




# R.S.G.B



# BULLETIN

## TELCON LOW-LOSS TRANSMISSION LINES

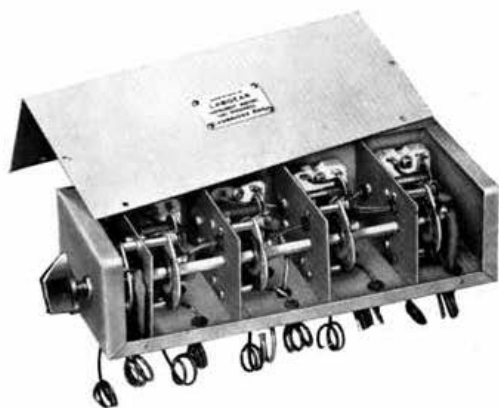
 <p><b>K.24.B</b> 150-ohms nominal impedance, figure-8 section twin; capacitance 10.6 mmf/ft; Attenuation at 50 Mc/s, 2.1 db/100 ft; power rating at 100 Mc/s, 300 watts.</p>	 <p><b>K.25.B</b> 300-ohms nominal impedance, flat ribbon-typetwin; capacitance 4.6 mmf/ft; attenuation at 50 Mc/s, 1.0 db/100 ft; power rating at 100 Mc/s, 500 watts.</p>	 <p><b>K.35.B</b> 300-ohm tubular twin feeder with stable characteristics in varying weather conditions. Capacitance 4.0 mmf/ft; attenuation at 50 Mc/s, 0.92 db/100 ft; power rating at 100 Mc/s, 550 watts.</p>
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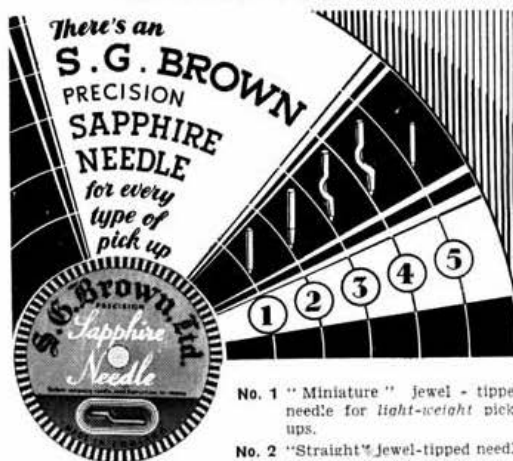
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# One head can excel at two jobs: A TURNOVER PICK-UP CARTRIDGE COMES TO STAY

The introduction of commercially produced micro-groove recordings brought to the user the complication of having to use two different styli. At once the question arose as to the best way of changing over from one stylus to the other. From the layman's point of view—and the largest proportion of the gramophone-playing public are laymen—the "best way" means the "simplest way." This explains the popularity of pick-ups with both styli fitted to the same cartridge and the provision of mechanical means, such as a simple swivel action, to bring one or the other stylus into use. The Acos G.P.25 has been one of the most popular cartridges of this type. Unfortunately, there have been serious technical objections to such dual stylus cartridges, and technical people as a rule have been accepting them merely as a concession to an over-riding demand for simplicity.

## Technical Objections

There were principally two objections, both of which were concerned with the output characteristics of such cartridges. First, it was argued, the considerable difference in the recording characteristics of the Standard and the Long Playing records required either two cartridges with two different reproducing characteristics or two separate compensating circuits. Neither is very simple or easy with a single cartridge. Secondly, it has been found that the free stylus tends to vibrate at its own resonant frequency, producing a deep trough in the overall response, thus spoiling the quality of reproduction to a noticeable extent.

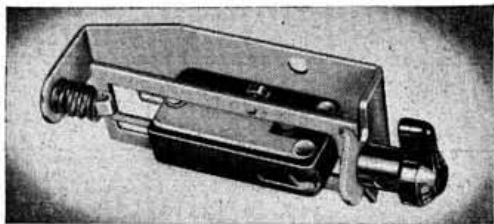
The system of using two separate heads avoids all these difficulties, as must be obvious to every sound engineer. The heads can be designed each to fulfil its specific purpose and they can be provided with means for plugging in or clipping on for comparatively easy change-over. The Acos G.P.20 is a good and well-known example of such a pick-up.

## Practical Advantages

Nevertheless, a pick-up which can be changed from Long Playing to Standard and vice versa is so enormously attractive for all commercial and general-purpose applications, that Cosmocord just could not help making a thorough investigation into the possibility of mass-producing a dual-stylus cartridge with acceptable

reproducing characteristics for both types of records. It was established from purely theoretical considerations that, given a set of critical conditions, the solution was possible. The real difficulties arose when trying to stipulate these critical conditions in terms of practical engineering and finding means of maintaining them in large quantity production. These difficulties could have proved insurmountable had it not been for a realistic approach right from the start by Cosmocord engineers, combined with the wide scope of Cosmocord's resources, which include considerable experience in the development and manufacture of special-purpose materials. Eighteen months of intensive work resulted in the introduction to the Radio Industry by Cosmocord of the Acos G.P.29 cartridge.

## THE G.P.29 PICK-UP CARTRIDGE



This new Acos cartridge is designed to give the best possible reproduction of both Standard and L.P. Records with the normal run of domestic radio sets under home conditions. No input correction is required apart from exceptional cases. The usual tone control on the set could provide additional adjustment to suit individual taste, but is not essential. The output of around 0.7 V at 1,000 c/s from Standard and about half that from Long Playing Records is right for present day requirements. The difference between the two output levels is no greater than variations found between recordings, and is no more noticeable in use. The response characteristics of the two sides of the dual cartridge unit are tailored to give optimum performance in both cases. The "Standard" side gives a falling characteristic beyond 5 kc. The bass end is compensated to within around -3 db at 70 c/s. The result is well balanced reproduction suggesting wide range but no or very little needle scratch. Long Playing Records with their softer and smoother surface require no top cut except to compensate for pre-emphasis in recording. However, the amount of top cut already in existence in a domestic receiver more than compensates for this. So much so that to give best overall balance the long playing output of the G.P.29 cartridge had to be raised substantially above 5,000 c/s. A very important feature of this cartridge is that it will truly track both types of record at 10 grams needle pressure. This, coupled with the appreciable vertical compliance of the cantilever stylus to compensate for pinch effect, ensures long record life and freedom from distortion.

The cartridge takes two sapphire tipped cantilever styli which are held in the needle chuck by a set screw. They are easily replaceable when so required in service. The cartridge is supplied either with two side brackets or mounted in a turn-over mechanism, and is available to manufacturers only. Insist that it is incorporated in your new equipment.



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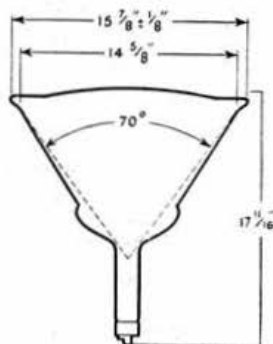
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# R·S·G·B· BULLETIN

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SEPTEMBER  
1952



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



# Forthcoming Events

## REGION 1

**Bury**.—September 11, October 9, 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**.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo, Liverpool.  
**Darwen & Blackburn**.—September 26, October 24, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.  
**Manchester (M. & D.R.S.)**.—October 6, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.  
**Preston**.—September 26, October 10 and 24, 7.30 p.m., Three Tuns Hotel, North Road, Preston.  
**South Manchester (S.M.R.C.)**.—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.  
**Southport**.—September 22, October 6 and 20, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.  
**Warrington (W. & D.R.S.)**.—First and third Tuesdays, 7.30 p.m., King's Head Hotel, Warrington.  
**Wirral (W.A.R.S.)**.—September 24, October 8 and 22, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

## REGION 2

**Barnsley**.—September 26, October 10, 7.30 p.m., King George Hotel, Peel Street.  
**Bradford**.—September 16 (A.G.M.), 7.30 p.m., Cambridge House, 66 Little Horton Lane.  
**Catterick & Richmond**.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.  
**Darlington**.—Thursdays, 7.30 p.m., 129 Woodlands Road.  
**Doncaster**.—October 8, 7.30 p.m., Black Bull, Market Place.  
**Gateshead**.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.  
**Hull**.—September 24 (General), October 8 (Beginners), 7.30 p.m., R.E.M.E. Canteen, Walton Street.  
**Middlesbrough**.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.  
**Pontefract**.—September 18, October 2, 16, 8 p.m., Fox Inn, Knottingley Road.  
**Rotherham**.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.  
**Scarborough**.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.  
**Sheffield**.—September 24, 8 p.m., Dog and Partridge, Trippett Lane; October 8, 8 p.m., Albreda Works, Lydgate Lane.  
**Slithwaite**.—Fridays, 7.30 p.m., 3 Dartmouth Street.  
**Spennorth**.—September 24, October 8, 7.30 p.m., Temperance Hall, Cleckheaton.  
**Sunderland**.—September 24, October 8, 7.30 p.m., 16 North Bridge Street.  
**York**.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

## REGION 3

**Birmingham South**.—September 21, 10.30 a.m., Stirehley Institute.  
**Coventry**.—September 26, October 24 (A.G.M.), 7.30 p.m., Priory High School, Wheatley Street.  
**Kenilworth, Warwick & Leamington**.—September 18, October 16, 7.30 p.m., Dalehouse Lane.  
**Malvern**.—October 6, 8 p.m., Foley Arms.  
**Rugby**.—October 7, 7.30 p.m., Public Library, St. Matthew Street.  
**Stourbridge (S. & D.R.S.)**.—October 7, 8 p.m., King Edward's School.  
**Worcester (W. & D.A.R.C.)**.—Thursdays, 7 p.m., City Library (basement), Foregate Street.  
**Wrekin (W.A.R.S.)**.—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington, Salop.

## REGION 4

**Alvaston (D.S.W.E.S.)**.—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.  
**Chesterfield**.—September 23, October 7, 7.30 p.m., Bradbury Hall, Chatsworth Road.  
**Derby (D. & D.A.R.S.)**.—September 24, October 1, 8, 15, 7.30 p.m., Derby College of Arts & Crafts, Sub-basement, Green Lane.  
**Leicester (L.R.S.)**.—September 15, October 6, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.  
**Loughborough**.—September 17, October 15, 7.30 p.m., Great Central Hotel.  
**Mansfield (M. & D.A.R.S.)**.—October 5, 3 p.m., Swan Hotel.  
**Newark**.—September 28, October 12, 7 p.m., Northgate House, Northgate.  
**Northampton (N.S.W.C.)**.—Fridays, 6 p.m.; October 3, 7 p.m., Club Room, 8 Duke Street.  
**Retford**.—October 5, 3 p.m., Community Centre, Chapel Gate.  
**Workshop**.—October 6, 7 p.m., King Edward Hotel.

## REGION 5

**Chelmsford**.—October 7, 7.30 p.m., Marconi College, Arbour Lane.  
**Ipswich**.—September 24, October 14, 7.30 p.m., T.A. Drill Hall, Stationbridge Road.

## REGION 6

**Cheltenham (A.R.S. & R.S.G.B. Group)**.—September 26, October 3, 10, 24, 7.45 p.m., St. Mark's Community Centre, Brooklyn Road.  
**Gloucester**.—Alternate Thursdays, 7.30 p.m., Spreadeagle Hotel.  
**North West Wilts.**.—Fridays, 8 p.m., G3HXA, London Road Inn, Calne.  
**Petersfield & District**.—September 25, 7.30 p.m., The Market Inn, The Square.  
**Portsmouth**.—Tuesday, 7.30 p.m., Signal Club Room, Royal Marine Barracks, Eastney.  
**Southampton**.—October 4, 7.30 p.m., 22 Anglesey Road, Shirley.  
**Stroud**.—Wednesdays, 7.30 p.m., Subscription Rooms.  
**Swindon**.—October 18, 7.30 p.m., Connaught Rooms (off Regent Street).

## REGION 7

**Barnes & Richmond**.—October 14, 7.30 p.m., 308 Upper Richmond Road, East Sheen.  
**Bexleyheath (N.K.R.S.)**.—September 25, October 9, 7.30 p.m., Congregational Hall, Clock Tower.  
**Brentford & Chiswick**.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.  
**Bromley (N.W.K.A.R.S.)**.—October 3, 8 p.m., Shortlands Hotel, Station Road, Shortlands.  
**Dulwich & New Cross**.—October 6, 7.45 p.m., Cliftonville Tavern, Ilderton Road, S.E.16.  
**Ealing**.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.  
**East London District**.—September 28, 3 p.m., Ilford Town Hall.  
**East Molesey (T.V.A.R.T.S.)**.—October 8, 8 p.m., Carnarvon Castle, Hampton Court.  
**Eltham & Sidcup**.—September 22, October 6, 7.30 p.m., Holy Trinity Church Hall, Hurst Road, Sidcup.  
**Enfield**.—October 19, 3 p.m., George Spicer School, Southbury Road.  
**Finbury Park**.—September 23, 7.30 p.m., 164 Albion Road, Stoke Newington.  
**Grays (G.A.R.S.)**.—September 19, October 3, 17, 8 p.m., Baird's Cafe, Orsett Road.  
**Guildford & Woking**.—September 28, Ham Party, 3 p.m., at GZCC, 89 West Street, Farnham, and not as stated last month.  
**Hayes & Uxbridge**.—October 3, 7.30 p.m., The Vine, Uxbridge Road.  
**Hendon & Edgware**.—September 17, 24, October 1, 8, 15, 8 p.m., St. Martin's School, 22 Goodwyn Avenue, Mill Hill.  
**Hoddesdon**.—October 2, 8 p.m., "Salisbury Arms."  
**Holloway (Grafton R.S.)**.—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.  
**Ilford**.—September 18, 25, October 2, 9, 16, G2BRH, 579 High Road.  
**Kensington and Shepherds Bush**.—October 10, 8 p.m., Basement Flat, 38 Royal Crescent, W.11.  
**Kingston (K.D.A.R.S.)**.—September 24, October 8, 7.45 p.m., Penrhyn House, 5 Penrhyn Road; October 3, 17, Radio Theory Class.  
**Lewisham (R.A.R.C.)**.—Wednesdays, 8 p.m., Durham Hill School, Downham.  
**Norwood**.—September 20, October 18, 7.30 p.m., 35 Grangecliffe Gardens, South Norwood.  
**Parley (P.D.R.C.)**.—September 25, 7.30 p.m., Railway Hotel.  
**Reigate (E.S.R.C.)**.—October 2, 7.45 p.m., 19 London Road.  
**Slough**.—September 18, October 16, 7.45 p.m., Golden Eagle, High Street.  
**Southgate**.—October 9, 7.30 p.m., Arnos Secondary Modern School, Wilmer Way, New Southgate.  
**Sutton & Cheam**.—September 16, October 21, 7.30 p.m., The Harrow, Cheam Village.  
**Wafford**.—October 7, 7.30 p.m., Cookery Nook, High Street.  
**Welwyn**.—October 7, 8 p.m., Council Offices, Welwyn Garden City.

## REGION 8

**Brighton (B.D.R.C.)**.—Tuesdays, 7.30 p.m., Eagle Inn Gloucester Road. (E.B.S.W.C.)—Thursdays, 7.30 p.m., 27 Warren Avenue, Woodingdean.  
**Chatham (M.A.R.T.S.)**.—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.  
**Eastbourne**.—September 25, October 30, 7.30 p.m., 333 Seaside.  
**Hastings (B. & H.R.C.)**.—September 23, October 7, Saxon's Cafe, Seafront.

(Continued on page 122.)

# R.S.G.B. BULLETIN

Volume 28 No. 3

September, 1952

## Current Comment . . .

### "Rules and Regs"

ONLY the simplest communities can be governed by rules that are limited to no more than "thou shalt" and "thou shalt not." In any developed civilisation the laws of government inevitably become increasingly complex until, in this twentieth century, they are so involved that few but legal minds can understand them!

Let it be hoped that no such criticism may be levelled at the new version of our own Articles of Association, of which a draft is printed in the present issue. Nevertheless, rules and regulations—or constitutions, if you like—will of necessity be somewhat precise and academic in their phraseology if they are to take account of most foreseeable contingencies. Because our Articles do not make easy reading this is no excuse for any member not to study them closely, for they are certainly of importance to him.

The new Articles of Association, while based in many respects on those far-sighted Articles of a quarter-century ago, take into account many of the changes that have developed in the character of the Society and of Amateur Radio since then. If they wear as well as the original Articles have worn they will do very well indeed. To ensure that they *shall* wear as well—perhaps even better—has been the object of the many Council members and Society representatives who over a period of years have concentrated so much mental effort upon them.

Probably the Article that will have the most immediate impact is No. 19, which refers to the new rate of subscription. The increase in subscription is much overdue. For too long the Society has been operating on a basis of post-war outgoings but, very largely, pre-war incomings. Most members will be glad that the increase in the subscription is a modest one.

In connection with membership an important change has been made. All members who are of age will be Corporates, and Associate membership will be confined to those who are under 21 years old, and are not qualified for Corporate membership. The introduction of an Entrance Fee for

new members will be noted as something commonly employed in most technical societies but, not so far, in ours. It does have about it the suggestion that membership of the R.S.G.B. is not something to be undertaken lightly or frivolously; it gives the entrant a *cachet* which every amateur who takes the hobby seriously will be glad to have.

Great interest is sure to be aroused in the Articles that refer to the composition of the Society's governing body, the Council. Abolition of the offices of Hon. Secretary and Hon. Editor—offices that were essential when no permanent paid staff existed—does not mean that the Council will lose any control over the secretarial and editorial functions.

Readers will also observe that Council members are to be elected for a period of three years instead of one—a valuable measure to enhance continuity of policy.

Of even more importance perhaps is the institution of six geographical zones (Article 27), each of which can return a member to the Council in addition to the twelve other Council members—an innovation that should put the quietus to critics who complain that the structure of the Society does not adequately embrace the widest representation.

These, however, are but a few extracts from the total of 71 Articles in the new draft. The reader is now counselled to study the draft itself. Many of the changes that have been made (comparing it with the original Articles) will be self-explanatory. Elucidation on any that are not can be given by the Regional Representatives, who have been kept closely in touch with the Council's thinking on the subject.

Once approved by the Board of Trade, the Articles of Association will then be submitted to a special general meeting of the membership for acceptance or rejection. If they meet members' general approval they will then become the Society's official constitution—its "rules and regs"—for the benefit of the most important person of all, the private member, without whose continued existence and loyalty this organisation would not remain in being.—J.H.

# The Measurement of Noise Factor in Receivers

By J. W. MATHEWS, Assoc. Brit. I.R.E. (G6LL)\* and W. H. ALLEN, M.B.E. (G2UJ)†

One of the most important but least understood performance characteristics of a v.h.f. receiver is its "noise factor." The following article explains the meaning of the term and how noise factor can be measured. A simple noise generator for carrying out such measurements is also described.

ONE measure of receiver performance is the input voltage required to produce a standard output—usually 50 milliwatts. This is a measure of overall gain and is satisfactory provided the gain of the receiver is not such that its inherent noise constitutes the limiting factor. A receiver with high gain, but with a correspondingly high noise level, would be inferior in performance to one with lower gain but with proportionately less noise in relation to the desired signal.

Noise may be produced in any stage of a receiver, but, with reasonable design, that originating in the input circuit of the first valve (and therefore followed by the full gain of the receiver) is the most important. A mixer valve is inherently more noisy because its overall amplification from signal-frequency input to intermediate-frequency output is lower than when a similar valve performs a normal amplifying function; for this reason an r.f. stage (or stages), having high amplification in relation to inherent noise, always precedes the mixer valve in a receiver designed for weak-signal reception.

Signal-to-noise ratio, another convenient expression of receiver performance, may be defined as the ratio of signal output to noise output for a given input signal. The measurement of signal-to-noise ratio involves a knowledge of the input signal level and the receiver bandwidth. A further term used to describe receiver noise is "equivalent noise sideband input," and this is a measurement of all random noise appearing in the output of the receiver.

None of the above methods provides a means of describing receiver performance without bringing in additional and extraneous factors and the use of a standard signal generator. The measurement of noise factor permits receivers to be compared one with another, and may be made with the aid of a piece of simple equipment and without regard to other performance characteristics.

## Principle of Noise Measurement

Two significant sources of noise are associated with a received signal: first, that due to the valve resistance and circuit noise in the receiver itself, and second, that due to thermal agitation in the resistive component of the aerial impedance. The latter is fundamental and not to be confused with any noise which may be picked up by the aerial; thus, if a perfect receiver producing no noise of its own could be made, its performance would be limited by this cause alone.

In the measurement of noise factor the performance of a receiver is compared with that of a perfect and noise-free receiver producing only the noise due to the previously mentioned aerial thermal agitations, the resulting ratio usually being expressed in decibels. It is, therefore, possible to define noise factor as the number of times by

which the total output noise exceeds that portion of it due to the thermal noise of the source, i.e.:

$$\text{Noise Factor} = \frac{\text{Noise of receiver + aerial noise}}{\text{Aerial noise alone}}$$

Although the perfect receiver is impossible of attainment, the present design of r.f. stages for use on the v.h.f.'s leaves something to be desired, and their comparison through the medium of noise-factor measurements is of considerable interest to amateurs desirous of obtaining the optimum performance from their apparatus.

Since, in a thermionic valve, the normal electron flow is characterised by random fluctuations (shot noise), it is a simple matter to harness this effect and so produce a controllable source of noise basically similar to that of a receiver. A convenient method is to employ a diode operating in a saturated condition, so that its anode current is dependent solely upon filament emission and can therefore be regulated by varying the temperature of the filament, which should be of tungsten. The CV172 is a diode specially designed for the purpose.

## Checking Receiver Linearity

Before a measurement can be made, the linearity of the receiver must be checked with the aid of the noise generator, as follows:—

Set the r.f. and a.f. gain controls of the receiver to their normal positions and switch-off the noise limiter (if fitted) and the a.v.c. Since most v.h.f. converters have fixed r.f. gain, the term "r.f. gain control" refers to that of the communications receiver following the converter, the first part of which is acting as an i.f. amplifier.

The noise output of the receiver may be read on an a.c. voltmeter or power-output meter. If a voltmeter is used it should possess a full-scale deflection of up to 3 volts and may be connected across the output-transformer primary. The meter should have a well-damped movement as the noise output of the average receiver, especially when

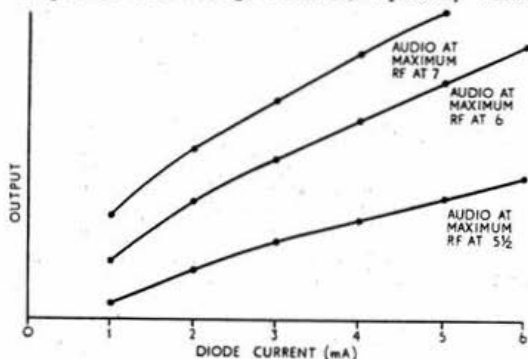


Fig. 1.  
The noise output of a receiver plotted against noise diode anode current. The three curves are for different settings of the r.f.-i.f. gain control on an HRO receiver into which a 2-metre converter was fed.

\* Woodlands, Tolmers Road, Cuffley, Herts.  
† 32 Earls Road, Tunbridge Wells, Kent.



running at high gain, fluctuates considerably about the mean reading.

The noise generator is then connected to the aerial input of the converter and its diode current adjusted to some low value such as 1 mA. This, and the reading of the output meter, are plotted on graph paper as shown in Fig. 1. It is preferable, in view of the constantly fluctuating output reading, to take the average of at least three independent measurements for each value of diode anode current. Successive readings at 2, 3, 4 mA etc., are made and the graph is drawn through the points so obtained. A number of curves may be taken at various settings of the gain controls. One or more should show a substantially straight portion, and it is between the limits of such straight portions of the curve that subsequent noise-factor measurements should be made.

This method of checking linearity becomes increasingly more accurate as the noise factor of the receiver improves. In the case of a 144 Mc/s converter working into a communications receiver at, say, 8 Mc/s the noise-factor of the latter should already be quite good and have, therefore, little effect on the overall factor of the combination.

Non-linearity† may be due to overloading or limiting in the r.f., i.f. or a.f. circuits of the receiver, or to insufficient signal at the detector causing that valve to operate on the lower bend of its characteristic; if present, it should be corrected by adjustment of the appropriate gain controls, in the following manner:

First turn-up the i.f. gain (r.f. control on communication receiver if converter is in use) until the noise output no longer increases with increasing gain, then back-off this control slightly. (The r.f. gain control must not operate on the first r.f.

† It has been suggested that compensation for non-linearity in the second detector might be made by feeding a signal into that stage, e.g. from the b.f.o. or from an external oscillator, but this system is not recommended by the authors since, as might be expected, the noise factor with the b.f.o. in circuit tends to be inferior to that obtained otherwise, and its use introduces noise dependent upon the bandwidth of the i.f. amplifier.

valve in the converter—or receiver if that is being checked alone—as the noise factor will change with its setting.)

The presence of regeneration in the r.f. or i.f. stages of the receiver has the effect of increasing the noise factor, and if considerable, may cause measurements to be subject to wide and random variations.

### Measuring Noise Factor

Noise factor may be measured by first obtaining a given noise power output from the receiver (with the generator connected but without h.t.), and then applying noise from the generator in sufficient quantity to double the original reading. Provided the receiver is linear this method is satisfactory, but as will be seen from Fig. 1, it would not give a true reading in every case and consequently is not recommended. The formula for use with this method of measurement, where only one reading of diode current is taken, is:—

$$\text{Noise Factor in db.} = 10 \log_{10} \frac{20 I_R}{I_{1000}}$$

The significance of the terms will be explained later.

The following alternative method, utilising the information obtained from the linearity check, is much more reliable and is the system used by the authors.

The noise generator is connected to the receiver input as previously described, the noise diode anode current being adjusted to a point near the lower end of the straight portion of the chosen linearity curve (e.g., 3 mA in Fig. 1). This is  $I_1$ . The gain controls of the receiver should, of course, be set in the position used to obtain the curve in question.

