m., 38 Royal Crescent, W.11.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—April 18, May 16, 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Slough.—April 16, May 21, 7.45 p.m., Labour Hall, Chandos Street.
Southgate & Finchley.—May 14, 7.30 p.m., Arnos School, Wilmer Way, N.11.
Sutton & Cheam (S. & C.R.S.).—April 21, "The Harrow," Cheam Village.
Uxbridge.—May 1, 7.30 p.m., "The Vine," Hillingdon.
Watford (W.A.R.S.).—April 21, May 5, 7.30 p.m., "Cookery Nook," The Parade.
Welwyn.—May 5, 8 p.m., N.F.D. Discussion, Council Offices.

REGION 8

Chatham (M.A.R.T.S.).—Mondays, 7.30 p.m., Club H.Q., 5 Bells Lane, Rochester; Monday, April 20, "Red Lion," Rochester.
Eastbourne.—April 16, 30, May 7, 7.30 p.m., 333 Seaside.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.
Hastings (B. & H.A.R.C.).—April 21, May 5, 19, 7.30 p.m., Saxons Cafe, Denmark Place, Hastings.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.
Maidstone (M.K.A.R.S.).—Fridays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.A.R.S.).—May 12, 8 p.m., Adult Education Centre.

(Continued on page 449).

R·S·G·B·

BULLETIN

Volume 28 No. 10 April, 1953

Current Comment . . .

Taking Stock

I HAVE used the phrase "taking stock" in looking back to the Special General Meeting which took place on February 27, 1953. Some Members may think it unfortunate that such a task should fall on a new Council so early in its term of office. I prefer to regard this as an opportunity to clear up the difficulties first, so that at the end of our term we may, perhaps, be back to real "Ham" Radio.

I have been especially interested to read, in an article in a recent issue of "The Times," that far from being alone in our subscription problems, we are in most illustrious company. The article refers to the difficulties of our learned contemporaries. They, too, have found their financial position seriously imperilled by the increasing expenditure that present-day economic forces continue to impose. The post-war fall in the value of money has dealt a damaging blow to the amount of cash which becomes available for hobbies and other leisure-time pursuits. This may be regarded as cold comfort, yet nevertheless it is a true statement of cause and effect.

We have to take our own problem firmly in both hands and work out the solution together. This attitude of mind was widely demonstrated during, and after, the last S.G.M. which filled me with new hope of getting the Society back to normal.

Naturally the Council, and some 2,000 odd Members, were disappointed that the Special Resolution was not carried, but they were not unhappy. The impression I gained that day and subsequently, was that a change of heart and mind had taken place and that many of those who were opposed to the Resolution left with a sensible understanding of our current difficulties.

The Council has no intention of holding a further S.G.M. until it has dug the ground very thoroughly. To this end it is its intention, during the summer, to submit to the membership the modified Articles of Association. Much time and thought have been devoted to the new Articles by present and past Councils. They have also been studied in detail by the Regional and County Representatives and a first draft has been seen in print by the whole membership.

The actual date of the meeting will depend upon the time taken by the Board of Trade to approve the revised draft, but June 19th has been reserved tentatively with the Institution of Electrical Engineers. The revised Articles were submitted to the Board last month.

To give you some indication of the possible way the Article dealing with subscription rates will read, I would like you to appreciate that it is designed to determine the *ceiling* rates which can be charged by future Councils. The Home Corporate Rate for the year 1953/54 may well be less than 30s.

The present Council hopes that the new Articles when approved will stand a reasonable test of time, in spite of this truly difficult age.

It is of interest to record that a saving of some £400 p.a. is about to be made on the BULLETIN because of reduced paper costs. A further reduction from the 30s. ceiling could be made by lowering the amount to be recovered for past losses.

The actual rates to be charged, as well as the question of the Entrance Fee, are matters yet to be discussed in Council, but I am confident of a happy and practical solution to both problems before the next S.G.M.

There now exist two vacancies on the Council occasioned by the resignations of Messrs. I. D. Auchterlonie and H. McConnell at the last S.G.M. Although most unfortunate we must understand they were activated by honest personal principles and we must therefore respect them.

I am glad to welcome back to the Council the three other members who resigned but later reconsidered their decision. The method to be adopted to fill the vacancies will be by means of a by-election. But the Council itself is not putting forward any names. This will allow the whole membership, especially our critics, a free hand to nominate their own candidates.

The May BULLETIN will contain further information about the forthcoming S.G.M. as well as a helpful editorial on proxy voting. It is my earnest hope that we shall all pull together thereby giving the Society the chance it truly deserves to progress and grow in stature.

Leslie Cooper (G5LC),

President.

Coronation Relay

IT has become necessary to explain that the term "local radio societies," used in the announcement published on page 402 of the March issue of the BULLETIN, refers to *overseas* local radio societies and not to local radio societies within the United Kingdom.

The Loyal Address to Her Majesty Queen Elizabeth, on the occasion of her Coronation, will be presented by the President and Council on behalf of the members of the Radio Society of Great Britain and of the members of societies affiliated thereto.

Amateur Microwave Experiments
Part II

Methods of modifying reflex klystrons and the construction of simple aerials for use in the 10,000 Mc/s band were described in Part I, published last month. In this article, the author discusses the use of waveguides and the problem of frequency measurement.

IN order to use, effectively, the small power generated by modified klystron valves, it is essential for the feed to the radiating system to be as low-loss as possible.

Coaxial cables may be used at 10,000 Mc/s, but their use is restricted to short connections, because the attenuation of typical cable is of the order of 30-50 db per 100 ft. That of *Uniradio 53*, for example, is 30 db at this frequency. The power handling capacity is reduced to a fraction of the value at low frequencies.

A waveguide, which is a rectangular, circular or elliptical tube made of copper, brass or silver, sometimes gold plated, has an attenuation as low as 2 db per 100 ft. when supporting the "dominant" mode under conditions of good standing-wave ratio.

Waveguides

A waveguide may be used to attenuate, very rapidly, frequencies below a certain cut-off value. This value is dependent on the physical dimensions of the waveguide. As the cut-off frequency is lowered the size of the waveguide increases, so that at frequencies below the kilomegacycle range the size becomes impracticably large. The operation of a waveguide must, therefore, be considered in different terms to that of a transmission line. Only the practical aspects of the problem will be considered here ; a more detailed treatment may be found in References (1) and (2). References (3) and (4) cover the mathematical details.

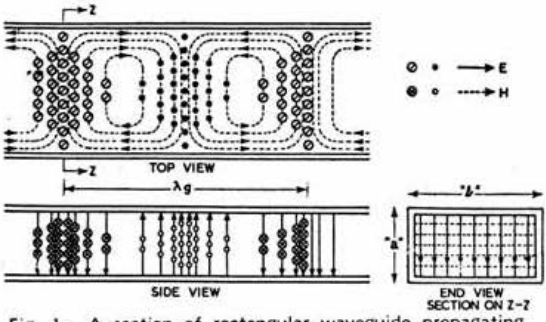


Fig. 1.—A section of rectangular waveguide propagating the dominant mode.

Microwaves are transmitted through the space in a waveguide in a manner somewhat similar to that in which radio waves of lower frequency are transmitted over long distances by means of the ionosphere. However, waves in the ionosphere are refracted, whereas in a waveguide they are reflected. Because they are considered in terms of field configuration rather than in terms of voltage and current distribution, the main modes of operation are referred to as the Transverse Electric (T.E.) or Magnetic (H), and the Transverse Magnetic (T.M.) or Electric (E) modes.

Fig. 1 illustrates a section of waveguide which is shown propagating the simplest (or dominant) mode, i.e. the mode which has the lowest cut-off frequency for a particular shape of waveguide. As a result, only this mode will be propagated without excessive loss, provided the size is chosen correctly. The resultant field moves with a speed greater than in free space, so that the distance λg (the waveguide wavelength) is greater than the wavelength (λ) measured in free space. All measurements are made in terms of λg, the formula relating the two wavelengths and the waveguide dimensions, for the dominant mode in a rectangular waveguide, being

$$\lambda g = \frac{\lambda}{\sqrt{1-\left(\frac{\lambda}{2b}\right)^2}} \qquad \textit{(with air dielectric)}$$

The inner dimension "*b*" of the wider side of the waveguide is the only dimension affecting λg.

Use is made of subscripts attached to the mode type to indicate the pattern in the waveguide. British practice favours the style $H_{.01}$ for the mode shown in Fig. 1. American practice is to use $TE_{.01}$.

Typical sizes of rectangular and circular waveguides, with their cut-off wavelengths (λc) for the different modes, are given in Table 1.

A major problem is that of introducing power into the waveguide. As the wavelength is small, efficient radiation from a resonant aerial inside the waveguide is possible. By placing this aerial in the correct position, the desired mode

Rectangular Type

Description	Type	Dimensions of inside faces	Cutoff (λc) for TE_{01}
B.S.S.A. 3 cm 1 in. x ½ in. inside	Standard	2.54 cm. x 1.27 cm.	5.08 cm.
American 0.9 in. x 0.4 in. inside x 0.05 in. wall.	Standard	2.29 cm. x 1.015 cm.	4.57 cm.
American 1.25 in. x 0.625 in. outside x 0.064 in. wall.	Bell Tel. Labs.	2.85 cm. x 1.265 cm.	5.72 cm.

Circular Type

Radius (a)		Cutoff (λc) for TE_{01} & TM_{11}	Cutoff (λc) for TM_{01}	Cutoff (λc) for TE_{11}
in.	cm.			
2½	2.38	3.9 cm.	6.2 cm.	8.15 cm.
1⅛	3.02	4.95 cm.	7.9 cm.	10.3 cm.
1¾	6.35	10.42 cm.	16.6 cm.	21.7 cm.
		= 1.64a	= 2.61a	= 3.42a

In the lower table the cut-off figures are arrived at by multiplying the radius (a) in cm by the appropriate factor viz. 1.64 x 2.38 equals 3.9 cm.

Table 1

Waveguide sizes suitable for use at 10,000 Mc/s.

* 6 *Isis, Damhead Hall, Glazebrook, Manchester.*

may be excited. For the dominant mode in rectangular waveguide, an aerial, somewhat less than $\frac{1}{4}\lambda$ long, spaced $\lambda g/4$ from a movable short circuiting plunger, with the wire placed parallel to the direction of the electric field and in the centre of the broad face of the waveguide, will give satisfactory results. Improvement may be made by adjusting the position of the plunger to match out the reactance of the probe. The various methods are illustrated in Fig. 2.

Joining Waveguides

Another problem is that of joining waveguides and components together. Carefully made, flat bolted flanges give passable results, but the use of choke joints is desirable. Their fabrication, like the manufacture of many other items, is, unfortunately, beyond the scope of most amateur workshops; the only source of supply is in surplus equipment. However, it must be emphasised that much may be produced with odd pieces of waveguide and the careful use of an electric hot-plate.

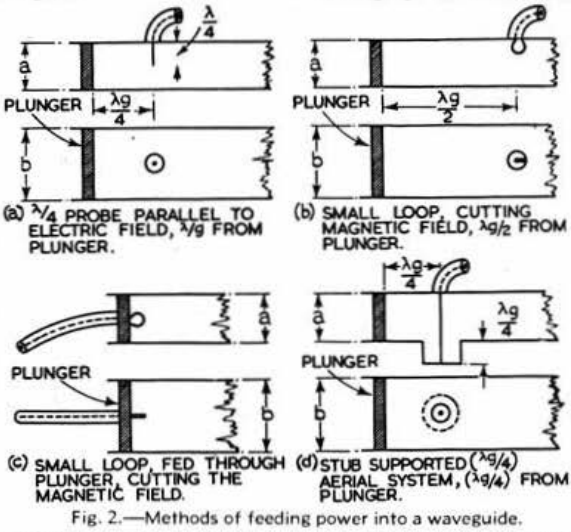


Fig. 2.—Methods of feeding power into a waveguide.

British and American waveguide, for example, may be joined satisfactorily. In Table 1, it will be seen that the inside dimensions of British 3 cm waveguide are the same as the outside of the American 1 in. x ½ in. size, the inside dimensions of which are given in the Table. The two sections may, therefore, be matched by means of a quarter wave transformer. Part of one broad and one narrow face of the American waveguide is removed so that it will fit into the British (Fig. 3). The modification is easily made, and the match obtained is good.

Choke joint flanges are illustrated in one of the photographs and also in Fig. 4. A groove is milled a short distance from the edge of one of the flanges, the mating flange being flat. As leakage could take place here the dimensions are critical. The distance CBA is $\lambda/2$, the short circuit at C being reflected as a short circuit at A. A mechanical connection between the flanges is, however, not necessary. While this facility is found useful in radar equipment—as a means for preventing vibrations being passed from one chassis to another—the main advantage of the choke joint is the reduced chance of mismatch.

Bends in Waveguide

Both rectangular and circular waveguide can be bent, although it would appear that, in the bending of the circular type, difficulties may be encountered.

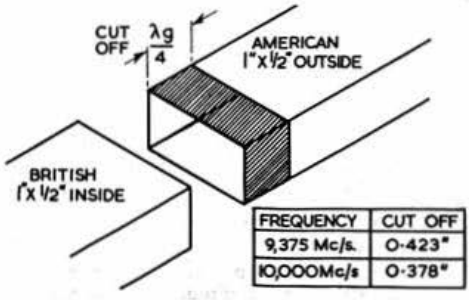
In rectangular waveguide, the standing wave ratio may be kept at a low value (less than 1.05) by making the radius of the bend large compared with the large dimension of the waveguide, and by arranging that the mean length is an integral number of half-waveguide - wavelengths ($\lambda g/2$) long.

So far as the circular type is concerned, similar conditions apply, but trouble may arise due to a change in the plane of polarization at the bend. However, by arranging for two similar bends to turn through 180° over a large radius, the initial plane of polarization appears at the output. Nevertheless, whenever possible, bends should be avoided.

Couplers

The directional coupler, two types of which are illustrated, is a device used for sampling a known fraction of energy being propagated in *one* direction along a waveguide. It is commonly used for coupling high power transmitters to test sets designed to measure smaller power. Two directional couplers may also be placed in opposite directions to provide indications on a suitable meter, from which the standing wave ratio (the ratio of reflected to incident voltage) of the system may be calculated.

The action of a two hole coupler is illustrated in Fig. 5. X is the main waveguide and Y the subsidiary one. A and B are two small holes cut in the common face of X and Y in the centre of the broad face. Energy passing along X in the direction shown excites a field in both directions in Y, through hole A. The same occurs at B, which is spaced $\lambda g/4$ from A. The two excited fields are in phase to the right of B, since both have travelled the same distance AB. To the left of A, however, the excited fields are out of phase, since the field excited at B which travels back to A in waveguide Y has travelled distance $\lambda g/4$ twice before joining the field excited through A to the left. Thus, in waveguide Y a field is excited which flows in the same direction as that in X. Any residual energy to the left of A is absorbed by the piece of matched "lossy" material shown.



FREQUENCY	CUT OFF
9,375 Mc/s.	0·423"
10,000Mc/s	0·378"

Fig. 3.—Method of joining British and American waveguide.

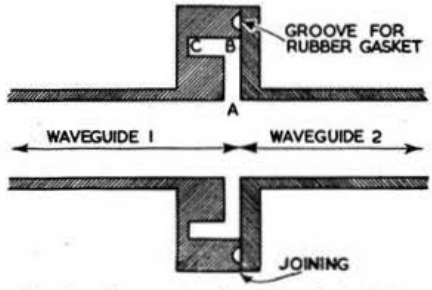
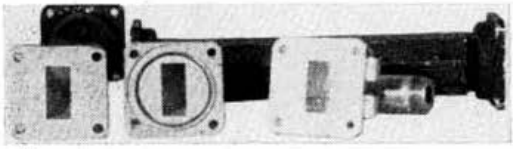


Fig. 4.—The construction of a choke joint.

If, on the other hand, a wave is propagated in X in the opposite direction, then the waves excited in Y will add in the direction of the load but subtract in the opposite direction. All the power coupled from X is therefore dissipated in the load, *i.e.*, purely "one way" operation is secured if all the parts of the coupler are accurately matched.

A waveguide-to-coaxial transformer is illustrated. In the type shown, the inner conductor



Choke joint flanges are on the left. A waveguide to coaxial transformer is shown to right of the picture.

of the special s.h.f. socket has little insulating material and is similar to Fig. 2(a), i.e., $\lambda/4$ probe parallel to electric field. Other types have an extended inner conductor support on a $\lambda g/4$ stub. Both types are backed by a plunger at a distance of $\lambda g/4$ from the socket. Energy reflected by the plunger will be in phase therefore with that propagated through the waveguide.

the electric field inside the waveguide. Both are found by exploring the field with a probe let into a slot in the centre of a length of waveguide. There is virtually no radiation from the slot, provided it is cut accurately with as narrow a width as practicable. The probe thus inserted feeds a

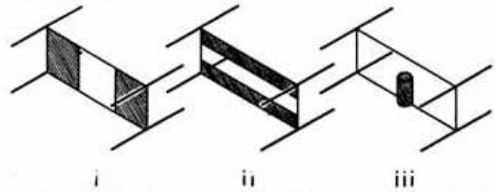
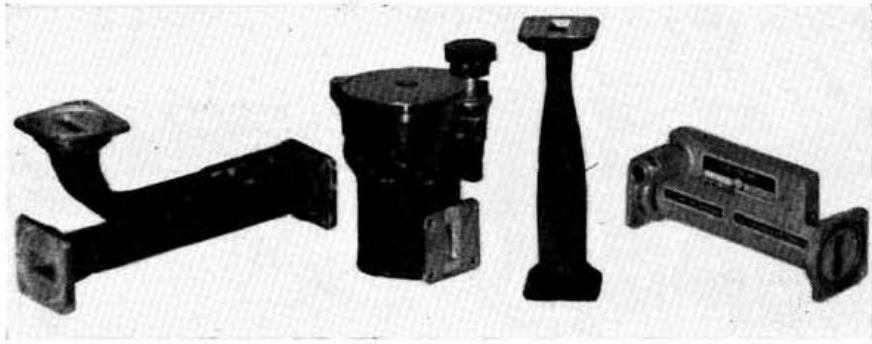


Fig. 6.—(i) Matching iris which shunts the waveguide with inductive reactance; (ii) an iris with capacitative reactance; (iii) screw-type iris.

tunable cavity, which contains a crystal detector. The crystal current is proportional to the square of the field strength (after suitable corrections have been made) at any point in the waveguide in which the probe is placed. For accurate measurements the probe insertion must be small to prevent reflections. A sensitive galvonometer is used as the indicating device. By moving the probe along the slot, the maximum and minimum crystal currents produced by the standing wave in



From left to right: directional coupler (waveguide output), cavity wavemeter, section of waveguide with 90° twist, and a directional coupler with co-axial output.

Matching Methods in Waveguides

Matching in waveguide systems is achieved in a similar manner to that which is used on lower frequencies, a plate (termed an *iris*), with inductive or capacitance reactance being suitably positioned inside the waveguide in the same way as a matching stub is used on the lower frequency bands. A plate, if arranged as in Fig. 6 (i), shunts the waveguide with inductive reactance. If arranged as in Fig. 6 (ii) with a capacitative reactance. The screw shown in Fig. 6 (iii) produces capacitative reactance when shorter than $\lambda/4$ and inductive reactance when longer; it is therefore analogous to a tuned circuit.

Measurement of Standing Wave Ratio

To position these plates it is necessary to know the s.w.r. and the position of a minimum point in

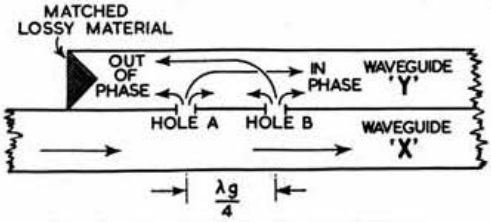


Fig. 5.—The two-hole directional coupler.

the waveguide may be found. The s.w.r. may then be read-off a suitably corrected graph as $L1/L2$, where

$L1$ = field strength proportional to minimum meter reading.

$L2$ = field strength proportional to maximum meter reading.

This gives s.w.r. values from zero to unity. American practice favours the reciprocal of these values, from unity to infinity.

Frequency is also measured absolutely by exploring the standing wave. In Fig. 1, it may be seen that the distance between two minima is $\lambda g/2$ from which the wavelength may be calculated, provided the waveguide dimensions are known accurately. Measurements of this nature are, in practice, beyond the scope of the amateur owing to the accuracy to which the waveguide must be manufactured. Nevertheless, it is possible to make rough measurements of both frequency and s.w.r. with home-made apparatus of the type mentioned. Frequency measurements can be made to within 15-20 Mc/s if great care is taken. A method which appears to offer a satisfactory solution is to use a fixed detector unit with a movable short-circuiting plunger, controlled by a micrometer head, at the end of the waveguide.

Wavemeters

Several ex-Government American precision cavity and coaxial wavemeters, when suitably modified, may be used to measure frequencies in the 10,000 Mc/s amateur band. Two of the cavity type wavemeters—modifications of which are to be described—are directly calibrated in megacycles from 9285 to 465 Mc/s (the American radar band, with suitable overlap) by a dial reading from 0 to 180 to which is added a fixed value of 9285 Mc/s, but the range may be extended to 10,250 Mc/s. The accuracy, after corrections for temperature and humidity have been made, is of the order of ±0.5 Mc/s.

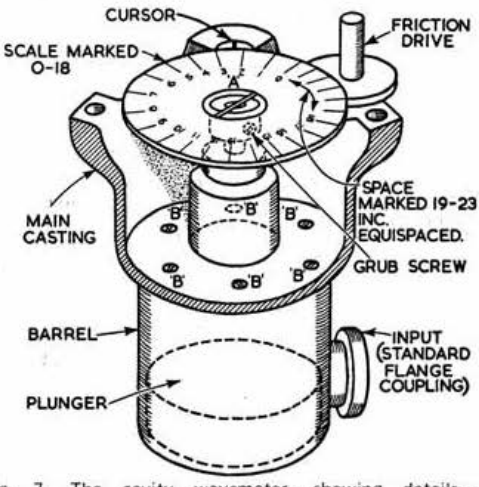


Fig. 7.—The cavity wavemeter, showing details of modification procedure.

Modification Details

(1) After a test oscillator, using an *unmodified* 723A/B, has been allowed to warm up for at at least one hour, the frequency should be adjusted to 9375 Mc/s, *i.e.*, 9 on the wavemeter dial.

(2) A mark should then be scratched across the centre of the dial and shaft (A in Fig. 7). Next, loosen the Allen screws on the dial and move the dial as far forward as possible. Tighten the screws again, after making sure that the marks are still in line. The dial reading should still be 9.

(3) *General Electronic Industries Model 1529 TFX25GA.* Remove the six screws B and gently ease the main casting from the barrel, so revealing the movable plunger, which has a grey absorbing disc fixed to it.

(4) Carefully file-down the stop pin (which works against the main shaft) so that the dial will continue to revolve past 18 but will still stop at 0.

(5) Clean out all filings, replace the screws B and tighten. See that resonance still occurs when the dial reads 9 on the first revolution.

(6) *Model 53.* Begin by carrying out operations (1), (2) and (3). In this model, the grey absorbing disc is fixed to the main casting and obscures the stop pin, making it necessary to remove the plunger. First, mark the shaft at the point where it meets the plunger and then slacken the two Allen grub screws.

(7) After removing the plunger, take out the four screws which hold the absorbing disc in place. The modification is then continued as in operations (4) and (5). The wavemeter is reassembled in the reverse order.

In the TFX25GA, the original pre-set calibration of the radar band will still be correct after modification but in the Model 53 it is necessary to fit the plunger back on to the shaft by trial and error until the wavemeter again indicates resonance at 9 on the first revolution of the dial. The modified wavemeters are useful for experiments in both the radar and amateur bands. The calibration after modification is reasonably universal so that if the instructions are carefully carried out it will conform to the graph in Fig. 8 to an accuracy within the G.P.O. requirements.

The original scale is not linear so the space between 18 and 0 is split into six equal parts giving a calibration curve spread over 3½ revolutions of the dial. It is also possible to use a straight-line scale marked every 10 Mc/s, as shown in the photograph, for rough measurements. The pointer is driven from the wavemeter shaft by a nylon cord running over two *Meccano* wheels.

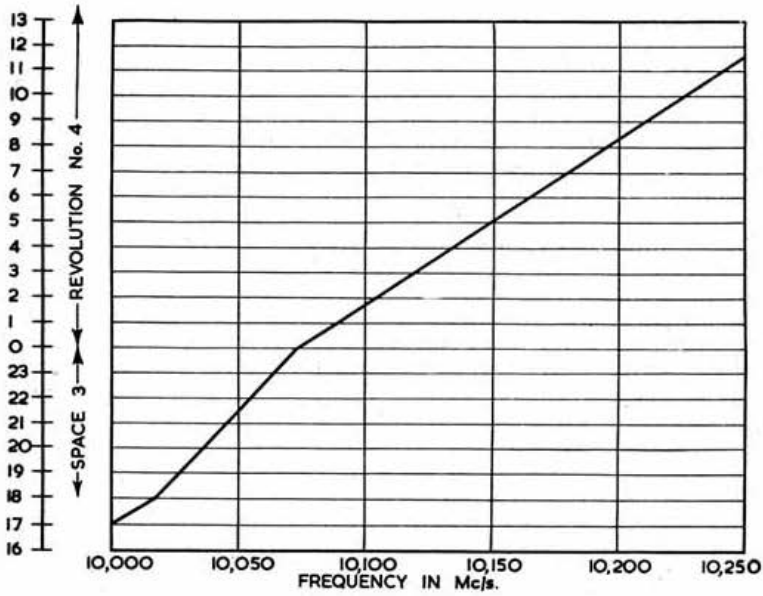


Fig. 8.
Calibration curve of modified wavemeter for the 10,000 Mc/s amateur band. The first 3 revolutions of the tuning control cover the range 9,285 Mc/s to 10,000 Mc/s.

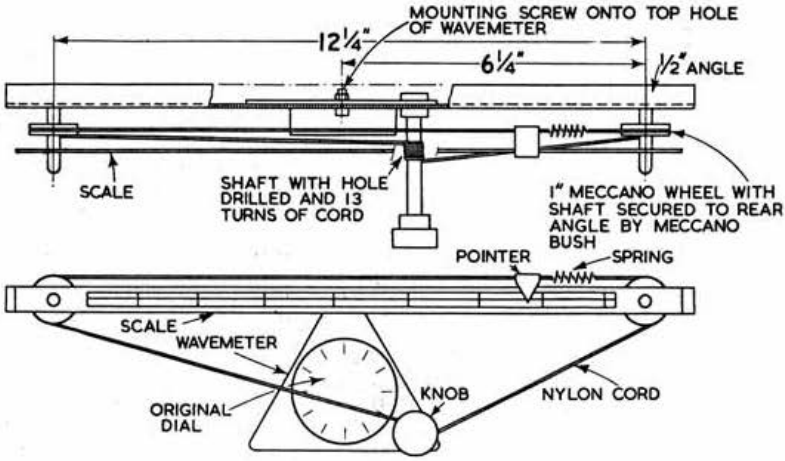
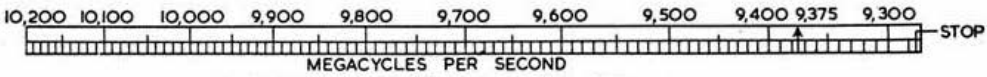


Fig. 9.
Details of straight-line scale for the wavemeter illustrated in Fig. 7.



DIRECT READING SCALE HALF ACTUAL SIZE

Fig. 10.—Straight-line calibration scale shown in Fig. 9.

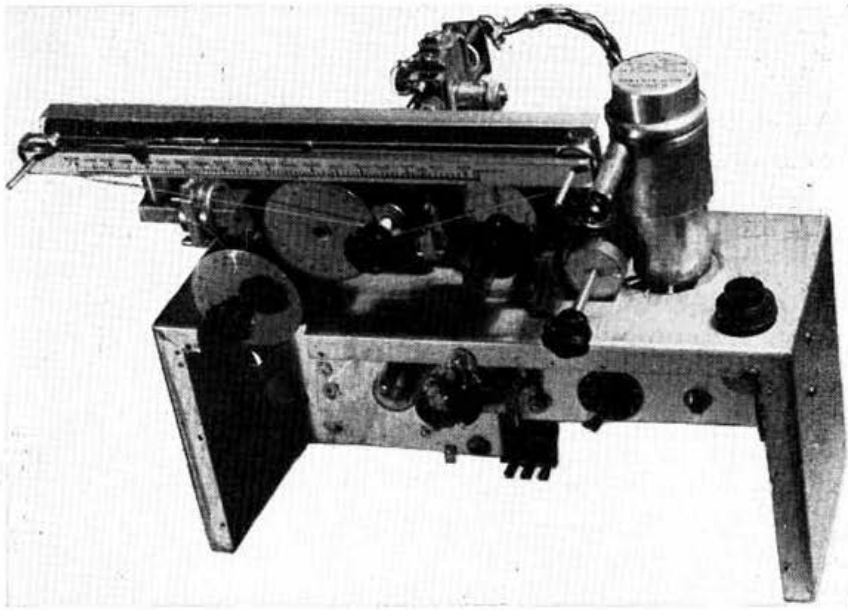
The mechanical details are given in Fig. 9 and a diagram of the scale—one-half actual size—is shown in Fig. 10.

Experiments have been carried out with a coaxial wavemeter. The type X63624B does not modify easily to cover a large range and many spurious responses occur, but it is useful for holding equipment to a given frequency over long periods of time.

References

(1) R.S.G.B. BULLETIN, July-November, 1943.
(2) *Radio Engineering*, Terman.
(3) *The Principles and Practice of Waveguides*, Huxley. Cambridge University Press.
(4) *Waveguides*, Lamont. Methuen.

(To be continued)



A modified cavity wavemeter with straight-line calibration scale, marked every 10 Mc/s. The original dial may be seen just below the new scale, which is illustrated (one-half actual size) in Fig. 10. The mechanical details are given in Fig. 9.

By C. H. L. EDWARDS, A.M.I.E.E. (G8TL)*

A "Top Band" Low Power Transmitter-Receiver

A compact, light-weight, portable transmitter-receiver for operation from all-dry internal batteries or external power supplies suitable for emergency use

IN designing this transmitter-receiver the writer had in mind cost and portability; consequently, where possible, surplus equipment of the miniature pattern was used in order to reduce both size and weight. Originally the set was constructed to carry two personal-receiver batteries beneath the chassis, the overall dimensions of which are 4½ in. by 6½ in., but it was found that the transmitter current consumption was more than these small cells could cope with. Consequently, an additional compartment 12 in. by 3¼ in. was added to house larger batteries capable of supplying the current required.

The transmitter-receiver, the aerial tuning unit, and the monitor are built as a single unit which can be removed from the case for inspection or servicing by withdrawing four front securing screws and removing the wander-plugs from the batteries separately housed in the second section of the box. All feeds to the transmitter-receiver are brought out to a 2-pole 3-way Yaxley switch mounted on the front panel, the centre being the *off* position. Provision is made to enable the unit to be run from external batteries or mains, so that the internal batteries need only be used when operating portable, thus ensuring the maximum economy when required.

* *10 Chepstow Crescent, Newbury Park, Ilford, Essex.*

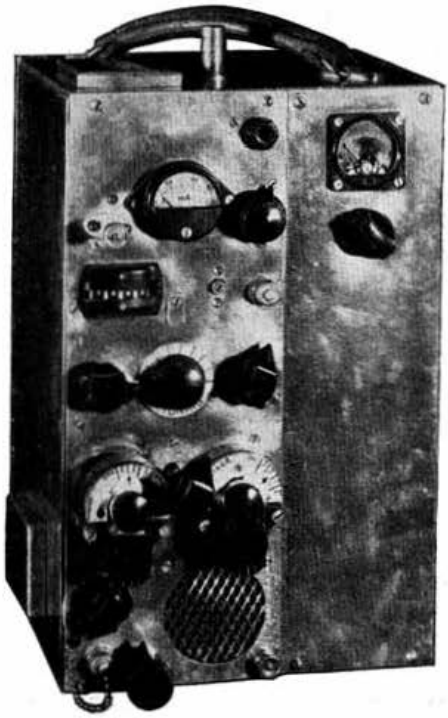
Transmitter

As can be seen from the circuit diagram (Fig. 1), the transmitter is a separate unit, consisting of a 3V4 v.f.o. driving a 3S4 p.a., modulated by the two final stages of the receiver. When transmitting, the speaker transformer acts as a Heising choke. Switching is carried out by means of a 2-wafer 3-pole change-over Yaxley which (i) breaks the filament supply to the first three stages of the receiver (in order to prolong the life of the l.t. battery); (ii) inserts a 300-ohm resistor to correct the bias on the audio stage; and (iii) changes-over the aerial to the loading coil.

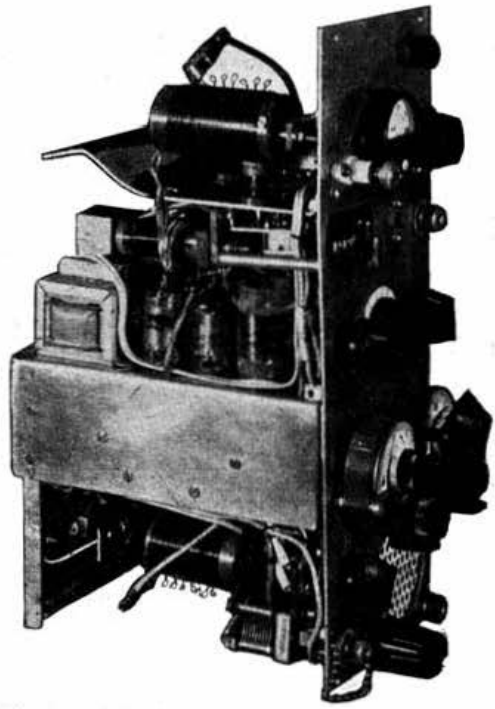
As difficulty was experienced in obtaining a suitable small 0-20 milliammeter at reasonable cost for the final stage, a 0-500 microammeter taken from a surplus visual indicator (SBA Type 3) suitably shunted to read 20 mA full-scale deflection was utilised. The final valve (3S4) can be used as either a pentode or a triode. The latter arrangement, which is preferred, produced a reading of 19 mA off resonance, and 1.5 mA at resonance.

Valve Data

The following data, provided by Standard Telephones and Cables, Ltd., may interest those who plan to build a transmitter similar to the prototype.



Front view of the transmitter-receiver, showing compact layout of panel controls.



Side view of chassis removed from case, showing interior assembly and construction.

Valve Data Table

V2 (3S4 p.a.)	V2 connected as pentode	V2 connected as triode
Grid current	0.68 mA	0.68 mA
Anode current (at resonance)	4.7 mA.	1.5 mA
Anode current (off resonance)	7.1 mA	21 mA
Anode current (tuning dip)	2.4 mA	19.5 mA

Conditions.—V1 (3V4 v.f.o.) operating at 1.67 Mc/s. With anode and screen of V2 disconnected, V1 anode current = 4.8mA; V2 grid current = 0.8mA; and V2 grid drive = 80V. The readings in the table are obtained for V2 anode and screen voltages of 100 V and 60 V respectively.

Receiver

The receiver section comprises a 5-valve superhet of conventional design. When switched to *receive*, the transmitter filament supply is broken, and the aerial changed over to the r.f. grid coil. The r.f. stage is separately tuned, the coil being tapped to match the type of aerial in use. The a.f. output is fed to a 2½-inch Goodman speaker, or to headphones *via* a jack.

Constructional Details

The unit is mounted on an aluminium chassis 4½ in. by 6½ in. and on the rear of a panel which measures 12 in. by 4½ in. Controls are brought out to the front, those for the transmitter to the left, and those for the receiver to the right (Fig. 2). The *send-receive* switch is mounted centrally between the v.f.o. and receiver tuning condensers. The aerial tuning unit, which is self-contained, is built on to a piece of aluminium 4 in. by 6½ in., secured to the rear of the front panel 4 in. above the chassis. On this is also mounted the small phone monitor.

At the rear of the chassis, on a polythene strip, are four sockets into which external l.t. and h.t. supply leads can be plugged if required. In order to reduce the voltage to the requisite value, a variable resistance is inserted in each positive

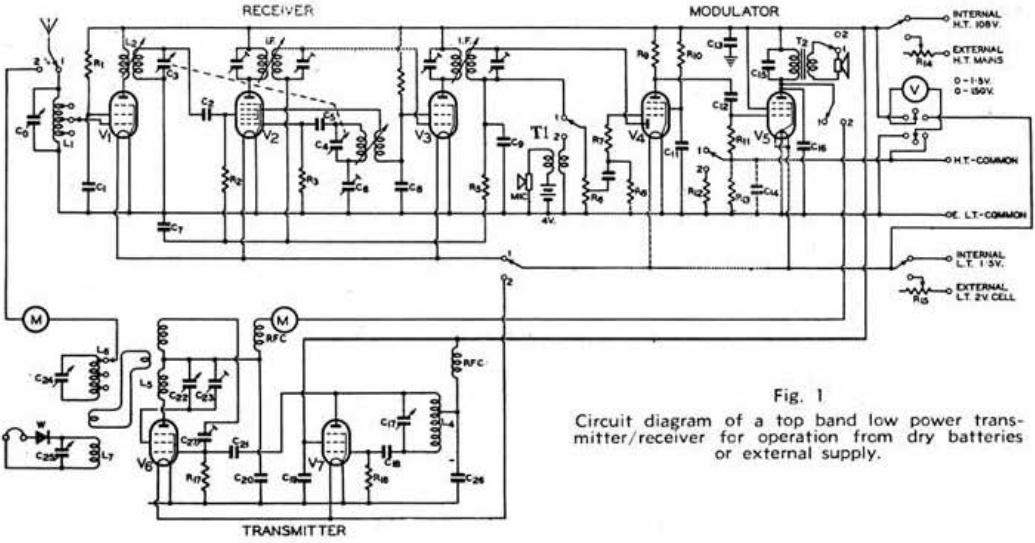


Fig. 1

Circuit diagram of a top band low power transmitter/receiver for operation from dry batteries or external supply.

COMPONENT LIST

RESISTORS

R1. 47,000 ohms, ½-W.
R2, 11. 1 megohm, ¼-W.
R3, 17. 100,000 ohms, ¼-W.
R4. 27,000 ohms, ½-W.
R5, 10. 2.2 megohms, ½-W.
R6. 1 megohm potentiometer.
R7. 22,000 ohms, ½-W.
R8. 6.8 megohms, ¼-W.
R9. 470,000 ohms, ½-W.
R12. 300 ohms, ½W.
R13. 1,000 ohms, ½-W.
R.14, 15. Variable potentiometer to suit power supply.
R16. 10,000 ohms, ½-W.

CONDENSERS

C0, 24, 22, 25. 100μμF variable air-spaced.
C1, 8, 11, 12. 0.01 μF
C2, 5, 9. 0.0001 μF.
C3, 4. 100μμF variable twin-gang.
C6, 18, 19, 20, 21, 26. 0.001 μF
C7. 0.1μF.
C10, 15, 16. 0.005μF.
C13. 2μF, 150V. wkg, midget electrolytic.
C14. 25μF, 12V. wkg, electrolytic.

VALVES

V1, 3. DF91 or 1T4.
V2. DK91 or 1R5.
V4. DAF91 or 1S5.
V5. DL93 or 3A4.
V6. DL92 or 3S4.
V7. DL94 or 3V4.

MISCELLANEOUS

R.F. Ammeter, 0–150mA 1" diam.
P.A. Ammeter, 0–20mA.
Two r.f. chokes (Denco).
One Westector (W).
One loudspeaker, 2" diam. (Goodman).
One speaker transformer (T2) (Wharfdale OP3).
One carbon microphone (G.P.O.).
One microphone transformer (T1) ratio 100 : 1.
One voltmeter, 0–1.5V/0–150V, 1" diam.
Two 465 kc/s i.f. transformers (Denco).
One 4½V microphone battery.
One 1.5V battery (Drydex H1155).
One 120V battery (Drydex H1006).

COIL DATA

L1. No. 28 s.w.g. enam. wire close wound to 1¾" length tapped every 10 turns on 1¼" diam. former.
L2. Denco Maxi-Q 160E Blue.
L3. Denco Maxi-Q 160E Red.
L4. 54 turns of No. 32 s.w.g. enam. tapped 20 turns from bottom close wound on 1" diam. former.
L5. No. 32 s.w.g. enam. wire close wound to 1⅜" length tapped at ⅜" on ⅝" diam. former.
L6. No. 28 s.w.g. enam. wire close wound to 1½" length tapped every 10 turns on 1¼" diam. former.
L7. No. 36 s.w.g. s.s.c. wire close wound to 1¼" length and wound back on itself ¼" on ½" diam former.

supply lead. A small 0-1.5-150V voltmeter, switched by means of a 2-pole change-over Yaxley, is mounted on the front of the panel which encloses the battery section. With the switch to the left, the instrument reads l.t., and to the right h.t. voltage, thus providing a convenient check on the condition of the cells.

The aluminium box has one large rear door so that adjustments can be made without removing the chassis. Two further small hinged doors allow for tapping up and down the transmitter loading coil and r.f. grid coil for aerial matching.

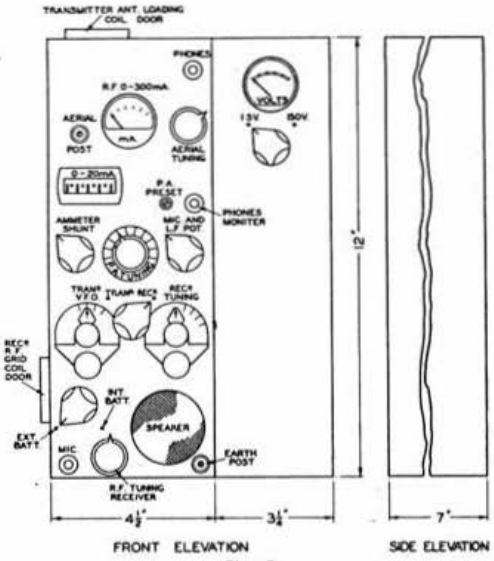


Fig. 2

Front and side elevations, showing layout of main controls.

Operation

The transmitter-receiver will operate satisfactorily on any length of wire, or on a whip aerial if desired. Using a long wire aerial 132 ft. in length, tuned against earth and with an input of one watt to the transmitter, S9 reports have been obtained from distances up to 20 miles. Housed in a car and attached to a whip aerial, S6-9 signals were reported over a path of 16 miles with an input of ¼-watt. On another occasion when standing stationary on the Southend arterial road, using an input of 0.75W, good signal reports were received from G6CH in Rochester, G3GSP in Gillingham, Kent, and other stations in the Southend area. The transmission was heard by a listener in Brightlingsea, Essex, some 50 miles distant. The receiver is extremely sensitive and selective, the B.B.C. Welsh and Northern Regional stations being received in London when conditions are good, at S9 on the small loudspeaker.

* * *

In conclusion, the writer wishes to thank John Erskine, B.R.S. 12381, for checking the circuit, and J. J. Hollington, G4GA, and F. Judd, G2BCX, for co-operating during portable tests.

Can You Help?

● L. E. Profaze, 40 Seafield Road, London, N.11, who would like to know whether the chirp, usually associated with the R.A.F. T.1154 transmitter, can be eliminated without major modifications? If not, can anyone suggest what alterations are necessary?

● H. Aitken, 22 Beech Street, Salford 7, Lancashire, who would like to hear from any member who has successfully converted the type R.F. 24 unit for use on 21 Mc/s.

National Emergency Amateur Radio Communications Service

THE response to the Editorial printed in the March, 1953, issue of the R.S.G.B. BULLETIN has produced correspondence from transmitting and B.R.S. Members in all parts of the U.K. expressing a wish to join a National Emergency Amateur Radio Communications Service. A number of non-members have also volunteered. In all cases, approval of the Editorial has been expressed and the writers have asked to be placed on the list of volunteers. The only conditional offers have come from those with Service commitments in time of war.

Although support for the National Emergency Amateur Radio Communications Service has already come from all over the U.K., many more volunteers are still required. Members are invited to register with Headquarters NOW, by sending a postcard bearing their name, call sign (or B.R.S. number) and address to the General Secretary, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1.

Reading the letters, we are reminded very forcefully of the old adage that one volunteer is worth a score of pressed men. Every letter, either by its brevity or by the account of preparations already under way, indicates the wholehearted enthusiasm and sense of purpose with which the writer is inspired. They range from the real old timers to the newest G3s; from those whose knowledge of radio is entirely amateur to men with years of commercial and wartime experience in both the Armed Forces and in those more spectacular, but less publicised, agencies which spring up at such times Some indicate that local emergency "nets" are already in process of formation.

Many of the offers are not restricted to participation in the Service when set up, but indicate a willingness to act as area organisers both now and in the future. Many letters show that suitable equipment is already available. For the moment we would urge interested members to build portable gear which may be operated independently of the public supply mains. A further announcement will be made later.

Faraday Medal

THE Council of the Institution of Electrical Engineers have made the 31st award of the Faraday Medal to Colonel Sir A. Stanley Angwin, K.B.E., D.S.O., M.C., T.D., B.Sc.(Eng.), for his outstanding contributions to the development of telecommunications in Great Britain and in the international and intercontinental fields.

For several years Sir Stanley Angwin was Engineer-in-Chief of the G.P.O. At the I.T.U. Conference held in Atlantic City during 1947, Sir Stanley was Chairman of the all-important Committee responsible for producing a new Frequency Allocations Table. He opened the first R.S.G.B. Amateur Radio Exhibition later in the same year.

PLEASE PAY YOUR SUBSCRIPTION PROMPTLY WHEN DUE.

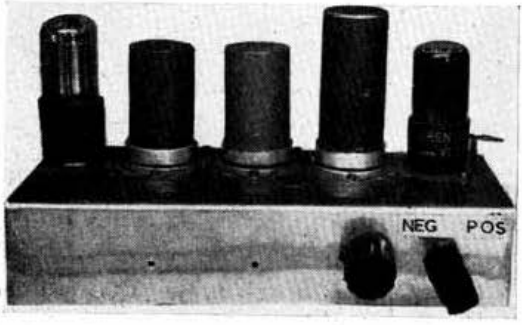
By M. BARLOW (G3CVO)*

Television Transmission for the Amateur

Part III. - Video Amplifier, Time Bases and Power Supplies

Part II of this series—published last February—described a simple film strip gate and gave brief details of the video amplifier. In this article, the adjustment of the amplifier for good definition, and the design of the cathode follower, phase inverter, time base and power supply circuits are considered.

THE video amplifier circuit for flying spot use described in the February, 1953 issue of the R.S.G.B. BULLETIN, although not a particularly good one, has the advantage that it is reasonably foolproof. An example of the amplifier (using two EF50s and an EF55) is illustrated. (Other valves which may be used are 6AC7s, EF91s or EF80s in place of the EF50s and a 6AG7 instead of the EF55.) On the same chassis there is also a 931A photocell and a 6SN7 phase inverter/cathode follower.



The video amplifier showing (left to right) the 931A photocell, EF50, EF50 and EF55 amplifiers, and 6SN7GT cathode follower/phase inverter.

The Circuit

When dealing with a large bandwidth, the effect of stray capacities, which tend to bypass the high frequencies (corresponding to fine detail in the picture), can be considerable. Exact component values are, therefore, best found by trial and error. The cathode decoupling arrangements should first be experimented with; a large decoupling condenser (1000 $\mu\mu$F) will allow the lower frequencies to be reproduced without attenuation, whereas a small capacity (0.001 μF) will effectively boost the higher frequencies by giving negative feedback at lower frequencies. Omitting the condenser altogether will give a reasonably flat response up to high frequencies but the gain of the stage will be reduced. A compromise is therefore required between h.f. boost (which produces sharp edges in the picture) and good l.f. response (corresponding to even colouring of large areas). Once the unit is working, different values of cathode condensers can be tried.

The values for screen and anode decoupling given in the original diagram will be found to be satisfactory. As in all vision equipment, the h.t. line is decoupled by two condensers, an electrolytic for the low and a small mica condenser for high frequencies. Heater decoupling is seldom necessary, but heater and h.t. wiring should be run on the *outside* of the chassis, not inside close to the sides as is usual.

If accurate test equipment is available, coil compensation is possible. As a start, 100 μH chokes may be used in series with the anode load resistors, although this may cause the amplifier to oscillate. Should it do so, the coils may be damped with resistors. Alternatively, some coils may be wound on dust cores so that they can be detuned slightly to prevent oscillation, which appears as a series of "ringing" lines parallel to the edges in the picture, the "rings" being alternately black and white, and gradually decreasing in amplitude. Other forms of coil compensation are not recommended owing to the difficulty of setting up.