The resulting noise output is noted and the diode current increased to give double the power output. Since the meter is indicating voltage, the first reading must be multiplied by 1.4. The new diode anode current reading is noted, and this is  $I_2$ . The noise figure of the receiver is then given by:

$$\frac{20 (I_2 - I_1) R}{I_{1000}}$$

where  $R$  is the terminating impedance of the noise generator. Details governing the choice of its value are given later in this article. Since the diode anode current is read in milliamps, it is necessary to include the divisor 1,000 in the above formula. The noise factor, as defined earlier, is normally quoted in decibels, the formula thus becoming:

$$10 \log_{10} \frac{20 (I_2 - I_1) R}{I_{1000}}$$

In a typical example,  $I_1$  could equal 3 mA, giving an output voltage of 0.75V measured across the output transformer of the receiver. Multiplied by 1.4 for the reason previously explained, this figure becomes 1.05V, and this voltage output can then be obtained from the receiver by increasing the noise-generator anode current to 6 mA. Thus  $I_2 - I_1 =$

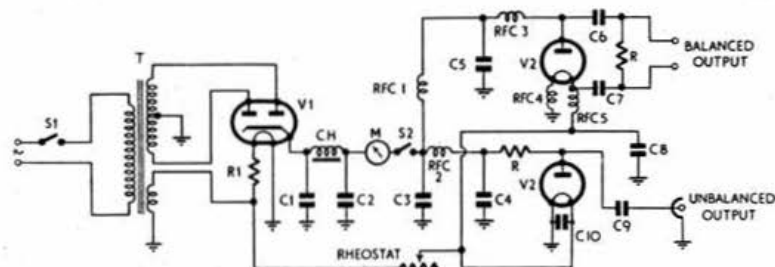


Fig. 2. Circuit of the noise generator. As explained in text, only one noise diode is used in either of the V2 positions. The switch for altering the range of the meter is not shown.

- C1+2. 8+8  $\mu$ F (T.C.C. CE27L)  
C3, 4, 5, 6, 7, 8, 9, 10. 0.001  $\mu$ F (T.C.C. CM20N)  
CH. L.F. choke, 10 H 50 mA (Haynes Radio)  
M. Meter, dual range 0-5 and 0-50 mA (Sangamo-Western)  
R. Terminating resistor (Erie carbon type). For value see text.  
R1. 2 ohms  
RFC1, 2. 50 turns of 30 s.w.g. close-wound on  $\frac{1}{2}$ " former  
RFC3. 50 turns of 30 s.w.g. spaced wire-diam. on  $\frac{1}{2}$ " former  
RFC4, 5. 36 turns of 24 s.w.g. close-wound on  $\frac{1}{2}$ " former  
Rheostat. 5 ohms (Reliance type TW)  
S1. Mains switch (Bulgin type S277)  
S2. H.T. switch (Bulgin type S259)  
T. Mains transformer, 200 V 50 mA, 7.5 V 1.5 A (Haynes Radio)

- V1. Brimar 6X4  
V2. CV172
- Other Components**  
Cabinet. E. J. Philpotts Metalworks, Ltd.  
Cabinet handle. A. Imhof, Ltd., type 15A  
Mains plug & socket. Bulgin type P74  
Meter range switch. Bulgin type S265  
Name plates. W. J. Butler & Co., Birmingham  
Output socket—balanced. Belling and Lee type L607/PG  
Output socket—co-axial. Belling and Lee type L604/S  
Signal Lamp. Bulgin type D9  
Valveholders. Belling and Lee type L500/C

3 mA, which (substituted in the above formula and with a terminating resistance of 100 ohms) gives a noise figure of 6, equal to a noise factor of 7.7 db.

Anode current (mA)	Noise factor (db)		Anode current (mA)	Noise factor (db)	
	Load resistance 80Ω	100Ω		Load resistance 80Ω	100Ω
1	2	3	4.5	8.6	9.5
1.5	3.8	4.8	5	9	10
2	5.1	6	6	9.8	10.8
2.5	6	7	7	10.5	11.5
3	6.8	7.7	8	11.1	12
3.5	7.5	8.5	9	11.6	12.6
4	8.1	9	10	12	13

Diode anode current readings and corresponding noise factors for two values of noise generator load resistance (80Ω and 100Ω).

It may be helpful to give at this point a few examples of the sort of noise factor to be expected on frequencies in the 144-146 Mc/s range, using r.f. amplifier valves of the following types:

R.F. Pentodes	-	-	-	7 - 12 db.
E.G. Triodes	-	-	-	4.5 - 6 db.
Neutralised Triodes	-	-	-	4 - 6 db.
Cascodes	-	-	-	3.5 - 5 db.

Obviously, the figure of 7.7 db. obtained in the examples quoted is not particularly good, and will bear some improvement.

A more elaborate method has been described by Moxon, but this has the advantage that the linearity check is performed in the same operation although similar precautions to avoid overloading apply.

For this method, connect up the noise generator, as before, with no h.t. applied, and adjust the receiver to give a convenient meter reading due to its own noise. The noise generator h.t. is then switched-on and the diode current increased to any convenient figure so that the output meter reading rises to a value appreciably greater than its previous one. Let this diode current be  $I_1$ . (Care is necessary to avoid overloading the receiver and a check should be made as previously described to ascertain that all is well.)

Next turn down the i.f. gain of the receiver and increase the diode current to give an output reading equal to that first obtained; this is  $I_2$ . The diode current is then further increased until the second output meter reading is reached; this value is  $I_3$ .

The noise figure may then be obtained from the formula:

$$\text{Noise Factor} = \frac{20 I_1 I_2 R}{I_3 - I_2 - I_1}$$

where  $R$  is the terminating resistance of the

noise generator in ohms and  $I_1$ ,  $I_2$ ,  $I_3$  are in milliamperes.

When taking these readings, care is needed to avoid making  $I_1 + I_2$  nearly equal to  $I_3$ , as a small error in readings will result in a large error in the noise figure. The noise factor in decibels may, of course, be obtained by multiplying the noise figure by  $10 \log_{10}$ .



Fig. 4.

General view of the completed instrument. The angle of the front panel assists in reading the meter. The large knob controls the filament rheostat.

#### The Noise Generator

The circuit shown in Fig. 2, together with the photographs, illustrates the simplicity of the device to be described, the only critical component being the terminating resistance  $R$ , the value of which depends upon the input impedance of the receiver and will, at least in v.h.f. applications, probably be restricted to those impedances for which feeder cables are readily available.

Feeder cable connected between the noise generator and the receiver should, of course, be of similar characteristic impedance. The feeder should be as short as possible—certainly not more than 3 or 4 feet—since losses introduced by it will reflect adversely upon measurements made. Alternatively, the valve and its associated r.f. components could be designed to plug directly into the receiver input, thus eliminating the necessity for an interconnecting feeder. Examples of plug-in units are illustrated in Fig. 3, from which it can be seen that the h.t. and variable l.t. supplies are derived via a flexible lead from the power pack which includes the meter and filament rheostat. Both units were designed for a receiver with unbalanced input, whereas the instrument illustrated in Fig. 4 caters for either balanced or unbalanced output, and requires a short length of interconnecting line.

Since r.f. switching in a device of this sort is undesirable, two separate valve-holders with appropriate circuitry are provided, the change from balance to unbalance being made merely by changing the valve from one socket to the other. The value of  $R$  must be chosen to suit the receiver and feeder in use, whether balanced or unbalanced. The circuit for unbalanced output is simpler, since fewer r.f. chokes are required, and is consequently effective over a wider range of frequencies.

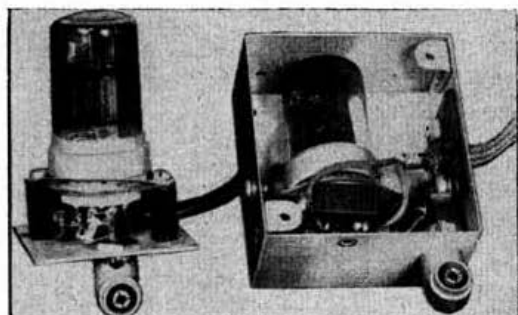


Fig. 3.

Two noise generators designed to plug directly into the input of a receiver.

## Construction

The resistance and by-pass condensers should be of good quality and small enough to be wired directly on to the tags of the valve-holder. The value of the terminating resistance should be known to a fair degree of accuracy since, apart from ill effects due to r.f. mismatch, the value is an important figure in the calculations.

In general, the design should take into consideration the diode capacitance, circuit capacitance, lead lengths and termination. The valve and circuit capacitance (capacitive reactance) may be neutralised by wiring a suitable inductance in parallel, a small 3-8  $\mu$ F trimmer being connected across to enable adjustment to be made. It has, however, been found in the case of the CV172, using a terminating resistance of 100 ohms, that on frequencies at least as high as 146 Mc/s, no parallel inductance is necessary. The reactance of the anode-to-filament capacity, plus strays, in the valve-holder and wiring must be high compared with the value of the terminating resistance, otherwise it will be necessary to use a parallel inductance to maintain a resistive impedance.

If desired, the power supply circuit shown in Fig. 2 may be simplified. Since the anode current is independent of h.t. voltage a fair degree of ripple can be tolerated, and a 3,000 ohm 5 watt resistor may be used in place of the smoothing choke provided the minimum voltage is not less than 200V. A half-wave selenium rectifier could be employed instead of the full-wave 6X4 shown.

The use of a dual-range meter is recommended, since, with receivers of poor noise factor, a considerable quantity of noise power would be required, whereas a more open scale can be used with advantage when making measurements on a good receiver. There is also the possibility of using the noise generator as a source of signal of very wide band-width in making adjustments to a receiver (e.g., for ganging circuits), and here again a high output is an advantage.

The input impedance of a receiver can be measured with the noise generator in quite a simple manner. First disconnect the load resistance, or make it very high compared with the expected input impedance; then obtain a convenient output reading with a given diode current. Next increase the diode current by four times, and decrease the value of the generator terminating resistance until the output falls to the figure first obtained. The input resistance of the receiver is then equal to the value of the load resistance.

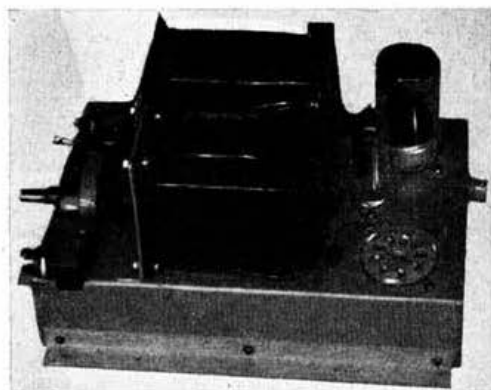


Fig. 5.

The noise generator removed from its case.

Linearity calibration is not required for this measurement, but it is desirable that the length of connecting cable should be kept as short as possible. The r.f. choke in the diode anode circuit must have a high impedance at the frequency in use compared with the expected input impedance of the receiver.

The whole question of noise measurement is of great interest, and one that will bear a good deal of investigation, especially from the point of view of receiver performance—a subject of some importance since, as amateurs, we are always striving to improve equipment and techniques.

The authors wish to thank Messrs. R. E. Burgess, D. N. Corfield and R. H. Hammans for their assistance in the preparation of this article.

## Radio Amateurs' Examination—Instruction Courses

**FURTHER** to the list published on page 59 of the August, 1952, issue of the BULLETIN, the following courses of instruction have been arranged for the benefit of those who wish to study for the Radio Amateurs' Examination.

**Brentford.** (Brentford Evening Institute, Boston Manor Road). *Radio Amateurs' Examination Course*, Wednesdays 7 p.m. to 9 p.m., commencing September 17; *City & Guilds Radio Service Course* (Instructor—J. R. Hamilton), Tuesdays 7 p.m. to 9 p.m., commencing September 16. Fee for each course 10/-; enrolment at the Institute during the week preceding commencing date.

**Brighton.** (Preston Technical Institute, Preston Road). *Radio Amateurs' Examination Course* (Instructor—F. R. Canning, A.M.I.E.E., G6YJ), commencing Monday, September 22, at 6.45 p.m.

**Bristol.** (The College of Technology, Leek Lane). Provided sufficient support is received, the College proposes to run a course, conducted by R. E. Griffin, G5UH, in preparation for the Radio Amateurs' Examination.

**Chichester.** (Chichester Evening Institute, Lancasterian Boys School, Orchard Street). *Radio Amateurs' Examination Course* (Instructor—E. J. Pearcey, G2JU), Wednesdays 6.30 p.m. to 8.30 p.m., commencing September 17. Fee 10/-; enrolment at the Institute on September 15 or 16, or at the class after the course has started.

## Lincolnshire Hamfest

**A HAMFEST** will be held at the George Hotel, Spilsby, on Sunday, October 5, 1952, from 1 p.m. onwards. There will be a technical lecture at 2.15 p.m., followed by high tea at 5 p.m., and a sale of surplus gear. Tickets (6/- each) may be obtained from Mr. N. Hodgson (G2ABK), Hundleby, Spilsby, Lincs.

## South-West Hamfest

**THE** third Annual South-West Hamfest will be held at the Rougemont Hotel, Exeter, on Sunday, October 26, 1952. Members and friends will assemble at 11.30 a.m. for lunch at 1 p.m. followed by a brief business meeting. The programme will include an Inter-Group and Town Quiz for the Bartlett Cup, a film show, competitions and raffles. There will also be an exhibition of amateur-built equipment. Full details can be obtained from the Devonshire C.R. (Gordon Wheatcroft, G3HMY, 27 Lower Wear Road, Countess Wear, Exeter). The cost is 12/6 per head, which includes luncheon and tea. Those applying for tickets are asked to include a stamped addressed envelope.



# Skip Distance Predictions for the Amateur Bands

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

THE charts which have been presented in this series since the April issue of the BULLETIN have provided data for one particular band, i.e. 14 Mc/s. The maximum skip distance (or greatest distance to which the region of zero sky-wave signal is likely to extend from the transmitter) has been plotted for all directions around the

direction—in which the distance is measured; (iv) time—time of day (G.M.T.).

The presentation of the prediction data on a great-circle map gives a general picture of conditions at any time. This is suitable for those who concentrate operation on one band, and who are not restricted so far as operating time is concerned. This type of chart, which will be recognised as a continuation of the current series, is illustrated in Fig. 1. Which of the bands does the reader think should be the subject of regular predictions?

An alternative presentation

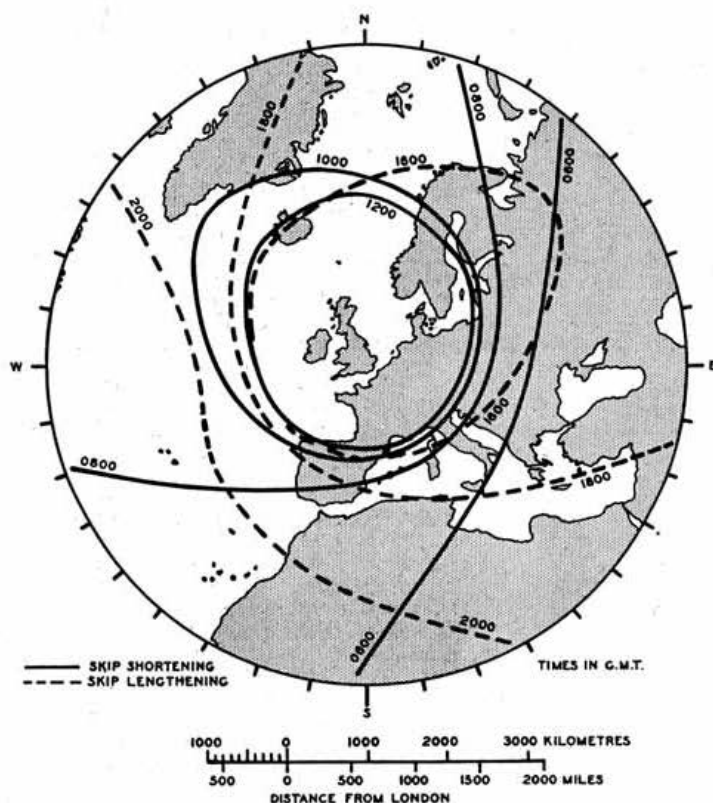


Fig. 1.

Chart showing predictions, for October, 1952, of the fringe of the skip zone for transmissions in the 14 Mc/s band from S.E. England via the  $F_2$ -layer, at various times throughout the day (expressed in G.M.T.)

transmitter, several curves being drawn for the various times of day. All prediction charts appearing on this and the following pages are for October, 1952.

To enable readers to interpret the prediction data more readily for their own special requirements, a series of diagrams have been prepared showing the possible permutations of the presentation technique. The article also indicates the extent of the problem involved in producing prediction data that will be useful to all readers. Four quantities must be specified to plot a point on any of the charts. Each curve is a relation between two quantities only, whether it be drawn on rectangular or polar co-ordinates. A series of curves can show the trend of variation of a third quantity, but the fourth quantity must be fixed for a given set of curves.

The four quantities concerned in the prediction of conditions around a given transmitter location for  $F_2$ -layer propagation are: (i) frequency—the maximum usable frequency of the  $F_2$  layer; (ii) distance—the maximum skip distance; (iii)

(Fig. 2) is suitable for those who can only operate at fixed times, but who can make use of any h.f. band. This figure consists of three charts superimposed; the groups of curves show the maximum skip distance for each band for the same time of day, three sets of curves being given for representative times. Propagation is optimum to points on or just beyond the curves. For which representative times should this type of chart be prepared to suit most readers?

For screened locations, from which transmissions are only effective in certain fixed directions, or for fixed beam aeriels, the graphs of Fig. 3a and 3b are appropriate. The maximum skip distance is plotted against time of day, families of curves showing the predicted conditions for a particular band in various directions, or for all the h.f. bands in a particular direction. Transmissions will be received at distances beyond those given by the curves for the appropriate band or direction.

If it is required to test an aerial under optimum conditions, the charts of Fig. 4a and 4b are suitable. The configuration of an aerial and its height above ground combine to concentrate the radiation at certain wave angles. The wave angle is related to the distance of a one-hop transmission by the geometry of the curved earth, the layer height, etc. A graph of this relationship

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

was produced in the July, 1952, issue of the BULLETIN (p. 8, "Skybeams, Moonbeams and Howitzers," Fig. 1). For a particular band, the time of day can be chosen so that the frequency is optimum for the direction given by Fig. 4a, at the wave angle (distance) required. Signals can propagate in directions and at times within the closed curves. The curves of Fig. 4b show the times and directions at which the various bands give optimum propagation at a fixed wave angle. Propagation is possible at 10-degree wave angle within the closed curves, with the exception of the 7 Mc/s band, for which the shaded areas denote circumstances under which propagation is impossible. In all cases, propagation is optimum when working on the curves.

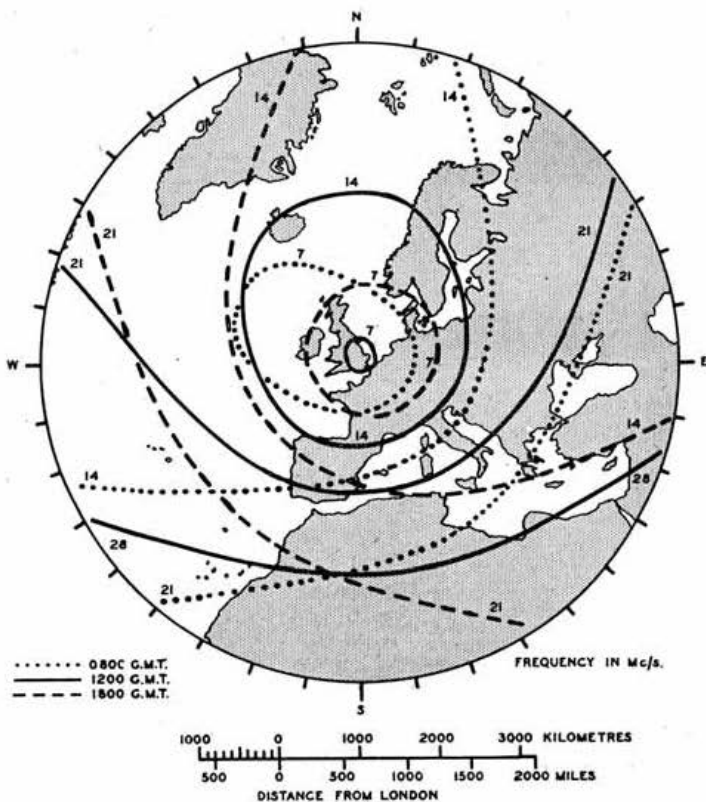
A series of conventional m.u.f. curves are illustrated in Fig. 5a for various distances in

easily prepared for circuits of any length, whereas the other types of presentation are readily applicable to the first hop (this is not necessarily a limitation, as illustrated in the chart on p. 536 of the June, 1952, issue of the BULLETIN). Which specified paths does the reader think should be the subject of regular predictions?

The relation between frequency and skip distance in fixed directions and at fixed times is the ionosphere characteristic, and depends upon the critical frequency, the layer height, the layer thickness, etc. The graphs of Fig. 6a and 6b show the kind of relationship which exists; certain

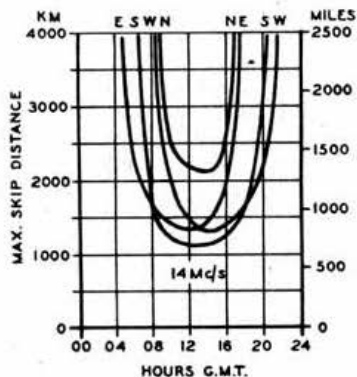
Fig. 2.

Chart showing skip-distance predictions, for October, 1952, for the 7, 14, 21 and 28 Mc/s. bands at certain specified times (G.M.T.) for propagation via the  $F_2$ -layer from S.E. England.



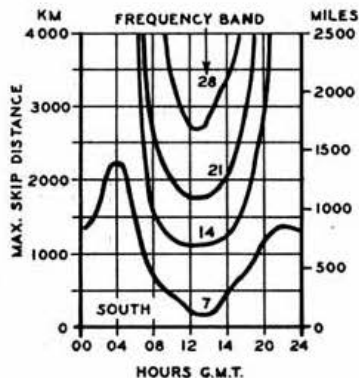
a fixed direction from London; in Fig. 5b, data is given for various directions at a fixed distance. Such curves apply only to a particular circuit; various adjacent paths may be worked out for serving an area, in which case the lowest m.u.f. to any point in the area is taken as the compromise m.u.f. for that area. These curves are of use when operating scheduled contacts; propagation is possible if the frequency used is below the m.u.f. for the path. Graphs can be

approximations are involved which are not significant for amateur purposes. It may be observed that conditions on one band cannot be deduced accurately from those existing on another band.

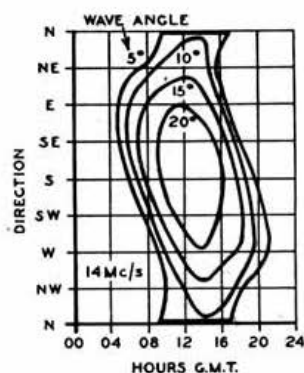


(a)

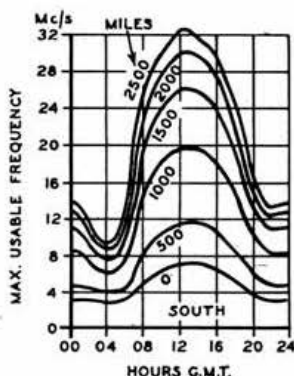
Fig. 3.  
Graph showing relation between maximum skip distance and time (G.M.T.) for (a) the 14 Mc/s band in various directions from the transmitter; and (b) for various bands in a fixed (southerly) direction from the transmitter.



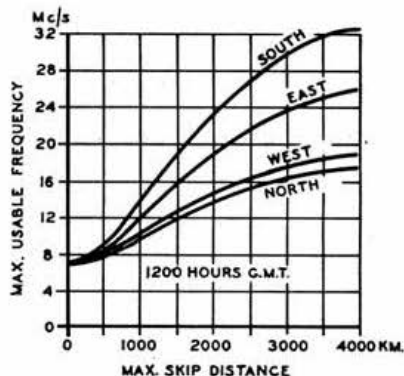
(b)



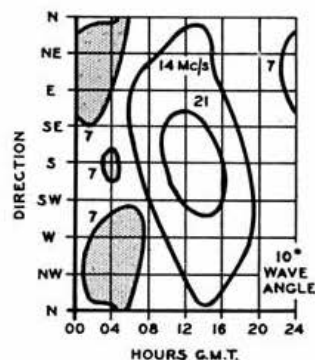
(a)



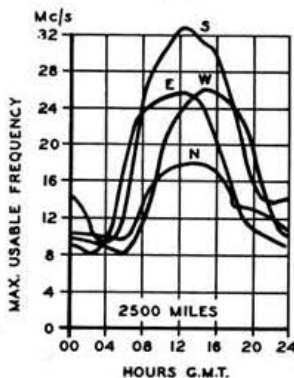
(a)



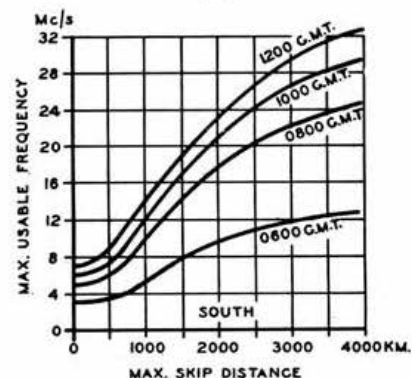
(a)



(b)



(b)



(b)

Fig. 4.

Graph showing relation between direction (or path) from the transmitter and time (G.M.T.) for (a) various wave-angles of propagation in the 14 Mc/s band; and (b) various bands at a fixed (10°) wave-angle.

Fig. 5.

Graph showing relation between maximum usable frequency and time (G.M.T.) for (a) various distances in a fixed (southerly) direction; and (b) various directions at a fixed distance of 2,500 miles from the transmitter.

Fig. 6.

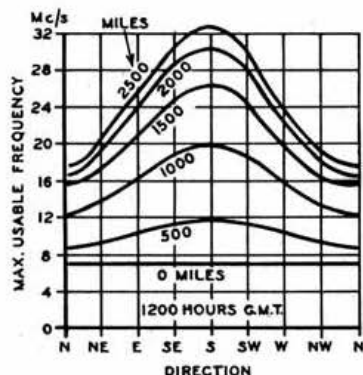
Graph showing relation between maximum usable frequency and maximum skip distance for (a) various directions at a fixed time (1200 G.M.T.); and (b) various times (G.M.T.) in a fixed (southerly) direction from the transmitter.

The final possible permutation of the four quantities is the relation of frequency with direction for fixed distances and times (Fig. 7a and 7b).

It should be realised that all of the curves give essentially the same predicted data, and that they are inter-related in a manner similar to valve characteristics. In practice it is too confusing to give sufficient information on any one chart to enable all the others to be developed from it.