Low value anode loads are used to obtain wide bandwidth; the resistors employed should be of high quality to prevent the introduction of noise. Three or five watt resistors are recommended, although well made one-watt types may be used. The valves should be of the low noise type with high mutual conductance, to provide sufficient gain. Most of the noise, however, is generated in the photocell itself, which (because it is a secondary emission device) is inherently noisy. The cell noise may be lessened by reducing the voltage across it but this reduces the output so that the amplifier gain has to be increased, with a consequent increase in amplifier noise. Invariably, a compromise giving high gain with low noise may be found. The cell power supply must be well smoothed to prevent hum pick-up. The ninth dynode is returned to a positive potential so that the negative supply is correspondingly reduced, but this junction must be very well decoupled. If hum is still picked up, it may be necessary to return the top of the dynode chain to earth. The cell load resistor R9 (2,200 ohms) is a critical component and may have to be adjusted later.

Compensation can also be accomplished by varying the coupling components, the leads to which should be short. Coupling condensers, particularly metal cased tubular types, must be kept away from the chassis.

The Cathode Follower and Phase Inverter

The addition of each valve to the amplifier chain causes a reversal of picture polarity. Similarly, if

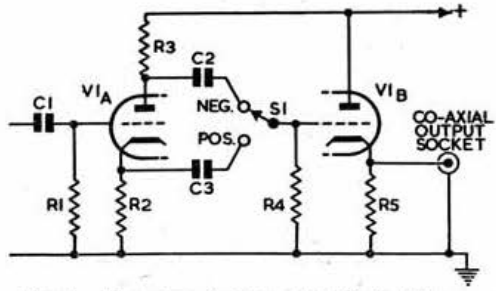


Fig. 1.—The phase inverter and cathode follower. C1, 2, 3: 0.1 μF (if metal cased, must be mounted away from the chassis); R1: 250,000 ohms; R2: 4,700 ohms; R3: 500,000 ohms; R5: 1,000 ohms, 2 W; S1: Single pole, 2-way, Yaxley, ceramic; V1A, B: 6SN7 or 12AU7.

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

either negative or positive transparencies are to be used as desired in the scanner, an optional phase reversing stage is needed. This can be combined with a cathode follower stage (Fig. 1) in a single 6SN7. No decoupling of the load resistor not in use is provided, as the overall gain in either "positive" or "negative" position must be the same.

As about 10 volts of video signal are available at the cathode follower it is possible to drive the monitor tube direct when maximum gain is used. It is preferable, however, to reduce the output to the co-axial cable to about 5 volts and to add a video amplifier at the monitor.

Testing the Amplifier

The amplifier must be run from a stabilized power supply similar to that described in the R.S.G.B. *Amateur Radio Handbook*.

After all the connections have been checked, the time bases, scanner and monitor tubes may be switched on and the h.t. supply set to about 280 V. When the scanning is seen to be working, the scanner brilliance is increased to maximum and the focus adjusted as sharply as possible. The video amplifier may now be switched on and the gain increased until noise ("snow") is seen on the monitor. The video gain is then reduced slightly and the cell volts increased until the noise reappears. If a screwdriver is now waved in front of the scanner, some indication should be seen on the monitor tube. A black cross of *Sellotape* may next be stuck on the face of the scanner tube and the position of the photocell adjusted for maximum output. Simultaneously, the optical focus should be adjusted, if a lens system is in use. The cell volts and amplifier gain controls should be carefully balanced for optimum picture and the phase inverter checked for correct operation. At this point, alteration to component values should be made to get sharp edges to the black cross and even illumination of the "white" background.

When the response is satisfactory, a simple test pattern consisting of very thin vertical black lines drawn with a mapping pen on a 3¼in x 2¼in piece of cellophane or *Kodatrace* should be easily seen. It should also be possible to get fair results from photographic negatives. As a further test, the output from an ordinary TV set, at normal contrast level, may be applied to the scanner tube (adjusted for maximum brilliance). It should be possible to resolve the picture on the monitor tube, with very little loss of quality.

Time Bases and Power Supplies

The time base units and power supplies are straightforward, but for those commencing TV experiments or wishing to modify their own sets, a circuit suitable for electrostatic deflection is given in Fig. 2. Since scanner and monitor tubes are not usually identical, and are frequently run at different e.h.t. voltages, two deflection outputs are available from the sawtooth amplifiers. The oscillators are transitrons, and the negative pulses obtained at the screen grids during flyback are mixed in a simple network for use as flyback suppression pulses. To blackout the return traces on the cathode ray tube, the pulses (about 40 volts peak-to-peak) are applied to one of the video amplifier suppressor grids or directly to the monitor tube or to both. The frame time-base is locked to the mains supply, but the line time-base is free running.

Separate e.h.t. chains must be used for scanner and monitor owing to the different conditions under which they operate. Any type of supply may be used, but the scanner tube should be run at maximum ratings in the interests of high output and fine spot size.

The negative supply required for the photocell is 500 volts at about 1 mA. For this purpose a small transformer may be used—a surplus SCR522 modulation transformer is ideal. A metal or selenium rectifier and smoothing completes the arrangement, but the cases of electrolytics must be isolated from the chassis.

(To be continued)

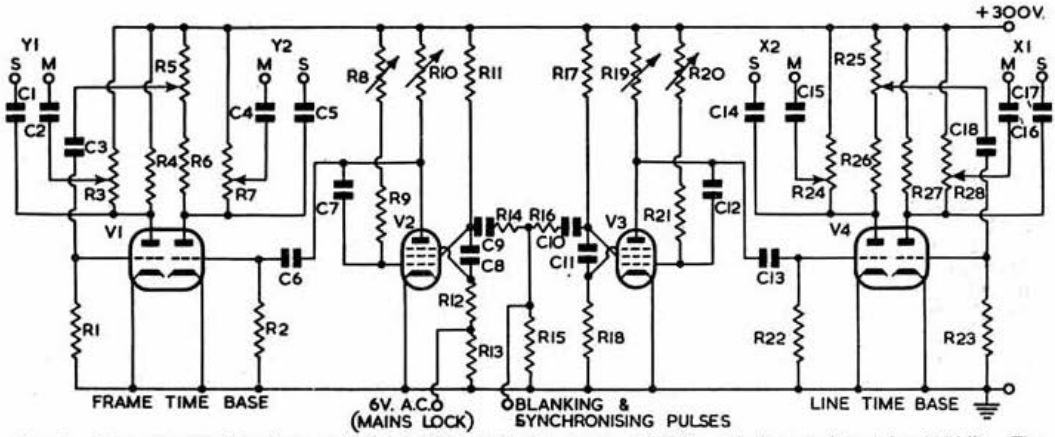


Fig. 2.—The common time base unit for feeding both the scanner ("S") and the monitor tube ("M"). The unit also supplies mixed frame and line pulses for blanking and synchronisation purposes, and may be locked to the mains frequency.

C1, 2, 3, 4, 5, 6, 9, 10, 13, 14, 15, 16, 17, 18.—0.1 μF
C7.—0.005 μF
C8.—0.01 μF
C11.—200 μμF
C12.—100 μμF
R1, 2.—1 megohm
R3, 7, 24, 28.—50,000 ohms variable
R4 27.—50,000 ohms
R5 (sawtooth balance control), R25 (balance).—20,000 ohms variable
R6, 26.—30,000 ohms variable
R8 (frame speed), R20 (line speed).—2 megohms variable
R9.—500,000 ohms
R10, 11, 19.—39,000 ohms
R12.—270,000 ohms
R13.—6,900 ohms
R14, 16, 21, 22, 23.—100,000 ohms
R15, 17.—27,000 ohms
R18.—68,000 ohms
V1, 4.—6SN7, 12AU7
V2, 3.—EF50, SP61, Z77

The Radio Amateurs' Examination

Model Questions and Answers

Part 9. Interference and Frequency Measurement

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

Interference

IT is the duty of every radio amateur to operate his station in such a manner that interference to other services is reduced to a minimum. Even the most simple amateur transmitting equipment is capable of causing severe interference—particularly to broadcast and television receivers—if it is incorrectly used. For this reason, questions on interference and means of eliminating it are often set in the examination.

How may a transmitter operating on an authorised frequency cause interference to receivers tuned to other frequencies? State how such interference may be cured.

Key Clicks.—This form of interference is the principal type caused by telegraphy transmitters, producing trouble not only on adjacent frequencies but also to nearby receivers tuned to signals in other bands. The abrupt change of power which occurs during keying sets up damped oscillations of brief duration and high amplitude which may be radiated to produce "clicks" on either side of the carrier frequency. The cure is to use a filter (Fig. 1) in series with the key to retard the build-up and decay of power in the keyed circuit. Suitable choice of filter components will produce "clickless" keying without making the signal difficult to read.

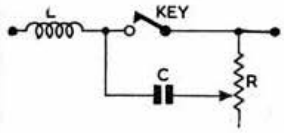


Fig. 1.
Key click filter for use in d.c. leads. Suitable component values are: L, up to 50 H; C, 0.1 to 0.5 μF; R, 25 to 500 ohms. Correct values are found by experiment.

Harmonic Radiation.—A transmitter may interfere with reception on harmonics of the frequency on which it is operating. For example, the third harmonic of a transmitter operating in the 14 Mc/s band will occur in the region of 42 Mc/s, which falls within the channel assigned to the London Television station. It is important, therefore, that harmonics should not be radiated.

Harmonic suppression may be achieved by operating p.a. stages under correct conditions (*e.g.*, by avoiding excessive drive and bias) and by the suitable choice of inductance and capacitance values in tank circuits. The use of an aerial tuning unit between the tank circuit and the radiating system will also reduce harmonic radiation. Further attenuation of harmonics may be obtained by using a low pass filter in the co-axial cable connecting the transmitter to the aerial tuning unit.

Parasitic Oscillations.—Unwanted resonances in wiring and r.f. chokes may cause oscillations on frequencies unaffected by the normal tuning controls. Radiation of these oscillations causes unnecessary interference—frequently outside the amateur bands. The inclusion of "stopper" resistors (of about 10 to 100 ohms) or v.h.f. chokes in grid and anode leads and the use of short, direct wiring will generally eradicate the trouble.

Production of Beat Frequencies.—The fundamental or harmonic frequency of the oscillator in a superheterodyne receiver may beat with a strong incoming signal, irrespective of the frequency to which the mixer is tuned, to produce a third frequency, which will cause interference to the desired signal. Improved radio frequency selectivity or the inclusion of a wave-trap in the aerial feeder to the receiver is indicated.

Swamping.—This occurs when the signal voltage applied to the receiver is so great that one or more stages are rendered inoperative, with a consequent variation in the volume of the desired signal. Alternatively, the direct pick-up of the transmission by leads—especially grid leads—in the receiver may make the interfering signal audible. This form of interference is little affected by the tuning controls. Improved selectivity, screening, or the use of a wave-trap, will cure the trouble in most cases.

Image Response.—If the r.f. selectivity of the receiver is inadequate, it will be possible to tune in a powerful signal at two settings of the receiver dial, first, when the local oscillator is at the i.f. above the signal (which is normal) and, second, when the local oscillator is at the i.f. below the signal. The cure is to improve the r.f. selectivity. The separation between a true signal and its image is twice the intermediate frequency.

Cross-Modulation.—In this form of interference, the modulation of a nearby transmitter becomes audible only when the receiver is tuned to another station—frequently a broadcasting station. The effect arises as a result of rectification in the early stages of the receiver caused by the excessive input from the local transmitter. Increased selectivity, a smaller aerial, a wave-trap or the installation of variable-*mu* valves are likely to help cure the trouble.

Modulation Hum.—Radio frequency currents in the mains may cause hum in a receiver. If the currents are due to direct pick-up by the mains wiring, the supply leads should be by-passed to earth at the point where they enter the receiver by good quality 0.01 μF condensers. An electrostatic screen between primary and secondary windings of the mains transformer may also help. Radio frequency currents at the transmitter may be prevented from entering the mains wiring by the installation in each lead of r.f. chokes capable of carrying the mains current and by the use of 0.01 μF by-pass condensers as in a receiver.

Frequency Measurement

Provision must be made in an amateur station to ensure that the transmitter is tuned to a frequency within an authorised band. Suitable types of instrument are described in the answers to the following typical examination questions.

What is an absorption wavemeter? For which applications is such an instrument best suited?

An absorption wavemeter (Fig. 2) is simply a resonant circuit with some means of indicating resonance. The instrument may be made in any convenient form and should be fitted with an insulated handle so that it may be held with the tuning coil (L1) near the circuit the frequency of which is to be measured.

* *48 Earlsfield Road, Hythe, Kent.*

At resonance, the wavemeter *absorbs* a small amount of power from the circuit to which it is coupled. When used to measure transmitter frequencies, resonance is shown by the increased reading of the meter (M). In a receiver, there will be a sudden drop of signal strength or background noise at resonance. The frequency may be indicated directly by the dial on the tuning condenser (C) or by means of calibration charts.

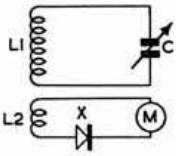


Fig. 2.
Circuit of a simple absorption wavemeter. L1, C—to tune desired frequency; L2, link coil; M, 500 μA meter; X, crystal diode.

An absorption meter is not highly accurate but it has the advantage that it will only respond to its resonant frequency. It is, therefore, satisfactory where approximate readings will suffice as, for instance, when

(a) identifying the correct harmonic to drive a subsequent stage,

(b) indicating the presence and order of harmonics in the output of a transmitter, especially high order harmonics which may interfere with television,

(c) determining the frequency of parasitic oscillations, and locating leads in which oscillation is present.

Describe a form of heterodyne frequency meter (wavemeter) suitable for use in an amateur transmitting station. State by what means the calibration may be checked.

The heterodyne frequency meter (Fig. 3) provides the following facilities: (a) crystal controlled check points at 1 Mc/s intervals; (b) calibration points every 100 kc/s from a pre-determined frequency; (c) a heterodyne oscillator for intermediate readings.

The triode section of the triode hexode valve is used as a Pierce crystal oscillator, the 1 Mc/s and 100 kc/s crystals being selected by S1. A part of the r.f. voltage developed by the crystal oscillator is fed *via* the small condenser C1 to the output terminal AE.

The hexode section of the valve is arranged as a variable frequency oscillator which covers a range of 100 kc/s, from say, 3400 to 3500 kc/s. This arrangement is necessary because, at 3.5 Mc/s, the harmonics of the 100 kc/s crystal oscillator are weak owing to the high order of harmonic involved. The 100 kc/s crystal oscillator is used, therefore, to modulate the variable frequency oscillator, the effect of which is to produce sideband frequencies at intervals of 100 kc/s. For example, if the v.f.o. is on 3400 kc/s, the modulated output will contain sideband frequencies of 3300 and 3500 kc/s. Other harmonics of the crystal oscillator will simultaneously produce sideband frequencies at 100 kc/s intervals on either side of 3400 kc/s at lower amplitude. Harmonics of the v.f.o. may be used for the 7, 14, 21 and 28 Mc/s amateur bands. The tuning dial of the v.f.o. is calibrated from 0 to 100 kc/s so that by tuning to zero beat (as heard in the headphones H) with the signal whose frequency is to be measured, the unknown frequency may be found by adding the dial reading to the frequency of the 100 kc/s calibration point on the lower frequency side of the signal.

Calibration.—The 1 Mc/s crystal oscillator frequency should be checked from time to time by allowing the appropriate harmonic to beat with a standard frequency transmission (such as those from WWV on 5, 10 and 15 Mc/s) tuned in on a receiver after the frequency meter has been allowed to warm up thoroughly. Then, if a beat note of 500 c/s is obtained on the h.f. side of the 10 Mc/s standard transmission, the crystal frequency is known to be 50 c/s higher than 1 Mc/s.

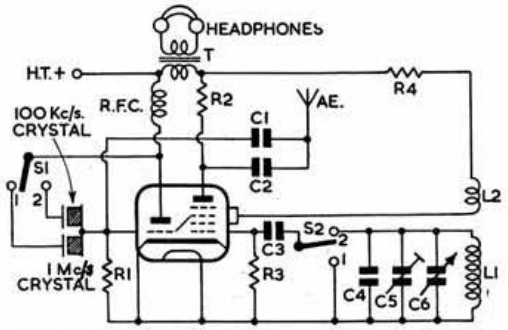


Fig. 3.—Circuit of the heterodyne frequency meter.

C1, 2	5 μμF	R1, 3	1 Megohm
C3	50 μμF	R2	2,000 ohms
C4	300 μμF	R4	20,000 ohms
C5	10 μμF	RFC	4 mH
C6	50 μμF	T	Headphone coupling transformer
L1	7 μH		
L2	2 μH		

The calibration of the variable frequency oscillator is checked by tuning a receiver nearly to zero beat with a harmonic of the 1 Mc/s crystal oscillator, and then, with switches S1 and S2 in position 2 and the v.f.o. set to zero, noting whether the same low pitched beat note is obtained in the receiver. Exactly the same beat note should be obtained when the v.f.o. is set to 100 kc/s. Any necessary small adjustment to the v.f.o. frequency may be made by the panel mounted trimming condenser C5.

Note.—The question does not ask for the procedure in using the instrument. If it did, the following could be appended.

Procedure.—After the frequency meter has warmed up, a short wire, connected to the output terminal AE, is run near to the aerial terminal of a receiver.

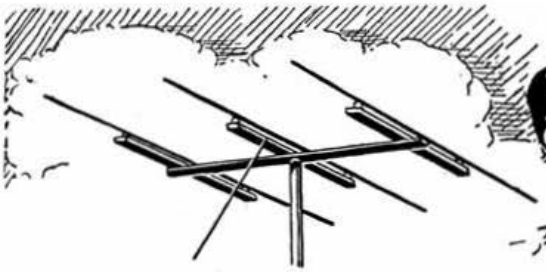
With switches S1 and S2 in position 1, 1 Mc/s check points are available. Alternatively, if the operator listens in the headphones, a transmitter may be set to any frequency which is a harmonic of 1 Mc/s by tuning to zero beat with the meter.

When switches S1 and S2 are in position 2, and the frequency meter dial at zero, output is obtained at 100 kc/s intervals from the 1 Mc/s calibration points. A transmitter can be tuned to any of these 100 kc/s points in a similar way to the 1 Mc/s points.

Radio Amateurs' Examination Revision Sheets.

THE author of the series of articles entitled "The Radio Amateurs' Examination" has prepared a comprehensive set of revision sheets for the use of candidates who are preparing to take the City and Guilds' of London Institute examination next month.

The revision sheets are available from Headquarters price 1/- per set, post free.



AROUND THE V.H.F.'s

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

GW2ADZ & ON4UV GAIN 70 cm WORLD RECORD

Best ever V.H.F. and U.H.F. openings. Signals from Czechoslovakia heard in England

THE series of anti-cyclones which were responsible for the settled weather conditions over the United Kingdom and parts of the Continent from the end of February until the end of March, produced an almost continuous series of v.h.f. openings and activity on both 2 m and 70 cm. So much has been done by so many stations that it is difficult to know where to start the story, but pride of place must go to Bill Parker, **GW2ADZ**, of Llanymynech, Montgomery, who, with **ON4UV**, Fayt-lez-Manage, now holds the world record for a two-way 70 cm contact, the distance of approximately 350 miles exceeding the previous record of 261 miles claimed by W6VIX/6 and W6ZRN/6 by a handsome margin. Signals were RST 599 both ways. 'ADZ, by virtue of contacts nearer home, qualifies for the 70 cm Regional Ladder with a score of 6 Regions, 7 stations and 2 countries worked since July 1, 1952. Elsewhere in this issue will be found details of a 2 m/70 cm cross-band QSO between G2WJ and DL3FM.

Portable Operation—To Some Purpose!

G3MY and **G2HQ** frequently work portable from a site six miles S.W. of Sheffield at a height of 1,400 ft. a.s.l. During the morning of March 1, 2 m sounded more like 80 on a Sunday afternoon with 'phone stations coming in at S9 all over the band. Between 1130 and 1420 G.M.T. 14 contacts were made ranging from Sussex to Gloucestershire. After obtaining an S8/9 report from G3AUS (Torquay) off the back of the beam, PA0FP and PA0IKS were worked on 'phone. At 1815 G.M.T. DL3VJP was called unsuccessfully. Ten minutes later 'phone signals from OK1AA—the first from Czechoslovakia ever to be received in this country on 2 m—were logged. OK1AA was calling a German station. Although deep fading was observed signals were audible for 20 minutes before they disappeared below the noise level. Contacts followed with DL3VJP, DL3FM, DL9LU and DL7FS (at a distance of about 650 miles), ON4BZ, 'HC, 'HN and PA0BN. At 2235 G.M.T. an RST 589 report was obtained from SM6QP (Gothenburg) and at 2255 a CQ call was answered by SM6ANR with another 589 report. Both these stations were about 625 miles distant. It is of interest to record that during the whole of March 1 Sheffield was enveloped in a dense, cold fog, but on the moors the weather was fine and sunny.

The following evening another portable expedition was made to the same site, but although conditions were excellent, fewer contacts were made due to the intense QRM. G5AM, BM, DL1CK, PA0OP and PA0FB were worked. SM7BE was an S8/9 'phone signal most of the evening but could not be raised. A further test made on March 8 showed conditions to be much poorer although GW3FYR (RST 589) and G6PG (Dartford, Kent), were contacted, the latter being very near to the noise level. March 17 found conditions again good, but owing to the intense cold at the 1,400 ft. level operations were abandoned at 2045 G.M.T. by which time nine stations, including three PA0s, had been worked.

The equipment employed by G3MY/P presents some interesting features apart from being extraordinarily compact—the entire transmitter and receiver occupy a space only 10 in. x 5 in. x 5 in. The transmitter consists of a 6AC7 tritet tripling from an 8 Mc/s crystal, 7C5 tripler and 832 push-pull doubler with series gating screen modulation. Due to the design of the output circuit, efficiency approaches that of a straight amplifier on c.w. The input of 20 watts is provided by a 300-volt vibrator. On 'phone, the output is 3 watts for 10 watts input. The receiver is original in design, a 12AT7 serving as e.g.t. amplifier and mixer with a 6J6 in a Squier circuit producing a 136 Mc/s injection voltage from a 22.7 Mc/s crystal. The output of the mixer is fed, *via* a capacity bridge, to a tunable regenerative detector (9003) followed by a similar valve as a.f. amplifier. The whole receiver occupies a space 4½ in. x 3 in.! (May we have an article please ?—Ed.)

More 2 m DX

At the beginning of March, **G5NF** (Farnham, Surrey), using 18 watts to a 12-element stack, worked DL3VJP, OZ2FR and SM7BE in addition to several French, Belgian and Dutch stations on 2 m. GC3EBK (Guernsey), whose appearance on the band coincided with the good conditions, was another contact along with G2DKH/P (Stanley, Co. Durham), 2CYN (Birkenhead), 3AUS (Torquay) and 3IOE (Newcastle) to mention but a few. As the only Channel Islands station active at the time, GC3EBK was in great demand and figured in many logs and his contact with OZ2FR (Baekke), while short of the European record by a few miles, was an outstanding performance.

G5YV (Leeds), who has some experience in these matters, considered that the opening on March 1 was the best he had heard, and remarked upon the fact that signals from all distances had one thing in common: almost complete absence of fading. On that day he worked SM6ANR, SM6QP (144.45 and 144.2 Mc/s respectively) as well as DL7FS (Berlin), who was also contacted, with only 9 watts input, by G3APY (Kirkby, Notts). That the DX was not represented by one or two stations in each country is proved by G5YV's log which showed DL (11 contacts), F (9), ON (12) and PA (13), apart from EI (3), OZ (2), SM (3) and many British stations never heard before. He was asked to look for LA4VR, who was reported by SM6QP, but failed to find him. Missing from all logs were the GM

* 32 Earls Road, Tunbridge Wells, Kent.

stations. Why? Conditions or no activity?

G2DKH/P, back at his portable site at Stanley, Co. Durham, reported that on March 1 he seemed to be at the northern edge of the area of good conditions. On several occasions G2FO, 25 miles to the south east, would work a station which faded out completely with 'DKH who could hear and work well to the east and south east but heard nothing from OZ or SM.

G8DV/A made the only reported contacts with Northern Ireland, working GI3AXD and GI3BIL. **G2HDZ** (Pinner, Middlesex) was generally unsuccessful with the DX but raised G2DKH/P, G2FO and several stations in Cheshire.

What would appear to be further evidence of the extremely localised effect of the good conditions at certain times was experienced by **G2HIF** (Wantage, Berks.) who, on March 5, after two hours of purely inter-G contacts, suddenly heard, and worked, OZ2FR at S8 both ways. After the contact the OZ was heard repeatedly calling CQ without success but G8DM, only 8 miles away, never heard the OZ although listening on his frequency.

G3WW (Wimblington, Cambs.) offers some observations on his own behalf and on behalf of PA0FB of how the area of good conditions moved over the country during the evening of March 1. At 1715 G.M.T. stations north of a line through Leicester could be heard at S9 working Continentals without difficulty, but only one German and two Dutch stations, all of them weak, were logged at G3WW. By 1830, G3WW was in the "duct" which shortly afterwards extended to the London area. OZ2FR, as well as several DL and PA stations, were raised between 2245 and 0025 G.M.T. On March 2, SM7BE (144.71) and GC3EBK (145.24) were worked at 1915 and 2100 respectively. A message was received from DL3VJP *via* ON4BZ that OK1AA would be active that evening on 144.13 Mc/s looking for British stations. By the evening the northern boundary of the "duct" appeared to be level with Cambridge and extending into Shropshire, and it was only after considerable difficulty that PA0FC and ON4WW were contacted.

ON4BZ was worked by both G3BK and 3WW at lunchtime on March 4, and from 2050 G.M.T. onwards conditions were excellent towards the west and south. After 2315 G.M.T. GW5MQ was logged calling GI3BIL but no EI or GI stations were heard although **G3BNC** said that signals from Ireland as well as from GM and SM were audible in the Southampton area.

G6XX (Goole, Yorks.) raised five new countries—GC, GI, F, ON and OZ—between March 1 and 5. GC3EBK was S8 and F8GH S9; DL3FM and SM7BE were heard. A regular sked with G3DA (Liverpool) gives consistent results even when other west coast stations are inaudible.

G2FJR (Sutton Bridge, Lincs.), 144.38 Mc/s, runs a nightly sked with G3FCL (Ilford) and G3YH (Bristol) at 1900 and 1850 G.M.T. respectively. He is lacking a number of cards and wants contacts with stations in Lancashire.

G5BM (Cheltenham) found conditions very good indeed for nearly the whole of the period from January 14 onwards. Completely screened by the Cotswolds to the east, conditions *have* to be good before London stations can be worked, and even during early March only a few of the Continental stations were heard. These include F8BY (S6), ON4BZ (S7), who was worked, ON4UV (S3), PA0NL (449) and SM7BE (S5).

G3BVU (Witney, Oxon.) heard G3MY/P putting in a good signal all day on March 1 and added GC3EBK and GW2ADZ to his log on March 6. The strongest signal from a distance in excess of 100 miles yet heard was G2BMZ (Torquay) just after midnight on the 7th. **G5MR** (Hythe, Kent) had a 'phone contact at S9 both ways with G3AGA (Penryn, Cornwall) along practically the whole length of the South Coast.

G8MW (nr. Mansfield, Notts.) worked, between 1800 and 2230 G.M.T. on March 1, G3AUS (589), GC3EBK (599), GW3FYR (589), F8KF (579), DL3FM (589), DL3MH (569) and PA0NL (589). Stations in North Holland, North Germany and Scandinavia were not heard but DL7FS (Berlin) was contacted on March 2 when it was noticed that DL3FM was much weaker than the night before.

G3GVL (Allestree, Derby), who started on 2 m in September last, has worked F8BY (Paris), DL3FM, ON4BZ and ON4HN besides stations in 17 British counties. He has an SCR522 transmitter and an all 6J6—G2IQ pattern—converter into an AR88D receiver and a 5-element Yagi beam.

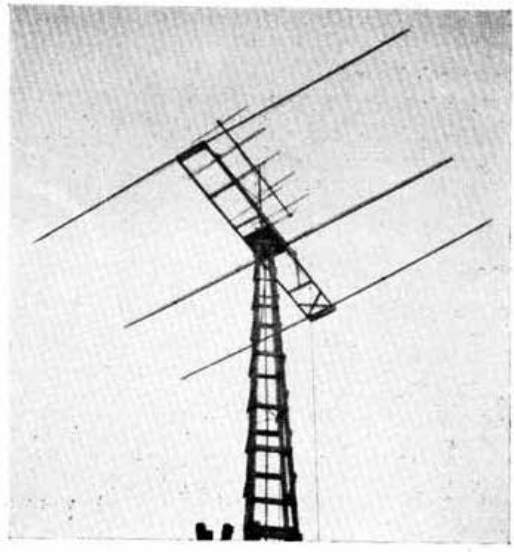
G2DDD (Littlehampton, Sussex), who was associated with G2ZV in 5 m work before the war, commenced activity on the 2 m band on September 15 and wishes to record his indebtedness to G2DSP for the assistance given him in getting started. Already 60 stations in 6 Regions have been worked, including G2FO and G5YV. Both G2DDD and **G2DSP** (Bognor Regis, Sussex) are active most evenings between 1900 and 2000 and again from 2200 to 2300 G.M.T.

Activity in Ireland

EI2B, '3S (Dublin), '4N (Ennis), '6A (Wicklow), '6B (Dublin) and '9U (Limerick) have been working one another as well as stations in the north of England and Wales. G5YV and GW3FYR are the most consistent. EI stations will move to the low frequency end of the band in the near future. At present EI6B, 6A and 3S are on 144.18, 144.3 and 145.2 Mc/s respectively.

Seventy Centimetres

G2RD's monthly report lists G2DD, FKZ, MV, RD, WJ, XV, 3BKQ, ECA, FP, FZL, GDR, HAZ, 5AA, CD, DT, RD, 6CW, NF, YP, 8KZ, ON4UV, PE1PL.



The main mast supporting the 3-element 10-metre beam, 5-over-5 2 m. array and 6-element 70 cm. Yagi, at G2WJ—Dunmow, Essex.

A most satisfactory increase of activity has taken place on the band under the stimulation of the v.h.f. "openings" of the past month and Continental contacts which would have hit the headlines only a few months ago, have become almost commonplace, particularly in the southern parts of the country. PE1PL (The Hague), reported to be using 150 watts to a 20-ft. diameter parabolic aerial, has figured in many logs, as has ON4UV, joint holder of the world record with GW2ADZ. **G4AP** (Swindon) after a long period on the band during which time he had only contacted three local stations, worked ON4UV on March 3 at 2245 G.M.T. Reports were S4/5 out and S6 in. He has also worked G2MV and G2WJ and now has a nightly sked with the latter at 2100 G.M.T. His receiver consists of a crystal mixer in a trough line with 409 Mc/s c.c. injection, a 6AK5 i.f. and 6C4 cathode follower stages. The transmitter output valve is an 832 tripler and the aerial three stacked folded dipoles at a height of 25 ft.

G3GDR (Abbots Langleys, Herts.), who worked PE1PL at 1250 G.M.T. on March 3, employs a 6-element stack with wire netting reflector at a height of 33 ft.

Distinct "skip" effects have been noticed by **G2FKZ** and **G3FZL.** The latter had difficulty in working G3BKQ (Leicester) but his signals were S9 with G5GX (Hull) at the time. **G3HAZ** (Birmingham) and **G6CW** (Nottingham) have been calling on 70 cm and listening on 2 m. Both have been well received by G2FKZ.

G5YV (Leeds) is now on 432.7 Mc/s with 4 watts output from an 832 tripler driven from his 2 m transmitter. The beam, an 8-element stack plus screen reflector, is at present 35 ft. high but will shortly be raised to the top of the 70 ft. tower together with the tripler stage.

London U.H.F. Group

At the March meeting G5CD spoke on the subject of noise factor measurement on receivers, illustrating his remarks with his 70 cm receiver and two-stage pre-amplifier described in *Around the V.H.F.s* in November, 1952. A noise factor of the order of 4 db was obtained which would be exceptionally good at 145 Mc/s, let alone at a frequency three times higher. The Group meets on the first Thursday evening in each month at the Bedford Corner Hotel, Tottenham Court Road. All u.h.f. enthusiasts are welcomed.

Last Look Round

As we close for press, conditions continue to be good on 2 m. On March 21 stations to the north and north east were coming in better than they have yet been heard at **G2UJ** and first contacts were made with G2DKH/P (Stanley, Co. Durham), 3APY (Kirkby, Notts.), 6CW (Nottingham) and 5YV (Leeds). The latter said that the band had been well open since 1100 G.M.T. that morning and that Continental stations were at that time (2000 G.M.T.) getting stronger again after a period of weaker signal strength. Half an hour later they could be heard in Kent, DL6EP (Linz on Rhine) being by far the most consistent signal ever heard for the distance. He only varied by an S point or so for more than three hours and was still putting in a beautiful 'phone signal, and raising G after G, when G2UJ closed down at 0030 G.M.T. on March 22. Others heard included DL3FM, DL3FO, F8AA, ON4CI, HN and KM. **G4FB** (Tonbridge, Kent) worked DL3QA and ON4HN. G3FAN (Ryde, I.O.W.) was calling OZ2IZ but was not heard to raise him. The OZ was not heard by G2UJ. **G6LL** (Cuffley, Herts.) worked DL3VJP at 1300 G.M.T. on March 22.

On 70 cm **G2WJ** worked, between 2000 and 2200 G.M.T. on March 23, PE1PL, PA0NL, PA0WAR and PA0JOB. The first two stations were on c.w.; 'WJ used only 'phone. PA0JOB, who is situated 18 ft. *below* sea level, was slightly weaker than the other three!

Correction

Under the heading "V.H.F. Aerials" in our last issue the words in brackets (or radiated) should not have appeared.

Regional Ladders

Owing to pressure on our space, due to the large number of reports received, it is regretted that it is not possible to publish the 2 m Regional Ladder this month. Members are thanked for their letters and claims and will see the fruits of their efforts in the May issue.

* * *

The support from readers has been most gratifying. If your report has not appeared in full you may rest assured that its contents have gone to make up the complete picture. Please send letters for the May issue to arrive by April 22.

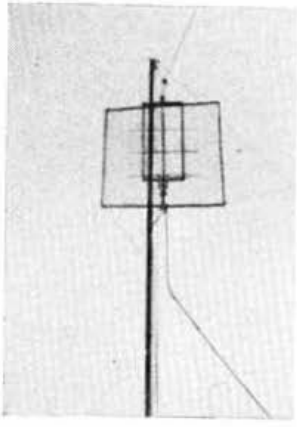
V.H.F. Stalwarts

No. 1—Ralph Royle G2WJ

A BRIEF reference to a cross-band 2 m/70 cm contact between G2WJ and DL3FM appeared in our last issue. Readers may be interested to learn more about this remarkable feat and of the British station concerned.

On March 2, during a QSO on 2 m, G2WJ suggested a test on 70 cm and the German station was received at 2030 G.M.T. at a steady RST 559 on 434.2 Mc/s. 'Phone was tried but was only partly readable. Unfortunately the 70 cm receiver at DL3FM was not operating properly, making two-way working impossible, so the contact was continued cross-band.

An almost complete lack of fading has been a marked characteristic of recent 2 m openings and this feature was repeated on the higher frequency band, DL3FM remaining at a steady strength for 15 minutes or more at a time. A further test on the following evening was unsuccessful as the DL was too weak, but between 2300 G.M.T. and midnight ON4UV, situated at Fayt-lez-Manage, between Mons and Charleroi, was worked on 'phone. No normal signal strength report seemed adequate for this contact, G2WJ describing it as only comparable with reception of a B.B.C. medium-wave transmitter in the service area, and it was gathered that his signal was of similar magnitude in Belgium. ON4UV employs a 32-element beam



The 8 element 70 cm. stack with wire netting reflector at G2WJ, Dunmow, Essex.

and a transmitter with an *output* of 32 watts, making him one of the most powerful stations on the band.

G2WJ, operated by old-timer Ralph Royle at Great Canfield, Essex, not far from Dunmow, is excellently sited for v.h.f. work. While the height above sea level is no more than about 250 feet there is an unobstructed "take off" for signals in all directions over the gently undulating countryside.

The accompanying photographs show the main tower supporting a 3-element 10 metre beam, a 5-over-5 2 m array and a 6-element Yagi for 70 cm all mounted on the same shaft, and with the electric turning gear controlled from the operating position. A second mast, also 45 ft. high, supports an 8-element 70 cm stack backed by a wire netting reflector and is the aerial normally employed owing to its superior gain.

In the 70 cm transmitter an EF50 c.o./tripler is followed by two *Mullard* QV04-7s, also triplers, feeding an 832 buffer amplifier at 218 Mc/s. This in turn feeds a CV53 doubler stage and finally another CV53 serving as a p.a. on a frequency of 435.8 Mc/s. Both CV53s have coaxial grid and anode circuits. The input to the final amplifier is 7 watts and the output approximately 3 watts. Coaxial feeder conveys the power, *via* a send-receive relay, to the beam in use.

The Receiver

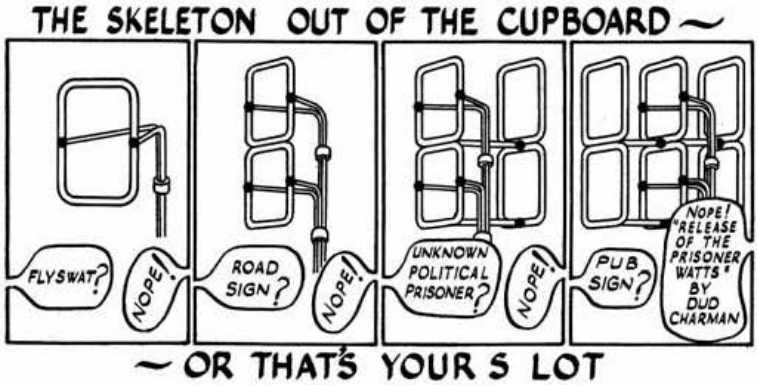
Realising that in nearly all cases the receiver is the weak link in the chain, much experimental work has been done on this side and the arrangement at present in use and giving consistently better results than have hitherto been obtained, is a crystal mixer (B.T.H. type CS3A) with crystal controlled injection voltage at 408 Mc/s. Coaxial lines, taken from a glide-path receiver, are employed in the mixer and final multiplier stages with a home made coaxial line high-Q filter interposed between them. It is to this component,[1] in the main, that G2WJ attributes the very satisfactory performance of the receiver.

Before passing to the AR88 communication receiver the 28 Mc/s i.f. is first amplified by a cascode stage, a worthwhile precaution when the noise factor of the i.f. amplifier has a direct bearing upon the overall noise factor of the receiver as must be the case when a crystal mixer alone, is in use.

Effective as is the high-Q filter in removing sub-harmonics and spurious voltages from the output of the crystal multiplier chain, there is no need to risk generating more of these than can be helped and to this end the 17 Mc/s c.o. and its associated frequency multipliers are all run at only 25 to 30 volts on the anodes which value has been found ample to provide the optimum crystal current of 100 to 150μA.

An opportunity was taken to make some comparative measurements of the noise-factor of the converter under various conditions of adjustment with the aid of the 70 cm noise generator built by J. W. Mathews, G6LL, and shown at the 1952 R.S.G.B. Amateur Radio Exhibition. It was immediately apparent that the high-Q filter previously mentioned made an enormous improvement in this respect, and although no claim is made to obtaining an absolute value for the noise-factor, the difference with the filter in and out of circuit was more than 2 to 1, the best readings indicating a figure of approximately 8 db. The addition of a "lighthouse" valve r.f. stage did nothing to improve matters despite its appreciable gain.

For comparison between 2 m and 70 cm, transmission may be changed from one band to the other by operating a single switch, a facility which has been invaluable on many occasions.



When the Aerial Wizard of Stoke Poges—Dud Charman (G6CJ)—recently lectured before the Society at the Institution of Electrical Engineers, he demonstrated the effectiveness of various types of V.H.F. aerials. Cartoonist "Seedy" now brings one of them—the "Skeleton Slot"—out of the cupboard!

Amateur TV

A further interest at G2WJ is Amateur Television, in which department Ralph is ably assisted by his son Jeremy. The same transmitter is employed under the callsign G2WJ/T and under TV conditions takes an input of about 2 watts, grid modulated. So far pictures have only been received locally, but an attempt is shortly to be made, with the aid of more portable equipment, to ascertain the maximum range at which the vision signal may be resolved.

W.H.A.

Lincolnshire Hamfest

A HAMFEST, sponsored by the Lincoln Short Wave Club, will be held on Sunday, May 10, 1953, at the Welcome Cafe, Lincoln (near the North Eastern Region Station). The assembly is fixed for 1.30 p.m. and the price for tickets (which includes the cost of a high tea) is 5/6. There will be a sale of surplus gear. The organiser is L. Gostelow (G2FOW), 21 Cannon Street, Lincoln.

Speedy Recovery

TO Vice-President Harry Clark, G6OT, injured in a road accident last month in New York City. Mr. Clark, who suffered injury to two ribs, was still in hospital when this issue closed for press. At the time of the accident Mr. Clark was about to sail for England after completing a business mission on behalf of E.M.I. Ltd.

(1) *A detailed description of a filter of this type will be given in a forthcoming article dealing with the design of 70 cm receivers.*

DX TOPICS
THE MONTH ON THE AIR

by A. O. Milne* G2MI

Top Band

ONCE again, but for a few very rare exceptions, Top Band has produced most of the interest. **G6CJ** (Stoke Poges, Bucks) reports a QSO with ZC4XP and says that both ZS3K and ZE3JP are active on the band. In a letter to 'CJ, ZC4XP reports that on March 1st he made six G, three OH and one VE contacts, the latter with VE1EA who gave him 569. **ZC4XP** uses a vertical aerial, suspended from a bunch of coloured balloons, which has much intrigued the neighbourhood! In a letter to G2MI he says ZC4RX has never been active on Top Band. The call heard was a pirate. ZC4GT is building equipment for the band. During the recent DX season, ZC4XP worked G2AOL, BOF, NJ, 3ATU, BKF, CXF, DYQ, ERN, FGT, GGN, HQQ, HRW, HYX, NT, US, 5BJ, RI, 6BQ, CJ, KP, 8KP, GD3FBS, GM3OM, HA5BX, OH3MC, NY, YV, 7OH, VE1EA and W1BB.

G3GKQ (Clitheroe, Lancs) recorded some interesting G-DX on this band during daylight on Sunday, February 21. At 1307 he worked G2NJ, Peterborough (150 miles) receiving 569; at 1311, G3LP, Cheltenham (150 miles), 569; at 1321, GW5BI, Cardiff (200 miles), 569; at 1335, GW3CBX, Pembroke (200 miles), 569 and finally G3IOQ, Haslemere (250 miles) at 559. He comments on the comparatively small number of OH and OK stations who use the band and wonders if this is due to special permit restrictions or to lack of general interest. DL, HA, HB and YU calls have been heard and stations worked but there is no information as to their status, except that one HB said he had a special permit.

John Hall **B.R.S.19107** (Croydon) logged 40 odd U.S. calls during the recent *S.W.M.* tests, including several W9s and W0s. In addition, he heard KV4AA, KV4BB, KG4AF, VP9BDA, VE1EA, KP4KD and ZC4XP. On January 11 he heard 32 transatlantic amateur stations including three W8s, four W9s and a W0.

Old Timer

Who remembers W1WV? In pre-war days the operator of that station, Miles Weekes, claimed to have worked more Gs than any one else in his part of the globe. His signals then were among the most consistent from the States. Today Miles operates from Menlo Park, California, under the call W6ZZ. Here he is in his shack.

First U.S. Phones on 7 Mc/s

Conditions in general, except for a brief period around tea-time, have been about as dead as they could have been. G6CJ, G6GN and a Cambridge listener send the first reports of U.S. phones on 7 Mc/s. W3UXR seems to have been the outstanding signal at about 2245. 5A3TK and other North Africans have also been heard. During the A.R.R.L. Contest G6CJ and G6GN concentrated on the l.f. bands. The former had 40 contacts on 7 Mc/s with stations across to W6. He also made 35 W and VE contacts on 21 Mc/s on the Sunday of the Tests. G6CJ says the first day was very difficult, all bands opened for only short periods. He spent two hours on 3.5 Mc/s and two on 14 Mc/s without a contact. The second day was almost as bad for Ws but ZL and VK signals roared in on 3.5 and 7 Mc/s. "Dud" has worked W7GHU and W7PGX (Arizona) on 3.5 Mc/s.

It is confirmed that the U.S. amateurs are now licensed for phone between 21250 and 21450 kc/s. The effective date was March 28.

W2TXB very much wants a card from VS1DC. We have a lot of cards at the Bureau for this station. Home QTH please. Stations in Qatar are MP4BAK, BAM, BAU and QAC; QSL *via* the R.S.G.B. **B.R.S.18017** reports having seen somewhere that Ruanda Urundi is now counted as a new country. This is not so. Its status is still under discussion with the DX.C.C. Committee of A.R.R.L. It is also reported that the

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

prefix VR7 has been allocated to Nauru but we have no confirmation. B.R.S.18017 reports hearing on 14 Mc/s phone ZS7C, 1730 G.M.T.; EL2A, 14250 kc/s; KV4BB; VS1AG, 1745; ZD2RRW and on c.w. ZC4IP, ZS6ZU/P, UI8AA, FF8AJ, FF8GP and ZS9D, 1830, 14030.

G6BS reports that licences are now being issued to Egyptian nationals and that SU1MR's position is therefore now regularised. He is on daily, looking for contacts with Great Britain on 14 Mc/s. QSL cards should go to Box 672, Cairo. **G3GUM** states that CE3AG sailed for Easter Island on April 10 and will be active on 14 and 21 Mc/s c.w. The expedition is being sponsored by the Chilean Navy.

G3BAK comments that much of the nice DX comes in while T.V. is on. If you want to work it you must T.V.I. proof the old rig.

B.R.S.7594 (Yeovil) agrees about the poor conditions and says the best period is between 1700 and 1900 G.M.T. During these times he has heard CR6AI, BX, CK, EL2P, FF8CN, GP, KV4BB, MI3LK, LV, OQ0DZ (Ruanda Urundi), PJ2AK, ST2NW, VQ5CB, ZD1SW and others. On Sunday afternoons he has heard CR4AI, OD5BA, OQ5HL, TA3AA, VQ2DT, HA, 4RF, ZD9AA, ZS2AV, 5MP, 6EK, 7C and 4X4BL on 21 Mc/s.

Who's Who

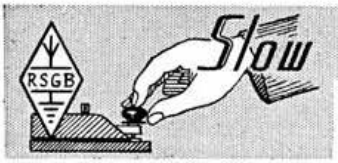
G2WW mentions that VQ4RF, who is in the Kenya Police Reserve, is shortly leaving his farm to live in Nakuru. His police duties will take him on to the v.h.f. bands and he is likely to be rather less active than of yore. He may operate for a while from VQ4AA.

GC2FZC has a card confirming a contact with LU0AAW, Mobile Marine off Cape Verde Is. The full QTH is Jorge Sampreto, Avda Castanares 136A, Buenos Aires. G6XY, G4ZU and G8IG were among the lucky few to work NE1NMC during his visit to Nepal. The first contact was made on 14155 kc/s on March 9 at 1600. The station was operated by W6NMC—the globe-trotting DX man. It is a pity that these chaps, when they make journeys to rare countries when conditions are bad, do not use c.w. They would make many more contacts.

VS9AN has arrived back in Aden for a further tour of duty with the R.A.F. Anyone still needing his card should re-submit one through the Bureau. **VE2KF** is ex-G3FFO whilst **VE2LI** is our old friend George Elliott ex-G5LI. **B.E.R.S.195** (Melbourne) reports a new station on Heard Is., VK1SK, and says VK1AF is a new one on Macquarrie Is.

B.E.R.U. Phone Contest

During the afternoon of Sunday, April 12, many African stations were logged at high signal strength on 21 Mc/s. Among the most prominent were VQ4RF, MD5EB, VQ2AT, ZS6CP, and 5A2CA.