The difficulty of producing prediction data which will be suitable for all amateurs can be realised if it is appreciated that, since all the graphs presented in this article refer only to propagation from London via the F<sub>2</sub>-layer, additional sets of curves are required for each layer, and further sets of all the above would be needed for each transmitter location considered.

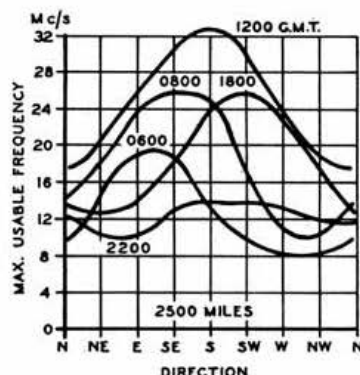
Reader's comments are invited as to which method of presentation is most desirable.



(a)

Fig. 7.

Graph showing relation between maximum usable frequency and direction for (a) various distances at a fixed time (1200 G.M.T.); and (b) various times (G.M.T.) at a fixed distance (2,500 miles) from the transmitter.



(b)

## Television comes to GW

**T**HE new B.B.C. television station at Wenvoe came into service last month, bringing TV to South Wales and the West Country. The station is situated 400 ft above sea-level, with the transmitting aerials on top of a 750 ft mast, bringing the total height to more than 1100 ft—an important factor in securing the greatest possible service area in this hilly terrain. The operating frequencies are 66.75 Mc/s (vision), and 63.25 Mc/s (sound), the vision programme being relayed from London via coaxial cable and radio link.

### The Transmitters

At present the service is limited to the medium-power vision transmitter, which is of the low-level modulated type with a peak-white output of 5 kW. Modulation is carried out at the 500-watt level, the signal being then amplified by two class B wide-band r.f. amplifiers. Mercury vapour rectifiers provide the 3000 V h.t. required. The shaping of the vestigial sideband signal is carried out in the transmitter circuits, and not by means of a separate filter as in the case of the high-power transmitter.

The sound transmitter, with an output of 2 kW, is of the conventional Class B modulated type, and is crystal controlled.

### Control Equipment

The two transmitters are controlled and monitored from a control desk incorporating a built-in waveform monitor and two picture monitors (enabling the incoming signal from London to be compared with that radiated by the transmitter) in addition to the conventional controls and meters. Programme switching for both sound and vision circuits is accomplished at the desk. Ancillary equipment provided in the transmitter hall consists of racks containing waveform generators for testing, lining-up, and maintaining the characteristics and performance of the vision transmitter.

### The Aerial System

The aerial mast, which is similar in construction to that at Holme Moss, comprises a 600 ft lattice structure of triangular section supporting a cylindrical section 110 ft high having slots cut in its surface to form a v.h.f. aerial for sound broadcasting at a future date. Surmounting this is a 40 ft steel tower carrying two tiers of four vertical dipoles forming the combined sound and vision aerial. The structure is stayed at four levels, the total down thrust of mast and stays on the concrete base exceeding 300 tons. A separate 150 ft mast carries the emergency aerial system for use in the event of a breakdown of the main aerial or transmission lines.

The transmission line feeding the main aerial is suspended from the top of the mast and has a total weight approaching five tons. It consists of a central conductor in the form of a locked-coil wire rope mounted coaxially in a five-inch copper tube and spaced by small rod insulators 120 degrees apart.

The main station building contains the offices, canteen, quality checking room, power distribution switchgear and the high-power transmitters, the installation of which is now proceeding. When the high-power transmitter is completed, the medium-power equipment will be held in reserve against possible breakdown.

## INCORPORATED

**RADIO SOCIETY OF GREAT BRITAIN,**  
New Ruskin House, Little Russell Street,  
London, W.C.1

### Assistant Editor

**A**PPPLICATIONS are invited for the above vacancy on the Headquarters' staff of the Society.

The undermentioned qualifications will be taken into consideration in the selection of an applicant:

- (a) Experience of Radio Journalism, preferably in a professional capacity.
- (b) Experience as an active radio amateur.
- (c) Sound, but not highly specialised, technical knowledge.

The successful applicant will be required to engage in the routine work of the Society, to entertain visitors and to attend meetings of Society members. A knowledge of typing is desirable.

The successful applicant will act as Assistant to the Editor of the R.S.G.B. BULLETIN and other R.S.G.B. publications and may be required to travel on behalf of the Society.

### Salary according to age and qualifications.

Applications, in the candidates own hand writing, giving particulars of education, qualifications and experience should be sent to the General Secretary, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, not later than September 24, 1952.

Candidates selected for interview will be required to submit references as to character and ability.

Candidates canvassing Members of the Council, directly or indirectly, will be disqualified.

**John Clarricoats,**  
General Secretary.

### The 21 Mc/s Band

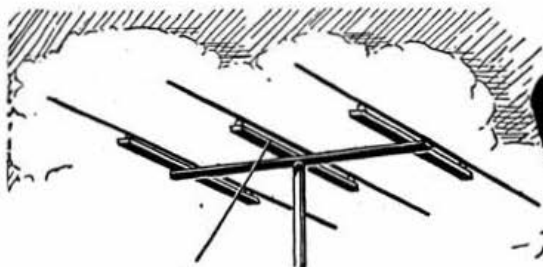
**U**P to the time of going to press, and despite constant pressure from the Society, no further statement has yet been made by the G.P.O. regarding the release of the remainder of the 21 Mc/s band and the use of telephony thereon.

There is reason to believe, however, that a favourable reply is imminent and may be available shortly. Members will be advised through the Society's organisation immediately the release date is given.

### Slow Morse Practice Transmissions

**D**ETAILS of the Society's schedule of Slow Morse Practice Transmissions have been unavoidably held over until next month. The schedule is the same as that published on page 61 of the August issue, with the addition of GW3BKP (Wrexham), who transmits on 1745 kc/s, at 2030 B.S.T. on Tuesdays and Thursdays.





## AROUND THE V.H.F.'s

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

**D**URING the last fortnight in July, when conditions were good in most parts of the country, G3EHY (Banwell, Som.) made many excellent contacts. Over the week-end July 19/20 a number of the northern stations were worked, including G2FCL (Shipley, Yorks.), 3BW (Whitehaven, Cumb.) at 230 miles, 3DA (Liverpool), 3EGW/P (225 miles), 3HWC (Preston, Lancs.), 5YV (Leeds), 8SB (nr. Manchester) and GM3BDA (Airdrie) at 325 miles. The series of depressions which occurred during the first ten days of August, accompanied by torrential rain and stormy conditions generally, apparently discouraged activity to such an extent that most of the time the band sounded completely dead. That it was not so was proved by a series of sixteen successful contacts between G3EHY and G13GQB (Belfast) which, considering that the stations are 268 miles apart, situated not far above sea level with beams about 30 ft. high, argues well for one of EHY's pet theories that 2 metres can provide reliable communication over distances of the order of 250 miles for a very large portion of the year. We look forward to learning of their findings in the projected series of skeds.

### Good News for 420 Mc/s Enthusiasts

**T**HE Society is pleased to announce that, as from November 1st next, power up to a maximum of 150 watts input will be permitted in the 420-460 Mc/s band provided no interference is caused to the Aeronautical Radio Navigation Service.

This new facility has been obtained as the result of discussions between representatives of the Post Office and the Society.

After all, the tests carried out with G2CPL (Lowestoft) some time ago continued most successfully for a lengthy period and they involved a distance of 220 miles. While not wishing to question G3EHY's results (the month by month account of his activity bears out his view that 2m does not suffer from bad conditions—just good and not quite so good) we do feel that there is an essential "something" which certain sites possess and others, apparently in superior locations, do not. G2UJ is situated most definitely in one of the latter and we must confess that quite often the band is far from lively, with a maximum range less than 100 miles. Regular skeds, however, are undoubtedly the only way of proving a site, and details from anyone who has conducted such tests over a considerable period would be welcome.

G6LI (Grimsby, Lincs.) experienced good conditions up to July 24, followed by a great decline in activity despite regular nightly "probes" at 1800, 2000 and 2200 B.S.T. Details given later of his successes during favourable conditions

towards the end of July, added to his past record of continental and other long-distance working, dispose of any suggestions that he suffers from an inferior situation. His conclusions on long-distance working on 2m run something like this: "skip-type" DX, in which signals from distant stations are heard only in isolated areas, falls to the watchful and not necessarily to those possessing high power or super aerial arrays. Very high aerials enhance the normal range—what would be referred to as the "ground wave" on the lower frequency bands—without necessarily bringing in records (but, we would add, when a really good aerial system is allied to an exceptionally good situation—G3BLP and G5YV come to mind as just two instances—then, all other things being equal, such stations are likely to turn in some spectacular logs).

High versus low power is a means of getting most amateurs arguing. That the power must be doubled, at least, to effect an audible increase at the receiving end is an inescapable fact, but equally inescapable is the fact that if, by employing high power and getting it away from the aerial, one can raise the signal appreciably above the noise (or on the lower frequencies above the prevailing level of competing signals) then contacts will be made over greater distances provided the distant station is similarly equipped both as to transmitter, receiver and aerial. Thus the high power station is likely to get more for his CQ and, on the v.h.f.'s, can afford a more generous frontage to his aerial radiation pattern, enabling him to take advantage of activity scattered in a geographical sense.

The highly directional array plus power may make an all-time record, but without prior knowledge of the bearing of the distant station the odds against this become greater as aerial directivity is increased. When 2m—or 70cm for that matter—is well and truly open due to ducting, tropospheric bending, etc., geographical position becomes more important than power or, to a limited extent, equipment, and it's a fair scramble for all.

GM3EGW (Dunfermline) and GM3FYB went portable in Westmorland on July 19/20 and after some fairly rough riding set up camp near Troutbeck at a height of 750 ft. a.s.l. The first call, at 2315 B.S.T., raised G3DA (Liverpool) followed by G3EHY and 8DA (Gloucester). For several periods during the next day stations were audible from Somerset and from the London area but none was worked. Camp was struck in the early hours of the 21st after a final contact with G3WW. On the return journey to Scotland, during a stop made at the top of Shap, GM3BDA was worked on schedule. Among the stations worked from Troutbeck were: G2AJ, HGR, 3AGS, AOO, BOC, BW, DA, EHY, FMI, GFT, GHI, HWC, WW, 5VN/A, YV, 6YU, 8DA, SB and GM3BDA. Those heard included G3VM, 4DC, SA, 5JU, SK, 6CI, NB/P, 8OU and GWSMQ. The transmitter

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

line-up comprised a 9002 c.o., 6J6 and QVO4-7 frequency multipliers and an 832 final with about 10 watts input. On the receiving side a 6J6 r.f. and 6J6 mixer with an oscillator on 5.7 Mc/s, fed a BC455 at an i.f. of 6.9 Mc/s. The 4-element w.s. beam was 18 ft. high. GM3EGW intends to operate from a site in Berwickshire for the 2m Field Day on September 21.

G2DKH/P (Stanley, Co. Durham) has hitherto found stations in London impossible to locate, but during the good conditions of July 22/26 managed to raise G4DC (London, S.E.). Late on the 24th, with batteries failing, 'DKH was called by DL3QA and an excellent QSO resulted with both stations RST 579. He comments upon the difficulties experienced by G3WW in contacting the Newcastle stations. The former is usually S9 at the same time as G3CYY and 4LX are blocking his receiver. Both 3WW and 6LI can be worked even when no other signals are audible, while to the north GM3BDA and 3EGW can always be relied upon.

GW8UH (Cardiff) appeals for more searching in his direction and towards the upper end of the band. He remarks that only two stations appearing in the "Ladder" for August have in fact worked him.

G3DLU (Weston-super-Mare, Som.) after some receiver difficulties is now active with a 6-element stack fed by 120 ft. of open wire feeder and a converter comprising a CV66 e.g.t., 6AK5/6J6 cascade and 6J6 mixer, into a triple conversion receiver. He gives details, gleaned during a recent visit, of G3AUS (Torquay) who has a home-built 60 ft. telescopic mast which can be raised or lowered from a 20 ft. tripod. G3DLU is warmly in favour of the V.H.F. Ladder scheme for recording competitive achievement and would like to see all contests abolished as they appear to cause completely dead bands for a week or more afterwards!

G3BVU (Witney, Oxon.) is getting out quite well with the transmitter of which details were given last month and recent contacts include G3BEX/P (nr. Brighton), 3DJX (Wheathampstead, Herts.), FAN (Ryde, I.O.W.), 5DS (Surbiton, Surrey) and 8VZ (Princes Risborough). Twenty-five other stations have been heard including GW2ADZ on July 23 and G3FKO/P (Bath) at 2225 B.S.T. on August 17.

For the middle two weeks in August the only station at any distance heard by G6XX (Goole, Yorks.) was G3EHY, but he was very difficult to raise. During the good conditions towards the end of July a contact with GM3BDA provided the best DX. G6XX suggests a contest running for a week with operation between 1800 and 2300 B.S.T. daily. We feel that the answer to this from many readers will be, "What—not another contest?" and from others an objection to the early start when many of the less fortunate of us are still on our way home. Still, what about it? (Have you worked G3DLU, O.M.?—Ed.).

"If there's going to be any DX it will be there between one and two hours after dusk." So says G6LI and he has certainly been proving his contention recently. A high-pressure system started to develop on July 21 and on the 22nd was stationary over the whole country. V.H.F. conditions remained—for G6LI—poor until a cold north wind on the following day caused a sharp fall in the temperature. That evening GM3BDA was heard at S5/6 at 1830 B.S.T. and both GM6WL and GM3EGW were worked before 2130. Half an hour later DL1LB came through. DL3VJP, worked by G5YV at 2315 B.S.T., was

not audible in Grimsby. On July 24 conditions were even better and brought a contact with DL1LB at 2100 B.S.T., while just afterwards DL6SV was heard putting in an S6 'phone signal with excellent quality but apparently not listening for replies on c.w. Why so many of the Continental 2m stations keep strictly to 'phone and thereby miss the chance of many contacts is anyone's guess, but they do. How about pounding brass now and then O.M.'s? To revert to G6LI's report for July 24, another country, represented by OZ2FR, put in an appearance at 2140 B.S.T. on 'phone and several calls were directed to SM and LA but without result. SM7BE seems to be the only Swedish station heard in this country; is this due to a very special location or are there no other SM's active these days? A good QSO was had with OZ6B (Kolding) on 145.8 Mc/s. at 2210 B.S.T. and his QSL card arrived within 36 hours! The distance from Grimsby to Kolding is 455 miles and represents 'LI's best DX this year. The next hour and a half produced nothing new, bearing out the view previously expressed that if you want to be in on the DX you can't enjoy the ever-lengthening TV programmes!

#### Here and There.

G2AHP (Greenford, Middlesex) worked G8AO/MM when he was some 175 miles away S.E. of Flamborough Head and is still trying for contacts with G2IQ and 5YV. G3BHS (Eastleigh, Hants.) added one more to his Regional score by working G2OI (Eccles, Lancs.) on July 23. Other northern stations heard but not so far worked included G2HGR, 2IQ, 3CHY, 5YV, 6LI and GW2ADZ.

G6UH (Hayes, Middlesex) is testing a new converter with two r.f. stages, the first being a GL446A "Lighthouse" valve followed by a Mullard EC91, both as earthed grid triodes. The mixer and oscillator is a 6J6 and the noise factor 3.5 db.

A new signal in Essex is G3BKF (Witham) who has migrated to 2m from 14 Mc/s. He says that he gets just as much kick out of the relatively local contacts on 2m as he did with the DX on 20m.

London stations who had their beams turned northwards during August may have been surprised to hear a powerful 'phone station apparently emanating from the north country, judging from the operator's accent. The signal in fact came from Stevenage in Hertfordshire, to which town G2BM has recently moved from Wakefield. He is situated on the top floor of a large block of flats in the growing town and, using only a dipole thrust out of a window 80 feet above ground, has worked a large number of stations in the Home Counties during his first two weeks on the band.

G3WW and 3BK recently visited G5YV in Leeds to find out how the latter hears and works everything! The transmitter in use is an SCR522 driving an 829B final, and the converter a "G2IQ" all-6J6 job into an Eddystone S640. The secret of success is undoubtedly the extremely good situation 580 feet a.s.l. with the country falling away for miles to the north and south. The 4-element Yagi is mounted on a steel-lined dural tube which is raised through the centre of a 58 ft. tower by means of a winch and when fully extended is no less than 90 feet above ground level.

G3WW took advantage of the recent activity to such good purpose that he now stands second on the "Ladder" to G5YV and only six contacts behind. Early on July 24 contacts were made

## Regional V.H.F. Ladder

### TWO METRE BAND

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

Psn.	Call & Location	Worked		
		Regions	Stations	Countries
1	G5YV ..... Leeds, Yorks.	13	151	9
2	G3WW ..... Wimblington, Cambs.	13	145	9
3	G3EHY ..... Banwell, Som.	13	77	5
4	G3BW ..... Whitehaven, Cumbs.	11	32	3
5	G2HIF ..... Wantage, Berks.	10	78	5
6	G5LI ..... Ludborough, Lincs.	10	47	6
7	G2DKH/P ..... Stanley, C. Durham.	9	45	4
8	GW8UH ..... Cardiff, Glam.	9	42	3
9	G2FNW ..... Melton Mowbray, Leics.	9	42	2
10	G3BHS ..... Eastleigh, Hants.	9	35	2
11	G3FD ..... Southgate, Herts.	8	65	4
12	G2FJR ..... Sutton Bridge, Lincs.	8	53	3
13	G6XX ..... Goole, Yorks.	8	45	3
14	G3FIJ ..... Colchester, Essex.	8	42	6
15	G6YU ..... Coventry, Warks.	8	32	2
16	G3BVU ..... Witney, Oxon.	8	27	1

with GW8UH (Cardiff), RS56, GM3BDA, RS55 and GM3EGW RS49. At 2250 B.S.T. the path to the Continent opened up and produced PA0RA (Oosterum), OZ2FR, DL3VPJ (nr. Bielfeld), 370 miles, OZ3WS (Vejele), DL6SV (Ahrensburg), 440 miles, DL3QA and DL6EP at Lins on Rhine, 20km north of Bonn and 328 miles away. ON4HC made the seventh country worked on that evening.

Westmorland seems popular for 2m portable operation this year, the latest being G4JJ who was there for the contest on July 26/27 and worked G3WW among others. Another portable station which attracted some attention recently was GW6NB/P at Whitton in Radnorshire. He was worked by G2UJ at 2130 B.S.T. on August 23 at RST 579 both ways, but was not heard after about 2200 B.S.T. when conditions deteriorated.

#### "Calls Heard" Lists

It has been suggested by G6RH that lists of calls heard on 2m should be published in the BULLETIN. As things are at present there is already in this feature quite a bit of information of this kind, often with more detail than could be incorporated in a list where, for reasons of space, the entry would have to be limited to the call sign with only a very broad idea of the date and nothing concerning the time, signal strength or other data which makes a report really worth

while. If there is a genuine desire for such a list limited to calls heard more than, say, 100 miles distant we will, with your assistance, provide it, but hesitate to take up space in the BULLETIN and more of our limited time in producing something for which there is no general demand.

#### Signal Reports on 70 cm.

G2FKZ suggests it is high time that a new system of reporting signals on 70cm be brought into use as the present RST does not convey the required information. In the skeds kept with GW2ADZ reports have been given for some months in the following form:

Figure up to 5	Readability.
" " " 9	Peaks of signal level.
Letter Q	Quick fading predominant.
" S	Slow " "
" B	Both quick and slow fading equally present.

Figure up to 9 Troughs of signal level.

No tone report is given unless the transmission is other than T9.

It is also considered desirable to have some sort of short addition to the two metre CQ call which would indicate that one is interested in 70cm tests. "CQ 70" is obviously useless as it is not unknown for stations sending this when actually on the 70cm band being heard for quite long distances on 2m. Would "CQ 270" meet the case? Any comments?

#### The V.H.F. Research Society of Ireland.

As foreshadowed in the July BULLETIN, this Society, which has for its objects the furtherance of all aspects of v.h.f. and u.h.f. activity in Ireland, was recently launched with EI2W as its President and a membership of 53, 26 of whom are in Eire and the remainder in Northern Ireland. The first issue of *The Upper Spectrum*, their official publication, contains much interesting information on v.h.f. matters and includes details of a number of the leading 2m stations in the United Kingdom. We wish this new society every success in its endeavours.

Thanks to our correspondents it has been possible to write a fairly full account of 2m activity during the past month, but no one seems to have been doing anything on the other v.h.f. bands, or if they have they have kept very quiet about it.

Contributions are requested by September 22 for appearance in the October issue.

\* \* \*

### Flash!

BOTH the 2m and 70cm European records changed hands as this issue went to press. The 2m record was broken on August 29 when EI2W (Dublin) and DL3VJ (operating portable near Horn/Lippe), worked one another on phone over a distance of 651 miles. Contact was first made at 2222 G.M.T. with reports of RS56 each way, and again at 0034 G.M.T. next morning when an improvement to S8 in signal strength was reported. The German station was 1300 ft. above sea-level, with 15 watts input to an 832 final and an 8-element stacked array, while EI2W, 760 ft. a.s.l., with 25 watts to an 829B, employed a 7-over-7 w.s. Yagi. Both stations relied upon cascode converters for reception.

According to F8NH and G2FIS, a 70cm QSO took place at 2215 G.M.T. on August 28 between F9BG (Toulon) and FA8IH (Algiers) over a distance of approximately 450 miles.





AS there seem to be no special moans and grumbles this month, we will get straight on with the news. Pride of place goes to G2DPY for what we consider to be the ideal report—lots of news and no dull lists of calls. Judge for yourselves: FB8BA, BB, BE and 8ZZ all put in good workable signals during the early evening. VE4RW was worked on 14035 and VE5, 6 and 7 all came in between 0070 and 0930 B.S.T. VQ3BM, a certain QSL from Tanganyika, seems rockbound on 14075. His QTH is Aeradio Mbeya. SM8AES is airborne. FO8AB has been heard some mornings (worked by G2MI) and FR7ZA is active again. VQ8CB is on 14100, call him 5 kc/s low. VQ8AF on the same frequency has also been worked. VS9AW has deserted c.w. for 'phone. PF1TL is the Thermion Factory in Holland and PI1LS is on again.

If you want to work FP8AJ, you have to do some fast switch-pulling—otherwise you find yourself signed off and left before you realise it! KA (JA) and KG have come through at S8 some afternoons and TG, CE and CP have been very strong late at night. CR6BZ is P.O. Box 378, Luanda. AP2L, with a T6/7 note and S9 at times, seems almost too strong, but comes in from the right direction. Who is YD5BC, 2330 B.S.T.? CR5AA is active again as is F9QV/FC. W5AGB/FM has been worked and promises cards when the plane calls in October, "if I've not frozen up before then!"

G5JL says G3AAT/OX (14050) is on the air with the Greenland Expedition. He is completely isolated. Anyone working him is asked to drop his mother a card (Mrs. Knowles, 3 Lenham Road, East Rottingdean, Sussex) just to let her know that he is O.K.

'JL has bees in his hollow mast, wonders what effect it has on rad'ation? B.R.S. 7594 of Yeovil lists AP2K (QSL via D.A.R.C.), 14109 at 1780; AP2L, 14242 at 1920, and AP2N, 14148 at 1750; CR6BW, 14188 at 1858; CR6BX, 14245 at 1808; and PJ2CB, 14260 at 2245. He says OX3FP has been heard to say that he was OY3FP in 1951 but the Faroe Islands amateurs say OY3FP was unlicensed. So what? G3CMH, the Yeovil Amateur Radio Club station, has worked SU3JQ, EA9AT, IT1SMO, TA2EFA and ZD2TTE (14215 at 1140); ZP5DC, 14267 at 2117, whose former call was ZP7AW, QTH Capt. Antonio Sanchez, U.S. Army Mission, c/o U.S. Embassy, Asuncion.

August produced a remarkable state of FP8's, some on 7 Mc/s, according to G5JL. Other interesting signals heard on that band were ZS5LU, 7028 at 0410; TI2TG, 7007, 0520; TI2PZ, 7028, 0210; VP8AJ, 7005, 0530; YI2AM, 7028, 0115 (the club call of the R.A.F. at Habbaniya).

G2YY says OH3NY is back on "Top Band." He made the first contact of the season on August 2 at 2300 (1840 kc/s).

G4CP reports that VP8AJ is active on 3.5 Mc/s, c.w. from Port Stanley, Falkland Islands. The

best time is around 0130 G.M.T. He has worked SM but so far has not raised a G. Ron mentions the DXers dream, a round-table, heard on Sunday, August 17, on 14 Mc/s 'phone between KL7AFR, KJ6AW, KC6QL, VR1B, ZK2AA and YJ1AA!

From W5KUC's *DX Bulletin* we learn that ZS6GV will be active in ZD7 from October 8 on all bands, both 'phone and c.w. ZD9AA is now v.f.o. and VK1PN is active on Heard Island. Floyd McCoy, VR6AC, will be back on Pitcairn Island in November. VS2CN may visit Sarawak in December. KA is the new prefix for American Service amateurs in Japan. JA is being reserved for Japanese nationals. Apologies to the one or two who have had their cards returned by the Bureau. G6BB has been on 21 most of the time but has managed to collect FB8ZZ, 14048 at 1738, and VS6CG, 14104 at 1706. Yes, O.M.—FB8ZZ does QSL. G8QX, at his new QTH in the valley, is up to 91 worked, his latest being FP8AQ. Eric Trebilcock, B.E.R.S. 195, gives the latest position on the VK1's as VK1RF, SD and PN on Heard Island and VK1AE, EM, RG and RR on Macquarie Island.

In contrast to most of the DX news this month, John Hall, B.R.S. 19107, of Croydon, with a new S750 receiver, says ZS2HI came through almost every weekend during June on 3515 kc/s, at 459 around 0230, and worked G5VB regularly. VP8AP was also on the band and seemed able to work Sweden but not the U.K. Also heard were CE3AX, 7AA, EX1FY, KB, 2AQ and several LU and PY stations between 0100 and 0400 G.M.T.

G3EBH of Lincoln runs a private competition with G3GAF on DX. The latter, however, soon returns to college so 'EBH will be at an advantage. Short skip conditions on 14 accounted for working GI, GM and GW and VO1P on 3.5 Mc/s—a few more towards EDX. His present score stands at 113 worked with 89 confirmed. He says ZD9AA is often on 14100 kc/s 'phone in the early evenings.

G3GAF has worked W5AGB/FM at 0800 on his ice floe. Two more nice ones were VE1OL/VO2 at Gander and LB6XD on Jan Mayen at 1320, who says he does not work many G's. G3AAT/OX was on a flying boat of the British North Greenland Expedition and was a rather scratchy signal from a TI154 with GW3IQQ on the key and microphone. He gives FB8BA, 1633 G.M.T., on 14 Mc/s and VS2DH at 1515 as worth looking for.

Don McLean of Yeovil, whose report last month was accidentally mislaid (for which apologies O.M.) sends us a few "plums": CR6AT DL4JI (mobile airborne), EL9A S9 on h.f. end of 14, HB9GX/MM on the "General Guisan," HE1JZ, in Leichtenstein; KW6BD, 14209 at 0726; OA4BC, and PJ2AA, 14103 at 2226; and quite a good selection on 21 Mc/s. Conditions on 28 have been very poor. FP8AJ was operated by VE3CCK and FP8AK by W2BBK. SU3JQ is XE3JQ.

\* 29 Kechill Gardens, Hayes, Bromley Kent.



G2ZC endorses our remarks about 'phone gabblers. He agrees that a call-sign is intended as a means of identification and should be treated as such.

## 21 Mc/s

Sunday, August 24, was undoubtedly the best day yet on this band. Most of the usual DX came in during daylight together with many British Isles and European stations. EI3R in particular was a terrific signal. In the early evening the North Americans began to arrive with VE4RO an outstanding signal, and after 2230 B.S.T. the band was wide open to the U.S.A. with W2WZ and several others at S9. KP4CC was also very strong. G2MI (24 countries worked) raised W6LEE at 2153 G.M.T. at 579 and wonders if this is the first Pacific Coast contact from Britain on this band. ZS4FF was an outstanding signal on the afternoon of Sunday, August 17, when activity was recorded from G, GM, GW, PA, KP4, ZS2, 4, 5, VS2, LU, PY, ZE and ZD9.

G6GN of Bristol claims the first G/VK contact with VK2AWU (ex-G3DCU) at 0850 G.M.T. on July 20. He got his QSL by air-mail only five days later. This gave him W.A.C., which he claims as the first in G. He thinks he may also have been first with ZP9AH at 1505 on July 13 and W0HVN at 2225 on the same day. He wonders who X8EE was at 2040 B.S.T. on July 29. G3COI (Wolverhampton) has yet to hear a signal on the band. You must have been very unlucky, O.M.

G6BB's list is as follows: FA8CR (v.f.o.), 1050; FF8AG, 21030, 1840; W3PMG, 21034, 2220; LU3DD, 21034, 2136; LU8NA, 21018, 2144; LU5CK, 21018, 2150; all worked. CE3AG and YV5AB were heard.

G2BJY (West Bromwich) has been busy on the band and his list includes ZS2AV, 2CB, 1BM, 4N, 4FF, LU3DD, 9AX, 1EK, 1EP, VS2CR, CN2AP, FF8AG, 11BCB (Trieste), ZE2JV and W2DOD. G6GO (Ashby Parva, near Rugby) thinks 21 may not reach its peak until 1956. He expects the sunspot minimums to continue until the end of 1953 and remarks how difficult it is these days, not so much to work stations as to gain their attention in the first instance.

## Pirates

The call-sign G2ND is being pirated. The last holder of this call died in 1948, and members are therefore advised to ignore the present user for whom a large number of cards has accumulated in the Bureau.

The following calls are also being pirated:—G3FVA (the call of the Manchester Radio Club) on 7; G3BRT (who uses 14 exclusively) on 3.5; and G2RS (which is unauthorised, the licensee being GC2RS). We are always loth to publish these complaints as they so often involve the licensee in endless argument on the air in trying to establish his identity.

## QRP Portable

G3CWL has just returned from a trip to the Isles of Scilly where he operated with a transmitter consisting of a single 3S4 c.o. with an input of 0.9 watt. The receiver was an O-V-1 and the aerial 132 feet long. He worked several G's on 3.5, the best being G3GLB/P, who was also working QRP on Dartmoor. His furthest contact was with G8DL in Christchurch, Hants, with a 559 report.

## QSL Returns

G3HFL, who has been compiling some statistics on QSL returns, finds that G and DL come out very

well with 90 per cent. and 95 per cent. respectively.

## Who's Who

"Butch" Orrell, ex-MT2E and VS9AO, is back in North Africa; this time his address is c/o C. & W., Ltd., Benghazi. He hopes to be on the air soon.

YI3BZL has had more than 90 contacts with G6LX and says the best signals regularly heard in Iraq are G2BXP, G4ZU, GM3DZB, GM3DHD, G2DPZ, G6LX, G3HLS, G2HFO, G5DJ, G8SC, G8CL, G2PU, G3CSP and G3MK in roughly that order. The list has been compiled over about six months. He returns to the U.K. this month. YI3BUX, 3GU1 and 2FD, 3WH, ex-G3WH (Capt. Edwards) and his wife, YI3YL, will carry on the good work plus YI2AM, the R.A.F. Amateur Club station.

VS9AW is G3GUK in the Sheikdom of Oman. The R.A.F. station is on territory leased from the Sheik and is many hundreds of miles from both Trucial Oman and Aden proper. The VS9 prefix is used merely because the licence is issued from the Aden Command. We have asked the A.R.R.L. to consider having this listed as a separate country and now await their decision. G3GUC is now ZC4BN and is active on 14 Mc/s with an input of 10 watts. G3HHU will shortly be operating from Port Elizabeth as ZS2JB on 14 and 7. ZB1BO, now G3JBO, still has a few cards left. Address: E. Anstey, 24 Holyhead Road, Oakenagates, Salop.

SU1XZ is QRT and will be home on leave for two months when these notes appear. ZD6DU is now back again having QSL'd all his contacts including several made on 21. ZL1AKL (ex-G3AYL) is looking for contacts with his home town, Swindon. His address is G. R. Pearce, c/o Bank of New Zealand, Queen Street, Auckland.

From G3BRT comes news of Rube Maclaren, ex-VP8AD, who is now settled in Argentina. He has operated as LU8AAA and LU5AAS but will shortly be up with another call-sign. VU5AB is now QRT, but there are hopes of another call coming up in that area soon.

Thanks for the much better response this month. Please keep it up.

## Important Notice to all DL2s

A SUB-MANAGER has now been appointed by the R.S.G.B. QSL Bureau to handle QSL cards addressed to DL2 calls. Operators of DL2 stations should continue to forward outgoing cards to G2MI; but to collect the cards addressed to them they should send stamped-addressed envelopes either to "G2MI, Bromley, Kent," or to George Verrill (G3IEC), 75 South Street, Gosport, Hants. The QSL Bureau at Walmerheide has now ceased operations and Captain Watson has been asked to forward all unclaimed cards to the R.S.G.B. QSL Bureau.

## Amateur Operation in the Persian Gulf

THE G.P.O. point out that British subjects who wish to operate Amateur Radio stations in Bahrain, Kuwait, Qatar and the Trucial States are required to obtain permission beforehand from the Political Residency, Bahrain, Persian Gulf.

It is understood that one or two enthusiasts are operating without permission and using call-signs which have not been allotted to them; this announcement is intended to help them to regularise their position.

# The Radio Amateurs' Examination

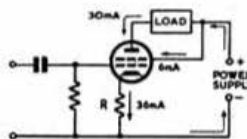
## Model Questions and Answers

### Part 2.—D.C. Calculations

#### Ohm's Law Applied To Bias Problems

**T**YPICAL problems involving the use of Ohm's Law arise when arranging automatic bias for valves. The directions of current flow will be more readily understood when electron movement is considered in the section dealing with valve operation, but as the calculations are very straightforward, they are given now.

Show how the inclusion of a resistor in the cathode circuit of a valve enables bias to be obtained. Calculate the value of such a resistor to provide a bias of 9V for a valve taking an anode current of 30mA and a screen current of 6mA.



As shown in the diagram above, the direction of current flow is from cathode to chassis and through the power supply. The current then divides, 30mA flowing to the anode and 6mA to the screen. If a resistor R be included between cathode and chassis the flow of current will cause a voltage to appear across R. Since current flows from the positive towards the negative end of any component, the chassis end of R will be negative with respect to the cathode; the grid, being returned to chassis, will similarly be negative with respect to the cathode.

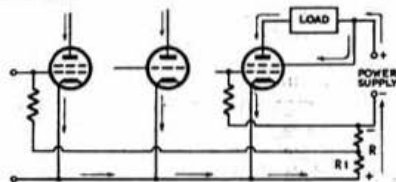
The current through R is (30+6) mA and it is required to develop a voltage of 9V across R.

By Ohm's Law:

$$R = \frac{E}{I} = \frac{9}{0.036} = 250 \text{ ohms}$$

[N.B.—Either the symbol E or V may be used to denote voltage, the former signifying electromotive force, and the latter potential difference.]

Show how bias may be obtained from a resistor inserted between l.t. negative and h.t. negative of a receiver. A receiver takes anode and screen currents totalling 15mA. Find the value of the resistor required to provide a bias of 6V for the output stage. At what point should the resistor be tapped to provide 2V for an earlier stage?



The circuit is shown above. The combined currents of all stages meet at the filament or cathode end of R, pass through R and through

the power supply, then divide to flow to the anodes and screens of the individual valves. Since the currents flow in the direction indicated, the h.t. negative end of R will be negative with respect to the filaments or cathodes, as will be any grid circuits returned to the same point.

The value of R required to develop a voltage of 6V when carrying a current of 15mA, is given by Ohm's Law as:

$$R = \frac{E}{I} = \frac{6}{0.015} = 400 \text{ ohms}$$

By

B. W. F. MAINPRISE

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

If a voltage of only 2 is required for an earlier stage, a tap must be provided on R. Let R1 be the value of the resistance between this tap and the filament end of R. The current carried by this portion is, as before, 15mA, so that:

$$R1 = \frac{E}{I} = \frac{2}{0.015} = 133 \text{ ohms}$$

While both methods provide bias, their effect is to reduce the anode voltage by 9, 6 and 2 volts in the respective cases. The reductions are, however, small compared with the anode voltage and will only slightly impair the stage gain.

#### Work and Power

When a load is moved from one point to another, work is done. Generally we are more concerned with the rate at which work is done, e.g. the rate at which a car of given weight can travel. This gives power, the familiar unit of measurement being the horse-power.

The corresponding electrical units of measurement have their own nomenclature. Thus, electrical losses result in the production of heat, the heating of valve anodes or the windings of transformers being typical examples. In practice it is the rate of loss which is important; this is measured in watts, or, where a larger quantity is more convenient, in kilowatts. One horse-power is equivalent to 746 watts, so that a ready comparison of power can be made, whether it is measured mechanically or electrically.

#### Power in D.C. Circuits

Power is given by: Watts = Volts × Amperes

thus,  $W = EI$  (1)

which is the fundamental expression.

But because by Ohm's Law,  $E = IR$  the expression may be written:

$$W = I^2 R \quad (2)$$

\* 48 Earlsfield Road, Hythe, Kent.

Similarly, because  $I=E/R$ , a third form of the expression is:

$$W=E^2/R \quad (3)$$

For rapid working all three forms should be remembered, though the latter two expressions can always be derived from the fundamental Volts  $\times$  Amperes relationship.

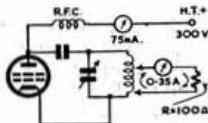
#### Efficiency

Efficiency is given by the ratio:

$$\frac{\text{Output}}{\text{Input}}$$

Because of inevitable losses, the output of a machine or circuit can never equal the input; the ratio must, therefore, be a number less than unity. It is often convenient to express efficiencies as percentages rather than as decimals; this is done by multiplying the ratio by 100. An efficiency of 0.42 would then be expressed as 42%.

The anode of the output valve of a small transmitter is drawing 75mA at 300V. The r.f. current flowing in the artificial aerial resistance of 100 ohms is 0.35A. Find (a) the power input, (b) the power output, (c) the efficiency of the stage.



A typical arrangement is illustrated above. R is the artificial aerial resistance, tapped across the tank coil of the stage, the tapping being adjusted until the maximum reading of current through R is obtained.

- (a) Input power ( $W_{in}$ ) =

$$\text{Volts} \times \text{Amperes (EI)} = 300 \times 0.075$$

$$\text{Therefore: } W_{in} = 22.5 \text{ watts.}$$

- (b) Output power ( $W_{out}$ ) =

$$(\text{Current})^2 \times \text{Resistance (I}^2\text{R)} = (0.35)^2 \times 100$$

$$\text{Therefore: } W_{out} = 12.25 \text{ watts.}$$

$$\text{Output (} W_{out} \text{)} = 12.25$$

$$\text{(c) Efficiency} = \frac{\text{Input (} W_{in} \text{)}}{\text{Output (} W_{out} \text{)}} = \frac{12.25}{22.5} = 0.544 \text{ (or } 54.4\%)$$

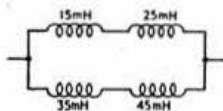
#### Calculations Involving L and C

Chapters III and IV of Electrical and Radio Notes for Wireless Operators deal with the effects of a current, the electric motor and measuring instruments. Their contents are essential for a good understanding of basic principles, but as they do not normally provide questions for the Radio Amateurs' Examination they need be only lightly covered if the candidate is pressed for time. Chapter V deals with Electromagnetic Induction and should be studied up to p. 45 to cover the effect of inductance, and how the value in a circuit may be adjusted by tapings, or by movement of a core or of a portion of the winding.

Inductances in series or parallel are treated as

resistances when it is desired to calculate the equivalent value, i.e. simple addition when they are in series; when parallel connected, the reciprocals are added and the result inverted. The following is a typical question:

Two series-connected coils of 15 and 25 millihenrys respectively are connected across two other series-connected coils of 35 and 45 millihenrys inductance respectively. Find the resulting inductance.



$$\text{Total inductance of first pair} = 15 + 25 = 40\text{mH.}$$

$$\text{" " " " second " " } = 35 + 45 = 80\text{mH.}$$

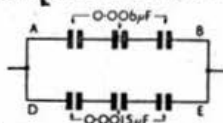
When these branches are connected in parallel, the resulting inductance L is given by:

$$1/L = 1/40 + 1/80 = 3/80$$

$$\text{Therefore: } L = 80/3 = 26\frac{2}{3} \text{ millihenrys.}$$

Subsequent sections of Chapters V and VI deal with the dynamo principle and electrostatics. Again, these are important for a general grounding, but, for the purposes of the Radio Amateurs' Examination, the chief points to note are the value of a parallel plate condenser (p. 57), and the calculation of series and parallel capacitances (p. 59). The following example should be noted:

AB is a line of three series-connected condensers, each of  $0.006\mu\text{F}$  capacitance. DE is a line of three similarly connected condensers, each of  $0.0015\mu\text{F}$  capacitance. Find the total capacitance when AB is connected in parallel with DE.



Since each condenser in AB is of equal capacitance, the combined value will be one-third of each individual value, i.e.  $0.002\mu\text{F}$ . (The addition of their reciprocals would be used if the values were not equal).

Similarly, the combined value of the condensers in DE will be  $0.0005\mu\text{F}$ .

When the two branches are connected in parallel, the total capacitance is obtained by simple addition, i.e.  $C = 0.002 + 0.0005 = 0.0025\mu\text{F}$ .

#### Ham Spirit

IN the course of a "Top-band" QSO early on the Sunday before August Bank Holiday, "Old Timer" Harold Chorley, G5YH, mentioned, casually, that the construction of an amplifier was being held-up owing to the difficulty of obtaining a certain component. By first post next morning he received the elusive component from a "G3+3" who had been listening to the QSO. G5YH comments: "Truly the genuine 'ham spirit' is still going strong."

#### Channel Swimmer, G3AKZ

MR. R. T. GLYNN, G3AKZ, of Kayte Lane, near Cheltenham, would be interested to know if he is the first Radio Amateur to try and swim the English Channel.

Mr. Glynn left the water at 2.45 p.m. on Friday, August 29, after swimming for 12 hours and when seven miles off the English coast. Tides were not favourable at the time. Mr. Glynn's attempt was self-backed.

# CQ Single Side Band

By H. F. Knott (G3CU)\*

## S.S.B. and T.V.I.

THE main advantages of the single-sideband system of communication are widely known and need not be enumerated here—but what is its effect, if any, on television? The answer is that the use of s.s.b. may, in many cases, prove an effective solution to the T.V.I. problem, enabling the amateur to go on the air without interference during television hours. While it is not suggested that the system guarantees interference-proof operating (much depends on the accuracy with which the amplifiers following the sideband generators are set-up), it undoubtedly has a great deal to offer, and tests at present being conducted by s.s.b. stations appear to indicate that, with simple precautions, T.V.I. should be eliminated.

The design of a single-sideband transmitter is such that there is little or no opportunity for harmonics of any order to be generated. In the first place, the required sideband is produced at the low power level of one or two watts, the carrier and unwanted sideband being suppressed. Secondly, the sideband generator usually operates at a frequency not in harmonic relationship with any of the television channels, the signal being heterodyned to the frequency required. Finally, the design and construction of the linear amplifiers must be such that no parasitic oscillation or instability is present (this is, of course, important even in amplitude modulation, but is not always apparent when the amplifier is operated class C).

A test for the presence of instability is to run the stage under consideration with just sufficient bias to allow full rated anode dissipation in the absence of drive, with the output circuit working into a dummy load. The presence of r.f. indicates spurious oscillation.

The amplifier stages should be adjusted to operate in a linear condition (free from distortion) so that the output voltage is proportional to the input voltage, and can be modelled on high-level audio amplifiers, adopting class B working conditions. Using suitable tank circuits having a loaded "Q" of 12 (high C/L ratio) to replace the input and output transformers, very good efficiency with very low harmonic output will be obtained. When the 21 Mc/s band becomes available for 'phone operation, correctly balanced push-pull finals will be helpful in limiting the radiation of the second harmonic.

## U.S. S.S.B. Stations Heard

The past month has shown an increase in the number of active 3.5 Mc/s s.s.b. stations, and every evening at least two or three QSOs have taken place, the stations usually operating within 1 kc/s of one another. The mornings, too, have not been without their pleasant surprises for those who have been up early. Numerous U.S.A. s.s.b. stations, including W3BOL, W4MCL, W5OHY, W4PER and WICGY, have been heard between 0400 and 0600 G.M.T., operating just below 4 Mc/s. Their daily strength has varied between S5 and S8. So far this summer, no U.S.A. a.m. stations have been heard on that band.

The appearance of U.S. stations a month or so earlier than last year may indicate that the first 3.5 Mc/s trans-Atlantic s.s.b. QSO is not far off. News of the reception of these signals has been

reported to W1DX, who is asking that U.S. stations shall monitor 3797 kc/s, especially between 2000 G.M.T. and midnight.

## Local Activity

G2ALH (Manchester) is active, but no details of his equipment have yet become available. G3BQQ (Wellington) has a G2NX-type crystal filter exciter driving a class AB2 807 on 3.5 Mc/s. He is conducting low-power tests with G3FDG and G3FHL, but hopes soon to "fire-up" an 803 to 150 watts.

G2IG is now back on 3.5 Mc/s, after a few months on 14 Mc/s. Reg has had many QSOs with Australian and South American stations, but due to his present location has experienced difficulty in working to the U.S. This will probably be rectified when he gets to his new QTH. Until then he will be inactive—possibly for some weeks.

## With the Europeans

ON4CC (Schilde) puts a nice signal into the U.K. with his W1JE0/9 crystal-filter exciter, driving a pair of 811s in class B. He has, however, revised the original circuit by using a 6SN7 balanced modulator for carrier suppression. HB9FU is back again on 3.5 Mc/s.

The effectiveness of single-sideband is confirmed by those listening to PA0KC, for, although he runs only 10 watts peak power to his final, yet with his phasing rig and voice-controlled break-in, he is a match for any high-powered station.

## Correction

In the bibliography of QST articles on s.s.b. operation (page 546, June, 1952), the issue in which the article *S.S.B. for the Average Ham* appeared was August, 1949, and not March as stated.

\* \* \*

Readers who find that the construction of s.s.b. phase-shift equipment is beyond their scope, or who have not the necessary test gear to align a sideband generator, should refer to the advertisement by Electrad Radio of Belfast on page 78 of the August issue of the BULLETIN.

## First 21 Mc/s W.A.C.

A WORKED All Continents certificate was issued on July 24, 1952, to Ivan Wood, ZE3JJ, of Salisbury, Southern Rhodesia, for work in the 21 Mc/s band. Although there is no special endorsement on W.A.C. certificates for 21 Mc/s operation it is believed that this is the first of its kind to be issued. Countries worked and confirmed are G, W, PY, VK, OD and OQ.



G3IBL (left) and G3FCY in action at the Derby "B" station during N.F.D.

\* 31 Batchwood Green, St. Paul's Cray, Orpington, Kent.





[Photo by Western Daily Press & Bristol Mirror  
Bristol "B" station (G6GN/P). Operating G6GN's trans-  
mitter is G3CHW; logging from '3CHW'S receiver (a  
Super-Pro with a "hot front end" using 6AK5s) is G3RQ;  
while G6GN and G2IK can be seen standing at the rear.

o o o o o  
"Before green apples blush  
Before green nuts embrown  
Why, one day in the country  
Is worth a month in town."

MAYBE the frenzied activity of a National Field Day was not exactly what Christina Rossetti had in mind when she wrote of the countryside . . . but there would be little disagreement with her conclusion from the several thousand members who, in the all-too-short twenty-four hours from 1700 B.S.T. on June 7th, 1952, manned over 250 portable stations, made some twenty-five thousand contacts, and between them succeeded in breaking every record in the

## UP . . UP . . UP . . UP

1947

First	Southgate	583
Second	Coventry	545
"A" Stn.	Worthing	275
"B" Stn.	Southgate	339

1948

First	Edgware/Hendon	774
Second	Southgate	693
"A" Stn.	Slough	423
"B" Stn.	Edgware/Hendon	441

1949

First	East Molesey	914
Second	Coventry	850
"A" Stn.	Slough	469
"B" Stn.	East Molesey	486

1950

First	Cheltenham	847
Second	Cambridge	818
"A" Stn.	Coventry	522
"B" Stn.	West Cornwall	431

1951

First	Falkirk	931
Second	Slough	894
"A" Stn.	Chelmsford	556
"B" Stn.	Falkirk	503

1952

First	Bristol	1,123
Second	East Molesey	1,032
"A" Stn.	Bletchley	627
"B" Stn.	Slough	511

WINNERS : ... BRISTOL  
RUNNERS-UP : ... EAST M  
LEADING "A" STATION : ... BLETCH  
LEADING "B" STATION : ... SLOUGH

Psn.	Town or Area.	"A" STATION.		"B" STATION.		Com- bined Score
		Call Sign.	Pts.	Call Sign.	Pts.	
1	Bristol ...	G2IK/P	625	G6GN/P	498	1123
2	East Molesey ...	G6MB/P	625	G8SM/P	407	1032
3	Slough ...	G3XH/P	493	G6CJ/P	511	1004
4	Berwick-on-Tweed ...	GM2YY/P	563	GM8SG/P	433	996
5	Glasgow ...	GM8MJ/P	517	GM3CSM/P	458	975
6	Guildford and Woking ...	G3ARM/P	582	G5WP/P	389	971
7	Southampton ...	G5LR/P	613	G3KJ/P	355	968
8	Hexham ...	G4LA/P	497	G5RI/P	459	956
9	Forfar ...	GM6RI/P	486	GM3EAK/P	469	955
10	Edinburgh ...	GM8FM/P	559	GM3UM/P	385	944
11	Cheltenham ...	G3CGD/P	604	G5BM/P	338	942
12	Eastbourne ...	G4FV/P	550	G2KU/P	383	933
13	Bletchley ...	G2DTD/P	627	G3AZ/P	285	912
14	Ashford and Canterbury ...	G2JF/P	607	G2JN/P	300	907
14	Cambridge ...	G5IG/P	526	G5DQ/P	381	907
16	Edgware and Hendon ...	G5FG/P	542	G2IM/P	354	896
17	Coventry ...	G2DK/P	554	G3HLI/P	341	895
18	Falkirk ...	GM4JQ/P	445	GM4MF/P	438	883
19	Chelmsford ...	G5RV/P	616	G4VF/P	263	879
20	Hayes and Uxbridge ...	G2FMF/P	567	G3HRG/P	309	876
21	Brighton ...	G5AO/P	458	G3YY/P	417	875
22	Derby ...	G3ERD/P	602	G5RW/P	271	873
23	Stourbridge ...	G4MI/P	611	G8GF/P	255	866
24	Belfast ...	G13ML/P	404	G15UR/P	447	851
25	East Ham ...	G2ZZ/P	581	G4CM/P	242	823
26	Ealing ...	G2DVD/P	537	G3CBN/P	282	819
27	Dulwich and New Cross ...	G4DC/P	430	G2HP/P	372	802
27	Blackpool ...	G6LD/P	516	G5ND/P	286	802
29	Croydon ...	G2RD/P	466	G5BZ/P	333	799
30	Gloucester ...	G3MA/P	495	G2RT/P	300	795
31	Southgate ...	G6QM/P	509	G5FA/P	285	794
32	Hastings ...	G2AVR/P	533	G2AX/P	259	792
33	Richmond, Barnes and Putney ...	G6RC/P	461	G4GD/P	330	791
34	Guernsey ...	GC2ASO/P	398	GC3HFE/P	382	780
35	Weston-super-Mare ...	G5DV/P	440	G8FC/P	328	768
36	Coulsdon ...	G2DN/P	514	G3CIE/P	235	749
37	Tonbridge and Tunbridge Wells ...	G4FB/P	353	G4IB/P	390	743
38	High Wycombe ...	G5WW/P	467	G6JK/P	274	741
39	Sutton and Cheam ...	G6KM/P	526	G8DF/P	208	734
40	Medway ...	G2CM/P	378	G6NU/P	350	728
41	Stroud ...	G5HC/P	464	G3CBH/P	258	722
42	Ilford, Wanstead and Woodford ...	G2RK/P	430	G2JG/P	272	702
43	Chingford ...	G2XG/P	455	G3YF/P	243	698
44	Penzance ...	G3FVD/P	321	G2WW/P	376	697
44	Hull ...	G6UJ/P	389	G5PQ/P	308	697
46	Watford ...	G2QB/P	425	G2VD/P	269	694
47	Boston ...	G8BQ/P	500	G2HFB/P	188	688
48	Bromley and Beckenham ...	G2MI/P	461	G4AU/P	226	687
49	Redhill and Reigate ...	G5LK/P	354	G2AJ/S/P	314	668
50	Worthing ...	G3BF/P	455	G3HQQ/P	207	662
51	Grimby and Cleethorpes ...	G2FT/P	468	G4XC/P	193	661
52	North Devon ...	G3BO/P	322	G6GM/P	321	643
53	Exeter ...	G3JW/P	385	G5QA/P	231	616
54	Bradford ...	G4GJ/P	359	G6KU/P	253	612

# ELD DAY 1952

## ULTS

(G2IK/P and G6GN/P) ... ..	1123 pts.
OLESEY (G6MB/P and G8SM/P) ...	1032 pts.
LEY (G2DTD/P) ... ..	627 pts.
(G6CJ/P) ... ..	511 pts.