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.*

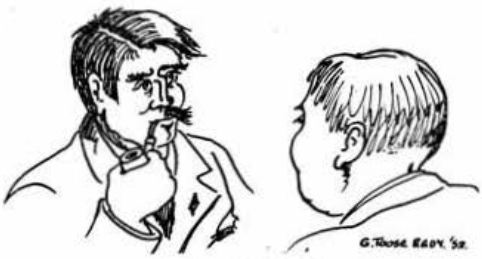
B.S.T.	*Call*	*kc/s*	*Town*
Sundays			
09.00	G3LP	1850	Cheltenham
09.30	G3BKE	1900	Newcastle-on-Tyne
09.30	G3ICX	1925	Sutton Coldfield
10.00	G6MH	1990	Southend-on-Sea
10.30 *	G3AAZ, G3EPK, G3EWG, G5UM	1780	Welwyn
10.30	G3GIO	1915	Guildford
10.30 *	G3CYS, G3ESP, G3HCX, G3HNC, G3IDT, G3US	1990	Pontefract
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
20.30 *	G3BFP, G3BLP, G6LX	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			
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3IBL	1883	Derby
20.30	GW3BKP	1745	Wrexham
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2BND	1890	Dalston, E.
22.00	G3GIO	1915	Guildford
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea
19.00	G3ADZ	1900	Southsea
19.00	G3GZA	1837.5	Bristol
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3HXN	1850	Cambridge, Glos.
22.00	G3GIO	1915	Guildford
22.45	GM3GUS	1800	Dunfermline
Thursdays			
19.00	G3NC	1825	Swindon
20.00	G3FVH	1920	Hull, Yorks
20.30	GW3BKP	1745	Wrexham
21.30	G6DL	1760	Birmingham
21.30	G3ICX	1925	Sutton Coldfield
22.00	G2NK	1730	St. Mary Cray
22.00	G3GIO	1915	Guildford
22.00	G3IFX	1910	Derby
22.30	G3OB	1803	Manchester
23.00 *	G3LA, G4AK	1915	Brentwood
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3CSG	1870	Wirral
21.00	G3BHS	1720	Eastleigh, Hants
22.00	G3GIO	1915	Guildford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford

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

CQ Single-sideband

By H. F. Knott, (G3CU)

UNTIL recently the biggest deterrent to building a phase-shift type of sideband generator has been the difficulty of obtaining the necessary close-tolerance components for the wide band 90° audio phase-shift networks. However, by the efforts of G3FHL and the willing co-operation of Charles Young, G2AK, of Birmingham, this problem has now been overcome. The simple circuit known as the W2KUJ, or "S.S.B.Jr." network (details of which may now be released to amateurs in this country by the courtesy of General Electric Co., New York), consists nominally of only a few components, and is capable of 39 db attenuation of the unwanted sideband, the differential phase-shift holding to within 1.3° over the frequency range 225 c/s to 2750 c/s. The operating band is adequate, even desirable, for 'phone working. At the moment G2AK is only able to stock the capacitors, which are closely matched between themselves and to 5% of the specified value. These are available as a kit of four, at a price that can be considered very reasonable.



S.S.B. Old Boy !

The point which will, of course, arouse most interest is that when these condensers, and the few standard value resistors that go with them, are once mounted on a suitable piece of paxolin, the complete network may be wired into circuit and forgotten, thus completing what otherwise could be a laborious and most exacting job.

This particular network can be used with practically any of the circuits so far published without alteration. For anyone interested, a circuit with details of the network and its associated components can be obtained from the writer, on receipt of a stamped addressed envelope.

Activity

The DX contacts reported in last month's M.O.T.A. column have now shown a decline, and although band conditions did reach a point where early evening trans-atlantic s.s.b. contacts took place over a period of fourteen consecutive nights, it will probably be some time before similar conditions present themselves again on 3.7 Mc/s.

G2NH (New Malden)—a newcomer to this feature—as would be expected, is using a crystal filter exciter, at present running a few watts to a 6AG7. In the first two weeks he contacted 14 different s.s.b. stations. He is now developing an 829B final. G2NH's filter is a band-pass arrangement operating at 435 kc/s, the two crystals being spaced about 1.5 kc/s, giving a response curve which is flat within 2 db from 400 c/s to 3 kc/s. A third crystal is used for carrier suppression, and as it is adjusted accurately, it realises something in the order of 60 db attenuation. G2NH suggests that those who are having trouble with carrier suppression when using the above method will probably find that the crystal in use is too far off frequency; the difference between the parallel and the series resonance can be in the region of 180 to 200 c/s at 450 kc/s, which is enough to be serious. No doubt the orthodox balanced modulator would be preferable. **G3ESV** (Wigan) is now using a two section crystal lattice filter at 450 kc/s, and is getting out nicely. As with most of us, he has had his moments of exasperation when a.m. stations he has called come back suggesting that his modulation is at fault, or that his microphone connection needs looking at! Perhaps they don't read this column! **G2AJS** (Caterham) appears to be fairly active during the early evenings on 80. All that is known about his rig is that it is a phase-shift exciter, finishing up with TT11s in the balanced modulators.

A listener's report has been received from a Marine operator, plying between Syria and France, who confirms the effectiveness of s.s.b. In the little spare time available on board ship, he has been listening to many of the s.s.b. QSOs on 3797 kc/s, receiving them at good strength, and with little difficulty, in the Mediterranean.

European Activity

OE7FA (Austria) is the second s.s.b. station active in that country. LA6J is back on 3.7 Mc/s after a spell of 14 Mc/s working, as is HB9HF who made the first HB-W s.s.b. contact. PA0KC, although in the army, is able to get home most week-ends. DL6WL, using a phase-shift exciter, puts a strong signal into the U.K.

* * *

Reports for publication in the June issue should reach G3CU by May 16.

* *5 Kevington Drive, St. Paul's Cray, Orpington, Kent.*

TALKING BOOKS

From Col. Sir Ian Fraser, C.B.E., M.P., Chairman, St. Dunstan's.

Dear Mr. Clarricoats,

Please convey to your Council and members the very warm thanks of the blind users of our Talking Book machines for the services they have rendered during the past year.

At a meeting of my Board recently, the help your members have given us was reviewed and we noted that in a large number of individual cases all over the country your people had helped the blind members of the Library with the installation of their machines, and when they got into minor trouble or did not know how best to work the instrument.

The friendliness as well as the intrinsic value of this service is very deeply appreciated.

Yours sincerely,
Ian Fraser,
Chairman,
Sound Recording Board of Directors.

Special General Meeting

Minutes of a Special General Meeting of the Incorporated Radio Society of Great Britain, held at The Institution of Electrical Engineers, London, W.C.2, on Friday, February 27, 1953, at 6.30 p.m.

Present

The President (Mr. Leslie Cooper in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, C. H. L. Edwards, D. A. Findlay, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, A. O. Milne, H. McConnell, L. E. Newnham and P. W. Winsford (Members of the Council), Messrs. V. M. Desmond and S. K. Lewer (Past Presidents), Messrs. M. Child, D. N. Corfield, J. W. Mathews and H. V. Wilkins (Vice Presidents), Mr. John Clarricoats (General Secretary), Miss May Gadsden (Assistant Secretary) and about 350 Members.

The Society's Legal Adviser (Mr. D. H. Johnson) was also in attendance.

Notice Convening the Meeting

The Honorary Secretary (Mr. C. H. L. Edwards) read the notice convening the Meeting.

President's Opening Remarks

The President referred to the presence of the Society's Legal Adviser and outlined the procedure to be adopted at a Special General Meeting.

Special Resolution

Pursuant to notice, Mr. H. A. Bartlett moved, and Mr. R. Walker seconded the following Special Resolution:—

That to enable the Council to increase members' subscriptions to meet the Society's expenditure the Articles of Association shall be amended so that

Article 19 shall read—

"The annual subscription shall be £1 10s. for Home Corporate Members, £1 1s. for Corporate Members residing outside the United Kingdom of Great Britain and Northern Ireland, the Channels Islands and the Isle of Man, and 15s. for Associates or such lesser sums as the Council may decide from time to time. Corporate Members shall pay an Entrance Fee of 10s. upon admission."

and

Article 27 shall read—

"At any time after having been a Corporate Member of the Society for five consecutive years, such Member may, subject to the approval of the Council, commute all future annual subscriptions by a payment of Twenty Pounds, which shall entitle such Member to all privileges and rights of ordinary membership for the remainder of his life."

In respect to Article 19 Mr. R. J. Donald enquired whether it was legally possible to test the views of the meeting separately on two issues, namely, Subscription Rates and Entrance Fee.

The President stated that he had been advised that it would not be legal for the meeting to vote on the two issues referred to by Mr. Donald.

After discussion it was moved as an amendment by Mr. R. J. Donald and seconded by Mr. J. D. Heys, that

Article 19 shall read—

"The annual subscription shall be £1 5s. for Home Corporate Members, £1 1s. for Corporate Members residing outside the United Kingdom of Great Britain and Northern Ireland, the Channel Islands and the Isle of Man, and 15s. for Associates or such lesser sums as the Council may decide from time to time. Corporate Members shall pay an Entrance Fee of 5s. upon admission."

After further discussion it was moved by Mr. Ferguson and a Member seconded that the Special Resolution be amended to read ". . . or such greater or lesser sums as the Council . . ."

The President informed Mr. Ferguson that he could not accept his amendment as the proposal could be regarded as prejudicial to absent Members.

After further discussion Mr. P. Cawson, speaking on behalf of a group of Region 1 Members, intimated that he and his colleagues would support the amendment proposed by Mr. Donald provided the reference to an Entrance Fee was omitted.

Having obtained the consent of his seconder, Mr. Donald agreed to the amendment going forward with the reference to Entrance Fee omitted.

Mr. R. Walker thereupon moved, a Member seconded and it was resolved that the question be now put.

The President informed the Meeting that he would first call for a show of hands on the motion and later, if so demanded, he would arrange for a poll to be taken.

A show of hands showed that 83 Members had voted **IN FAVOUR** of the amendment and 247 **AGAINST.**

Ten Members then demanded a poll.

All Open Proxy Votes were then called in.

The President announced that 138 Proxy Votes had been cast **IN FAVOUR** of the amendment and 1,545 **AGAINST.**

The President thereupon announced that the amendment had been **LOST** by 1,792 votes (1,545 by proxy, 247 in person) to 221 votes (138 by proxy, 83 in person).

Mr. Thorogood thereupon moved, a Member seconded, and it was resolved that the Special Resolution be now put to the vote.

A show of hands showed that 256 Members had voted **IN FAVOUR** of the Special Resolution and 53 **AGAINST.**

Ten Members then demanded a poll.

All Proxy Votes were then called in.

The President announced that a total of 2,247 votes had been cast **IN FAVOUR** of the Special Resolution (including 1,991 proxies) and 1,019 votes (including 966 proxies) **AGAINST** the Special Resolution. Percentage in favour of the Resolution, 68.8.

The President further announced that the Special Resolution was not carried because less than 75% of the Members voting in person or by proxy had voted in favour.

Following the announcement of the result of the voting, Messrs. I. D. Auchterlonie, H. A. Bartlett, A. O. Milne, H. McConnell and D. A. Findlay (Members of the Council) tendered their resignation from the Governing Body.

The President, after intimating that he did not intend to resign from the Council, then read a statement which indicated that, if the Special Resolution had been carried, the Council would have been prepared to give careful consideration to the question of fixing the Home Corporate subscription at a figure of less than 30s.

The Meeting terminated at 9.30 p.m.

Report of Special General Meeting

THIS Report of the Special General Meeting held on February 27, 1953, should be read in conjunction with the Minutes of the Meeting as published on page 439 of this issue.

Opening Remarks of President

Mr. Leslie Cooper stated that the Society's legal adviser was in attendance to give guidance on any legal point which might arise during the meeting. Mr. Cooper expressed the hope that now a new Council had assumed office the meeting would follow its own pattern and not become a shadow of the Special General Meeting held in December 1952. Mr. Cooper emphasised that the purpose of the meeting was to consider proposals to amend two existing Articles of Association. If accepted he hoped the new Articles would stand the same test of time as those they would be replacing. Mr. Cooper stressed the seriousness of the present financial position of the Society and emphasised that the Council were firmly of the opinion that the ceiling figure for Home Corporate Members should be fixed at 30/-. He accepted the view put forward in some quarters that subscription rates should have been raised several years ago. In this connection Mr. Cooper reminded the meeting that during and just after the war the Society showed substantial profits each year, chiefly as the result of the success achieved by the sale of Society publications. Membership too had risen rapidly whilst overhead costs had been comparatively small. Had the Society maintained a separate account for publications at that time and subsequently, the membership would have realised much more quickly, that for many years this phase of the Society's work had been subsidising the more normal day-to-day activities, such as the publication of the BULLETIN.

At the Regional Representatives' Conference held in July 1952 all aspects of the Society's work were discussed and an overwhelming majority of the Regional Representatives present on that occasion supported the proposal that the Home Corporate subscription should be increased to 30/-. The Regional Representatives had themselves put forward the proposal in regard to an Entrance Fee.

Mr. Cooper then proceeded to explain that the resolution and any amendments thereto would be voted upon by a show of hands. If 10 or more qualified persons made the request a poll would be conducted.

Special Resolution

Mr. Bartlett then moved the Special Resolution standing in his name on the Agenda and **Mr. R. Walker** seconded.

In respect to Article 19 **Mr. R. J. Donald** enquired whether it was legally possible to test the views of the meeting separately on two issues, namely, Subscription Rates and Entrance Fee.

The Chairman explained that it would not be legal for the meeting to vote on the two issues.

Mr. E. K. Williams expressed regret that the Council had put forward a Resolution in terms which they knew were unacceptable to a large number of members and appealed to them to protect the prestige and unity of the Society by withdrawing the motion if there was any danger that it would be defeated, or at best carried against substantial opposition. He suggested that many compromise solutions were possible. Although a figure of 30/- had been referred to as the ceiling for Home Corporate Members it appeared from the announcement in the February BULLETIN that this is the amount the Council regard as essential in order to conduct the business of the Society.

Mr. R. J. Donald then moved his amendment and **Mr. J. D. Heys** seconded (see Minutes, page 439).

Mr. Donald gave as his reasons for moving the amendment (a) that the possible loss of Members if a 30/- rate were introduced would be much greater than estimated by the Council (b) the strength of the organised opposition which might be sufficient to defeat the original Motion leaving the Society on the 15/- and 21/- rates. Mr. Donald expressed the view that it was psychologically bad to double the Country Corporate Membership subscription. He also registered a mild protest against the decision of the President and Members of the Council not to publish his amendment in the February issue of the BULLETIN. He pointed out that the text of the amendment had been sent to Headquarters on January 20, 1953. He considered it was bad policy on the part of the Council to suppress information. Mr. Donald stated that he held no strong views about the Entrance Fee.

Mr. V. Penfold suggested that if Members were really interested in the work of the Society they would not object to paying the increased subscription. He considered it important, however, to have an assurance that the maximum economies had already been effected at Headquarters.

The Chairman explained that the Council anticipate expenditure for the current financial year will be about £1,300 less than in 1952/3.

Mr. G. McWilford suggested that the Council is wasting money by allowing Empire DX Certificates to be produced by hand at a cost of £2 12s. 6d. each.

Mr. A. O. Milne pointed out that the E.DX Certificate is regarded throughout the world as the premier Amateur Radio award. Although instituted more than 4 years ago, only 75 had been issued to date. The Council had agreed to review the method of production when 100 had been produced by hand.

Mr. C. T. Dollery felt that the Council had made a mistake in bringing forward substantially the same Special Resolution only two months after it had been rejected by the membership. He was of the opinion that, although the Council had attempted to make out a good case for 30/-, a rate of 25/- would still allow a margin of 3/- based on last year's figures. He considered it would be unwise to introduce an Entrance Fee.

Mr. I. D. Auchterlonie posed the question "Why do the Members vote us in (to the Council) and then throw out our recommendations?"

Mr. H. Chorley considered that a remarkable feature of the present dispute was that every Council during the past eight difficult years had succeeded, somehow, in avoiding having to ask the membership for higher subscription rates. Practically all clubs and societies had reluctantly been compelled to follow the economic trend and raise their rates. There appeared to be two arguments against raising subscriptions in general; first members will resign, second, members will say they cannot afford to pay the new rate. His experience had shown that members do not resign. He had also found they produce the money somehow to remain in association. As far as the Society is concerned the increase asked for would equal the cost of the stub of one cigarette per diem! He considered that the Council should never have allowed the present situation to arise. There had

been ample grounds in recent years for asking for increased rates. He hoped the Members present would now whole-heartedly support the Resolution.

Mr. W. L. Lewis called attention to the fact that at a Bristol Group meeting held in October 1952 a resolution had been passed requesting the Council to amend its proposals by fixing the rate for Licensed Members at 30/- and B.R.S. Members at 21/-. No reference to the resolution had appeared in the BULLETIN. The **Chairman** assured Mr. Lewis that the resolution, together with all other resolutions, proposals, and suggestions, had been most carefully considered by the Council.

Mr. Meredith, in the course of a long speech, suggested that the Council should have taken note of the decision reached at the previous S.G.M. If the Council had not wished to be bound to a course of action it did not support the Members could have resigned. In order that the ceiling should not exceed 25/- he suggested that the BULLETIN and salaries could be cut. He considered that the old English custom of compromise should have been tried out in order to arrive at a figure to satisfy all concerned. In his view the Special Resolution in its present form should not have been brought forward. He made reference to "a collection of people playing power politics."

The Chairman expressed the hope that Members, even if they disagreed, would part as friends.

Mr. Donald asked whether a 95 per cent. majority would have been required to carry his amendment if it had been published in advance.

The Chairman indicated that a three fourths majority would have been required if the amendment had been circulated at least 21 days prior to the Meeting.

Mr. Ferguson proposed, as a further amendment, that the words "greater or" be inserted before "lesser."

The Chairman advised Mr. Ferguson that he could not accept his amendment as the proposal could be regarded as prejudicial to absent Members.

Mr. Ferguson in withdrawing his proposal expressed the hope that the membership would trust the Council to deal with the business of the Society in a proper manner, by giving them the maximum amount of statutory power.

Mr. J. N. A. Hudson commented that whilst 25/- might be sufficient at the present moment it may not be enough in two or three years time. He supported the ceiling figure of 30/-.

Mr. R. Walker moved, a Member seconded and it was **Resolved** that the question be now put.

Mr. P. Cawson intimated that the group which he represented would support the amendment provided Mr. Donald withdrew his proposal in regard to the 5s. Entrance Fee.

Mr. Donald, with the consent of his seconder, agreed to the amendment going forward with the reference to Entrance Fee omitted.

(The result of the voting on the amendment is set out in the Minutes of the Meeting).

Mr. P. A. Thorogood then moved, a Member seconded and it was **Resolved** that the Special Resolution be now put.

In answer to a question **Mr. Findlay** stated that it was not possible to estimate the amount of revenue that might be received if an Entrance Fee is charged.

(The result of the voting on the Special Resolution is set out in the Minutes of the Meeting.)

Following the declaration of the result of the voting **Mr. Thorogood** asked whether the Council would take steps to conduct a postal vote on the question of subscription rates.

The Chairman explained that all matters arising from the S.G.M. would need the careful consideration of the Council. (**Mr. Cooper** then read the statement which is referred to in the Minutes.)

Continuing, **Mr. Cooper** emphasised that the Members of the Council had sincerely tried to do their best for the Society in general. As recently as the previous week the General Secretary had put forward certain suggestions to the Technical Committee which, if adopted by the Council, would have the effect of reducing quite considerably BULLETIN production costs. The Council and the General Secretary were fully alive to the need for effecting economies and were continually reviewing expenditure.

Mr. Dollery speaking on behalf of all Members present thanked the Chairman for the impartial manner in which he had conducted the meeting.

Mr. H. V. Wilkins suggested that a Society with the prestige and of the size of the R.S.G.B., should not be arguing about half crowns.

Mr. B. Herbert suggested that members should pay a separate fee for the BULLETIN.

The Chairman appealed for the co-operation of those who had voted against the Special Resolution.

Mr. J. Hunter considered that the Society's position would be jeopardised by attempting to operate the Society on inadequate subscription rates.

Mr. E. Dales appealed to those Council Members who had resigned to reconsider their position.

The meeting terminated at 9.30 p.m.

Educational Films

AN extensive series of educational films, most of which are available in both sound and silent versions, may be borrowed from the E.D.A. Film Library.

Among the many titles are "What is Electricity?", "Putting Free Electrons to Work," "High Frequency Heating," "Ammeters and Voltmeters," "Capacitors," "Inductors," "Electrical Induction and Capacity" and "Alternating Current and Power Factor." Each film is accompanied by a set of notes and a reprint of the commentary. Running times vary from 8 to 50 minutes.

Further details may be obtained from the General Manager and Secretary, British Electrical Development Association, 2 Savoy Hill, London, W.C.2.

Scientific Film Association

AT the Annual General Meeting of the Scientific Film Association, the following Officers were elected for the year 1953-4: *President*, Sir Arthur Elton; *Vice-President*, W. J. C. Chapple; *Hon. Treasurer*, K. Baron Hartley.

As a result of recent changes in the Articles of Association, the Council of Management of the Association will in future consist of the Officers, six elected Members and seven Members nominated by the Lord President of the Council to represent general scientific and public opinion.

I.A.R.U. REGION I CONGRESS

European Societies to meet in Lausanne

THE first I.A.R.U. Congress to be held since the inaugural meeting twenty-five years earlier took place in Paris, during May, 1950. At that meeting it was unanimously agreed that in future representatives of the 23 I.A.R.U. Societies in Region I (Europe and Africa) should meet every three years to discuss matters of mutual interest. A Region I Congress will be, therefore, held in Lausanne, Switzerland, during the period from Wednesday, May 13, to Saturday, May 16, 1953.

The Programme

There will be an informal meeting of delegates during the evening of May 13th and a Plenary Session of the full Congress during the morning of the next day. In the afternoon the Congress will split up into two Committees, *viz.* Administration and Technical. Every Society represented at the Congress will be allowed to appoint not more than two delegates to serve on each Committee. A further Plenary Session will be held during the afternoon of May 16th, after which U.S.K.A., as host Society, will entertain delegates at an International Hamfest.

Agenda

At the time of writing (late March) not all the Societies taking part had sent in their proposals for the Agenda, but from the following list, it will be seen that the delegates will not have much spare time.

On the Administrative side it is proposed to discuss, amongst other matters,

1. The best way of co-ordinating the efforts of all Region I Societies in the retention of the amateur bands and the best way in which each Society can ensure the goodwill of its own administration at any future I.T.U. Conference, such as was held in Atlantic City in 1947.
2. Ways and means of combating "interlopers" into the "exclusive" amateur bands.
3. The European "Band-Plan."
4. The correlation of Contests, so as to minimise their number.
5. A suggestion that the R.S.G.B. National Field Day should become part of a larger International Field Day.
6. The desirability of setting-up an International Emergency Network.
7. The International exchange of portable facilities, *i.e.*, to examine the possibility of certain countries in Western Europe offering limited facilities to properly licensed amateurs of other countries in the same group, for portable operation during holidays, on a reciprocal basis.

The Technical Committee will discuss a wide variety of topics including,

1. Operating standards.
2. Technical and operating standards as they apply to helical beams and to systems of transmission such as Single Side-band, Frequency Modulation, Pulse, etc.
3. T.V.I. problems.
4. Amateur Television.
5. V.H.F. Propagation and Microwave Development.

Delegates

The R.S.G.B. will be represented at the Congress by the General Secretary (Mr. John Clarricoats, G6CL), who will sit on the Administrative Committee, and Mr. R. H. Hammans, G2IG (Council Member and Vice-Chairman of the R.S.G.B. Technical Committee), who will sit on the Technical Committee. In addition, Mr. A. O. Milne, G2MI, (Executive Vice-President of R.S.G.B.), will attend in his capacity as Honorary Secretary of the I.A.R.U. Region I Bureau. Mr. Milne will be responsible for arranging the business of the Congress whilst U.S.K.A. (who have set up a special Committee for the purpose) will be responsible for the general arrangements. including accommodation, etc. The Hamfest, which will take place on the Saturday and Sunday after the Congress finishes, is being organised by U.S.K.A. A.O.M.

An Invitation

SOCIETY members who would like to attend the Hamfest and spend a few days holiday in Switzerland at special rates arranged by U.S.K.A., should write for full details to:

The Secretary, Congres de l'Union International des Radio Amateurs (Region 1), c/o Bureau des Interets de Lausanne, 7 Av. Benjamin-Constant, Lausanne, Switzerland.

Visiting Amateurs will be welcome at meetings of the Congress as observers. R.S.G.B. members who contemplate attending the Congress in this capacity are advised to make early application to the organisers. Please do not write to R.S.G.B. Headquarters on any matter concerning attendance at the Hamfest.

Newfoundland Amateur Radio Association

AT the Annual General Meeting of the Association held last December, the following were elected to office: *President*, H. Wells, VO1Y; *Vice-President*, T. Giannou, VO1AB; *Hon. Treasurer*, G. Rabbitts, VO1R; *Hon. Secretary*, H. F. Rowe, VO1HD.

It is good news that the N.A.R.A., after a brief period of inactivity, is again flourishing.

The address of the Association is P.O. Box 660, St. John's, Newfoundland.

Montreal Amateur Radio Club

AT the Annual General Meeting held in Montreal last January, the following Executive Officers were appointed: *President*, Tom Lott, VE2AGF; *Vice-President*, Hal Ward, VE2XZ; *Treasurer*, Dick Bromwich, VE2HY; *Secretary*, Ethel Pick, VE2HI.

Swedish Summer Camp

THE Swedish Third Amateur Radio District is to maintain a summer camp at Oston in the neighbourhood of Sundsvall (Lat. N62° 24′ 4″, Long. E17° 43′ 17″) from July 6 to 12. Board and lodging will cost 6 Swedish Crs. per day. There will be no charge for children under 15.

Further information can be obtained from Mr. Sven Granberg, SM6WB, Arvid Lindmansgatan 15 A, Gothenburg H.