The Welwyn Group (G5UM/P) operators with a visitor or two. Left to right: G2CN and Junior Op., G8DR, G3B8Z, G3AAZ, G5UM, G6CL, G3ENE and B.K.S. Owen.

book. Certainly not from the Groups who, for the first time, topped the elusive 1,000-point mark; nor from Bristol who compiled the amazing highest-ever combined total of 1,123 points; nor from Bletchley "A" station who, with three men at the key, managed to scrape home a "nose" in front of the "A" scores of Bristol and East Molesey, the runners-up, to set a new "A" record of 627 points (well above the winning 1947 combined score made with the 25-watt limit); nor from that consistent N.F.D. performer—the Slough Group—who also relied on three operators to show that the "B" station record could be shattered even in a year of low spout activity. Nor even, if truth were told, from the many of us ordinary mortals who contended with weather that ranged from extremely good to extremely bad; cattle that resented the invasion of their domains, and young children who welcomed it; trees that seemed ever more unclimbable as the passing years harden our arteries; valves that waited until "The Day" to develop inter-electrode leakages; and accumulators that lost their charges as readily as operators disappeared when midnight approached.

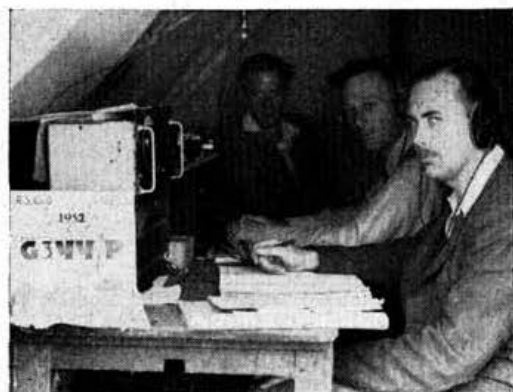
Psn.	Town or Area.	"A" STATION.		"B" STATION.		Combined Score
		Call Sign.	Pts.	Call Sign.	Pts.	
55	Wirral ...	G2AMV/P	411	G8BM/P	197	608
56	Scarborough	G8KU/P	399	G6KS/P	196	595
57	Manchester N.W. ...	G3HAC/P	512	G3RP/P	81	593
58	Torrey ...	G2GK/P	327	G3GDW/P	261	588
59	Darlington	G8IA/P	415	G3CDM/P	170	585
60	Sheffield ...	G8NN/P	366	G5TO/P	218	584
61	Darwen and Blackburn	G2HW/P	516	G3EK/P	63	579
62	Ipswich ...	G4RW/P	337	G2AN/P	238	575
63	Newcastle-on-Tyne...	G3BEJ/P	328	G2CO/P	248	576
64	Aberdeen ...	GM3ALZ/P	244	GM2FHH/P	326	570
65	South Shields and Sunderland	G4WG/P	271	G3IV/P	296	567
66	Loughborough...	G4BI/P	389	G4MM/P	176	565
67	Great Yarmouth	G6ZG/P	392	G3CFK/P	231	563
68	Cleckheaton	G8NF/P	498	G3FQH/P	64	562
69	Isle of Thanet ...	G8QB/P	561	—	—	561
70	Bath ...	G8DX/P	368	G6UR/P	188	556
71	West Cumberland	G3HNI/P	393	G3DNI/P	158	551
72	Barnsley ...	G3ELG/P	379	G5IV/P	164	543
73	Dundee ...	GM4NR/P	236	GM4HR/P	293	529
74	Malvern ...	G2AO/P	409	G2XX/P	119	528
75	Woolwich	G3HSO/P	392	G8LN/P	133	525
76	West Hartlepool	G4OD/P	427	G3TO/P	93	520
77	Barnet ...	G4BX/P	251	G6CY/P	266	517
78	Christchurch ...	G4RP/P	327	G8DL/P	188	515
79	E. Renfrewshire ...	GM3AR/P	227	GM3CAR/P	287	514
80	Preston ...	G3HWC/P	327	G8MD/P	184	511
81	Leicester ...	G2RI/P	318	G4BB/P	184	502
82	South Birmingham	G8JI/P	270	G8PN/P	229	499
83	Sheffield and Baldock ...	G4OL/P	304	G3CEU/P	193	497
84	Reading ...	G3AED/P	322	G5DF/P	170	492
85	Bury ...	G2GA/P	487	—	—	487
86	Chester ...	G3HPM/P	339	G2YS/P	145	484
87	Pontefract	G3US/P	414	G6MF/P	58	472
88	Liverpool ...	G6KS/P	276	G8DI/P	193	469
89	Cray Valley	G3ANK/P	346	G6VV/P	121	467
90	York ...	G3FYP/P	318	G3DTA/P	143	461
91	Shepherds Bush and Kensington	G3EZM/P	457	—	—	457
92	Southport ...	G3EFA/P	388	G2ART/P	66	454
93	Enfield ...	G8SK/P	445	—	—	445
94	Portsmouth	G6NZ/P	324	G8WC/P	107	431
95	Llandudno	GW3WX/P	238	GW3JENY/P	189	427
96	Finsbury Park ...	G2BAB/P	294	G3CWS/P	128	422
97	Welwyn Garden City	G5UM/P	416	—	—	416
98	Amersham, Beaconsfield and Chalfont	G3BII/P	259	G3DAG/P	156	415
99	Norwood ...	G4JH/P	411	—	—	411
100	Romford ...	G4KF/P	410	—	—	410
101	Dunfermline	—	—	GM3XO/P	407	407
102	Luton ...	G3ASD/P	404	—	—	404
103	Worksop and E. Retford	G6MN/P	265	G3BTU/P	138	403
104	Middlesbrough ...	G3CBW/P	299	G5YP/P	103	402
105	Hoddesdon	G3BUN/P	283	G4HY/P	106	389
106	Plymouth ...	G3TX/P	330	G3HMT/P	53	383
107	Southend ...	G5QK/P	381	—	—	381
108	Harlow ...	G6UT/P	230	G3ERN/P	146	376
109	Warrington	G3CKR/P	317	G8TR/P	44	361

Psn.	Town or Area.	"A" STATION.		"B" STATION.		Combined Score
		Call Sign.	Pts.	Call Sign.	Pts.	
109	Neath and Port Talbot	—	—	GW2AVV/P	351	351
110	Brentwood	G3LA/P	348	—	—	348
111	Spalding ...	G2DRT/P	341	—	—	341
112	Peterborough...	G2NJ/P	256	G3EEL/P	82	338
113	Rugby ...	G4KK/P	274	G3AUT/P	58	332
114	West Wilts.	G2PS/P	324	—	—	324
115	Lincoln ...	G4BU/P	232	G5XL/P	88	320
116	Newark ...	G3FA/P	312	—	—	312
117	Dorchester	G2TZ/P	303	—	—	303
118	Wrexham ...	GW3HHF/P	195	GW3GWA/P	107	302
119	Petersfield	G6DT/P	286	—	—	286
120	Maidstone	G3FMK/P	187	G2BMP/P	94	281
121	Ayrshire ...	GM3FMD/P	201	GM3CSO/P	68	269
122	Wellington North	G3IFT/P	186	G6KR/P	80	266
123	Cornwall Kingston-on-Thames ...	G3FCC/P	151	G2AYQ/P	115	266
124	Bexley, Erith and Dartford	G2ACA/P	225	G3DHz/P	22	247
125	Hereford ...	G3ENT/P	201	—	—	201
126	Newbury ...	G3NA/P	21	G3ESY/P	136	157
		G3IG/P	55	—	—	55

\* Disqualified—Entry received late.

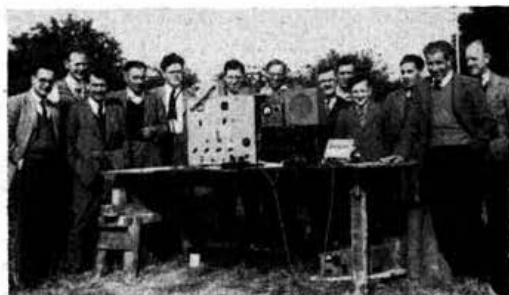
Check logs are gratefully acknowledged from the following:—G2BP, BT, FTK, GZ, UX/P, OI/P, VV, ZC, GM2CAS/P, G3ABM/P, EJE, FFY, HCY/P, NT/P, GM3IGW, G4DVP, GW4NZ/P, G5YH, G6KP, PD, ZR, G8NF/P, GW8UH/P, E12F/P, 2G/P, 8P/P, 9Y/P, MD6BZL/P, PA0ZL, RB, ON4VQ/P, SUIJY, ZBIAFF, ZC4XP, ZL4GA.

This year, to gain a commanding position in the "A" table, it was necessary to make more than 200 contacts: leading "B" stations had to be content with about 150 contacts. On the lower frequencies, the 50-contact score was being chalked up soon after 2000 B.S.T., while the "Century" was being passed between 0030 and



Brighton "B" station, with G3YY and G2CMH (who was mainly responsible for the transmitter construction) hard at work.

0200 B.S.T.: but it was not until sometime after the grey dawn of the Sunday morning that the weary night operators began to cry "150 up." On 7 and 14 Mc/s, the leading stations were logging their fiftieth contacts after about 2230 B.S.T.; and if there were 100 contacts safely in the bag by 0700 B.S.T. then you were almost certainly at either G2IK/P or G6CJ/P who though pursuing different tactics—CJ concentrated slightly more on the DX—kept almost dead level in contacts throughout the entire twenty-four hours.



Hull "B" station. Left to right: G3FKK, S.W.L., G3CWT, S.W.L., G3PL, G2CNX, G5MN, S.W.L., G3ALY, S.W.L., G5PQ, G3FCY and G2AAX.

DX, though less abundant than in the high sunspot activity years immediately following the war, still made a determined appearance in many logs: particularly noteworthy were the ZLs on 7 Mc/s (G6CJ/P worked ZL2, 3 and 4 on this band); and on 14 Mc/s VP9AX/P, W, VE, ZL and ZC4.

While in contact with WIRZO, the Cambridge "B" station was visited by W5AOT of the U.S. Air Force who was due to fly back to the States on the Sunday morning: G5DQ/P was thus able to say "Card already completed and now on its way!"

MD6BZL/P operated in Iraq under N.F.D. rules with an input of 4.5 watts to a half-wave

dipole. The equipment was taken six miles into the desert and erected in a temperature of 115° F. in the shade! Despite the persistence of high power fixed stations—mostly located on the Continent—a number of British portables were contacted, including 2WW, 3CFK, 5PQ, 8DL, 8FC and GM2FHH. Even a dust storm failed to silence this keen group of Service enthusiasts.

ZC4XP on Cyprus was adjudged the overseas station contributing the most points to British portables.

N.F.D. would not seem complete without the welcome presence of our old friends the EI and HB1 portables who were out in full-strength once again; joined this year by a number of DL, ON and PA field stations. We all hope that this is but the foretaste of what the future will bring us in the way of European co-operation. On the debit side, portables in ZB1 were much-missed absentees.

### How to win N.F.D.

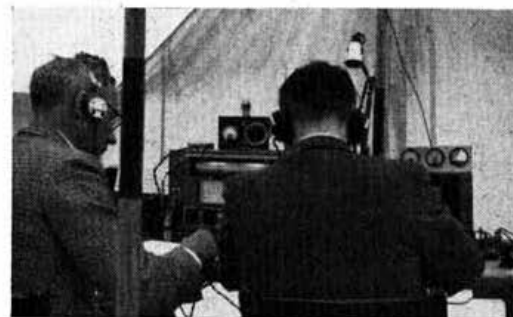
Obviously your station must be "ship-shape and Bristol fashion." It must also, it would seem, be located at Hill Farm, Dundry and—for "A" station—have a 6L6 v.f.o. and 807 p.a./doubler, a half-wave dipole on each band, an HRO receiver with 132 ft. long-wire aerial, and a 110-volt a.c.



Forfar "A" station at Tannadice, showing (left to right) GM2HIK and GM6RI.

petrol generator: for the "B" station, you should acquire a 6V6 v.f.o., an optional 6J5 f.d. and an 807 p.a. with half-wave dipoles for 7 and 14 Mc/s; an SP400X Super-Pro receiver with a "semi-vertical length of wire" will look after the reception side, while a 110-volt petrol generator will take care of the power question. You will also need the following operators: (A) G2BYA, '2FYT, '2IK, '3CTN and '6RB; (B) G2BYA, '3CHW, '3ECS, '3GZA, '3RQ and '6GN.

If your aim is to be top "A" station, then take a tip from G2DTD/P of Bletchley. This is to use



Chelmsford "B" station (G4UF/P) showing (left to right) '5QO and G3ABB.

a 6K7 e.c.o./doubler, a 6F6 b.a. and a 6V6 p.a. with a 265 ft. long-wire—which need be only 20/30 ft. high—together with an HRO with a 40 ft. aerial (10/20 ft. high). A petrol generator is again indicated. If you adopt this station as your mentor, your "Front Line" operating team need be only three in number—provided they are of the calibre of G2DTD, '3EEB and '3HYM—and you would split up the vital first twelve hours as follows: 1700/2145 (3.5 Mc/s), 2145/0325 (1.7 Mc/s), 0325/0615 (3.5 Mc/s) and 0615/0820 (1.7 Mc/s).

"B" station results are notoriously tricky, and we cannot guarantee that you will displace G6CJ/P at the top of the table even if you do use an EF50 Clapp oscillator, an EF50 b.a./f.d. and an 807 p.a. with a selection of 7 Mc/s dipole, 14 Mc/s dipole and a 400 ft. long-wire aerial,



Pontefract "A" station: Left to right: G3IDT with YL, G3CYS and G3US.

and an AR88 receiver, all powered from 12-volt accumulators by means of vibrator packs. Your 7 Mc/s operating schedule for the first twelve hours, in this case, would be 1700/0020, 0050/0125, 0545/0640 with the intervening periods devoted to 14 Mc/s operation: a somewhat unorthodox allocation that was well justified by the results obtained. Of course, it will also help if you can acquire the services of G3SU, '3XH and '6CJ—for details of "transfer fees" apply direct to the Slough Group!

To bring home the N.F.D. Shield, good organisation, efficient office work, logging operators, generator/accumulator mechanics, cooks and



The Barnet "A" and "B" stations operated from Tyler's Causeway, Epping Green. G6CY (with pipe) and G3DC (extreme right) are featured in this picture (with G2BRH and G6CL) taken during the visit of the R.S.G.B. Film Unit.

"general duties" personnel will also be required. The full extent of the invaluable assistance offered by these "backroom boys" of N.F.D. cannot, however, be gleaned simply from a study of the entry forms, but all who take part in N.F.D. will appreciate the importance of these posts—often filled by B.R.S. members and XYLs.

#### How not to win N.F.D.!

One way, discovered by the 1950-winners, Cheltenham, is to choose a field full of heifers. These friendly creatures are happiest when rubbing



The Enfield Group operated an "A" station from the grounds of The Forge in the Hertford Road. G8SK is the central figure in this group pictured just before zero hour.

shoulders against the guy wires of a 40 ft. mast: if disturbed they stampede full-tilt into the wires; if left alone they contentedly chew 80-ohm feeder line, but this—according to Cheltenham—in no way affects its subsequent performance. But heifers are a mere Sassenach frivolity compared to the sterner dangers that beset the Scot who would operate in the vicinity of the Earl of Elgin's "large, black and very fierce" bull: after the tents at the Dunfermline "A" had been twice erected—and twice struck in record time—it was decided that Scottish honour would be in no way tarnished by a strategic withdrawal to a less exposed position.

Another, and indeed far more serious way—if you are a T.R. or N.F.D. organiser—is to suppose that those members who have spent so much time in preparing (or, at least, talking about preparing) for Field Day will have, at any time, taken the



Chores. Old-Timer Bill Pope, G3HT (left) and Phil Thorogood, G4KD, operate the potato slicer at the Edgware and Hendon Group Stations.





The newly formed Norwood and District Group has its first attempt at N.F.D. G3FZL is at the key, while G3FIO keeps the log.

trouble to read and digest the Rules of the event. The comments made by several T.R.s on this topic are amply confirmed by the experience of the Contests Committee; a notable example, this year, being the number of members who persisted in sending their initials rather than the first three letters of their surname.

#### Operating

There is little doubt that the higher scores are chiefly the result of the gradual improvement of and greater experience in contest operating. A typical note comes from ZL4GA, worked by many British portables on 7 and 14 Mc/s, "I would

There is, however, one operating matter that requires comment and attention. Several members point out that while "BK" procedure is, in many ways, excellent, it does require some modification during crowded contests if confusion is to be avoided. Unless, when establishing and acknowledging contact, both call signs are given in full other operators may be left in doubt as to whom the station has, in fact, replied. During the checking of the logs very clear evidence was found by the Committee that in practice, serious confusion did occur; with many stations genuinely believing that contact had been made when, actually, this was not so.

#### Logs and Log Checking

Once again it must be reported that some Groups pay insufficient attention to the accuracy—and neatness—of their entry forms. On the other hand, it is only fair to note that there is some improvement in the general standard and a fairly high percentage of Groups do not find it too much trouble to prepare logs that offer every possible assistance to the Contests Committee. This year, entrants were asked, on a voluntary basis, to provide alphabetical lists of stations worked: the response to this request was

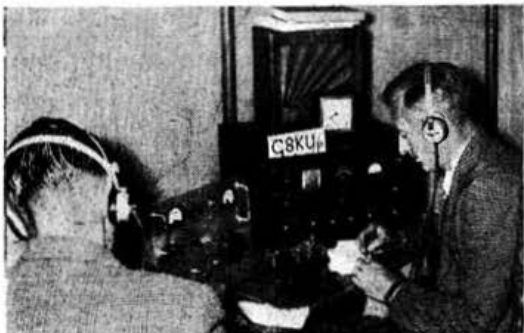


Jack Frost (T.R., G3GNL), Lyell Herdman (G6HD), and Paul Solim (G3BGL) at the Bromley and Beckenham N.F.D. site.

reasonably good, and proved most helpful. While the Committee is anxious not to add unduly to the clerical work involved in making an entry, the vast increase in the total number of contacts, in recent years, threaten to make the checking of this event an almost intolerable burden for a voluntary body. It may well become essential that some of this load should be shed by making the preparation of such lists obligatory rather than voluntary. If this has to be done, it is hoped that members generally will assist in this work and not just "leave it to the T.R."

#### Comments and Suggestions

In response to the Committee's request for comments on certain aspects of the Rules, a very satisfactory volume of correspondence as well as a number of resolutions have been received. While it is regretted that a small minority of the writers take the attitude that they, personally, are doing the Committee and the Society a great favour by participating and that the Rules should therefore be framed expressly to favour their particular circumstances, the vastly greater number of writers show that, throughout the country, balanced and careful thought has been given to the many factors involved in the proposed changes. All Rules—power, equipment, aerials, frequency grouping, 21 Mc/s and the like—are to be reviewed shortly in the light of the comments and experience of recent years and it is hoped to publish the decisions in good time for starting work on the equipment for the 1953 N.F.D.



Operating and log-keeping respectively at Scarborough "A" station (C8KU/P) are G2CP and B.R.S. 18461.

very much like to pass comment on the excellent signals heard during the Contest. The tone, stability and clean sporting operating were of a standard higher than in any previous N.F.D."

It was also generally agreed that the new "three letter" rule had much to do with improving the standard of operating. With this system there can be far less of the "guesswork" and confusion that occurred with the former QTR code group—this rule also seems to have provided a good deal of pleasure both in the form of ribald comments on some less fortunate code groups and, more seriously, as a result of the opportunity it often gave of recognising the fellow at the other end. It is now becoming more widely appreciated that the practice, popular a few years ago, of cutting out every "superfluous" signal can easily be overdone, and that an occasional 73 or other remark can add much to the good feeling of the event without making serious in-roads into valuable operating time.

# Amateur Television Topics

By M. Barlow (G3CVO)\*

**H**IGHLIGHT of the British Amateur Television Club's recent activities was the very fine show organised by the Dagenham and Romford groups, at the Dagenham Town Fair. This was the first time that full telestill facilities were available, and also the first time that anything in the nature of an "Outside Broadcast" had been attempted. Pictures were shown during the entire exhibition period.

The main exhibit was a miniature studio complete with dummy window and artificial flowers; partitioned off from this was the camera control rack, the whole being installed on a small stage. At ground level were the telestill unit and gram console. The pictures were shown on three standard television sets above a static display of television components. Additional monitors were available above the control rack and in the studio, but owing to a last minute hitch, it was necessary to use the official camera-control monitor for the telestill unit, so that it was not possible to preview any pictures before they were actually transmitted. The "O.B." point was some 50 yards away in the centre of the marquees, and more than 200 interviews were conducted from there.

The telestill scanner, designed to show test slides, could be used for either 35mm filmstrips or for larger transparencies. The latter method was largely employed, as it was then possible to show slides prepared on the spot. In addition, by fading and superimposing camera and telestill signals, some most interesting effects could be produced, such as screening the "interval" sign against the background of the Dagenham Borough crest with flags blowing gently in the breeze. Variation was possible by changing to a negative picture—although on studio interviews the effect was somewhat startling! As is usual with the rather insensitive RCA 5527 camera tube (bought, incidentally, for 30/- in Lisle St.) heat from the studio lighting in the evening was excessive, and several members of the team came away with a healthy tan on their faces.

The show was seen by some 20,000 visitors, and the Club won 2nd prize in the competition for the best stand. In the absence of a sound radio exhibit, a good case was made for Amateur Radio in general, and it is felt that Dagenham, at least, has a better idea of average (or not-so-average) amateur activities. The equipment and the organisation of the show reflect the greatest credit upon G3AKJ and his helpers.

[Photographs of Amateur TV activities taken at the Dagenham Town Fair came too late for reproduction in this issue.—Ed.]

## Other News

As a result of the note in the July BULLETIN, Liverpool is now definitely a centre of activity, with G3HWX and five or six others hoping to make TV contacts with G3ETI in Wirral. Other reports have come in from a new 5527 owner in the Hague, and from ZS5PA in Durban. ZC4BN, who is also GM3GUC, hopes to start on colour telecine work when he gets home next year, and asks anyone in the Edinburgh area to contact him. Eddie Collins, W4MS/TV, runs a 262-line rig using a 5527, and hopes to start an organisation in the U.S.A. similar to the B.A.T.C.

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

Progress on five of the seven new cameras under construction by members has been held up due to coil-winding difficulties; anyone having a supply of 1/16th-inch formers (3.625 in. o.d., and 12 in. long) is asked to contact G3CVO. The East Grinstead Radio Club has an active TV group, and they hope to have an image iconoscope in action in the near future. G3ETI was unable to complete the camera unit in time for the TV Society's Exhibition in Manchester, but the display of equipment aroused much interest.

In Ross on Wye, Grant Dixon now has a pan-chromatic photocell, and his colour telestill unit is therefore being reconstructed. His camera and control units are being built with colour in mind, and it is hoped to have these units on show at the 1953 R.S.G.B. Exhibition—which reminds us that the B.A.T.C. hope to show at the R.S.G.B. Amateur Radio Exhibition in November, when examples of various types of equipment will be demonstrated.

News and views for the next edition to G3CVO by October 16th, please.

## Clerk Maxwell Premium

**T**HE senior award of the Brit.I.R.E., the Clerk Maxwell Premium, will be made to H. Paul Williams, Ph.D., for his paper on *Subterranean Communication by Electric Waves* published in the Institution's Journal, March 1951. Dr. Williams was formerly with A. C. Cossor, Ltd., and is now with Fairey Aviation Company. This premium is for the most outstanding paper published in the Institution's Journal during the year 1951.

## G3GOX/A at Honiton

**A**N Amateur Radio Station, operating under the call G3GOX/A, was featured at a Model Engineering and Hobbies Exhibition held at Honiton, Devon, last month. Taking turns at the operating position throughout the two days of the Exhibition were the organisers, Miss Ann Walford, G3GOX, and K. Acton, G2DWQ.

The equipment comprised a transmitter, running 50 watts to an 807 feeding an end-fed long-wire aerial, an S640 receiver, an R1224A stand-by receiver, and a wavemeter. Many contacts were made on the 80-metre band, though, due to the high level of electrical interference, a number of stations were unreadable.

The stand drew a large number of visitors and aroused a great deal of interest.

## Amateur Radio at Scout Jamboree

**S**COOTS from 25 nations attended the Jamboree held recently at Belchamps, Essex, at which the Southend and District Radio Society operated an Amateur Radio station under the call G5QK/A. A message of goodwill was received from the Australian Broadcasting Commission.

The station was operated by T. Hudson and L. Barclay (of the S. & D.R.S.), more than 200 QSL cards, specially printed for the occasion, being exchanged. In addition, the Society provided walkie-talkie apparatus for use on the camp site.

## R.S.G.B.

### Amateur Radio Call Book

This new edition is the most accurate and up-to-date list of British Amateur Radio stations ever published.

Price 3/6, By Post 3/9

FROM HEADQUARTERS

# SOCIETY NEWS

## London Meetings, 1952/3

THE following is a list of Society meetings to be held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, during the coming autumn and winter:—

1952	Subject
October 31.	Topical and Technical Film Show arranged by Messrs. Dorsett and Wenn. Programme will include the first showing of the 1952 N.F.D. Film.
November 21.	"The Sky-beam Propagation Problem" by Paul H. Sollom, G3BGL, B.Sc., A.C.G.I.
December 19.	Annual General Meeting.
1953	
January 30.	"Single Sideband Transmissions" by Reg. H. Hammans, G2IG.
February 27.	"Oscilloscopes" by Frank Hicks-Arnold, G6MB.
March 20.	"V.H.F. Aerial Developments" by Frederick Charman, B.E.M. G6CJ.