GI QSL Bureau

THE R.S.G.B. QSL Sub-Manager for Northern Ireland (Mr. W. H. Martin, GI5HV), has recently moved to Swallow Lodge, Greenisland, Co. Antrim. Northern Ireland members are asked to note this important change of address.

Society News

New Honorary Member

AT the meeting of the Council held on March 17, 1953, William Arthur Scarr, M.A. (G2WS), was unanimously elected an Honorary Member of the Society.

Mr. Scarr, who is at present representing the British Council in North-West India, was President of the Society during 1950 and 1951, having previously served in the office of Acting Vice-President during Mr. Desmond's Presidency.

Mr. Scarr represented the Society at the I.A.R.U. Region I Congress in Paris in 1950 and was elected President of that Congress by the assembled delegates. He also represented the Society at the V.E.R.O.N. 25th Anniversary celebrations in Holland two years ago.

Mr. Scarr with VU2JV. A photograph taken recently in Cuttack, Orissa, Northern India.

Mr. Scarr graduated from Cambridge shortly after World War I.

His Presidential Address delivered at the Institution of Electrical Engineers in January, 1950, focused attention on the more scientific aspects of Amateur Radio. He is a keen v.h.f. enthusiast and an exponent of low power portable work. He pioneered amateur activity on 5 metres and in the early days frequently operated under the call "G Two Walking Suitcases" from remote parts of the Midlands. He continued his portable activities until he left for India last summer.

Mr. Scarr was Director of Education at Ilkeston, Derbyshire, for some years prior to the last war. He became Director of Education at Beckenham, Kent, before joining the British Council as Director of the Students' Department just after the last war.

The news that Mr. Scarr has been elected to Honorary Membership—an honour he will share with only eight other Members—will be received with pleasure by his very many friends in the Society.

Mr. Scarr's present address is c/o British Council, 5 Theatre Road, Calcutta 16, India.

Resignation of Council Members

WITH much regret the Council has accepted the resignations from the Governing Body of Mr. Ian D. Auchterlonie, G6OM, of Whitefield, Manchester, and Mr. Hugh McConnell, GM2ACQ, of Alloway, Ayrshire. Both Members resigned immediately after the announcement was made at the recent Special General Meeting that the Special Resolution relating to subscription rates, etc., had not been carried.

Mr. Auchterlonie served on the Council for three years between 1947 and 1949 and headed the poll when nominated to serve on the 1953 Council. Mr. McConnell served on the 1952 Council and was re-elected last December.

The Council regrets that the valued services and long experience of Mr. Auchterlonie and Mr. McConnell have been lost to the Governing Body.

London Lecture Meeting

MR. ERNEST L. GARDINER, B.Sc., G6GR (Past President) presided at the London Lecture Meeting held at the Institution of Electrical Engineers, on Friday, March 20, 1953, when the Immediate Past President, Mr. F. Charman, B.E.M., G6CJ, lectured on "Recent V.H.F. Aerial Developments." Numerous model aerials were convincingly demonstrated.

An interesting discussion followed, after which Mr. D. N. Corfield, D.L.C.(Hons.), G5CD (Vice-President) proposed a vote of thanks to the lecturer.

There was an attendance of about 75, which included Council Members Frank Hicks-Arnold, G6MB, and Reg. H. Hammans, G2IG. The President was unavoidably absent due to indisposition.

Coronation Year Activities

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

* * *

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

R.O.T.A.B. Trophy Presentation

RECENTLY, in his own home at Weston-super-Mare, Mr. W. E. D. Parker, B.Sc., G6BY, received from the hands of Council Member Herbert Bartlett, G5QA, the R.O.T.A.B. Trophy which was awarded to him last year. Due to illness, Mr. Parker was unable to attend the Annual General Meeting in December. The presentation was made on behalf of the President.

R.S.G.B. COUNCIL BY-ELECTION

CONSEQUENT upon the resignations of Messrs. I. D. Auchterlonie, G6OM and Hugh McConnell, GM2ACQ, from the Governing Body of the Society, nominations are invited for the vacancies thus created.

Not later than April 30, 1953, any ten Corporate Members (but not more than ten) may nominate any duly qualified person by delivering their nomination in writing to the General Secretary together with the written consent of such person to accept office if elected. Each such nominator shall be debarred from nominating any other person for this By-Election.

If more than two nominations are received a Ballot will be conducted on lines similar to those which apply for normal Council Elections except that Ballot Envelopes will not be provided.

The Social Side

Sutton and Cheam Radio Society Annual Dinner

THE Fifth Annual Dinner of the Sutton and Cheam Radio Society was held at Wilson's Restaurant, Grove Road, Sutton, on Saturday, March 14, 1953. The attendance of 97 included the President of the R.S.G.B. and of the Thames Valley Amateur Radio Transmitters' Society (Leslie Cooper, G5LC) and Mrs. Cooper, the Executive Vice-President of the R.S.G.B. (Arthur Milne, G2MI) and Mrs. Milne, R.S.G.B. Council Members Frank Hicks-Arnold, G6MB, and P. W. Winsford, G4DC, and their ladies, the General Secretary of the R.S.G.B. and Mrs. Clarricoats, the Assistant Secretary (Miss May Gadsden), the South West London D.R. (Fred Lambeth, G2AIW) and Mrs. Lambeth.

The Chair was taken by the President of the Society (Stanley Vanstone, G2AYC), who had the support of Mrs. Vanstone and the Members of his Committee with their ladies.

During speech time, which followed an enjoyable dinner, Mr. Vanstone extended a cordial welcome on behalf of his Society to the very large and distinguished gathering of visitors. He also spoke of the happy liaison which exists between the Sutton & Cheam and Thames Valley Societies and of his pleasure that representatives of the Purley & Sanderstead Society were present.

Mr. Clarricoats, replying for the visitors, spoke of the importance of extending the social side of Amateur Radio. He hoped that during Coronation Year the emphasis at R.S.G.B. Provincial Meetings would be on that aspect of the Society's work. Mr. Clarricoats also referred to Mr. Vanstone's work as Chairman of the London Members' Luncheon Club and of the efforts made by that Club to promote a spirit of friendship. On behalf of the assembled company he extended congratulations to Old Timer Horace Cullen, G5KH, on his recent marriage to Mrs. Betty Molesworth.

To the President of the R.S.G.B fell the honour of proposing a toast to the Sutton & Cheam Society. Mr. Cooper welcomed the decision of

Ladies' Man !
Stanley Vanstone (G2AYC), President of Sutton and Cheam Radio Society, with the Ladies at the recent Annual Dinner of that Society.
[Photo.: courtesy Croydon Times

"We Wanted to Encourage You," says Thames Valley President Leslie Cooper (G5LC), to Sutton and Cheam President, Stanley Vanstone (G2AYC), explaining why T.V.A.R.T.S. "allowed" S. and C. to win the Cullen Cup last year! Also in the picture (taken at the recent S. and C.R.S. Dinner), Council Members P. W. Winsford (G4DC), F. Hicks-Arnold (G6MB), and A. O. Milne (G2MI). Leslie Seaton (G3HSK) and the General Secretary (G6CL) complete the group.
[Photo.: courtesy Croydon Times

the Society to cater for the up and coming enthusiast and told a story concerning a young man of 16 who, on the day after the recent Special General Meeting, had written to assure the President of his loyalty to the R.S.G.B. Mr. Cooper was happy to see that young man present at the Dinner. Congratulations were offered to Sutton & Cheam for their success over Thames Valley in the Cullen Cup Contest.

Mr. Roderick Clews, G3CDK, replying on behalf of the Society, made use of a number of apt and amusing quotations.

The important toast to The Ladies was entrusted to the Virtuoso of Ashtead—Reg Pearson, G4DH, who, later in the evening, brought down the house with a skilful rendering on his ukelele of a new song entitled "On the Day I took over the Bull." A charming response to the toast came from Mrs. R. L. Harvey.

The after-proceedings were enlivened by music, song and dance.

Pontefract Area Transmitting Group

ABOUT 40 Members and friends attended the Second Annual Dinner of the Pontefract Area Transmitting Group on March 6, 1953.

During the evening Ian Auchterlonie (G6OM) gave a first-hand account of the recent Special General Meeting and summarised the events leading up to that meeting. Later, boxes of chocolates were presented to the ladies, whilst the menfolk, by "lucky dip," acquired various small but useful items. A number of raffle prizes were disposed of, ranging from a 12 in. c.r.t to a box of solder.

London Members' Luncheon Club

AT the Annual General Meeting of the Club held at the Bedford Corner Hotel, W.C.1, on Friday, March 20, Stanley Vanstone, G2AYC, was re-elected Chairman for the third consecutive year, while Clem Jardine, G5DJ, and May Gadsden were persuaded to continue in office as Hon. Treasurer and Hon Secretary respectively.

Amateurs from the Provinces and from abroad are cordially invited to attend meetings of the Club whilst in London. The Club will meet on April 24, May 22 and June 19. Reservations should be made to Miss Gadsden at R.S.G.B. Headquarters the day before each meeting.

Spen Valley and District Radio and Television Society.

THE Society held its Annual Dinner at the Co-operative Society Cafe, Cleckheaton, on March 28. Gifts generously donated by radio concerns were presented to the male members present whilst the ladies received boxes of chocolates. The success of the dinner was in no small measure due to the efforts of Jack Rose and Jesse Charlesworth, G3IJC. There was an attendance of 22.

Second North Cornwall Hamfest

MORE than fifty members, wives and friends gathered at the Cove Cafe, St. Agnes, on March 29, for the second Cornish Hamfest. Headquarters was represented by Council Member Herbert Bartlett, G5QA (Region 9 Representative) who travelled from Exeter with the T.R. for that city. Once again the walls of the cafe were adorned with cartoons of well-known Cornish amateurs.

A special feature of the occasion was a display of amateur-built equipment including a T.V.I.-proof Transmitter constructed by Mr. J. Ridge, G3HFS.

During tea Mr. Bartlett expressed his pleasure that the Hamfest had been so well supported and congratulated the North Cornwall A.R. (J. E. Bowden) and his colleagues for the arrangements. As a mark of appreciation for his services to Cornish members, Mr. Bowden later presented Mr. Bartlett with an ashtray in the form of the chimney stack and engine house of a Cornish tin mine, many of which can be seen in and around St. Agnes. Mr. Bartlett made a suitable reply.

Following a draw for prizes—there were over 50 of them valued from 2s. to £2—Mr. Bartlett judged the exhibits. Certificates of Merit were subsequently awarded to Messrs. J. Ridge, G3HFS; E. Carter; J. Tremain, G3EHT; J. E. Bowden, G2AYQ; and S. Cowl, B.R.S. 15631. A display of films brought to an end another highly successful Cornish Hamfest.

The organisers record their thanks to those manufacturers who donated prizes and to all who helped to make the occasion a success.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

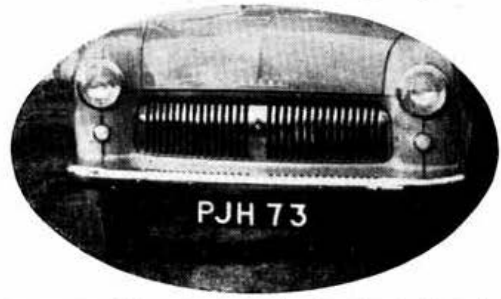
At 12.30 p.m. on April 24, 1953.

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

"73" on the Road

THE peculiarities of the British system of allotting motor-car registration numbers do not normally allow the use of an Amateur Radio call sign on a vehicle number plate. All the same, it *is* possible to acquire car registration numbers which are not entirely unconnected with our hobby.

The Hon. Editor, on recently acquiring a new



car, was able to persuade the local licensing authorities to oblige with an appropriate index number. In one respect he was rather fortunate because his initials are the same as one of the index blocks for the county of Hertfordshire, where he lives, namely JH. When he acquired his new car the allocation of the PJH block was imminent, so he asked for a number in this series—and what more appropriate number than "73," perhaps the most used expression in Amateur Radio? The result is seen in the accompanying picture.

Other amateurs who wish to acquire their initials on the number plate of a new vehicle can frequently do so provided they register the vehicle in the county to which those initials apply. It is not, however, at all easy to get hold of an old, already allotted, index number unless the last holder is traced and the number plates purchased from him at the cost of £5. The Hon. Editor had designs on UM5—but they were thwarted!

By the way, you can, if you are lucky, get "73" in your telephone number, too, as the "landline call sign" of Headquarters confirms.

Uncle Mike.

Tests and Contests

Affiliated Societies' Contest, 1953

PROBABLY the first reaction of competitors on seeing the list of results of this contest will be one of surprise at the large amount by which claimed scores have been reduced. The Contests Committee have decided on drastic action because the monitoring stations reported that many competitors had been heard asking stations other than known club stations to "give me a number so that I can claim 5 points." For this reason all claimed scores were adjusted to allow 5 points only for contacts with those Affiliated Society stations which submitted an entry or check log. This accounts for the greater part of the reductions made which, incidentally, did not materially affect the order of the competitors. Club points were claimed for some 30 c.w. and 25 phone stations other than those listed and this aspect of the contest will receive consideration in framing the rules for the next event. Check logs were received from G3HXN and GM3IGW.

Direction Finding Field Day

DETAILS of the Qualifying Field Day to be held on Sunday, May 3, 1953, are as follows:

Organiser :	R. H. Newland, 10 Holmstall Avenue, Edgware, Middx.
Call Sign :	G3CWW/P.
Frequency :	1782.5 kc/s.
Assembly Point :	Wilson Road, West Harrow. Off Vaughan Road, 150 yards South of West Harrow Metropolitan Railway Station. N.G.R. 51/141879.
Map :	Ordnance Survey, New Popular Edition, Sheet 160.
Assembly Time :	1330 B.S.T.

Intending competitors should notify the organiser by Monday, April 27, stating the number in their party requiring tea. The location of the restaurant will be notified to competitors when their entries are acknowledged.

Results of Affiliated Societies' Contest, 1953

Posn.	Name of Society	Telegraphy		Telephony		Total Points
		Call Sign	Points	Call Sign	Points	
1	Coventry Amateur Radio Club	G3FAB	178	G3FAB	162	340
	Stourbridge & District Amateur Radio Society	G3BMY	188	G3CLG	152	340
3	Surrey Radio Contact Club	G3BFP	183	G3BFP	150	333
4	Cheltenham Amateur Radio Society	G3GPW	167	G3GPW	160	327
5	Thames Valley Amateur Radio Transmitters' Society	G6MB	159	G6MB	165	324
6	Chester & District Amateur Radio Society	G2YS	185	G2YS	135	320
*	Worthing & District Amateur Radio Club	G3GGN	168	G3GGN	146	314
7	Medway Amateur Radio & Transmitters' Society	G2CBA	187	G2CBA	126	313
8	West Kent Radio Society	G4IB/P	161	G4IB/P	147	308
9	Sheffield Amateur Radio Club	G4JW	161	G4JW	137	298
*	Edinburgh Amateur Radio Society	GM3HAM	168	GM3HAM	124	292
*	Harlow & District Radio Society	G3ERN	145	G3ERN	143	288
10	Lincoln Short Wave Club	G3EBH	157	G3EBH	130	287
11	Courtaulds Amateur Radio Group	G3CQD	159	G3CQD	122	281
12	R.A.F. Amateur Radio Society (Locking)	G8FC	161	G8FC	114	275
*	Gravesend Amateur Radio Society	G3GRS	163	G3GRS	112	275
*	Murphy Radio Sports Club	G8LM/P	152	G8LM/P	109	261
13	Army Apprentices' School Amateur Radio Club (Arborfield)	G3HOS	145	G3HOS	104	249
14	Rotherham Radio Club	G3ELG	134	G3ELG	76	210
15	Sutton & Cheam Radio Society	G3FRV	102	G3FRV	100	202
16	Ribblesdale Amateur Radio Society	G3HKF	108	G3HKF	90	198
*	Walsall & District Amateur Radio Society	G2FPR	85	G2FPR	110	195
17	Ariel Radio Group, B.B.C. Club	G3GDT	133	G3GDT	61	194
	Edgware & District Radio Society	G3ASR/A	108	G3ASR/A	86	194
19	Leicester Radio Society	G2FMO	123	G2CFC	46	169
*	Admiralty Electronics Society	G3GPU	125	G3GPU	43	168
20	Grafton Radio Society	G2AOW	157	——	—	157
21	Kingston & District Amateur Radio Society	G3DHZ	120	G3DHZ	29	149
22	York Amateur Radio Society	G3HWW	142	——	—	142
*	South West Essex Radio Club	G3FZF	96	G3FZF	24	120

* Disqualified—Affiliation Fee in arrears at time of contest.

Cullen Cup Contest

THE Annual Contest between the Thames Valley and Sutton and Cheam Radio Societies will take place on Sunday, April 26, 1953, from 1400 G.M.T. to 1700 G.M.T. Competitors will be allowed to work on any band and with any power within the scope of their licence. Contacts will be permitted with all amateur stations except those operated by members of either Society. An exchange of RST and QTH will constitute a contact. Phone or c.w., wholly or in part, may be used. Competitors will call "CQ Contest" (c.w.) or "CQ Cullen Cup Contest" (phone).

The total number of points scored by all the competitors in each Society will be divided by the number of entrants from that Society. The Society obtaining the highest average will hold the Cullen Cup for one year.

"OZ Cross Country" Contest

THE second "OZ Cross Country" Contest, organised by the Danish National Society (E.D.R.), will commence at 2100 G.M.T. on Saturday, May 9, 1953, and finish at 2100 G.M.T. on Sunday, May 10, 1953. From 0001 G.M.T. to 0700 G.M.T. on May 10, Danish stations will not work other Europeans for contest points.

Telegraphy and telephony contacts with Danish stations in the 3.5 to 28 Mc/s amateur bands will score two points each and contacts on 144 Mc/s four points each. An entrant's final score will be the total points scored, multiplied by the number of OZ districts worked on all bands. Contestants will call "CQ OZ CCA de . . ." and exchange a code-group consisting of an RST or RS report followed by a three-figure serial number, starting at 001 for the first contact.

The "OZ Cross Country Contest Award" will be made to the leading c.w. and phone stations in each participating country and contacts made by all stations will be allowed to count for the "OZ Cross Country Award."

Further details, including a list of OZ districts, may be obtained from the Traffic Dept., E.D.R., P.O. Box 335, Aalborg, Denmark. Entries should be sent to the same address.

First Two-Metre Field Day, 1953

THE Rules for the first Two-Metre Field Day, 1953, are the same as those published in the August, 1952, issue of the BULLETIN except for the following:

Rule 7. Add "on one side of the paper only." Alter date to June 21, 1953.

Rule 9. Alter date to June 21, 1953.

Rule 15. Alter date to June 29, 1953.

Contests Diary

1953

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

Coronation Year QSL Cards

MINERVA PRESS, 46 Queen's Road, Brentwood, Essex, have produced an attractive commemorative QSL card design for Coronation Year. The card—printed in royal purple and black—reproduces the Coronation Coach.

The cards are priced at 18/- per 100.

What is Panl?

PANL—a special black crackle finish preparation—produces results which, from an appearance point of view—compare favourably with those obtained from baking processes.

Panl can be obtained from L. Millar, 8 Kenton Park Crescent, Kenton, Middlesex.

Rediffusion Ltd.

IN the report published last month of the part played by Hull radio amateurs during the recent flood disaster it was stated that the local Rediffusion system was put out of action temporarily. This was not the case. The Hull Rediffusion system remained fully operative.

G2HKU Returns Thanks

MR. E. H. TROWELL (G2HKU), 4a Clyde Avenue, Sheerness, Kent, wishes to express his appreciation of the kindness shown to him and his family during the recent floods by members of the Society and other amateurs.

It's Topical

AT Manchester University's Jodrell Bank Experimental Station, 8,000 tons of concrete are being used in the foundations for the **world's largest radio telescope.** It is due to come into use next year.

News from three countries this month emphasises the onward march of television. In the United States, the Radio Corporation of America is ready to commence **colour T.V. broadcasts** immediately permission to do so is granted by the Federal Communications Commission. The B.B.C. has ordered three pairs of medium power **sound and vision transmitters** from Marconi's Wireless Telegraph Co. Meanwhile, **in Japan** the State Broadcasting System is transmitting television programmes for five hours each day. A commercial service is expected to start this month.

The annual contests organised by the **International Radio Controlled Models Society,** will take place this year in Southend-on-Sea. The model boats event will be staged on Saturday, July 25, and three contests for model aircraft on the following day.

The first use of a **transistor for amateur transmission** is reported by *QST*. Using a point contact type transistor, as a crystal oscillator on 146 Mc/s, K2AH worked W2UK, at a distance of 25 miles, receiving a report of RST559. Power was derived from a 22½ V hearing aid battery, the voltage being dropped to 10 V at the transistor. The input was approximately 30 *milliwatts*.

A Standard Specification (BS 1927 : 1953) applying to **nominal loudspeaker sizes** from 2½ to 18 inches diameter, has been issued by the British Standards Institution

Capt. **Kurt Carlsen, W2ZXM,** of the *Flying Enterprise,* received a "ticker tape" welcome and the call-sign KZ5HC when he arrived in the Panama Canal Zone recently. Now in command of *Flying Enterprise II* he will be operating Marine Mobile in the Pacific for the next two years.

The second control station in the Automobile Association's chain **for radio contact with its road patrols** is to be near Guildford, Surrey. The Association already operates breakdown services controlled by radio in London and Birmingham.

The Voice of America's **Radio Amateurs' Programme** is now broadcast at 1915 G.M.T. on Sundays on the following frequencies: U.S.A., 9.615, 9.700, 11.755, 11.870, 15.165 and 15.270 Mc/s; Munich, 6.105 Mc/s; Tangier, 9.635 Mc/s and by the B.B.C. on 6.060 Mc/s. When will the B.B.C. follow the good example of the V.O.A.?

To improve television reception in the Brighton and Worthing area, a temporary **low-power "booster"** operating on Channel 3 (56.75 Mc/s vision and 53.25 Mc/s sound) is to be installed near Kingston-on-Sea. Vertical polarisation will be used.

National Field Day, 1953.

The May issue of the Bulletin will contain a complete list of N.F.D. stations with details of call signs and locations.

Have You Worked G3CFK?

PETER HARRISON, G3CFK—who is T.R. for Great Yarmouth—was unlucky enough to lose his collection of QSL cards when his radio shack was flooded during the recent disaster. Amateurs who have worked his station would be contributing to his pleasure by sending a duplicate card.

Council Proceedings

Résumé of the Minutes of the Proceedings at a 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 Thursday, February 26, 1953.

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

* * *

Membership.
Resolved:—
(a) to elect 107 Corporate Members and 36 Associates;
(b) to grant Corporate Membership to 11 Associates who had applied for transfer.

Applications for Affiliation
Resolved to grant affiliation to the Royal Signals Boys Amateur Radio Club and Amateur Radio Society of Uganda.

Honorary Member.
Mr. F. Charman proposed that Mr. William Arthur Scarr, M.A. (a Past President of the Society), be elected to Honorary Membership.
[The Articles of Association state that Honorary Members shall be proposed at one Meeting and elected by ballot at a subsequent Meeting of the Council.—ED.]

Special General Meeting.
The Secretary submitted a report showing the number and status of the proxy forms which had been received in good time.
Matters relating to the business of the Special General Meeting were discussed, during which each Member of the Council expressed his views on the question of subscription rates.
Resolved (by 7 votes to 4) that, in the event of the Special Resolution being approved, the subscription rate to be paid by Home Corporate Members for the current financial year shall be fixed at 27s. 6d.
Those who voted for the resolution were Messrs. Auchterlonie, Charman, Edwards, Hammans, Hicks-Arnold, Milne and Newnham.
Those who voted against the resolution were Messrs. Bartlett, Hum, McConnell and Winsford.
The President and Mr. Findlay did not vote.
It was mutually agreed that all Members of the Council should consider themselves free to state their personal views on the issue of subscription rates if requested to do so by Members or groups of Members.

Lausanne I.A.R.U. Region I Congress.
Consideration was given to the Report of a Meeting of the Region I Bureau Committee.
After a lengthy discussion it was resolved that the R.S.G.B. delegation to the Lausanne I.A.R.U. Region I Congress in May, 1953, shall comprise two persons in addition to the Hon. Secretary to the Region I Bureau Committee (Mr. A. O Milne).
It was further resolved that Messrs. J. Clarricoats and R. H. Hammans shall represent the R.S.G.B. at the Lausanne I.A.R.U. Region I Congress.

Change of Name.
Resolved to agree, in principle, to submit to the membership at the appropriate time, a Special Resolution relating to a change in the name of the Society to "Radio Society of Great Britain."