Buffet tea will be served free of charge from 5.30 p.m. Meetings will commence at 6.30 p.m.

All meetings (except the A.G.M.) will be held in the Tea Room.

## European V.H.F. Contest Trophy

THE Council has been pleased to accept from Mr. P. A. Thorogood, G4KD, a new perpetual trophy to be competed for annually by Members of I.A.R.U. Societies in Europe.

The rules governing the award of the trophy are as follows:

- (1) The European V.H.F. Contest Trophy will, at the discretion of the Council of the Incorporated Radio Society of Great Britain, be awarded to the person, who being a licensed Member of his National I.A.R.U. Society, shall have scored the highest number of points (as recorded in the R.S.G.B. BULLETIN) in the Annual V.H.F. Contest organised by the I.A.R.U. Societies in Europe.
- (2) The Trophy will be held for one year, and will be awarded at such functions as the Council of the R.S.G.B. shall decide.
- (3) The Council of the R.S.G.B. reserve the right to award the Trophy for any purposes other than that mentioned in Rule 1.

## Portable Stations

IT has been suggested by one or two members that the recently published revised regulations dealing with portable operation are unreasonable in the requirement that operation shall not take place within one mile of a Government wireless station. Some have asked how such stations can be recognised.

The Post Office have been consulted on this matter and have pointed out that the prohibition is not new; in fact, it has been a condition of the normal portable licence for many years. As the location of nearby Government wireless stations is usually well-known to local inhabitants, any amateur in doubt should make enquiries before setting up his equipment in a strange neighbourhood. It is unlikely that an amateur will be penalised for working a few yards inside the mile radius.

## PORTABLE FACILITIES

AMATEURS using the new portable facilities should note that the following address is all that is necessary when despatching telegrams of movement to the G.P.O.

**AMATRADIO, CRICKLE, LONDON.**

## Log Entries

THE Post Office has suggested that it would be helpful if licensed amateurs voluntarily noted in their log-books any period during which their transmitter is switched-on, although no actual communication is radiated.

Such a record would protect the amateur in cases of interference and would help to facilitate the elimination of possible sources as the cause of such interference, and perhaps serve to clear the licensee himself.

The members of the G.P.O. Liaison Committee feel that the request is a reasonable one entailing no hardship, and endorse it wholeheartedly.

## Wedding Bells

HER many friends in the Society—especially regular visitors to Headquarters and to the Annual Amateur Radio Exhibition—will wish to offer warm congratulations to Miss Hazel Lightfoot (H.M.L.) who is to marry Mr. Bryan Harris, at St. Andrew's Church, Totteridge Lane, Totteridge, Herts., at 2 p.m. on Saturday, September 27. Miss Lightfoot joined the staff at Headquarters in 1945.

## National Publicity Co., Ltd.: Change of Address

READERS are asked to note that the Society's Advertisement Managers (National Publicity Co., Ltd.), have moved to larger and more conveniently appointed offices at 36-37 Upper Thames Street, London, E.C.4.

The telephone number is now CENTRAL 0473-6.

The European V.H.F. Contest Trophy donated to the Society by Mr. P. A. Thorogood (G4KD). The first holder is Mr. J. P. Haydon (G3BLP) of Croydon, winner of the 1951 contest. The trophy was presented to Mr. Haydon by the President (Mr. F. Charman) at a dinner arranged by the Croydon group on September 3, 1952.



# REPRESENTATION 1953-1954

## *Election of County Representatives*

**I**N accordance with recommendations made at a meeting of Regional Representatives held last year, which recommendations were subsequently accepted by the Council, an election of County Representatives is due to take place this year with effect from January 1, 1953.

### **Nominations.**

Not later than October 31st next, any five Corporate Members resident in a particular County (or group of Counties as the case may be) may nominate any duly qualified Corporate Member resident in the particular County (or group of Counties) by delivering their nomination in writing to the General Secretary, together with the written consent of such person to accept office if elected.

### **Period of Office.**

County Representatives will hold office for a period of two years as from January 1st, 1953, subject to any revision that might be necessary in the light of any alterations to the Society's Articles of Association.

### **Vacancies.**

In the event of an office not being filled by the prescribed time the appropriate Regional Representative shall be authorised to invite any Corporate Member to serve in that post. In such cases the Member concerned shall send a letter to the Regional Representative, for forwarding to Headquarters, agreeing to take office. It will be the responsibility of the Regional Representative to notify Headquarters so that the appointment can be confirmed and recorded.

### **Confirmation of Appointment.**

County Representatives will only be confirmed in their appointment if the total membership in the County (or group of Counties) they propose to represent is in excess of 25.

### **Ballots.**

In the event of more than one person being nominated for a particular office a Ballot will be conducted, details of which will be published in the November 1952 issue of the R.S.G.B. Bulletin.

### **Resignations.**

If, for any reason, an elected or appointed Representative wishes to resign his office, he should notify Headquarters who will advertise the vacancy. **Local Members cannot automatically appoint another Member to undertake the duties of a Representative who has resigned.**

The Council reserves the right to call upon any Representative to resign his office if, in their opinion, he is considered to be unsuitable or unsatisfactory.

### **Local Societies.**

It is **not permissible** for local societies, whether affiliated to the R.S.G.B. or not, to nominate persons to serve as R.S.G.B. Representatives.

### **Present County Representatives.**

In the past, certain County Representatives have assumed, incorrectly, that they are entitled to remain in office without being re-elected. **All present County Representatives go out of office on December 31st, 1952.**

### **Regions and Counties.**

The following is a list of the Regions, and Counties (or Districts) forming them:—

**Region 1** (North Western).—Cheshire; Cumberland; Lancashire (East); Lancashire (West) and the Isle of Man; Westmorland.

**Region 2** (North Eastern).—Durham; Northumberland; Yorkshire (East); Yorkshire (North); Yorkshire (West).

**Region 3** (West Midlands).—Herefordshire; Shropshire; Staffordshire; Warwickshire; Worcestershire.

**Region 4** (East Midlands).—Derbyshire; Leicestershire and Rutland; Lincolnshire; Northamptonshire; Nottinghamshire.

**Region 5** (Eastern).—Bedfordshire; Cambridgeshire; Essex (outside London Region); Hertfordshire (outside London Region); Huntingdonshire; Norfolk; Suffolk.

**Region 6** (South Central).—Berkshire (outside London Region); Buckinghamshire (outside London Region); Gloucestershire (excluding the Bristol Area); Hampshire; Oxfordshire; Wiltshire.

**Region 7** (London).—London North; London South; London South East; London South West; London West; London East. (In the London Region the Representatives are regarded as District Representatives.)

**Region 8** (South Eastern).—Kent (outside London Region); Sussex.

**Region 9** (South Western).—Bristol; Cornwall; Devon; Dorset; Somerset.

**Region 10** (South Wales).—Brecknockshire and Radnorshire; Cardiganshire; Carmarthenshire and Pembrokeshire; Glamorganshire; Monmouthshire.

**Region 11** (North Wales).—Anglesey and Caernarvonshire; Denbigh; Flintshire; Merioneth and Montgomery.

**Region 12** (North Scotland).—Aberdeenshire, Banffshire and Kincardineshire; Angus and Perthshire; Morayshire, Nairnshire, Invernessshire, Ross-shire, Sutherland, Caithness, Orkney and Shetland.

**Region 13** (East Scotland).—Berwick, Peebles, Roxburgh and Selkirk; East, Mid- and West Lothian; Fifeshire and Kinross.

**Region 14** (West Scotland).—Argyll and Dumbarton; Ayrshire, Bute, Dumfries, Kirkcudbright and Wigtown; Clackmannan and Stirlingshire; Lanarkshire, Renfrewshire and County of Glasgow.

**Region 15** (Northern Ireland).—Antrim; Armagh; Down; Fermanagh; Londonderry; Tyrone.

### **LONDON MEMBERS' LUNCHEON CLUB**

will meet at the Kingsley Hotel, Bloomsbury Way, W.C.1 (opposite Headquarters)

at 12.30 p.m. on September 19, 1952.

Visiting amateurs especially welcome.

Telephone table reservations to HOL 7373 prior to day of luncheon.



## Tests and Contests

### Low Power Contest, 1952

**T**HE rules are generally the same as for last year, except for the fact that it has been decided to limit the contest to members resident in the British Isles.

## Rules

1. The contest is open to all fully paid-up Corporate members of the Society, resident within the British Isles (G, GC, GD, GI, GM, GW).
2. The contest will commence at 2300 G.M.T. on Saturday October 4, 1952, and continue until 2259 G.M.T. on Sunday, October 5, 1952.
3. Entries will only be accepted if submitted in the form set out below:—

### Low Power Contest 4-5 October, 1952

Call Sign ..... Claimed Score .....

County number .....

Name.....

Address .....

Transmitter ..... Aerials ..... Receiver .....

G.M.T.	Power	Call Sign of Station Worked	My Report on his Signals	His Report on my Signals	Points claimed	County Code No. of station worked

**Total points**

.....Counties worked x 10

Grand Total

4. Full circuit details of the transmitter and power supply must be given on a separate sheet, signed by the competitor.
5. All contacts must be made between 3500 and 3600 kc. with stations located in the British Isles.
6. The power input to the transmitter shall not be intentionally varied during any contact.
7. The contest is confined to two-way telegraphy (A1) contacts and any competitor receiving tone reports lower than T8 may be disqualified.
8. Only one contact with a specific station will be allowed to count for points.
9. Power input, in watts to the p.a. stage, must be recorded in the second column at the time of the contact.
10. No preceding stage may have a power input in excess of that to the p.a.
11. Scoring will be as follows:—

Watts input to the p.a. stage ..	Up to 0.5	To 1	To 2	To 3	To 4	To 5
Points per contact	20	10	5	3	2	1

12. If different power is used at various times during the contest, the scoring must be altered accordingly.
13. Ten points should be added to the score for each new County worked (there is no multiplier).
14. Competitors must use the code number of their County whilst calling (e.g. CQ CQ CQ de G . . . 17 AR.). An exchange of RST and code number—both of which must be acknowledged by the signal R—will be required before points may be claimed (e.g. RST 579 NR 17.). Where non-competitors do not give a county number, this may be inserted provided that this fact is indicated on the log sheet.
15. Proof of contact may be required.
16. Contacts with unlicensed stations will not count for points.
17. Only the competitor may operate the station during the contest period.
18. Entries should be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, W.C.1 and should bear a postmark not later than Monday, October 17, 1952.

A list of County Code Numbers is set out below:—

ENGLAND (G).

- |                |                               |                 |
|----------------|-------------------------------|-----------------|
| 1. Bedford     | 15. Hereford                  | 28. Nottingham  |
| 2. Berkshire   | 16. Hertford                  | 29. Oxford      |
| 3. Bucks       | 17. Huntingdon                | 30. Rutland     |
| 4. Cambridge   | 18. Kent                      | 31. Shropshire  |
| 5. Cheshire    | 19. Lancashire                | 32. Somerset    |
| 6. Cornwall    | 20. Leicester                 | 33. Stafford    |
| 7. Cumberland  | 21. Lincoln                   | 34. Suffolk     |
| 8. Derby       | 22. London (Postal Districts) | 35. Surrey      |
| 9. Devon       |                               | 36. Sussex      |
| 10. Dorset     | 23. Middlesex                 | 37. Warwick     |
| 11. Durham     | 24. Monmouth                  | 38. Westmorland |
| 12. Essex      | 25. Norfolk                   | 39. Wiltshire   |
| 13. Gloucester | 26. Northampton               | 40. Worcester   |
| 14. Hampshire  | 27. Northumber'ld             | 41. Yorkshire   |

## SCOTLAND (GM)

- |                 |                   |                     |
|-----------------|-------------------|---------------------|
| 42. Aberdeen    | 53. East Lothian  | 65. Perth           |
| 43. Angus       | 54. Fife          | 66. Renfrew         |
| 44. Argyll      | 55. Inverness     | 67. Ross & Cromarty |
| 45. Ayre        | 56. Kincardine    |                     |
| 46. Banff       | 57. Kinross       | 68. Roxburgh        |
| 47. Berwick     | 58. Kirkcudbright | 69. Selkirk         |
| 48. Bute        | 59. Lanark        | 70. Snetland        |
| 49. Caithness   | 60. Mid-Lothian   | 71. Stirling        |
| 50. Clackmannan | 61. Moray         | 72. Sutherland      |
| 51. Dumbarton   | 62. Nairn         | 73. West Lothian    |
| 52. Dumfries    | 63. Orkney        | 74. Wigton          |
|                 | 64. Peebles       |                     |

## WALEs (GW)

- |                |               |                |
|----------------|---------------|----------------|
| 75. Anglesey   | 79. Carnarvon | 83. Merioneth  |
| 76. Brecknock  | 80. Denbigh   | 84. Montgomery |
| 77. Cardigan   | 81. Flint     | 85. Pembroke   |
| 78. Carmarthen | 82. Glamorgan | 86. Radnor     |

## NORTHERN IRELAND (GI).

- |            |               |                 |
|------------|---------------|-----------------|
| 87. Antrim | 89. Down      | 91. Londonderry |
| 88. Armagh | 90. Fermanagh | 92. Tyrone      |

## CHANNEL ISLANDS (GC).

- |              |            |          |
|--------------|------------|----------|
| 93. Alderney | 95. Jersey | 96. Sark |
| 94. Guernsey |            |          |

## 97. ISLE OF MAN (GD).

## Contests Diary

September 21 144 Mc/s Field Day (No. 2)

September 28 D/F National Final<sup>®</sup>

October 4-5 - Low Power

November 8-9 "Top Band" (No. 2)

\* For Rules see page 503, May issue

### PA-Rest of Europe Contest

**T**HE Dutch National Society (V.E.R.O.N.) announces that a contest (known as the "PA-Rest of Europe Contest") will be held during two successive week-ends in November.

The telegraphy section will commence at 2230 G.M.T. on Saturday, November 15, and will end at 0200 G.M.T. on Sunday, November 16. The telephony section will commence and end at the same times on Saturday and Sunday, November 22-23. Operation will be confined to the 3.5 and 3.6 Mc/s c.w. and 'phone bands respectively.

Competitors are required to work the eleven provinces of the Netherlands, each of which will be identified by a code letter, and will count one point for each PA contact, the total score being multiplied by the number of provinces worked. A six (or five) figure group comprising RST (or RS) report and a three-figure serial number commencing at 001 for the first contact will be exchanged. Logs should be sent to the V.E.R.O.N. Contest Manager, PA0JQ, (from whom further details may be obtained), Lisstraat 11, Rotterdam, Netherlands, by not later than December 10. A certificate will be awarded to the leading station in each country.

## Romford Nocturnal D/F Contest

SEVEN competitors took part in the recent Romford Nocturnal D/F Contest, which started at Childeritch Common, near Brentwood, Essex. Weather conditions were ideal—mild, with no wind or rain—but the organizers had chosen a moonless night. Radio conditions were such that the competitors were able to take bearings of much greater accuracy than had been anticipated, sky-wave signals being absent.

The hidden transmitter was located at a point some eight miles from the start in a forest glade which could be reached by car; most of the competitors, however, waited for at least a mile.

The winner was H. Drury (Romford), who arrived at 0217 B.S.T., followed at 0220 by A. Glozier (Romford). At 0300, W. Holdaway (Romford) and Messrs. Newman (Salisbury) and Hallett (Romford) arrived in close succession. G. T. Peck (High Wycombe) reached base at 0427 after a difficult passage through the woods. The remaining competitor, Mr. Woolford (Edgware) did not succeed in locating the transmitter, although he was in the vicinity.

Ingenuity was noted in the torch used by Mr. Holdaway to combat a rule prohibiting the use of more than 1½ watts for illumination, and in the "Land-rover" car, complete with chart-table and light, used by the Salisbury party. Breakfast was at 0645 B.S.T.



Messrs. Newman (left) and Glozier (G3CRR) take the first bearing at the beginning of the Romford Nocturnal D/F Contest.

## D/F Field Day National Final

DETAILS of the R.S.G.B. D/F National Final—to be held on September 28, 1952—are as follows:

**Call Sign:** G8VZ/P.  
**Frequency:** 1854 kc/s.  
**Assembly Point:** Butts Hill, 5 miles west of Hitchin, ¼-mile south of Hexton cross-roads. N.G.R. 52/106300.  
**Map:** Ordnance Survey, New Popular Edition, Sheet 147.  
**Assembly Time:** 1330 B.S.T.

The fifteen qualified competitors will be notified individually.

## Fire at G3GRL

DURING the early hours of August 27 the shack and rig of John Bonser, G3GRL, were completely destroyed by fire. The fire also destroyed more than 800 QSL cards confirming contacts with 98 countries.

Amateurs who have contacted G3GRL in the past would be doing him a kind turn by sending him another QSL. His address is "Brookside," Watnall Road, Hucknall, Nottingham.

R.S.G.B. BULLETIN, SEPTEMBER, 1952.

## The Hendon Show

THE Edgware and District Radio Society made their first appearance in an exhibition with their stand at the Hendon Show, held this year in Hendon Park, Middlesex, between August 4th and 9th.

A station was operated on 145 Mc/s under the Society call sign, G3ASR/A, using equipment loaned by G3CWW, but due to considerable variation in line voltage, and the lack of activity during working hours, only eight contacts were made during the period. The heavy load taken by floodlights used in the marquees caused the supply to drop to about 200 volts in an area normally supplied at 240 volts. Electrical interference was not so high as was anticipated, but considerable audio interference was present in the form of cinema trailers exhibited on an adjoining stand!



The Mayor of Hendon (Alderman Sumpter) and his party visited the stand of the Edgware and District Radio Society at the opening of the Hendon Show last month. Also in the photograph are Bill Pope, G3HT and Bob Newland, G3VW (President and Hon. Secretary respectively, E.D.R.S.)

Distinguished visitors welcomed during the week included the Mayor and Mayoress of Hendon (Alderman and Mrs. Sumpter), the Chairman of Middlesex County Council; the Mayors of Willesden and Wembley and the Deputy-Mayor of Finchley; Charles Ian Orr-Ewing, M.P. (ex-G5OG); R.S.G.B. Council Members C. H. L. Edwards (G8TL), Jack Hum (G5UM), and F. G. Lambeth (G2AIW); the General Secretary (John Clarricoats, G6CL); Miss May Gadsden; and Lieut.-Col. Ashley-Scarlett, one-time Secretary of the now disbanded Golders Green and Hendon Wireless Society.

All equipment exhibited was constructed by members of the Society, a special feature being made of D/F gear. As is always the case when a new venture is made, many lessons were learned, and the Society hopes to benefit by this experience at next year's Show.

Special thanks are due to the members, several of whom gave up a week of their annual holiday, who staffed the stand between 11 a.m. and 10 p.m. each day. The attendance at the Show was almost 40,000 in spite of variable weather conditions.

Identify Yourself during Field Days

by Flying a

**R.S.G.B. PENNANT**

Large size 6/6; small size 5/6

(postage 3d. extra)

# COUNCIL PROCEEDINGS

*Résumé of the Minutes of the Proceedings at the Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Friday, July 4, 1952, at 6.15 p.m.*

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

**Apology.**—An apology for absence was submitted on behalf of Mr. T. L. Herdman, who was abroad on business.

## Certificate of Merit.

Colour trials of a new Certificate of Merit, for use by R.S.G.B. Town Groups and Affiliated Societies in connection with local contests, etc., were submitted and a design printed in green was approved.

## Membership.

Resolved:—

- to elect 47 Corporate Members and 27 Associates;
- to grant Corporate Membership to 3 Associates who had applied for transfer.

## Applications for Affiliation

Resolved to grant affiliation forthwith to the Aircraft Apprentices' Radio Club, No. 6 Radio School, R.A.F. Cranwell, and to the Radio and Electronic Society of the Hoffman Gloucester Athletic and Social Club.

## R.S.G.B. Amateur Radio Exhibition, 1952.

Resolved to dispense with a separate Exhibition catalogue and to publish, as in 1951, an eight-page supplement of exhibits and special exhibition advertisements in the November, 1952, issue of the BULLETIN.

## Discounts on R.S.G.B. Publications.

After several Members had expressed the view that dissatisfaction exists in certain parts of the country regarding the decision of the 1951 Council to allow trade discounts to Affiliated Societies and not to R.S.G.B. Town Groups it was resolved:—

- to rescind that part of the resolution adopted by the Council at its Meeting on October 16, 1951, which deals with trade discounts to Affiliated Societies;
- that the practice of allowing trade discounts to Affiliated Societies shall cease.

## London Headquarters' Club.

Resolved to defer, until the September, 1952, meeting, consideration of proposals put forward by Mr. A. Taylor for the setting-up of a London Headquarters' Club.

## License Matters.

It was reported that:—

- the G.P.O. is not yet in a position to state when the remainder of the 21 Mc/s band will be released to U.K. amateurs;
- the G.P.O. is not yet in a position to make a decision regarding the Society's request for the band 3635-3685 kc/s to be released to U.K. amateurs;
- the G.P.O. had agreed to hold a Radio Amateurs' Examination during October, 1952, in both London and Edinburgh provided sufficient applications are received. For the year 1953 the G.P.O. may be prepared, in addition, to hold an examination in one other centre most suitable for Welsh candidates.
- correspondence had been received from three members regarding the new portable and alternative address facilities. The Secretary had explained to the members concerned that the new facilities (which were granted after prolonged negotiations between the Society and the G.P.O.) have been framed with a view to assisting, not hindering, portable and alternative address operation and will be reviewed after 12 months. If, at the end of that period, it is generally felt that the facilities are too restrictive, the Society will, probably, reopen negotiations with the G.P.O.

## Mr. W. A. Scarr.

The Immediate Past President (Mr. W. A. Scarr, M.A.) advised the Council that he had been appointed British Council Representative for North-East India and would be sailing for Calcutta shortly.

The President, on behalf of his colleagues, congratulated Mr. Scarr on his new appointment and wished him success in his new sphere of activity. Mr. Scarr thanked the Council and intimated that he wished to donate to the Society a trophy for annual award to the Member who, in the opinion of the Council, has done the best work, in its widest international aspect, or to the Member who has given the most loyal and unselfish service to the Society. Mr. Scarr indicated that he did not wish the trophy to be awarded in connection with Society contests.

Resolved to accept, with thanks, the offer made by Mr. Scarr.

## Falkland Islands Dependencies.

Further to the correspondence reported upon at the May, 1952, Meeting of the Council (see p. 32 of the July, 1952, issue of the BULLETIN) the A.R.R.L. wrote to say that "our experts in the Department of State on this matter of sovereignties, have advised us that despite the claims of three nations (Argentina, Chile, and the United Kingdom) for the territory involved, the problem of national sovereignties of these portions of the Antarctic area is completely unresolved as of this time." As a result of this statement from their Department of State, the A.R.R.L. had decided that, rather than make some arbitrary decision in favour of one country or another, all amateur stations operating from the Falkland Islands Dependencies will be recognised for the time being. Resolved to receive the letter.

## Pakistan.

It was reported that the Director of Communications, Pakistan, had offered to look into the complaint of the Society that a Pakistan Broadcasting Station operates on a frequency within the exclusive part of the 7 Mc/s amateur band.

## Technical Committee.

Resolved to accept a recommendation of the Committee that for the current year the Norman Keith Adams Prize be awarded to Mr. D. N. Corfield and the Bevan Swift Memorial Premium to Mr. H. Whalley.

After receiving a report from the Honorary Treasurer on the financial position of the Society it was resolved not to accept a recommendation of the Committee that a new edition of "Service Valve Equivalents" be published.

It was reported that the Technical Committee had also dealt with a wide variety of other matters including questions of television interference, technical aspects of the amateur transmitting licence, BULLETIN contributions, equipment for the Amateur Radio Exhibition, Headquarters Station and the London lecture programme.

The Meeting terminated at 8.30 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, July 22, 1952, at 6 p.m.*

**Present.**—The President (Mr. F. Charman in the Chair), Messrs. H. A. Bartlett, C. H. L. Edwards, D. A. Findlay, J. H. Hum, F. G. Lambeth, R. Walker, P. W. Winsford and John Clarricoats (General Secretary).

Apologies for absence were submitted on behalf of Messrs. L. Cooper, T. L. Herdman, H. McConnell, A. O. Milne and W. A. Scarr.

## Purpose of Meeting.

The President explained that the Meeting had been called, primarily, to give consideration to recommendations put forward by the Regional Representatives at the Conference held on July 5, 1952, when a draft of the revised Articles of Association was presented.

## Decisions Reached.

The Council accepted a recommendation (Article 11) that Non-Corporate Members (Associates) shall be persons under 21 years of age.

The Council accepted a recommendation (Article 19) that an entrance fee of 10/- shall be charged in the case of Corporate Members.

The Council did not accept a recommendation (Article 19) that no entrance fee shall be charged in the case of a transfer from Non-Corporate Membership.

The Council resolved that a fee of 5/- shall be charged for transfer from Non-Corporate to Corporate Membership.

The Council did not accept a recommendation (Article 27) that a zonal representative need not necessarily reside in the zone which he is nominated to represent. The Council expressed the view that, in order to obtain fair zonal representation, it is essential for nominees to live among the Members they represent, and with whom they are in close contact. The Council considered that this arrangement would be more likely to produce the kind of representation which the membership has so long desired.

The Council did not accept a recommendation (Article 43) which would allow a zonal representative to reside outside the zone he represents.

The Council accepted a recommendation (Article 45) to delete the requirement that ballot papers shall be marked in ink.

The Council did not accept a recommendation (Article 45) to substitute "mark" for "cross" and to delete the words "with a cross."

The Council accepted a recommendation (Article 46) that in a zonal ballot a Member shall vote only for a zonal candidate nominated for the zone in which the voter resides.

The Council did not accept a recommendation (Articles 52 and 54) to insert the word "General" before "Secretary." The President pointed out that as it had been agreed to

dispend with the office of Honorary Secretary the need to differentiate in the Articles between the Honorary Secretary and the General Secretary had disappeared.

The Council accepted a recommendation (Article 62) to insert the word "Honorary" before "Treasurer."

#### *Present Memorandum and Articles of Association.*

Resolved that any Member who requires a copy of the present Memorandum and Articles of Association shall be charged the sum of one shilling.

#### *Staff.*

It was reported that only one application had been received for the position of Administrative Assistant.

Resolved to defer consideration of the appointment of an Administrative Assistant for the present.

#### *N.F.D., 1952.*

The Council adjudicated on a number of matters which had been brought to their notice by the Contests Committee as the result of examining the 1952 N.F.D. entries.

#### *D/F Contests.*

Resolved to pay the out-of-pocket expenses incurred by observers appointed by the Contests Committee to officiate at D/F Contests arranged by the Society.

The Meeting terminated at 8.45 p.m.

### **Representation**

The following are additions or amendments to the list published in the February, 1952, issue.

#### **Town Representatives**

##### **Region 3.—Worcestershire.**

Stourbridge.—F. A. Bills (G3CLG), The Pharmacy, Kinver, nr. Stourbridge.

##### **Region 7.—London South.**

Postal districts of S.W.2, 4, 8, 9, 11, 12, 17 & 18.—M. S. Thayer (G3HFK), 4 Lyham Close, Brixton Hill, S.W.2.

##### *London South-East.*

Eltham & Sidcup.—E. J. King (G3DCC), 109 Marlborough Park Avenue, Sidcup.

##### *London South-West.*

Dorking & Leatherhead.—W. J. Walsh (G3HZJ), 4 Meadowbrook Road, Dorking.

#### *Vacancies.*

Messrs. B. Wilbraham (G2ATV), N. G. Anslow (G4GD), R. J. Harvie and A. V. Greenwood (G3DCQ) have resigned as Representatives for the Towns of North-West Manchester and Barnes, Putney and Richmond, Brighton and Chingford respectively.

Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by October 15.

## **BRISTOL COUNTY MEETING SUNDAY, OCTOBER 5, 1952**

**GRAND HOTEL, BROAD ST., BRISTOL 1**

#### **Programme:**

Demonstration of the Philips Electron Microscope at the Royal Fort, Bristol University)\* - 11.0 a.m.

Assemble (at the Grand Hotel) 12 noon

Luncheon - - - 12.30 p.m.

Photographs - - - 2.00 p.m.

Business Meeting - - - 2.15 p.m.

Tea and Raffle - - - 4.30 p.m.

Model Aerials Demonstration by the President, Mr. Frederick Charman, B.E.M., G6CJ - 5.30 p.m.

Demonstration of High Fidelity Audio Equipment, by Goodmans Industries, Ltd. - 7.00 p.m.

Visit to B.B.C. West Regional Recording Studios - 8.00 p.m.

Tickets (11/6 each inclusive) may be obtained in advance from D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

\* Visitors requiring transport to the University will assemble at The Grand Hotel at 10.45 a.m.

## **HAMPSHIRE COUNTY MEETING SUNDAY, OCTOBER 12, 1952 POLYGON HOTEL, SOUTHAMPTON**

#### **Programme:**

Assemble - - -	12 noon
Lunch - - -	1.00 p.m.
Business Meeting - - -	2.15 p.m.
Tea - - -	4.30 p.m.

Tickets (10/6) from the C.R., Mr. E. R. Bassett, 42 Norham Avenue, Southampton, by not later than October 5.

## **WEST OF SCOTLAND REGIONAL MEETING**

**SATURDAY, OCTOBER 18, 1952.  
THE ICE RINK, FALKIRK**

#### **Programme:**

Assemble - - -	2.00 p.m.
Business Meeting (free and open to all Members) - - -	2.30 p.m.
Tea (informal) - - -	4.15 p.m.
Official Photograph - - -	5.30 p.m.
Dinner - - -	6.30 p.m.

Display of Equipment throughout day. Tickets (10/- each) from either O. M. Derrick (GM3OM), 261 Main Street, Larbert, or B. Fulton (GM4JQ), Kerton, Burnbrae Road, Falkirk, not later than October 13, 1952.

The President (Mr. F. Charman, B.E.M., G6CJ), Council Members H. A. Bartlett, C. H. L. Edwards, H. McConnell, the General Secretary (John Clarricoats, G6CL), and the Assistant Secretary (Miss May Gadsden) will be in attendance and expect to speak at the Business Meeting.

## ***Book the Date***

**LONDON REGIONAL MEETING  
SATURDAY, NOVEMBER 1, 1952**

**Cornwall House Refreshment Club, Cornwall House, Stamford Street, London, S.E.1.**

#### **Programme:**

Bar Open - - -	2.30 p.m.
Business Meeting - - -	3.30 p.m.
High Tea - - -	4.30 p.m.
Business Meeting - - -	6.00 p.m.
Entertainment - - -	7.00 p.m.

Tickets (6/6) now available from District, Town or Area Representatives.

## **BERKSHIRE COUNTY MEETING**

The Berkshire County Meeting which was due to take place in Reading on Sunday, September 28, 1952, has regretfully been cancelled due to lack of support.



# REGIONAL AND CLUB NEWS

## Brighton & District Radio Club

"Practical TV Construction," by Mr. Bannister, was the topic for the first lecture of the autumn season. Subjects of future talks include "Home-constructed Tape Recorders," by G. E. Brown (G2DBP) and R. J. Harvie (G2DRP), on September 30; "Studio Acoustics and Microphones," by Dr. Alexander of the B.B.C.; and a demonstration of the *Soundmirror* tape recorder by a representative of Thermionic Products, Ltd. Visitors and new members are welcomed at the Club Headquarters. *Hon. Secretary:* R. T. Parsons, 14 Carlyle Avenue, Brighton 7.

## Bristol

At the August meeting, which coincided with the opening of the Wenvoe television station, Cyril Blizzard, G3HSD, gave a talk entitled "Getting Started on 144 Mc/s." The proposed alteration to the N.F.D. rules was discussed and a resolution approved. At the next meeting Eric Chambers, G2FYT, will talk about his life as an amateur. Members are asked to note the County Meeting announcement appearing elsewhere in this issue.

## Cambridge & District Amateur Radio Club

A successful V.H.F. picnic was held recently in ideal weather, the event being supported by the families and friends of local members. G2XV operated portable on 2m with the aid of an aerial about ten feet high surrounded by trees. On September 26, M. T. O'Dwyer (G4MW) will talk on "V.H.F. Converters." *Hon. Secretary:* T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge.

## Coventry

The Group recently operated an Amateur Radio station at an Arts and Crafts Exhibition held in the recreation grounds of a local motor works. The station attracted much interest among visitors.

The Warwickshire pool of lecturers extended its activities when R. Palmer, G5PP, assisted by J. R. Tuck, G6TD, demonstrated 70cm technique at the recent Leicester and Rutland County Meeting. Local members are asked to note that the A.G.M. will be held on October 24.

## Coventry Amateur Radio Society

Attendances at the fortnightly meetings remain good in spite of the holiday season, and the winter programme is being prepared.

## Eastbourne

At a recent meeting attended by members from Bridgewater (Som.), Birmingham, Rutland, Croydon and East Molesey, an interesting informal talk was given by R.S.G.B. Vice-President, Leslie Cooper (G5LC), who was on holiday in Eastbourne. The next "Bucket and Spade Party" was discussed, and arrangements made to hold this function at Eastbourne on July 26, 1953.

## Eltham and Sidcup

Meetings are held at Holy Trinity Church Hall, Hurst Road, Sidcup, on alternate Mondays. Since the new premises are in a central position (3 minutes' walk from Sidcup station), it is hoped that more members will be able to attend. A "junk sale" will take place on September 22, and a number of technical lectures by representatives of commercial firms are planned for future meetings.

## Kingston & District Amateur Radio Society

Radio theory and Morse classes are held on Friday evenings. The future programme includes lectures on Transformers, Tape Recorders and Receivers. It is hoped soon to form a 2-metre group from among the Society's 72 members. *Hon. Secretary:* R. S. Babbs, B.Sc., 28 Grove Lane, Kingston-on-Thames.

## Lewes Model Engineering Club

A series of five talks on "The Principles of Television" has just been concluded. Meetings are held at Southover Grange, Lewes.

## Medway Amateur Receiving & Transmitting Society

Members of M.A.R.T.S. recently paid their annual visit to the Southend Amateur Radio Society. During the visit, which was a great success, thanks to the hospitality of the Essex amateurs, 50 persons had tea together, and the ensuing speeches, raffles and ragchew were enjoyed by all.

## Portsmouth & District Radio Society

"Reception and Transmission on Centimetre Wavelengths" is the subject of a lecture to be given by J. A. Hedges, G3DBV, on September 23. Meetings are held on

Tuesdays at 7.30 p.m. at Eastney Barracks, Portsmouth. *Hon. Secretary:* L. V. Shaw, 8 Belmont Street, Southsea, Hants.

## Purley & District Radio Club

On September 25, R. Herbert, G2KU, will talk on his recent visit to Monaco, where he operated as 3A2AL. At the following meeting (October 11) members are invited to bring along their lady friends and families for a social evening which will include games and raffles. Refreshments will be available. Visits to the B.B.C. station at Tatsfield are planned for October 12 and 19. *Hon. Secretary:* A. Frost, G3FTQ, 18 Beechwood Avenue, Thornton Heath, Surrey.

## Salisbury & District Short-Wave Club

The club team secured fourth place in the recent Romford Nocturnal D/F Contest. The club's "aerial farm" has been reorganised and now includes a 2-metre Yagi. Equipment is being constructed for the coming autumn contests. New members, especially local Servicemen, are always warmly welcomed. *Hon. Secretary:* V. G. Page, G3IVP, 32 Feversham Road, Salisbury.

## Slade Radio Society

At the meeting on September 26, J. N. Walker, G5JU, will lecture on "Two Metre Equipment." The Society, in conjunction with the Midland Amateur Radio Society, will take part in an Exhibition of Model Engineering to be held at Church House, Erdington, from October 2 to 4, at which it is hoped to operate an Amateur Radio station in addition to displaying amateur-built equipment. Visitors will be welcome at either the Exhibition or at Society meetings, which are held on alternate Friday evenings at Church House.

## Spenn Valley & District Radio & Television Society

After a successful summer season, the autumn session will open on September 24 with a social evening, concert party and free supper. Subsequent meetings will be held fortnightly at the Temperance Hall, Cleckheaton. Copies of the programme may be obtained on application to Norman Pride, 100 Raikes Lane, Birstall, Leeds.

## Thames Valley Amateur Radio Transmitters Society

At the August meeting the club welcomed the return of Major A. E. Eden, G3HAE, ex-VSICE, who spoke of his experiences—radio and otherwise—in Singapore. An unusual lecture was given recently by Rennie Emerson, a research engineer, on "Electronic Testing of I.C. and Jet Engines." Congratulations go to F. A. Binden, G8LX, who was awarded the M.B.E. in the recent Birthday Honours List. The Club President, Leslie Cooper, G5LC, much enjoyed the hospitality of the Eastbourne Group during his recent holiday in that town.

## Tops C.W. Club

The second annual "Topsfest" of the Tops C.W. Club was held last month at the headquarters of the Chester and District Amateur Radio Society. After tea the Chairman (R. Burns, G3GLV) welcomed the visitors, and the Hon. Secretary (P. Evans, GW8WJ) reported on the year's work, commenting on the steady growth of membership. For his Address, the President (A. Taylor, G8PG) chose the subject of "Past and Present Trends in C.W. Operating Techniques." J. Morris, G3ABG, then described the work of radio clubs in junior and modern secondary schools.

## Can You Help?

▲ E. H. Williams (G3DUC), 12 The Arrowery, Hanmer, Whitchurch, Salop, who requires circuit and modification details for the RU.19 TRF American Aircraft Receiver?

● Frank Wyer (G8RY), 23 Belton Street, Shepshed, Leics., who requires information on the mains conversion of the Wavemeter Type W.1191.

● R. F. G. Thurlow (G3WW), North House, Wimlington, Nr. March, Cambs, who requires practical advice on how either an ET.4432 or ET.4436 can be T.V.I.-proofed for the London or Birmingham areas—particularly the latter. G3WW uses an external Wilcox-Gay v.f.o. as he is on the fringe of the service areas covered by both stations.

● J. B. Armstrong (G3EJR), 40 The Oval, Mirehouse, Whitehaven, Cumberland, with service manuals on the R.1147A and B, and details of modifications for 2-metre working?

R.S.G.B. BULLETIN, SEPTEMBER, 1952.

# LETTERS TO THE EDITOR

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

## Screen Modulation

DEAR SIR.—Many of the statements in the article by Alan G. Dunn ("A Direct-Coupled Screen Modulator") in the July 1952 issue show an alarming lack of knowledge of the elementary principles of the modulation process.

(i) Any system of modulation, to be worthy of consideration, must theoretically be capable of distortionless modulation up to a reasonable percentage at least, and preferably to 100 per cent. It should be noted that this criterion does not preclude the deliberate use of pre-modulation audio distortion, when the spurious frequencies necessarily introduced are removed or considerably reduced before modulation takes place.

(ii) Any distortion of a waveform produces one or more harmonics, and if the resultant is used to modulate a carrier, the emitted signal must be broadened.

(iii) Over-modulation is only one of the many possible causes of "splatter" and in this case negative-peak clipping takes place at 100 per cent. modulation; but negative-peak clipping at any level of modulation is a gross distortion of the modulating signal and is bound to produce severe splatter.

(iv) Negative-peak clipping, introduced asymmetry, or any other form of distortion, must be followed by a low-pass filter to remove the high-order harmonics produced in the distortion process, and so prevent them from modulating the carrier. This filtering is impracticable where the clipping takes place in the modulated stage itself as pure over-modulation, "clamp-tube modulation," incorrectly adjusted "super-modulation," or G3PL's circuit.

(v) The "width" of a modulated signal depends only upon the highest audio signal producing modulation, whether that frequency is present at the microphone, or whether it is the result of distortion of a lower frequency.

Any departure from true linearity anywhere in the microphone—speech-amplifier—modulator—modulated-stage chain must lead to splatter, regardless of the measured percentage of modulation.

(vi) An experimental low-power transmitter following G3PL's circuit, modulated with a sine-wave at 1,000 c/s, produced detectable sidebands out to 15 kc/s each side of the carrier frequency, when set for 70 per cent. negative modulation and 110 per cent. positive modulation. In terms of speech waveforms, such a signal would produce considerable splatter locally out to at least 60 kc/s each side of the carrier frequency, i.e. a bandwidth of 120 kc/s. Even at considerable distance—reduction in field-strength, this would be a very "anti-social" signal.

(vii) Terminologically, "super-modulation" and "controlled-carrier modulation" are not synonymous.

Paragraph (v) above is, may I dare to suggest, worthy of study by those who maintain that plenty of "top" in transmission "cuts through QRM." A "toppy" transmission does not "cut through"; by taking up an unnecessary and unfair amount of room it splatters round the QRM—which is, after all, another contact with equal claim to frequency space.

To maintain the high standard of technical excellence shown in the BULLETIN in the past, I would suggest the consideration of the desirability of setting up a small Technical Sub-Committee to examine articles submitted for publication.

Yours faithfully,

DESMOND M. DOWNING, M.B., D.R.C.O.G. (G13ZX)  
Belfast, N. Ireland.

[Editorial Note: Whilst Dr. Downing's comments are technically true in that any distortion produces a broader signal, many readers may feel that he is exaggerating the effects in practice. The system of modulation described by Mr. Dunn can be linear if the modulation is kept very low. If a high level is essential, more elaborate and expensive gear must be built to cover it. It is doubtful if many transmitters on the air, when fully modulated by 1,000 c/s tone, would produce no detectable sidebands at 15 kc/s off the carrier; what matters is how many decibels "down" these sidebands are. All technical articles are examined by members of the Technical Committee before being accepted for publication.]

DEAR SIR.—In the August issue, Mr. Bagley said some unkind words about clamp-tube modulation which should not be allowed to go unchallenged. First, clamp-tube modulation is a poor man's way of getting on 'phone; it is ideal for the occasional 'phone operator who does not feel inclined to invest in bulky and expensive high-power audio equipment. Second, given suitable valves and operating conditions, more than 80 per cent. of linear modulation can be achieved, with little distortion and over-modulation or spreading as was inferred.

The writer has used, for the past two years, a push-pull 807 p.a., clamp-tube modulated by a 6L6. Initially, there were the usual teething troubles, but now that the correct operating conditions have been arrived at, the system works very satisfactorily. Many stations have expressed great surprise when informed of the modulation system being used. The circuit is similar to the one described on page 46 of the

March, 1950, issue of QST, and no controlled-carrier effect is intended. Linear modulation up to 85 per cent. has been obtained with this circuit.

It has been stated that the only simple thing about clamp-tube modulation (and there is a great deal of truth in this) is the circuit diagram. While much less critical as regards aerial loading than Taylor "Super-modulation," nevertheless, more care must be taken with this point than in the case of anode modulation. As to the choice of valves—a single 807 with a 6V6, or two 807s with a 6L6, have proved suitable.

I should be interested to know whether Mr. Bagley has tried this type of screen modulation for himself, or whether he objects on purely theoretical grounds.

Yours faithfully,

N. A. S. FITCH, G3FPK.

Leyton, London, E.10.

DEAR SIR.—I have read with interest Mr. Bagley's letter published in the August issue. To avoid writing a long screed containing mostly what has been said more ably elsewhere, I would refer Mr. Bagley to the excellent and most comprehensive article by Frank C. Jones in, I think, the January, 1952, issue of CQ. I do not agree that the system of modulation (which I have now been using for nearly four years on 160 metres with no complaints from local amateurs about a broad transmission or splatter) is unsuitable for amateur use. I am prepared to offer technical reasons as well as practical results if required.

Regarding the term "Super-modulation," the sense in which I recall seeing the term used was to describe the Taylor system, or a variation of it, in which the unmodulated carrier level was lower in amplitude than the effective carrier during modulation. This is the sense in which I used the term in my article. Whether the term should be used in this way (referring to the modulated signal) or with reference to a circuit or method of producing the modulated signal, is a matter of opinion.

I would like to point out that amateur telephony transmissions consist mostly of speech, which is far from sinusoidal in waveform, so that one must avoid drawing conclusions from tests made with sinusoidal signals, and applying them without modification to the case of speech wave-forms.

Yours faithfully,

ALAN G. DUNN, G3PL.

Hull, Yorks.

## Skybeams, Moonbeams and Howitzers

DEAR SIR.—I refer to Mr. Catt's letter in the August issue. The impression I gain is singularly unfortunate.

(i) Your correspondent mentions "calculations that are purely theoretical." I think most of us are already aware that calculation is almost synonymous with the application of theory.

(ii) The suggestion that the same units should be used where possible throughout the article is perhaps justifiable; it is, however, an easy error to make, and criticism might well be levelled at the "proof-reader" here.

(iii) Mr. Sollom surely quotes the absence of D/F bearings as a natural corollary, and it seems to me that Mr. Catt's "proof of a proof" is superfluous.

(iv) I found plenty of snags with ribbon feeder more than ten years ago, and I doubt if Mr. Sollom will find it difficult to explain his objections. I did not notice any suggestion in the original article that 2,000-ohm line was necessary, and therefore your correspondent's remarks about such a horror are irrelevant.

(v) I should have thought that the wish to obtain gain in certain directions and to use power "to its maximum" (whatever that means) was not peculiar to amateurs. I fail to see why the shape of the polar diagram of an aerial should change with the power input. Can that be Mr. Catt's suggestion?

If your correspondent should claim that I have incorrectly interpreted his remarks, then he must lay himself open to the same charge as he appears to be levelling at Mr. Sollom.

To conclude, Mr. Sollom's article may not be perfect, but it is worthy of more constructive criticism than that of Mr. Catt, whose remarks do not seem to give much encouragement to contributors to our BULLETIN.

Yours faithfully,

W. B. J. HACKNEY.

Camberwell, London, S.E.5.

[Editorial Note: Mr. Paul Sollom has also contributed a very lengthy reply to Mr. Catt's letter which it is hoped to publish later in the form of an article.]

## Mullard Photocells

The Communications and Industrial Valve Division of Mullard Ltd. announce that, due to improved manufacturing methods, the list prices of their range of photocells for industrial purposes have been greatly reduced. As a typical example, the type 20CG, originally £3 10s., is now £1 15s. Further details may be obtained from Mullard Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

## Speedy Recovery

To Ken Rogers, G3AIU, energetic Hon. Secretary of the Thames Valley Amateur Radio Society, who is now convalescing after a serious spinal operation.

## Around the Trade

Standard Telephones & Cables Ltd have recently issued a number of application reports for *Brimar* valves, containing detailed information on the operation and measured performance of current valves and cathode-ray tubes, together with typical circuits and design data.

The reports are available to the public generally on payment of an annual subscription of 20/-, the service including all new reports as issued, data on new valves, and the provision of special binders as necessary. Additional or separate copies of individual reports are available at a cost of 2/6 or 5/- each, depending on the size. All enquiries should be addressed to Publicity Dept., Standard Telephones and Cables Ltd. (Radio Receiving Valve Division), Footscray, Kent.



The Axiom 150 12" high-fidelity loudspeaker

A booklet containing comprehensive technical information about the Axiom 150 12-inch High Fidelity Loudspeaker (illustrated above) is now available on request from the manufacturers, Goodmans Industries Ltd., Axiom Works, Wembley, Middlesex. In addition to specifications, details of frequency response and performance, and other technical data, the booklet also contains plan and elevation diagrams for the construction of suitable corner reflex and bass reflex cabinets to house the speaker.

Copies of *The Raca Review*, an illustrated brochure describing the activities of the Raca Organisation in the field of radar, communications and electronics, may be obtained on application from Roles and Parker Ltd., 160 Cheapside, London, E.C.2.

Bruce Barrett (G3DZU), of Bury, Lancashire, has been appointed Production Manager of Panda Radio Ltd., Rochdale.

## New Books

**SOUND RECORDING & REPRODUCTION.** By J. W. Godfrey and S. W. Amos, B.Sc., Engineering Training Dept., British Broadcasting Corporation. Page size 8½ in x 5½ in. 271 pages, 165 illustrations. Published for "Wireless World" by Iliffe & Sons, Ltd. Price 30/-.

Although written primarily as an instruction manual for the use of B.B.C. engineers, this book will be of considerable value to all interested in the technique of sound recording. The authors have had the collaboration of M. J. L. Pulling, M.A., K. R. Sturley, Ph.D., B.Sc., and P. J. Guy.

The principles of electrical recording and reproduction are first set out clearly and fully. Disc recording is then dis-

cussed, with a detailed description of the B.B.C. and American Presto equipment now in operation in British broadcasting services, followed by chapters on the reproduction of discs and pressings and the processing of discs. The principles of magnetic recording are next explained, with descriptions of the Marconi-Stille, Magnetophon and E.M.I. magnetic systems. The book then deals with recording on film and describes the Philips-Miller film equipment. Appendices contain a generous amount of reference information and a wealth of photographs and diagrams, including many useful graphs.

While the emphasis throughout is on B.B.C. equipment, no student or sound engineer concerned with high-quality recording can fail to find the book of interest, filling, as it does, a noticeable gap in telecommunications literature.

**ALTERNATING CURRENT IN TELECOMMUNICATIONS.** By W. T. Palmer, B.Sc.(Eng.). Page size 7¼ in x 5 in. 36 pages, 41 diagrams. Published by Pitman. Price 4/-.

The author has undertaken the rather difficult task of providing an introduction, without the use of mathematics, to the fundamental part which alternating current plays in telecommunications. He also explains in a simple manner how several aspects of telecommunication circuit practice are dependent upon a.c. for their operation.

A brief study of mechanical oscillation is followed by a detailed description of the methods used to produce alternating current. Electrical oscillation is explained and amply illustrated.

The last chapter describes a number of practical applications ranging in scope from voice-frequency telegraphy to "wide-band" carrier systems.

Recommended to the student who is anxious to obtain a sound introduction to telecommunications theory. The diagrams are excellent.

## FORTHCOMING EVENTS.—(Continued from page 90).

**Gillingham (G.T.S.).**—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.  
**Isle of Thanet (I.O.T.R.S.).**—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.  
**Worthing (W. & D.R.C.).**—October 13, 8 p.m., Adult Education Centre, Union Place.

### REGION 9

**Bath.**—September 21, October 20, 7.30 p.m., Y.M.C.A., Broad Street.  
**Bristol.**—September 19, 7.30 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.  
**Exeter.**—October 3, 7 p.m., Y.M.C.A., 41 St. David's Hill.  
**North Devon.**—October 2, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.  
**Penzance.**—October 2, Railway Hotel.  
**Plymouth.**—September 20, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.  
**Torquay.**—September 20, 7.30 p.m., Y.M.C.A., Castle Road.  
**West Cornwall.**—September 18, October 2, "Fifteen Balls," Penryn.  
**Weston-super-Mare.**—October 7, 7.30 p.m., Y.M.C.A.  
**Yeovil.**—Wednesdays, 7.30 p.m., Grove House, Preston Road.

### REGION 10

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

### REGION 13

**Edinburgh (L.R.S.).**—September 18, October 2, 16, 7.30 p.m., Edinburgh Chamber of Commerce, 25 Charlotte Square.

### REGION 14

**Falkirk.**—September 26, October 10, 7.30 p.m., The Temperance Cafe, High Street.



A group picture taken at the Yorkshire County Meeting held in York on June 15th, 1952. Front row, G3YK, 5UM, 6CL, 6KU, 4DC, 4LX, 4JW and 31V.