Amateur Radio Exhibition, 1953.
It was reported that accommodation for the Seventh Annual Amateur Radio Exhibition had been reserved at the Royal Hotel, Woburn Place, London, W.C.1, for the week ending November 27, 1953. It was agreed to invite Mr. H. Freeman to act as Exhibition Manager on the same terms and conditions as in former years.

Special General Meeting, December 19, 1952.
It was reported that two Members had drawn attention to what they considered to be an error in the arrangement of certain sections of the Minutes of the Special General Meeting held on December 19, 1952, as published in the January, 1953, BULLETIN.
The Secretary was authorised to publish a suitable statement in the March issue of the BULLETIN.

Affiliation Fees.
It was reported that the Brighton and District Radio Club had decided to secede from affiliation following the decision of the Council to increase affiliation fees. Correspondence was read from two other Societies.
It was agreed to review the question of affiliation fees at the next Regular Meeting of the Council.

Cash Account.
Resolved to receive and adopt the Cash Accounts for December, 1952, and January, 1953, as submitted by the Hon. Treasurer.

Business Deferred.
Due to pressure of other business, discussion was deferred on a number of matters including (i) a consideration of views expressed by the Society's legal advisers on the revised Articles of Association, (ii) proposals for the establishment of an Emergency Communications Network, (iii) a consideration of correspondence relating to the National Radio Exhibition.
The meeting terminated at 10.35 p.m.

* * *

Résumé of the Minutes of the Proceedings at a Special Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, March 10, 1953, at 6.15 p.m.

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

* * *

Purpose of Meeting.
The Council discussed at length various matters arising from the Special General Meeting and made a number of decisions in regard to future action.

Resignation of Council Members.
It was reported that (a) Messrs. H. A. Bartlett and A. O. Milne (two of the five Members of Council who resigned at the Special General Meeting on February 27) had written to the President withdrawing their resignation; (b) Messrs. I. D. Auchterlonie, D. A. Findlay and H. McConnell had written to the President regretting that they could not alter their decision.
After discussion it was resolved (by 4 votes to 3 with 2 Members abstaining) to write to Messrs. Auchterlonie, Findlay and McConnell requesting them to reconsider their decision to resign. [Mr. Findlay later withdrew his resignation.—ED.]

By-Elections.
Resolved that, in the event of vacancies occurring on the 1953 Council as the result of the resignation of Members, the vacancies shall be advertised in the BULLETIN and arrangements made to conduct a by-election if more than the requisite number of Members is nominated for the vacancies.
The meeting terminated at 9.35 p.m.

Regional and Club News

BRIGHTON.—Under its new T.R., Ron Langridge, 27 Warren Avenue, Woodingdean, the Group is entering N.F.D. as usual.

BRIGHTON & DISTRICT RADIO CLUB.—In the March issue, under Forthcoming Events, it was stated that meetings of the Club are held on Thursdays, at 27 Warren Avenue, Woodingdean. This reference was incorrect as the club continues to meet on Tuesdays at the Eagle Inn, Gloucester Road, Brighton 1. The B. & D.R.C. is no longer affiliated to the R.S.G.B.

BRISTOL.—At the March meeting, D. G. Watts delivered a demonstration-lecture on "The Generation and Propagation of TVI." A number of members indicated their willingness to join the National Emergency Amateur Radio Communications Service when it is formed.

CHELTENHAM.—The proposed National Emergency Amateur Radio Communications Service was discussed at the meeting held on April 2. At the same meeting, G6VX demonstrated the transmitters he has designed for N.F.D. Newcomers to the town are invited to contact the T.R. (J. J. Yeend, G3CGD, 30 St. Luke's Road, Cheltenham).

CHESTER & DISTRICT AMATEUR RADIO SOCIETY. Meetings will be held on April 21 ("Radio Interference"), April 28 ("Test Gear"), May 5 (G2ATZ) and May 12 ("Light Beam Transmitter"). *Hon. Secretary:* A. N. Richardson, 1 Victory Villas, Newton Lane, Upton, Chester.

CHINGFORD.—A recent lecture by G3ECA on simple equipment for 70 cm was well received and many members have already constructed the units which are to be calibrated at future meetings. A visit to North Weald Radio Station on March 14 proved very popular.

COVENTRY.—Plans for N.F.D. were discussed at the March meeting. The local Police Radio System will be inspected on April 17; meet 7.30 p.m. in St. Mary's Street. The next informal meeting will be held at 84 Dudley Street, Bell Green, on May 10.

COVENTRY AMATEUR RADIO SOCIETY. — The Society's 21st Annual Dinner, held on February 27, was well attended. The Annual C.A.R.S./M.A.R.S. Inter-Club Contest is arranged for April 19. Club Night on Top Band is the second Thursday in each month. The next meeting at the Y.W.C.A., Queen's Road, is at 7.30 p.m. on April 27 ("A Multi-purpose Power Supply"). *Hon. Secretary:* K. Lines, 142 Shorncliff Road, Coventry.

EAST GRINSTEAD & DISTRICT AMATEUR RADIO CLUB.—Morse classes and lectures on transmitter theory continue. Meetings are held at 7.30 p.m. on Thursdays and a series of talks and demonstrations on fault finding are to begin shortly. *Hon. Secretary:* E. Miller, 30 Forest View Road, East Grinstead, Sussex.

EAST SURREY RADIO CLUB.—"A home constructed Electronic Time Switch," by Dennis Lloyd, and "TVI Prevention," by G4ZU, have been the subjects of recent talks. At the meeting in the Club Headquarters, British Legion, Redhill, on April 22, G2MV will give a lecture entitled "Polar Diagrams of popular Beam Aerials." *Hon. Secretary:* L. G. Knight (G5LK), Radiohme, 6 Madeira Walk, Reigate.

GRAFTON RADIO SOCIETY.—More than 70 members attended a lecture and demonstration of his TVI-proof transmitter given by Louis Varney (G5RV) on March 6. At the meeting on April 24 at 7.30 p.m., H. F. Knott (G3CU) will give a talk and demonstration on "Single Sideband Transmission." *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

HOVE.—The newly formed Hove Group plans to operate two N.F.D. stations, probably from the Devil's Dyke. Interested members living in the area are asked to get in touch with the A.R., Eric Basilio, G3HVH, 111 Vale Road, Portslade.

ROYAL SIGNALS BOYS' AMATEUR RADIO CLUB is now affiliated to R.S.G.B. Communications should be sent c/o Major I. McAinsh, 6 (Boys) Training Regiment, Normandy Camp, Beverley, East Yorkshire.

SLADE RADIO SOCIETY.—There will be a lecture and demonstration of an Electric Guitar at the meeting in the Church House, Erdington, at 7.45 p.m. on April 17. A visit to Elmdon Airport is arranged for May 1. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Birmingham 23.

SOUTH MANCHESTER RADIO CLUB.—Meetings will be held at Ladybarn House, Mauldeth Road, Fallowfield, on April 24 ("Junk Box Transmitter") and May 8 ("Operating Experiences with Simple Equipment"). The next R.A.E. course, including Morse instruction, will begin in June. *Hon. Secretary:* M. Barnsley (G3HZM),) 17 Cross Street, Bradford, Manchester 11.

SOUTH WEST ESSEX RADIO CLUB.—Meetings are held at 367 Rush Green Road, Romford, at 8 p.m. on Tuesdays. New members are invited to attend. *Hon. Secretary:* B. W. Le Grys (G3GOT), 75 Shaftesbury Road, Romford, Essex.

STOCKPORT RADIO SOCIETY.—At the A.G.M. held on March 17, it was announced that there are now 74 paid-up members. E. Lindop (G3DWH) was elected Vice-Chairman. *Hon. Secretary:* G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport.

TORBAY AMATEUR RADIO SOCIETY.—The A.G.M. will be held at the Y.M.C.A., Torquay, on April 18, followed by a sale of surplus equipment in aid of Society funds. R.S.G.B. members of the Society will help to man the Torquay "A" station on Milber Down during N.F.D. A small Committee has been formed to help organise the Devon Hamfest due to take place in Torquay next autumn. *Hon. Secretary:* L. D. Webber, G3GDW, 43 Lime Tree Walk, Milber, Newton Abbot, Devon.

WALSALL.—The attention of members in South Staffordshire is drawn to the announcement under "Forthcoming Events" of a joint meeting of the local Group with the Walsall and District Amateur Radio Society in Walsall on April 22. It is hoped this meeting will receive good support.

Silent Key

It is with regret that we record the passing of old-timer Stanley Ward, ex-G2QS, of New Malden, Surrey. Mr. Ward was taken ill whilst working in the Admiralty Research Laboratories at Teddington and died shortly after admission to hospital.

Although he had not been actively engaged in transmitting since before the last war, he retained an interest in the Amateur Radio movement through his keen association with the Thames Valley Amateur Radio Transmitters' Society. His main interest lay in test equipment.

Mr. Ward was an early member of the Wireless Society of London and had been a member of the R.S.G.B. for more than 30 years. At one time he held commissioned rank in the Royal Navy. Our heartfelt condolences are extended to his widow and brother.

L.C.

FORTHCOMING EVENTS.—(Continued from page 418).

REGION 9

Bath.—April 20, 7.30 p.m., Y.M.C.A., Broad Street.

Bristol.—April 24, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.

Exeter.—May 1, 7 p.m., Y.M.C.A., St. David's Hill.

North Devon.—May 7, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Penzance.—May 7, Railway Hotel.

Plymouth.—April 18, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

Torquay.—April 18, 7.30 p.m., Y.M.C.A., Castle Road.

West Cornwall (W.C.R.C.).—April 16, May 7, Fifteen Bells, Penryn, Nr. Falmouth.

Weston-super-Mare.—May 5, 7.30 p.m., Y.M.C.A.

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

REGION 10

Cardiff.—May 11, 7.30 p.m., "The British Volunteer," The Hayes.

REGION 11

Holywell.—May 3, 4 p.m., Congregational Chapel Schoolroom

REGION 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace.

Edinburgh.—April 16, 30, May 14, 7.30 p.m., Edinburgh Chamber of Commerce, 25 Charlotte Square.

REGION 14

Falkirk.—April 24, May 8, 7.30 p.m., Temperance Cafe, High Street.

Glasgow.—April 29, 7.15 p.m., 39 Elmbank Street.

Prestwich.—April 19, 7 p.m., Royal Hotel.

The extracts published below are only a small—but quite representative—selection from the heavy correspondence which has been received at Headquarters on the subject of subscription rates.

Subscription Rates

DEAR SIR,—There must be many among us who are distressed by the difficulty of getting over to some sections of the membership the absolute necessity of the projected increase in the subscription rates. May I suggest a method by which some, at least, of the necessary funds may be raised?

On the payment of the next subscription a donation could be added according to the desires and resources of the member, such donation to be applied by the Society to the purpose for which the increased subscription was originally required.

It would thus be very simple for the *real friends* of the Society to give it their personal support, and I would suggest that the donation should be at least an amount to bring the payment up to 30s. and that all such members should be known by a special title (such as " Friends of R.S.G.B.").

F. G. LAMBETH (G2AIW).

Twickenham.

* * *

DEAR SIR,—As a protest against the crass stupidity of the membership's rejection of the proposal to increase subscription rates, I have pleasure in voluntarily enclosing the difference between the current and the proposed new rate, with the earnest hope that the "Ayes " will do likewise.

It is extremely doubtful whether the present sub. is worth more than about 7s. 6d. at pre-war values . . . how any member can possibly expect a flourishing Society at £1 1s. p.a. is beyond comprehension. . . .

Come on chaps—*one* less fag a week will put the Society on its feet!

" OLD-TIMER."

Somewhere in N.E. London.

[*" Old Timer " is but one of many members who have voluntarily increased their subscription to a higher figure.*—ED.]

* * *

DEAR SIR,—It is obvious that the majority of members have given little consideration to the finer points of the financial aspects governing the operation of a national society. . . .

In these days of general financial stress, any rise in membership fee is greeted with a pseudo gnashing of teeth. After careful thought, however, surely it must be obvious to those members who are capable of interpreting a balance sheet, that the proposition of 30s. membership fee was a very wise one.

Any company must provide for a working profit—and remember, we are the shareholders.

S. A. HOWELL (GW5FN), T.R., Cardiff.

Cardiff.

* * *

DEAR SIR,—If the R.S.G.B. is to function on a sound foundation, increasing the yearly subscription to 30s. is a necessity.

For Overseas Members the position is somewhat different, but I would like to say now that I personally am willing to pay £1 per annum for the privilege of being a member of the R.S.G.B. I may add that I was a Home Corporate Member from 1934 to 1949, and an Overseas Corporate Member from 1950 to date. I further realise that to a Home Corporate Member 30s. p.a. is high compared with the same figure in Southern Rhodesia, but a Home Member can at least attend R.S.G.B. functions in London and the larger cities. . . .

It is said that a high percentage of the present members will resign if and when the subscription rates are increased to 30s. p.a. as they cannot afford the extra shillings. This seems rather farcical when one notices that quite a high number of G licence-holders can well afford to build and operate good 150-watt stations. . . .

MAL. GEDDES (ZE3JO, ex-G2SO).

Salisbury, Southern Rhodesia.

* * *

DEAR O.M.,—The enclosed is a small contribution from the Montreal Amateur Radio Club towards the running expenses of R.S.G.B. It seems like a long time since we sent you any money in the Club's name, and I always receive the Club's copy of the BULLETIN so promptly, that the executive asked me to forward this to you with the thought that " every little helps! "

In the meantime, you can count on our loyal support in your mighty " travail," and as many subscriptions and renewals as we can raise among the VE2 gang.

With very cordial 73,

SID CHAPMAN (VE2LV).

A Letter from Ian Auchterlonie (G6OM)

DEAR SIR,—I have been asked by a number of members to explain why I resigned from the Council after the Special General Meeting on February 27, 1953.

My sole reason for resigning was that I had lost the confidence of those members who voted for me last December.

It was apparent to me at the Special General Meeting that the bulk of the opposition to the Special Resolution came from the North and North-West of England.

Prior to my election to the 1953 Council, I had attended a number of local meetings in Region 1, and had listened with great care to arguments as to the proposed subscription rate.

The main points seemed to be that:—

(a) the governing body had *not* produced figures to back up their request for the increase;
(b) they had failed in their duty in *not* giving *all* members an opportunity of voting on the matter;
(c) there was a general feeling that the rate should not be in excess of 25/- *at present.*

At the January Council meeting I pleaded these points before my colleagues.

Now to my complaint. Following the January Council meeting—the *first* I had attended—there came the statement in the February BULLETIN of expenses, together with the issue of the proxy forms. In other words, G6OM had won over the other members of the Council on *two* of three points that had been put to him. Further, so far as was possible, the membership were informed of these moves in advance by me *via* the Regional Representative. Imagine my feelings when a large body of these self-same people still *voted against a resolution, which did not mean that the subscription was to be 30/-;* it only fixed that as a *ceiling* figure. In other words, the members felt that despite having accomplished two out of three things I had been specifically asked to do, they still could *not* rely on me to influence my fellow Council members to agree to the third point.

As further evidence of my desire to do the best possible in the interests of members, I would draw attention to the last item in the Résumé of the January Council minutes published in the March issue of the BULLETIN. I refer to the point about Zonal representation. Members will see that this was also raised by me.

Taking all the above into account, does anyone, I wonder, still think that my action in resigning was *not* justified?

I have since been asked if I am willing to accept re-nomination for Council. To this I have answered, " Yes, when I am assured that it is the desire of the members."

Yours faithfully,

IAN D. AUCHTERLONIE (G6OM).

4 Stand Close, Ringley Road,
Whitefield, Manchester.

[*Mr. Auchterlonie topped the poll last year. He was also top of the poll for three years between 1947 and 1949.*—ED.]

807s on Top Band

DEAR SIR,—In the recently published report of the first 1953 Top-Band Contest, it is remarked that " key clicks from a station in the South of England could be heard throughout the U.K." This, I imagine, is just another indication of the apparent tendency among some amateurs to use excessive (and unnecessary) input powers on the 1.8 Mc/s band in the hope of obtaining some contest award.

The writer has heard two stations admit to using 813s on Top-Band, and while these are undoubtedly exceptional cases, the use of 807s as power-amplifiers on 1.8 Mc/s is very common indeed.

Now the 807 has a rated anode dissipation of 30 watts, which means that it will handle an input of some 60 watts under Class C conditions comfortably and efficiently. Any marked deviation from the recommended operating conditions, such as are entailed in under-running to keep the input to 10 watts, can only result in a fall of efficiency, and it is strange, therefore, that so many amateurs who genuinely keep to their licence regulations should use an 807 in preference to a much smaller valve which will perform the same function more efficiently and economically.

One is constrained to wonder, therefore, if the majority of the 807 transmitters working on Top Band are, in fact, running at 10 watts, especially when one hears some of the really " ear-splitting " transmissions.

The fact that high power is not essential for consistent communication on 1.8 Mc/s has been proved time and time again by QRP enthusiasts more experienced than the writer, who, incidentally, uses a 7C5 as p.a. valve.

As it is hardly possible or expedient that the R.S.G.B. attempt disciplinary action against the " QRO fraternity," it is hoped that these few words may come to the attention of the offenders and, perhaps, cause second thoughts.

Yours faithfully,

R. L. PLUCK (G4AY).

Rainham, Kent.

New Books

RADIO AND RADAR. By A. T. Starr, M.A., Ph.D., M.I.E.E. Page size 9" x 5¼". 812 pages, 730 diagrams. Published by Pitman. Price 75/-.

In this book Dr. Starr has presented the essentials of knowledge of radio and radar. Much attention has been given to noise, microwave techniques, wave forms, pulse circuit techniques and electron tubes. Where possible mathematical analysis has been relegated to the appendices, which occupy nearly 300 pages. There are several hundred references to specialist text and original papers.

The book is intended chiefly for designers and other advanced workers in the electronic equipment field.

Experimentally-minded radio amateurs, interested in centimetric operation, will find much valuable information in Chapter 3—" Microwave and Short Wave Techniques," Chapter 4—"Antennæ," and Chapter 5—" Valves."

Applications are not described, emphasis being placed on methods and physical interpretations. The reader is expected to have already mastered the subject to a standard approaching that of a University Degree.

* * *

TELEVISION. By F. Kerkhof and W. Werner. Page size 9¼" x 6¼". 434 pages, 360 illustrations, including numerous half-tone blocks printed on art paper. Bound in blue cloth. Price 50/-.

This book is one of the first to present and discuss the basic theory, as well as the technical consequences, of the various systems of television in use or projected in Great Britain, the United States, France, Holland and elsewhere. The joint authors are principals in the Television Development Laboratory of the Philips organisation in Eindhoven.

It is interesting to read in the preface to the list of photographic illustrations, that " the series opens with two historic photos by Mr. Kerkhof which gives evidence of the fact that, as was the case with radio, the amateur had an active part even in the earliest stages of the development of television." The first photograph was taken in 1927 and illustrates a transmitter-receiver for shadow pictures with 10 picture lines. The second, taken 10 years later, is a reproduction of two television pictures with 30 lines, as received by a television amateur at a distance of 70 miles. The transmitter was in the house of Mr. Kerkhof at Eindhoven.

The advanced television worker will find much to interest him in this latest addition to the Philips Technical Library.

The English distributors are Cleaver-Hume Press Ltd., 42a South Audley Street, London, W.1.

* * *

DATA AND CIRCUITS OF MODERN RECEIVING AND AMPLIFYING VALVES. Second Supplement. Book IIIA of the Philips Series on Electronic Valves. Page size 9¼" x 6¼". 500 pages, 505 illustrations. Bound in blue cloth. Price 40/-.

This new book in the Philips Valve Series contains descriptions and data of the receiving and amplifying valves brought out by Philips during the years from 1945 to 1950. Rimlock valves take a prominent place as do the miniature battery and Noval types.

Much space is devoted to applications of the new valves, illustrated with numerous circuit diagrams of receivers. The graphs are reproduced on a larger scale than in the earlier volumes.

The book is indispensable to those whose professional interests bring them into close contact with Philips valves, Philips receivers, and Philips measuring and auxiliary equipment.

The very high standard of production achieved in earlier books in the Philips Technical Library has been well maintained.

The English distributors are Cleaver-Hume Press Ltd., 42a South Audley Street, London, W.1.

* * *

TELEVISION PICTURE FAULTS. By John Cura and Leonard Stanley. Page size 7½" x 4½". 68 pages. Contains reproductions of 150 actual screen photographs. Published by Television Times Ltd., London, E.C.1. Price 3/6.

In preparing material for this book, which is printed on art paper, many hundreds of photographs were taken of actual television faults, some as and when they appeared on the screen and others deliberately introduced. Mr. Stanley has contributed the explanatory notes associated with each photograph, and Mr. Cura is the photographer.

The purpose of the book—as its title emphasises—is to enable those who are connected with television in any way, to identify the various faults to which receivers are liable, by an examination of the image on the screen.

Sections 19 to 21 illustrate the effects caused by interference from diathermy, motor vehicles, aircraft and various types of transmitters. There are no specific pictures of interference due to amateur transmitters, but the text indicates that h.f. filters may be used to overcome certain forms of TVI.

This nicely produced little book should appeal to all who are interested in television reception. Incidentally, one of the joint authors (John Cura) has taken more than 35,000 Tele-Snaps, many of which have been accepted by Royalty and famous personages.

Around the Trade

Multicore Solders Ltd. are introducing a tape solder which melts with the heat from a match. Attractively packed, on a two-colour printed card, this new product retails at 1/-. To join two lengths of flex it is only necessary to twist the bared ends together, wrap a short piece of the tape solder around the joint, and hold a lighted match or cigarette lighter flame underneath.

Can You Help ?

• R. Reynolds, G3IDW, 136 Beech Avenue, Swindon, Wilts., who urgently requires the circuit of the Bendix TA12C transmitter.

REPRESENTATION

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

Region 3
Herefordshire
P. B. Buchan (G3INR), 123 Hinton Road, Hereford.

Region 7
London—West
P. J. H. Matthews (G3BPM), 163 Ladbroke Grove, W.10.

Region 15
Co. Antrim
M. G. Williamson (B.R.S. 7781), Avonmore, Antrim Road, Ballymena.
Co. Down
J. E. Maxwell (GI3ML), 31 Farnham Road, Bangor.

* * *

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

Region 2—Co. Durham
Sunderland
E. Hughf (G3ETG), 43 Torrens Road.

Region 4—Nottinghamshire
Mansfield
A. W. Fowler (G3FR), Windsor, Cowpasture Lane, Sutton-in-Ashfield.

Region 5—Norfolk
Norwich
P. C. Ives (G3ASQ), 10 Welsford Road, Eaton Road.

Region 7—London South-East
London East
Harlow
H. Ivan Wright (G3IVA), Allandale, Start Hill, Bishops Stortford, Herts.
Eltham-Sidcup Area
T. I. Lundegard (G3GJW), 11 Avondale Road, Mottingham, S.E.9.

London West
Slough
P. R. Baldwin (B.R.S. 15966), 6 Pitts Road, Salt Hill.

Region 8—Sussex
Brighton
R. G. Langridge (B.R.S. 19946), 27 Warren Avenue Woodingdean.

Vacancies

Messrs. N. D. Atkins (G3EXG), D. Smith (B.R.S. 16757), M. Baerlein (G3EII) and P. F. Clarke (G3CQL) have resigned as Representatives for the towns of Warrington, Retford, Bedford and Southend respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by May 31, 1953.

* * *

East Lancashire C.R. Vacancy

Mr. John E. Hodgkins (G3EJF), of 24 Beryl Avenue, Tottington, near Bury, and Mr. Joseph Simpson, G4JS, of 1 Marsh Terrace, Darwen, having both been nominated for the vacant office of East Lancashire County Representative, a Ballot becomes necessary.

Corporate Members resident in East Lancs. are invited to record a vote in favour of one of the two candidates and to forward same on a *postcard* so that it reaches the General Secretary, Incorporated Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, by not later than April 30, 1953.

Prescribed Form of Voting Card

I ..... *being a fully paid-up Corporate Member of the Society, wish to record my vote in favour of Mr.* .....
as Representative for .....
Call-sign (or B.R.S.) ..... *Signed* .....
Address .....