[Photo, J. Clegg, G3FQH]

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FIG. 1: Not engraved



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		2 ozs.	4 ozs.	2 ozs.	4 ozs.	2 ozs.	4 ozs.	2 ozs.	4 ozs.
16	.064	1/4	2/-	1/4	2/-	1/4	2/-	1/4	2/-
17	.056	1/4	2/1	1/4	2/1	1/4	2/1	1/4	2/1
18	.048	1/4	2/2	1/4	2/2	1/4	2/2	1/4	2/2
19	.040	1/4	2/3	1/4	2/3	1/4	2/3	1/4	2/3
20	.036	1/5	2/4	1/5	2/4	1/5	2/4	1/5	2/4
21	.032	1/5	2/5	1/5	2/5	1/5	2/5	1/5	2/5
22	.028	1/6	2/6	1/6	2/6	1/6	2/6	1/6	2/6
23	.024	1/7	2/7	1/7	2/7	1/7	2/7	1/7	2/7
24	.022	1/7	2/8	1/7	2/8	1/7	2/8	1/7	2/8
25	.020	1/8	2/9	1/8	2/9	1/8	2/9	1/8	2/9
26	.018	1/8	2/10	1/8	2/10	1/8	2/10	1/8	2/10
27	.0164	1/9	2/11	1/9	2/11	1/9	2/11	1/9	2/11
28	.0148	1/9	3/-	1/9	3/-	1/9	3/-	1/9	3/-
29	.0136	1/10	3/1	1/10	3/1	1/10	3/1	1/10	3/1
30	.0124	1/10	3/2	1/11	3/5	2/-	3/6	2/4	4/2
31	.0116	1/11	3/3	2/-	3/6	2/1	3/7	2/5	4/4
32	.0108	1/11	3/4	2/1	3/8	2/1	3/8	2/7	4/8
33	.010	2/-	3/5	2/2	3/10	2/3	3/11	2/10	5/2
34	.0092	2/-	3/6	2/3	4/-	2/4	4/2	2/11	5/4
35	.0084	2/1	3/7	2/4	4/2	2/6	4/5	3/1	5/8
36	.0076	2/1	3/8	2/6	4/5	2/7	4/8	3/3	6/-
37	.0068	2/2	3/10	2/2	4/7	2/11	5/6	3/5	6/4
38	.006	2/3	4/-	2/3	5/6	3/4	6/2	3/7	6/8
39	.0052	2/4	4/2	2/10	5/2	—	—	3/10	7/2
40	.0048	2/5	4/4	3/-	5/6	4/7	8/2	4/1	7/8
41	.0044	1/6	per oz.	1/9	per oz.	—	—	2/3	per oz.
42	.004	1/9	—	—	—	—	—	2/6	—
43	.0036	2/3	—	—	—	—	—	3/-	—
44	.0032	3/-	—	—	—	—	—	4/-	—
45	.0028	4/-	—	—	—	—	—	5/6	—
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17	1/6	1/6
18	1/6	1/6
19	1/6	1/6
20	1/6	1/6
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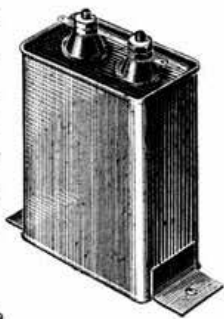
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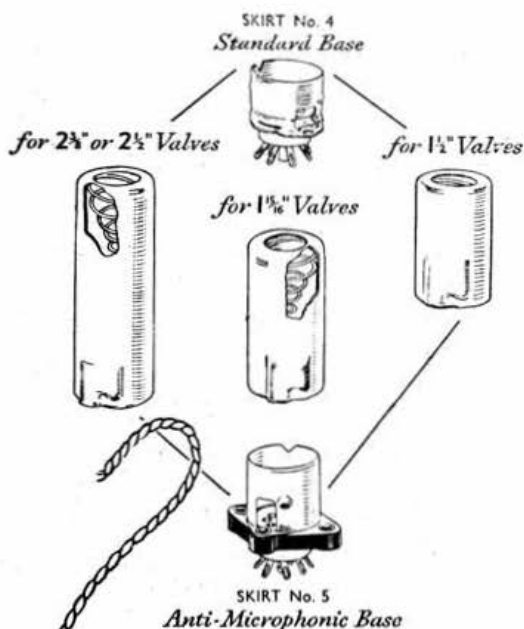
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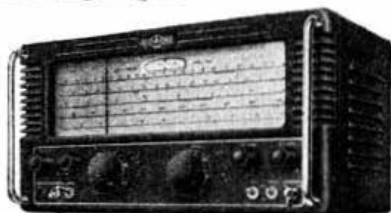
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**AMPLIFIERS.** 15 watts, Marconi type 6, using 2-PX25, MHL4, rack mounting, complete with power pack, 200 to 250 V. 50 c/s., meter, etc., less valves, £6. Carriage 10/-.

**SLOW-MOTION DIAL** with vernier 200-1 reduction, front of panel mounting, 6" diam., calibration 0-100, 5/6 each. Post 1/-.

**MICROAMMETERS.** D.C., 100-0-100, 2 1/2" flush, 40/-; 0-100 with scale marked in yards, which can easily be rewritten, 39/6; 0-50 American Westinghouse make, 90/-.

**MILLIAMMETERS.** 0-200 or 0-250, 2 1/2" flush, 12/6.

**ELECTROSTATIC VOLTMETERS.** 0-2,000, 2 1/2" flush, 40/-.

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**VALVES.** Guaranteed, tax included, Government surplus.

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5U4G	8/6	955	6/-	H63	6/6
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6AC7	5/6	7475	10/6	L63	6/6
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6K7G	8/6	CV1001	6/6	S130	10/6
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6U5G	10/6	EA50	3/6	V872	6/-
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6X5G	9/6	EC52	6/6	V197	6/6
12K8GT	12/6	EC54	6/6	6SN7GT	10/6
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# EXCHANGE AND MART SECTION

**ADVERTISEMENT RATES.** Members' Private Advertisements 2d. per word, minimum charge 3/-; Trade Advertisements 6d. per word, minimum charge 9/- (Write clearly. No responsibility accepted for errors.) Use of Box number 1/6 extra. Send copy and payment to **National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4**, by 25th of month preceding date of issue.

**A** MATEUR moving—must clear. .5μF 450 V tubular. 2s. doz. 1143 10 Mc/s i.f. transformers. 1s. 6d. each. .0001 2,500 V Micadon. 3s. 2d. doz. 12.5/40 μμF butterfly variable. 1s. 3d. each. New, unused. S.A.E. lists.—G3DSK, Oakfield Cottage, Moat Road, East Grinstead. (573)

**A** MATEUR requires APA 6 or 10, tuning units TN1, TN2, TN3, TN4, TU56, TU57, TU58, TU59, BC455 in good condition less valves, R1392 crystals 100 and 1000 kc/s bars and 3070 in FT243 holder. Leach, 35 Homecroft Road, Sydhams, London. (603)

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

**A** RMY set No. 12; 1.2 Mc/s to 17.5 Mc/s 110 or 220 V 50 c/s a.c. 40 W c.w. 20 W phone. Internal v.f.o. or crystal. Diagram. £18 plus carriage. Box 604, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London E.C.4. (604)

**A** R.77 (two), good condition, together with other equipment. Receivers £15 and £25 each.—Box 571, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (571)

## IMPORTANT NOTICE

All replies to Box Nos. should be sent to the NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4.

**A** R.88D model, perfect condition, also spare valves, £55.—Box 563, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (563)

**B** ARGAINS.—Columbia electric record player, auto-stop, polished cabinet, as new, £12 10s. Mazda 12 in. TV tube, CRM121A, in original carton, with guarantee, £14. Resistance colour code indicators, disc type, 9d. each, per gross £3 10s. 12 W amplifier, p.p., PX4s, with mains unit and valves, £7 10s. 25 W c.w. transmitter (requires 0-100 mA), 6V6 6L6, coils 20 and 40, crystal 7026, £3. Eddystone AW2, mains version with open scale dial, £2. 0-2 mA d.c. meter, £1. Several 10 in. and 12 in. records, 1939, little used, 1s. 3d. each.—G2DPH, Bennington, Dean Row, Wiltshire, Cheshire.

**B.2** transmitter and receiver with coils, etc., £11. 832s 20s., 523s, 5s. S.A.E. details, G3AGQ, Gornedon, Salisbury. (570)

**C** COMPLETE transmitter for sale. M.O.P.A. 3-stage modulator. Power pack. Standard chassis. First-grade components. £15.—MATTHEWS, 14 Emmanuel Road, Sutton Coldfield, Warwickshire. (600)

**C** R.100/2, condition as new, with speaker and spare valves, £30. 10-metre three-element rotary beam, all brass, on wood lattice mast, sound job, £25. G62 Admiralty pattern wavemeter, nine valves, crystal oven, £10. TS.313 transmitter, as new, with complete set of coils, spare valves, £8. Naval power pack, 500 V-250 V, £6. Naval superhet receiver, inclusive speaker, modified 160 m, 20 m, £5. National Multi-vibrator power pack in black crackle, 6 V to 180 V, as new, £7 10s.—G2JG, 24 Headley Drive, Ilford, Essex. (579)

**E** DDYSTONE 358, complete coils, 1.250 kc/s to 31 Mc/s, and valves. Good condition. What Offers? Buyer collects.—STANDLEY, 26 Queen's Avenue, Blackhall, Edinburgh. (558)

**E** XCHANGE for radiogram: 00 model railway or what have you? 4-tier 150 W transmitter and quantity gear.—Box 560, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (560)

**E** XCHANGE 1947/50 "QST," "Short Wave Magazine," 50 issues each, for "CQs," or "what have you?" 1,100 V 400 mA transformer with chokes and condensers, 30s. Buyer collects.—23 Nora Avenue, Dundee. (590)

**F** OR SALE.—CR.100, black cracked, fitted full-vision dial, electrical handspread, "calibrated," EF5, 4 r.f. stages, AR.88 noise limiter, "S" meter, speaker to match, controls engraved, £30 or offer. BC.221D, stabilised power supply, fitted 500 μA visual resonant indicator, in new case, 14 in. x 9 in. x 9 in., black cracked, engraved, charts, £18. T.V.I. harmonic monitor, 100 μA meter, etc., 50s. Absorption meter, all bands, switched, Q-max coils, meter, indicator, 'phone monitor, 50s. Transformers, double 500-0-500, 200 mA, £2. 650 V 250 mA, 5 V, 4 V and 6.3 V, £2. Chokes, valves, meters, etc. Send for lists. Wanted.—"Monarch" autochanger.—RUSSELL, 39 Kingsway, Ashton, Preston, Lancs. (597)

**F** OR SALE.—AVO oscillator (battery type) No. B369-947; offers invited.—A. FOWLER, Roadside Cottage, Birse by Aboyne, Aberdeenshire. (552)

**F** OR SALE.—BC.221 wavemeter, nearest £17 10s. 2 new 832s with bases, £2 pair. CV67 with cavity, £1. Wolf Quartermaster drill, £7 10s. or offers.—PROCTOR, Oak House, Prestbury, Cheshire. (592)

**F** OR SALE.—A complete amateur station, the property of the late Norman Deadman, G3EWD, consisting of a professionally built 150 W all band transmitter mounted in a 6 ft. rack, black crackle finish, all circuits metered, v.f.o. and crystal control, 813 in final, SX.28 receiver and speaker, in perfect condition. Dynamic microphone on plated stand, Emdo 10-metre beam with indicator. Price £120 the lot or reasonable offer. Would consider separating.—Full particulars on receipt of S.A.E. from JOHN KANE, 23 Oaklands Avenue, Oxhey, Herts. (Telephone Gadebrook 2300.) (587)

**F** OR SALE.—H.R.O. Senior, coils, power pack, speaker, £19; QSer, £2 10s.; d.c. AVO, £3, Lancs area.—Box 593, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (593)

**F** OR SALE.—H.R.O. Senior c.w., P.S.V., matched speaker. Coils 0.48/0.96, 14/30 Mc/s. No crystal. Prefer buyer arrange collection. £20.—H. S. MARTIN, 6 Teesdale Road, Catterick Camp, Yorks. (591)

**F** OR SALE.—The whole station of the late G6XS: v.f.o.—BA-PA 50 W transmitter; receiver AR.77, brand new, with manual; BC.221 frequency meter and various other components, valves, keys, bug key and assortment of useful equipment. Meter power packs, etc. What offers? Write or see by appointment.—MRS. F. CROPPER, "Garth," King's Road, Ashton-under-Lyne, Lancs. (555)

**G** REY rack transmitter, modified 1131, black crackle panels, TZ40s final, two-stage exciter, i.v. and h.v. packs, modulated two TZ40s, has W.A.Z.; no reasonable offer refused. Eddystone 358X, all coils, £17 10s., with power pack £20. 4 813s, 50s. each, unused, unboxed. Bases 7s. 6d. Plate transformer, 230 V input, 1,800-0-1,800 V, 600 mA, 90s. Two chokes for the above, 27s. 6d. each. 1132a v.h.f. receiver, tuning requires modifying; a bargain, 40s. ZB2 unit with acorn valves, 30s. SCR.522 transmitter, less modulation transformer, etc., 15s. Command transmitter with new valves, 25s. Rack and panels, approximately 5 ft. high, 26 in. wide, 15 in. deep, 20s. Modulation transformer, 813s into 813s, 30s. Co-ax, 1 in. diameter, 80 ohms in 100 yd. coil, 60s., or in part. Preference to those who collect.—3 Summer Avenue, East Molesey, Surrey. (Telephone Embrook 2185.) (572)

**H** ALLICRAFTERS Skyriders (super) 11-valve. Elect bandspread, 550 kc/s-35 Mc/s in 5 bands. Crystal filter, p.p., 6L6 output, lined up, tested and recommended, £27 10s. 9 Priory Crescent, Wembley. (ARNOLD 7516.) (577)

**H** AM offers £40 for AR.88; £15 for BC.221. Also requires boxed valves. Will collect.—Box 490, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (490)

**H** AM requires transmitter, receiver and BC.221 frequency meter. Collection arranged.—Box 497, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (497)

**H**. R.O. Senior, as new. Power pack, 6 coils. All amateur bands covered, £26. H.R.O. Junior, as new. Rack mounted. Complete with rack. Power pack, 8 coils. All amateur bands covered and medium wave. £25.—ROSE, 70 Schneider Road, Barrow-in-Furness, Lancs. (596)

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

**M** ODULATION multi-match transformer, suitable modulating high power, £1 10s. Also Hallicrafters SX.16, £48, nice condition.—47 Zoar Street, Gornal Wood, Nr. Dudley. NATIONAL H.R.O. (type) receiver, 4 bandspread coils, 160, 80, 40, 20, crystal "S" meter, power pack, etc. Offers. Will consider exchange for BC.348, cash adjustment.—G3JXL, 7 Newland House, Avignon Road, London, S.E.4. (New Cross 6032.) (589)

**O** SCILLATOR unit, type 76, 98 to 152 Mc/s, £3. Sprague condensers, 1 plus 1 μF, 1,000 V working, 1s. 3d. each. Screened r.f. chokes (stripped) from 1155 b.f.o.s. 1s. each. Test set, 210, as new £15.—Phone LEY 7572. LIVERMORE, 256 Grove Green Road, Leytonstone, E.11. (598)

**P** ATENTS 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)

**Q** RT complete 'phone transmitter, £12. SCR.522 transmitters R.3084A receiver, R.1116A receiver. Class "C" wavemeter. Tuning and coupling units. Components. 813, 832 and other valves. Write requirements, S.A.E.—G3BUB, 61 Broomleaf Road, Farnham, Surrey. (Farnham 5662.) (557)

**Q** SLs and log book (P.M.G. approved); samples free. State whether G or BR5.—ATKINSON BROS., Printers, Elland. (97)

**Q** SLs by The Sudbrook Press combine highest quality with low cost. Stamp for samples.—SUDBROOK PRESS, Prestwood, Bucks. (561)

**R** ECEIVERS: ASB8 converted to 70cm £10. National 1-10, £10. RME 5-10, £20. G5LJ, Butler, 32 Pilkington Avenue, Sutton Coldfield, Warwick. (605)

**R**. F. UNIT for sale, 6L6-807, complete standard chassis, £5.—MATTHEWS, 14 Emmanuel Road, Sutton Coldfield, Warwickshire. (601)

**R** ME.69 with 6AK5 r.f. stage, phone monitor, crystal, "S" meter, etc.; modified by research engineer, £28.—Hillside 1550. 75 Queen's Avenue, London, N.20. (554)

**R** OMAC personal receiver, new condition, £10. 20 W Broadcast Ltd., corner-type loudspeaker in special cabinet, £12.—FULLARTON, "Rowallan," Saltcoats, Ayrshire. (612)

(Continued on Page 132)



## EXCHANGE and MART SECTION

(Continued from Page 131)

**R.** 1132A receiver, £2 10s. (buyer collects). 78 receiver, less crystal calibrator, £1 10s. Various valves, components, etc. S.A.E. for list.—G3GSS, 44 Gores Lane, Formby, Liverpool. (585)

**R.** 1294, good condition, working order, £25 or nearest offer. Instruction manual loaned.—B.R.S. 18537, 41 Hansol Road, Bexleyheath, Kent. (586)

**S.** SALE: complete station Transmitter, Radiocraft B/switched transmitter. Crystal osc./pa. 3.5, 7, 14 and 28 Mc/s; RF: 6AG7/6L6; Mod: 6J7, 6J5, 6L6; and new, only used twice; with valves; £20. 160 metre using same valves plus 524 230V p/p; slight adjustment needed to pa; less valves; £7. Both transmitters in T.U. size cases. Class "D" wave-meter, good condition £5. Box 607, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (607)

**SELLING UP.**—CR.100 (B.28), excellent condition. CR.100 (B.28) chassis only, repair required. National (RBJ-HRO) rack mounted with power unit and full set coils. Triumph model 830 oscilloscope wobblator, slight repair necessary. Hickok model 550X multi-test and valve-test meter. Weston E.665 selective analyser, E.692 oscilloscope, combined carrying case. Instruction manuals supplied with all the above items. Weston 665 selective analyser, 664 capacity meter. American models in carrying case. Marconi TF.340 output meter. 250 V Wee Megger. —Offers to B.R.S. 3127, Park House, Donyatt, Ilminster, Somerset. (584)

**SEVERAL** high-speed relays needed for radio controlling two models.—WILKENS, (B.R.S. 6735), 270 Central Avenue, Southend-on-Sea, Essex. (565)

**TYPE 45P** Radiocraft transmitter for sale, complete with valves and coils for 40 m. Nearest £10. Wanted.—1082R with full set coils and in working order.—WILLIAMS, 9 Hylton Drive, Cheadle Hulme, Cheshire. (564)

**USED** valves from 1s. each. All soiled but tested and O.K. Popular 4 V, 6 V and a.c./d.c. types. Please send S.A.E. for list.—ADAMS, G2YN, 70 Shaftesbury Road, Wilton, Salisbury. (581)

**VALVES.**—Guaranteed 832s, 12s, 6d.; 6V6Gs, 5s, 6d.; 5U4Gs, 6s, 7 Mc/s crystals, complete, 5s. TZ40, 10s, each.—Box 575, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (575)

**VALVES**, unused, in original carton: 832, 22s, 6d.; 1616, 6F12, 6F33, 6L7, 807, 6X5, VR105, VR150, ECH42, 6V6GT (5), 6C4 (2), 7s, 6d.; 801, 12A6, 6D2, EZ2 (s.c.), D41, 12SH7, EF22, 9001 (4), 9002 (3), 9003, 5s. Used, good condition: 6AK5 (6), 6J6 (5), 7s.; 6AG5 (2), 6SN7 (2), 5s.; 6SL7 (2), 6SA7, 12A6, 6J5, 3s.; VR56 (5), VR67, VR100 (2), VR135 (2), VR136, VR137, VT60A, MH41, 12SJ7 (3), 12SK7 (4), 6H6 (4), 6SK7, 78 (2), 2C26, 1s, 6d. Postage extra. SCR, 522 panel with meter, crystal for 2 metres and mains power pack, crystal-controlled 2 metre converter and 6-element rotary beam, all working, £10.—G. ELDER, 25 Strathmore Road, Hamilton, Scotland. (602)

**WANTED.**—BC.610 Hallicrafters, ET.4336 transmitters, SX.28s, AR.88s, receivers and spare parts for above. Best prices.—Write Box 864, SPIERS SERVICE, 82 Centurion Road, Brighton, Sussex. (595)

**WANTED.**—B.2 transmitter/receiver with p.p. complete; prefer model for 160; must be in tip-top order.—G4OT. (553)

**WANTED.**—Dural tubing for three-element 20-metre beam, prop-pitch motor, T.1131 m.c.w. unit, H.R.O. crystal. For sale.—T.1131 r.f. p.p., less valves.—Offers to GM3AYR, North Queensferry, Fife. (559)

**WANTED** from Leicester or near, Hamander, 640 or similar with 10 metres.—Particulars and price to MARKLEY, 105 Oxendon Street, Leicester. (580)

**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.**—Instruction manual for Marconi receiver CR.100; buy or borrow.—B.R.S. 17389, 25 Lancotbury Close, Totterhoe, Dunstable, Beds. (588)

**WODEN** swinging choke, 150 mA, £1. Eddystone 958 dial, 13s, 6d. 3 Eddystone transmitter coil forms with plug bases and base, £1. 8 QRO ceramic rotary switches as used in GSRV transmitter, 10s, each. 2 50  $\mu$ F transmitting variables, 5s, each. Eddystone 595 dials, 3s, each. 3 Weston 150 mA meters, 2 in. square, 10s, each. 1 Weston 0-1 mA, 2 in. round, 12s, 6d. Ceramic valve holders, 4 and 5-pin American, 9d. 7-pin ceramic, English, 1s. Ceramic Octal, 10d. Raymont 6 and 7-pin coil forms, 1s, 6d. 2 Dubilier 4  $\mu$ F, 2,000 V, oil filled, 15s, each. 1 Woden UM3, £3. 1 Woden UM2, £2. Raymont midget variables, 15  $\mu$ F 2s, 6d., 60  $\mu$ F 3s, 120  $\mu$ F 4s, 6d. Eddystone RFC.1022, 2s. 2 grey crackle louvered cabinets to take 19 in. x 9 in. panel, less panels, 30s, each. All above goods are new and unused. The following slightly used goods: 807s, 7s, 6d, each. 2 803s, 30s, each. 400-0-400, 100 mA, 15s. 5-0-5, 9 A, 10s. T.C.C. 4  $\mu$ F, 2,000 V working, 10s. 2 B.T.H. Selsyns, less brushes, 30s, each. 1 VCR138 with base, unused, £1. 300 mA swinging choke, 15s. 330 mA 10 H choke, £1. 250 mA 10 H choke, 15s. Kindly add postage when remitting.—READ, G6US, The Flagstaff, Llyncllys, Oswestry. (551)

**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, W.6.

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

**WANTED.**—Two complete B.2 transceivers with original p.p.s and spares, also steel transit cases. Reasonable offers.—Box 578, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (578)

**WANTED.**—"Wireless Worlds" to complete binding set: 1941, October, November; 1942, May; 1943, September, December.—CITY LIBRARIAN, Central Library, Bradford, Yorkshire. (566)

**YOUNG** "Apprentice Ham" wishes to exchange Hornby Dublo electric train set in first-class condition (cost £18) for communications receiver in good working order.—Box 583, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (583)

**45/-** EACH offered for new boxed 813s. Other new surplus valves purchased for cash.—Send details to Box 582, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (582)

## APPOINTMENTS SECTION

CROWN AGENTS FOR THE COLONIES

**(A) DIESEL—ELECTRIC MECHANIC** (M.29389.B.) and **(B) WIRELESS OPERATOR MECHANIC** (M.29387.B.) required for the Falkland Islands Dependencies Survey for one tour of 18 or 30 months in the first instance. Salary according to qualifications and age in scale £250 rising to £415 a year. Duty allowance of £40 a year. Quarters, subsistence, clothing and liberal routine canteen stores are provided free of charge while serving in Dependencies; it is possible for officers to save almost all emoluments. Liberal leave on full salary. For both posts candidates should preferably be single. For post (A) they must possess a general working knowledge of electricity, and be capable of running and maintaining small diesel generating sets with associated switch-boards, accumulators etc. For post (B) candidates must be able to transmit and receive morse at 25 words a minute (plain language or code) and be capable of elementary maintenance of wireless transmitting and receiving 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 the reference number against the appointment for which application is made. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (606)

**WIRELESS STATION SUPERINTENDENT** (temporary) required by the Gold Coast Government Posts and Telegraphs Department for two tours of 18 to 24 months in the first instance. Commencing salary, according to qualifications and experience in the consolidated scale 1955 rising to £1,180 a year, with gratuity of £25 or £37 10s, according to salary, for each completed period of three months' service. Outfit allowance £60. Liberal leave on full salary. Free passages. Candidates must possess a Higher National Certificate in Electrical Engineering or equivalent, and have had practical experience in two or more of the following fields: v.h.f. link systems; h.f. communication network; frequency shift keying and teleprinter maintenance; v.h.f. and h.f. direction-finding systems; aeronautical navigation aids (ground); manufacture of light engineering equipment. Apply at once by letter, stating age and 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 N.29100.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (556)

**DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.**—Applications are invited for an unestablished Experimental Officer post in the Radio Research Organisation at Teddington, Middlesex, for abstracting scientific and technical articles on radio research and development. Candidates should possess a Higher National Certificate or equivalent qualifications and have a considerable knowledge and experience of some branch of radio research or development. The ability to read technical French and German would be useful but not essential. The salary range for men is at present £628-£786. Candidates should be at least 26 and preferably under 31, but older candidates are not excluded. Forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26 King Street, London, S.W.1. Quoting Ref. D 268/52A. (567)

**P.O. Radio/Radar Mechanic** desires progressive post from May. Preferably in or around North London area. Experienced servicing, aligning, testing usual equipment, including v.h.f. gear, Marconi type S.W.B. transmitters, little experience SSB freq. shift gear, teleprinters, etc.—Box 576, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, E.C.4. (576)

**McMICHAEL** Radio Ltd. require experienced radio technicians for the inspection, testing and servicing of Government radio and electronic equipment.—Apply to Personnel Officer, Wexham Road, Slough. (377)

**WANTED** for North London District. —Capable Radio Engineer to take charge of production and testing of Quartz Crystals for Radio Frequency Control.—Write full particulars, salary, etc., to Box 545, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (545)

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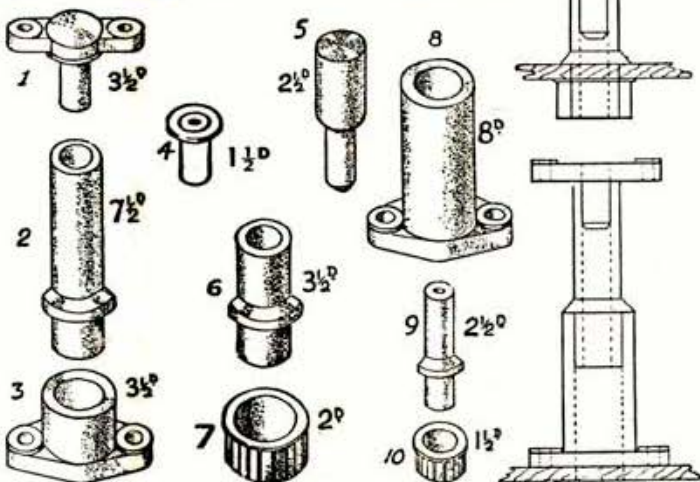
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