New Members

Corporate Members (Licensed)

G2BJT J. Taylor, "Hollinwood," Ridge End, Marple, Cheshire.
G3NM S. R. Pountney, 1169 Pershore Road, Stirchley, Birmingham 30.
G3BYA E. A. Pountney, 164 Tennal Road, Harborne, Birmingham 17.
G3CMP C. M. White, 154 Vale Road, Windsor, Berks.
G3DBN †G. H. Dimond, Little Paddocks, Beyton Green, Suffolk.
G3DJE G. E. Lumley, 84 Greencroft Road, Heston, Hounslow, Middlesex.
G3FWW S. W. Watts, "Devonia," 4 Lynton Road, Burnham-on-Sea, Somerset.
G3GKL A. Fowler, 26 Denning Road, Hampstead, London, N.W.3.
G3IBG M. Prutton, 20 Spring Road, Letchworth, Herts.
G3IFM F. Mellon, 133 Ellerdine Road, Hounslow, Middlesex.
G3IPD C. W. Oakley, Ramsden Cottage, Varley Road, Slaithwaite, near Huddersfield, Yorks.
G3IQB M. Balister, 70 Kenilworth Drive, Croxley Green, Herts.
G3IRK A. C. Whitehill, Hut 29, R.A.F. Digby, Lincolnshire.
G3IRU *N. Harvey, 2 Willis Avenue, Sutton, Surrey.
G3ISK K. Easter, 28 Maltings Road, Gt. Baddow, Chelmsford, Essex.
G3ITG G. D. Bark, 7 Park Crescent, Newark, Notts.
G3JAC J. Wood, Castle House Hotel, Isle of Walney, Barrow-in-Furness.
G3JFM E. F. Moore, 5a Manor Road, Bowes Park, London, N.22.

* * *

G2DCU L. Turgill, 68 Herga Court, Harrow-on-the-Hill, Middlesex.
G2DHG M. S. Mitchell, 62 Ely Road, Worthing, Sussex.
G2FCJ †D. F. Sullivan, 34 Elmwood Road, Chiswick, London, W.4.
G2HHN †L. H. Potter, 16 Station Rd., Yate, Nr. Bristol.
G3ADL K. Freestone, 25 Whitbread Road, Crofton Park, London, S.E.
G3BHJ O. J. Russell, 15 Reepham Road, Norwich, Norfolk.
G3FHR F. H. Rayns, 82 Auckland Road, Upper Norwood, S.E.19.
G3GAA †W. P. Jeans, 58 Coningsby Road, High Wycombe, Bucks.
G3GHM P. H. Maxwell, 93 Bowerdean Road, High Wycombe, Bucks.
G3GUU C. H. Hall, 23 Swainson Street, Lytham, Lancs.
G3HGB †J. Mills, 19 Walnut Avenue, Weaverham, Northwich, Cheshire.
G3HJW J. W. Webber, "Westgarth," Cainscross Road, Stroud, Glos.
G3IFG W. R. C. Scott, 19 Redford Avenue, Horsham, Sussex.
G3IIV *A. Davies, "Woodlands," 18 Sandyfields Road, Sedgley, Nr. Dudley, Worcs.
G3IJU E. Briggs, 1 Dragon Junction, Harrogate, Yorks.
G3IKR J. P. Moore, 16 Silverbirch Road, Solihull, Nr. Birmingham, Warwickshire.
G3IKU E. Howarth, 4 Cobham Street, Gravesend, Kent.
G3IMC B. E. Clark, 7a Mornington Road, Woodford Wells, Essex.
G3INU R. J. Appleby, 95 Oxford Road, Clacton-on-Sea, Essex.
G3IPH L. Smith, 77 Dunkirk Street, Droylsden, Lancs.
G3IQG G. S. Austin, 75 Haslemere Road, Bexleyheath, Kent
G3IQU B. E. Buckingham, 88 Rydal Crescent, Perivale, Middlesex.
G3ISC F. W. H. Colborne, 118 Packsfield Road, R.A.F., West Raynham, Fakenham, Norfolk.
G3ISQ R. C. White, 40 Parkwood Road, Wimborne, Dorset.
G3ITK P. Haddock, 19 Aldersyde Street, Lever Edge Lane, Bolton, Lancs.
G3ITP J. T. Parker, 34 Glebe Road, Letchworth, Herts.
G3IUQ C. Pearson, 10 Lammas Park Gardens, Ealing, London, W.5.
G3IUU 1920216 Cpl. J. Elliott, S.H.Q. Signals, R.A.F. Lindholme, Nr. Doncaster, Yorks.
G3IUW L. E. Pritchard, 42 Coronation Road, Sheerness, Kent.
G3IVA *H. I. Wright, "Allandale," Start Hill, Bishops Stortford, Herts.
G3IVB L. R. Beeson, 131 Whitehall Road, Bordesley Green, Birmingham 9.
G3IVG F. Stocks, 7 Waingate, Rawtenstall, Lancs.
G3JJR *J. Rickwood, 52 Fifth Avenue, Low Hill, Wolverhampton, Staffs.
G3JMA *J. M. Appleyard, 13 Roseley Cottages, Eastwick, Nr. Harlow, Essex.
G3JMD M. E. Delany, 11 Hawkesbury Road, Putney, London, S.W.15.
G3JOY D. J. Weaver, Guild of Undergraduates Union University Road, Edgbaston, Birmingham 15.
GM3BNX J. J. Shaw, 60 High Street, Coldstream, Berwick.
GM3HUN W. F. Hunter, 7 Haugh Park, Longstone, Edinburgh.
GM3IAZ *A. H. Wickham, 46 Greenhill Road, Rutherglen, Glasgow.
GM3ITN *L. Hamilton, "Hall's Land," Hardgate, Clydebank, Glasgow.
GM3IUA L. W. Bell, 2 India Street, Edinburgh.
GM3IUI D. Colligan, 45 Milnbank Road, Dundee, Angus.

Corporate Members (Overseas)

F3QP G. A. Armagnac, 7 Place Saint-Thomas, Strasbourg, France.
F8QV J. Pouyet, 7 Quai des Bateliers, Strasbourg, France.
VQ2GM H. G. Manchip, 8th Avenue, Fish Hoek, Cape Town, South Africa.

* * *

DL2UA R. J. Keech, 30 District Headquarters, Army Kinema Corp., B.A.O.R. 29.
EI5Q K. F. Corry, Barkhall, Letterkenny, Co. Donegal, Eire.
F9DV A. Grosse, 148a Route de Polygone, Strasbourg-Neudorf, Bas Rhin, France.
HE9RRU B. Zweifel, Ch. Levant 123, Mousquines, Lausanne, Switzerland.
JY1BB 579305, Cpl. E. G. Stevens, Billet 26, R.A.F. Mafraq, Jordan, M.E.A.F. 2.
JY1RT 2462832, S.A.C. R. T. Thompson, Billet 26, R.A.F. Mafraq, Jordan, M.E.A.F. 2.
MF2AG Cpl. D. J. Doleman, c/o B.E.T.F.O.R. Signals, British Element, Trieste Force.
VQ3BM C. Watson, Aeradio Station, Mbeya, Tanganyika.
VQ4AQ G. J. Dent, P.O. Box 1717, Nairobi, Kenya.
VS7AR H. A. Don Ranasinghe, Station Officers' Mess, R.A.F. Henlow, Beds.
W5KTC M. F. Canion, P.O. Box 235, Port Lavaca, Texas, U.S.A.
W6UC A. W. Martin, P.O. Box 264, Carmel, California, U.S.A.
ZC4HV H. L. Verinder, c/o No. 5 Forces Broadcasting Station, Benghazi, N. Africa, M.E.L.F. 6.
ZE5JP 2514896, L.A.C. P. Rackham, P.M., "Transmitters," R.A.F. Kumalo, Nr. Bulawayo, S. Rhodesia.

Corporate Members (British Receiving Stations)

19862 *J. Johnston, 224 South Palmerston Street, South Shields, Co. Durham.
19863 *G. F. Milne, 626 Alexandra Parade, Glasgow, E.1.
19864 *A. Ashcroft, 1b Gaw Hill Lane, Aughton, Ormskirk, Lancs.
19865 *P. J. Nicholls, 5 Victoria Road, Prestatyn, Flints.
19866 *H. White, "Chezlyn," 279 Neasham Road, Darlington, Co. Durham.
19867 K. J. White, 20 Normans Close, Willesden, London, N.W.10.
19868 P. E. Johnson, High Street, Gnosall, Staffs.
19869 H. W. Chenery, 43 Wessex Estate, Ringwood, Hants.
19870 J. Lofthouse, c/o Chalmers, "Tarvit" (Garage), Cupar, Fife.
19871 W. McKerrow, Woodlea, Auchinleck, Ayrshire.
19872 A. D. Paxton, 93 The Avenue, Sunbury-on-Thames.
19873 J. W. Wells, 91 Park Road, Blackpool, Lancs.
19874 G. Taylor, 362 Huddersfield Road, Battyeford, Mirfield, Yorks.
19875 A. D. J. Horder, High Street, Thornbury, Bristol.
19876 E. D. Evans, 6 Winton Avenue, South Shore, Blackpool.
19877 J. M. Beck, 4 Hilton Terrace, Whitehaven, Cumberland.
19878 A. Farrer, 5 Low Kells, Whitehaven, Cumberland.
19879 N. F. Cowie, "Suncroft," 562 Toller Lane, Heaton, Bradford, Yorks.
19880 P. D. Brans, 46 Babs Field, Bentley, near Farnham, Surrey.
19881 B. J. Gainard, 62 Beechen Drive, Fishponds, Bristol.
19882 E. W. Carter, 66 Kings Dyke, Whittlesey, near Peterborough, Northants.
19883 G. S. Cosh, 1 Cardiff Road, North End, Portsmouth, Hants
19884 E. Byrne, Stone Fell Gate, Swallow Hill, Distington, Cumberland.
19885 A. J. Sekinger, 93 Deodar Road, Putney, London, S.W.15.
19886 A. White, 26 Southbourne Avenue, Humprey Park, Urmston, Manchester.
19887 D. Graham, 10 Chepstow Mansions, London, W.2.
19888 R. Leitch, 34 Reservoir Road, Rugby, Warwickshire.
19889 A. A. G. Brown, 65 Malmsmead House, Homerton, London, E.9.

19890 T. G. E. COLE, 93 Morley Avenue, Wood Green, London, N.22.
19891 G. H. W. BOYS, Dane Court, Pyrford, Woking, Surrey.
19892 J. V. EVANS, 2 Shakespeare Drive, Cheadle, Cheshire.
19893 R. G. WHITEING, 9 Stour Avenue, Norwood Green, Southall, Middlesex.
19894 E. J. L. SMART, 20 Compstall Road, Marple Bridge, Stockport, Cheshire.
19895 J. N. WOODS, 4 Saithaelwyd Park, Holywell, Flintshire.
19896 P. C. ROBSON, 14 Kingshill Drive, Kenton, Middx.
19897 P. J. CARTER, 1 Baytree Road, Weston-super-Mare, Somerset.
19898 J. AITKEN, 49 Park Street, Bonnybridge, Stirlingshire.
19899 G. H. PRICE, 20 Heol Dyfed, Fishguard, Pembrokeshire.
19900 G. W. ALDERMAN, 30 Ellerton Road, Tolworth, Surbiton, Surrey.
19901 R. I. COX, B.Sc., Ph.D., Biochemistry Dept., University of Edinburgh, Teviot Row, Edinburgh 8.
19902 J. HORNE, 16 Florence Street, Middlesbrough, Yorks.
19903 Y. SALEK, 31 Church Drive, Boultham, Lincoln.
19904 M. G. LEE, 73 Shinrig Road, Nelson, Nr. Treharris, Glamorgan.
19905 J. STRACHAN, c/o Mrs. Wyber, 3 Boswall Place, Edinburgh 5.
19906 P. N. SARGENT, "The Oak Inn," Easton-on-the-Hill, Stamford, Lincs
19907 D. SCOTT, 53 Granton Crescent, Edinburgh.
19908 R. WARD, 24 Gibraltar Street, Blackburn, Lancs.
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Correction

In the list of New Members published in the February, 1953, issue of the BULLETIN, the call-sign held by E. Crouch should be shown as G2HDT; the name of the Member allotted B.R.S. 19755 should read J. H. A. Pyne.

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HAMMARLUND HQ-129-X, as new, with internal crystal calibrator, £65. Hallicrafters S.27, 27-145 Mc/s, £20 Eddystone 640 with "S" meter, £18. G.E.C. Miniscope, in case, with i.f. adaptor unit, £10. UHF receiver, 1294, 500-3,000 Mc/s, £10. No. 19 set, Mk. III, with generator unit, £8. Set of spare valves for H.R.O., £3.—G3ITI, South Street House, Cottingham, E. Yorks. (979

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H.R.O. Senior with power unit, 10 coils and spare valves, £37. BC.221 with power pack, £25. ASB8 receiver, £3; APQ9 transmitter, 50/-; both modified for 70 cm. 145 v.f.o., £3. (2) 813, 40/- each. (2) QY2-100, 50/- each. TZ40, 20/-. (2) 832, 20/- each.—G3GMZ, 12 Kingsmead Avenue, Tolworth, Surrey. (957

H.R.O., type MX, 50 kc/s to 30 Mc/s, power unit, speaker, £35. 1131 modulator, complete valves and power supply, £15. 1131 power supply, 1,000 V 250 mA, with valves, £5. 100TH, new, boxed, 30/-. 813 and base, £1. 2E29 (2), new, with bases, £1 each. 832, 15/-. TZ40 (4), 10/- each.—KEEBLE, 139 Sidegate Lane, Ipswich. (951

MAINS transformers, Zenith 1,500-1,000-500 V 300 mA, shrouded, £4; 840 V 200 mA, £2 10s.; 500 V 200 mA, 7.5 V 5 A, 4 V 3 A, 6 V 8 A, £2 10s.; 4 V 8 A, 10/-. Woden swinging choke, 5/25 H, 250 mA, £1. Meters: 0-100 mA, 0-200, 0-250, 0-300, all moving coil, 3½ in., 10/- each; 0-1,500 V, 0-3,000 V, £1 each. Valves: 866s, 10/- each; new R.C.A. 807s, 7/6 each; 2A3s, 7/6 each. Send for lists.—G8UA, 406 Higher Brunshaw, Burnley, Lancs. (974

MCR.1, 4 coils, power pack, phones, £8. R.103, no power pack, £5. RF.27, including valves but less panel and plug, £2.—THACKER, 29 Chapmans Walk, Leigh-on-Sea. (942

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

MODULATION transformers: 807s, Class B, to 813, plate and screen, various tapping, both secondaries, 40/-; R.C.A. 400 W 805s/813s, 30/-; 1,250-0-1,250 500 mA, 200/250, 40/-; 10-0-10 10 A 200/250, 15/0. Swinging choke, 5/30 H, 400 mA, 20/-. Brand new 805 (2) and bases, 22/6 each. (2) PT15, 5/- each. 10 Raymart 1½ in. formers, 1/- each. Postage please.—G3BDS, 34 Tybridge Street, Worcester. (970

(Continued on page 460)

EXCHANGE & MART SECTION

(Continued from page 459)

NEW De Luxe Table-top Transmitter, commercially built and specially designed for amateur use; 200 W input to 813 on 3.5-28 Mc/s, c.w. or 'phone from 807 modulator. Low-power 'phones or c.w on 160 metres. Completely band-switched, 1.7-28 Mc/s. Temp. compensated UFO with full vision bandspread dial. Broadband coupled exciter. Fully screened and T.V.I. proofed. Built-in crystal calibrator. Only used few hours. Cost over £250. No better amateur transmitter available; accept £125 (delivered). Vortexion modulator, two 807s, in grey ventiated cabinet, 50/60 W output, £20. Portable tape recorder, with spare tapes, £25. Will consider exchanges on above equipment, particularly for Collins 75A receiver and 32V transmitter.—Box (Surrey) 976, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (976

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

PYE PCR.2 receiver, modified, 175 kc/s to 22 Mc/s, as new, £10. Transmitter/receiver, 18 set, £3 10s. 38 set, £1 10s. Power pack, type 3, £3. Power pack, type 599, 230 V; outputs, d.c., 250 V 60 mA, 12 V 3½ A. £2. V.H.F. wavemeter, type 1310, £3 10s. Constant-voltage transformer, £3 5s. Valves: 813, £2; 35T, £1 5s.; 807, 6K8, 6G6, 6B8, 830B, 836, VR150/30, 715B, EBC33, 872A, RK20A, 6E5, ECH33, EF36, 6SH7, 2A3, all at 7/6.—Box 990, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, E.C.4. (990

SALE. — AR.88LF, £45, perfect condition. BB.221T frequency meter, new, £20. — Details, GW5VX, 14 Holland Street, Port Talbot. (968

SALE.—Receiver, type R.107, £10. Receiver, type R.208, £10. Class "D" wavemeter Mark 2, converted a.c. mains, £5. 10-metre converter (Radiocraft), £2 10s. All in first-class order. Eddystone 2-metre beam aerial, unused, £4.—TIMEWELL, Carhampton, Minehead, Somerset. Dunster 250. (983

SALE.—R.1155, perfect working order, £7 10s. Crystals, 7040 (9), 7055, 7075, 7225, 10/- each. RF.24, modified 10 metres, 15/-. 832 with base, 20/-. 3 RF ammeters, 5/- each. Wanted: Class "D" wavemeter. Crystal microphone, KT8C.—LAWN, 20 Croft Road, Godalming, Surrey. (965

SALE.—Mazda tube, type CRM92, 9 in., new, in maker's carton, £8. P.M. focus unit, 7/6. Scanning coil assembly, 7/6. Premier 9 in. televisor cabinet, new, not drilled for control knobs, £5.—PERRY, B.R.S. 7866, Sandfield, Market Lavington, Devizes, Wiltshire. (953

SALE.—Packard-Bell 2-stage pre-amplifier, new, boxed, £2. 6V6, p.p. amplifier, 230 V, gram. motor, pick-up, case soiled, p.p., offers. Reflex Klystron. Butler L pass TV filter, £1. U.M.I., 35/-. New 813s (2), 45/- each. 813 ceramic base, 10/-. PT15 (3), 25/-. Garrard Sapphire stylus pick-up, spare stylus. Offers. 40 receiving valves, various; s.a.e. list; going cheap.—Box 992, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (992

SELLING up.—Double superhet, 150 kc/s-44 Mc/s, £10. Signal generator, 90 kc/s-30 Mc/s, £5. Type 145 v.f.o. and power pack, £5. Various crystals, 10/-. S.A.E. for list of bargains.—G3TS, Viola, Cambridge Road, Laindon, Essex. (959

S. 640, immaculate, £21. Frequency meters: W.1117, very fine condition, £3 15s.; BC-906-C, 140-225 Mc/s, superb instrument, as new, £5 10s. Pair good used CV-174 with jumbo-bases, 18/6. All carriage extra. Offers invited.—Box 984, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (984

TRANSMITTER for sale, 2 racks, 12 panels, black crackle and chrome, built to commercial standards, separate trays for each band, 80-40-20-10, 'phone and c.w., crystal or v.f.o. Full power, comprises 18 controls, 9 meters, 30 valves; noted for quality. Cost £160 to build; sacrifice, £90. Considered one of the finest stations in the Midlands.—Apply Box 941, THE NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (941

VALVES: 211 with base, £1; 28D7s, 4/-; 25L6s, 7/-; 1229s (76s), 3/-; PX4s, 7/6; VCR97, £1; 5BPI, £1; VCR97, 15/-. B.2 receiver, needs attention. W/S38, complete, £2. 230 d.c./a.c. converter, 150 W, £3. RF24, 25, 27, £1 each. R.1355, modified with power supply for TV, £6. EHT unit, £3. H.R.O. receiver with power pack, speaker and 5 BS coils, condition excellent, £30. RU.16/BC.429 coil pack, 10/-. Control units for BC.430 transmitter and CRV/ARB receivers, 6/- (circuits available). Several 500 V packs and transformers, 25/- each. Weston reference cell, M60 i.f. strip, suit TV, plated chassis with 8EF50s, £5. All band transmitter with power supplies, nearly complete, £20. Very cheap e.h.t. transformers, 2,000/3,000 V output, also several old broadcast receivers cheap; enquire. Lots ex-Government circuits available. Want your useless plugs or sockets, buy or exchange. Offer please. Carriage extra.—Box 977, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (977

WANTED.—BC.610 Hallicrafters, ET.4336 transmitters, SX.28s, AR.88s, receivers and spare parts for above. Best prices.—P.C.A. RADIO, The Arches, Cambridge Grove London, W.6. (955

WANTED.—B.2 receiver in good condition, or exchange quantity new and used valves and components.—HOWES, 14 Sinhurst Road, Camberley, Surrey. (948

WANTED.—Good receiver, Commander, AR.88D, 750 or other makes. Also tape recorder. No fancy prices, just plain facts.—Reply G3IFK, 77 King James Avenue, Cuffley, Herts. (995

WANTED.—H.R.O. Senior, must be in excellent condition with bandspread coils for all h.f. bands.—Full particulars and price to E19Q, 16 Manor Street, Waterford, Eire.

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

WANTED.—Labgear transmitting coils, type T20A, BCL, FCL, also base for same.—J. STONESTREET, G2JN, Bossingham Street, Canterbury (981

WANTED. — 20-metre rotary-beam. — LEE, G3GYK, "Primus," Pine Glen Avenue, Ferndown, Dorset. (973

WANTED.—R.C.A. speech amplifiers type MI-11220 J or K and aerial tuning units BC.939A, coils and tuning units for BC.610 transmitters.—Offers stating quantity and price to P.C.A. RADIO, The Arches, Cambridge Grove, London, W.6. (956

WANTED. — R.C.A. 4331 transmitters.—P.C.A. RADIO, Cambridge Grove, Hammersmith, W.6. (Telephone RIVerside 3279.) (562

WANTED.—Relays, ex-BC.357/624, similar, 2AP1 CRT holder, 1853, 813, 6Q7, 6Y6, BC.457, etc., chassis, Dewar switches, FT243 crystal sockets, 465 IFTs, small meters—MCR.1 or B.2 receiver, unserviceable considered.—SEED, 8 Witheart Avenue, Bebington, Cheshire. (963

WANTED.—Type "A" Mark III suitcase transmitter/receiver, complete with original 6 V vibrator pack; mint condition; or B.2. Good price offered. Urgent.—COOKE, "Larbreck," Gt. Eccleston, Preston, Lancs. (950

WANTED.—Wilcox Gay M.O., unmodified and complete. To be collected in Sussex.—VQ2GW, Box 74, Luanshya, Northern Rhodesia. (978

WANTED.—Wilcox Gay M.O. unit, unmodified. State price and condition.—MACPHERSON, 6 House O'Hill Crescent Blackhall, Edinburgh 4. (987

WANTED.—25 W 807 c.w. transmitter; 80-40-20.—Price, full details to CHARLTON, 17 Thelwall Lane, Warrington.

"WIRELESS World," August, 1949, to date (July, 1951, missing); BULLETIN, September, 1946, to date; for sale; in perfect condition. — B.R.S. 31812, 4 St. Margaret's Avenue, Benton, Newcastle-upon-Tyne. (971

200 W c.w. transmitter, 3.5 Mc/s input, 14 Mc/s output, standard rack, power, complete, £14. Transformer, 2,000 c.t., 150 mA, taps, 15/-. RF25, 7/6. 50kc/s crystal in holder, 7/6. Four bandpass crystals around 465 kc/s, mounted, 10/- each. New, boxed, 803, 25/-. 35T, pair, 35/-. New 832, 15/-. Three little used 866/866A, each 10/-. T20, ATP7s, VT90s, 7/-. Two 10,000 Mc/s mixers including klystrons and crystals, each 30/-.—G3BQ, 75 Queen's Avenue, N.20. Hillside 1550. (964

APPOINTMENTS SECTION

Appointments vacant

CROWN AGENTS FOR THE COLONIES

METEOROLOGICAL ASSISTANT for Radio/Radar duties required by the East Africa High Commission. Option of appointment either (a) on probation for two years leading, subject to satisfactory service, to permanent and pensionable employment, or (b) on contract for one tour of 30-48 months with gratuity of 13⅓% of total salary earned. Salary (including allowances) according to qualifications and experience in scale £715 rising to £1,170 a year. Outfit allowance £30. Free passages Liberal leave on full salary. Candidates must have have good experience of operating and maintenance of ground radar equipment and be capable of undertaking radio-sonde/radar-wind operation, including the determination of results, and the operation and maintenance of meteorological electronic equipment including ionospheric sounders, "Sferics" and diesel electric equipment. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.33571.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (945

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH require EXPERIMENTAL OFFICER (unestablished) in Radio Research Organisation, Teddington, Middlesex, for abstracting scientific and technical articles on radio research and development. H.N.C. or higher qualifications with considerable knowledge and experience of some branch of radio research or development. Ability to read technical French or German useful. Minimum age, 26; salary in the range £628-£786. Forms from M.L.N.S. Technical and Scientific Register (K) 26, King Street, S.W.1. (960

ST. THOMAS'S HOSPITAL, LONDON, S.E.1, require YOUNG TECHNICIAN to assist in construction experimental electronic apparatus. Experience light mechanical engineering essential and have completed or be exempt from National Service. Apply in writing to PERSONNEL OFFICER.